Islamic Republic of Afghanistan
Ministry of Public Health
General Directorate of Preventive Medicine
Public Nutrition Directorate

Integrated Management of Acute Malnutrition
National Guidelines

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Foreword

The Public Nutrition Directorate (PND) of Ministry of Public Health (MoPH) through the technical support of UNICEF and nutrition partners revised the Integrated Management of Acute Malnutrition (IMAM) Package comprises of guidelines and operational guidelines/ job aids.

From 1996 onwards, multiple interventions strengthened the management of acute malnutrition in Afghanistan. In 2003, when the PND was established, UNICEF and WHO supported the development of national Severe Acute Malnutrition (SAM) guidelines to standardize treatment. In 2008, the PND introduced Community based Therapeutic Care (CTC) and revised the guidelines to include outpatient care.
Subsequent revisions of the CMAM and IMAM guidelines in 2010 and 2014 further improved the acute malnutrition treatment protocols. The 2010 revision added outpatient care and the 2014 revision aligned the treatment protocols with the 2013 WHO Update on SAM evidences.

The health actors involved in the management of acute malnutrition had identified gaps in the latest 2014 IMAM guideline, and a comprehensive review of the guidelines was being suggested in-order to further contextualize and adopt the guideline in different level of service delivery points.

Hence, in 2017 PND with the support of UNICEF hired an international IMAM expert to revise the IMAM package based on scientific evidences, international experience, update WHO recommendation and contextualize the guideline for Afghanistan.

The consultant with the support of Afghanistan`s IMAM technical working group members conducted an in-depth literature review, field review, situation analysis and revised the IMAM package accordingly.
The revised IMAM package will assist health agents (managers and care providers) in the management of acute malnutrition in community based and health facility based primary care and secondary care. The MoPH is pleased to urge implementation of this document as national guideline through all levels of health system for combating the problem of malnutrition in Afghanistan.

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Acknowledgements

Ministry of Public Health (MoPH) acknowledges with all gratitude the substantial technical contribution of those who involved in the harmonization, standardization and revision of Integrated Management of Acute Malnutrition (IMAM) package (guideline, operational guideline and job aids).

The Public Nutrition Directorate (PND) of MoPH would particularly like to thank the leadership of MoPH for continuous support and inspiration. The MoPH also thanks to UNICEF and especially to Ms. Hedwig Deconinck, international IMAM expert for the technical support and expertise in revision of IMAM package.

The MoPH also thank to assigned task force members of IMAM (WHO, WFP, UNICEF, MEDAIR, ACF, AADA, AKHS, SCI, RMNCH, CBHC, GCMU), BPHS/ EPHS implementing NGOs, nutrition cluster and all partners who involved in the revision process. Health professionals especially the paediatric specialists from Indragandi, Maiwand and Ata Turk hospitals contributed to the revision and integration process. The MoPH thank them for their efforts.

MoPH would like to thank Ms. Piyali Mustaphi and Ms. Jecinter Oketch from UNICEF for providing strategic advices throughout the process of revision of IMAM package. Also we thank Dr. Shafiqullah Safi from Public Nutrition Directorate and Dr. Ahmad Nawid Qarizada from UNICEF for providing substantial technical and managerial support and for getting all pieces of work together to develop this fundamental package.

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Abbreviations and Acronyms

ART	Antiretroviral therapy
AWG	Average weight gain
BHC	Basic health centre
BPHS	Basic package of health services
CBHC	Community-based health care
CBNP(S)	Community-based nutrition package (services)
CHC	Comprehensive health centre
CHS	Community health supervisor
CHW	Community health worker
CMV	Combined mineral vitamin mix
DH	District hospital
EPHS	Essential package of hospital services
EPI	Expanded Programme for Immunisation
ER	Emergency room
ETAT	Emergency Triage Assessment and Treatment
FHA	Family Health Action (group)
FBNS	Facility-based nutrition services
Hb	Haemoglobin
HIV	Human immunodeficiency virus
HMIS	Health management information system
HP	Health post
HSC	Health sub-centre
IMAM	Integrated Management of Acute Malnutrition
IMNCI	Integrated Management of Neonatal and Childhood Illness
IM	Intramuscular
IV	Intravenous
IPD	Inpatient department
IYCF	Infant and young child feeding
L	Litre
LAZ	Length-for-age z-score
LOS	Length of stay
MAM	Moderate acute malnutrition
MCH	Mother and child health
MHNT	Mobile health and nutrition team
MN	Micronutrients

MOPH	Ministry of Public Health
MUAC	Mid-upper arm circumference
NCC	Nutrition Cluster Coordination
NG	Nasogastric
OPD	Outpatient department
ORS	Oral rehydration solution
PCV	Packed cell volume
PCR	Polymerase chain reaction (test)
PH	Provincial hospital
PLW	Pregnant or lactating woman
PND	Public Nutrition Directorate
RDT	Rapid diagnostic test
ReSoMal	Rehydration solution for malnutrition
RH	Regional hospital
RUSF	Ready-to-use supplementary food
RUTF	Ready-to-use therapeutic food
SAM	Severe acute malnutrition
SHC	Sub health centre
SOP	Standard operating procedures
SST	Supplemental suckling technique
TB	Tuberculosis
UNICEF	United Nations Children's Fund
WAZ	Weight-for-age z-score
WFP	World Food Programme
WHO	World Health Organization
WHZ or WLZ	Weight-for-height (length) z-score; Weight-for-length z-score

Introduction to the Guidelines

Purpose

The *Guidelines for the Integrated Management of Acute Malnutrition (IMAM)* of the Ministry of Public Health (MOPH) Public Health Directorate (PND) are a tool to assist health agents (managers and care providers) in the management of both severe acute malnutrition (SAM) and moderate acute malnutrition (MAM) care and services in community-based and health facility-based primary care and secondary care. A child with acute malnutrition undergoes profound physiological and metabolic changes. For this reason, specific guidance is required for the management of the condition and its associated complications. The Guidelines promote standardised case management of acute malnutrition in an efficient and cost-effective manner. Adherence to the Guidelines significantly contributes to reducing mortality from acute malnutrition. Local adaptations may be considered, but these should be made in collaboration with and with the consent of the MOPH.

Target Audience and Use

The Guidelines are intended for use by health managers and health workers, including nutrition officers and counsellors and community health workers, who are supported by the required level of training and resources to manage and perform the services safely and effectively. Education institutions that teach students or new graduates joining the health workforce may use the Guidelines as a training manual. The Guidelines will also help scale up or strengthen acute malnutrition services during emergencies by using the standardised treatment protocols established by the MOPH.

Content and Organisation

The 2018 Guidelines are updated with the latest evidence and best practices, and a strengthened integrated approach adapted to the context of Afghanistan by complementing and referencing existing health and nutrition initiatives and approaches and policies. Complementary information is provided in the **Annexes**. Essential tools for the implementation of the Guidelines are provided in the **Appendices. Forms**

and Registers are presented at the end of the document, and all are referred in the text. Guidance on the following topics was newly added to strengthen efforts to achieve integrated and comprehensive child-centred healthcare:

- The management of uncomplicated SAM in infants under 6 months of age in outpatient care;
- The management of acute malnutrition in emergencies;
- The organisation of care at the community, health facility and provincial levels; and
- The management of severe malnutrition in school-aged children, adolescents and adults (as an annex).

The chapters of the Guidelines are colour-coded for easy reference:

1. Principles of the Integrated Management of Acute Malnutrition in Afghanistan
2. Diagnosing Acute Malnutrition
3. Community Outreach for the Integrated Management of Acute Malnutrition
4. Management of MAM and Uncomplicated SAM in Children 6–59 Months of Age
5. Management of Complicated SAM in Children 6–59 Months of Age
6. Management of Uncomplicated and Complicated SAM in Infants under 6 Months of Age
7. Management of Moderate Malnutrition in Pregnant and Lactating Women
8. Involving Mothers in Care
9. Management of Acute Malnutrition in Emergency Situations
10. Organisational Management of the Integrated Management of Acute Malnutrition

Chapter 1. Principles of the Integrated Management of Acute Malnutrition in Afghanistan

This chapter describes the various forms and causes of malnutrition, the burden and intervention strategies, principles of the integrated management of acute malnutrition (IMAM) approach and how it is integrated into the national health system of Afghanistan.

1.1 Forms of Malnutrition

Malnutrition comprises undernutrition and overnutrition [2]. Undernutrition is the result of insufficient intake or absorption of proteins, carbohydrates, lipids, vitamins, minerals and other nutrients essential for health and adequate growth. Undernutrition may result from inadequate food intake or disease, causing a nutrient imbalance or malabsorption, increasing nutrient requirements or invoking nutrient losses [3]. Overnutrition is the result of excess intake of nutrients, and includes overweight and obesity. In these *Guidelines*, the term 'malnutrition' relates exclusively to undernutrition.

There are several forms of undernutrition:

- **Acute malnutrition** is characterised by a rapid deterioration in nutritional status over a short period, resulting in nutritional oedema, wasting, or nutritional oedema and wasting combined.
- **Nutritional oedema** is an abnormal infiltration and excess accumulation of fluid in the body, identified by bilateral pitting oedema.
- **Wasting** is sudden weight loss through loss of body fat and muscle tissue, identified by low body fat and muscle tissue in the mid-upper arm or inadequate weight for length or height.
- **Stunting** is characterised by growth retardation resulting from chronic undernutrition, identified by inadequate length or height for age.

- **Underweight** is a combined indicator of nutritional status, reflecting both chronic and acute malnutrition, identified by inadequate weight for age.
- **Micronutrient deficiencies** are the result of inadequate intake, absorption or utilization by the body of a specific vitamin or mineral and encompass a wide range of symptoms and disorders, identified by clinical examination or biomedical tests (see the *National Guidelines on Micronutrients* [4]).

Acute malnutrition includes moderate acute malnutrition (MAM)–defined by moderate wasting–and severe acute malnutrition (SAM)–defined by nutritional oedema and/or severe wasting. The presence of anorexia or poor appetite and medical complications are clinical signs indicating the severity of disease progress and classifies SAM in uncomplicated and complicated SAM. The terms marasmus (severe wasting), kwashiorkor (nutritional oedema) and marasmic-kwashiorkor (severe wasting and nutritional oedema combined) are used to describe the clinical manifestations of SAM. All different forms of undernutrition can appear isolated or in combination, but most often overlap in one child or in a population.

1.2 Pathophysiology and Consequences of Malnutrition

Malnutrition is a process that occurs over time resulting from an imbalance in essential macro- and micronutrients. The pathophysiological responses to nutrient depletion place children with acute malnutrition at increased risk of infections and of life-threatening complications that lead to increased risk of death. Because of the profound physical and metabolic changes, the health of a child with acute malnutrition may rapidly deteriorate over a short period. Specific treatment of the condition and its associated complications is required.

Management of acute malnutrition in children aims to restore the metabolism by correcting the electrolyte balance to reverse metabolic abnormalities and restore organ function, and to provide nutrients for catch-up growth. Because of the pathophysiological changes that accompany acute malnutrition, acutely malnourished children often do not present with the typical clinical signs of infection seen in sick children without malnutrition, such as fever. Consequently, children need specific assessment and treatment protocols for the management of acute

malnutrition and underlying infections or associated disease. Misdiagnosis and inappropriate treatment and feeding will contribute to slow convalescence and increased risk of death. Adherence to these *Guidelines* in their entirety is critical. **Annex 1** provides a comprehensive overview of the pathophysiological changes seen in acute malnutrition.

Malnutrition overall can have short-term and long-term consequences on health and development for the individual and the society (**Table 1.1**). Short-term consequences are increased risk of infection and death, and long-term consequences affect health, motor and cognitive development, health status and economic productivity.

Table 1.1. Consequences of malnutrition for health and development

	Health consequences	Motor and cognitive development consequences	Economic consequences
Short-term	Increased risk of premature death Increased risk of infectious diseases such as diarrhoea, pneumonia and measles	Delayed motor skills (sitting, standing and walking) Delayed cognitive development (learning)	Health costs
Long-term	Increased risk of overweight later in life with associated higher risk of hypertension, coronary heart disease, stroke and type II diabetes Higher risk of complicated labour and retarded foetal growth	Delayed cognitive and language ability at 5 years of age Impaired learning in school Lower score in development tests and school performance	Lower aerobic capacity affecting physical work Reduced likelihood of formal employment 10% lower earning than non-stunted individuals 1% loss in adult height due to childhood stunting associated with 1.4% loss in economic productivity

1.3. CAUSES OF MALNUTRITION

Malnutrition is a disease caused by the interaction of many factors. The UNICEF conceptual framework for malnutrition (**Figure 1.1**) shows the relationship among these causal factors, which are divided into *immediate causes*, *underlying causes* and *basic causes.* These factors interact differently in a community than in individuals in the community [5].

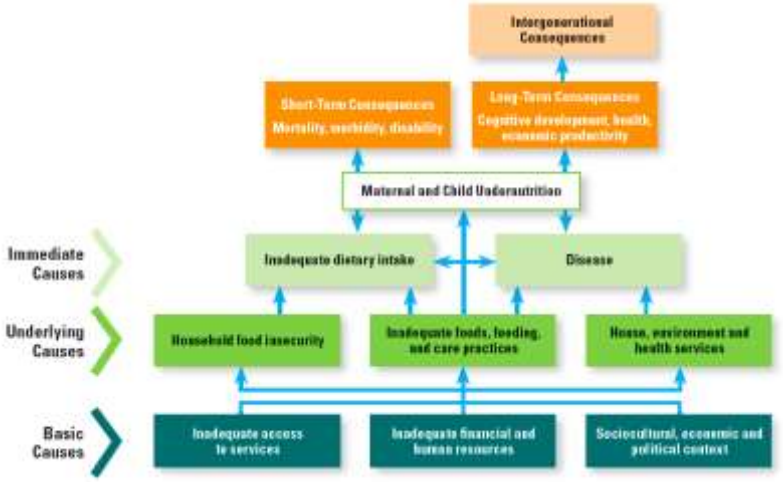


Figure 1.1. Conceptual framework for malnutrition

Immediate causes of malnutrition

The immediate causes of malnutrition affect individuals. Inadequate food intake (the quantity and quality of food required to provide adequate amounts of nutrients for health and growth) and disease are inextricably linked. Poor food intake may disturb biochemical processes, decreasing the function of every organ in the body. The reduced function of body systems may lead to the onset or worsening of other disease conditions. Infection may directly increase nutritional requirements because fever elevates body temperature and increases the rate of utilisation of nutrients. Vomiting and diarrhoea may adversely affect the absorption, utilisation and availability of nutrients because food does not pass through the gut in the usual way.

Underlying causes of malnutrition

Other factors may affect the immediate causes of malnutrition. These underlying causes are usually seen at the household or community level. Adequate dietary intake for an individual is not possible if the food available in the household does not provide the diet needed to avoid malnutrition. Food insecurity exists when not all people at all times have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. [1] Inadequate dietary intake may also result from inadequate child or maternal care. For example, a child under 6 months of age may not be exclusively breastfed, or older infants may not receive adequate complementary feeding. Inadequate child healthcare may also cause disease. For example, a child may not be vaccinated against preventable diseases or household hygiene practices may be inadequate. Adequate and accessible vaccination services or proper hygiene facilities may not be available. An inadequate public health environment also contributes to the likelihood of infection or other diseases, ultimately leading to malnutrition.

Basic causes of malnutrition

The underlying causes of malnutrition may be related to other factors beyond the control of individuals and often communities. These factors include the international and national economy and national health and education infrastructure, which may make it difficult for a country to provide

the health or education services required to prevent disease or provide education on eating a healthy diet.

1.4. Malnutrition Burden and Intervention Strategies —The First 1,000 Days

The nutrition situation in Afghanistan is characterised by high levels of wasting and stunting, with high variation across and within provinces. In 2013, the national prevalence rate of wasting was 9.5% (with 4.0% severe wasting)[7], and the national prevalence rate of stunting 40.9%. In 2015, severe wasting was estimated to affect about 600,000 children[2] under 5 years of age in Afghanistan. Levels of micronutrient deficiencies are high, with iodine deficiency prevalence at 30% in children and 40% in women of childbearing age, iron deficiency prevalence at 26% in children and 24% in women of reproductive age and vitamin A deficiency prevalence at 50% in children and 11% in women of reproductive age [8].

Evidence has shown that poor nutrition during the first 1,000 days from pregnancy through a child's second birthday can cause life-long and irreversible damage, with consequences at the individual, community and national level. A child that is malnourished during the first 1,000 days of life has a weaker immune system and a higher risk of severe infectious diseases, including diarrhoea and pneumonia. When malnourished children become adults, they are more likely to suffer from chronic diseases such as high blood pressure, diabetes, heart disease and obesity. These health impacts have devastating consequences for social and economic outcomes. Poorly nourished children are more likely to complete fewer years of school and earn 10% less over their lifetimes than their well-nourished peers [6]. Poor nutrition multiplied across an entire nation can reduce economic advancement by at least 8% from direct productivity losses and losses resulting from poorer cognition and reduced schooling. **Figure 1.2** [8] shows how undernutrition repeats itself generation after generation, also known as the intergenerational cycle of growth failure [9].

[2] Based on the 2013 National Nutrition Survey and updated population figures.

Figure 1.2. Intergenerational cycle of growth failure

By improving nutrition, a country can build human capital and fuel economic growth for generations to come. However, improved nutrition can only have a full impact when all sectors do their part, as indicated in the UNICEF conceptual framework in **Figure 1.1** [2, 6]. Solutions to improve nutrition in the 1,000-day window are available, affordable and cost effective. Nutrition-specific interventions, such as the management of acute malnutrition, address the immediate causes of undernutrition (dietary intake and disease) and some of the underlying causes (feeding practices and public health services). Nutrition-sensitive interventions address some of the underlying and basic causes of malnutrition by addressing nutrition goals and actions in a wide range of sectors [2, 6, 10]. In Afghanistan, the *National Public Nutrition Strategy* [2] outlines both nutrition-specific and nutrition-sensitive interventions, which are coordinated by the *Nutrition Programme Coordination Committee* and supported by two multi-sectoral policy documents [11, 12]. **Table 1.2** gives an overview of nutrition-specific interventions provided in the health sector in Afghanistan.

Table 1.2. Nutrition-specific interventions delivered through the health sector in Afghanistan

Intervention	Description	Target population
Community-based and facility-based preventive nutrition interventions		
Growth monitoring	Creating awareness and monitoring nutrition status (surveillance)	Children 0–23 months of age
Infant and young child feeding (IYCF) and maternal nutrition including counselling, education and food demonstration	Improving care and feeding practices and behaviour change for optimal breastfeeding and complementary feeding and maternal nutrition	Children 0–23 months of age and their mothers or carer
Screening and referral for acute malnutrition	Early detecting acute malnutrition	Children 0–59 months
Micronutrient interventions		
Vitamin A supplementation	Preventing vitamin A deficiency with preventive doses in bi-annual campaigns	Children 6–59 months of age
Deworming	Preventing iron deficiency anaemia with presumptive treatment in bi-annual campaigns	Children 12–59 months of age
Iron and folic acid supplementation	Supplementing and counselling during antenatal care	Pregnant women
Micronutrient powder (MNP) in-home fortification of complementary foods	Providing home-fortification of micronutrients (2 months dosage) in bi-annual campaigns	Children 6–23 months of age (6–59 months in provinces with severe anaemia)
Weekly iron and folic acid supplementation (WIFS)	Providing weekly iron and folic acid to prevent anaemia before pregnancy	Adolescent girls 10–19 years

Zinc supplementation with ORS	As part of diarrhoea management with oral rehydration salt (ORS)	Children under 5 years of age (not in treatment for SAM)
Salt iodisation	Iodization of centrally processed salt	General population
Food fortification	Fortifying edible oil (vitamins A and D) and wheat flower (iron, folic acid, vitamin B12, zinc)	General population
Integrated management of acute malnutrition	Creating community awareness and involvement for referral, and diagnosing and treating MAM and SAM	Children under 5 years of age and pregnant and lactating women (PLW)
Nutrition information (surveillance, monitoring and surveys)	Assessing and monitoring nutritional status and performance of interventions	Children under 5 years of age and PLW

1.5. The IMAM Approach In Afghanistan

In Afghanistan, SAM in children was managed in therapeutic feeding units of the paediatric ward until 2008 when outpatient care was introduced to address the high caseloads when a ready-to-use therapeutic food (RUTF) was made available. Subsequently, a comprehensive IMAM approach allowed the treatment of uncomplicated SAM in children in primary care, and of complicated SAM until stabilisation in secondary care. The paradigm shift enabled to decentralise, scale up and integrate IMAM services and offer these as routine child health services. Key elements for IMAM to be effective and cost-efficient are to generate awareness of acute malnutrition in communities and detect acute malnutrition early. As such, children and pregnant and lactating women (PLW) with acute malnutrition will be identified and referred to start treatment as outpatients before complications develop and hospitalisation is needed, and effectiveness coverage will improve (affected children are cured).

IMAM aims to reduce mortality and morbidity in children under 5 years of age due to acute malnutrition and associated disease. The specific objectives of the IMAM approach in Afghanistan are:

- Generate community awareness on the causes and consequences of acute malnutrition and encourage treatment uptake, and involve communities in care
- Detect and treat acute malnutrition in children under 5 years of age to reduce mortality and morbidity and sustain their nutritional status after cure
- Detect and treat acute malnutrition in PLW with infants under 6 months of age
- Contribute to the prevention of stunting in young children in the critical 1000-day window

IMAM services

The IMAM approach in Afghanistan targets children under 5 years of age and PLW with an infant under 6 months for treatment because of their vulnerability and the integrity of the mother-child nucleus, and includes the following components:

- Community outreach for community awareness and involvement, and early detection and referral
- OPD-MAM for the treatment of MAM in children 6–59 months of age and in PLW
- OPD-SAM for the treatment of uncomplicated SAM in children under 5 years of age
- IPD-SAM for the treatment of complicated SAM in children under 5 years of age

Key principles of the IMAM approach (**Box 1.1**) mirror the guiding principles of the *National Nutrition Policy and Strategy [2]* and the *National Reproductive, Maternal, Newborn, Child and Adolescent Health (RMNCAH) Strategy* [13]:

Equity of access: Ensure equity by having full coverage of essential actions and services to save the lives of mothers, newborns and children through expanded coverage and access to improved quality of critical lifesaving interventions, especially for the rural and the poor.

Quality of care: Improve the quality of critical lifesaving interventions of RMNCAH services.

Effectiveness: Use interventions of proven effectiveness for each of the major causes contributing to maternal, newborn, child and adolescent mortality and morbidity in Afghanistan.

Scale-up: Apply the critical lifesaving interventions nation-wide by extending services outward to reach the population where they reside.

Affordability and sustainability: Efficiently use limited resources so RMNCAH services are cost-effective and ultimately sustainable with available resources.

Integrated approach: Provide comprehensive integrated care through RMNCAH services that are made available to all by merging activities at the various platforms by which maternal, newborn, child, adolescent, birth spacing and family planning, nutrition, immunization, and other aspects of primary health care are delivered.

Continuum of care: Connect RMNCAH services that are provided at the different levels from the household to the community, the primary care facilities and secondary hospital services by an effective referral system.

IMAM as a public health approach targets children under 5 and PLW, but **Annex 5** provides guidance on the management of severe malnutrition in other age groups for in case the needs arise.

Box 1.1. Key principles of the Integrated Management of Acute Malnutrition

- Empowering communities by make them aware about the causes and severity of acute malnutrition, why and how to prevent, the need for treatment in case of illness and where to seek care, and how to involve in the care process.
- Active case finding in the community and routine case finding in health facilities improve early access to treatment and coverage and avoid missing opportunities.
- Early detection of illness and referral for treatment ensure that treatment starts before the onset of complications, which simplifies treatment and improves treatment outcome.
- Differential diagnosis ensures that affected children receive the right comprehensive treatment focuses on their health needs and expectations (of the mother or carer) rather than on disease.
- Providing decentralised services closer to the homes of vulnerable populations improves access to care.
- Aiming for good quality of care by adhering to the *Guidelines* and being responsive to the child and mother's needs to retain children in treatment until full recovery, which improves treatment outcome and avoids relapse.
- A referral system traces affected children in the community and across services and in time, which assures continuity of care.
- Opportunities to promote and support optimal infant and young child care and feeding for children and pregnant and lactating women are considered at all times, including support for e.g., early childhood development and psychosocial needs.
- Children and mothers or carers are mostly from vulnerable households and are linked with community initiatives to improve health, nutrition, dietary diversity and social protection to break the cycle of ill health and alleviate poverty.
- Support from technical officers from the Ministry of Public Health may be sought when required or when considering context adaptations.

1.6. Health System Organisation

IMAM services are part of the Integrated Management of Neonatal and Childhood Illness (IMNCI) approach [14] of the Basic Package of Health Services (BPHS) [15] in primary care and of paediatric hospital care [16] of the Essential Package of Hospital Services (EPHS) [17] in secondary (and tertiary) care to ensure the continuity of RMNCAH.

The 'integrated' management of acute malnutrition in Afghanistan underlines the comprehensive and integrated child-centred healthcare approach that promotes a continuum in time and place from prevention to cure of any health need. IMAM services are aligned with national strategies and guidelines of associated care and are either merged or linked with existing health and nutrition activities. Activities are organised as follows:

Community health workers (CHWs) run their health and nutrition activities from the health post situated in their home and through community contact and home visits. Mothers or carers of children under 2 are encouraged to attend monthly growth monitoring, infant and young child feeding and maternal nutrition sessions at the health post and health facilities where children under 5 years of age and PLW are screened for acute malnutrition for early start of treatment. CHWs and their supervisors (community health supervisors (CHSs) engage with community groups and opinion leaders to create awareness and stimulate involvement.

Mothers or carers of children under 2 are also encouraged to attend monthly growth monitoring, infant and young child feeding and maternal nutrition sessions at the respective health centres where children under 5 years of age and PLW are also screened for acute malnutrition for early start of treatment. Any contact with the health system should use the opportunity to identify acute malnutrition.
At the health sub-centres, treatment of MAM is provided if OPD-MAM is functional and SAM pre-treatment is provided before referring the affected children to the closest OPD-SAM. Health workers of Basic Health Centres, Mobile Health and Nutrition Teams or Comprehensive Health Centres, District Hospital, Provincial Hospitals or Regional Hospitals screen and assess the children's condition, and start treatment of MAM and uncomplicated SAM and refer complicated SAM to IPD-SAM. After a period of stabilisation in IPD-SAM provided at the local hospitals, these children are referred back

to their primary care facility of origin to continue treatment in OPD-SAM until they have fully recovered. Mother and Child Health clinics screen PLW for malnutrition, provide treatment in OPD-MAM and refer severe malnutrition cases for further investigation. The communities, health centres and hospitals maintain communication links to track referral and movement of children and their mothers or carers between services.

Health managers at health facility or district and province level plan and organise care, provide supplies and equipment, and supportive supervision, and monitor service quality. They should also prepare for contingencies and surge capacity in case of emergency situations to strengthen existing services or expand services to uncovered areas.

Figure 1.3 shows how the components of the IMAM approach are being provided in community- and facility-based healthcare linking with the respective nutrition services. **Figure 1.4** maps IMAM implementation in the health system. **Table 1.3** gives an overview of IMAM activities by key staff involved at the various levels of the health sector and regulated by the BPHS in primary care and EPHS in secondary (and tertiary) care.

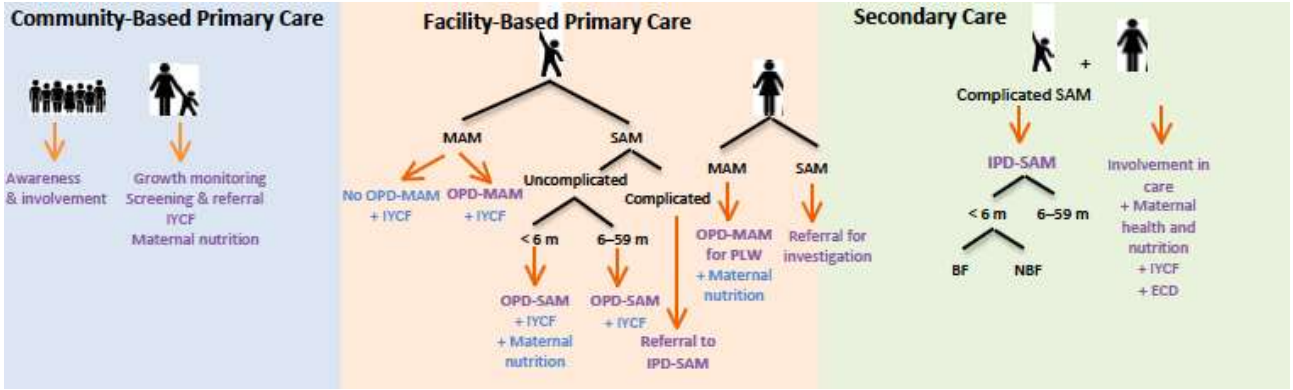


Figure 1.3. Components of the IMAM approach

BF = breastfeeding, IPD = inpatient department, IYCF = infant and young child feeding, NBF = non-breastfeeding, MAM = moderate acute malnutrition, OPD = outpatient department SAM = severe acute malnutrition.

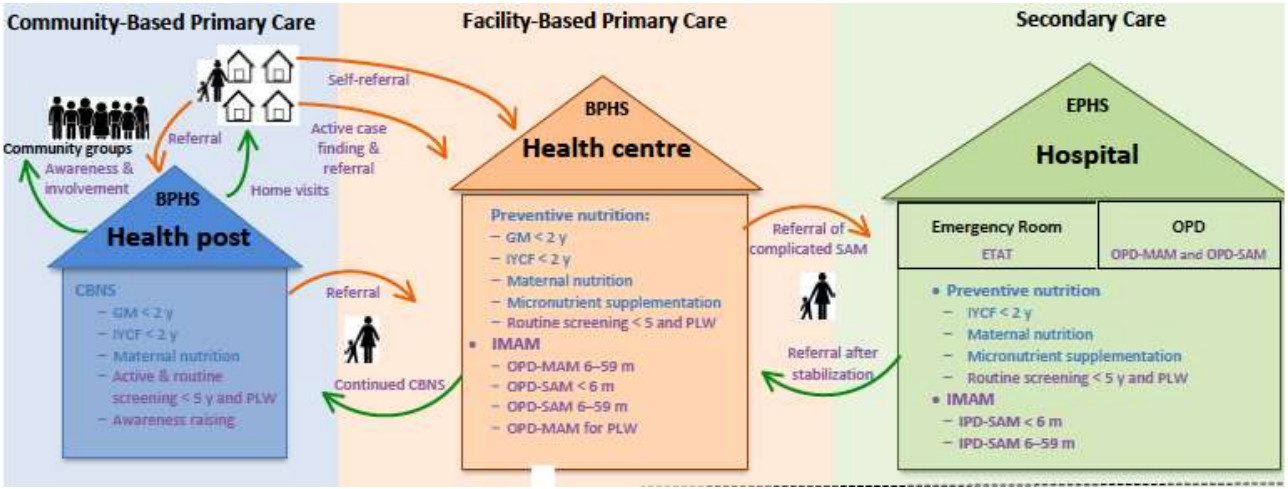


Figure 1.4. Map of IMAM implementation in the health system

BPHS = Basic Package of Health Services, EPHS = Essential Package of Hospital Services, ETAT = Emergency Triage, Assessment and Treatment, GM = growth monitoring, IYCF = infant and young child feeding, IPD = inpatient department, MAM = moderate acute malnutrition, OPD = outpatient department, PLW = pregnant and lactating women, SAM = severe acute malnutrition.

Table 1.3. Position of IMAM in the Afghanistan's health system

Service delivery level:							
Community-based primary care	*Facility-based primary care (OPD)*				*Secondary (and tertiary) care (IPD) (OPD + Emergency Room)*		
	Basic Package of Health Services				**Essential Package of Hospital Services**		
Community:	*Health facilities:*						
Health post	*Health sub-centre*	*Basic health centre*	*Mobile health and& nutrition team*	*Comprehensive health centre*	*District hospital*	*Provincial hospital*	*Regional & national hospital*
Key staff:							
Female and male community health worker	Nurse Midwife	Physician/Nurse Midwife Vaccinator Community health supervisor	Physician/Nurse Midwife (counsellor) (Vaccinator)	Physicians Nurses Midwives Vaccinators Psychosocial counsellor Pharmacist Community health supervisor	Paediatrician Other physicians Nurses Midwives Psychosocial counsellor Vaccinator Pharmacist Community health supervisor	Paediatricians Other physicians Nurses Nutrition nurse Midwives Psychosocial counsellor Pharmacists + Expanded team	Paediatricians Other physicians Nurses Nutrition nurse Midwives Psychosocial counsellor Pharmacists + Expanded team
Nutrition volunteers	Nutrition counsellor	Nutrition counsellor	Nutrition counsellor°	Nutrition counsellor	Nutrition counsellor		

Preventive Nutrition Services (IMAM related):							
CBNS	***Facility-Based Nutrition Services***						
Growth monitoring Screening & referral Nutrition counselling Nutrition education	GM Screening & referral Nutrition counselling Nutrition education	GM Screening Nutrition counselling Nutrition education	GM Screening Nutrition counselling Nutrition education	GM Screening Nutrition counselling Nutrition education	GM Screening Nutrition counselling Nutrition education	GM Screening Nutrition counselling Nutrition education	GM Screening Nutrition counselling Nutrition education
Curative Services (IMAM related):							
Community outreach*	***OPD-MAM/SAM***				***IPD-SAM***		
Sensitisation for awareness raising and involvement Home visits Linkage with community initiatives	Emergency care Assessment & diagnosis Pre-treatment SAM and treatment MAM Counselling and referral	Emergency care Assessment & diagnosis (referral) Treatment Counselling Monitoring progress End of treatment	Emergency care Assessment & diagnosis (referral) Treatment Counselling Monitoring progress End of treatment	Emergency care Assessment & diagnosis (referral) Treatment Counselling Monitoring progress End of treatment	Emergency care Assessment & diagnosis (referral) Treatment Counselling Monitoring progress Referral OPD	Emergency care Assessment & diagnosis Treatment Counselling Monitoring progress Referral OPD	Emergency care Assessment & diagnosis Treatment Counselling Monitoring progress Referral OPD
Mothers' involvement	Mothers' involvement	Mothers' involvement	Mothers' involvement	Mothers' involvement	Mothers' involvement	Mothers' involvement	Mothers' involvement

Planning Monitoring of activities	Planning Monitoring quality of care Monitoring of services	Planning Monitoring quality of care Monitoring of services	Planning Monitoring quality of care Monitoring of services	Planning Monitoring quality of care Monitoring of services	Planning Monitoring quality of care Monitoring of services	Planning Monitoring quality of care Monitoring of services	Planning Monitoring quality of care Monitoring of services
Provincial health management: Provincial Public Health Office and partner agencies Key staff: Health and nutrition managers and/or officers IMAM: Capacity strengthening; organisational management (planning, monitoring quality of care and services, information management, supply chain management and contingency planning)							
National health management: Ministry of Public Health, Public Nutrition Directorate and partner agencies Key staff: Health and nutrition managers and/or officers IMAM: Policy and strategic planning and financing; coordination; capacity strengthening; organisational management including monitoring quality of care and services, information management, supply chain management and contingency planning; linkage with relevant MOPH departments							

CBNS = Community-Based Nutrition Services, IMAM = Integrated Management of Acute Malnutrition, IMNCI = Integrated Management of Neonatal and Childhood Illness, GM =growth monitoring, IPD = inpatient department, MAM = moderate acute malnutrition, OPD = outpatient department, SAM = severe acute malnutrition; ^ Mothers or carers; ° Partner agency staff.

Chapter 2. Diagnosing Acute Malnutrition

This chapter provides guidance on the diagnostic procedures of acute malnutrition in the IMAM approach as part of the BPHS in primary care and paediatric hospital care of the EPHS in secondary (and tertiary) care.

2.1. Identification of Acute Malnutrition

In the IMAM approach, anthropometric measures together with the presence of nutritional oedema indicate acute malnutrition. Clinical signs of poor appetite and associated disease indicate severity of disease progress. Biomedical assessments may be considered in the contexts of severe disease in tertiary care and/or research.

Anthropometric measurements are a proxy for assessing physiological adaptations in the body of an individual due to a health condition. They are not precise measurements but indicate an association with disease progress and risk of mortality. **Anthropometric indicators** measure different body compositions and body adaptations to pathophysiological changes therefore may not identify the same individuals or population groups. **Clinical indicators** indicate malnutrition disease, disease progress and severity.

Depending on the child's **age**, different nutrition (anthropometric) and clinical indicators decide the severity of acute malnutrition and treatment plan for children 0–5 months and 6–59 months of age. Age is best identified by either the birth certificate or the mother or carer's recall. When the birth date is unknown and cannot be verified, the age of the child may be estimated by asking the mother or carer using a local calendar of events. It is not recommended to use a height cut-off as proxy for 6 months of age because in a stunted population many infants 6 months or older will have a height less than 65 centimetres (cm).

Acute Malnutrition in Children 6–59 Months of Age

The identification of acute malnutrition in children 6–59 months of age combines clinical and anthropometric indicators to make a correct diagnosis of disease progress or severity:

Clinical indicators

- Nutritional oedema

Anthropometric indicators

- Mid-upper arm circumference (MUAC)
- Weight-for-height (or length) z-score (WHZ or WLZ)

Clinical indicators of severity

- General danger signs or symptoms of serious associated disease
- Poor appetite (anorexia is a general danger sign)

Nutritional oedema

Bilateral pitting oedema is a clinical manifestation of SAM caused by an abnormal infiltration and excess accumulation of serous fluid in connective tissue or serous cavity. It is verified when thumb pressure applied on top of both feet for 3 seconds leaves a pit (indentation) in the feet after the thumb is lifted.

Nutritional oedema is **always** an indication of SAM and is always bilateral. Oedema in only one limb may indicate another disease process.

How to detect nutritional oedema is explained in **Appendix 1.** Nutritional oedema always begins in the feet and becomes more widespread as severity increases. Severity is graded and determined by spread:

Grade (+)	Bilateral pitting oedema of both feet
Grade (++)	Bilateral oedema of the feet and lower limbs/hands
Grade (+++)	Generalised nutritional oedema of the feet, lower limbs, hands and periorbital area (puffy eyes)

Mid-upper arm circumference

Assessing MUAC involves measuring the left mid-upper arm with a measuring tape. MUAC measures both fat and lean muscle mass of the upper arm. In wasted children, it detects loss of subcutaneous fat and muscle mass [18, 19]. MUAC is influenced by age, sex and body composition of lean mass. Using the same MUAC cut-off in children 6−59 months of age detects younger children, because they have smaller arms than older children, and more girls because they have smaller arms than boys [19].

MUAC is the best indicator of risk of mortality in acutely malnourished children 6–59 months of age [20, 21].

For children 6–59 months of age, a MUAC reading equal to or above (≥) 115 mm and less than (<) 125 mm indicates MAM, and a reading < 115 mm indicates SAM [22].

How to measure MUAC is explained in **Appendix 2**. Measuring MUAC requires placing the tape correctly, and reading and recording measurements accurately. MUAC tapes are inexpensive, portable and easy to use with training and supervision [22].

Weight-for-height z-score

WHZ is a composite index of weight relative to height for children of 2 years or older, or to length for children under 2 years of age. Expressed in z-score, WHZ describes how far and in what direction a child's weight deviates from the median of the weight of a child of the same height (length) and sex in the WHO Child Growth Standards [23].

Assessing WHZ requires good training and regular supervision. It require first weighing the child using a weight scale and measuring length or height using a height (length) board. Both the scale and height board have to be functional and calibrated for accuracy. Comparing the weight of a child with the weight of a child of the same height (or length) and sex of the WHO Growth Standard will classify the child as normal nourished or moderately or severely acutely malnourished. WHZ's association with risk of mortality of acute malnutrition in children 0–59 months of age is inferior to that of MUAC [21].

For children 6-59 months of age, WHZ ≥ –3 and < –2 indicates moderate wasting and WHZ < –3 indicates severe wasting, and combined, WHZ < –2 indicates overall wasting [22].

How to measure weight and height (or length) is explained in **Appendices 3 and 4**. Weight is measured with the child undressed for improved accuracy.

How to identify WHZ (or WLZ): Finding the WHZ (or WLZ) of a child can be done by use of the Moyo Chart©[3] or the WHZ look-up tables in **Appendix 5** following the steps:

- Measure the weight of the child (in kg).
- Measure the height of the child if 2 years of age or older, or the length if the child is under 2 years of age or 87 cm tall (in cm).

  If the child's age is difficult to assess, children at least 87 cm tall are measured standing, and those less than 87 cm are measured lying down. If children of 2 years of age or older (or at least 87 cm tall) are unable to stand, they are measured lying down and 0.7 cm is subtracted from the measurement.

- Take the WHZ (or WLZ) look-up tables.
- Find the height (or length) of the child in the middle column of the table.
- Compare the weight of a girl with the weight indications of the right columns and the weight of a boy with the weight indications of the left columns.
- Follow on the same horizontal line and identify the column with the weight that is closest to but just above the weight of the child.
- Decide whether the weight of the child falls in the column of z-score < –3 (red), –2 (yellow) or –1 (grey).
- Decide whether the child has a WHZ (WLZ) < –3 (severe wasting), WHZ ≥ –3 to –2 (moderate wasting) or WHZ ≥ –2 (normal).

General danger signs and serious associated disease

Medical complications may develop during the progression of acute malnutrition or any childhood illness. The IMNCI approach assesses the child for general danger signs that indicate very severe disease requiring urgent referral (**Table 2.1)**[14]. There are three major points in the assessment, classification and treatment of general danger signs in children with acute malnutrition that need attention:

- Clinical signs and symptoms of general danger signs or serious associated disease may be less pronounced and easily missed
- Appetite is being tested

[3] https://healthbooksinternational.org/product/moyo-weight-for-height-chart-boygirl-split-sex-version/

- Treatment protocols of certain general danger signs are different than for healthy children

Table 2.1. General danger signs in children (IMNCI)

General danger signs in children 2 months to 5 years of age [14]
Very severe disease:
Anorexia or poor appetite: Inability to drink, breastfeed or eat; failure of the appetite test
Persistent vomiting of all food and fluids
Convulsions
Reduced consciousness or lethargy
Circulatory collapse: Cold hands and feet, weak radial pulse, diminished consciousness
Serious conditions:
Cough or difficult or fast breathing: 2–12 months of age: ≥ 50 breaths/minute 12–59 months of age: ≥ 40 breaths/minute
Chest indrawing, stridor or wheezing
In case of SAM, any form of dehydration: Clinical signs (may be absent) and recent history of fluid loss (diarrhoea or vomiting) or recent sunken eyes
High fever: Raised temperature > 39° C (decide malaria risk, look and feel for stiff neck, runny nose, bacterial cause, measles)
Hypothermia: < 35.5° C
Severe palmar pallor
Skin lesions: Extensive skin ulceration requiring antibiotic treatment
Eye signs: Corneal lesions indicative of vitamin A deficiency
In case of SAM: Recent measles (now or before 3 months)
General danger signs in newborns and young infants < 2 months of age [16]
Not feeding well
Convulsions
Drowsy or unconscious
Movement only when stimulated or no movement at all
Fast breathing (60 breaths /minute)
Grunting

Severe chest indrawing
Raised temperature > 38°C
Hypothermia < 35.5°C
Central cyanosis
Dehydration

Poor appetite

The most common complication associated with acute malnutrition is no (anorexia) or poor appetite, which is an indication of a serious pathophysiological response to nutrient depletion from disturbed and dysfunctional liver and metabolic functions. In addition, children with a significant infection also lose appetite, especially in the acute phase of disease.

Children with SAM and poor appetite are at higher risk of death and need urgent attention in inpatient care. For this reason, the appetite of children 6–59 months of age is verified through observation at each contact using ready-to-use therapeutic food (RUTF) (at the start of treatment and during each follow-up visit) until recovery (**Box 2.1**).

Box 2.1. How to test the appetite in children 6–59 months of age

- Do the test in a quiet, separate area to allow the carer and child time to get accustomed to the ready-to-use therapeutic food (RUTF).
- Explain the purpose and procedure of the test to the carer
- Advise the mother or carer:

  1. Wash her hands, wash the child's hands and clean the RUTF sachet
  2. Knead the sachet for a few seconds before opening to ensure a homogenous mixture
  3. Tear open the sachet at the corner
  4. Sit the child on your lap and gently offer the RUTF by squeezing the sachet
  5. Encourage the child to eat the RUTF without force-feeding
  6. Offer the child plenty of clean water to drink from a cup while the child eats the RUTF

- Observe the child for up to 30 minutes and decide the outcome:

Good appetite	Poor appetite
Passing the appetite test:	**Failing the appetite test:**
Child eats at least 1/3 of a 92 g RUTF sachet or 3 teaspoons within 30 minutes	Child does NOT eat 1/3 of a 92 g RUTF sachet or 3 teaspoons within 30 minutes

Table 2.2 shows how to classify acute malnutrition in children 6–59 months of age.

Table 2.2. Severity of acute malnutrition in children 6–59 months of age

Normal nutrition	MAM	Uncomplicated SAM	Complicated SAM
• MUAC ≥ 125 mm or WHZ ≥ –2	• MUAC ≥ 115 mm and < 125 mm or WHZ ≥ –3 and < –2	• Bilateral pitting oedema (+) or (++) without MUAC < 115 mm or WHZ < –3, or • MUAC < 115 mm or WHZ < –3 • Appetite preserved • Alert	• Bilateral pitting oedema (+++), or • Bilateral pitting oedema and MUAC < 115 mm or WHZ < –3, or • MUAC < 115 mm or WHZ < –3 with - General danger sign or serious associated disease - Poor appetite - Weight < 4 kg

MUAC = mid-upper arm circumference; WLZ = weight-for-length z-score, used for children < 24 months of age; WHZ = weight-for-length z-score, used for children 24–59 months of age.

Acute Malnutrition in Infants under 6 Months of Age

The identification of acute malnutrition in infants < 6 months of age combines the assessment of clinical indicators and anthropometric indicators to make a correct diagnosis of disease progress and severity [24]:

Clinical indicators

- Nutritional oedema

Anthropometric indicators

- WLZ

Clinical indicators of severity

- General danger signs or symptoms of serious associated disease
- Breastfeeding difficulties
- Weight gain failure

Nutritional oedema
Nutritional oedema in infants < 6 months of age is assessed by bilateral pitting oedema in the same way as in children 6–59 months of age. Its prevalence may be very low.

For infants < 6 months of age, presence of any bilateral pitting oedema is a very severe disease.

Weight-for-length z-score
Weight and length measurements and WLZ is assessed in the same way as in children 6–59 months of age. Weight is measured with an infant scale with the infant undressed for improved accuracy.

For infants < 6 months of age, WLZ ≥ –3 and < –2 indicates moderate wasting and WLZ < –3 indicates severe wasting [22].

In very small infants with a length of < 45 cm, weight-for-age z-score (WAZ) is used to define acute malnutrition. For these infants, WAZ ≥ –3 and < –2 indicates MAM and WAZ < –3 indicates SAM [22]. For the WAZ growth chart, see the *Child Growth Monitoring Card*.

General danger signs and serious associated disease

See **Table 2.1** for danger signs and serious associated disease with acute malnutrition in infants.

Breastfeeding difficulties
The assessment of the mother's breastfeeding capacity and her health and nutrition status is also assessed since her wellbeing directly affects her infant. It is important to treat the dyad of mother-infant rather than separate individuals. The assessment of the mother's breastfeeding capacity and health will identify problems that need counselling and support.

Breastfeeding difficulties are classified as severe, moderate (mild or possible) and none, based on the following criteria:

- **Severe** breastfeeding difficulties if the infant (any of the following):
  - Has structural abnormalities

- Has abnormality of tone, posture and movement interfering with breastfeeding
- When held, has arms and legs falling to the side
- Has a stiff body, is hard to hold or move
- Has excessive jaw opening or clenching
- Is not willing or able to suckle on the breast
- Is coughing and eye tearing while breastfeeding (sign of unsafe swallowing)

- **Moderate** breastfeeding difficulties if the infant (any of the following):
  - Is not well attached
  - Is not suckling effectively
  - Takes less then 8 breastfeeds in 24 hours
  - Receives other foods or drinks
- **Mild/possible** breastfeeding difficulties if the infant has:
  - Breastfeeding difficulties based on the mother's breast conditions, or
  - Non-severe respiratory difficulties that interfere with breastfeeding, e.g., nasal congestions
- **No** breastfeeding difficulties if there are:
  - No signs of inadequate feeding, or
  - No additional issues for mother-infant dyad

If there is no prospect for the infant < 6 months with SAM to be breastfed–the mother is absent and no wet nurse is available–a context-specific decision on appropriate treatment and feeding will have to be taken.

Weight gain faltering

Weight gain–or growth velocity–is an important indicator of growth in young infants. It can be assessed by comparing absolute weight gain to the median of the WHO Growth Velocity Standards [25], and more easily by plotting weight on the WAZ child's growth card and as such monitor weight gain. Adequate weight gain means that the infant's weight follows the WAZ lines. Adequate weight gain in breastfed infants is directly related to the adequacy of breastfeeding; therefore, the mother's health and nutrition status is also assessed.

Growth monitoring activities target children under 2 years of age and assesses in the community WAZ, and in the health facility WAZ, length-for-age z-score (LAZ) and WHZ. They monitor monthly individual growth and population trends of stunting, wasting and underweight. In the assessment of the infant, the weight gain is verified by looking at the monthly weight indications or the line plotted on the WAZ chart. In case the history of weight indication is missing, the mother or carer will be asked whether there has been perceived weight loss or recent failure to gain weight.

> For infants < 6 months of age, weight loss, recent or prolonged (days-weeks-months) failure to gain weight or a sharp drop across WAZ lines in combination with severe wasting indicates a risk.

The IMAM approach in Afghanistan does not target infants < 1 month of age (neonates), but in case of visible severe wasting (nutritional oedema will be highly unlikely) infants will be referred to the neonatal care unit of the hospital. Also, MUAC is not yet used to detect acute malnutrition in infants under 6 months of age, but recent studies found that for infants 2–5 months a MUAC cut-off of < 110 mm is a good indicator for SAM [26]. **Table 2.3** classifies severity of acute malnutrition in infants under 6 months of age.

Table 2.3. Severity of acute malnutrition in infants under 6 months of age

Normal nutrition	MAM	Uncomplicated SAM	Complicated SAM
• WLZ ≥ –2	• WLZ ≥ –3 to < –2	• WLZ < –3 with ○ Moderate, mild or possible breastfeeding difficulties, or ○ Moderate weight loss, recent (days-weeks) failure to gain weight, or moderate drop across WAZ lines • Alert	• Bilateral pitting oedema, or • WLZ < –3 with - A general danger sign or serious associated disease, or - Severe breastfeeding difficulties, or - Recent severe weight loss, prolonged (weeks-months) failure to gain weight or sharp drop across WAZ lines

Infants < 1 month of age with visible wasting are being referred to neonatal care; WAZ = Weight-for-age z-score, used for infants < 45 cm length; WLZ = weight-for-length z-score.

Acute Malnutrition in Pregnant and Lactating Women

Malnutrition in PLW with infants up to 6 months of age is assessed by measuring MUAC and presence of nutritional oedema. Weight-for-height and body mass index are not reliable indicators in PLW, whose weight does not accurately reflect their nutrition status. **Table 2.4** lists the indicators that define and classify malnutrition in PLW.

For PLW:

- MUAC ≥ 185 mm and < 230 mm identifies moderate malnutrition
- MUAC < 185 mm and/or bilateral pitting oedema identify severe malnutrition

Table 2.4. Severity of malnutrition in pregnant and lactating women

Normal nutrition	Moderate malnutrition	Severe malnutrition
• MUAC ≥ 230 mm	• MUAC ≥ 185 mm and < 230 mm	• Bilateral pitting oedema, or • MUAC < 185 mm

2.2. Strategies for Early Detection and Referral for Start of Treatment

Early case finding of acute malnutrition means detecting children with acute malnutrition at an early stage of the illness, and refer them to start treatment before complications have developed. It makes care more efficient and cost-effective and being provided close to children's homes.

Screening is a strategy for early case finding of acute malnutrition in children under 5 and PLW, and to be effective, it should be done monthly and with a good coverage. Screening involves measuring MUAC and checking for oedema of children 6–59 months of age and PLW, which is quick, accurate and simple for trained people and takes less than 1 minute per child. Screening, by definition detects asymptomatic disease in a specific population group. Acute malnutrition often goes unrecognized and often carers or communities are unaware of its signs and consequences. It is important therefore to both raise awareness and promote health seeking and provide active screening in communities to monthly cover all children under 5 and PLW, and systematically screen children and PLW at health facilities or any other contact with the health system.

The following different methods for early case finding should be considered to ensure maximal and regular coverage of screening:

Active case finding is on-site screening of a target population through face-to-face contact. Active case finding for acute malnutrition is an organised activity that aims to measure all children and PLW in the community on regular intervals, ideally monthly. For example, CHWs are trained to do active case finding, but also community volunteers and mothers of affected children could be trained to participate in case finding.

Enhanced case finding, or self-referral, is when people seek diagnostic and treatment services on their own initiative because they understand the symptoms and treatment path of the illness. Enhanced case finding for acute malnutrition works through making populations aware of the symptoms of acute malnutrition and encouraging them to seek care [27, 28].

Routine or systematic case finding is screening people whenever they are in contact with a health service. Routine case finding for acute malnutrition ensures that children under 5 and PLW at any contact of the healthcare service are screened for acute malnutrition.

Timely referral is referral of cases early in the progression of acute malnutrition. Early identification and referral increases the likelihood of a successful treatment outcome and decreases the cost of treatment. Timeliness is in part achieved through multiple screening strategies and in part through an efficient referral system, that links malnourished children and PLW between services across time and place.

Growth monitoring is provided in the community and the health facility as a public health measure to monitor the nutrition status of children under 2 years of age on a monthly basis. It assesses the level of underweight by the weight-for-age (WAZ) indicator, stunting by the height (or length)-for-age (HAZ) indicator and wasting by the WLZ indicator. WAZ is a composite indicator and low WAZ may indicate stunting, wasting or both, but is unreliable for detecting acute malnutrition [29]. The respective indicators are plotted on the young child's growth chart and indicated in a register. While growth monitoring targets children under 2 years of age, it provides another opportunity to catch young children with acute malnutrition that were missed.

Box 2.2. Strategies for empowering communities and improving coverage and early start of treatment of acute malnutrition

In the community:

- Actively screening for acute malnutrition through home visits or other health outreach activities.
- Routinely screening for acute malnutrition during health post visits.
- Identifying growth failure and breastfeeding difficulties through monthly growth monitoring.
- Teaching community volunteers and mothers to screen children for acute malnutrition and encourage health seeking.
- Sensitising mothers or carers of children under 5 years of age and pregnant and lactating women on adequate infant and young child feeding and maternal nutrition and malnutrition for improved healthy behaviours.
- Sensitising community members on healthy nutrition and behaviours and encouraging involvement in health and nutrition activities through social and individual behaviour change initiatives.

At primary and secondary health facilities:

- Systematically screening children under 5 years of age and pregnant and lactating women for acute malnutrition at any contact with the health sector, including in the emergency room.
- Providing monthly growth monitoring for infants under 2 years of age, including having difficulties on breastfeeding and weight gain evaluated.
- Starting treatment or referring to a higher level of care if no local treatment is available or appropriate.
- Providing individual counselling on infant and young child feeding and maternal nutrition for improved healthy nutrition and behaviours.
- Sensitising mothers or carers of children under 5 years of age and pregnant and lactating women through health and nutrition education and food demonstrations.

2.3. Initial Assessment

Upon arrival at the OPD of a primary care health facility, or the OPD or emergency room of a hospital, health workers will give priority attention to children with general danger signs and start emergency treatment followed by a comprehensive assessment as soon as the condition of the child allows. Children who are alert will receive an initial assessment that comprehensively examines the child in line with the IMNCI approach.

Box 2.3. Activities during the initial assessment of children in health facilities

Initial assessment in the outpatient department (OPD):

- Screening for acute malnutrition
- Assessment of general danger signs and signs of serious associated disease and provision of life-saving treatment before referral to a higher level of care
- Comprehensive assessment for signs and symptoms of associated illness, including history;
- Appetite test and breastfeeding assessment as appropriate
- Rapid diagnostic test for malaria and urine infection if indicated and feasible
- Differential diagnosis and decision for start of treatment or referral to a higher (lower) level of care

Initial assessment in the emergency room (ER) and/or inpatient department (IPD):

- Screening for acute malnutrition
- Emergency triage, assessment and treatment (ETAT, a stepwise and systematic assessment of emergency signs and provision of life-saving treatment)
- Comprehensive assessment for signs and symptoms of associated illness, including history
- Appetite test and breastfeeding assessment as appropriate
- Rapid diagnostic test for malaria and urine infection and other laboratory tests as indicated
- Differential diagnosis of associated illness and decision of comprehensive treatment and eventual referral to a higher (lower) level of care

In both occasions, it is important to know the nutritional status of the child early in the assessment, because clinical signs, live saving procedures and treatment indications may differ in the presence of acute malnutrition from a normal nutritional status. Assessment procedures in OPD and IPD are covered in the respective chapters, and are summarised in **Box 2.3.**

2.4. Differential Diagnoses of Complicated and Uncomplicated Acute Malnutrition

The comprehensive assessment allows the classification of acute malnutrition and severity (complicated and uncomplicated) of disease. Besides signs and symptoms of very severe and/or associated disease, for children 6–59 months, the appetite test, and for infants under 6 months of age, adequacy of breastfeeding, breastfeeding support and weight gain are decisive for referral to a higher level of care (**Table 2.5)**.

Table 2.5. IMAM diagnostic criteria for treatment

OPD-MAM	OPD-SAM (Uncomplicated SAM)	IPD-SAM (Complicated SAM
Infants < 6 months of age:		
• WLZ ≥ –3 to < –2 *Infants with MAM and satisfactory breastfeeding are referred to facility-based and community-based nutrition services that include growth monitoring, infant and young child feeding and screening for acute malnutrition*	• WLZ < –3 with - Moderate, mild or possible breastfeeding difficulties, or - Moderate weight loss, recent (days-weeks) failure to gain weight or moderate drop across WAZ lines • Alert	• Bilateral pitting oedema, or • WLZ < –3 with - A general danger sign or serious associated disease, or - Severe breastfeeding difficulties, or - Recent severe weight loss, prolonged (weeks-months) failure to gain weight or sharp drop across WAZ lines
Children 6–59 months of age:		
• MUAC ≥ 115 and < 125 mm or WHZ ≥ –3 and < –2	• Bilateral pitting oedema (+) or (++) without MUAC < 115 mm or WHZ < –3, or • MUAC < 115 mm or WHZ < –3 • Appetite preserved • Alert	• Bilateral pitting oedema (+++), or • Bilateral pitting oedema and MUAC < 115 mm or WHZ < –3, or • MUAC < 115 mm or WHZ < –3 with ○ Poor appetite ○ A general danger sign or serious associated disease ○ Weight < 4 kg
Pregnant and lactating women with infant < 6 months of age:		
• MUAC < 230 mm	-	*In case MUAC < 185 mm and/or bilateral pitting oedema: referral to hospital for further investigation.*

Children with MAM and associated illness are treated per the Integrated Management of Neonatal and Childhood Illness (IMNCI) protocol, IPD = inpatient department, MAM = moderate acute malnutrition, OPD = outpatient department; SAM = severe acute malnutrition.

2.5. Referral System

Children identified with MAM or SAM identified in the community, should be referred to the closest health facility with treatment capacity and start treatment. **Table 2.6** gives the criteria for identifying and referring cases of acute malnutrition in the community, and **Table 2.7** gives the criteria for starting and ending treatment in the health facilities, and shows the movement between levels.

Table 2.6. Criteria for identifying and referring cases of acute malnutrition in the community

Infants < 6 months of age	Children 6–59 months of age	Pregnant and lactating women
• Bilateral pitting oedema • Visible wasting • Loss of appetite • Breastfeeding difficulties • Drop across WAZ lines or failure to gain weight	• Bilateral pitting oedema • MUAC < 125 mm • Loss of appetite	• MUAC < 230 mm

Upon arrival in OPD, severely ill children with complicated SAM will be identified for urgent attention and referral for treatment to the emergency room and/or IPD-SAM of a hospital in the vicinity. Means of transportation of the ill child and options should be discussed with the mother or carer. In any case, lifesaving care should start before referral and continue during the transport.

A well-established referral system verifies the movement of referral (to higher level of care because of deterioration) and counter-referral (to lower level of care because of improvement) between the initiating and receiving facilities for admission, start of treatment and follow up that also foresees supervision and capacity strengthening for referral [30]. A tracing system should monitor the movements between the various IMAM services in time and place–from detection and referral for treatment, to arrival and start of treatment, retention in treatment, up to the decision to return.

A *Referral Slip* helps the tracking of movement between IMAM services from the community to the health facility (**Form 16**) and between health facilities (**Form 17**).

Table 2.7. Diagnostic and treatment plan of acute malnutrition in the IMAM approach

IPD-SAM and OPD-SAM for infants < 6 months of age:

Treatment:

IPD-SAM	OPD-SAM	Continued FBNS and CBNS	Continued FBNS and CBNS
Complicated SAM	**Uncomplicated SAM**	**MAM**	**Normal nutrition**
• Bilateral pitting oedema, or • WLZ < –3 with either or - A general danger sign or serious associated disease - Severe breastfeeding difficulties - Recent severe weight loss, prolonged (weeks-months) failure to gain weight or sharp drop across WAZ lines	• WLZ < –3 with either or - Moderate, mild or possible breastfeeding difficulties - Moderate weight loss or recent (days-weeks) failure to gain weight, or moderate drop across WAZ lines • Alert	• WLZ ≥ –3 to < –2 • Breastfeeding satisfactory • Weight gain satisfactory • Alert and well *Infants with MAM and satisfactory breastfeeding are referred to FBNS and CBNS that includes monthly growth monitoring, infant and young child feeding, maternal nutrition and screening for acute malnutrition*	• WLZ ≥ –2 • Breastfeeding satisfactory • Weight gain satisfactory • Alert and well

IPD-SAM, OPD-SAM and OPD-MAM for children 6–59 months of age:

Treatment (continue treatment after stabilisation)

IPD-SAM	OPD-SAM	OPD-MAM	Continued FBNS and CBNS*
Complicated SAM • Bilateral pitting oedema (+++), or • Bilateral pitting oedema and MUAC < 115 mm or WHZ < –3, or • MUAC < 115 mm or WHZ < –3 with either or - A general danger sign or serious associated disease - Poor appetite - Weight < 4 kg (treated in IPD-SAM as infant < 6 months)	**Uncomplicated SAM** • Bilateral pitting oedema (+) or (++) without MUAC < 115 mm or WHZ < –3, or • MUAC < 115 mm or WHZ < –3 • Appetite preserved • Alert **Continue treatment in OPD-SAM after stabilisation in IPD-SAM (Option 1)** • Medical complications resolving and oedema reducing (to ++ or +) • Eats **at least 75%** of the daily amount of the RUTF diet or **two full meals** of RUTF • Alert	**MAM** • MUAC ≥ 115 mm and < 125 mm or WHZ ≥ –3 and < –2 • Alert and well	**Normal nutrition** • MUAC ≥ 125 mm or WHZ ≥ –2 • Alert and well

OPD-MAM for pregnant and lactating women (PLW) with infant under 6 months of age:

Treatment:

OPD-MAM for PLW	Continued FBNS and CBNS
Acute malnutrition in PLW • MUAC < 230 mm *PLW with MUAC < 185 mm and/or bilateral pitting oedema are referred to hospital for further investigation*	**Normal nutrition (or infant ≥ 6 months)** • MUAC ≥ 230 mm

*Children with MAM and associated illness are treated per the integrated management of neonatal and childhood illness (IMNCI) protocol, and receive strengthened nutrition support; Infants < 1 month of age are referred to neonatal care; * Use the same anthropometric indicator for start and end of treatment.*

CBNS = community -based nutrition services, FBNS = facility-based nutrition services, IPD = inpatient department, OPD = outpatient department.

Chapter 3. Community Outreach for the Integrated Management of Acute Malnutrition

This chapter provides guidance on community outreach for acute malnutrition in children under 5 years of age and PLW as a core component of the IMAM approach.

3.1. Principles of Community Outreach

Health outreach in the community is an essential aspect of primary care that brings health services closer to people and their communities. Community health and nutrition activities are described in the *Community-Based Health Care* (CBHC) *Strategy* [31] and *Community-Based Nutrition Package* (CBNP) [32] and implemented through the BPHS [15]. They ensure comprehensive and integrated child-centred continuity of care in the community to improve the wellbeing of children and their mothers or carers.

CBHC is the cornerstone of the BPHS, linking preventive and curative care. Male and female community health workers (CHWs) based in health posts are responsible for community health and nutrition activities and home visits and are supported and supervised by community health supervisors (CHSs). CHWs are also supported by members of community-based groups and committees, such as Family Health Action (FHA) groups and Health Shuras, and by community volunteers. CHWs play a key role in linking communities with health facilities to exchange information, balance expectations in demand and supply of health and nutrition services and build trust which positively impacts on health-seeking behaviour and adoption of healthy practices.

Community outreach for IMAM is integral part of the CBNP that includes growth monitoring and infant and young child feeding (IYCF) of children under 2 years of age, maternal nutrition, micronutrient supplementation and screening for acute malnutrition of children under 5 years of age and PLW with an infant under 6 months of age. IYCF covers nutrition counselling, health and nutrition education and food demonstrations. Home visits are conducted to counsel mothers and members of households with vulnerable or malnourished children.

The objectives of community outreach for IMAM are to:

- Empower the community by increasing knowledge and understanding of acute malnutrition and the services available to treat it.
- Engage communities for joint problem solving on barriers to service access and utilisation.
- Conduct active and routine case finding of acute malnutrition and refer for early start of treatment.
- Provide nutrition counselling and education on infant and young child feeding and care practices for healthy behaviours.
- Follow up at-risk and problem cases with home visits.

3.2. Community Outreach Activities

Community outreach activities for IMAM target children under 5 years of age and PLW for acute malnutrition prevention and cure. Activities include 1) community sensitisation, 2) community screening and 3) home visits for problem cases.

Community Sensitisation to Increase Awareness and Involvement

Sensitisation of the community raises awareness of malnutrition as a cause of disease and death in the short term and resulting developmental delays in the long term. Many communities in Afghanistan believe in spiritual or non-medical causes of illness. Delayed access to proper treatment of acute malnutrition can increase the risk of morbidity and mortality as well as the cost of treatment. Sensitisation of the community for IMAM should be aligned with other community-based sensitisation initiatives for promoting healthy behaviours of health, water, sanitation and hygiene (WASH), such as the Community-led Total Sanitation (CLTS) initiative, and strengthening healthcare-seeking behaviour.

Sensitisation of communities in the CBNP begins by making malnutrition visible by plotting the weights of all children in a village on a community nutrition chart. Seeing the numbers of malnourished children in red and well-nourished children in green, community members realise the magnitude of the problem of malnutrition. This triggers a dialogue on what can be done to reduce the problem. The next step is to plan how to pass this information along in the community, especially to the most influential people (local political, traditional or religious leaders). While female carers

are most interested in child healthcare, it is also important to gain the consent and support of their male relatives, religious and opinion leaders, and private health practitioners.

Sensitisation can be done through formal or informal community meetings and social gatherings, e.g., meetings of FHA groups and health shura, Friday prayer, weddings and funerals. The local radio and other public media may disseminate key messages via radio spots or billboards, or community drama opportunities.

Sensitisation messages should be simple and clear on how malnutrition is caused, why it is serious, how to prevent it, how to identify malnutrition in children, how to cure it and where to refer children and PLW for treatment. IMAM-specific sensitisation messages should be adapted to the community context and aim for:

- Improving the understanding of adequate nutrition and malnutrition and their effects on the community.
- Empowering communities by raising awareness that prevention is better than treatment and that attending monthly growth monitoring, health and nutrition education sessions and cooking demonstrations help prevention.
- Encouraging the adoption of healthy behaviours and timely health-seeking.
- Encouraging to access treatment that it is freely available, and retain in treatment until full recovery.

Community Screening for Active Case Finding and Referral

Children under 5 years of age should be screened monthly for acute malnutrition as part of the Village Nutrition Plan, and their weight should be tallied in the *Child Nutrition Tracking Register* (**Form 1**) and on the *Pictorial Nutrition Monitoring and Promotion Card* (**Form 4**). CHWs should tally the number of acutely malnourished children under 5 years of age and PLW identified through community screening in the *Monthly Health Post Pictorial Monitoring Report* (**Form 10**) and refer identified cases with a *Referral Slip of CHW* (**Form 16**) to the closest health facility with OPD-SAM.

The following strategies may be considered for early detection and referral of cases of acute malnutrition in the community:

1. **Monthly growth monitoring** assesses underweight in children under 2 years of age by finding their weight-for-age z-score (WAZ), a composite indicator of weight and age. Low WAZ may indicate stunting, wasting or both. Children with breastfeeding difficulties, weight faltering or WAZ in red or yellow are referred for investigation.
2. **Monthly screening** of children under 5 attending the health post by measuring their mid-upper arm circumference (MUAC) and checking for bilateral pitting oedema.
3. **House-to-house case finding** involves CHWs going to every house in the health post catchment area to do screening. Screening can be combined with home visits for other health activities.
4. **Involving mothers or carers of children with acute malnutrition** in screening and monitoring puts them at the centre of care and acknowledges their care role. They are in the best position to detect the earliest signs of malnutrition in their children, which may encourage them to promote better child health and nutrition [33]. CHWs can provide a MUAC tape and train mothers to measure MUAC correctly and check for oedema in their own and other children in their close environment [33-36].
5. **Case finding through routine or special health outreach opportunities** may include measuring MUAC and checking for oedema**.** Opportunities include health outreach activities and campaigns that use house-to-house or on-site methods to access children and PLW. Mobile health and nutrition teams (MHNTs) may be organised for difficult-to-reach populations and should include case finding, treatment or referral.
6. **Active-adaptive case finding** identifies children with acute malnutrition in the community aided by a local case definition using common terms in the local language. Case finders do not go house-to-house but instead visit houses with children who have locally understood signs of malnutrition, e.g., thinness, swelling and sickness. The case finders then ask community members to refer them to children with similar signs, until no more cases are found in the area.
7. **Mass screening** for acute malnutrition may be organised in special cases such as emergencies. Mass screening organised with the consent and cooperation of village leaders can reach most children in a

community with efficient screening. However, children who are sick or weak may be left at home, or stigma may prevent carers from allowing malnourished children to be seen in public. Additional efforts must be made to identify children who do not attend mass screening, either by checking the village register or asking the village leader and other carers if they know of any children who were not screened. Mass screening is not a good method for assessing acute malnutrition prevalence or treatment coverage, because the screening may not be exhaustive or representative.

8. **Other community-based entry points** for screening children for malnutrition include carers seeking advice or care from private health practitioners, drug vendors, teachers or mullahs when their children become sick. Sensitising and training opinion leaders on how to measure MUAC and check for bilateral pitting oedema will be useful to not delay treatment.

Criteria for identifying acute malnutrition in children under 5 years of age and PLW in the community and referral for treatment are part of the CBNP and summarised in **Table 3.1**.

Table 3.1. Criteria for identifying and referring cases of acute malnutrition in the community

Infants under 6 months of age	Children 6–59 months of age	Pregnant and lactating women
• Bilateral pitting oedema • Visible wasting • Breastfeeding difficulties • Loss of appetite • Failure to gain weight	• Bilateral pitting oedema • MUAC < 125 mm • Loss of appetite	• MUAC < 230 mm

CHSs and CHWs, together with village volunteers and members of community groups, should agree on the best ways to measure MUAC and check for bilateral pitting oedema monthly in children under 5 years of age as a routine community-based activity. They may also help identify mothers or carers that can actively monitor their own children, as well as children in their extended families or neighbourhoods, for acute malnutrition. In

addition, CHWs can make home visits and target vulnerable and remote households with young children to do monthly screening and counsel mothers or carers on improved feeding and care practices.

No opportunity should be missed to provide screen and counsel on IYCF and childcare practices. People involved in screening and counselling should know which messages on illness and treatment to share, whom to screen, how to screen and where to refer malnourished children or PLW.

Home Visits to Strengthen Compliance with and Retention in Treatment

During home visits, CHWs may track children that are being treated for acute malnutrition but are not thriving or default early from treatment. Often mothers or carers do not comply with treatment because of ignorance, competing priorities, opportunity costs or difficulties getting to health facilities. CHWs can discuss these problems with mothers or carers, look for solutions with them and counsel them on how to ensure their children comply with treatment and how to improve care and feeding practices. A *Home Visit Questionnaire* (**Form 18**) can help CHWs identify problems related to non-adherence or non-response to treatment or reasons for defaulting from treatment or death that can be shared with their CHSs.

Linkage with Community-Based Initiatives

Children with acute malnutrition are often from poor families and/or vulnerable to food insecurity, poor feeding and care practices and a poor public health environment. Families with children with acute malnutrition should be linked to and/or targeted by community initiatives or groups that improve the home environment and promote access to an improved diet and livelihood. Community-based health promotion and environmental and social protection initiatives complement IMAM activities. CHWs and CHSs may discuss with community coordinators to link malnourished children and their families to these initiatives.

Chapter 4. Management of Moderate Acute Malnutrition and Uncomplicated Severe Acute Malnutrition in Children 6–59 Months of Age

This chapter provides guidance on the case management of MAM and uncomplicated SAM in children 6–59 months of age in OPD-MAM and OPD-SAM respectively as part of the IMAM approach aligning with IMNCI. **Annex 2** gives complementary guidance on the treatment of associated medical conditions. **Annex 3** gives complementary information on specialised foods and products for the management of acute malnutrition.

4.1. Principles of Care

All children under 5 years of age who come in contact with the health system will be systematically assessed for acute malnutrition in order not to miss opportunities for early start of treatment. Missing opportunities to detect acute malnutrition early may lead to delaying treatment, with increased cost and risk of death.

All children attending the OPD of the health facility undergo the same assessment procedures that follow the IMNCI guidance and lead to a differential diagnosis, which decides the treatment pathway. The vast majority of children 6–59 months of age with SAM have uncomplicated SAM, and their most suitable case management is in outpatient care, which will be offered at the OPD in primary care facilities and the hospital. Children with complicated SAM will be referred to IPD-SAM and after stabilisation return to continue treatment in OPD-SAM until full recovery.

If the nearest primary care facility has no OPD-MAM or OPD-SAM, then children will be referred to the nearest primary care facility with OPD-MAM or OPD-SAM. In general, children should be able to receive healthcare close to their homes. In areas with remote or isolated vulnerable populations, Mobile Health and Nutrition Teams (MHNTs) should be enabled to offer the IMAM services.

Children 6–59 months of age newly identified with MAM or uncomplicated SAM for treatment as outpatients will receive routine medication,

supplementary or therapeutic foods, and a weekly or bi-weekly clinical follow-up assessment to monitor progress until full recovery. Their mothers or carers will be encouraged to be involved in care of the children and will receive counselling and health and nutrition education for improved feeding and care practices. They will also receive health and psychosocial support for themselves. Mother-to-mother support will be encouraged.

In case there is no OPD-MAM available, children with MAM should be referred to attend monthly community-based and facility-based nutrition services, where the mothers or carers will receive infant and young child feeding (IYCF) support—including counselling, health and nutrition education and food demonstrations—and the young child under 2 years of age will receive growth monitoring and all children under 5 years of age acute malnutrition screening.

Case management of acute malnutrition in infants under 6 months of age follows a different treatment protocol, which is covered in **Chapter 6.**

4.2. Systematic Screening

Children with acute malnutrition who have been identified in the community through active and routine case finding will have been referred to the closest health facility to start treatment.

All children under 5 years of age attending any service at the health facility should be systematically screened for acute malnutrition for early start of appropriate treatment. Monthly facility-based growth monitoring of children under 2 years of age to detect stunting, underweight and wasting creates another opportunity to detect malnutrition early. Nutrition screening for acute malnutrition is based on anthropometry and checking for bilateral pitting oedema. It is not recommended to rely on signs of visible wasting such as ‘thinness’ or ‘weakness’, ‘distended belly’ or ‘hair colour’ for diagnosis of acute malnutrition because they are extremely unreliable. In particular, cases of MAM may be missed.

4.3. Emergency Case Management

Children with SAM and a life-threatening condition will receive emergency care and are stabilised before referral to the hospital or a site with 24-hour care, which is adapted to the SAM condition. Children with MAM and a life-threatening condition will receive emergency care following IMNCI.

Emergency assessment:

- Look for general danger signs (**general danger signs**):
  - Is the child able to drink or breastfeed?
  - Does the child vomit everything?
  - Has the child had convulsions?
  - Is the child lethargic or unconscious?
  - Is the child convulsing now?
- Determine the child's acute malnutrition status by testing for the presence of bilateral pitting oedema and measuring mid-upper arm circumference (MUAC), because the severity of danger signs and decision for referral to hospital differs in the case of SAM.

Emergency treatment:

In case of any general danger sign, emergency treatment is started and urgent referral to hospital is organised (follow IMNCI emergency treatment and referral):

- Give diazepam if the child is convulsing.
- Give 10% sugar water to prevent low blood sugar (10% sugar water = 10 g or 2 heaped teaspoons in 100 ml water) if available.
- Give any pre-referral treatment immediately, depending on the diagnosis.
- Start presumptive antibiotic treatment.
- In case of high fever (**Box 4.1**), sponge the child with lukewarm water to cool him/her down.

  Look and feel for stiff neck, runny nose, bacterial cause and measles.
  Do **not** give paracetamol to children with SAM because of risk of liver damage at normal dosage.
- Encourage continued breastfeeding.

- Keep the child warm and away from draughts.
- Complete the assessment of other serious signs that need urgent referral to hospital:
  - Nutritional oedema grade (+++), any nutritional oedema combined with severe wasting, or severe wasting in children weighing less than 4 kg
  - Difficult breathing: Chest in-drawing, stridor or wheezing
  - Fast breathing: 2–12 months of age: ≥ 50 breaths/minute
    12–59 months of age: ≥ 40 breaths/minute
  - Severe dehydration: Clinical signs AND recent history of fluid loss (diarrhoea or vomiting) or recent sunken eyes
  - Hypothermia: Fever less than 35.5° C
  - Severe anaemia: Severe palmar pallor
  - Skin lesions: Extensive skin ulceration requiring antibiotic treatment
  - Eye signs: Corneal lesions indicative of vitamin A deficiency
  - Recent measles (now or in past 3 months)
  - TB contact

Box 4.1. How to measure fever

Using a rectal thermometer:

- Shake the thermometer down to below 35°C.
- Position the child on his/her side or back with legs lifted.
- Insert the thermometer in the rectum so that the bulb goes in about ½ inch.
- Keep it in place for 1 minute and take the reading.

Using an axillary thermometer:

- Shake the thermometer down to below 35°C.
- Place it under the child's armpit.
- Keep it in place for 3 minutes.
- If the reading is below 35°C, take a rectal temperature for more accurate reading.

4.4. Initial Assessment and Diagnosis

All children under 5 years of age attending the OPD of the health facility, after their anthropometry has been taken and bilateral oedema checked, will undergo a clinical assessment that follows the IMNCI guidance. The assessment will lead to the differential diagnosis and classification of acute malnutrition. In case of SAM, the diagnosis and treatment pathway of some medical conditions will be different. The *OPD-MAM/SAM Record* (**Form 6**) is used to collect the individual information during the assessment, start of treatment and follow-up monitoring of care.

Assess:

- Ask for demographic information on the child, the family's living conditions, any deaths of siblings, the child's birth weight, breastfeeding and other feeding history, recent illness.
- Indicate whether the child is a new admission, a re-admission (returned defaulter within 3 months of absenteeism) or referred from IPD-SAM to continue treatment.
- Check the following signs:
  - Presence of bilateral pitting oedema grade (+) (++) or (+++) and duration
  - MUAC reading
  - Weight
  - Height (or length) and WHZ only if capacity exists (use the Moyo chart to identify WHZ)
  - Number of stools per day and appearance of stool
  - Presence and appearance of vomit
  - Passing urine
  - Cough
  - Feeding history
  - Respiratory rate
  - Chest indrawing
  - Pallor
  - Temperature
  - Signs of dehydration (and recent sinking of eyes)
  - Mouth infection
  - Eye infection
  - Ear infection

- Lymph nodes
- Disability
- Skin changes, infection or scabies
- Immunization history
- Contact with measles or tuberculosis

- Test appetite with RUTF in case of SAM for all children that are alert (**Box 2.1**).
- Decide whether to do a rapid diagnostic test of malaria and urine.

Diagnose and decide:

- Decide whether the child 6–59 months of age has MAM or complicated or uncomplicated SAM and needs treatment in OPD-SAM or OPD-MAM or referral to IPD-SAM (**Table 4.1)**.

  - Children with MAM (moderate wasting) will start treatment in OPD-MAM.
  - Children with uncomplicated SAM (nutritional oedema grade (+) or (++) without severe wasting, or children severe wasting who pass the appetite test and have no or minor medical conditions and are alert) will start treatment in OPD-SAM.
  - Children with complicated SAM (nutritional oedema grade (+++), oedema and severe wasting, children with severe wasting and any danger sign) or children with uncomplicated SAM and weighing less than 4 kg will be referred to IPD-SAM. They will receive immediate attention and start treatment before referral. Children with complicated SAM will be treated in IPD-SAM until their condition is stabilised and appetite has returned, after which they will be referred to OPD-SAM to continue treatment until full recovery.

Table 4.1. Diagnosis and treatment plan for children 6–59 months of age identified with acute malnutrition

Diagnosis		
MAM	**Uncomplicated SAM**	**Complicated SAM**
• MUAC ≥ 115 and < 125 mm	• Bilateral pitting oedema grade (+) or (++) without MUAC < 115 mm or WHZ < –3, or • MUAC < 115 mm or WHZ < –3 • Appetite • Alert	• Bilateral pitting oedema grade (+++), or • Bilateral pitting oedema and MUAC < 115 mm or WHZ < –3, or • MUAC < 115 mm or WHZ < –3 with: – General danger sign or serious associated disease, or – Poor appetite, or – Weight < 4 kg
Treatment plan		
Start treatment in OPD-MAM.	Start treatment in OPD-SAM.	Refer to IPD-SAM.

The first page of the *OPD-MAM/SAM Record* provides guidance on the clinical signs and parameters to check during this procedure and record in a standard manner.

4.5. General Case Management of Moderate Acute Malnutrition in OPD-MAM

The child with MAM will receive routine treatment for MAM and specific treatment for any associated disease that was diagnosed. The treatment will include a supplementary food to 'supplement' the home food by providing balanced nutrients to restore metabolism and catch up body weight.

Treat:

- Treat for presumptive helminthiasis on admission (**Table 4.2**):

Single dose mebendazole 250 mg for children 12–23 months of age and 500 mg for children ≥ 2 years of age, or albendazole 200 mg for children 12–23 months of age and 400 mg for children ≥ 2 years.

Table 4.2. Routine anthelminthic for children 12–59 months of age with MAM

Drug*	Age	Dose	Prescription
Mebendazole	12–23 months	250 mg	Single dose orally on admission
	24 months and older	500 mg	
Albendazole	12–23 months	200 mg	
	24 months and older	400 mg	

** Use either mebendazole or albendazole.*

- Treat for associated medical conditions according to IMNCI and decide whether general danger signs or complications need a medical referral.
- Give a take-home amount of ready-to-use supplementary food (RUSF) providing 500 Kcal per day (1 sachet of 92 g) as a supplement to the home foods to recover lost weight, and continue breastfeeding if they are breastfed.

  The amount of RUSF the mother or carer receives to take home should be sufficient to cover the period until the next follow-up visit, i.e., 14 sachets of RUSF for bi-weekly follow-up visits.

  If no RUSF is available, give mothers or carers 'intensified' health and nutrition counselling and guidance on IYCF with special attention to improved complementary feeding.

- Advice the mother or carer on the treatment with RUSF as a supplement to the home foods, and continue breastfeeding.
- Counsel the mother or carer on health and nutrition, and advise to attend nutrition services in the health facility and the community.
- Counsel the mother or carer on sensory stimulation and emotional support of the child.
- Advice the mother or carer to attend the nutrition services in the health facility and the community.
- Verify the mother or carer's health and nutrition status, and refer

for psychosocial support if needed.
- Verify the immunization schedule and vaccinate the child if needed.
- Make an appointment for a follow-up visit every other week (bi-weekly).
- Register the child and give a unique registration number (if not given before).
- Record all information from the consultation on the *OPD-MAM Record.*
- Fill out the *Prescription Card* (**Form 19**) that is kept by the mother or carer.

Monitor:

- Check the child's condition and treatment progress at each follow-up visit (usually bi-weekly):
  - Weight gain
  - MUAC (WHZ) increase
  - Appetite maintained
  - Temperature normal
  - Respiratory rate normal
  - Absence of health problem or medical condition according to IMCNI
- Determine whether a general **danger sign** or complication needs immediate attention and/or referral.
- Determine whether the child has reached the end of treatment criteria.
- Decide whether the child **fails to respond to treatment.** The child should gain in weight and MUAC. The child's general clinical condition should also improve. If not, decide on a home visit to support the feeding and care environment and/or refer for further medical investigation.
- Give take-home RUSF until the next follow-up visit; fill out the *Prescription Card.*
- Register attendance and record all information taken during the consultation on the OPD-MAM Record.
- Monitor **bi-weekly attendance**: Check whether the child attends OPD-MAM. If not, decide on a home visit to find out the reason for absenteeism or defaulting.

4.6. General Case Management of Uncomplicated Severe Acute Malnutrition in OPD-SAM

The child with uncomplicated SAM will receive routine treatment for SAM and specific treatment for any associated disease that was diagnosed. The treatment will include a therapeutic food that replaces the home food, providing all nutrients to restore metabolism and catch up body weight.

Treat:

- Prevent deterioration of the child's condition (prevent hypoglycaemia, hypothermia, dehydration):
  - Give 10% sugar water if available (10 gr or 2 heaped teaspoons in 10 ml water).
  - Encourage continued breastfeeding if breastfed and start feeding.
  - Cover the child and keep him/her warm and away from draught.

- Treat for presumptive infections with antibiotics (**Table 4.3**):

  Amoxicillin 40 mg/kg orally two times per day for 5 days, or if amoxicillin is not available,
  Cotrimoxazole (trimethoprim 4 mg/kg + sulfamethoxazole 20 mg/kg) orally two times per day for 5 days

Table 4.3. Dosage of routine antibiotic for children 6–59 months of age with uncomplicated SAM

Drug* and dosage	Dose according to body weight			
	–< 6 kg	6–< 10 kg	10–< 15 kg	15–< 20 kg
Amoxicillin 40 mg/kg orally two times per day for 5 days				
Tablet 250 mg	1	1 1/2	2	3
Syrup 250 mg/5 ml	2.5 ml	7.5 ml	10 ml	-
Cotrimoxazole (trimethoprim 4 mg/kg + sulfamethoxazole 20 mg/kg) orally two times per day for 5 days				
Adult tablet (T 80 mg + S 400 mg)	1/4	1/2	1	1
Paediatric tablet (T 20 mg + S 100 mg)	1	2	3	3
Suspension (T 40 mg + S 200 mg/5 ml)	2 ml	3.5 ml	6 ml	8.5 ml

** Use either amoxicillin or cotrimoxazole.*

- One week after start of treatment, treat for presumptive helminthiasis infection (**Table 4.4)**:

  Mebendazole 250 mg for children 12–23 months of age and 500 mg for children ≥ 2 years, or Albendazole 200 mg for children 12–23 months of age and 400 mg for children ≥ 2 years, single dose**.**

Table 4.4. Dosage of routine anthelminthic for children 12–59 months of age with uncomplicated SAM

Drug*	Age	Dose	Prescription
Mebendazole	12–23 months	250 mg	Single dose orally after 1 week
	24 months and older	500 mg	
Albendazole	12–23 months	200 mg	
	24 months and older	400 mg	

** Use either mebendazole or albendazole.*

- Treat or prevent associated medical conditions (see **Annex 2** for detailed guidance)**:**
  - Measles: Give measles vaccination on admission.
  - In case of eye signs of vitamin A deficiency, refer the child to IPD-SAM; do not give vitamin A in the absence of eye signs and if the child receives RUTF with WHO specifications.
  - Malaria: Treat according to the national protocol.
  - Mild anaemia: Do not give iron when the child receives RUTF with WHO specifications.
  - Diarrhoea: Continue feeding and giving fluids; do not give ORS or zinc if the child receives RUTF with WHO specifications.
  - In case of bloody, persistent or profuse watery diarrhoea, which is a medical complication, refer the child to IPD-SAM.
  - Minor skin infections: Treat according to the national IMNCI guidelines.
  - Minor eye infections: Treat according to the national IMNCI guidelines.
  - TB contact: Treat according to the national guidelines.
  - Suspected HIV: Test and treat according to the national guidelines.
  - Fever: Cool the child by sponging the child's body with lukewarm water.
  - In case of high fever (body temperature ≥ 39.5° C) or persistent fever, refer the child to the hospital for further investigation and care; do not use paracetamol because of the risk of hepatic damage.
- Give take-home amount of RUTF providing 200 Kcal/kg/day for therapeutic feeding to restore metabolism and recover lost weight (catch-up growth).

Table 4.5 lists the amount of RUTF the child should eat per day and the number of sachets the mother or carer should receive per week. The amount of RUTF the mother or carer receives to take home should be sufficient to cover the period until the next weekly follow-up visit. Children should eat the entire daily dose of RUTF and continue breastfeeding if breastfed. Home foods can be offered from the second week, after the daily amount of RUTF has been consumed.

Table 4.5. Dosage of RUTF (92g) for children 6–59 months of age with uncomplicated SAM

Weight of the child (kg)	Sachets per day	Sachets per week
4.0–4.9	2	14
5.0–6.9	2.5	18
7.0–8.4	3	21
8.5–9.4	3.5	25
9.5–10.4	4	28
10.5–11.9	4.5	32
> 12	5	35

- Counsel the mother or carer on feeding and care practices and the use of RUTF at home (**Box 4.2)**
- Make an appointment for a follow-up visit every week.
- Register the child and give a unique registration number (if not given before).
- Record all information from the consultation on the *OPD-SAM Record*.
- Fill out the *Prescription Card* that is kept by the mother or carer.

Box 4.2. Key messages on feeding and care practices in OPD-SAM

On admission:

1. Explain the severity of the child's condition; explain that the child can be treated as an outpatient as long as he/she can comply with the treatment, come back each week for follow-up to monitor progress until the child fully recovers, and that treatment is likely to take about 2 months.
2. Explain how to give the drugs (observe giving the first dose) and the RUTF (observe and guide the mother during the appetite test) at home.

On admission and at each follow-up visit, share the following messages:

1. Continue to breastfeed the child on demand until the child reaches at least 2 years. Breast milk is the best food but has to be complemented with other nutritious food from 6 months of age onward.
2. Give the prescribed drugs as indicated.
3. Wash the child's hands and face and clean the RUTF sachet with soap before feeding.
4. Give the daily-prescribed dose of RUTF to the child with sips of drinking water after each mouthful. The first week, the child should not eat anything else; from the second week, complementary food may gradually be offered after taking the prescribed dose of RUTF.
5. Do not mix RUTF with water or other fluids.
6. Keep the RUTF sachet clean and covered.
7. Do not share the RUTF with members of the family; RUTF is a treatment for the malnourished child.
8. Continue to feed the RUTF even if the child has diarrhoea. During illness, give more food and fluids.
9. Keep the child covered and warm. Malnourished children get cold quickly.
10. Return to the health facility whenever the child's condition deteriorates or the child is not eating well.
11. Return to the health facility after 1 week to monitor the condition of the child and to receive RUTF.

After the first week, give age-specific counselling on feeding and care. Complementary feeding should be gradually introduced alongside continued breastfeeding after the daily RUTF dose is taken.

In case of continued treatment in OPD-SAM after stabilisation in IPD-SAM:

Children with **SAM referred from IPD-SAM** after their condition was stabilised will also have joined OPD-SAM and will be monitored as the other children in treatment. They should not receive routine medications because these have already been administered during their hospital stay. However, if any treatment is incomplete, this information should have been communicated on the *Referral Slip* and the doses required to complete the treatment should be given.

Monitor:

- Check the child's condition and treatment progress at each follow-up visit (usually weekly):
  - Oedema loss
  - Weight gain
  - MUAC (WHZ) increase
  - Appetite maintained
  - Temperature normal
  - Respiratory rate normal
  - Absence of health problem or medical condition according to IMCNI
- Determine whether a general **danger sign** or complication needs immediate attention and/or referral.
- Determine whether the child has reached the end of treatment criteria.
- Decide whether the child **fails to respond to treatment** (see **Box 4.3).**

  The child should gain weight and MUAC should increase accordingly; or, if the child has oedema, the oedema should decrease and the child may first lose weight. The child's general clinical condition should also improve. If not, decide on a home visit and/or referral for further medical investigation.
- Advise the mother or carer to gradually introduce complementary foods after the child has eaten the daily RUTF dose.
- Counsel the mother or carer on health and nutrition, and advise to attend nutrition services in the health facility and the community.

- Verify the mother or carer's health and nutrition status, and refer for psychosocial support if needed.
- Counsel the mother or carer on sensory stimulation and emotional support of the child.
- Verify the immunization schedule and vaccinate the child if needed.
- Give the take-home amount of RUTF until the next follow-up visit and fill out the *Prescription Card*.
- Register attendance and record all information from the consultation on the *OPD-SAM Record*.
- Monitor **weekly attendance**: Check whether the child attends OPD-SAM. If not, decide on a home visit to find out the reason for absenteeism or defaulting.

Box 4.3. Possible reasons for failure to respond to treatment in OPD-MAM/SAM

A child may not gain weight or may lose weight because of undetected illness or poor quality of care, poor adherence to treatment or poor functioning of the service; other reasons may be socioeconomic.

Underlying illness:

- Unrecognized infections, e.g., persistent diarrhoea, dysentery, otitis media, pneumonia, urinary tract infection, malaria, helminthiasis, hepatitis, TB or HIV infection
- Vitamin or mineral deficiency
- Other serious underlying diseases, e.g., congenital abnormalities, physical or mental handicaps, inborn errors of metabolism
- Psychological trauma

Sub-optimal individual care and services:

- Initial assessment missed a reason the child is ineligible for admission to OPD-MAM/SAM
- Poor assessment of appetite on admission and follow-up visits
- Inadequate instructions given to mothers and carers on feeding and caring
- Breaks in supply of RUSF or RUTF
- Routine drugs not available, or not taken
- Any other non-adherence to the protocol

Socioeconomic situation:

- Sharing of RUTF or RUSF with other family members level because of lack of food in the household or lack of income leading to sale of RUSF or RUTF
- Poor feeding or caring practices due to lack of time, other pressures or poor knowledge
- Weak health and nutrition services for vulnerable populations or people in hard-to-reach areas

4.7. End of Treatment

Children being treated for acute malnutrition have usually suffered some combination of nutritional deficit and/or infection, which arise as a result of many factors. To continue healthy growth and prevent relapse, follow-up care is always required. Mothers or carers are encouraged to continue attending monthly facility-based and community-based nutrition services (FBNS and CBNS).

Decide end of treatment for OPD-MAM/SAM:

- Check whether the child reaches the **end of treatment criteria** for two consecutive visits (**Table 4.7**):
  - MUAC ≥ 125 mm or WHZ ≥ –2; use the same anthropometry for start and end of treatment
  - Absence of oedema
  - Child alert and well
- If the child is absent for two consecutive visits, record the third missed visit as defaulting, and request a home visit to inquire the reason for defaulting.

Start end of treatment procedure:

- Verify whether the immunization schedule has been completed, and vaccinate the child if needed.
- Complete the *OPD-MAM/SAM Register* and the *OPD-MAM/SAM Record*:

  Date; treatment outcome (cured, died, defaulted, non-cured or referred out), end anthropometry, length of stay, weight gain.
- Advise the mother or carer to continue attending monthly facility-based and community based nutrition services and to return to the health facility if a problem occurs or the child's condition deteriorates.

Table 4.7. Criteria for start and end of treatment for children 6–59 months of age in OPD-MAM/SAM

Start of treatment	End of treatment
OPD-MAM	**Continued FBNS and CBNS**
MAM • MUAC ≥ 115 mm and < 125 mm	**Normal nutrition** • MUAC ≥ 125 mm for two consecutive visits • Alert and well
Start of treatment	**End of treatment***
OPD-SAM	**Continued FBNS and CBNS**
Uncomplicated SAM • Bilateral pitting oedema grade (+) or (++) without MUAC < 115 mm or WHZ < –3, or • MUAC < 115 mm or WHZ < –3 • Preserved appetite • Alert	**Normal nutrition** • MUAC ≥ 125 mm (or WHZ ≥ –2) for two consecutive visits • No oedema for two consecutive visits • Alert and well

** Use the same anthropometric indicator for start and end of treatment.*

CBNP = Community-based nutrition services, FBNS = Facility-based nutrition services.

Chapter 5. Management of Complicated Severe Acute Malnutrition in Children 6–59 Months of Age

This chapter provides guidance on the management of complicated SAM in children 6–59 months of age in IPD-SAM as part of the IMAM approach, aligning with paediatric hospital care. **Annex 2** gives complementary guidance on the treatment of associated medical conditions. **Annex 3** gives complementary information on specialised foods and products for the management of acute malnutrition.

In IPD-SAM, two options for the management of complicated SAM in children 6–59 months of age after stabilisation are considered:

> ***Option 1:*** If OPD-SAM is available (there is access to RUTF), then children 6–59 months of age with complicated SAM will be treated in IPD-SAM until the child's condition is stabilised and the appetite has returned and the child can be referred to OPD-SAM to continue treatment until full recovery; children 6–59 months with uncomplicated SAM will be treated in OPD-SAM from the start up to full recovery.
>
> ***Option 2:*** If no OPD-SAM is available (there is no access to RUTF) or there is no possibility to eat RUTF, then children 6–59 months with (un)complicated SAM will be treated in IPD-SAM until full recovery.

5.1. Principles of Care

The management of complicated SAM in children in IPD-SAM follows the principles of paediatric hospital care [16, 37] that shows differences in care of children with SAM and well-nourished seriously ill children. Children with SAM are treated differently because their pathophysiology is seriously abnormal due to reductive adaptation. For example, three important implications that affect the treatment protocols are: 1) they may not show usual signs of infections, 2) the increased iron storage due to a reduced haemoglobin makes iron supplementation to address anaemia dangerous, and 3) the disturbed electrolyte balance requires a fluid management with increased potassium and restricted sodium.

All sick children 6–59 months of age arriving at the emergency room of the hospital will systematically be screened for acute malnutrition by assessing bilateral pitting oedema and wasting by measuring MUAC in order not to miss any opportunity to start early and adapted care. They will be weighed as soon as their condition allows for drug dose adaptation and weight gain monitoring. Their WHZ may be assessed when capacity exists and when the child's condition allows it.

All sick children will be assessed for life-threatening conditions; the emergency triage, assessment and treatment (ETAT) procedure will verify emergency and priority signs that need urgent attention. Children that are admitted will be monitored for life-threatening conditions continuously and undergo the ETAT procedure as needed.

IPD-SAM aims to stabilise the child's condition until the child regains appetite and the medical condition is resolving. The child will then be referred to continued treatment as an outpatient in OPD-SAM and recover at home (*Option 1*). The duration of hospitalisation should always be short because of the risks of acquiring new infections and the burden on families and the health system. If referral to OPD-SAM is not possible (RUTF is not available or there is a social or security issue), the child should remain in IPD-SAM until full recovery (*Option 2*).

Children with SAM are best separated from other ill children because of their vulnerability (e.g., to infection, shock, hypothermia or hypoglycaemia) and different treatment pathway (e.g., longer duration, slower recovery, different feeding pattern). Careful infection control procedures should be respected, and the room should be kept warm without draughts.

Mothers or carers should be encouraged to be involved in care and provide sensory stimulation and emotional support for their children. They should receive counselling and health and nutrition education for improved feeding and care practices, and medical and psychosocial support for themselves as needed.

The decision to discharge children recovering from SAM from hospital should be made jointly by the health team, which may include a social worker, as all aspects of wellbeing need to be stable prior to discharge. Mothers or carers of the children will be referred to the OPD-SAM close to

their homes to continue treatment and support. They will be encouraged to continue accessing monthly facility-based and community-based nutrition services.

5.2. Emergency Triage, Assessment and Treatment

The first contact of a health worker with a seriously ill child will trigger urgent attention and **Emergency Triage, Assessment and Treatment (ETAT)** procedures. ETAT procedures for the seriously ill child with SAM follow the same procedures as for the child without SAM with some differences, and are therefore described in this section [16, 1].

Principles of ETAT

Seriously ill children must be checked for **emergency signs** of airway (A) and breathing (B), circulation and coma or convulsion (C) and severe dehydration (D), to be treated promptly. Health workers responsible for ETAT should always systematically assess a child's nutritional status early because the treatment for positive emergency signs of shock and dehydration differ for children with or without SAM. They should also always make sure the child is warm, with head and body covered, unless the child has a high fever.

SAM status for children 6–59 months of age is verified by checking for the presence of bilateral pitting oedema and measuring MUAC. In the absence of an emergency sign, SAM is always a **priority sign**, which means that children with SAM require prompt a full assessment and start of treatment.

ETAT procedures for the seriously ill child with SAM are summarized in **Box 5.1.** Treatment of the different conditions may overlap, and a return to previous steps may be considered, based on close monitoring of the condition of the child. The *IPD-SAM Record*, consisting of the *Initial Management Card* and the *Daily Care Card*, provides guidance on the procedures to follow (**Form 7)**.

Box 5.1. ETAT for children with SAM

Emergency signs:

If any sign is positive, call for help; assess and resuscitate; measure MUAC for children 6–59 months of age and verify oedema and visible wasting for infants under 6 months of age to determine whether the child has SAM; give treatment(s); draw blood for emergency laboratory investigations for, e.g., glucose, malaria smear, haemoglobin (Hb).

ASSESS	TREAT
Airway and breathing (A, B) • Obstructed or absent breathing *or* • Central cyanosis *or* • Severe respiratory distress	• Manage the airway. • Give oxygen. • Make sure the child is warm (cover the child's head and body, apply the kangaroo technique).
Circulation (for shock) (C) Cold skin with: • Capillary refill longer than 3 seconds, *and* • Weak and fast pulse	If the child is lethargic or unconscious: • Give intravenous (IV) glucose. • Give IV fluids. • Give oxygen. If the child is not lethargic or unconscious: • Give glucose orally or by nasogastric tube and reassess within 30 minutes. • Proceed immediately to full assessment and treatment.

Coma/convulsing (C) • Coma, or • Convulsing (now)	• Manage the airway. • If convulsing, or SPO2 <94%, give oxygen. • If convulsing, give diazepam rectally. • Position the unconscious child. • Give IV glucose.
Severe dehydration (D) (only in a child with diarrhoea or profuse vomiting) Diarrhoea plus any two of the following signs: • Lethargy • Sunken eyes • Very slow skin pinch, or • Inability to drink or drinking poorly	• Make sure the child is warm. • Do not insert an IV line. • Proceed immediately to full assessment and treatment.

AIRWAY (A) and BREATHING (B)

Assess:

- Examine the child's breathing:
  - *Does the child's breathing appear obstructed?* Look at the chest wall movement and listen to breath sounds to determine whether there is poor air movement during breathing.
  - *Is there central cyanosis?* Determine whether there is a bluish or purplish discoloration of the tongue and the inside of the mouth.
  - *Is the child breathing?* Look and listen to determine whether the child is breathing.
  - *Is the child in severe respiratory distress?* Determine whether the child's breathing is very laboured, fast or gasping with chest indrawing, nasal flaring, grunting or the use of auxiliary muscles for breathing (see head nodding), inability to feed and tiring easily.

- Measure oxygen saturation:

Non-invasive measurement of oxygen saturation (SpO2) by pulse oximetry is a practical and easily applicable intervention for use in most settings. Pulse oximetry is recommended to determine the presence of hypoxaemia in all children with ETAT emergency signs [1].

SEVERE PNEUMONIA AND ASPIRATION PNEUMONIA may be the cause of the breathing emergency signs. Pneumonia is common in children with SAM admitted to hospital. Aspiration pneumonia may develop because of aspiration of milk feeds, especially if the child has swallowing difficulties (e.g., in case of cerebral palsy). Health workers should be aware of this complication, and acknowledge this risk during re-feeding. Aspiration of feeds can also occur at home. Aspiration pneumonia is suspected if a child's condition suddenly deteriorates, and treatment should be given immediately because it can be fatal.

Treat:

- Place the child on his/her side.
- If the child has only respiratory distress, give oxygen supplementation at SpO2 < 90%.
- If the child presents with other emergency signs with or without respiratory distress, give oxygen therapy at SpO2 < 94%.
- Start antibiotic treatment:
  - Give chloramphenicol 25 mg/kg intravenous (IV) or intramuscular (IM) three times per day (8-hourly) until the child can take it orally, or
  - Give ampicillin 50 mg/kg IM (or IV) four times per day (6-hourly) for 2 days, followed by amoxicillin 25 mg/kg orally two times per day (12-hourly) for 5 days AND gentamicin 7.5 mg/kg IM (or IV) once a day for 7 days.

CIRCULATION or shock (C)

Treatment of shock in children with SAM differs from that in well-nourished children, because shock from dehydration and sepsis are likely to coexist and difficult to differentiate on clinical grounds alone; also, children with SAM may not cope with changes in fluid and salt balance.

Assess:

- Examine the child for shock:
  - *Are the child's hands cold?* If so, continue to determine whether the child is in shock.
  - *Is the capillary refill time slow?*

    Apply pressure to whiten the nail of the thumb or the big toe for 2 seconds; determine the time from the moment of release until total recovery of the pink colour. Capillary refill is slow if it takes longer than 3 seconds

  - *Is the pulse weak and fast?*

    If the radial pulse is strong and not obviously fast, the child is **not** in shock.
    If the radial pulse of an infant (under 1 year of age) cannot be felt, feel the brachial pulse or, if the infant is lying down, the

femoral pulse. If you cannot feel the brachial pulse, feel the carotid. If the room is very cold, rely on the pulse to determine whether the child is in shock.

- Is the systolic blood pressure low for the child's age?

  Shock may be present with normal blood pressure, but very low blood pressure means the child is in shock. Poor circulatory volume or perfusion can co-exist with nutritional oedema.

- **Decide** whether the shock is from dehydration or sepsis (**Box 5.2**).

Box 5.2. Differential diagnosis of shock from dehydration or sepsis in children with SAM

Hypovolaemic shock:

- Reduced level of consciousness
- Cold hands
- Capillary refill* longer than 3 seconds, OR
  Weak or fast radial pulse
  (≥ 160/minute in children 2–12 months of age, ≥ 140/minute in children 1–5 years)

Septic shock:

- Reduced level of consciousness
- Cold hands
- Tachycardia, with weak or absent radial pulse (femoral pulse may also be weak)
- No signs of heart failure (but possible signs of infection may be masked in children with SAM)

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 another severe condition is present, septic shock should be assumed. Septic shock is often seen in people who are immunocompromised or have hospital- acquired infections. Mortality due to multiple organ failure may exceed 50%.

** Determine capillary refill by pressing the nail of the thumb or big toe for 2 seconds. Count the seconds from release until return of the pink colour. If it takes longer than 3 seconds, capillary refill is slow.*

Treat:

In children with signs of shock, low or un-measurable blood pressure, coma, very severe anaemia or severe heart failure:

- Give oxygen therapy at SpO2 < 94% and maintain oxygen saturation at ≥ 94%.
- Give sterile 10% glucose 5 ml/kg by IV (see Hypoglycaemia below).
- Give IV fluids (**Box 5.3**) **only if the child has all three signs of shock AND** reduced level of consciousness or lethargy.
- Give broad-spectrum antibiotics.
- Measure and record pulse and respiratory rate every 30 minutes.
- Keep the child warm.

Box 5.3. How to give intravenous fluids for children with SAM

- Insert an IV line (and draw blood for emergency laboratory investigations).
- Weigh the child (or estimate the weight) to calculate the volume of fluid to be given.
- Start IV fluid at 10–15 ml/kg over 1 hour [1]; the amount of fluid given should be guided by the individual child's response and whether there is a history of profuse watery diarrhoea.
- Avoid over-hydration; monitor the pulse and breathing at the start and every 5–10 minutes to check whether they are improving.
- Use one of the following solutions according to availability:

  Ringer's lactate with 5% glucose (dextrose), or
  Half-strength Darrow's solution with 5% glucose (dextrose)
  If neither is available, use 0.45% NaCl plus 5% glucose (dextrose).
- Do not give IV fluids to children with SAM when they have just one or two signs of shock. Further close monitoring of these children is essential.

Monitor:

If there are **signs of improvement** (pulse rate falls, pulse volume increases or respiratory rate falls) **AND no evidence of pulmonary oedema**:

- Continue the IV infusion at 10–15 ml/kg over 1 hour, then
- Switch to ReSoMal 5–10 ml/kg per hour for oral or nasogastric rehydration up to 10 hours.

ReSoMal is an oral rehydration solution (ORS) exclusively for oral or nasogastric rehydration in SAM. It is provided under medical supervision in IPD-SAM; it is never given for free to mothers or carers. The standard WHO ORS for general use has a high sodium and low potassium content, which is not suitable for children with SAM unless they have cholera or profuse watery diarrhoea. If ReSoMal is not available, half-strength low osmolality ORS can be used. **Annex 3** includes recipes for ReSoMal**.**

- Initiate re-feeding with starter therapeutic milk F75.
- Ensure continued and more frequent breastfeeding if the child is breastfed.

If the child **fails to improve after 1 hour of IV fluid therapy at 10–15 ml/kg**:

- Give maintenance IV fluid (3 ml/kg per hour) while waiting for blood.
- When blood is available, transfuse fresh whole blood at 10 ml/kg slowly over 3 hours (use packed cells if the child is in cardiac failure).
- Then, initiate re-feeding with starter F75.
- Start IV antibiotic treatment.

If the child **deteriorates during IV rehydration**, pulmonary oedema may be suggested (identified by increased breathing and pulse rate, enlarged liver, fine crackles throughout lung fields, increased jugular venous pressure, galloping heart rhythm):

- Stop the infusion immediately.

In limited-resource settings, shock can be very difficult to manage. It is best prevented by careful fluid management, re-feeding and individual bedside assessment to follow progress. Even in high-resource settings, IV fluid management of well-nourished children with severe circulatory impairment can result in fluid overload, which may be harmful. Fluid overload generally indicates the need for inotrope and ventilation support [1].

SEVERE ANAEMIA IN SAM may be the cause of shock and respiratory distress, and children with SAM and very severe anaemia require a

blood transfusion. **Figure 5.1** is the algorithm for deciding blood transfusion in the treatment of severe anaemia in SAM.

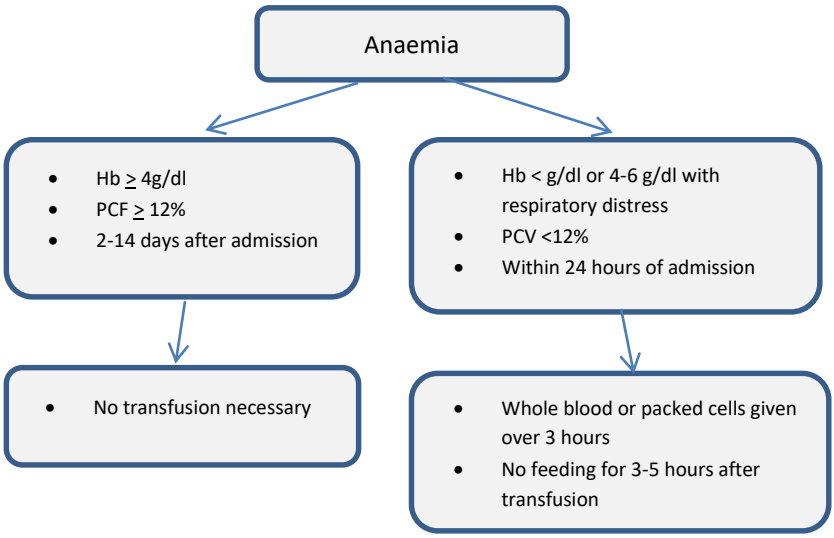


Figure 5.1. Algorithm for blood transfusion in the treatment of severe anaemia in SAM

Assess whether haemoglobin (Hb) is < 4 g/dl or 4–6 g/dl with respiratory distress.

Treat:

- Give whole blood as soon as possible (within the first 24 hours after admission), 10 ml/kg, slowly over 3 hours. The transfusion must be slower and of smaller volume than for a well-nourished child.
- Give furosemide, 1 mg/kg IV, at the start of the transfusion to make room for the blood.
- If the child has signs of heart failure, give 5–7 ml/kg of packed cells because whole blood is likely to worsen this condition; if no packed cells are available, give whole blood 10 ml/kg slowly over 3 hours.
- Stop all oral intake and IV fluids during transfusion.

In some children with severe anaemia, the circulating volume is normal or even expanded, so, although a blood transfusion is urgently required, it should be given slowly. If it is given too rapidly, it can lead to circulatory overload [1].

Monitor:

- Closely monitor the pulse and respiratory rates, listen to the lung fields, examine the abdomen for liver size and check the jugular venous pressure every 15 minutes during the transfusion.
- If either breathing or heart rate or pulse increases, transfuse more slowly.
- If there is basal lung crepitation or an enlarging liver, stop the transfusion and give furosemide at 1 mg/kg by IV.
- Look for signs of congestive heart failure such as fast breathing, respiratory distress, rapid pulse, engorgement of the jugular vein, cold hands and feet or cyanosis of the fingertips and underside of the tongue.
- Do not repeat transfusion even if Hb is still low or within 4 days of the last transfusion unless the child has life-threatening severe anaemia or active bleeding.
- Do not give iron during stabilisation of SAM even if the child is suspected to be anaemic because iron can make infections worse; iron can be given when the child has a good appetite and starts gaining weight if fortified foods are not given.

CONGESTIVE HEART FAILURE, or congestive cardiac failure or cardiac shock, occurs when the heart is unable to provide sufficient pump action to distribute the blood flow to meet the needs of the body. Heart failure can cause a number of symptoms, but in children with SAM, the first sign of heart failure is fast breathing. Heart failure is usually a complication of over-hydration (especially when an IV infusion or standard oral rehydration solution has been given), very severe anaemia, a blood or plasma transfusion or a diet with high sodium content.

Heart failure must be differentiated from respiratory infection and septic shock, but this differentiation is extremely difficult, and the two conditions may occur together to a greater or lesser extent, in which case treating one may lead to worsening of the other. The key to successful management is frequent bedside reassessment. **Box 5.4** summarises the diagnosis of heart failure.

Assess:

- Examine the child's respiratory rate (has it increased) (first sign)?
- Examine the child's pulse rate (has it increased?), distension of the jugular veins, enlarged liver, cold hands and feet, and cyanosis of the fingertips and under the tongue (later signs)?

It may be difficult to distinguish between heart failure and pneumonia in children with SAM. **Figure 5.2** is the algorithm for making a differential diagnosis between pneumonia and fluid overload.

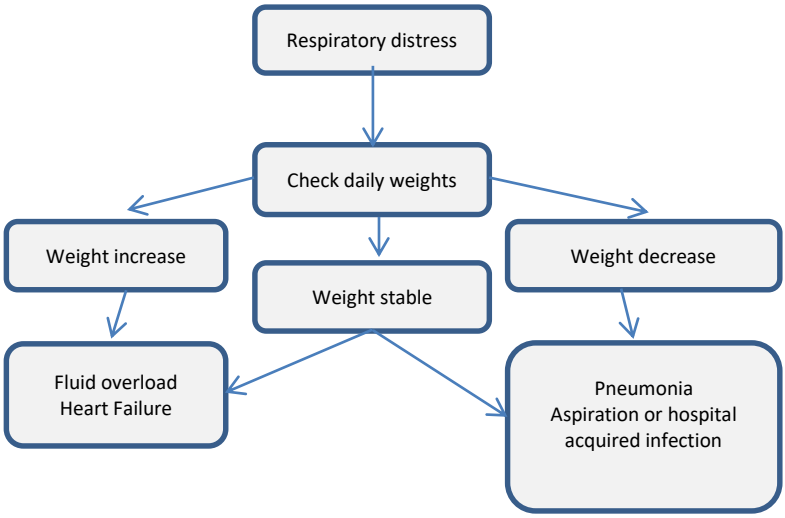


Figure 5.2 Algorithm for differential diagnosis of pneumonia and fluid overload

Prevent heart failure during re-feeding:

- Monitor early signs of rapid pulse, fast breathing, basal lung crepitation, enlarging liver, galloping heart rhythm and raised jugular venous pressure every 30 minutes.
- If both pulse and respiratory rates increase (pulse rate by 25 beats/minute or more and respiratory rate by 5 breaths/minute or more) and the increase is sustained for two successive 4-hourly readings, then:

- Reduce the volume of feeding to 100 ml/kg per day for 24 hours
- Gradually increase the volume of feeding as follows:

  115 ml/kg per day for the next 24 hours,
  130 ml/kg per day for the following 48 hours, thereafter,
  10 ml at each feed.

Treat heart failure caused by fluid overload:

- Give oxygen if the child has a respiratory rate ≥ 70 breaths/minute, shows signs of respiratory distress or has central cyanosis or a SpO2 of < 94%.
- Stop all intake of food.
- Stop all intake of fluids.

  Do not give any fluid until the heart failure has improved, even if this takes 24–48 hours.

- Give a diuretic, **furosemide** 1 mg/kg IV, and reassess the child after giving furosemide.

  Do not give **digoxin** unless the diagnosis of heart failure is unmistakeable (jugular venous pressure is elevated) and the plasma potassium level has been measured and is normal: digoxin 5 µg/kg IV as a single dose, or orally if the IV preparation is not available.

  Giving digoxin is as dangerous as giving IV fluids, because it may cause shock or dangerous electrolyte changes. These are especially problematic in children with kwashiorkor because they cannot regulate their intravascular volume. There is no reported experience of angiotensin-converting enzyme inhibitors or other drugs used to treat congestive heart failure in children with SAM.

  Never treat nutritional oedema with a diuretic because nutritional oedema partly results from potassium deficiency and sodium retention.

GASTROINTESTINAL PROBLEMS may manifest as absent bowel sounds, gastric dilation or intestinal splash with abdominal distension in children with SAM because overgrowth of intestinal bacteria is usual.

This may lead to reduced gastric motility, deterioration of the gut lining and, in some cases, intestinal obstruction with an absence of peristalsis. Bacteria are able to cross the gut lining, causing **sepsis.** This is a clinical emergency with a poor prognosis.

Assess:

- Examine whether the child has absent bowel sounds, gastric dilation or intestinal splash with abdominal distension

Treat:

- Give intravenous antibiotics as for septic shock.
- Stop all other drugs that may be causing hepatotoxicity.
- Give IM magnesium sulphate (2 ml of 50% solution) two times per day until stool is passed.
- Insert a nasogastric (NG) tube and **do gastric lavage** with 5% dextrose or 10% sugar water (**Box 5.5**).
- Give intravenous glucose to treat or prevent hypoglycaemia.
- Monitor continuously for improvement for 6 hours without other treatment.

Box 5.5. How to give a gastric lavage

- Insert 50 ml of 5% dextrose or 10% sugar water into the stomach via a nasogastric tube and aspirate the contents back immediately. This should be repeated until the gastric aspirate becomes clear.
- When gastric aspirates are clear, insert 5 ml/kg of 10% sugar water and leave for 1 hour.
- Aspirate sugar water after 1 hour. If the amount is less than what was inserted, make up the volume again to 5 ml/kg with 10% sugar water. Do not discard the aspirated fluid.
- Keep the child warm.

Improvement in the clinical status of the child will be indicated by:

- Decreased abdominal distension
- Increased peristalsis/bowel sounds
- General improvement in condition (e.g., level of consciousness)

If there is improvement:

- Start F75 (give half the normal quantity for the child's weight).
- Aspirate the stomach before each feed.
- If the amount of aspirate is large, decrease the amount of F75.
- If the amount of aspirate is small, increase the amount of F75 gradually.

If there is no improvement after 6 hours:

- Consider an intravenous infusion (use a fluid suitable for children with SAM), and infuse fluids at a maximum of 4 ml/kg per hour (use a burette or pump).
- When gastric aspirates decrease to ½ of the fluid inserted into the stomach, discontinue the intravenous infusion and continue with oral treatment only.

COMA (C)

Assess:

- Examine whether the child is lethargic or in a coma (unconscious) by checking the level of consciousness on the "AVPU" scale (A alert, V responds to voice, P responds to pain, U unconscious)
  - If the child is not awake and alert, try to rouse the child by talking or shaking the arm. A child who is not alert but responds to a voice is lethargic. If there is no response, ask the mother or carer whether the child has been abnormally sleepy or difficult to wake.
  - Determine whether the child responds to pain or is unresponsive to a painful stimulus. If so, the child is in a coma (unconscious) and needs emergency treatment.

CONVULSIONS (C)

Convulsions in children with SAM is treated in the same way as in children with normal nutritional status [16].

Assess:

- Examine whether the child is convulsing: *Does an unresponsive child show spasmodic repeated movements?*

Treat:

- *Manage the airway.*
- Give diazepam rectally.
- Position the unconscious child.
- Give IV glucose.

DEHYDRATION (D)

Dehydration and its severity may be difficult to estimate in children with SAM because some of the clinical signs (lethargy, delayed skin pinch and sunken eyes) may be present whether the child is dehydrated or not. There is not usually a recent pre-illness target weight measurement. Dehydration may be overestimated in a severely wasted child and underestimated in a child with severe oedema.

Assess:

- Assume that all children with acute watery diarrhoea or vomiting or reduced urine output have some dehydration (typically 5% of body weight).
- Check clinical signs of dehydration (**Box 5.6**): Does a skin pinch go back very slowly (longer than 2 seconds)? Is the child passing urine normally?

  The skin pinch may not be a good sign of dehydration in children with SAM who have lost subcutaneous fat and skin elasticity.

- Ask the mother the recent history:
  - Can the child drink?
  - Is the child lethargic?
  - Does the child have a recent history of watery diarrhoea or vomiting?
  - Does the child have recently sunken eyes?
- Weigh the child.
- Check the heart rate.
- Check the respiratory rate.
- Feel and note cold extremities.
- Palpate the liver and mark the costal margin with indelible ink.
- Verify the absence of jugular venous distension.

- Verify the level of consciousness of the child.
- Verify the severity of oedema.

Box 5.6. Clinical characteristics of dehydration in children with SAM

Assessing dehydration for children with SAM can be very difficult. Even skilled health staff can confuse dehydration in SAM with other conditions. **It is essential to manage the child with SAM and dehydration with extreme caution**. If the clinical status of the child improves with rehydration, then the child was dehydrated; if not, then there was no dehydration. There is a narrow 'therapeutic window' for children with SAM and dehydration; over-hydration and death can occur quickly.

- The skin pinch test of the abdomen or other part of the body is an unreliable sign in marasmic children. The test may be positive in a marasmic child with normal hydration status.
- Children with chronic diarrhoea may adapt physiologically to this state and do not require urgent rehydration therapy.
- Recent 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. In dehydration, this is due to contraction of the venous plexus behind the eye and occurs acutely. Sunken eyes can also occur over time in marasmic children from loss of fat behind the eyeball.
- A diagnosis of dehydration should ALWAYS be provisional. Response to treatment must be observed before the diagnosis can be confirmed.
- Concomitant signs of dehydration may include increased heart rate and temperature and/or reduced blood pressure.
- A child with oedema may be hypovolaemic and should be rehydrated in the same way as a child with severe wasting.

Treat:

- If the child is dehydrated **with signs of shock,** treat for shock (see above).
- If the child is dehydrated **without signs of shock**, rehydrate slowly with the special rehydration solution for malnutrition (ReSoMal) either orally or by NG tube (**Table 5.1)**:
  - Give ReSoMal 5 ml/kg every 30 minutes for the first 2 hours.
  - After 2 hours, alternate ReSoMal with F75 formula 5–10 ml per kg per hour for up to 10 hours. The exact amount depends on

how much the child wants, how much stool has been lost and whether the child is vomiting.

- If rehydration is still required after 12 hours, give starter F75 instead of ReSoMal; use the same volume of starter F75 as of ReSoMal: 5–10 ml/kg per hour.
- Give first-line antibiotics and start re-feeding together with rehydration.
- In case of suspected cholera or similar profuse watery diarrhoea with SAM, do not give ReSoMal but give undiluted low-osmolality oral rehydration solution (ORS) and a zinc supplementation.
- If the child has severe dehydration but cannot be rehydrated orally or by NG tube, give IV fluids, either:

  Ringer's lactate solution with 5% dextrose, or
  Half-strength Darrow's solution with 5% dextrose.

  If neither is available, use 0.45% saline with 5% dextrose.

Table 5.1. ReSoMal regimen for dehydrated children with SAM

ReSoMal:	Amount:
Every 30 minutes for the first 2 hours	5 ml/kg body weight
Alternate with F75 for up to 10 hours	5–10 ml/kg

Figure 5.3 is an algorithm for treatment of dehydration in a child with SAM. Children with SAM, signs of dehydration and no shock should not be rehydrated with IV fluids, because severe dehydration is difficult to diagnose in children with SAM and is often misdiagnosed. Giving IV fluids would put these children at high risk of over-hydration and death from heart failure.

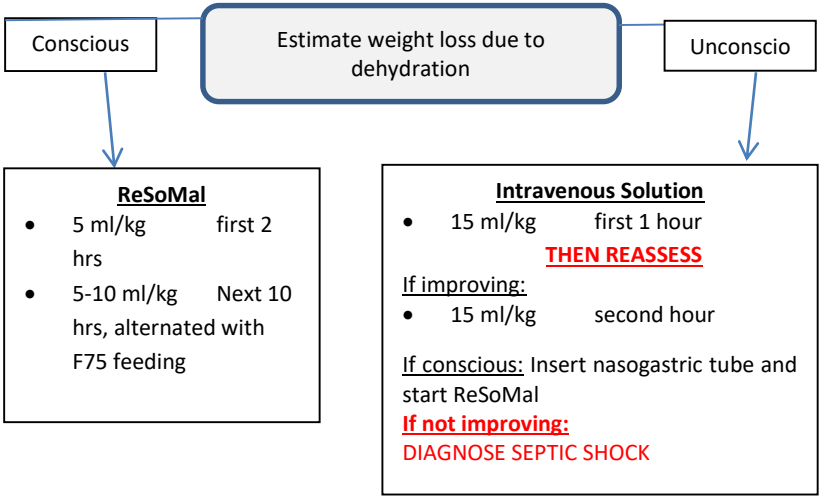


Figure 5.3. Algorithm for treatment of dehydration in a child with severe wasting

Monitor:

As a result of rehydration, rapid respiratory and pulse rates should slow and the child should start to pass urine. Satisfactory progress of rehydration is further indicated by return of tears, moist mouth, less sunken eyes and fontanel, improved skin turgor and passage of urine. However, many children with SAM will not show these changes even when fully rehydrated. **Figure 5.4** is an algorithm for monitoring rehydration therapy.

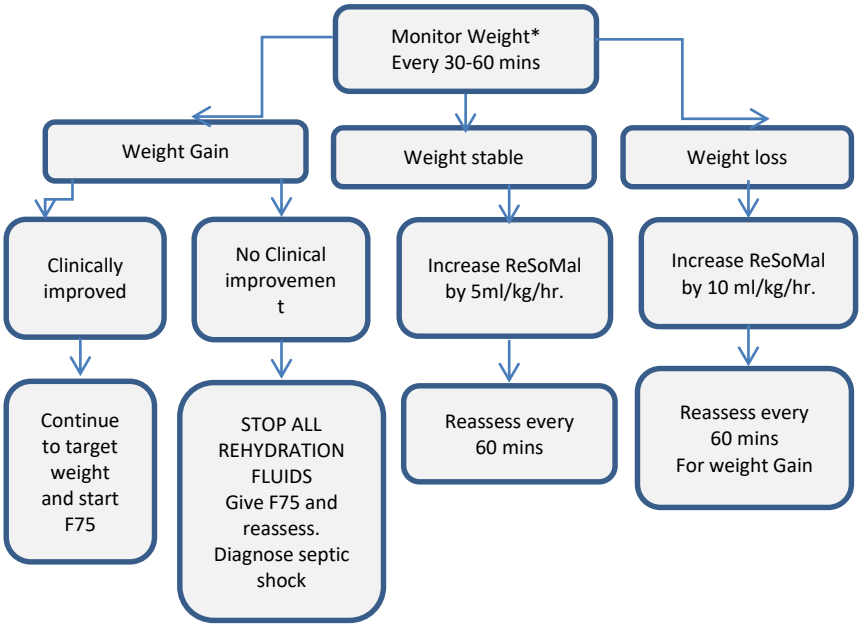


Figure 5.4. Algorithm for monitoring rehydration therapy in a severely wasted patient

*** The aim is improvement of clinical status; the maximum weight gain should be no more than 5% of body weight.**

- Monitor rehydration progress every 30 minutes for 2 hours, then every hour for the next 4–10 hours
- Be alert for signs of over-hydration, which is very dangerous and may lead to heart failure.
- Monitor danger signs of over-hydration or under-hydration:
  - Weight gain: It should not be quick or excessive; weight loss caused by dehydration (typically 5% of body weight) should be regained over the full 12 hours but not quicker.
  - Increasing respiratory rate.
  - Increasing pulse rate.
  - Frequency of urine: Has the child urinated since last checked?

- Enlarging liver size on palpation.
- Frequency of stools and vomit.

- If the child shows the following signs of over-hydration, stop fluids immediately and reassess after one hour:
  - Increasing pulse rate (increase of 25 beats/minute or more).
  - Increasing respiratory rate (increase of 5 breaths/minute or more).
  - Puffy eyelids or increasing oedema.

Prevent:

Prevent dehydration from continuing watery diarrhoea in children with SAM in a similar way as preventing dehydration in well-nourished children, but use ReSoMal fluid instead of standard ORS.

- Continue to breastfeed if the child is breastfed.
- Initiate re-feeding with starter F75 (see below).
- Give ReSoMal between feeds to replace stool losses: 50–100 ml after each watery stool.

5.3. Initial Assessment and Diagnosis

Any child with SAM will undergo a comprehensive assessment to decide the treatment plan. During the assessment, the clinician should remain alert for **emergency and priority signs**. Biomedical tests are decided if indicated. The initial assessment is recorded on the *Initial Management Card* (**Form 7**).

Assess:

- Examine the child for:
  - Hypoglycaemia
  - Signs of shock: Lethargy or unconsciousness, cold hands, slow capillary refill (> 3 seconds), or weak (low volume), rapid pulse and low blood pressure
  - Signs of dehydration
  - Severe palmar pallor
  - Eye signs of vitamin A deficiency: Dry conjunctiva or dry cornea, Bitot spots, corneal ulceration (keratomalacia)

Children with vitamin A deficiency are likely to be photophobic and will keep their eyes closed. It is important to examine their eyes very gently to prevent corneal rupture.

- Signs of infection, including ear and throat infections, skin infection or pneumonia
- Severity of bilateral pitting oedema
- Skin changes of kwashiorkor: Hypo- or hyperpigmentation, desquamation (peeling skin), ulceration (spreading over limbs, thighs, genitalia and groin and behind the ears), exudative lesions (resembling severe burns), often with secondary infection (including candida)

- Fever: Temperature ≥ 36.5°C
- Hypothermia: Rectal temperature < 35.5°C
- Mouth ulcers
- Recent intake of food and fluids
- Usual diet before the current illness
- Breastfeeding
- Loss of appetite
- Duration and frequency of diarrhoea and vomiting
- Type of diarrhoea (watery/bloody)
- Family circumstances
- Cough > 2 weeks
- Contact with tuberculosis
- Recent contact with measles
- Known or suspected HIV infection and/or exposure
- Appetite of children who are alert (test with RUTF; see **Box 2.1**)

Laboratory investigations: Rapid diagnostic tests for malaria, urinary infection and blood sugar (and HIV if relevant) are useful. Where health facilities can do laboratory tests and clinical assessment has indicated their need, tests may help diagnose specific pathophysiological problems that affect nutritional status (**Table 5.2**)**.** Tests are not needed, however, to guide or monitor treatment of SAM, and the SAM condition may alter the interpretation of test results. For this reason, laboratory tests may misguide experienced health workers. The most important guide to treatment is frequent careful assessment. Tests of

little or no value for diagnosing acute malnutrition include serum proteins (though the results may guide prognosis) and electrolytes (which may lead to inappropriate treatment).

Table 5.2. Laboratory tests to consider for a comprehensive diagnosis in children with SAM

Test	Result and significance
Blood glucose	Glucose concentration <54 mg/dl (3 mmol/L) indicates hypoglycaemia.
Blood smear or rapid malaria test	The presence of malaria parasites indicates infection.
Haemoglobin or packed-cell volume	Haemoglobin < 40 g/L or packed-cell volume < 12% indicates very severe anaemia and testing is indicated in case of severe palmar pallor.
Urine specimen	The presence of bacteria on microscopy (or > 10 leukocytes per high power field) indicates infection.
Faeces	The presence of blood indicates dysentery. Giardia cysts or trophozoites indicate infection.
Chest X-ray	Pneumonia causes less shadowing of the lungs in malnourished children than in well-nourished children. Vascular engorgement indicates heart failure. Bones may show rickets or fractures of the ribs.
Skin test for tuberculosis	This is often negative in children with tuberculosis or those previously vaccinated with BCG vaccine.
HIV test	Should be accompanied by counselling of the child's parents, and the result should be confidential

Decide:

- Define treatment plan to start treatment of complicated SAM in IPD-SAM, or refer uncomplicated SAM to OPD-SAM. **Table 5.3** is the diagnosis and treatment plan for children 6–59 months of age.

Table 5.3. Diagnosis and treatment plan for children 6–59 months of age identified with acute malnutrition

Diagnosis		
MAM	**Uncomplicated SAM**	**Complicated SAM**
• MUAC ≥ 115 and < 125 mm	• Bilateral pitting oedema grade (+) or (++) without MUAC < 115 mm or WHZ < –3, or • MUAC < 115 mm or WHZ < –3 • Appetite • Alert	• Bilateral pitting oedema grade (+++), or • Bilateral pitting oedema and MUAC < 115 mm or WHZ < –3, or • MUAC < 115 mm or WHZ < –3 with: – General danger sign or serious associated disease, or – Poor appetite, or – Weight < 4 kg
Treatment plan		
Refer to OPD-MAM.	Refer to OPD-SAM.	Start treatment in IPD-SAM.

5.4. General Case Management in IPD-SAM

The general case management of complicated SAM involves **10 steps** in two phases, which is shown on an indicative time line in **Figure 5.5** [1]. Stabilisation will take place in IPD-SAM and rehabilitation in OPD-SAM (*Option 1).* In exceptional cases, rehabilitation until full recovery may take place in IPD-SAM (*Option 2*). A short period of transition between the two phases will prepare the child to adapt to the change in diet for catch-up growth.

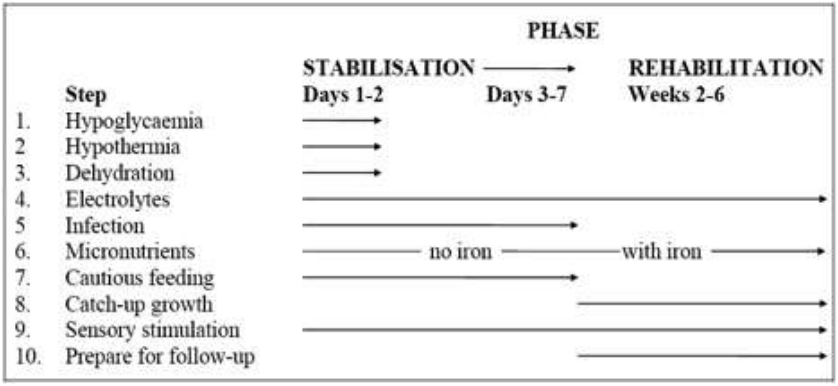


Figure 5.5. Time frame for the management steps of complicated SAM in children [1]

Stabilisation

Ideally, the child and mother or carer are admitted to a special IPD-SAM ward or area close to the paediatric intensive care unit, where competent staff will treat and monitor the child on a 24-hour basis. The IPD-SAM ward has adult beds to enable child and mother or carer to sleep together and keep the child warm. Children with complicated SAM are separated from infectious children in a warm area (25–30°C) with no draughts.

Before the start of any procedure, verify whether the child has **corneal ulceration** that needs immediate attention:

- Give vitamin A and put chloramphenicol or tetracycline and atropine drops in the eye:

Age	< 6 months	6–12 months	> 1 year
Weight	3–< 6 kg	6–< 10 kg	10–29 kg
Vitamin A dosage	50,000 IU	100,000 IU	200,000 IU

- Cover the eyes with a saline-soaked eye pad and bandage.

Hypoglycaemia (Step 1)

All children with SAM are at risk of hypoglycaemia and should be given, immediately on admission, a feed of 10% glucose or sucrose (see below). Frequent 2 hourly feeding is important.

Assess:

- Measure blood glucose (**Box 5.7**) if there is any suspicion of hypoglycaemia and blood glucose can be measured quickly (e.g., with Dextrostix®).

  Hypoglycaemia is present when the blood glucose is < 3 mmol/litre (L) or < 54 mg/dl.

Box 5.7. How to measure blood glucose

Use paper strips such as Dextrostix or Glucostix to measure blood glucose. When the end of the paper strip is covered with a blood sample, the strip changes colour to indicate the blood glucose level.

Check the expiry date of the strips: if the date is expired, the readings may not be correct.

Different testing kits may have different instructions.
Measure blood glucose as follows:

- Touch the paper to the blood sample.
- Wait for an appropriate number of seconds.
- Wash the blood off the strip with running water.
- Compare the test paper to the colour scale provided with the strips.

In many cases, the colour scale for the paper strips may not clearly show the level. For example, it may say that a certain colour corresponds to 2–4 mmol/L. If a range is given, assume that the child's blood glucose is the lower reading (2 mmol/L in this case).

- If blood glucose cannot be measured, assume that all children with SAM are hypoglycaemic and give treatment.

Treat:

- Give 50 ml bolus of 10% glucose or sucrose solution (1 rounded teaspoon of sugar in 3 tablespoons of water) orally or by NG tube, followed by the first feed as soon as possible.
- If the child is unconscious, treat with IV 10% glucose at 5 ml/kg followed by 50 ml of 10% glucose or sucrose by NG tube to prevent rebound hypoglycaemia.
  - If IV access cannot be quickly established, give 10% glucose or sucrose solution by NG tube.
  - If IV glucose is not available, give 1 teaspoon of sugar moistened with one or two drops of water sublingually, and repeat every 20 minutes to prevent relapse,
  - Monitor children for early swallowing, which leads to delayed absorption. If present, give another dose of sugar.
- If convulsion persists after giving glucose IV, give rectal diazepam 0.5 mg/kg body weight.
- Start feeding with F75 therapeutic milk every 30 minutes for the first 2 hours, giving ¼ of the total amount of the 2-hourly feed; continue with F75 feeds every 2 hours for 24 hours, day and night (see Re-feeding).
- Encourage breastfeeding if appropriate.
- Start broad-spectrum antibiotics (see Infection).
- Keep the child warm: cover the child's head and body, and whenever appropriate apply the kangaroo technique, unless the child has high fever.

Monitor:

- If the initial blood glucose was low, repeat the measurement after 30 minutes.
- If blood glucose falls to < 3 mmol/L (< 54 mg/dl), repeat the 10% glucose or oral sugar solution.
- If rectal temperature falls to < 35.5 °C, or if the level of consciousness deteriorates, repeat the Dextrostix measurement and treat accordingly.

Prevent:

- Feed every 2 hours, starting immediately (see Re-feeding) or, when dehydrated, rehydrate first.
- Continue feeding throughout the night.
- Encourage breastfeeding if appropriate.
- Encourage mothers to watch for any deterioration, help feed and keep the child warm.
- Check for abdominal distension.

Hypothermia (Step 2)

Hypothermia is very common in malnourished children and often indicates coexisting hypoglycaemia or serious infection.

Assess:

- Measure temperature (**Box 4.1**): If the axillary temperature is < 35.0 °C or does not register on a normal thermometer, assume hypothermia; when a low-reading thermometer is available, take the rectal temperature to confirm hypothermia (< 35.5 °C).

Treat:

- Treat all children with hypothermia routinely for hypoglycaemia and infection.
- Start antibiotic treatment.
- Feed the child immediately and then every 2 hours unless he/she has abdominal distension.
- Re-warm the child:
  - Make sure the child is clothed (especially the head) and covered with a warmed blanket and place a heater (not pointing directly at the child) or lamp nearby. Use a heater or incandescent lamp with caution. Do not use a hot water bottle or fluorescent lamp.
  - Put the small child on the mother's bare chest or abdomen (kangaroo technique) (**Box 5.8**)
- Let the mother or carer sleep with the child to keep the child warm in the night.
- Keep the child away from draughts.

Box 5.8. Skin-to-skin or kangaroo technique for infants and small children

Warm the infant or small child by putting the child on the mother's bare chest (skin-to-skin) and cover them up together.

Monitor:

- Take the child's rectal temperature every 2 hours until it rises to > 36.5 °C. Take it every 30 minutes if a heater is being used.
- Check for hypoglycaemia whenever hypothermia is found.
- Cover the head of the child with a bonnet. Keep the child covered at all times.

Prevent:

- Treat for hypoglycaemia (see Step 1).
- Start antibiotic treatment.
- Feed the child immediately and then every 2–3 hours, day and night, especially for the first 24–28 hours.
- Keep the child covered with a blanket and a bonnet. Put the small child on the mother's bare chest or abdomen (kangaroo technique) (see **Box 5.8**) and keep away from draughts.
- Avoid exposing the child to cold (e.g., after bathing or during medical examinations); dry carefully after bathing, but do not bathe if very ill; change wet nappies, clothes and bedding to keep the child and the bed dry.
- Keep the room warm. Maintain room temperature at not less than 27° C.
- Place the child in an adult bed to let the mother or carer sleep with the child to keep the child warm in the night.

Dehydration (Step 3)

Assess and treat:

Dehydration in SAM tends to be over-diagnosed and its severity overestimated in children with SAM because dehydration is difficult to determine accurately from clinical signs alone (see **Box 5.6**). For assessing, treating and monitoring dehydration, see Section 5.2.

Prevent:

Measures to prevent dehydration due to continuing watery diarrhoea in children with SAM are similar to those for well-nourished children, except that ReSoMal fluid is used instead of standard ORS (and no zinc supplementation):

- Give 50–100 ml ReSoMal between feeds after each watery stool to replace stool losses.
- If the child is breastfed, ensure continued and more frequent breastfeeding.

Electrolyte Imbalance (Step 4)

All children with SAM have deficiencies of electrolytes, particularly potassium and magnesium, which may take about two weeks to correct. Start of feeding with the therapeutic milk formulation F75 that contains sufficient potassium and magnesium will cover all the need. Oedema is partly a result of potassium deficiency and sodium retention, and should not be treated with a diuretic. Excess body sodium exists even though the plasma sodium may be low. Giving high sodium loads could kill the child.

Infection (Step 5)

In SAM, the usual signs of bacterial infection, such as fever, are often absent, yet multiple infections are common. Therefore, assume that all children with SAM have infection on arrival in hospital, and treat with antibiotics immediately. Hypoglycaemia and hypothermia are often signs of severe infection.

Treat:

- Give a broad-spectrum antibiotic:

- If the child has **uncomplicated SAM**, give a broad-spectrum antibiotic routinely (**Table 5.4**):

Amoxicillin 40 mg/kg orally two times per day for 5 days, or, if not available,
Cotrimoxazole (trimethoprim 4 mg/kg + sulfamethoxazole 20 mg/kg) orally two times per day for 5 days.

Table 5.4. Dosage of broad-spectrum antibiotic treatment for uncomplicated SAM

Drug* and dosage	Dose according to body weight			
	3–< 6 kg	6–< 10 kg	10–< 15 kg	15–< 20 kg
Amoxicillin 40 mg/kg orally two times per day for 5 days				
Tablet 250 mg	1	1 1/2	2	3
Syrup 250 mg/5 ml	2.5 ml	7.5 ml	10 ml	-
Cotrimoxazole (trimethoprim 4 mg/kg + sulfamethoxazole 20 mg/kg) two times per day for 5 days				
Adult tablet (T 80 mg + S 400 mg)	1/4	1/2	1	1
Paediatric tablet (T 20 mg + S 100 mg)	1	2	3	3
Suspension (T 40 mg + S 200 mg/5 ml)	2 ml	3.5 ml	6 ml	8.5 ml

** Use either amoxicillin or cotrimoxazole.*

- If the child has **complicated SAM** (hypoglycaemia, hypothermia, lethargic or any other medical complication), give a parenteral antibiotics routinely (**Table 5.5**):

Ampicillin 50 mg/kg IM or IV four times per day (6-hourly) for 2 days followed by amoxicillin 40 mg/kg orally two times per day (12-hourly) for 5 days, AND gentamicin 7.5 mg/kg IM or IV once a day for 7 days

If the child is not passing urine, gentamicin may accumulate in the body and cause deafness. Do not give a second dose until the child has passed urine.

Table 5.5. Dosage of broad-spectrum antibiotic treatment for complicated SAM

Drug and dosage*	Dose according to body weight			
	3–< 6 kg	6–< 10 kg	10–< 15 kg	15–< 20 kg
Ampicillin 50 mg/kg IM or IV four times per day on days 1 and 2				
Vial 500 mg mixed with 2.1 ml sterile water to give 500 mg/2.5 ml	1 ml	2 ml	3 ml	5 ml
Amoxicillin 40 mg/kg orally two times per day on days 2–7 (5 days)				
250 mg tablet	1	1 1/2	2	3
Syrup (containing 250 mg/5 ml)	2.5 ml	7.5 ml	10 ml	-
Gentamicin 7.5 mg/kg IM or IV once a day on days 1–7				
Vial containing 20 mg (2 ml at 10 mg/ml) undiluted	2.25–3.75 ml	4.5–6.75 ml	7.5–10.5 ml	_
Vial containing 80 mg (2 ml at 40 mg/ml) mixed with 6 ml sterile water	2.25–3.75 ml	4.5–6.75 ml	7.5–10.5 ml	_
Vial containing 80 mg (2 ml at 40 mg/ml) undiluted	0.5–0.9 ml	1.1–1.7 ml	1.9–2.6 ml	2.8–3.5 ml

**Calculate the exact dose based on body weight and use the doses above only when this is not possible; all three are being given.*

- If the child **fails to improve clinically by 48 hours or deteriorates by 24 hours** or presents with septic shock or meningitis, use second-line antibiotics targeted at likely causes:

For severe pneumonia or sepsis, give ceftriaxone 80 mg/kg IV once daily or divided into two daily doses. When staphylococcal infection is strongly suspected, give flucloxacillin 50 mg/kg every 6 hours IV plus IV gentamicin 7.5 mg/kg once a day. Where there may be extended spectrum beta-lactamase resistance (ESBL) in community-acquired infections, or the infection is thought to be hospital acquired (a risk of poor hand hygiene), use ceftriaxone together with oral ciprofloxacin or IV amikacin.

Indiscriminate use of cephalosporin and other second- or third-line antibiotics is likely to accelerate serious problems with antimicrobial resistance in the IPD-SAM ward, especially when coupled with poor infection control.

- If the child's clinical condition does not improve after 5 days of antibiotic treatment, re-assess the child for infection and potentially resistant organisms and take appropriate measures.
- If there is partial improvement after 5 days, complete a full 10-day course.

- Give measles vaccine if the child is 6 months of age or above and not vaccinated, or was vaccinated 6 months ago; delay vaccination if the child is in shock.
- Give an oral anthelminthic after one week for presumptive treatment (**Table 5.6)**:

Mebendazole two times per day for 3 days for children ≥ 2 years of age, or
Albendazole single dose of 200 mg for children 12–23 months and 400 mg for children ≥ 2 years, or
Pyrantel pamoate single dose 10 mg/kg for children ≥ 1 years of age.

If there is evidence of severe worm infestation that is life threatening, treat immediately (do not delay).

Children under 12 months of age are never treated presumptively but are treated when infestation has been confirmed.

Table 5.6. Dosage of routine anthelminthic after one week of start of treatment in IPD-SAM

Drug*	Age	Dose	Prescription
Mebendazole	24 months and older	100 mg	Two times per day for 3 days
Albendazole	12–23 months	200 mg	Single dose
	24 months and older	400 mg	
Pyrantel pamoate	12 months and older	10 mg/kg	

** Use only one of the anthelminthic.*

- Treat other associated infections as appropriate **(Annex 3)**:
  - If meningitis is suspected, do a lumbar puncture for confirmation where possible and treat with the antibiotic regime.
  - If other specific infections (e.g., pneumonia, dysentery, skin or soft-tissue infections) are identified, give antibiotics as appropriate.
  - If the child has a positive blood film for malaria parasites or a positive malaria rapid diagnostic test, give an antimalarial.
  - If tuberculosis (TB) is diagnosed or strongly suspected, treat for TB.
  - Test for HIV infection if HIV is suspected. Give immediate prophylactic treatment with cotrimoxazole against pneumocystis pneumonia and other infections and start lifelong antiretroviral therapy (ART) as soon as possible after stabilisation of metabolic complications and sepsis, indicated by return of appetite and resolving severe oedema.
- Treat high fever (≥ 39.5° C) or persistent fever:
  - Sponge the child's body with tepid (lukewarm) water.
  - Use paracetamol only if the fever causes the child distress and be cautious of the risk of hepatic damage at normal doses (**Table 5.7).**

    Paracetamol 120 mg/5 ml syrup every 6 hours (250 mg tablet replaces 10 ml syrup)

If the child is not responding to paracetamol, do not repeat the dosage. Paracetamol is **not** a routine drug.

Table 5.7. Dosage of paracetamol by body weight for children with high fever and distress

Drug and dosage	Dose according to body weight				
	3–< 6 kg	6–< 10 kg	10–< 12 kg	12– < 15 kg	15–< 20 kg
Paracetamol 10–15 mg/kg up to four times per day					
Syrup (containing 120 mg/5 ml)	2 ml	2.5 ml	5 ml	7.5 ml	10 ml
Tablet 250 mg	¼	¼	½	¾	1

Monitor:

- If the child is still anorexic after 7 days of antibiotic treatment, continue for a full 10-day antibiotic course; if anorexia persists, reassess the child fully.

Micronutrient Deficiencies (Step 6)

All children with SAM have vitamin and mineral deficiencies. Multivitamins including vitamin A and folic acid, zinc and copper are already present in F75, F100 and RUTF when commercial pre-mixed sachets are used. There is no strong need for additional doses.

Vitamin A

- If the child has no eye signs or history of measles, do not give vitamin A because the amounts already present in the therapeutic foods are enough.
- If the child has **any sign of vitamin A** deficiency such as corneal ulceration or had a recent episode of measles (within the past 3 months), give vitamin A on day 1 and repeat on days 2 and 14:

Age	< 6 months	6–12 months	> 1 year
Weight	3–< 6 kg	6–< 10 kg	10–29 kg
Vitamin A dosage	50,000 IU	100,000 IU	200,000 IU

Folic acid

- Give folic acid 5 mg supplementation on day 1 followed by 1 mg per day for every day on F75 or F100.

Iron

- Although mild anaemia is common in children with SAM, do not give iron during stabilisation, but wait until good appetite and start of gaining weight because iron can make worsen infections.

Cautious feeding (Step 7)

When admitted to hospital, almost all children with SAM have infections, impaired liver and intestinal function and problems related to imbalance of electrolytes. The potassium deficit, present in all malnourished children, adversely affects cardiac function and gastric emptying. Magnesium is essential for potassium to enter cells and be retained. Because of these problems, children with SAM cannot tolerate the usual amounts of dietary protein, fat and sodium. It is therefore important to begin feeding these children with a diet that is low in protein, fat and sodium and high in carbohydrate and to move gradually to a high-energy high-protein diet after stabilisation for catch-up growth.

Feeding must start cautiously, in frequent, small amounts. If feeding begins too aggressively, or if feeds contain too much protein or sodium, the child's systems may be overwhelmed, and the child may die. To prevent death, feeding should begin as soon as possible with F75, the 'starter' formula, until the child is stabilized and regains appetite.

F75 is a low osmolality and low lactose and protein starter formula with 75 Kcal/100 ml and 0.9 g of protein/100 ml. Commercial F75 may be available and has lower osmolality than locally prepared F75 because maltodextrin is used instead of sugar. Where commercial F75 is not available, F75 can be prepared easily from basic ingredients with dried skimmed milk, sugar,

cereal flour, oil, mineral mix and vitamin mix (**Annex 3**). **Box 5.9** summarizes feeding during stabilisation.

Box 5.9. Cautious feeding of children 6–59 months of age during stabilisation in IPD-SAM

Essential features of re-feeding:

- 100 Kcal/kg/day of starter formula F75 that has low osmolarity, lactose and sodium and about 1 g protein/kg/day.
- Frequent oral small feeds every 2–3 hours of 130 ml/kg/day in case of severe wasting or 100 ml/kg/day in case of severe oedema, or nasogastric feeds if oral feeding is impaired (parenteral preparations are never used).
- If the child is breastfed, breastfeeding is supported and continues but the full-prescribed amounts of F75 should be taken daily:

Days	Frequency	Volume/kg/day	
		Volume/kg /feed	
1–2	very 2 hours	11 ml	130 ml
3–5	very 3 hours	16 ml	130 ml
6 onward	very 4 hours	22 ml	130 ml

The F75 formula and feeding schedules are designed to meet these targets and look-up tables are available (**Appendix 7**). Milk-based formulas such as starter F75 are satisfactory for most children (**Annex 3**). Because cereal-based F75 partially replaces sugar with cereal flour, its lower osmolarity may benefit some children with persistent diarrhoea.

Nearly all children with SAM have poor appetite when first admitted to hospital. Patience and coaxing are needed to encourage the children to complete each feed. Children with good appetite who are clinically well may have their appetite tested and start from the beginning feeding with RUTF if they passed the appetite test (see **Box 2.1**).

Initiation of re-feeding:

Re-feeding of children 6–59 months with complicated SAM and impaired appetite in the initial phase should be gradual:

- Give F75 diet, 130 ml/kg/day that provides 100 Kcal/kg/day during the initial phase of stabilisation.
- Give F75 frequently (every 2–3 hours, day and night—2–8 feeds per 24 hours) and in small amounts to avoid overloading the intestine, liver and kidneys.
- Ensure and support continued breastfeeding and give support to re-establish breastfeeding.
- Use body weight on admission (or body weight after rehydration in case of dehydration) throughout the initial phase of treatment to determine the daily amount of the F75 diet.
- Feed the child from a cup (**Figure 5.6**).
- Use a spoon, dropper or syringe to feed very weak children. Never use feeding bottles, even for very young infants, as they are an important source of infection.
- Feed children who are unwilling to eat by NG tube only (see NG feeding below).
- Do not use IV fluids unless indicated.
- If vomiting occurs, reduce both the amount given at each feed and the interval between feeds.
- Maintain the volume of F75 at 130 ml/kg/day but gradually decrease the frequency of feeding and increase the volume of each feed until the child feeds every 4 hours (6 feeds per 24 hours).
- Discard any therapeutic milk not taken by the child; never reuse it for the next or later feed.
- Give the child at least 80 Kcal/kg/day, but never more than 100 Kcal/kg/day.

    - If the child is given less than 80 Kcal/kg/day, the tissues will continue to break down and the child will deteriorate. If the child is given more than 100 Kcal/kg/day, the child may develop a serious metabolic imbalance.
    - In very hot weather, encourage the mother to increase the number of breastfeeds.
    - Advise the mother or carer not to eat meals beside the child; sharing the carer's meal with the child can be very dangerous for the child in the initial phase of stabilisation.

Figure 5.6. Feeding the child with a cup

Appendix 7 contains **look-up tables for therapeutic feeding with F75**, with volumes needed at each feed for different feeding schedules by the child's weight to achieve an intake of approximately 130 ml/kg per day (providing 100 Kcal/kg per day)**.** A first F75 table gives volumes of F75 used in severe wasting and mild and moderate oedema (+, ++). A second F75 table gives volumes of F75 used in severe oedema (+++), for which a correction factor for the increased body weight due to the oedema has been applied.

Therapeutic milk feeding schedule:

- Preferably, give therapeutic milk 8 times per 24 hours, or every 3 hours.

  The risk of hypoglycaemia during stabilisation is reduced if the child receives the full amount of the prescribed milk in 8 feeds over 24 hours. In some circumstances, due to staffing shortages during the evening or night shift, the child will be given the amount of milk spread over fewer feeds. The reduced schedule should not be used routinely during stabilisation.

Breastfeeding support:

- Continue breastfeeding; re-establish re-lactation with the supplemental suckling technique for young children (see **Chapter 6**).

Nasogastric feeding:

Only feed the child using a NG tube when the child does not take sufficient diet by mouth during the first few days of treatment. Common reasons for NG feeding include very poor appetite, weakness and painful stomatitis. End NG feeding as soon as possible.

Criteria for nasogastric feeding:

- Anorexia, taking less then 80% of prescribed daily need
- Repeated vomiting
- Severe dehydration or severe pneumonia but conscious
- Too weak to drink
- Painful mouth, throat, or physical disability
- Lethargy or unconsciousness without shock

Procedures for nasogastric feeding:

- At each feed, offer the child the diet orally; after the child has taken as much as he/she wants, give the remainder by NG tube.
- Remove the NG tube when the child is taking 80% of the day's diet orally or two consecutive feeds fully by mouth.
- If over the next 24 hours the child fails to take 80 Kcal/kg, reinsert the tube.
- If the child develops abdominal distension during NG feeding, give 50% magnesium sulfate solution 2 ml IM.
- Always aspirate the NG tube before administering fluids; fix the tube properly so that it cannot move to the lungs during feeding.
- Experienced staff should carry out the NG feeding.
- A child who is being fed by NG tube is not considered ready to transition to rehabilitation.

MILK OR LACTOSE INTOLERANCE is unusual in children with SAM. Intolerance should be investigated only if children have copious watery diarrhoea promptly after milk-based feeds are begun and the diarrhoea clearly improves when milk intake is reduced or stopped and recurs when milk is given again. Other signs of milk intolerance include acidic faeces (pH 5.0) and the presence of increased levels of reducing substances in the faeces. In such cases, partially or totally replace the milk with fermented milk or yoghurt or a commercial lactose-free formula. Before the child is discharged, give milk-based feeds again to

determine whether the intolerance has resolved. **Annex 3** discusses milk or lactose intolerance and osmotic and persistent diarrhoea.

Record 24-hour therapeutic milk intake:

Record the feeding plan and detailed food intake to monitor the amounts of feed offered, left, taken orally, taken by NG tube, and vomited, as well as presence of watery diarrhoea, on the *Daily Care Card*. **Box 5.10** explains how to record milk intake with examples.

- After each feed, accurately record the amounts of F75 offered and taken and the date and time on the *Daily Care Card*.
- If the child vomits, estimate the amount lost in relation to the size of the feed (e.g., a whole feed, half a feed) and deduct it from the total intake.
- Once a day, determine the energy intake for the past 24 hours and compare it with the child's weight.

Box 5.10. How to record milk intake

- It is vital to record milk intake accurately on the *IPD-SAM Record, Daily Care Card* that has an area designated for monitoring milk intake.
- Each feed time is associated with a box of four squares. Each large square represents one feed at the indicated time of day, and each small square represents ¼ of the feed given at each meal.
- The nurse estimates the amount with the help of the carer.
- The chart is completed AFTER the feed has been given.

Example of how to record the milk intake for one feed:

The child took all the milk (indicate X) but vomited back approximately ¼ (indicate V).

X	
X	V

Example of feeds between 0600 and 1500 h over 2 days:

- On Day 1, the child is fed 100% at 0600 h using an NG tube (indicate NG). At 0900 h, the child was able to take 50% orally and 50% by NG tube. The 1200 h and 1500 h feeds were taken entirely orally.
- On Day 2, at 0600 h, the child took the feed orally but vomited 25% of the feed. The child took the rest of the feeds 100% orally without any problems.
- In this example, the child took all of the milk with almost no losses through vomiting. The appetite improved after day 1, and the milk is taken orally.

	Time	Day 1		Day 2	
A = Absent V = Vomiting R = Refused NG = Nasogastric tube Volume taken: 100% 4x X ¾ 3x X ½ 2x X ¼ 1x X	0600	NG	NG	X	X
		NG	NG	X	V
	0900	X	X	X	X
		NG	NG	X	X
	1200	X	X	X	X
		X	X	X	X
	1500	X	X	X	X
		X	X	X	X

Involving Mothers in Care (Step 9)

Throughout the treatment procedure, the mother or carer are encouraged to involve in comforting, feeding and bathing the child, and provide sensory stimulation and emotional support by playing with the child, giving tender loving care and creating a stimulating environment**. Chapter 8** discusses and provides further guidance on mother's involvement.

The wellbeing for the mothers or carers are also considered and support should be provided as needed.

Daily Care

When the treatment guidelines are followed, a child with complicated SAM should show definite signs of improvement within a few days and continue to improve thereafter.

Failure to achieve initial improvement at the expected rate is called primary failure to respond, whereas deterioration of the child's condition when a satisfactory response has been established is called secondary failure to respond.

Monitor:

Children should not gain weight during stabilisation, and children with oedema should start losing weight as their oedema decreases. Weight and weight gain or loss are critical key signs in the initial treatment and should be closely monitored and recorded.

- Monitor vital signs every 4 hours, or more often if indicated:

  An experienced health worker involved in management of SAM should always be attentive and promptly identify emergency signs that need immediate attention (see **5.2 ETAT**) based on:

  - Respiratory rate, pulse rate and temperature
  - Daily weight and weight gain
  - Daily 24-hour food intake (amounts of feed offered and left over, vomited or taken by NG tube)
  - Presence of diarrhoea and other signs of infection

- Monitor and detect any sudden appearance of danger signs:

  - Level of consciousness: Lethargy, decreased consciousness and convulsions
  - Fast or difficult breathing
  - Increase in respiratory rate
  - Weak and fast pulse, increase in pulse rate
  - Sudden (or high) increased or decreased (or low) body temperature
  - Vomiting or acute or persistent diarrhoea
  - Other changes in condition
  - Sudden and/or important weight gain > 5g/kg/day

- Record key parameters on the *Daily Care Card:*
  - Days in hospital, daily weight, weight gain, oedema, diarrhoea
  - Feeding plan and intake
  - Antibiotics intake and other medication and supplementation
- Monitor improvement during stabilisation:

  The initial treatment during stabilisation ends when the child becomes hungry; this indicates that infections are coming under control, the liver is able to metabolize the diet and oedema and other metabolic abnormalities are improving; if the child's appetite improves, then the treatment is successful and the child is ready to change diet and start recovering lost weight.

- Decide to end stabilisation when:
  - Medical complications start resolving.
  - Oedema starts reducing.
  - Appetite returns.
  - There is no weight gain (or weight loss in case of oedema).
  - The child is awake and increasingly alert.

Failure to Respond to Treatment

When a child fails to respond to treatment, it is essential to review all practices in the treatment unit carefully and to re-evaluate the child. The objective is to identify the cause of failure to respond and to correct the problem by making specific changes to care practices or to the child's treatment. Treatment should never be changed blindly; this is more likely to be harmful than to help the child. The child should therefore undergo a full and thorough assessment to identify newly developed or missed conditions or underlying disease, and receive prompt treatment based on diagnosis.

Failure to respond to treatment during stabilisation includes:

- (Re-)appearance of any danger sign
- Failure to gain consciousness
- Failure of medical complication to start resolving
- Failure to start to lose oedema, or increased oedema
- Failure to regain appetite

Failure to respond to treatment is more likely when a malnourished child is treated in a general paediatric ward than in a special nutrition unit. This is because in a general ward, the risk of cross-infection is higher, it is more difficult to provide the necessary care and attention and staff are less likely to have the essential skills and attitudes for the management of SAM and the close monitoring of improvements and danger signs. Wherever possible, malnourished children should be managed in a special unit with well-trained health workers. **Box 5.11** lists the most frequent reasons of failure to respond to treatment in IPD-SAM.

Box 5.11. Possible reasons of failure to respond to treatment in IPD-SAM

Problems with care practices:

- Poor environment for malnourished children, including hygiene (e.g., hand washing of staff and carers, body hygiene of child, bed and ward hygiene)
- Insufficient or inadequately trained staff
- Inaccurate anthropometric equipment and insufficient essential supplies
- Inadequate detection of medical complications, infections and serious underlying diseases
- Lack of compliance with specific and routine treatment protocols
- Incorrect preparation or provision of therapeutic food
- Insufficient emotional and physical stimulation of the child
- Inadequate counselling and psycho-social support to the mother or carer, or lack of engagement of mother or carer in the rationale for the treatments given
- Inadequate individual case monitoring, quality improvement and quality performance monitoring

Problems with the treatment of the child:

- Feeding: Insufficient therapeutic food and/or fluid taken, insufficient vitamin or mineral supplementation, malabsorption of nutrients, rumination
- Undetected or untreated infections or serious underlying disease
- Psychological trauma

5.5. Transition for Catch-up Growth (Step 8)

Once children regain appetite and have reducing oedema, usually about **2–7 days** after initiating treatment, they can **transition** from the starter formula F75 to a high-protein high-energy therapeutic food, RUTF or therapeutic milk formula F100. Both therapeutic foods have similar formulations for catch-up growth, but RUTF contains iron unlike F100 and is consumed without adding water.

Transition covers the few days a child needs to adapt to the change of diet and may be spread over **1–3 days**. Some children may take longer, whereas others take RUTF instantly. It is the child's appetite and general condition that determine the phase of treatment and not the length of time since admission.

Children will be ready for discharge from hospital to continue treatment in OPD-SAM *(Option 1)* as soon as they complete their feeds on RUTF. If RUTF is not available or feasible to consume, children will receive F100 and remain in hospital until full recovery *(Option 2)*.

Look-up tables for volumes of RUTF and F100 feeding during transition are provided in **Appendices 6 and 8**.

RUTF diet (Option 1)

- Introduce RUTF providing 135 to 150 Kcal/kg/day with 2-4 g protein/kg/day:
  - Offer RUTF at each feed until the child takes the fully required amount as tolerated and prescribed for transition (at least 135 Kcal/kg/day and not more than 150 Kcal/kg/day).
  - If the child does not take the prescribed amount of RUTF, top it up with F75 (or F100) to meet the need for 135 Kcal/kg/day.
  - If the child refuses to take the RUTF, give F75 (or F100 in the same volumes), but offer RUTF first until the child takes the appropriate amount to meet the daily energy needs.
- Explain to the mother or carer how to give the RUTF (see **Box 4.3**) and offer drinking water freely.
- Give the same number of feeds with the same timing as during stabilisation, e.g., feed the child every 4 hours, day and night, or 6 feeds per 24 hours.

Omit the night-time feeds to allow the child longer undisturbed periods when the child is no longer at risk of developing hypothermia or hypoglycaemia; it is also less tiring for those caring for the child.

Encourage a good attitude in those feeding the child, as this is crucial to success. The mother or carer should spend sufficient time with the child to enable him/her to finish each feed and actively encourage the child to eat RUTF while sitting comfortably on the mother's or carer's lap. Children should never be left alone to 'take what they want'.

- Continue to support or re-establish breastfeeding.
- Do not supplement iron and folic acid when children are on RUTF, as the daily dose of RUTF contains sufficient iron (10–14 mg/100g RUTF) and folic acid (210 µg/100g RUTF).
- Do not mix RUTF and F75/F100 or water together into a single food to avoid the risk of bacterial proliferation.
- Record the amounts of feed offered and taken on the *Daily Care Card*.
- As soon as the child is eating well, the volume of the feeds should increase and the child should be prepared for discharge from hospital.

F100 diet (if RUTF is not available or possible) (Option 2)

- Give F100 every 4 hours in the same amounts and frequency as the F75 diet was given.
- After 2 days of weight gain on F100, give iron 3 mg/kg twice a day.
- Continue folic acid supplementation 1 mg/day throughout.
- Discard any therapeutic milk the child does not take and never reuse it for the next feed.
- Record the amounts of each feed offered and taken.

Box 5.12 summarizes feeding during transition.

Box 5.12. Feeding of children 6–59 months of age during transition in IPD-SAM

Once the child is stabilized—i.e., regain of appetite and oedema is reducing—he/she is ready to change diet for catch-up growth. The F75 milk is replaced by RUTF *(Option 1)* or, if RUTF is not available, by F100 (*Option 2).* Look-up tables for RUTF are available in **Appendix 6** (and for F100 **in Appendices 8**).

Essential features of feeding during transition:

- 135–150 Kcal/kg/day of therapeutic food with 2–4 g protein/kg/day or about 25–28 g of RUTF/kg/day
- If the child does not complete the prescribed amount of RUTF, feeds should be topped up with F75 (or F100)*. RUTF should always be offered first, with plenty of drinking water given.
- If feeding with RUTF is not feasible, the child should be given a full F100 diet in the same amounts and same frequency as F75 at the end of stabilisation.
- If the child is breastfed, breastfeeding should continue.

* Calorie value of RUTF: 25 g RUTF (135 Kcal) = 180 ml F75 = 135 ml F100
20 g RUTF (108 Kcal) = 144 ml F75 = 108 ml F100
18 g RUTF (1/5 of sachet of 92 g) (100 Kcal) = 133 ml F75 = 100 ml F100

Monitor:

Transition is marked by daily closely monitoring of danger signs and progress (see **Box 5.1**).

- Monitor weight gain: In the first days during transition, when the child adapts to the new diet, weight gain should not exceed 5 g/kg/day; excess weight gain is not a good sign during the first days.
- Give presumptive treatment of anthelmintic after 7 days in treatment (see **Infections**).
- Examine the child daily and adapt the treatment based on diagnosis.
- Monitor key parameters and record on the *Daily Care Card*.

Improvement during transition:

- Medical complications continue resolving.
- Oedema continues reducing.
- Appetite has returned.
- The child tolerates a high-energy high-protein diet.
- Slow weight gain has started (< 5 g/kg/day) or weight loss continues in case of oedema.
- The child is alert and clinically well.

Danger signs during transition:

The transition from low to high protein-energy feeds should be gradual to avoid the risks of osmotic diarrhoea and congestive heart failure, which can occur if children suddenly consume too large amounts of feed, overloading the absorptive capacity of the intestines. The health worker should continue to monitor **danger signs** and remain attentive and promptly identify emergency signs that need immediate treatment, and/or decide for a full assessment and decide on **return for stabilisation:**

- Level of consciousness: Lethargy, decreased consciousness and convulsions
- Breathing: Fast or difficult breathing, increase in respiratory rate > 5 breaths/minute or more
- Weak and fast pulse, increase in pulse rate > 25 beats/minute or more
- Sudden increased (or high) or decreased (or low) body temperature
- Vomiting or acute or persistent diarrhoea
- Other changes in condition
- Sudden and/or important weight gain (or weight gain > 5 g/kg/day)
- Signs of rumination

RUMINATION is a condition that occurs in up to 10% of emotionally impaired children with SAM. This should be suspected when a child eats well, but fails to gain weight. Children with this condition regurgitate food from the stomach into the mouth, and then vomit

part of it and swallow the rest. This usually happens when they are ignored, so it may not be observed. They are often unusually alert and suspicious, may make stereotyped chewing movements and do not appear distressed by vomiting. Rumination is best cared for by staff who have experience with this problem. Staff will show disapproval whenever the child begins to ruminate without intimidating the child but encouraging good behaviour.

Failure to respond to treatment during transition:

- (Re-)appearance of any danger sign
- Maintaining or increasing oedema or (re-)appearance of oedema
- Weight gain > 5 g/kg/day or loss of weight in the absence of oedema

The child should undergo a full and thorough assessment to identify newly developed or missed conditions or underlying disease and receive prompt treatment based on diagnosis.

5.6. Referral for Rehabilitation in OPD-SAM (Option 1)

Health workers should prepare for the child to be reintegrated into the family and community at discharge from IDP-SAM and continue treatment in OPD-SAM at a site close to their home.

Prepare for referral to OPD-SAM:

The child should meet the following criteria (**Table 5.8**):

- Has appetite restored and eats **at least 75%** of the daily amount of the RUTF diet or **two full meals** of RUTF
- Has medical complications resolving and oedema reducing
- Is alert, smiles, responds to stimuli, is interested in surroundings, sits, crawls, stands or walks depending on age and has a normal body temperature (36.5–37.5° C)
- Has an updated immunization schedule

The mother or carer should meet the following criteria:

- Understands why and how to provide RUTF and understands that this is the main diet until full recovery and that it should not be shared with others
- Has received counselling on feeding and care practices, support to re-initiate and/or encourage breastfeeding, health and nutrition education and cooking demonstrations
- Has been taught how to provide sensory stimulation and emotional support to the child
- Has received psychosocial support and health and nutrition care for herself as needed
- Understands where and how to continue treatment in OPD-SAM after stabilisation

Table 5.8. Criteria for start and end of treatment in IPD-SAM for children 6–59 months of age

Start of treatment	End of treatment *	
IPD-SAM	**Referral to OPD-SAM**	**Continued FBNS and CBNS**
Complicated SAM • Bilateral pitting oedema grade (+++), or • Bilateral pitting oedema and MUAC < 115 mm or WHZ < –3, or • MUAC < 115 mm or WHZ < –3 with either or – Any general danger sign or serious associated disease – Poor appetite – Weight < 4 kg	**Uncomplicated SAM** • Medical complications resolving and oedema reducing • Child eats **at least 75%** of the daily amount of the RUTF diet or **two full meals** of RUTF • Child is alert	**Normal nutrition** • MUAC ≥ 125 mm or WHZ ≥ –2 for 2 consecutive days • No oedema for 2 weeks • Child is alert and well

CBNS = Community-based nutrition services, FBNS = Facility based nutrition services.
** Use the same anthropometric indicator for start and end of treatment.*

- Give an amount of RUTF to bridge the gap to the follow-up visit in OPD-SAM.
- Link the mother or carer with the health facility that will follow up the child in OPD-SAM until full recovery and the CHW in the community.
- Ensure that mothers or carers know how to feed the child with RUTF and to continue treatment at home with weekly OPD-SAM visits for monitoring, counselling and receiving RUTF.
- Fill a *Referral Slip* **(Form 17**) with details on the child's health and nutritional status, medical history and treatment received. A system to trace and monitor movement should be in place to ensure that no children are lost between the levels of care.
- If discharge is not possible, arrange rehabilitation in IPD-SAM until full recovery.
- Alert the CHW and CHWs of the discharge of the child and the need to continue treatment in the closest OPD-SAM to the home of the child.

5.7. Rehabilitation in IPD-SAM (Option 2)

Rehabilitation until full recovery in IPD-SAM is only necessary if there is no OPD-SAM because RUTF is not available, or if there are other concerns related to the child's feeding or health condition.

Rehabilitation is characterized by allowing the child to eat a catch-up diet freely. Home foods are also introduced and offered once a day for the child to get used to eating solid foods before returning home. Daily quality care and monitoring progress and signs of complications should continue. The child and mother or carer should be prepared for discharge from hospital and end of treatment for the child to return to the community with a minimal risk of relapse.

Treat:

- Start to give **F100 diet** in the same volume as the amount of F75 and gradually increase amounts up to 220 Kcal/kg/day as tolerated. If intake is below 130 Kcal/kg/day, the child will not catch up lost weight and will fail to respond (**Box 5.13)**.

  Look-up table for volumes of F100 feeding during rehabilitation, see **Appendix 8.**

- Increase the amount of F100 diet given at each feed by 10 ml (e.g., if the first feed was 60 ml, the second should be 70 ml, the third 80 ml, and so on) until the child refuses to finish the feed.
  - When a feed is not finished, offer the same amount at the next feed; if that feed is finished, increase the amount offered for the following feed by 10 ml; continue this process until some food is left after most feeds.
  - Discard any therapeutic milk not taken and never reuse it for the next feed.
- Record the amounts of each feed offered and taken on the *Daily Care Card*.
- Ensure continued breastfeeding if appropriate.
- Give folic acid supplementation 1 mg once a day and iron 3 mg/kg twice a day.

Box 5.13. Feeding of children 6–59 months of age during rehabilitation on F100

Once the child tolerates the feeding regimen during transition—i.e., change of diet to F100 and increasing volumes—he/she is ready for rehabilitation (*Option 2*: Early discharge from hospital and treatment in OPD-SAM care is not feasible or possible).

Essential features of feeding during rehabilitation:

- 150–220 Kcal/kg/day with 4-6 g protein/kg/day
- Frequent feeds of F100 with added daily iron 3 mg/kg/day and continued folic acid 1 mg/kg/day
- Allow to eat catch-up diet freely until full recovery
- If the child is breastfed, breastfeeding continues and is supported
- Gradual introduction of family foods, but with the prescribed amounts of F100 taken first

Look-up tables for F100 are available in **Appendix 8.**

- **Introduce solid foods:**

  For most children, especially for those who want a mixed diet, it is appropriate to introduce solid food gradually after 1–3 days, as tolerated. Most traditional mixed diets have much lower energy content than F100. They are also relatively deficient in various vitamins and minerals, particularly potassium and magnesium, and contain substances that inhibit the absorption of zinc, copper and iron. Thus, local foods should be fortified to increase their content of energy, minerals and vitamins. Oil should be added to increase the energy content, and the mineral and vitamin mixes should be added after cooking. Other ingredients, such as dried skimmed milk, may be added to increase the protein and mineral content. The energy content of mixed diets should be at least 1 Kcal/g.

  To avoid the effects of food interaction, which reduce the absorption of minerals, F100 should be given between feeds of the mixed diet. For example, if the mixed diet is given three times per day, F100 should be given three times per day, making six feeds a day. Water should be offered systematically to smaller children; older children may ask for it when thirsty.

Monitor:

- Weigh the child:
  - With high-energy feeding, most children with SAM will gain weight well and reach their discharge criteria after 2–4 weeks.
  - Weight gain will be about 10–15 g/kg/day and should be above 5g/kg/day; a child who does not gain 5 g/kg/day for 3 consecutive days in this phase of rehabilitation is failing to respond to treatment.
- Monitor vital signs as before

  The health worker should remain attentive and promptly identify emergency signs that need immediate treatment and/or decide on a full assessment to identify newly developed or missed conditions or underlying disease and provide prompt treatment based on diagnosis.
- Continue treatment until the child achieves the discharge criteria, MUAC ≥ 125 mm or WHZ ≥ –2 for 2 days and no oedema for 2 weeks.

Improvement or response to treatment in rehabilitation includes:

- No medical complications
- No oedema
- Good appetite
- Good weight gain (> 5g/kg/day)
- Alert and well

Failure to respond to treatment in rehabilitation includes:

- Presence of any danger sign
- (Re-)appearance of oedema
- Failure to gain weight of at least 5 g/kg/day, static weight or loss of weight

Prepare for end of treatment and discharge from hospital:

A child is considered fully recovered and ready for discharge when the criteria for end of treatment are met. To achieve this goal, the child

should receive as many meals per day as possible. To prevent relapse, all the criteria listed should be met before the child is discharged.

- Check whether the child reaches the end of treatment criteria.
- If the child is absent for 2 consecutive days, record the third missed visit as defaulting, and request a home visit to inquire about the reason for defaulting.
- Verify whether the immunization schedule has been completed.
- Indicate the outcome of the treatment in the *IPD-SAM Register* and on the *IPD-SAM Record*: Date, treatment outcome (cured, died, defaulted, non-cured or referred out), end anthropometry, length of stay, weight gain.
- Advise the mother or carer to continue attending monthly FBNS and CBNS and to return to the health facility if a problem occurs or the child's condition deteriorates. Mothers or carers may be taught to monitor the recovering child (and other children at risk from the environment) with a MUAC tape.

Criteria for end of treatment at full recovery:

The child should meet the following criteria **(Table 5.8)**:

- MUAC ≥ 125 mm (if admitted by MUAC) or WHZ ≥ –2 (if admitted by WHZ) on two consecutive measurements (2 consecutive days)
- No oedema for 2 consecutive weeks (if admitted by oedema)
- Alert and well

The mother or carer should meet the following criteria:

- Has received counselling on feeding and care practices, support to re-initiate and/or encourage breastfeeding, health and nutrition education and cooking demonstrations
- Has been taught how to provide sensory stimulation and emotional support to the child
- Has received psychosocial support and health and nutrition care for herself as needed
- Understands where and how to seek treatment in case of deterioration

Organise follow-up after discharge from hospital *(Step 10)*:

Children returning from hospital are at higher risk of infection, and nutritional relapse or medical deterioration should be prevented. All children should be followed up monthly in FBNS and CBNS because the risk of relapse is greatest soon after discharge.

Mothers or carers must demonstrate that they understand the importance of continued appropriate feeding for their child. They should have practiced preparing and feeding improved complementary foods with the home diet for the child. Appropriate home diets are the same as those normally recommended for healthy children. They should provide at least 110 Kcal/kg per day and sufficient vitamins and minerals to support continued growth. For breastfed infants and children, breastfeeding should continue.

Table 5.9 summarizes dietary treatment in IPD-SAM for children 6–59 months of age.

Table 5.9. Overview of dietary treatment in IPD-SAM for children 6–59 months of age

	Stabilisation phase	Transition	Rehabilitation phase
Objective	Stabilising medical complication(s) and metabolism for electrolyte and micronutrient imbalances	Transitioning the feeding protocol	Restoring body function and catch up growth
Condition	Child has poor appetite or is clinically unwell	Child has returned appetite and is alert and clinically well	Child gains weight
Duration of stay	2–7 days	1–3 days Child referred to OPD-SAM as soon as eats 75% of RUTF or two full meals	1–4 weeks Child continues treatment in OPD-SAM; rare cases remain in IPD-SAM until full recovery
Therapeutic food	F75	RUTF (if available and possible) topped up with F75 (or F100) in case needed* F100 in case RUTF not available or not possible	RUTF or F100 Gradually introduce complementary home foods
Amount	F75 130 ml/kg/day in 8–6 meals	RUTF 27.6 g/kg/day F100 130 ml/kg/day in 8–6 meals with daily increase of 10 ml per feed	RUTF 36.8 g/kg/day F100 220 ml/kg/day in 6–5 meals
Energy	100 Kcal/kg/day	150 Kcal/kg/day	200 Kcal/kg /day
Weight gain	None ((weight gain is a danger sign)	Average of 5 g/kg body weight/day	Substantial, ≥ 10 g/kg body weight/day

** RUTF can be topped up with F75 or F100 as follows: 25g RUTF (135 Kcal) = 180 ml F75 = 135 ml F100*
20g RUTF (108 Kcal) = 144 ml F75 = 108 ml F100
18g RUTF (100 Kcal) = 133 ml F75 = 100 ml F100 = 1/5th of RUTF sachet (92g)

Chapter 6. Management of Uncomplicated and Complicated Severe Acute Malnutrition in Infants Under 6 Months of Age

This chapter provides guidance on management of uncomplicated and complicated severe acute malnutrition (SAM) in infants under 6 months of age in Outpatient Department-SAM (OPD-SAM) and Inpatient Department-SAM (IPD-SAM) as part of the Integrated Management of Acute Malnutrition (IMAM) approach [24, 22]. Management of SAM in infants under 6 months of age is aligned with the Integrated Management of Neonatal and Childhood Illness (IMNCI) approach, paediatric hospital care and management of SAM in children 6–59 months of age **(Chapters 4 and 5)**.

6.1. Principles of Initial Care

Exclusive breastfeeding is the optimal feeding for infants under 6 months of age to thrive and be protected against infections. It is promoted and supported in community-based and facility-based infant and young child feeding (IYCF) and healthcare services.

The development of SAM in infants under 6 months commonly reflects sub-optimal breastfeeding practices. Re-establishing satisfactory breastfeeding is at the core of treatment. But sub-optimal breastfeeding is also associated with low birth weight, pre-term birth, recurring infections, persistent diarrhoea, chronic diseases, disability and social problems. Risk factors for increased morbidity and mortality in infants with SAM include the presence of bilateral oedema, recent weight loss, failure to gain weight, failure to feed effectively or loss of the mother.

There are important physiological and pathological differences between young infants and older children that justify separate consideration of the management of SAM in this age group. Before 6 months of age, physiological processes including thermoregulation and renal and gastrointestinal functions are relatively immature and may require modified management approaches or clinical interventions. Clinical signs of infection and dehydration may also be more difficult to identify and interpret.

Infants should be screened monthly in community-based and facility-based growth monitoring by the community health worker (CHW) and nutrition counsellor. Infants identified with a danger sign, weight loss or failure to gain weight or sub-optimal breastfeeding should be referred with their mothers or carers for assessment and follow-up. Infants with illness or feeding problems at any contact with the healthcare system should be systematically screened for breastfeeding adequacy and acute malnutrition upon arrival in OPD.

Previous recommendations advised inpatient management for all infants under 6 months of age with SAM. New recommendations propose outpatient management of uncomplicated SAM in infants under 6 months of age. The potential benefits of inpatient care should be carefully considered against potential risks, especially of nosocomial infections [22] and opportunity costs for the mother and the health system.

Infants under 6 months of age should always be considered in conjunction with their mothers and family settings. The physical and mental health status of the mother or primary carer should be assessed and the best relevant treatment or support determined. Therefore, management of acute malnutrition in infants under 6 months of age is based on the severity of both the infant's and the mother's condition. The mother or carer should be encouraged to be involved in care of the infant and receive counselling and health and nutrition education and psychosocial support; mother-to-mother support should be encouraged.

If breastfeeding is not feasible or possible, a wet nurse should be sought or the grandmother encouraged to re-lactate (or a breast milk substitute should be used for cup feeding under strict supervision).

6.2. Initial Assessment and Diagnosis

In the OPD of the health facility, the infant and mother or carer—referred by the CHW or self-presented—should receive a comprehensive assessment to decide whether to start treatment in OPD-SAM or refer for treatment in IPD-SAM.

Assess:

Infants under 6 months of age should be assessed according to IMNCI guidelines, and the mother or carer should receive a breastfeeding assessment and psychosocial and health and nutrition assessment. Both outcomes should be considered to decide the severity of illness and treatment plan. The steps include:

Infant:

1. Danger signs or signs of severe disease
2. Nutrition status assessment
3. Clinical assessment
4. Breastfeeding assessment

Mother:

1. Nutrition status assessment
2. Breastfeeding assessment
3. Clinical assessment
4. Psychosocial assessment for mental health and general wellbeing

INFANT

- Check for **general danger signs**, following the same guidance as for children 6–59 months of age:
  - Inability to drink or breastfeed
  - Vomiting everything
  - Lethargy or unconsciousness
  - Convulsions (past or present)
- Ask, look, listen, and feel for main **symptoms of severe illness**:
  - Cough or difficult breathing with chest indrawing or stridor in calm child (Box 6.1.)
  - Diarrhoea and sign of dehydration (recent sunken eyes)
  - High fever or stiff neck
  - Measles now or in the past 3 months, clouding cornea or other eye signs of vitamin A deficiency or deep/extensive mouth ulcers
  - Ear pain with tender swelling behind the ear
  - Severe palmar pallor
  - TB contact

→An infant with danger signs or symptoms of severe disease needs immediate life-saving interventions. Complete the assessment and give pre-referral treatment immediately.

Box 6.1. How to assess difficult breathing in infants

Respiratory distress in infants 0–< 2 months of age may be expressed by **slow breathing** (respiratory rate < 20 breaths/minute) or **fast breathing** (respiratory rate > 60 breaths/minute) or episodes of **apnoea** (cessation of breathing for > 15 seconds).

Respiratory distress in infants 2–6 months of age may be expressed by **fast breathing** (respiratory rate > 50 breaths/minute).

Infants under 12 months of age without respiratory distress or pneumonia generally breathe fast. Unless the infant's normal respiratory rate is known to be high, fast breathing should assume over-hydration or pneumonia. Careful evaluation, taking into account prior fluid administration, will help differentiate the two conditions and appropriate treatment.

- Verify nutritional status:
  - Ask about appetite.
  - Check for the presence of bilateral pitting oedema.
  - Measure weight and length and classify weight-for-height z-score (WHZ) using the Moyo chart.
  - Plot the weight on the weight-for-age (WAZ) growth chart on the *Child Growth Monitoring Card* (**Form 5**) and look at the position and any drop across WAZ lines; Ask about recent weight loss or failure to gain weight. WLZ is not available for infants < 45 cm long; WAZ is used instead to classify SAM.

- Do an initial assessment following the same guidance as for children 6–59 months of age:
  - Conduct a full assessment with the support of the *OPD-SAM Record* (**Form 6**) and the IMNCI algorithm.
  - Identify other medical conditions that need treatment.
  - Do laboratory tests and ask for other investigations as indicated by the assessment.

- Do a breastfeeding assessment of the infant, asking the mother questions (without judging her choice of feeding method) and observing a breastfeeding session.

- Ask, listen:
  - What is the breastfeeding history? How often is the infant breastfed? Any problems or concerns?
  - Has the infant received any other feeds? Water, liquid or milk? When did this start? Solid foods? When did this start?
  - Observe breastfeeding and assess non-breastfeeding based on conversation
- Identify, analyse:
  - Structural abnormalities through physical examination
  - Muscular abnormalities
  - Breastfeeding based on observation

Breastfeeding assessment outcome

Severe breastfeeding difficulties (any of the following):

- Structural abnormalities
- Abnormality of tone, posture and movement interfering with breastfeeding
- Infant's arms and legs falling to the side when infant is held
- Infant's body stiff, hard to contain or move
- Excessive jaw opening or clenching
- Unwillingness/inability to suckle on breast
- Coughing and eye tearing while breastfeeding (sign of unsafe swallowing)

Moderate breastfeeding difficulties (any of the following):

- Infant not well attached
- Infant not suckling effectively
- Fewer then eight breastfeeds in 24 hours
- Infant receiving other foods or drinks

Mild/possible breastfeeding difficulties (either of the following):

- Breastfeeding difficulties based on mother's breast conditions

- Non-severe respiratory difficulties, e.g., nasal congestion, interfering with breastfeeding,

No breastfeeding difficulties (either of the following):

- No signs of inadequate feeding
- No additional issues for mother-infant dyad

No breastfeeding

MOTHER

- Verify nutritional status:
  - Check for the presence of bilateral pitting oedema.
  - Measure.
- Do a breastfeeding assessment of the mother, ask and listen

Breastfeeding assessment outcome

Breastfeeding difficulties, if ANY indication of the need for support on:

- Re-lactating
- Expressing breast milk and cup-feeding
- Breast conditions, e.g., engorgement; sore and cracked nipples; plugged ducts and mastitis; flat, inverted, large or long nipples; nipple pain; thrush
- Perception of not having enough breast milk
- Other concerns, e.g., lack of confidence, concerns about diet, working away from home

No breastfeeding difficulties, if ANY indication of the need for support on:

- Re-lactating
- Meeting the nutritional needs of the infant
- Working away from home
- Delegating infant feeding and care to another

- Investigate whether there is a medical problem that needs attention and referral.
- Investigate general wellbeing and identify any mental health problem that needs action according to mental health guidance, including care and social support.

Decide:

INFANT

- **Refer to facility-based nutrition services (FBNS) and community-based nutrition services (CBNS) if:**
  - Normal nutritional status or WLZ ≥ –2 or <– 3, and
  - No oedema
  - No breastfeeding difficulties
  - No weight loss or failure to gain weight, no drop across WAZ lines
  - Infant alert and well

- Adequate social circumstances and breastfeeding and IYCF support availability

- **Start treatment in OPD-SAM if:**
  - The infant has WLZ < –3 with:
    - Moderate, mild or possible breastfeeding difficulties, or
    - Moderate weight loss or recent (days-weeks) failure to gain weight, or moderate drop across WAZ lines
  - The infant is alert.
  - Social circumstances are adequate, and breastfeeding and IYCF support is available.

- **Refer to IPD-SAM if:**
  - The infant has bilateral pitting oedema, or
  - WLZ < –3 with
    - A general danger sign or serious associated disease, or
    - Severe breastfeeding difficulties, or
    - Recent severe weight loss or prolonged (weeks-months) failure to gain weight, or sharp drop across WAZ lines
  - Social circumstances are inadequate and breastfeeding or IYCF support is available.

MOTHER

- Admit to OPD-MAM if MUAC < 230 mm.
- Refer to hospital if bilateral pitting oedema or MUAC < 185 mm or any danger sign.
- Refer to mental health counselling if needed.
- Refer to community-based health and nutrition support and link with community-based initiatives.

Table 6.1 summarizes the diagnosis and treatment of acute malnutrition in infants under 6 months of age.

Table 6.1. Diagnosis and treatment plan for infants < 6 months with acute malnutrition

Diagnosis			
Normal nutritional status	**Moderate acute malnutrition (MAM)**	**Uncomplicated SAM**	**Complicated SAM**
• WLZ ≥ –2 • No breastfeeding difficulties • Weight gain • Alert and well	• WLZ ≥ –3 to < –2 • No breastfeeding difficulties • Weight gain • Alert and well	• WLZ < –3 with – Moderate, mild or possible breastfeeding difficulties, or – Moderate weight loss or recent (days-weeks) failure to gain weight, or moderate drop across WAZ lines • Alert	• Bilateral pitting oedema, or • WLZ < –3 with – A general danger sign or serious associated disease, or – Severe breastfeeding difficulties, or – Recent severe weight loss or prolonged (weeks-months) failure to gain weight, or sharp drop across WAZ lines
Treatment plan			
Continued FBNS and CBNS	**Continued FBNS and CBNS**	**OPD-SAM**	**IPD-SAM**

CBNS = Community-based nutrition services, FBNS = Facility-based nutrition services.
In case of inadequate social circumstances and breastfeeding support, refer to a higher level where it is available.

6.3. General Case Management in OPD-SAM

Treat:

- Advise to keep the infant warm. Cover the head and body to prevent hypothermia.
- Give routine, preventive treatment and other specific treatment based on diagnosis:

  Amoxicillin 40 mg/kg/day two times per day for 5 days

  Drug regimens for infants with weighing ≥ 3 kg are similar to those for infants ≥ 6 months of age.

  Do not give vitamin A, folic acid, anthelminthic or measles vaccination.
- Counsel and support the mother or carer on appropriate care and feeding practices.
- Encourage continued breastfeeding; provide counselling breastfeeding support:

  If the mother is available and breastfeeding is insufficient, counsel and support the mother to re-lactate (plan A). If the mother is not available, consider options for wet-nursing or accessing safe expressed breast milk (plan B). If there is no realistic prospect of the infant being breastfed, consider appropriate replacement feeding with commercial infant formula (plan C) and provide support for safe preparation and use at home (**Annex 3)**. Early introduction of complementary foods for older infants could be considered, depending on maturity of swallowing.
- In malarial areas, encourage sleeping under impregnated bed-nets.
- Monitor the infant's weight gain weekly and plot WAZ on the *Child Growth Monitoring Card*.
- Verify the mother or carer's health and nutrition status, and refer for psychosocial support if needed.
- Counsel the mother or carer on health and nutrition, advise to attend nutrition services in the health facility and community, and ask to return to the health facility in case of a deterioration of the infants' condition.
- Counsel the mother or carer on sensory stimulation and

emotional support of the child.

- Refer the infant and mother or carer to IPD-SAM if the infant develops general danger signs or symptoms of serious disease, does not gain weight or loses weight while the mother or carer is receiving counselling and support for breastfeeding or replacement feeding.

Monitor:

Monitoring progress in infants with uncomplicated SAM is similar to monitoring progress in older children. Weekly follow-up visits in primary health care services should be conducted to monitor breastfeeding (or replacement feeding), weight gain and response to treatment:

- Identify danger signs and non-response to treatment:

  The development of a complication or deterioration (danger sign, losing, static or faltering weight, altered feeding) should lead to a referral to IPD-SAM.

- Monitor weight and weight gain:

  Plot the infant's weight is plotted on the WAZ growth chart and evaluate the growth curve. Serial measurements showing flattening of the curve or unexpected crossing of two or more percentile lines downward is considered failure to thrive or growth failure, indicating ineffective lactation.

- Involve mothers in care:

  - Counsel mothers or carers on appropriate breastfeeding and growth.
  - Guide mothers or carers to provide sensory stimulation and emotional support for the infants.
  - Provide health and nutrition education for improved feeding and care practices.
  - Provide psychosocial support to mothers or carers.
  - Provide health and nutrition support to mothers or carers according to their health and nutritional status.

Prepare for end of treatment:

Specialised care for the infant under 6 months of age ends when the infant:

- Breastfeeds effectively or feeds well with replacement feeding
- Gains adequate weight and follows the WAZ growth curve (serial weight measurements follow consistently on or between the same percentiles)
- Has WLZ at least ≥ –2
- Has completed age-specific immunisation schedules
- Has a mother or carer who has no ongoing health or psychological condition requiring intensive treatment

6.4. General Case Management in IPD-SAM

Management of complicated SAM in infants under 6 months of age in IPD-SAM is complementary to the care in IPD-SAM for children 6–59 month of age discussed in **Chapter 5**.

All infants should be screened systematically for malnutrition on arrival, at the time that is most appropriate in the assessment, depending on the child's condition and presence of emergency signs. When infants with their mothers or carers present at the hospital because they are referred or self-present, they receive ETAT as needed (see **5.2 ETAT**).

Treat:

- Give routine, preventive and other specific treatment based on diagnosis. Routine, preventive and other specific treatment based on diagnosis of infants weighing 4 kg or more is similar to that for children 6 months of age or older, except, do not give vitamin A, folic acid, anthelminthic or measles vaccination.
- Prevent hypothermia:
  - Encourage breastfeeding immediately and then feed every 2–3 hours, day and night.
  - Keep the infant warm, put on a hat, apply the kangaroo technique (**Box 5.8**), cover the body with a blanket.

- Place the infant in an adult bed to let the mother sleep with the infant (under impregnated bed-nets in malaria-infected regions) in a draught-free part of the IPD-SAM ward.
- Avoid exposing the child to cold, e.g., after bathing or during medical examinations.

Dry the infant carefully after bathing, but do not bathe if very ill.

- Change wet nappies, clothes and bedding to keep the infant and the bed dry.
- Use a heater or incandescent lamp with caution.
- Do not use a hot water bottle or fluorescent lamp.

Nutrition Support for Infants with the Prospect of Breastfeeding

- Provide nutritional support for breastfeeding infants:

  Feeding approaches should prioritise establishing or re-establishing effective exclusive breastfeeding by the mother or other carer. If the infant is not breastfed, give support to the mother or female carer to re-lactate.

  During the period that exclusive breastfeeding does not provide enough breast milk for the infant to gain weight appropriately, support re-lactation and stimulate it by the **supplemental suckling** technique (SST) with a milk supplement (**Box 6.2**). If the SST is not working or skilled staff is not available, support the mother to express breast milk by hand and feed the infant using a cup.

  - Supplement infants without oedema with expressed breast milk, a generic infant formula or F100-Diluted. F100-Diluted provides 75 Kcal/100 ml but has a lower osmolarity than F75 with a better carbohydrate-to-lipid ratio and thus is better adapted to immature organ functions.
  - Supplement infants with oedema with expressed breast milk or F75 until the oedema has resolved. Undiluted F100 should never be given to infants under 6 months of age with SAM because of high renal solute load and risk of hypernaetremic dehydration.

- Encourage and support the following:

- Breastfeed on demand or offer breast milk at least every 3 hours for at least 20 minutes (more if the infant cries or demands more). The infant should be breastfed as frequently as possible.
- Between ½ hour and 1 hour after a normal breastfeeding session, give maintenance amounts of a milk supplement at 130 ml/kg/day–by SST, nasogastric (NG) tube or cup, distributed across eight feeds per day providing 100 Kcal/kg/day. Two-hourly feeding can be followed if the infant is having problems taking the milk.

Look-up tables of F100-Diluted and F75 for use in infants < 6 months are provided in **Appendix 9**.

Regulation of the amount of milk feeds:

- Monitor the progress of the infant by daily weighing.
- If the infant loses weight or has a static weight over 3 consecutive days but continues to be hungry and is taking all the milk, progressively add 5 ml extra to each feed.
- Weigh the infant daily with a scale graduated to within 10–20 g.
- In general, do not increase the quantity of milk supplementation during the stay, because the adequacy of the breastfeeding should improve.
- If the infant starts gaining weight, gradually decrease the milk supplement by one-third of the maintenance intake so that the infant is stimulated to take more breast milk.
- If the weight gain is sufficient and maintained for 2–3 days (after gradual decrease of the milk supplement), stop the milk supplement.
- If the weight gain is not maintained, re-increase the amount of milk supplement to 75% of the maintenance amount for 2–3 days, then gradually decrease the amount again if the infant starts gaining weight.

Box 6.2. How to do the supplemental suckling technique

The supplemental suckling technique (SST) entails the infant suckling at the breast while also taking the milk supplement from a cup through a fine tube that runs alongside the nipple. The infant is nourished by the milk supplement while suckling stimulates the breast to produce more milk:

- While the mother holds a cup with the milk supplement, put the end of a nasogastric tube (size nº 8) in the cup and place the tip of the tube on the breast at the nipple.
- Place the cup 5–10 cm below the level of the nipple for easy suckling.
- Offer the infant the breast with the right attachment.
- When the infant suckles more strongly, lower the cup up to 30 cm.
- After feeding is completed, flush the tube with clean water using a syringe, spin (twirl) rapidly to remove the water in the lumen of the tube by centrifugal force. If convenient, leave the tube exposed to direct sunlight.

Nutrition Support for Infants without the Prospect of Breastfeeding

Infants with SAM without the prospect of breastfeeding should be fed with safe expressed breast milk.

If there is no realistic prospect of accessing safe breast milk, they should be given appropriate replacement feeding. Infants with SAM without oedema could be fed with a generic infant formula or F100-Diluted. Infants with oedema could be fed with a generic infant formula or F75 until the oedema has resolved and then switch to F100-Diluted.

Feeding during stabilisation:

- Give generic infant formula milk or F100-Diluted or F75 (in case of oedema) at 130 ml/kg/day, distributed across eight feeds per day (3-hourly feeding) providing 100 Kcal/kg/day.

Use the look-up tables in **Appendix 9** for amounts of F100-Diluted (severe wasting) or F75 (bilateral pitting oedema) for infants under 6 months in stabilisation.

- Feed by cup and saucer, or by NG tube (drip, using gravity not pumping) when the infant is not taking sufficient milk by mouth. Feeding by NG should not be longer than 3 days and only during stabilisation.
- Once appetite returns and oedema starts resolving, transition the feeding of the infant to prepare for rehabilitation of catch-up growth.

Feeding during transition:

- Give expressed breast milk, or, infant formula or F100-Diluted at 150–170 ml/kg/day, or increased by one-third over the amount given in the stabilisation phase providing 110–130 Kcal/kg/day.
- Use the look-up table in **Appendix 9** for amounts of infant formula milk or F100-Diluted for infants under 6 months without the prospect of breastfeeding in transition.

Criteria to progress from transition to rehabilitation:

- Good appetite (infant takes at least 90% of the infant formula milk or F100-Diluted prescribed for transition)
- Complete loss of bilateral pitting oedema
- Minimum stay of 2 days in the transition
- No other medical problem

Feeding during rehabilitation:

- Give expressed breast milk, infant formula milk or F100-Diluted provided at 200 ml/kg/day, or twice the volume given during stabilisation, providing 150 Kcal/kg/day.
- Use the look-up tables in **Appendix 9** for amounts of infant formula milk, F100-Diluted for infants under 6 months with no prospects of being breastfed in rehabilitation.

Monitoring daily progress:

Monitoring progress of complicated SAM in infants is similar as for older children:

- Verify danger signs and non-response to treatment:

  Continuous monitoring of key vital signs is daily care practice. The development of a complication or deterioration (no weight gain, altered feeding, danger sign) should lead to a referral to inpatient care.

- Monitor weight and weight gain.
- Involve the mother or carer in care of the infant:
  - Counsel the mother or carer on appropriate breastfeeding and growth.
  - Guide the mother or carer to provide sensory stimulation and emotional support for the infant.
  - Provide health and nutrition education for improved feeding and care practices.
  - Provide psychosocial support to the mother or carer if needed.
  - Provide health and nutrition support to the mother or carer according to their health and nutritional status.

Preparing for referral to continued support in OPD-SAM:

- Verify whether the infant has reached the following criteria:
  - All clinical complications including oedema are resolved.
  - Weight gain on either exclusive breastfeeding or replacement feeding is satisfactory, with the weight curve following the WAZ growth line.
  - The immunization schedule and other routine interventions have been completed
  - The infant has good appetite and is alert and well.
- Advise the mother or carer on for safe feeding at home:

  Mothers or carers who are expected to give replacement feeding to their infants after they are discharged from IPD-SAM need clear guidance on safe preparation and use of replacement feeds. Whenever formula milk is provided as part of management of SAM in infants, it should not confuse or compromise the wider public

health message concerning exclusive breastfeeding for infants under 6 months of age. Early introduction of complementary foods for older infants could be considered depending on maturity of swallowing.

- Encourage the mother or carers to attend monthly FBNS and CBNS and advise them to return to the health facility in case of a health problem.

Special support for low birth weight infants:

Low birth weight (LBW) infants, especially those born earlier than term or small for their gestational age, need additional care to survive and stay healthy. This care includes providing greater support to keep them warm, initiating early and exclusive breastfeeding and preventing infections [16, 38]:

Infants with birth weight between 2.25 and 2.50 kg are normally strong enough to start feeding themselves after delivery. They need to be kept warm and attention for infection control, but otherwise no special care unless feeding problems or danger signs are identified.

Infants with birth weight between 1.75 and 2.25 kg need extra care, but can normally stay with their mothers to provide feeding and warmth, especially if skin-to skin contact can be maintained.

Infants with birth weight below 1.75 kg are at risk of hypothermia, apnoea, hypoxaemia, sepsis, feed intolerance and necrotizing enterocolitis. The smaller the infant, the greater the risks. All low birth weight infants in this category should be admitted to the Special Care or Neonatal Unit.

In addition to the postnatal care interventions for all newborns, mothers with LBW infants should receive increased support:

- Keep the newborn warm, including skin-to-skin contact with the mother (kangaroo technique).
- Assist with initiation of breastfeeding within the first hour after birth. This may mean helping the mother express breast milk and feed the newborn breast milk with a cup if the infant is not strong

enough to suckle. An infant that cannot accept cup feeds should be referred to hospital.

- Give extra attention to hygiene, especially hand washing.
- Give extra attention to danger signs and the need for early care seeking and referral.
- Give additional support for breastfeeding and growth monitoring.

Table 6.2 summarizes the criteria for treatment of infants under 6 months of age in IPD-SAM or OPD-SAM.

Table 6.2. Criteria for start and end of treatment in IPD-SAM or OPD-SAM for infants under 6 months of age

Start of treatment		End of treatment*
IPD-SAM°	**OPD-SAM**	**Continued FBNS and CBNS**
Complicated SAM	Uncomplicated SAM	Normal nutrition
• Bilateral pitting oedema, or • WLZ < –3 with – A general danger sign or serious associated disease, or – Severe breastfeeding difficulties, or – Recent severe weight loss or prolonged (weeks-months) failure to gain weight, or sharp drop across WAZ lines	• WLZ < –3 with – Moderate, mild or possible breastfeeding difficulties, or – Moderate weight loss or recent (days-weeks) failure to gain weight, or moderate drop across WAZ lines • Alert	• WLZ ≥ –3 for two consecutive visits (2 consecutive days in IPD-SAM) • No bilateral pitting oedema for 2 weeks • Satisfactory breastfeeding ** • Satisfactory weight gain (weight curve follows the WAZ line) • Alert and well

CBNS = community-based nutrition services, FBNS = facility-based nutrition services.

*** or satisfactory replacement feeding; ° Infants with SAM older than 6 months of age weighing less than 4 kg are treated in IPD-SAM with the treatment protocol for infants under 6 months of age, and move into the treatment protocol for children 6–59 months of age as soon as they weigh more than 4 kg.*

Chapter 7. Management of Moderate Malnutrition in Pregnant and Lactating Women

This chapter provides guidance on the management of moderate malnutrition (or moderate undernutrition) in pregnant women and women with a breastfeeding infant under 6 months of age in OPD-MAM for PLW as part of the IMAM approach.

7.1. Principles of Care

Pregnant women and women with a breastfeeding infant under 6 months of age need additional energy requirements in addition to the on average 2,200–2,400 Kcal (depending on the basal metabolism and physical activities).

For pregnant women of normal status, the additional energy requirement is estimated at [39]:

- 1st trimester 85 Kcal /day
- 2nd trimester 285 Kcal /day
- 3rd trimester 475 Kcal /day

They are expected to gain 300 g per week in the second and third trimester.

For lactating mothers in the first 6 months the additional energy requirement is estimated at:

- Well-nourished 500 Kcal /day
- Under-nourished 675 Kcal /day

OPD-MAM for PLW improves maternal nutrition during foetal development and for the first 6 months of the infant's life while the mother is breastfeeding the infant, and therefore is considered an essential part of the IMAM approach. Therefore, the maternal nutrition status of PLW are routinely assessed in the community by the CHWs and in the Mother and Child Health (MCH) clinics of the health facility by the midwife.

PLW identified with moderate malnutrition will receive a fortified food supplement (Super Cereal) on a monthly basis until recovery or until the

infant reaches 6 months. PLW identified with severe malnutrition also receive the supplement and are referred to hospital for further investigation.

Pregnant women should receive maternal nutrition counselling and support during the prenatal care visits, e.g., micronutrient supplementation, counselling, health and nutrition education, breastfeeding preparation and screening. Lactating women with an infant under 6 months of age should attend monthly nutrition services in the community and the health facility for growth monitoring, infant and young child feeding (IYCF)—including counselling, health and nutrition education, and food demonstrations—and screening for acute malnutrition. PLW receive psychosocial support as needed. Mother-to-mother support will be encouraged.

In case OPD-MAM for PLW is not available, maternal nutrition and IYCF will be strengthened in the facility-based and community-based nutrition services (FBNS and CBNS).

7.2. Initial Assessment and Diagnosis

Active and routine screening in the community

Women identified as being pregnant or having a breastfeeding infant under 6 months of age should be systematically screened for malnutrition in the community by the community health worker (CHW):

- Assess and refer for treatment if MUAC < 230 mm

Routine screening in the health facility

Women from the time of confirmed pregnancy or having a breastfeeding infant under 6 months of age when attending MCH for reproductive health interventions or other health services should be systematically screened for malnutrition by the midwife.

- Assess and refer for treatment if MUAC < 230 mm, or presence of bilateral pitting oedema

Decide:

- PLW with MUAC < 185 mm and/or bilateral pitting oedema are identified with SAM, start treatment in OPD-MAM for PLW (receive the fortified food supplement) and are referred to hospital for further investigation.
- PLW with MUAC ≥ 185 mm and < 230 mm are identified with moderate undernutrition (malnutrition) and start treatment in OPD-MAM for PLW.
- PLW with MUAC ≥ 230 mm and no nutritional oedema are identified with a normal nutrition status, and are encouraged to continue monthly community-based and facility-based nutrition services.

7.3. General Case Management

Malnourished PLW, from the time of confirmed pregnancy or breastfeeding infant under 6 months of age, start treatment:

Treat:

- Give a dry take-home fortified food supplement Super Cereal flour of 7.5 kg for one month:

  Super Cereal is a wheat soya blend with sugar and fortified with vitamin and minerals developed for the treatment of moderate malnutrition in PLW. The daily ration of 250 g includes 50 g for sharing. The daily ration covers the reference nutrient intake (RNI) providing **953 Kcal** with 38 g protein (16% of Kcal), 20 g fat (19% of Kcal) and 25 g sugar.

- Give advice on preparation, consumption and storage:

  To prepare the porridge, mix 40 g of Super Cereal flour with 250 g clean water, bring to a boil and let it simmer for five to ten minutes

- Ensure pregnant women receive iron folate supplementation as a routine MCH service (60 mg iron + 400 mg folic acid) regardless the fact that Super Cereal contains iron folate
- Give counselling and health and nutrition education, and refer for monthly growth monitoring, maternal nutrition and IYCF sessions at the health post close to their home and the health facility

- Request to return after one month
- Record information:
  - Record a new admission in the *OPD-MAM for PLW Register* **(Form 3)** and give a unique registration number that will be recorded on all documents.
  - Use the *OPD-MAM for PLW Record* **(Form 8)** to indicate individual information on assessment, treatment plan and progress.
  - Indicate the amount of food supplement provided on the *Prescription Card* **(Form 19)**.

Monitor progress at follow up at each monthly visit:

At each visit:

- Check MUAC and monitor progress.
- Continue nutrition counselling and education.
- Record information.

End treatment:

- Decide the end of treatment when:
  - MUAC ≥ 230 mm for two consecutive visits (cured), or
  - Infant reaches 6 months of age
- In case the PLW is absent for two consecutive visits, on the third missed visit, record as defaulting.
- Indicate the outcome of the treatment in the Register and on the OPD-MAM for PLW Record: Date, treatment outcome as cured, death, defaulted, non-cured or referred out and end anthropometry.
- Encourage the mother to attend the monthly FBNS and CBNS.

Table 7.1 lists the criteria for starting and ending treatment of PLW in OPD-MAM.

Table 7.1 Criteria for start and end of treatment in OPD-MAM for PLW

Start of treatment	End of treatment
OPD-MAM for PLW	**Continued FBNS and CBNS**
Moderate malnutrition • MUAC ≥ 185 mm and < 230 mm If MUAC < 185 cm and/or bilateral pitting oedema, referral to hospital for further investigation	**Normal nutrition (or infant ≥ 6 months)** • MUAC ≥ 230 mm for two consecutive visits, or • Infant reaches 6 months of age

CBNS = Community-based nutrition services, FBNS = Facility-based nutrition services.

Chapter 8. Involving Mothers in Care

This chapter provides guidance on involving mothers or carers in the management of acute malnutrition in children under 5 years of age in OPD-MAM/SAM and IPD-SAM as part of the IMAM approach.

8.1. Principles of Involving Mothers in Care

Mothers or carers are encouraged to involve in the care of their children during treatment and recovery of acute malnutrition.

Mothers or carers involve in supporting their children's recovery in the following ways:

- Participating in the treatment of their children will help mothers or carers understand the child's condition, support progress and take responsibility for care.
- Receiving individual counselling during the health facility visits and in the community at the health post or through home visits will help mothers or carers believe in their ability to feed and care for their children effectively according to their children's age.
- Providing sensory stimulation and physical and emotional support for their children will address the physical, social, emotional, and intellectual developmental needs of the child. Integrating simple early stimulation, learning and play activities with nutrition support is important to increase and sustain the impact of treatment on a young child's health and nutritional status.
- Enhancing maternal knowledge and practice of early childhood development activities, mother and child groups strengthen connections among women and raise awareness of the risks of malnutrition, overweight and undernutrition.

Mothers and carers have opportunities to improve their own health and wellbeing when attending services for their ill children by:

- Receiving health and nutritional support as needed.
- Receiving psychosocial support as needed [13]. E.g., mental health interventions are part of the Basic Package of Health Services (BPHS)

and psychosocial counsellors are present in comprehensive health centres and hospitals.

- Caring for their ill children enhances maternal wellbeing.
- Participating in health and nutrition education sessions reinforces the same messages on improving feeding and care practices and provides and opportunity to discuss with other mothers and create mother-to-mother support.
- Linking with community initiatives and accessing social protection or safety nets help strengthen their coping ability and confidence.

Nutrition messages should align with messages of the *Community-Based Nutrition Package Guideline* (CBNP) [40] and be consistent across all nutrition actors. The use of the Afghanistan Mother and Child Handbook [41] promotes the comprehensiveness of integrated continuity of care that covers the needs of mother and child.

8.2. Healthy Maternal Nutrition

For mothers or carers to have the ability to adequately care for their children, support their development and prevent malnutrition also needs the promotion of the educational, social and emotional status and overall wellbeing of women.

Mothers or carers will have access to health and nutrition care for antenatal and post-natal care, and referral to treatment for medical conditions. Considering the dyad of mother and child, a healthy maternal nutrition will promote healthy growth of the infant. All pregnant and lactating women should be counselled by a trained service provider on the following:

Nutrition during pregnancy:

- Control of maternal iron deficiency anaemia with iron folate supplementation
- Adequate food-intake:
  - Increasing energy intake through one additional meal a day.
  - Improving variety of foods (cereal/starchy roots plus animal foods/legumes/nuts plus fruit/vegetable).
  - Reducing workload (or at least have regular resting moments).
  - Using iodized salt daily for all family members.
  - Monitoring weight gain in pregnancy (a woman should gain 10–12 kg weight during pregnancy).
- Readiness for breastfeeding:
  - Initiating breastfeeding within 60 minutes from birth.
  - Understanding the importance of colostrum or 'first milk'.

Nutrition during breastfeeding:

- Control of maternal iron deficiency anaemia with iron folate supplementation
- Adequate food-intake:
  - Increasing energy intake through two additional meals a day (a lactating mother requires 550 calories extra per day).
  - Improving the variety of foods with cereal, starchy roots plus animal foods, legumes, nuts plus fruit and vegetable.
  - Reducing workload (or at least have regular resting moments).
  - Using iodized salt daily for all family members.
  - Continuing to breastfeed during common illnesses and pregnancy.
- Birth spacing
  - Using correct family planning methods.

8.3. Psychosocial Health of Mothers or Carers

Nutrition interventions need to reflect an understanding of mental health and psychosocial services (MHPSS), including cultural factors that impact health and nutrition interventions and facilitate mother- or carer-child relations. Carers with physical or mental health problems need extra support to ensure that they can provide adequate care for their children [42].

Improving maternal mental health (e.g., reducing maternal depression) may be one of the most important interventions, especially in situations of food shortage or crisis for both mother and child.

Psychosocial support regarding nutrition addresses psychosocial barriers to breastfeeding, maternal nutrition, avoiding breast milk substitutes and optimal complementary feeding practices.

Possible problems, examples:

- Mothers, carers, other family members and religious leaders may have limited understanding of the role of breastfeeding in child nutrition and development.
- Mothers may not be able to establish good attachment and positioning for successful breastfeeding.
- Communities may expect to receive drugs to address malnutrition rather than therapeutic foods and counselling on feeding and care practices.
- Mothers or carers may believe treatment stops once children begin gaining weight.

Possible solutions, examples:

- Community-based engagement with other family members (e.g., husbands, mothers-in-law and other in-laws) is essential to transfer understanding of feeding and care practices from the health facility to the home environment.
- Facilitation should use context-appropriate messages and images of successful hygienic feeding and care practices with good physical and emotional attachment to prevent and treat malnutrition.
- Psychosocial and nutrition support to mothers or carers with malnourished children is provided and underline the need to

adhere to treatment and care advice. This can avoid noncompliance in the early stages of weight gain due to regular hygienic feeding.

8.4. Health and Nutrition Counselling and Education

Individual counselling is an interactive process that focuses on individual needs, problems, emotional states and relationships with significant others. The counsellor's role is to facilitate positive coping and problem solving using available resources. The counsellor uses listening and communication strategies that help mothers or carers learn how to improve their own and their children's health and nutritional situation. Counselling facilitates problem solving and decision-making and empowers mothers or carers to analyse their situation, make informed choices and commit to actions to address their problems. Counsellors need to have effective communication skills. **Box 8.1** lists basic requirements for good counselling [40].

Box 8.1. Basic requirements for good counselling [40]

- *Gaining trust* of those who are being counselled is key to good counselling
- *Being objective*: viewing the mother's problems objectively without allowing personal biases and not interrupt the mother by bringing in one's own views and biases
- *Being open-minded*: accepting what the mother may presents with an open mind, and complementing the mother when she is doing some of the things right
- *Being non-judgmental and tolerant*: impartial on views, opinions and actions of the mother, and towards her attitudes and beliefs
- *Being perceptive*: aware of the context and environment, understand the need of feedback.
- *Being self-aware*: conscious of how own words and actions impact on the mother and being mindful of one's own limitations
- *Being an effective listener*: listening and asking questions so the mother shares what is in her mind.
- *Being attentive* to the words as well as actions of the mother

- *Being an effective communicator*: able to communicate messages in a clear and precise manner, ensuring that the mother has understood what is being said, asking the mother to repeat the important points that was said
- *Being committed and responsible*: committed to the role as a counsellor and assume responsibility of one's actions and words
- *Being informed*: making efforts to be informed well enough so as to provide the right information whenever required during the course of the interactions with the mother

Nutrition counselling in the community is provided by community health workers (CHWs) and Family Health Action (FHA) groups to pregnant and lactating women, mothers or carers of children under 2 years of age and of malnourished children. Nutrition counselling at the health facility include maternal nutrition counselling during antenatal and post-natal visits, breastfeeding counselling for pregnant and lactating women, nutrition counselling for mothers or carers during growth monitoring for children under 2 years of age (1000 days) and specific nutrition counselling for mothers or carers of malnourished children.

Counsellors need knowledge of key health and nutrition messages, treatment plan and progress. At the start of the treatment, counselling should cover specific aspects on feeding and care of the ill child and provide the following advise:

- Continue treatment and care at home (e.g., give antibiotic, give regular small amounts of Ready-to-use therapeutic food (RUTF) and drinking water, continue breastfeeding, give all daily RUTF first before offering other foods, do not share RUTF).
- Return to the health facility in case of deterioration or any other health problem.
- Return for weekly visits to monitor progress until full recovery.

Health and nutrition education sessions should be held regularly to explain how mothers and carers can improve their own and their children's health and nutrition. These sessions can be held at health facilities or in the community. Health education sessions at a health facility should be

conducted according to a specific schedule (including topics and timing). Community-level health and nutrition education is provided by CHWs and FHA groups during home and health post visits and social events. Topics may include dietary diversity, food functions and groups and complementary feeding. CHWs should conduct specific education sessions for mothers of malnourished children at village level, combined with cooking demonstrations. **Box 8.2** lists key messages for health and nutrition education; details are provided in the CBNP [40].

Box 8.2 Key messages for health and nutrition education [40]

- Ensure healthy maternal nutrition.
- Start breastfeeding at the first hour after delivery.
- Ensure exclusive breastfeeding until 6 months of age.
- Give healthy complementary feeding starting at age 6 months up to 35 months and continue breastfeeding.
- Continue good feeding during and after illness.
- Wash hands before handling food an after using the toilet.
- Store food in a clean way.
- Boil water before consumption.
- Use zinc with ORS when diarrhoea.
- Access biannual vitamin A supplementation and deworming.
- Access Iodized salt and fortified blended foods.
- Use latrines and safely dispose of waste.

8.5. Sensory Stimulation and Emotional Support for the Child

During acute malnutrition treatment, care must be taken to avoid sensory deprivation of the child. Neurological research has shown that deprivation of sensory stimulation and emotional support alter long-term development and mental health. A supportive environment at critical stages of early childhood development is essential for a healthy growth in children. Children with acute malnutrition are likely to come from a situation of nutritional, physical or psychological insecurity. Studies have indicated that long-term environmental stress, such as continued exposure to conflict in Afghanistan, has significant negative effects on child development.

Children need to see and hear what is happening around them and have unrestricted movement. The traditional practices of swaddling small children or covering their faces reduce sensory stimulation and should be discouraged because they may limit the contact children need with the environment and consequently limit psychosocial stimulation and development. Discouraging these practices must be dealt with sensitively to avoid undermining mothers' or carers' confidence and role, and it should be explained to all members of the family. For example, mothers or carers should be taught that newborns are highly sensitive to light and sound, but in a few days begin to turn their heads toward light and sound, and that light makes them close and open their eyes. Mothers or carers respond to this with spontaneous and reactive facial gestures. Malnourished children also need continual eye contact and emotional and physical stimulation.

The following guidance may be considered by the team involved in IMAM:

- **Ensure the presence and involvement of mothers or carers during treatment in OPD-SAM or IPD-SAM.** Encourage mothers or carers to feed, hold, comfort and play with children as much as possible. IPD-SAM wards should have adult beds for mothers or carers to sleep with their children. However, as few other adults as possible should interact with the children. Adults should talk to, smile at and show affection to the children. Medical procedures such as venepuncture should be done by the most skilled person available preferably out of earshot and sight of the other children. Immediately after any unpleasant procedure, children should be held and comforted.

- **Make the play environment as stimulating as possible.** Rooms or wards have bright colours, decorations and colourful mobiles that interest children. Brightly coloured aprons more informal clothing are encouraged. A radio can provide background music. The atmosphere in the ward should be relaxed, cheerful and welcoming. Toys should be available in the children's beds and rooms, as well as in play areas, and should be safe, washable and appropriate for the children's age and level of development. In low-resource settings, health workers that engage with mothers or carers can be trained in activities appropriate for each stage of development. Children need familiar objects and scenarios with toys and play scenes appropriate for their developmental age to learn.

- **Provide one-on-one counselling of mothers or carers.** Health providers should provide mothers or carers with precise messages on feeding and care practices. For example, messages on the importance of breastfeeding should include how breastfeeding provides an opportunity to show warmth and love and communicate through singing, touch and facial expression. The messages should indicate that care provided in this way is as vital as the breast milk.

- **Deliver health and nutrition messages to mothers or carers in an interactive way.** Health messages to promote good hygiene, proper nutrition, infant stimulation and early child development should be delivered using large pictorial cards and interactive methods, such as provided in the CBNP community kit. Mothers' and carers' confidence and feeling of security and household status influence their children's nutritional intake and should be taken into account when delivering messages on feeding and care practices. Messages and visuals should pair to form a consistent narrative structure.

- **Invite mothers or carers and babies to mother and baby groups.** Time can be dedicated to mother and baby groups in child-friendly spaces. Mother and baby groups enhance maternal knowledge and practice of early childhood development activities and strengthen connections among women. Peer demonstrations and support enhance care practices knowledge and experience. This direct and continuing social support is one of the key elements in improving maternal mood and fostering positive psychological and community resilience. The groups also provide safe spaces for babies to interact with their carers and one another and for carers to watch and learn from each other.

- **Visit mothers or carers in their homes.** Home visits allow an integrated holistic approach tailored to the infant's or young child's needs. This is particularly beneficial for infants with developmental delays or disabilities who may need additional individual attention. Health, nutrition, hygiene, infant stimulation and responsive interactive parenting can be addressed in a supportive manner. Home visits provide an opportunity to praise good parenting and feeding practice and model additional practices.

- **Involve communities in early childhood development activities.** Communities should be engaged in the discussing, planning, decision making, implementing, monitoring and evaluating early childhood development activities from the outset. Open discussion meetings through community groups can advertise and explain ideas and help people agree on the best methods. They also help raise awareness about the importance of these activities.

- **Encourage child participation.** Young children are active agents in their own development process and shape their environment through their participation. Mothers or carers should be encouraged to listen to and consult with their infants and children in any activities. Creative media of art and play can help very young children express their views. Children with mental and physical disabilities or children with HIV are at higher risk of being neglected and not receiving appropriate nutrition or play opportunities. Every effort should be made to ensure the willing participation of children from vulnerable groups.

Chapter 9. Management of Acute Malnutrition In Emergency Situations

This chapter provides guidance on strengthening the resilience capacity of the local health system to prepare for and manage acute malnutrition surges due to shocks.

9.1. Principles of Managing Acute Malnutrition in Emergencies

Afghanistan is extremely susceptible to recurring natural disasters because of its geographical location and environmental degradation. The country regularly experiences flooding, earthquakes, avalanches, landslides and drought in addition to civil unrest. These shocks result in frequent loss of life, livelihoods and property and contribute to increasing levels of instability, population displacement and poverty across the country. On-going population movements of internally displaced persons (IDP), refugees fleeing instability in neighbouring countries and returnees in need of resettling require continuous support to have their basic needs covered. This unfavourable situation particularly affects children under 5 years of age and pregnant and lactating women (PLW) who are most vulnerable to acute malnutrition. Strengthening the resilience capacity of local health systems and providing emergency interventions that cover priority needs or affected populations are strategies to cope with the impact of shocks on services for women and children and vulnerable groups.

The principles of the IMAM approach are the same in emergencies as in routine situations, but different support strategies are needed to cover the capacity gaps due to an increase in caseload. Increased resources and support will be needed to 1) manage increased caseloads without jeopardizing quality of care or impacting on other health activities, and 2) cover affected areas where health structures are insufficient, inaccessible, inexistent or destroyed health structures.

Depending on the emergency scenario, new temporary fixed and/or mobile health and nutrition services or additional support to existing service sites may be needed in terms of human resources, supply management, supervision, training and mentoring for scaling up IMAM services. In

addition, support for community outreach to strengthen awareness of acute malnutrition and early identification and referral of cases is key to ensure early start of treatment before complications develop and good coverage of services. Insecurity should be considered when establishing new sites to avoid separating families for long periods while children and carers and to avoid long travel and waiting times at the service sites, which could be a security risk or especially difficult for mothers or female carers.

During large or protracted emergencies, the National Nutrition Cluster (NNC) Coordination will facilitate the nutrition emergency response interventions for prioritised vulnerable populations and coordinate multiple emergency partners and resources.

9.2. Strengthening Resilience Capacity and Preparing for Contingencies

Areas prone to shocks or seasonal food insecurity should be prepared to manage increased caseloads of acute malnutrition. Strengthening resilience capacity and contingency planning for probable or recurrent emergencies should be part of annual action planning and budgets. This planning should foresee actions that increase capacities and resources, for example, to manage the workload, avoid stockouts, cover underserved populations.

A series of steps may be put into place to enable the local health system and communities to both continue to improve sustainable and integrated preventive and curative acute malnutrition services and to prepare for and respond to increased demand for services in response to shocks. The steps should neither affect delivery of other health and nutrition services nor undermine the capacity of government health actors. The steps should anticipate an increase in the prevalence of acute malnutrition in a geographic or administrative area that then triggers certain actions to respond to the surge based on the capacity gap of the local health system. Concurrently, the local health system will increase its resilience capacity over time through long-term and continued system strengthening efforts, and be better prepared to respond to an unexpected surge [43] (**Figure 9.1)**.

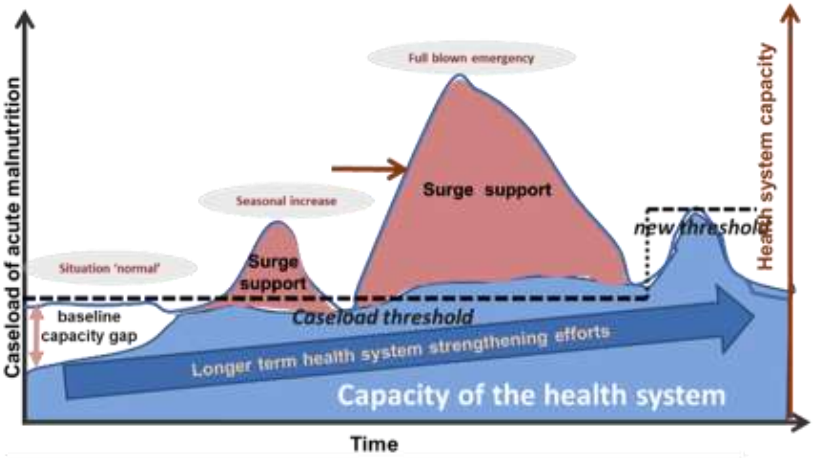


Figure 9.1. Strengthening the resilience capacity for acute malnutrition surge [43]

The resilience capacity approach links a situation analysis of the local health system (probability of events, vulnerability, risk, health system capacity and needs) with pre-defined, budgeted and agreed support actions operated from within and outside the system. The four steps in building the resilience capacity are (1) situation analysis, (2) action planning, (3) real-time monitoring and actions, and (4) learning and adapting (**Figure 9.2**). The approach tailors capacity support to local contexts according to pre-set thresholds and develops local solutions to local problems and needs. Through local ownership, it supports and protects the long-term impacts of interventions by reducing the vulnerability and fragility of the health system and promoting its ability to adapt to change [44].

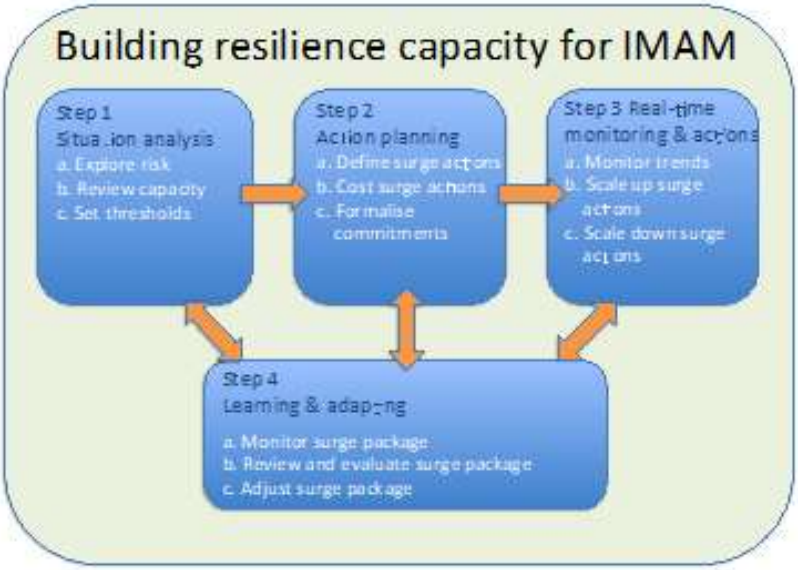


Figure 9.2. Resilience capacity framework for IMAM [44]

The resilience capacity approach requests that each health facility sets according to its own perceived capacity and caseload (thresholds are points when major change occurs). Real-time monitoring of health and nutrition data then triggers response actions when pre-defined thresholds are passed to a higher (or lower) response phase and back (three phases are normal, serious or emergency; a second alert phase could be added) (**Table 9.1**). Actions are initiated when the situation deteriorates and deactivated when the situation normalises. The approach should be monitored, evaluated and adapted in an iterative process of ongoing learning by the local health system actors, for example, health facility staff supported by provincial officers.

Table 9.1. Response phases

Phase	Description
Normal	The health facility team can handle the workload and has adequate resources to meet the demand for services. A minor increase in SAM cases is managed without external support by improving efficiency through actions such as rational use of resources, task sharing through teamwork or rescheduling vacations. → Regular support actions focus on sustainably, improving quality IMAM and other facility- and community-based nutrition services.
Serious	The health facility team is overstretched because of increased caseload and requires additional support from a higher level to appropriately meet the demand for services. Reorganisation of the health facility and mobilisation of its own resources are insufficient to handle the situation. → Specific support actions focus on scaling up quality IMAM and other facility- and community-based nutrition services.
Emergency	The health facility team is overstretched to the point where it requires additional support from the provincial health directorate, Nutrition Cluster Coordination and/or partners to ensure that (1) increased demand for IMAM and other nutrition services is met effectively and (2) the population can access care in a timely manner. Significant resources are provided for additional human resources, supply chain support, infrastructure and equipment. → Emergency support actions focus on scaling up quality IMAM and other facility- and community-based nutrition services, linked with multisectoral quality services for saving lives.

9.3. Emergency Response

To reinforce the capacities of IMAM services to treat a large increase of children with acute malnutrition, both supporting existing sites and setting up additional and/or mobile sites should be considered. This will ensure that the services are accessible to the affected populations and that the increased caseload can be managed without compromising the quality of services. Besides support for implementation of strengthened and expanded service delivery, interventions should include:

- **Mobilisation of financial resources**: Access emergency funds and mobilise locally available resources.
- **Reinforcement of the health workforce**: Facilitate sharing and/or shifting tasks of existing staff (improve team-work) and/or deploy health workers, supervisors, logisticians and community outreach staff. Volunteers or temporary emergency workers can help share the work burden in the short term and reduce waiting times for mothers or carers.
- **Reinforcement of information**: Strengthen the monitoring, reporting and surveillance systems to detect changes in weekly caseload and performance of interventions to adjust plans and resource allocations.
- **Provision of additional supplies:** Provide additional essential medicines, vaccines and therapeutic foods and related logistics management support, including ordering, transport, storage and distribution.

Specific emergency nutrition interventions may include the strengthening of the following:

- Real-time information on the nutrition situation and burden of acute malnutrition
- Community awareness and screening
- IMAM with strengthened community awareness and screening
- Blanket supplementary feeding
- Infant and young child feeding
- Management of older people's malnutrition
- Cash or vouchers for the prevention of malnutrition
- Micronutrient supplementation and fortification and deworming
- Nutrition care and support of HIV-positive or other vulnerable children
- Monitoring adherence to the International Code of Marketing of Breast Milk Substitutes (BMS) and managing donations of BMS
- Monitoring interventions and evaluation of coverage and equity

Blanket supplementary feeding is an emergency intervention to prevent acute malnutrition that may be provided to all the children between 6–23 months or 6–59 months of age depending on the assessment findings. It should be started as early as possible after the onset of a crisis. It may create an opportunity for community screening for acute malnutrition and involvement in IMAM and other health interventions and that may have a positive impact on health seeking and trust.

A daily ration of a fortified blended food (such as Super Cereal *plus*[4] containing wheat or corn, de-hulled soya beans, refined soya bean oil, dried skim milk powder, sugar and a wide range of vitamins and minerals) or a lipid-based nutrition supplement (LNS) may be provided. The timeframe of the intervention may vary, but it is recommended to plan the intervention for a period of 3–6 months.

Strengthening community outreach

In an emergency, as in a routine service setting, strengthened community outreach activities include:

- Raising awareness on the causes and consequences of acute malnutrition and the need for treatment.
- Engaging communities in decision making, planning, implementing and monitoring response activities.
- Active case finding and routine screening for early referral.
- Improving infant and young child feeding and care practices, including counselling, health and nutrition education and food demonstration, linked with monthly continued growth monitoring and micronutrient supplementations.
- Considering opportunities of early childhood development and involving mother in care.
- Linking with general food (or cash/voucher) distribution and social protection interventions.
- Reporting BMS and RUTF abuse.

[4] Information on Super Cereal *plus:*

http://documents.wfp.org/stellent/groups/public/documents/manual_guide_proced/wfp281211.pdf

Evidence on the role of the communities in emergency interventions has proven the importance of being the first to alert and provide care or support either during disease outbreak, natural disasters or situations of severe malnutrition. Communities hold the key to success for their own communities and households. Strategies to empower and involve communities have to be strengthened. For example, the local media through radio messages and religious leaders during Friday prayers may share information to empower communities and reduce their vulnerability to acute malnutrition in fragile and stable settings.

Strengthening IMAM services

Services: For OPD-MAM and OPD-SAM, temporary fixed or mobile support teams should strengthen health teams at existing health facilities or at new sites to improve service access and treatment coverage and avoid unnecessary population movement and long waiting times. Support teams require trained health workers and additional supplies, including ready-to-use therapeutic food (RUTF) and ready-to-use supplementary food (RUSF).

One outpatient site can serve up to 30 children per day per designated clinical health worker. One inpatient site can serve up to 50 children. If there are more than 50 children, a second site should be established. Each site should include a unit for intensive care cases to provide around-the-clock specialised care for initial treatment to stabilise children with complications, and either an area for recovering cases or referral to site for OPD-SAM.

Additional sites can be established on a temporary basis in displacement or refugee camps or affected areas. Care should be taken to ensure that adequate services are provided to both host and incoming populations and socio-economic and age groups and that there is no loss to follow-up. Active engagement of the community and use of community-appointed volunteers who know the context may be helpful.

Infrastructure: Temporary fixed or mobile outpatient sites should ideally serve as satellite sites of existing health facilities. Temporary inpatient care sites should be in a ward or a temporary structure on the compound of a health facility.

Health workforce: Each outpatient site should have at least one nurse. Each inpatient site should have at least one part-time doctor, three nurses and 10 nursing aides. Mothers or carers of children may also provide some assistance. Staff to add and also current staff must be clearly identified according to the response phases in **Table 9.1**. During emergency response/contingency planning and budgeting, the possibility for re-allocation of staff should be identified and their transportation and accommodation costed so that they can be deployed immediately in an emergency.

Equipment and supplies: The sites should be well equipped with appropriate medical supplies and therapeutic and supplementary foods based on the estimated number of infants and children with acute malnutrition. Food should be available for mothers or carers in case of inpatient care. A collective kitchen should be organised and a reliable supply of fuel for cooking and heating assured. Secure storage facilities are required for therapeutic food and medical supplies.

Water supply and sanitation: OPD-MAM/SAM sites should have access to water and a latrine. IPD-SAM sites should have a minimum of 30 litres of water available per child per day. If less than 10 litres of water is available per child per day, the site will be unable to function. A latrine and bathing area are required for every 20 people. Hand washing facilities for health workers and carers are essential to reduce risk of cross-infection.

Early childhood development (ECD) activities: In emergencies, as in non-emergency situations, psychosocial and nutrition interventions should be combined to address the physical, social, emotional and intellectual developmental needs of children and enhance maternal wellbeing [45]. Simple early stimulation, learning and play activities are crucial to increase and sustain improved child health and nutritional status. The various entry points for emergency interventions can provide access to large groups of vulnerable children and carers that create opportunities for ECD awareness and activities. Children's needs should be addressed by providing child-friendly spaces and ECD centres, which often incorporate IYCF interventions. The participation of children from vulnerable groups such as children with HIV or mental and physical disabilities has to be encouraged. Ideally, an ECD specialist should be part of the emergency intervention team to train and engage nutrition and psychosocial staff and volunteers in ECD activities.

Expanding associated health activities. Expanded measles immunization, micronutrient supplementation or hygiene promotion may be required in a nutrition emergency. In an outbreak of acute watery diarrhoea or other severe infectious disease, clear instructions should be made available for managing both acute malnutrition and/or acute diarrhoea to ensure children are adequately hydrated and prevent cross-infection from other immune-compromised children in therapeutic care. International guidance on treating acute watery diarrhoea is available in the 2017 WHO 2017, Algorithm for Treatment of Profuse Acute Watery Diarrhoea in Children with Severe Acute Malnutrition [46].

9.4. Coordination and the Cluster Approach

The Inter-Agency Standing Committee (IASC) Cluster Approach has been activated in Afghanistan since 2008 to strengthen system-wide preparedness and technical capacity to respond to humanitarian emergencies, and provides clear leadership and accountability in the main areas of humanitarian response.

The Ministry of Public Health (MOPH), Public Nutrition Directorate (PND), with the oversight of the Emergency Preparedness and Response (EPR) Directorate and UNICEF as lead, manages the NNC, which coordinates emergency nutrition activities with over 50 emergency partners and about eight major and some smaller donor agencies. The NNC leads and facilitates effective nutrition response by strategically mobilising emergency partners and funds. The NNC monitors and sets priorities for emergency nutrition interventions based on comprehensive assessment and emergency management that targets vulnerable provinces and populations, including internally displaced populations and returnees, and areas not under government control [47]. The NNC ensures response to nutrition needs that may include, e.g.:

- Establishing and managing coordination of nutrition actors at national and sub-national levels.
- Facilitating assessments of the situation, needs and gaps.
- Ensuring gaps are addressed and duplications avoided.
- Facilitating response plans.
- Mobilising resources.
- Monitoring adherence to regulations and technical standards.
- Strengthening capacities.
- Monitoring and reporting on response and coordination activities.

Chapter 10. Organisational Management of Integrated Management of Acute Malnutrition Services

This chapter provides guidance on the organisational management of IMAM services as part of IMNCI in the BPHS [15] and of paediatric hospital care in the EHPS [17].

10.1. Principles of Organisational Management of IMAM Services

The following key elements of organisational management of IMAM services enable health actors to achieve set goals, resolve problems and make decisions to improve the efficiency and effectiveness of IMAM services:

- **Organisational structure and capacity:** Ensuring that leadership and capacities for goal setting, decision-making, coordination and resource mobilisation respond to needs for quality service implementation.
- **Planning for implementation:** Building on needs and gaps, ensuring that resources (including people and competencies, materials, funds, systems and structures) are in place and roles and responsibilities for providing quality services (delivering service) and empowering communities (generating demand) are clear and assigned.
- **Monitoring the quality of community outreach:** Ensuring that communities are aware of and empowered to access IMAM services, which generates trust and demand and increases community capacity to claim rights, contribute to costs and be involved in care as possible.
- **Monitoring the quality of individual care:** Ensuring timely, effective, comprehensive child-centred care that is responsive to perceived needs at low financial risk. This includes early identification of moderate acute malnutrition (MAM) and severe acute malnutrition (SAM) and associated illness and referral for treatment uptake, timely start of treatment, monitoring of treatment progress (or failure) and subsequent actions, involving mothers in care, retention in treatment until full recovery and continued monthly attendance of facility-based and community-based nutrition services.

- **Monitoring the quality of IMAM services:** Ensuring accessible, effective, cost-efficient, equitable, integrated and sustainable services at scale, satisfying both users and providers.
- **Evaluating change:** Determining whether goals and objectives have been achieved, evaluating desirable and sustainable improvements in acute malnutrition services and health status, evaluating system-wide improvements in health and wellbeing and generating knowledge to inform policy design and strategic planning.

10.2. Organisational Structure and Capacity

As part of the BPHS and EHPS, IMAM is covered in both the National Health Strategy [13] and National Nutrition Strategy [2] and its organisational structure mirrors existing structures for efficient and effective service delivery.

Organisational Structure

The organisational management of IMAM follows the tiers of the health system, i.e., national, provincial, district, health facility and community levels. IMAM organisational functions may include setting goals and standards, deciding policies and strategies, coordinating and regulating health actors, calling health actors to account for non-performance, mobilising and allocating resources, keeping records, sharing knowledge and information and overseeing service delivery. While IMAM organisational management and service delivery are part of the BPHS and EPHS, IMAM information and supply chain management systems have a parallel support structure.

- **At national level:** The Public Nutrition Directorate (PND) of the Ministry of Public Health (MOPH) manages the national nutrition portfolio. It presides over the Nutrition Programme Coordination Committee (NPCC) that consists of government actors of various departments and technical, financial and implementing partners to ensure sectoral and multisectoral linkage. The PND manages IMAM policies and interventions and brings together all health and nutrition partners involved in IMAM in the IMAM Technical Working Group. Non-government partners include the World Health Organisation (WHO), UNICEF, the World Food Programme (WFP) and international and

national non-governmental organisations (NGOs) that provide technical, logistic and implementation support through the BPHS and EPHS in development areas as well as in emergency settings. Academic, research and training institutions and professional associations are encouraged to participate in IMAM capacity strengthening. The PND has strong oversight of IMAM at provincial and implementation levels.

- **At provincial level:** The Provincial Public Health Directorate (PPHD) presides over the Provincial Health Coordination Committee (PHCC) that brings together provincial government actors and implementing partners and manages all health interventions of the BPHS and EHPS in the province. The PPHD Provincial Nutrition officer (PNO) links with the BPHS partners and oversees the nutrition interventions in health facilities and communities and assists with information and supply management. The health and nutrition officers of the partners manage the IMAM implementation and organisation of services.

- **At community level:** Community health workers (CHWs) work in their community and link with the Health Shura and Family Health Action (FHA) group with oversight from the Community Development Committee where community health activities are discussed, organised and coordinated.

Organisational Capacity

Organisational capacity focuses mainly on providing quality IMAM services for improving health outcomes, but it should also ensure that services are sustainable and integrated into the health system. It is common to plan and monitor the quality of individual care for consistency based on current evidence or professional knowledge of technical quality [48] [49] and the quality of services for e*ffectiveness, efficiency*, *accessibility*, *people-centredness*, e*quity, coverage and scale* [50]. It is less common to strengthen the integration and sustainability of services for which organisational management of IMAM should plan and monitor along with quality. Capacity strengthening efforts go well beyond knowledge, skills and supplies, and should be strategic and comprehensive to achieve set goals, for which the theory of change, that identified short- and long-term determinants of change, is a helpful tool. A framework for capacity strengthening is shared in **Annex 4**.

10.3. Planning for Implementation

Minimum resources for IMAM service delivery are the team of health workers, infrastructure and space, drugs, equipment and supplies, a referral system, information system, community involvement and job aids.

Key Elements of Planning for IMAM Implementation

- **Team:** Consider staff roles and responsibilities from the perspective of team-based care, which encourages task sharing, complementary competencies, problem solving and learning together for continuous quality improvement (CQI). Staff availability, competencies and workload will determine staff organisation and needs. Supportive supervision, training and development, performance appraisal and career opportunities are important motivators to improve attitudes, job satisfaction and self-esteem and prevent attrition.

  Training is essential but not sufficient to strengthen the capacity of health workers for IMAM scale-up and quality improvement. Pre-service education of health professionals should cover IMAM as part of child healthcare, and training institutions should be involved in all IMAM learning and research opportunities and have access to IMAM learning sites for internships. In-service training and continual professional education should be provided by experienced master trainers, using IMAM training materials and sessions tailored to the identified needs and context and balancing knowledge and skills development.

- **Infrastructure and space:** Ensure a dedicated and clean environment with access to clean water, hand washing and a toilet to minimise cross-infections and encourage healthy behaviours. Where possible, link with services and initiatives that support provision of clean water and good sanitation practices in the community, e.g., community-led total sanitation (CLTS).

- **Equipment and renewable supplies:** Secure timely access to routine IMAM drugs and other essential drugs and therapeutic and supplementary food products. Any dysfunction or supply rupture will compromise adherence to drug, fluid management and dietary treatment protocols and influence treatment outcome. Quantification and forecasting, ordering, receiving, storing, dispensing, recalling and

monitoring of supplies should align with the national *Supply Chain Management (SCM) Standard Operating Procedures (SOP)* [51]. Minimum material lists for OPD-MAM/SAM and IPD-SAM provided in **Appendices 10 and 11**.

- **Referral system:** Organise transportation and communication for referral to improve continuity of care and adherence to treatment protocols. A local ambulance system will help people access health facilities, track movement of children between community and health facility services in time and space and share information on diagnosis and treatment between health professions.

- **Monitoring and reporting system:** Ensure standardised recording, monitoring and reporting that generate information and improve learning and knowledge sharing to enhance the quality of care and services and professional development. Making standardised recording and monitoring and reporting forms available will improve information generation. Health workers should understand why and how monitoring is done, what to learn from it and how to continuously improve quality). They should know what feedback and support to expect from supervisors, and what (and how) to communicate to service users and communities. Making guidelines, job aids and access to an information-sharing platform will enhance continuous learning and improve performance of health workers.

- **Community involvement:** Empower community members to understand health problems and engage in healthcare by creating awareness about illness and its causes and prevention and encouraging healthy practices and behaviours. Generating trust and overcoming barriers to service access and uptake encourage communities to use services, adhere to treatment and jointly identify problems and find solutions. A mechanism should be set up to address barriers to services, bring services closer to the population in need, create community awareness (generate demand) and encourage involvement in promotive, preventive and curative health and nutrition tasks.

- **Job aids:** Standardise task- and level-specific job aids as memory aids for daily use to ensure quality care, recording, monitoring and reporting. IMAM job aids include national guidelines, SOP, operational charts but also job descriptions are useful tools.

Planning for Community Outreach

Community activities for IMAM target children under 5 years of age and PLW with infants under 6 months of age with acute malnutrition in the community as part of the Community-Based Nutrition Package (CBNP) and aligned with community-based healthcare (CBHC) of the BPHS.

- **Team:** Male and female CHWs are supervised by the CHSs and supported by community volunteers and members of community-based groups and committees. The expanded team for community outreach for IMAM may therefore consist of:
  - Male and female CHWs with their CHSs
  - Mothers of ill children and influential family members (e.g., fathers, grandmothers)
  - Community volunteers
  - Community group members, e.g., from FHA groups and health shuras
  - Influential community members, e.g., teachers, elders, mullahs, private healers, drug vendors

  Below is a list of IMAM community outreach activities with responsible persons:

Community outreach activity:	**Suggested responsible person:**
Community sensitisation and discussion meetings	CHWs and trained community members
Active and routine screening	CHWs and trained community members
Transportation and communication for referral	CHWs and focal point ambulance system
Home visits	CHWs
Health and nutrition education	CHWs

Linking with community-based initiatives	CHWs, CHSs and community groups
Monthly reporting	CHWs and CHSs

- **Infrastructure and space:** Health posts, which are the respective homes of the male and female CHWs, function as meeting spaces. No extra storage space is required. Transportation for home visits and participation in community meetings is conducted by foot.
- **Equipment, job aids and forms:** MUAC tape, weighing scales, means of communication, forms and registers.

Planning for OPD-MAM/SAM

OPD-SAM and OPD-MAM target children under 5 years of age who are identified with uncomplicated SAM and MAM, and services are provided at the OPD of the health facility or the community site in case of Mobile Health and Nutrition Teams (MHNTs).

- **Team:** The team of health workers at the health facility (physician, nurse, midwife, nutrition counsellor, pharmacist and food distributor) is responsible for organising and providing care, including monitoring and reporting. Providers organise sharing of roles and responsibilities, and link to supervisors for support. Below is a list of OPD-MAM/SAM activities with responsible persons:

OPD-MAM/SAM activities for children under 5:	**Suggested responsible person:**
Emergency triage and management	Physician or nurse
Routine screening	Physician, nurse and nutrition counsellor
Anthropometric measurement	Nutrition counsellor
Initial assessment and history	Physician
Appetite test	Physician and nurse
Differential diagnosis and treatment plan and referral decision	Physician and nurse
Start of treatment, counselling and prescription of drugs and RUTF or RUSF	Physician (and nurse)

Provision of drugs and RUTF or RUSF	Pharmacist
Follow up visit: assessment, vaccination schedule completion, progress monitoring	Nurse (or physician, midwife)
Decision end of treatment	Nurse (or physician, midwife)
Health and nutrition education	Nutrition counsellor
Mother's involvement in care, and care of the mother	Nurse, midwife, nutrition counsellor, mental health counsellor and CHS
Registration	Nurse
Recording on treatment card and ration card during consultation	Physician and nurse
Monthly reporting	Responsible nurse

- **Infrastructure and space:** Health facility staff decide how to use available space to organise the different activities of OPD-SAM or OPD-MAM. Minimal infrastructure requirements are running water, gender-sensitive latrines, a shelter or protected waiting area, adequate storage for therapeutic and supplementary food supplies and a privacy-protected area for measurements and consultations.

- **Equipment and renewable supplies of drugs, food products, job aids and forms:** Minimum requirements are covered in **Appendix 10**. Renewable supply needs are forecasted annually and requested quarterly using the *Quarterly Nutrition Supply Request* **(Form 21)**, which may be adjusted for fluctuations in caseload or corrected for stock balance.

  The average monthly need of RUTF and RUSF is automatically calculated by the *Quarterly Nutrition Supply Request* spreadsheet, or can be calculated as shown in **Table 10.1**:

  - **RUTF:** Each child around two years of age in OPD-SAM consumes approximately 20 sachets a week, which corresponds to 15 kg per 6 to 8-week treatment (approximately one carton of RUTF per child). The total requirement of RUTF per child depends on the child's weight at the start of treatment, adjusted for weight gain during treatment and treatment duration. A correction for defaulting may be anticipated.
  - **RUSF:** Each child in OPD-MAM receives seven sachets of RUSF a week, which corresponds to about 5 kg per 8-week treatment. The total requirement of RUSF per child depends on the treatment duration.

Table 10.1. RUTF and RUSF requirements for use in OPD for children 6–59 months of age

Calculation of RUTF requirements for use in OPD-SAM		
Number of OPD-SAM clients	**A**	
Monthly sachet consumption per child (@ 20 sachets/child/week)	**B**	**= 80**
Monthly sachet consumption for a site	**C**	**= A x B**
Monthly carton consumption for a site	**D**	**= C/150**
Monthly net weight (MT) (@13.8 kg/carton)	**E**	**= D x 13.8/1000**
Monthly gross weight (MT) (@14.9 kg/carton)	**F**	**= D x 14.9/1000**
Calculation of RUSF requirements for use in OPD-MAM		
Number of OPD-MAM clients	**A**	
Monthly sachet consumption per child (@ 7 sachets/child/week)	**B**	**= 28**
Monthly sachet consumption for a site	**C**	**= A x B**
Monthly carton consumption for a site	**D**	**= C/150**
Monthly net weight (MT) (@13.8 kg/carton)	**E**	**= D x 13.8/1000**
Monthly gross weight (MT) (@14.9 kg/carton)	**F**	**= D x 14.9/1000**

Planning for IPD-SAM

IPD-SAM targets children under 5 years of age identified with complicated SAM. IPD-SAM services are provided in a health facility with 24-hour care. Planning for IPD-SAM covers needs in both the emergency room and the IPD-SAM ward.

- **Team:** Trained, experienced and competent staff are essential for well-functioning IPD-SAM. Staff should be rotated at times that minimize disruption of routine procedures and allow mentoring of and learning for new staff. Loss of experienced staff should be avoided. Effective management should ensure good monitoring of each child by trained staff and use of the most experienced staff for supervising and reliable record-keeping. Staff involved in preparing therapeutic feeds should be checked to ensure that they follow the

correct procedures for weighing, measuring, mixing, cooking and storing the product. They should be observed making the feeds to ensure recipes are correct and all ingredients are added. People with infections should not handle any food.

Staff **attitudes** can determine whether treatment of a very ill child succeeds or fail. Staff that believe that a child is beyond help and mothers that are neglectful may pay less attention to the child. Such a child often fails to respond to treatment, which seems to confirm the opinion of the staff. This clinical prejudice may be difficult to correct, especially when it reflects the views of the most experienced staff. It is essential to remind staff frequently that each child's wellbeing depends on their efforts and that every child must be given their full attention. Below is a list of IMAM IPD-SAM activities with responsible persons:

IPD-SAM activities for children:	**Suggested responsible person:**
Emergency triage, assessment and treatment (ETAT)	Physician
Routine screening	Physician or nurse
Anthropometric measurement	Physician or nurse
Initial assessment and history	Physician
Appetite test	Physician and nurse
Laboratory test	Physician and nurse
Differential diagnosis and treatment plan and referral decision	Physician
Start of treatment and close monitoring of danger signs	Physician
Start of re-feeding and close monitoring of feeding and danger signs	Nurse
Food preparation	Nurse
Daily care and progress monitoring	Physician and nurse
Vaccination schedule completion	Nurse
Decision to refer to OPD-SAM to continue treatment as outpatient (option 1) or end treatment (option 2)	Physician and nurse
Health and nutrition education	Nutrition counsellor
Mother's involvement in care, and care of the mother	Nurse, midwife, nutrition counsellor, mental health counsellor and CHS
Registration	Nurse

Recording on treatment card and ration card during the consultation	Physician
Monthly reporting	Responsible nurse

- **Infrastructure:** Wherever possible, malnourished children should be managed in a special **IPD-SAM ward** or designated area of the paediatric ward where trained staff are available. The ward should be warm (25–30°C) with no draughts. The ward must be well organised, with running water, electricity and quality diagnostic and feeding equipment. **Infection control** procedures and **hand washing** of staff and carers must be strictly observed at the following five points of care [52]:

  - Before contact with the child
  - Before an aseptic task
  - After exposure to body fluids
  - After contact with the child
  - After contact with the child's surroundings

  The kitchen used for **therapeutic food preparation** should be equipped with cooking utensils and clean water and use standard hygiene practices for storing, preparing and handling therapeutic food. Any prepared solid food that will be stored for more than 2 hours should be refrigerated (after allowing it to cool to room temperature) and re-heated until it is thoroughly hot and then allowed to cool before serving.

  Other requirements are gender-sensitive latrines, facilities for bathing and cooking for mothers or carers and a **playroom** with toys for sensory stimulation and emotional support of children and for teaching mothers or carers to play with their children.

- **Equipment and renewable supplies of drugs, specialised food products, job aids and forms:** Minimum requirements are covered in **Appendix 11**. Renewable supply needs are forecasted annually and requested quarterly using the standard forms, or can be calculated as shown in **Table 10.2**. Annual forecasting guides quarterly requests, which may be adjusted because of expected changes in caseload.

  About 10–15% of children with SAM develop complications and need IPD-SAM. On average, the duration of treatment for

stabilisation in IPD-SAM is 7–10 days. For all children, about 2 kg of F75 per child is planned, which translates in about 6 kg of F75 per month for one paediatric bed occupation. Less then 5% of children may not be able to consume RUTF and will continue rehabilitation with F100 for catch-up growth. For these children, about 9 kg of F100 per child is planned. For about 95% of all children RUTF will be needed for a few days.

Table 10.2. Therapeutic food product requirements for 100 SAM cases in IPD-SAM

Therapeutic product	Use	Estimated children's need	Number of children using (P)	Duration of treatment	Quantity per treatment (Q)	Quantity/100 SAM cases (P x Q x 100)
F75	Stabilisation	10–15% of overall SAM and 100% of IPD admissions		5–7 days	2 kg	
F100	Rehabilitation	5% of IPD admissions		3 weeks	9 kg	
RUTF	Transition	95% of IPD admissions		2 days	4 sachets	
ReSoMal	Stabilisation	90% of IPD admissions		2–3 days	0.084 kg	

Planning for OPD-MAM for PLW

OPD-MAM consists of services in the outpatient department (OPD) for PLW with infants under 6 months of age with acute malnutrition and is provided in the Mother and Child Health (MCH) room of the health facility. Its activities are aligned with the Reproductive, Maternal, Newborn, Child and Adolescent Health (RMNCAH) strategy [13].

- **Team:** The midwife in the MCH section of the health facility is the in-charge, assisted by the nutrition counsellor, and organises health and nutrition education and food demonstrations with the support of the health facility team and supervisor. Below is a list of IMAM OPD-MAM for PLW activities with responsible persons:

OPD-MAM activities for PLW:	**Suggested responsible person:**
Routine screening	Midwife
Initial assessment and history, diagnosis and referral	Midwife
SuperCereal provision	Food distributor
Decision end of treatment	Midwife
Health and nutrition education	Nutrition counsellor
Care of the mother	Midwife, nutrition counsellor, mental health counsellor and CHS
Registration and recording on treatment card and ration card during the consultation	Midwife
Monthly reporting	Responsible midwife

- **Infrastructure and space:** The health facility decides how to organise OPD-MAM for PLW at the MCH. Finding enough space to store supplies may be challenging.

- **Equipment and renewable supplies of Super Cereal, job aids and forms:** Super Cereal supplies are forecasted annually and requested quarterly using the standard forms. Annual forecasting guides quarterly requests, which may be adjusted for expected changes in caseload. The quarterly requirement for Super Cereal per PLW depends on treatment duration and is based on the monthly supplement of 7.5 kg.

10.4. Monitoring the Quality of Community Outreach

Monitoring the quality of community outreach is part of the routine monitoring of CBNP and CBHC of the BPHS that may receive strengthened support from the provincial nutrition officers.

Key Elements of Quality of Community Outreach

- **Capable and motivated CHWs:** CHWs have the competencies, time, tools and equipment to perform activities according to their job description and are supported by CHSs. Satisfaction of CHWs generates motivation and ownership, and promotes sustainability of services.
- **Sensitized and empowered communities:** Community awareness and understanding generate service demand and use and empower communities to adopt healthy practices and behaviours and be involved in care.
- **Active and routine screening:** Early case finding for early start of treatment before the onset of complications is essential to minimize opportunity costs for mother or carers and the health system. Children under 5 years of age should be screened monthly to ensure no opportunities are missed to identify SAM or MAM.
- **Home visits:** CHWs make home visits to trace defaulters and other problem cases to understand reasons for absenteeism, mortality or non-response to treatment.
- **Accurate anthropometric measurement:** Trained measurers calibrate and use appropriate tools for accurate measuring of MUAC and weight (and estimating age).
- **Responsiveness to community needs and expectations:** Satisfaction of service users and community members generates trust, increases service utilisation and strengthens community capacity to claim rights.

Methods

Monitoring the quality of community outreach involves participatory discussions and two-way exchange of information that includes discussions of the quality of activities.

- **Tools:** Tools to collect monitoring data on IMAM community outreach include are those of the community-based nutrition package (CBNP) (indicated with *):
  - CBNP Monitoring Report for Community Health Supervisors*
  - Child Nutrition Tracking Register*
  - Home Visit Questionnaire (for defaulter tracing and mortality audit)
  - Monthly Health Post Pictorial Monitoring Report*
  - Pictorial Nutrition Monitoring and Promotion Card*
  - Referral slip for CHW*
- **Indicators:** Monitoring IMAM community outreach may include collecting information on the following indicators:
  - **Number of children under 5 years of age and PLW screened and identified with SAM or MAM:** The register tallies how many children are screened for acute malnutrition in the community and how many cases of SAM and MAM are identified and referred for treatment. The tally may be used for geographic mapping of the severity of cases and vulnerability of population groups. It also may be used to tally the screening of PLW.
  - **Number of cases referred for treatment:** CHWs fill out referral slips when they identify children under 5 years of age or PLW with acute malnutrition. The referral slip has two parts. The CHW completes one part and gives it to the mother or carer when a case is identified, and shares the other part with the CHS. When a mother or carer attends the health facility for treatment, the *Referral Slip* is collected by the CHS, who may, during supervisory visits, compare the slips to see which clients attended or did not attend the health facility after referral. The CHW then follows up missed cases.
  - **Number of home visits for screening and defaulter tracing:** When a child misses one or two health facility visits, the CHS notifies the CHW to follow up the child during a home visit and encourage return to treatment. Every defaulter should be followed up to identify the reason for defaulting, encourage return to treatment and, in case of death, identify the cause. The CHW uses the *Home Visit Questionnaire* to record why the child stopped attending

treatment or died. The CHW shares this information with the CHS, who can collate home visit questionnaires to identify barriers or weaknesses that then will be addressed in health facility meetings, community meetings that discuss quality of services and address barriers to treatment.

- **Number of health and nutrition education sessions and community meetings and topics covered:** This information is monitored as part of the CBNP.

Dissemination and Use of Information

CHWs discuss nutrition tracking information with the CHS to identify problems or elements to improve during supervisory visits. Actions for improvement that may be tailored on-the job mentoring, refresher training or other interventions. Based on the discussion of the findings, the CHS and the CHW decide what (and how) to communicate to the communities and service users. It is essential to share information on community outreach between:

- CHW and mothers or carers and other community members during health post or home visits
- CHWs and community groups in organised meetings
- CHWs and health workers of the health facility during occasional meetings
- CHW and CHS during supportive supervision visits

Outreach performance investigations in assessments or evaluations, such as coverage surveys or bottleneck analysis, may use information from the monitoring tools for further analysis.

10.5. Monitoring the Quality of Case Management

The monitoring of the quality of individual case management for acute malnutrition is facilitated by the standardised approach described in these guidelines.

Key Elements of Quality of Case Management

- **Capable and motivated health workers:** Health workers have the competencies, time, tools and equipment to perform activities

according to their job description and are supported by their team and supervisor. As a team, they are able to provide comprehensive child-centred care. Satisfaction of CHWs generates motivation and ownership, and promotes sustainability of services.

- **Distance that mothers or carers travel to access services**: If many clients (especially clients with very low MUAC) have to travel for a full day to access IMAM services, distance is a major barrier to coverage. If most clients travel very short distances, the services do not reach very far, and the reasons for this need to be investigated.

- **Routine screening:** Children under 5 years of age and PLW are screened at every opportunity for early start of treatment before the onset of complications.

- **Accurate anthropometric measurement:** Trained measurers calibrate and use appropriate tools for accurate measuring.

- **Adherence to guidelines for assessment, diagnosis, treatment plan, referral and start of treatment until recovery:** Health workers apply emergency case management for seriously ill children before doing initial assessment for differential diagnosis for treatment. Adherence to treatment protocols promotes effective and efficient recovery and avoids aggravation of acute malnutrition, death or relapse after cure.

- **Adequate feeding practices:** Health workers spend sufficient time and care on testing appetite and counselling mothers or carers on feeding at home (continuing breastfeeding, and correctly providing therapeutic foods and not sharing therapeutic foods with other family members). Feeding a malnourished child takes more time and patience than feeding a normal child. In IPD-SAM, competent staff are allocated for this task, day and night. If there are not enough staff, treatment of a child may fail because insufficient time is taken for feeding.

- **Safe therapeutic food handling, preparation and storage:** All staff use standard hygiene practices when storing, preparing and handling therapeutic, supplementary or complementary food and follow correct procedures for calculating quantities, weighing, measuring, mixing, cooking, storing and monitoring the quality of the food. In IDP-SAM, any prepared therapeutic milk is used and leftovers are discarded; any prepared unused solid food is refrigerated (after allowing it to cool to

room temperature) and re-heated until it is thoroughly hot and then allowed to cool before serving. People with infections do not handle any food.

- **Close monitoring of response to treatment:** Staff adhere to treatment protocols. Any failure to diagnose and immediately treat or refer life-threatening and other medical complications, infections or serious underlying diseases can adversely affect treatment outcome by causing development of a more serious condition, delay in response, non-response, relapse or death.

- **Successful retention in treatment until full recovery, and home visits in case of problems with response to treatment or absenteeism:** Health workers monitor progress of treatment and act upon absenteeism and non-response to address the causes. Health workers record treatment outcome at the end of treatment, including recovery, mortality, defaulting, non-cure, length of stay (LOS) and weight gain (WG).

- **Continuity of care:** Children receive comprehensive care according to their needs and expectations, and are followed over time and across services and referred to other care as needed. Referral or movement of children from or to the community or between services is tracked, and a communication and/or transportation system is established.

- **Involvement of mothers or carers in care:** Mothers or carers are actively engaged in care and receive specific counselling on their children's condition and care in addition to general health and nutrition education. They also receive health, nutrition and psychosocial care as needed. Mother-to-mother support is encouraged. Mothers are supported to be active in assessing and monitoring their own children (and other children as convenient).

- **Responsiveness to the needs and expectations of the service users and communities:** Service users and community members are satisfied with IMAM services, which generates trust, increases service utilisation and strengthens the community capacity to claim rights.

- **Satisfaction of health workers:** Job satisfaction generates motivation and ownership, reduces attrition and improves adherence to guidelines.

Methods

Methods for monitoring the quality of case management include CQI done by the team of care providers, and supportive supervision done by the team of care providers and their supervisors.

Continuous Quality Improvement (CQI)

- **Aim:** Promote quality of care in everyday work by testing small improvements to address identified problems, discussing with team members how problems were addressed and further improving identified solutions.
- **Team:** Team members sit together at regular intervals and discuss problems and think through opportunities for solutions and improvements, and continually test improvements.
- **Tools:** Treatment records determine the quality of clinical care by assessment, diagnosis, treatment, response to treatment and treatment outcome; analysis of monthly reports of quality of care and performance of services; problem solving and quality improvement discussions; and case study discussions.
- **Indicators:** Monitoring tools and indicators are used and targets for improvement are set by mutual agreement.

Supportive Supervision

- **Aim:** Promote quality of care by strengthening relationships between health workers and supervisors to work together to set goals, monitor performance, identify and correct problems and proactively improve service quality. Supportive supervision also creates opportunities to encourage good practices and help health workers maintain high-quality service delivery. The following activities assess the quality of care and inform actions for improvements:
  - Identifying weaknesses in clinical care and care organisation and the causes that need correction and providing guidance for problem solving.
  - Strengthening the technical capacity of health workers through discussion and on-the-job mentoring during visits, or planning tailored refresher training.

- Motivating staff by encouraging good practices and appraising performance.

Supportive supervisors visits may be conducted every 3 months or more often to ensure that the quality and organisation of clinical care meet standards, discuss and solve identified problems, observe care provision and verify the quality of records. During supervision, gaps and discrepancies should be identified in consultation with the team and, as much as possible, with representatives of the community. Immediate feedback should be given to allow joint discussion of possible solutions to problems identified.

- **Tools:** Supportive supervision tools include registers, treatment records, stock cards, monthly reports and supervision checklists. *Health Facility Supervisory Checklists* **(Form 20)** have been developed to collect the data.

- **Indicators:** The following indicators are monitored to assess the quality of clinical IMAM care:

  - Register, records and monthly reports adequately filled
  - Status on admission recorded and tallied
  - Guidelines for assessment, diagnosis, treatment, and monitoring of condition and progress adhered to
  - Failure to respond to treatment verified
  - Absentee and defaulter traced
  - Mortality audits conducted
  - LOS and WG at end of treatment calculated
  - Person-centred care provided
  - Team-based care provided
  - Hygiene standards respected
  - Satisfaction of user and provider supported
  - Mother or carer received care, involved in care, informed, and linked with peers

Monitoring the Quality of Case Management in OPD-MAM-SAM

- **Team:** The responsible health worker, with support from the team members (physician, nurse, midwife, nutrition counsellor), monitors the quality of individual care and services, focusing on appropriate

admission, progress of treatment and treatment outcome, which reflects adherence to guidelines and adequate organisation of care.

- **Recording:** On admission and each follow-up visit, the physician or nurse records information in the register and on the treatment card to monitor individual clinical care until the end of treatment. The treatment card indicates what to assess and what to monitor during progress and at the end of treatment. A unique registration number is provided and recorded on all forms.
- **Referral tracking:** Referral slips track movement of children with SAM and MAM between the community and health facilities and/or services.
- **Adaptation to care:** On each visit, health workers adapt health and nutrition counselling to the client's health and nutritional status, progress and needs. If nutritional status stagnates or worsens, a history and clinical examination may reveal the causes, or referral to hospital may be necessary. If clients do not return to the health facility, the CHS may ask the CHW to do a defaulting and mortality audit.
- **Tools:** The following tools are used to collect monitoring data on OPD-MAM/SAM for children 6–59 months of age:
  - OPD-MAM/SAM Monthly Report
  - OPD-MAM/SAM Record
  - OPD-MAM/SAM Register
  - Prescription Card
  - Referral Slip
  - Screening Tally Sheet
- **Indicators:** Date, nutritional status and type, start and end of treatment are recorded in the register and on the treatment card. Standard monitoring categories are listed in **Table 10.3**. LOS in treatment, severity on admission, weight gain during treatment are indicated in the register and on the record.
- **Monthly reporting:** Information on admissions and end of treatment from the register is tallied to fill the monthly report. The team uses the monitoring tools to verify quality by observing care, discussing with service providers and users and checking monitoring records.

Table 10.3. Monitoring categories in OPD-MAM/SAM for children 6–59 months of age

ENTRY (start of treatment in OPD-MAM/SAM)	
Newly admitted	Child met criteria for start of treatment This category includes **relapsed cases** (child relapsed within 2 months of ending treatment of previous episode; 2 months indicates recovery of the same episode of illness).
Returned defaulter	Child defaulted and returned within 2 months to continue treatment (2 months indicate the same episode of illness)
Referred from OPD-MAM°	Child deteriorated in OPD-MAM and started treatment *(this category is not retained for OPD-MAM)*
Referred from IPD-SAM°	Child stabilised in IPD-SAM and continued treatment in OPD-SAM until recovery
Transferred-in	Child moved from another site to continue the same level of care
EXIT (end of treatment in OPD-MAM/SAM)	
Cured	Child remained in treatment until full recovery and met criteria for end of treatment
Died	Child died while in treatment
Defaulted	Child absented for two consecutive visits (exited on third absence) The reason for defaulting is investigated (died, moved, other).
Non-cured	Child has remained in treatment for 3 months and has not reached the end of treatment criteria despite full assessment and treatment
Medical referral	Child was referred to specialised care for treatment of underlying condition (e.g., child with TB and SAM was referred to TB treatment site where SAM treatment will ideally continue)
Transferred-out	Child moved to another site to continue same level of care

Monitoring the Quality of Case Management in IPD-SAM

- **Team:** The responsible health worker, with support from the team (physician, nurses, midwife, nutrition counsellor) monitors the quality of individual care and services, focusing on danger signs, assessment, progress of treatment and treatment outcome, reflecting adherence to guidelines and adequate organisation of care.

- **Recording:** The physician or nurse records individual information in the register on admission and on the treatment record (*Initial Management Card and Daily Care Card*) during treatment to monitor individual clinical care until the end of treatment. The treatment card indicates what to assess at the start of treatment, during treatment and at the end of treatment. A unique registration number is provided and recorded on all forms.

- **Danger signs and treatment progress:** Quality care includes closely monitoring danger signs and treatment progress, which are essential for the child's recovery. Any failure to diagnose and immediately treat life-threatening and other medical complications, infections or serious underlying diseases can adversely affect treatment outcome by causing development of a more serious condition, delay in response, non-response, relapse or death. Any child death needs to be audited to understand the cause and what elements of care need improvement. Referral to other specialised care may be necessary. In case of defaulting, a home visit may be requested to find out the reason.

- **Monitoring feeding of the child:** Sufficient time must be allocated to feed each child, and adequate staff should be allocated for this task, day and night. Feeding a malnourished child takes more time and patience than feeding a normal child. If it takes about 15 minutes to feed each child and food is given every 3 hours, one person is needed, day and night, to feed 12 children. When therapeutic food is given every 2 hours, more staff are needed. If there are not enough staff, treatment of a child may fail because insufficient time is taken for feeding. Having mothers or carers help feed their children can relieve this situation, but they should be supported for correct feeding and care practices. Mothers' or carers' involvement in care and preparedness for discharge are also indicated on the treatment card. Re-feeding of the child is carefully monitored and indicated on the Daily Care Card. Health and

nutrition counselling and actions are adapted to the child's health and nutritional status, progress and needs, and mothers or carers receive treatment if needed.

- **Referral tracking:** Referral slips track movement of children with SAM and MAM between the community and health facilities and/or services.
- **Tools:** The following tools collect monitoring data on IPD-SAM:
  - IPD-SAM Monthly Report
  - IPD-SAM Register
  - IPD-SAM Record: Initial Management Card and Daily Care Card
  - Referral Slip
- **Indicators:** Date, nutritional status and type, start and end of treatment are recorded in the register and on the treatment card. Standard monitoring categories are provided in **Table 10.4**. LOS in treatment for stabilisation or full recovery, weight gain at the end of treatment can be indicated in the register and on the record.
- **Monthly reporting:** Information from the register on admissions and end of treatment is tallied to fill the monthly report. The team uses the monitoring tools to verify quality by observing care, discussing with service providers and users and checking monitoring records.

Table 10.4. Monitoring categories in IPD-SAM for children 6–59 months of age

ENTRY (start of treatment in IPD-SAM)	
Newly admitted	Child met the criteria for start of treatment This category includes **relapsed cases:** children who relapsed within 2 months of ending treatment of a previous episode (the 2 months indicates recovery from the same rather than a new episode of illness).
Returned defaulter	Child defaulted and returned within 2 months to continue treatment
Referred from OPD	Child deteriorated when in treatment in OPD-SAM
Transferred-in	Child moved from another IPD-SAM/hospital to continue the same level of care
EXIT (end of treatment in IPD-SAM and/or discharge from hospital):	

Stabilised—Referred to OPD*	Child was treated successfully for stabilisation and met the referral criteria to continue treatment in OPD-SAM (child has not fully recovered and will complete treatment in OPD-SAM)
Cured	Child remained in treatment until full recovery and met criteria for end of treatment
Died	Child died while in treatment
Defaulted	Child was absent for more than 2 days while in treatment The reason for defaulting is investigated (died, moved, or other). This category may include **early discharge:** child left the hospital against medical advice.
Non-cured	Child remained in treatment for 2 months and did not reach the end of treatment criteria despite full assessment and treatment
Medical referral*	Child was referred to specialised care for treatment of an underlying condition (e.g., child with TB and SAM was referred to a TB treatment site where SAM treatment will ideally continue)
Transferred-out*	Child moved to another IPD-SAM/hospital to continue the same level of care

** Child has been discharged from hospital but did not end treatment.*

Monitoring the Quality of Case Management in OPD-MAM for PLW

- **Team:** The midwife responsible for OPD-MAM for PLW, with support from the health facility team, monitors the quality of individual care and services, focusing on treatment progress and outcome and adhering to guidelines and organisation of care.
- **Recording:** On admission and each follow-up visit, the midwife records individual information in the Register and on the *OPD-MAM for PLW Record* until the end of treatment. The record indicates which data to assess at the start of treatment, during treatment and at the end of treatment. A unique registration number is provided and recorded on all forms for the PLW.
- **Referral tracking:** Referral slips track movement of PLW between the community and health facility and/or services.
- **Adaptations to care:** On each visit, PLW receive health and nutrition counselling and interventions adapted to their health and nutritional status, progress and needs. If their nutritional status stagnates or worsens, they receive a history and clinical examination to reveal the causes or are referred to hospital if necessary. If they do not return to

MCH/OPD-MAM, the CHS may ask the CHW to do a home visit for a defaulting and mortality audit.

- **Tools:** The following tools are used to monitor OPD-MAM for PLW:
  - OPD-MAM Monthly Report
  - OPD-MAM for PLW Register
  - OPD-MAM for PLW Record
  - Prescription Card
- **Indicators:** Date, nutritional status and type, start and end of treatment are recorded in the register and on the treatment card. Standard monitoring categories are listed in **Table 10.5**. LOS, MUAC on admission or MUAC gain during treatment are not recorded in OPD-MAM for PLW but could be assessed for research or evaluation purposes.
- **Monthly reporting:** Information on admissions and end of treatment from the register is tallied in the monthly report. The team uses the monitoring tools to verify quality by observing care, discussing with service providers and users and checking monitoring records.

Table 10.5. Monitoring categories in OPD-MAM for PLW

ENTRY at start of treatment	
New admission	Pregnant woman from the time of confirmed pregnancy or lactating woman with a breastfeeding infant under 6 months of age met criteria for start of treatment
Returned defaulter	To be changed as discussed
Transfer-in	PLW moved from another OPD-MAM site to continue the same level of care
EXIT at end of treatment	
Cure	PLW remained in OPD-MAM until full recovery and met the end of treatment criteria
Death	PLW died while in OPD-MAM
Default	PLW was absent for two consecutive visits (exited on the third absented visit)
Transfer-out	PLW moved to another OPD-MAM site to continue the same level of care

Use of Information

During supervision visits, the team should use the various monitoring tools and indicators to identify problems with individual care or services, discuss quality improvement, provide on-the job mentoring or tailor refresher training. Main issues are recorded in formal or informal notes or minutes of meetings. The team decides how to monitor progress and follow-up actions to discuss in the next meeting. A copy of the monitoring visit report should be submitted to the PNO and PND at national level, where the information is analysed and feedback is provided to the implementing partner.

Information on individual care is tallied and amalgamated in monthly reports that will be used for the performance monitoring of services and inform actions for improvements. Performance investigations through point assessments or evaluations may use information from the monitoring tools for further in-depth analysis to better understand service outcomes and inform actions for improvement.

10.6. Monitoring the Quality of IMAM Services

Monitoring the quality of services for acute malnutrition are facilitated by the standardisation of care and management procedures described in these guidelines. Key attributes of quality IMAM services—a accessibility, effectiveness, cost-efficiency, equity, comprehensiveness, integration, sustainability, responsiveness to needs and expectations (people-centredness) and scale—may be routinely monitored or can be assessed in more depth in targeted investigations.

Key Elements of Quality of IMAM Services

- **Barriers to service access and uptake:** These factors may indicate lack of awareness of disease and treatment need (demand factors) but also reflect the community's unwillingness to accept or inability to pay for the services s (supply factors).
- **Geographic coverage:** The proportion of health facilities that provide IMAM services indicates geographic spread or scale.
- **Treatment coverage:** The proportion of children with acute malnutrition (the IMAM target group) in treatment indicates the

burden of disease but also of the community's willingness to use the services.

- **Trends in admission:** Monthly admissions are plotted against the seasonal calendar for the year and compared with admission in previous months and years, which may identify unusual patterns. An unusual (unseasonal) drop or increase in admissions may be due to a drop or increase in incidence or in access to services because of an event, intervention or change in behaviour.

- **Spread of MUAC on admission:** A high proportion of admissions based on very low MUAC (e.g., < 100 mm) indicates late presentation of cases or failure of community outreach to catch cases early and is therefore a proxy for poor treatment coverage.

- **Average distance that clients travel to access services**: A high average distance to travel indicates poor accessibility or poor decentralisation.

- **Periodic stockouts:** Weak supply chain management can create stockouts that cause all treatment to stop, and may affect trust and discourage mothers or carers from returning to continue treatment.

- **Major causes of defaulting and death:** Defaulting and mortality audits are done during home visits to identify the most common causes and inform strategies for quality improvement.

- **Treatment effectiveness:** Amalgamation of individual treatment outcomes (*cure, death and default rate* of services that are recorded monthly) provides information on treatment effectiveness (or performance) and can be compared to national standards. Comparison of rates from the previous month or year may identify unusual patterns that should be investigated and may indicate change in service quality or incidence.

- **Bottlenecks to service delivery:** Key bottlenecks to service delivery are identified and assessed to understand causes that influence effective coverage.

- **Effective coverage:** The proportion of the target group that recovered effectively indicates the proportion of the burden reached.

Methods

The quality of IMAM services is routinely monitored by monthly reporting of service performance. Some attributes of service quality, integration and sustainability may be assessed through specific point activities, e.g., coverage and barrier surveys, supply audits, bottleneck analysis (BNA) and capacity assessments that are briefly described, but for their implementation the reader should consult the respective guidelines.

Monthly Monitoring of Service Performance

- **Aim:** Monitor key performance indicators that are compared to national standards to interpret the level of performance of IMAM services and inform service improvements.
- **Methods:** Key performance indicators are calculated monthly per health facility based on information on children or PLW who started treatment and ended treatment in IPD-SAM, OPD-SAM and OPD-MAM using the respective registers (and treatment cards).
- **Tools:** These include registers, treatment cards, tally sheets, monthly reporting forms and an electronic database for a national IMAM repository. *IPD-SAM, OPD-SAM and OPD-MAM Monthly Reporting Forms* (**Forms 12 to 14**) are summary spread sheets for easy recording.
- **Indicators:** Routine data are tallied and amalgamated monthly in the reporting forms for OPD-MAM, OPD-SAM and IPD-SAM.

  Key indicators for a given month are:

  - Number of new admissions (incidence)
  - Number of children in treatment (beneficiaries currently registered)
  - Cure rate, or proportion of children who ended treatment cured out of all children that ended treatment (discharges)
  - Death rate, or proportion of children who ended treatment because they died out of all children that ended treatment (discharges)
  - Default rate, or proportion of children who ended treatment because they defaulted out of all children that ended treatment (discharges)

- Therapeutic and supplementary food used and in stock

Table 10.6 lists formulas to calculate key indicators for OPD-SAM and OPD-MAM, and **Table 10.7** lists formulas to calculate key indicators for IPD-SAM. Indicators use a similar denominator (see the bottom line of the equation): the total number of children that end treatment in OPD-SAM or are discharged from IPD-SAM, or children who have been cured, died, defaulted and non-cured in OPD-SAM, and the total number of children who have been stabilised, died or defaulted in IPD-SAM.

The difference between key indicators for OPD-SAM and IPD-SAM is that in IPD-SAM, children are not treated until full recovery but are instead referred to continue treatment in OPD-SAM.

National standards or benchmarks for quality of IPD-SAM, OPD-SAM and OPD-MAM services for children 6–59 months of age are provided in **Table 10.8**. If IMAM services do not comply with national standards, a narrative report should explain the reasons for the outcomes and suggest actions to address the issues.

Table 10.6. Indicators for OPD-MAM/SAM

Cure rate (%)	= Number of children *cured* that month x 100 / Total number of children who ended treatment that month
Death rate* (%)	= Number of children who *died* that month x 100 / Total number of children who ended treatment that month
Default rate (%)	= Number of children who *defaulted* that month x 100 / Total number of children who ended treatment that month
Average length of stay (days)	= Total number of days in treatment for all children who ended treatment cured / Total number of children who ended treatment cured that month
Average weight gain (g/kg/day)	= Total weight gain of children with wasting° or oedema who ended treatment cured / Total number of children with wasting or oedema who ended treatment cured that month

Table 10.7. Indicators of monthly service outcomes for IPD-SAM

*Total number of children who ended treatment in OPD is all children who have been cured, died, defaulted and non-cured to treatment; * Case fatality during treatment; ° Calculated separately for severe or moderate wasting; Calculated differently in case of oedema from the minimum weight and days since minimum weight.*

Stabilisation rate (%)	= Number of children who were stabilised that month x 100 / Total number of children who were discharged from IPD-SAM that month°
Death rate* (%)	= Number of children who *died* that month x 100 / Total number of children who were discharged from IPD-SAM that month
Default rate (%)	= Number of children who *defaulted* that month x 100 / Total number of children who were discharged from IPD-SAM that month
Average length of stay for stabilisation (days)	= Total number of days in stabilisation for all children referred to OPD-SAM that month^ / Total number of children who were referred to OPD-SAM that month
Referral to OPD-SAM rate (%)	= Number of children who were referred to OPD-SAM after stabilisation that month / Total number of children who were discharged from IPD-SAM that month

*Total number of children who were discharged from IPD-SAM is all children who have been stabilised, died, defaulted and non-cured; * Case fatality during treatment; ^ Referred to OPD-SAM assumes end of stabilisation.*

Table 10.8. National standards of quality of IMAM services for children 6–59 months of age

Indicator	IPD-SAM^	IPD-SAM°	OPD-SAM	OPD-MAM
Cure rate	/	> 75%	> 75%	> 75%
Default rate	< 15%	< 15%	< 15%	< 15%
Death rate*	< 10%	< 10%	< 10%	< 3%
Average length of stay	< 7 days	< 30 days	< 56 days	< 56 days
Average weight gain	/	> 5 g/kg/day	> 5 g/kg/day	> 5 g/kg/day

^ *Option 1*: IPD-SAM refers children to OPD-SAM after stabilisation; ° *Option 2*: IPD-SAM retains children until full recovery; * Case-fatality rate during treatment.

Other indicators may be considered but are usually not part of the monthly reporting system:

- **Average weight gain (AWG) in OPD-SAM** is calculated for all (or a sample of) children with severe wasting or bilateral pitting oedema separately:

  For children with severe wasting, first calculate weight gain of the individual child who ended treatment, and next calculate the AWG of all children who ended treatment as cured, expressed in g/kg/day:

  $$\text{Weight gain} = \frac{\text{[End of treatment weight – Admission weight (g)]/Admission weight (kg)}}{\text{Length of stay from start to end of treatment cured (days)}}$$

  $$\text{AWG} = \frac{\text{Total weight gain of severely wasted children who ended treatment cured}}{\text{Total number of wasted children who ended treatment cured}}$$

  For children with bilateral pitting oedema, first calculate weight gain of the individual child who ended treatment as cured starting from the moment when oedema resolved, and next calculate the AWG of all children who ended treatment as cured, expressed in g/kg/day:

  $$\text{Weight gain} = \frac{\text{[End of treatment weight (g) – Minimum weight (g)]/Minimum weight (kg)}}{\text{Length of stay from minimum weight to end of treatment cured (days)}}$$

AWG = Total weight gain of oedematous children who ended treatment cured
Total number of oedematous children who ended treatment cured

- **Number of children who relapsed after cure:** Relapse means deterioration within 2 months after recovery and up to the point that criteria to start treatment are reached. The period of 2 months after recovery is used to indicate that the deterioration is from the same episode of illness and not a new episode. Relapse may indicate that the health worker or child, or both, did not adhere to the treatment protocol or that the environment the child lives in is highly unfavourable to maintain good health. The underlying reasons should be investigated and resolved.

- **Timeliness of treatment:** The timeliness of referral from the community and start of treatment can be estimated by assessing the severity of the nutritional status on referral or at the start of treatment, and should be interpreted with information on service access in the catchment area. At the health facility, a *Screening Tally Sheet* (**Form 9**) may record MUAC on admission.

  Cut-offs to indicate early or later referral may be set depending on the context. Late start of treatment may indicate barriers to access services or that community-based nutrition services were inadequate. The underlying reasons should be investigated and resolved to improve coverage.

- **Case mapping:** When a child with SAM is identified and attends treatment, the village of origin can be noted on a tally sheet that lists all the villages of the catchment area of the health facility. During supportive supervision meetings (monthly or quarterly), the tally sheets are reviewed. If many cases are coming from particular villages, it may mean that malnutrition is a problem in that area or that malnutrition is the same everywhere but good case finding is happening in some villages. Villages with no cases may indicate ineffective sensitisation and screening. Findings can be correlated with referrals/attendance and timeliness of treatment to further indicate the effectiveness of case finding in those areas. A tally

sheet can be used when a case is eligible for treatment. The tally of admissions helps assess the coverage of the treatment service.

- **Referral rate** to a higher level of care–from OPD-SAM to IPD (or from OPD-MAM to OPD-SAM)–may indicate that children were being identified late or that the quality of case management was inadequate. It may be calculated as follows:

  $$\text{Referral rate} = \frac{\text{Number of cases referred to a higher level}}{\text{Total number of cases treated at a given level of care}}$$

  In a stable situation with a well-established service and good community outreach, the referral rate from OPD-SAM to IPD-SAM may be as low as 5%. At the start of services, the referral rate may be as high as 20% because more untreated cases are found in the community. Over time and with effective case finding, the referral rate should drop, and unexpected increases should be investigated.

- **Use of information:** Monthly reporting sheets summarise IMAM indicators on IPD-SAM, OPD-SAM and OPD-MAM per health facility, are shared and entered in an electronic spreadsheet at provincial level, and are amalgamated at provincial and national level. The repository is kept by the PND and may be accessed on request.

  Monthly performance of IMAM services by health facility, district or province or nationally and trends over time may inform strategies for service improvements and advocacy for resource mobilisation. Standardised reporting facilitates the compilation and interpretation of information and allows comparison and decisions for quality improvement at facility, provincial, national and global levels. Information is shared in various health reports for advocacy and resource mobilisation and inform strategy improvements.

Coverage Assessment

- **Aim:** Estimate treatment coverage; classify areas as having poor, fair or good coverage; identify factors that promote or hinder service access and uptake; and inform service improvements.

- **Methods:** Depending on the information needs and resources and/or capacities different methods can be used (the methods can also be combined), e.g.:
  - Semi-Quantitative Evaluation of Access and Coverage (SQUEAC) [53, 54]
  - Quantitative population survey with Simplified Lot Quality Assurance Sampling (LQAS) Evaluation of Access and Coverage (SLEAC) [53, 54] to classify areas according to treatment coverage level
  - Qualitative population survey using semi-structured interviews of clients and community members [55, 56] to explore determinants of treatment coverage

  Coverage can be assessed using a variety of techniques. Some methods are simple, but combined with qualitative information, as described above, can be powerful in identifying successes or problems with service coverage. For example, SLEAC combines LQAS with active adaptive case finding and allows classification of coverage rather than providing a percentage estimate. SLEAC classifies areas with coverage under 30% as poor, coverage between 30% and 60% as fair, and coverage ≥ 60% as good.

- **Indicators** may include:
  - **Availability coverage:** The proportion of malnourished children for whom the service is available, assessed by proxy indicators of (1) the number of services available by the population in the catchment area, (2) the geographic coverage of IMAM services by the number of health facilities in the catchment area and (3) the average distance to the closest IMAM services for the population in the catchment area, or (4) the (excess) burden per service site of the catchment area.
  - **Accessibility coverage:** The proportion of malnourished children who use the service and factors that boost or hinder service access and use.
  - **Acceptability (and affordability) of services**: The proportion of malnourished children whose carers are willing and can afford to use the service. Proxy indicators are contact coverage or start of

treatment, and willingness for out-of-pocket payment for transport or medicines.

- **Timely detection and referral for start of treatment:** Advancement of illness on admission is assessed by severity of MUAC reading and proportion of nutritional oedema.
- **Contact coverage:** The proportion of malnourished children who are using the service (started treatment).
- **Referral success:** The proportion of malnourished children who are screened and referred for treatment and actually use the services.
- **Responsiveness:** Whether carers receive the type of service they expected.
- **Satisfaction of clients:** Whether people are satisfied with the quality of care they receive (defaulting during treatment may be a proxy indicator, but the reason for defaulting needs to be investigated).
- **Satisfaction of health workers:** Whether health workers are satisfied with the quality of care they are able to provide.

- **Use of information:** Classification or estimate of coverage, combined with other routine monitoring data, can indicate causes of poor, fair or good coverage. A point coverage estimate as provided by SQEAC can be compared to international standards for treatment coverage as shown in **Table 10.9** [57].

  It is important to improve coverage no matter what result is obtained from any assessment methods, but the context of implementation and prior implementation support have to be considered to correctly interpret the current coverage result. Treatment coverage (i.e., proportion of children with SAM who accessed treatment) combined with cure rate indicates effectiveness coverage, or whether children in need of treatment have been successfully treated (i.e., need was met). Both treatment coverage and effectiveness coverage indicate IMAM performance and are shared in coordination meetings and performance reports, and inform improvement strategies.

Table 10.9. International standards of treatment coverage

Site	Minimum standard of coverage
Urban	> 70 %
Rural	> 50 %
Internally displaced people or refugee camp	> 90 %

Service Uptake or Barrier Assessment

- **Aim:** Identify boosters and barriers, which are factors or activities that may positively or negatively affect access to and use of IMAM services, retention in treatment and adherence to treatment.
- **Methods:** Depending on the information needs and resources and/or capacities different methods (e.g., qualitative or mixed-methods) can be used. For example, a survey may investigate factors that influence IMAM service quality; any time a CHW or CHS visits a community or has an opportunity to talk to carers of children or PLW receiving treatment, a simple questionnaire may gather perceptions of the beneficiaries on the quality of the services.
- **Tools:** Specific questionnaires will be developed to cover the information needs, and the routine monitoring information available may be used accordingly.
- **Indicators:** Depending on the information needs, they will be selected based on knowledge from document review and expert consultation.

  Typical boosters are:

  - Provision of good and reliable services
  - Good relationship between health workers at community and health facility level and clients
  - Support of community leaders in promoting the service
  - Effective sensitisation of the community to the IMAM approach
  - Effective and timely case finding
  - Strong referral networks (from community to health facilities and vice versa)
  - Active case finding by CHWs

- Systematic follow-up of absentees in the community by CHWs on request
- Active FHA groups

Typical barriers are:

- Lack of knowledge about malnutrition in the community
- Lack of systematic screening in communities and health facilities
- Lack of effective services in the area
- Opportunity costs for carers
- Lack of male relatives to accompany female carers to the sites
- Cost of treatment (treatment is free, but out-of-pocket payment may be requested in times of stockouts)
- Stockouts or RUTF and RUSF
- Geographical barriers and distance (or security)
- Climate/seasonal factors
- Agricultural duties (especially during planting and harvest seasons)

- **Use of information:** Barriers should be analysed carefully to determine how to address them. Barriers may be overcome by strengthening relationships with communities to build awareness, trust and ownership; adapting service delivery modalities; or improving competencies and attitudes of staff. This may require thoughtful and creative changes in community sensitisation and organisation of activities. Boosters may be reinforced to further improve their effects on service access and utilisation. Any changes should be made in consultation with senior MOPH technical staff at provincial and national level.

Supply Audit

- **Aim:** Identify bottlenecks in supply chain management to inform actions to optimise supply chain procedures.
- **Methods, tools and indicators:** These depend on the objective of the inquiry (which questions to answer) and use of information in line with the SCM SOP [51].
- **Use of information:** Diagnostics of supply chain management are shared in coordination meetings and performance reports to inform decision-making for resource allocation and improvement strategies.

Bottleneck Analysis

- **Aim:** Identify bottlenecks to service implementation and their causes and estimate effectiveness coverage as an indication of the quality of IMAM to inform service improvements.
- **Methods:** Data are extracted from routine monitoring and point assessments of IMAM implementation and validated in participatory discussions in which key health actors do root cause analysis of the identified bottlenecks and identify pathways for improvements.
- **Tools**: Routine monitoring and other tools amalgamate data that are presented in a matrix or dashboard of results of indicators for each health district ad province. The *BNA Questions Monthly Report* (**Form 15**) has been developed to report BNA indicators monthly.
- **Indicators:** The following indicators can be monitored in bottleneck analysis:
  - **Commodities:** Proportion of health facilities offering OPD-SAM with no stockouts of RUTF for 2 or more consecutive weeks in the past 6 months
  - **Health workforce:** Proportion of health workers (clinicians, nurses, midwives and CHSs) who have been trained in IMAM
  - **Geographical access:** Proportion of health facilities offering OPD-SAM
  - **Outreach:** Proportion of CHWs who have been trained to screen using MUAC
  - **Utilization:** Proportion of children 6–59 months of age with SAM who were admitted for treatment in the past 6 months
  - **Continuity:** Proportion of children 6–59 months of age with SAM in treatment who did not default
  - **Quality:** Proportion of children 6–59 months of age with SAM in treatment who were cured
- **Use of information:** Information on bottlenecks and their root causes and overall effectiveness coverage is shared in coordination meetings and performance reports to inform decision-making for resource allocation and improvement strategies.

Capacity Assessment

If integration and sustainability of IMAM services are set as goals, specific interventions should be put in place to achieve them, and process and outcome indicators should be monitored.

- **Aim:** Appraise the capacity of a team of health workers, a health facility or a local health system to provide quality IMAM services.
- **Methods:** Methods depend on the objective (questions to answer) and use of information. They may include monitoring individual care and services through supportive supervision, participatory action research and mixed-methods investigations. Methods to monitor and interpret integration and sustainability apply systems thinking to explore interactions and system-wide effects. This is beyond the scope of these guidelines, but good guidance exists [58, 59]
- **Tools and indicators** should be tailored to identified information needs. The supervisory checklists may be used to identify gaps in service delivery.
- **Use of information:** Capacity assessment results, linked with a gap analysis, may inform decision-making for resource allocation and improvement strategies.

10.7. Evaluating Change

Evaluating interventions to improve the quality of IMAM services is beyond the scope of these guidelines. Such evaluation may investigate the quality of services, interventions or protocol changes through review studies, impact studies, population studies, implementation research or health systems and policy research to understand how and why changes came about (or did not). Evaluations have the same purpose as monitoring systems, i.e., to generate information, expand knowledge, learn lessons and understand pathways for improving effectiveness, efficiency, scale, sustainability and integration. Evaluations may use information generated through a monitoring system but be more rigorous, but they will not provide real-time information that is valuable for immediate action for improvement.

Annexes, Appendices and Forms

Annex 1. Pathophysiology of Acute Malnutrition

This annex provides details on the pathophysiological changes in malnutrition that complements the discussion in **Chapter 1**.

Malnutrition is a process that occurs over time resulting from an imbalance in essential nutrients. Nutrients needed in large quantities to provide energy for a wide range of body functions and processes are called macronutrients. The three macronutrients are fat, protein and carbohydrates. Nutrients required in tiny amounts to produce enzymes, hormones and other substances essential for proper growth and development are called micronutrients (vitamins and minerals). As fewer nutrients are available to the body, the body undergoes adaptation. Traditionally this adaptation was referred to as Protein Energy Malnutrition, but the term is misleading, because it may suggest that providing proteins and energy would cure the condition. The lack of adequate nutrients is related not only to proteins but also to other nutrients including micronutrients essential for growth; in fact, the absence of micronutrients alone can produce signs and symptoms of malnutrition. Children recovering from malnutrition need both macronutrients **and** micronutrients in the diet in the proper proportions to allow recovery and catch up normal growth, which has been lost.

All nutrients are essential to the body. Some nutrients are required for normal systemic function but are not essential for growth, while some nutrients must be present in the right amounts for growth to occur. Nutrients can be divided into two types, those which are essential for growth and those which are not. The classification is based on the response to a deficiency of the nutrients. There are approximately 40 known essential nutrients. The nature and consequences of deficiencies of these essential nutrients is determined by the body's physiological response to their deprivation. The essential nutrients have been classified into Type 1 (functional) nutrients and Type 2 (growth) nutrients (**Table A1.1)**.

Table A1.1. Type 1 and type 2 nutrients

Type 1 nutrients	Type 2 nutrients
Ascorbic acid	Carbon skeletons of essential amino acids
Calcium	Lysine
Cobalamin	Magnesium
Copper	Nitrogen
Fluorine	Oxygen
Folate	Phosphorous
Iodine	Potassium
Iron	Protein
Manganese	Sodium
Nicotinic acid	Sulphur
Pyridoxine	Threonine
Retinol	Water
Riboflavin	Zinc
Selenium	
Thiamine	
Tocopherol	
Vitamin D	
Vitamin K	

Examples of Type 1 nutrients are iron, iodine, vitamin C and vitamin A. In response to Type 1 nutrient deficiency, children's bodies continue to grow and use up the stored nutrient, eventually leading to tissue depletion, metabolic dysfunction and consequent ill health. Examples of Type 1 nutrient deficiency are iron deficiency anaemia and scurvy. Examples of Type 2 nutrients are potassium, magnesium, zinc and amino acids. In response to a Type 2 nutrient deficiency, the body stops growing and repairing tissue to conserve nutrients, and the body breaks down its own tissue to make the nutrients available.

Even though illness resulting from Type 1 nutrient deficiency has characteristic signs and symptoms, the deficiency is not identified through

anthropometric measurements, but through biomedical markers. While Type 2 nutrient deficiency can be identified through anthropometric measurements of wasting and stunting, identifying the deficit nutrients is complex because deficiency in one Type 2 nutrient is often accompanied by deficiency in other Type 2 nutrients. Undernutrition accompanied by infection can operate in a self-reinforcing downward cycle of tissue depletion and lowered resistance to disease (**Table A1.2)**.

Table A1.2. Responses to deficiencies in type 1 and type 2 nutrients

Type 1 nutrients	Type 2 nutrients
Growth continues in early stages	Growth failure is the first response
Specific clinical signs develop	There are no specific clinical signs
The body stores nutrients	There is no body store of nutrients
Nutrients are concentrated in particular tissues	Nutrients are not concentrated in a particular tissue
Deficiency affects specific enzymes	Deficiency has a general effect on metabolism
The child is not usually anorexic	Anorexia is a common response
Tissue concentration is independent of other types of nutrients	Tissue concentration depends on all the other type 2 nutrients
Tissue concentration drops with deficiency	Tissue concentration is maintained with deficiency
Tissue concentration is maintained in different metabolic states	Tissue concentration may change depending on metabolic state
Food sources vary widely	The ratio in foods is not very variable
Deficiency is diagnosed by biochemical tests	Deficiency is diagnosed by anthropometric abnormality
Anthropometric abnormality appears late	

The process of severe wasting occurs as a **reductive adaptation** to nutrient shortage. Physiological and behavioural changes reduce energy expenditure and the need for nutrients. During this adaptation, organs and physiological systems reduce or lose their 'redundant capacity' and the wasted child is no longer able to adapt to changes in the external or internal environment. Maintaining this excess functional capacity is very costly in terms of nutrition

required. Therefore, reduced organ function saves on the amount of nutrients and energy needed to sustain it. These changes affect all systems in the body. As reductive adaptation continues, the child becomes more prone to infections and less able to respond to them. Organ functions continue to deteriorate. The liver loses its capacity to metabolise and detoxify protein, and further ingestion of protein can be fatal. The child loses appetite as a self-defence mechanism, preferably digesting body tissues for the metabolites needed for survival. Loss of appetite is a crucial point in the process of severe wasting.

Without specialised interventions (such as therapeutic milk), the process is irreversible, and death results quickly. By this point, the normal physiology is highly disturbed, with abnormal levels of fluids and electrolytes in the different body compartments. In the initial stages of treatment of severe wasting, this pathophysiology must be reversed carefully, during a stabilisation phase using low protein milk (excess protein can be fatal to the child) and low energy (excessive energy can induce re-feeding syndrome leading to death). As cellular processes recover, fluid and electrolytes move between compartments (e.g., from intercellular to intravascular spaces). If heart and kidney function have not recovered adequately, fluid overload may occur and heart failure and death result quickly. More important, during the recovery process, replacing a single deficient type 2 nutrient at the normal daily requirement does not reverse the wasting and allow rapid catch-up growth. During the rapid catch-up growth following wasting, all required nutrients must be present in higher than normal quantities. The consequences of acute malnutrition affect every organ and system, giving rise to the typical signs and symptoms in **Table A1.3**. The point at which breakdown of physiological coping mechanisms occur differs for each child. As systems become disrupted, general danger signs and other complications start to occur.

Table A1.3. Pathophysiological changes as a consequence of acute malnutrition

Organ system	Pathophysiological effects
Cardiovascular system	• Reduced cardiac output and stroke volume • Sudden increases in cardiovascular volume may result in heart failure • Reduced blood pressure that compromises tissue/organ perfusion

Organ system	Pathophysiological effects
Gastrointestinal system	• Reduced production of gastric acid, compromising the first line of immunity • Decreased intestinal motility • Reduced production of digestive enzymes • Atrophied pancreas • Atrophied intestinal mucosa/microvilli allowing invasion of pathogens through the stomach wall, leading to diarrhoea • Reduced absorption of nutrients when large amounts of food are eaten • Disturbed normal gut flora, with an overgrowth of pathogenic bacteria
Liver function	• Production of abnormal metabolites of amino acids • Compromised detoxification of by-products of protein metabolism (ammonia) • Reduced storage of glycogen • Reduced gluconeogenesis, increasing the risk of hypoglycaemia • Reduced bile secretion • Reduced heat production (normally 1/3 of body requirements) • Reduced transferrin activity, limiting capacity to absorb and reduce iron
Genitourinary system	• Reduced renal perfusion and circulation time • Reduced glomerular filtration • Reduced sodium excretion • Low urinary phosphate output • Reduced ability to concentrate urine
Immune system	• Atrophied lymph glands, tonsils and thymus • Severely reduced cell-mediated T-cell immunity • Reduced IgA levels in secretions • Low complement components • Reduced production of phagocytes and inability to kill ingested bacteria efficiently • Diminished acute phase immune response • No normal inflammation or white cell migration resulting from tissue damage • Impaired hypothalamic temperature regulation

Organ system	Pathophysiological effects
Endocrine system	• Reduced insulin production and increased glucose intolerance • Reduced Insulin Growth Factor (IGF-1) production • Reduced growth hormone production • Increased cortisol levels
Circulatory system	• Plasma volume usually normal • Reduced red cell volume
Homeostasis	• Basal metabolic rate reduced by 30% • Impaired temperature regulation, producing poikilothermy • Reduced energy expenditure through reduced activity • Reduced sodium pump activity • Increased permeability of cell membranes, leading to an increased intracellular sodium • Decreased intracellular potassium and magnesium
Skin, muscles and exocrine glands	• Atrophied skin and subcutaneous fat, leading to loose folds of skin • Unreliable normal signs of dehydration; eyes are sunken because of loss of subcutaneous fat in the orbit • Atrophied glands, including sweat, tear and salivary glands; dry mouth and reduced tears and sweat production. • Easily fatigued respiratory muscles; lack of energy
Psychology	• Irritability • Lethargy • Rumination after feeding • Developmental delays

The presence of nutritional oedema, or bilateral pitting oedema, is always a sign of SAM. Severe oedema is marked by generalised swelling including in the face and per orbital (signs of puffy eyes) is associated with high mortality. Occasionally, nutritional oedema occurs in combination with severe wasting. When both forms of SAM are present, the risk of mortality is high.

In children, other conditions such as nephritic syndrome also give rise to oedema, but nutritional oedema can usually be identified through examination and a careful history. In nutritional oedema, swelling is first

seen in the feet and lower limbs, whilst in nephritic syndrome, oedema is usually first seen in the face. The aetiology of nutritional oedema is quite different from the aetiology of nephritic oedema syndrome.

The consequences of oedematous malnutrition result in high mortality. One study suggested a genetic predisposition to nutritional oedema [60]. Oedema results from a protein-losing enteropathy, but it is not primarily the results of a low-protein diet. Low-protein diets are used to reverse both nutritional oedema and wasting. Some studies have found that the development of oedema results to some extent in preservation of lean tissue and may even protect against the development and progression of certain diseases.

Pathophysiological responses to nutrient depletion place children with malnutrition at increased risk of life-threatening complications that increase the risk of death. Therefore, successful management of acute malnutrition in children requires systematic medical treatment of underlying infections and dietary treatment or rehabilitation with specially formulated therapeutic and supplementary foods, such as F75 and F100 therapeutic milk, ready-to-use therapeutic food (RUTF) and ready-to-use supplementary food (RUSF). Therapeutic and supplementary foods have the correct balance of essential nutrients and electrolytes and a high nutrient density and bioavailability that address the body's needs. Treatment aims to restore metabolism by correcting electrolyte balance, reversing metabolic abnormalities, restoring organ functions and providing nutrients for catch-up growth.

Because of the pathophysiological changes that accompany acute malnutrition, children with SAM often do not present with the typical clinical signs of infection (e.g., fever) seen in ill children without acute malnutrition. Consequently, children with SAM need systematic medical treatment of underlying infections. Treatment protocols for children with SAM for some medical complications, such as dehydration or diarrhoea, differ from the classical treatment protocols for ill children without SAM. Adherence to SAM treatment protocols is critical because misdiagnosis of medical complications, inappropriate treatment and feeding of severely malnourished children contributes to slow convalescence and increased risk of death.

Annex 2. Treatment of Associated Medical Conditions in Children with Acute Malnutrition

This annex provides guidance on the treatment of associated medical conditions in children under 5 years of age with severe acute malnutrition (SAM) in OPD-SAM and IPD-SAM of the IMAM approach that have not been covered in the respective chapters. Guidance considers the SAM condition [61] and is in line with *IMNCI* [62] and the *WHO 2013 Hospital Care for Children Pocket Book* [16].

Listed in alphabetical order, associated conditions covered are anaemia, candidiasis, diarrhoea, disabilities, eye infection, helminthiasis, high fever, HIV, malaria, measles, meningitis, milk or lactose intolerance, nosocomial infections, otitis, pneumonia, re-feeding syndrome, skin infections and lesions, tuberculosis, urinary tract infection, and vitamin and mineral deficiencies.

ANAEMIA

Nearly all children with SAM have anaemia, which is often associated with bacteraemia, frequent bouts of malaria, hookworm infection, HIV infection and micronutrient deficiencies.

Children with SAM have non-severe anaemia if they have palmar pallor, or their haemoglobin is ≥ 4 g/dl (or ≥ 6 g/dl in the presence of respiratory distress) and < 9.3 g/dl. They should not be given iron, but wait until they start gaining weight (usually in the second week) because iron can increase infections.

Prevent:

- Give the routine antibiotic treatment for SAM
- Examine and treat for infections
- Continue breastfeeding and start feeding with therapeutic foods

Treat non-severe anaemia:

- If the child is on a ready-to-use therapeutic food (RUTF) diet that complies with WHO specifications:

Do not give folic acid or iron as the daily dose of RUTF contains sufficient to cover the daily requirements (folic acid 0.42 mg and iron 2 mg per 20 g or 100 Kcal RUTF)

- If the child is on a F75 diet that complies with WHO specifications:

  Give folic acid 5 mg orally single dose on day 1 in IPD-SAM

Severe anaemia in SAM (haemoglobin is < 4 g/dl or < 6 g/dl in the presence of respiratory distress) is a serious condition and treated in IPD-SAM (see **Chapter 5, 5.2** ETAT**).**

CANDIDIASIS

Children with SAM are severely immunocompromised, even when HIV negative, and candidiasis is common. Oral candidiasis causes creamy-white lesions in the mouth and may be painful, making feeding difficult. The diagnosis of superficial (oral, skin) candidiasis is confirmed by the presence of typical yeast forms on Gram staining of scrapings from the lesion.

- Give 100,000 units/ml of nystatin suspension 1–2 ml orally every 6 hours for 7 days
  - If nystatin suspension is not available, apply half strength gentian violet solution (0.25%)
  - If both these treatments are ineffective and if available, apply 2% miconazole gel, 5 ml every 12 hours for 7 days

Suspect oesophageal candidiasis if the child has difficulty or pain while vomiting or swallowing, is reluctant to take food, has excessive salivation or cries during feeding. Candidiasis can also involve the stomach, rectum and moist tissues (e.g. in the axillae or groin). In systemic candidiasis, the respiratory tract and blood may be involved.

- Give fluconazole 3-6 mg/kg/day orally once a day for 7 days.
- If the child has active liver disease, does not respond to or tolerate oral therapy or is at risk of disseminated candidiasis, give amphotericin B 0.5 mg/kg by IV once a day for 10–14 days.

DIARRHOEA

Acute watery diarrhoea

Small mucoïd stools are common in children with SAM but do not cause dehydration. Acute watery diarrhoea, defined by three or more loose stools per day (lasting less than 14 days), is often a leading cause of SAM and of dehydration. In children with SAM, diarrhoea and recent sunken eyes are emergency signs of dehydration that need to be treated in IPD-SAM.

Prevent:

Children who have SAM and acute watery diarrhoea but no signs of dehydration or medical complications and are clinically alert are treated in OPD-SAM, to prevent dehydration:

- Start feeding immediately.
- Give routine antibiotic treatment for SAM, and examine and treat for other infections.

Children who have SAM and acute watery diarrhoea but no signs of dehydration and treated in IPD-SAM for other complications, to prevent dehydration:

- Start feeding immediately.
- Give routine antibiotic treatment for SAM, and examine and treat for other infections.
- Give ReSoMal 5 ml/kg after each loose stool to make up for the additional losses.
- If on a therapeutic food diet that complies with WHO specifications, do not give zinc supplementation.

Therapeutic foods contain high levels of zinc: F75 contains 2.0 mg zinc/100 ml, F100 contains 2.3 mg zinc/100 ml, and RUTF contains 2.2–2.8 mg zinc/20 g equivalent to 100 ml of F100. The daily dietary food amounts will always approach or exceed the recommended zinc 20 mg daily dose. Zinc bio-availability could change in the presence of other micronutrients, but potential harm associated with high-dose zinc supplementation should be discouraged.

Treat:

Children who have SAM with acute watery diarrhoea and signs of recent sunken eyes need immediate referral and emergency treatment in IPD-SAM (see **Chapter 5, 5.2 ETAT**).

- Start treatment before referral: give first dose of antibiotic, give sugar water, if corneal clouding apply eye ointment and bandage, continue breastfeeding, give RUTF if appetite, advice to keep child warm, fill the referral slip and mark the treatment given.

Dysentery

Dysentery is diarrhoea presenting with loose, frequent stools containing blood. Most episodes of dysentery are due to **shigella**, and nearly all require antibiotic treatment. Other findings on examination may include abdominal pain, fever, convulsions, lethargy, dehydration and rectal prolapse. Treatment is with an oral antibiotic to which most local strains of shigella are sensitive. Unfortunately, the choice of antimicrobials for treatment of Shigellosis has narrowed considerably in recent years as the prevalence of antimicrobial resistance has increased. Resistance to ampicillin and cotrimoxazole (sulfamethoxazole trimethoprim), formerly the drugs of choice, is widespread.

- Give ciprofloxacin 30 mg/kg orally every 12 hours for 3 days as a first-line antibiotic.
- If there are no signs of improvement (no fever, fewer stools with less blood, improved appetite) after 2 days, give ceftriaxone 80 mg/kg IV (or IM) once a day over 30 minutes for 3 days as a second-line antibiotic where local antimicrobial sensitivity is not known.
- Give supportive care, including the prevention of dehydration with continued feeding, and/or correction of additional losses with oral rehydration solutions.
- Treat children with SAM first for shigella and then for amoebiasis.

Health facilities in areas with high incidence of bloody diarrhoea should keep several antimicrobials in stock that are known to be effective against most local strains.

Amoebiasis

Amoebiasis can cause dysentery, liver abscess and other systemic complications but is rare in children under 5 years of age. Treat children for amoebiasis if motile trophozoites of Entamoeba histolytica containing ingested erythrocytes are found in a fresh stool sample or if bloody diarrhoea continues after successive treatment with two antibiotics that are usually effective for shigella. The finding of amoebic cysts in the stools is not sufficient for a diagnosis of amoebiasis.

- Give metronidazole 7.5 mg/kg orally every 8 hours for 5 days.

Giardiasis

Intestinal infection with giardia is common and may have no adverse effect on well-nourished children. However, children with SAM should be treated for giardiasis when cysts or trophozoites are seen in the stool.

- Give metronidazole 7.5 mg/kg orally every 8 hours for 5 days.

Osmotic diarrhoea caused by carbohydrate intolerance

Carbohydrate intolerance is usually the result of intestinal damage (villous atrophy) and small bowel bacterial overgrowth, which are common in children with SAM. Osmotic diarrhoea caused by carbohydrate intolerance may be suspected if diarrhoea worsens substantially with hyperosmolar F75 and ceases when the sugar content and osmolarity are reduced.

- Use a lower-osmolarity cereal-based starter F75 in the initial phase of the treatment.
- Introduce RUTF (or F100) gradually for catch-up growth.
- Consider treatment with metronidazole 5 mg/kg orally every 8 hours for 5 days if the persistent diarrhoea does not improve.

Osmotic diarrhoea caused by lactose intolerance

Diarrhoea is rarely a result of lactose intolerance.

- Treat children for lactose intolerance only if the continuing diarrhoea is preventing general improvement; starter F75 is a low-lactose feed.
- In exceptional cases, substitute milk feeds with fermented milk such as yoghurt or with a lactose-free infant formula.

Persistent diarrhoea

Persistent diarrhoea is defined as three or more loose stools a day for at least 14 days. Weight loss is common with persistent diarrhoea. Possible causes of persistent diarrhoea in children with SAM include causes that give rise to malabsorption (osmotic diarrhoea) and enteric infections such as cryptosporidiosis, giardia, shigella or salmonella. Infants and children with decreased host immunity, for example, after an attack of measles, delayed repair of intestinal damage, or immune system depression associated with SAM, are prone to persistent diarrhoea. Younger infants who are weaned early could develop intolerance to food proteins such as cow's milk or even soya milk. Poor personal hygiene and environmental or food contamination may lead to recurrent intestinal infections before the infant recovers from a previous episode.

Management of persistent diarrhoea in children with SAM involves therapeutic feeding, which is rich in essential nutrients, in particularly zinc, restricting disaccharides, treating bacterial overgrowth and excluding enteric or other systemic infections. Children who have SAM with no signs of dehydration, clinically alert and with appetite are treated as outpatients. Persistent diarrhoea usually resolves when the child begins to gain weight.

- Give the routine antibiotic treatment for SAM.
- Examine and treat for any infections:
  - If the stool contains blood, give an antimicrobial that is effective for dysentery
  - Do not give an anti-diarrhoeal as they may not be effective in children and be dangerous
- Give standard low-osmolarity ORS to make up for additional losses to prevent dehydration
- Do not give zinc if the therapeutic foods comply with WHO specifications because the daily zinc supplementation needs are covered.
- Start feeding adjusted to the child’s weight to provide the recommended energy intake.
- Encourage continued breastfeeding as often and as long as the child wants.
- If the persistent diarrhoea continues and no cause is found, or if investigations are limited, consider treatment with ciprofloxacin 15

mg/kg every 12 hours for 3 days, or metronidazole 5 mg/kg orally every 8 hours for 5 days.

- Immediately refer children with SAM who develop danger signs or when failure to treatment is considered for emergency treatment in IPD-SAM.

Profuse watery diarrhoea or cholera

In children with SAM who have profuse watery diarrhoea or suspected or confirmed cholera, usually sodium losses are above 90 mOsm/l. ReSoMal is not adapted to provide the amount of sodium losses. Standard low-osmolarity oral rehydration solutions should be used for oral rehydration. For details on treatment of children with SAM and cholera, see *WHO 2017 SAM and Cholera Guidance* [63, 64].

- Refer urgently to hospital or specialized cholera care sites, and start treatment before referral.
- Treat dehydration with standard low-osmolarity oral rehydration solutions and zinc supplementation, and carefully monitor signs of rehydration (see **Chapter 5**, ETAT)**.**
- Give erythromycin 12.5 mg/kg orally every 6 hours for 3 days as the first-line antibiotic of choice to speed recovery as soon as vomiting stops, or give an oral antibiotic to which strains of vibrio cholera in the area are known to be sensitive.

Disabilities interfering with feeding

Identify any neurological disorder or mental, anatomical or surgical condition that could interfere with appropriate feeding, and provide special feeding support accordingly.

EYE INFECTIONS

If a child with SAM has sticky eyes and mild conjunctivitis, and no other complications:

- Wash the eyes (after washing own hands), use a clean cloth to gently wipe away the pus.
- Apply tetracycline eye ointment or chloramphenicol eye ointment every 6 hours for 5 days.

- Show the mother how to wash the eyes with water or breast milk and to put eye ointment in the eyes, and advise the mother to wash her hands before and after.
- Review for improvement 48 hours after treatment, or treat until redness is gone.

If a child with SAM has corneal clouding or more severe signs of vitamin A deficiency (i.e. xerophtalmia with xerosis, ulceration and keratomalacia), see vitamin A deficiency below.

HELMINTHIASIS

Ascaris, hookworm and trichuriasis infection

Children who play outside are commonly infected with ascaris lumbricoides (roundworm), ancylostoma duodenale (hookworm) or trichuris trichiura (whipworm). Hookworm infections can cause severe anaemia. Whipworm infections can cause dysentery, anaemia and occasionally prolapse of the rectum. In areas where hookworm and whipworm is common, presumptive treatment of these infections is routinely provided after one week in treatment in the child with SAM of 1 year or older (child is stabilised and has regained appetite). If the infestation is severe and life threatening, treat:

Age: Weight:	< 12 months < 10 kg		≥ 1 year ≥ 10 kg
Drug: Dosage:	pyrantel 10 mg/kg orally single dose	albendazole 400 mg orally single dose	mebendazole 100 mg orally two times per day for 3 days

Strongyloidiasis infection

Infection with strongyloides stercoralis is also common in children who play outside. It is diagnosed by detecting typical larvae in the faeces. In children whose immune systems are depressed by other diseases, the larva may become widely disseminated giving rise to life-threatening pulmonary, cerebral and hepatic complications. If the infestation is severe and life threatening, treat:

Age:	< 12 months	≥ 1 year	
Weight:	< 10 kg	≥ 10 kg	
Drug:	albendazole	albendazole	or ivermectin
Dosage:	200 mg orally single dose for 3 days	400 mg orally single dose for 3 days	200 µg/kg orally single dose for 2 days

Tiabendazole is effective but should be avoided because it causes severe anorexia, which is dangerous for children with SAM.

HIGH FEVER

If a child with SAM has high fever (body temperature 39.5° C) or persistent fever:

- Sponge the child's body with lukewarm water.
- **Use paracetamol only in IPD-SAM if the fever causes the child distress and be cautious of the risk of hepatic damage at normal doses:**

  Paracetamol 120 mg/5 ml syrup every 6 hours (250 mg tablet replaces 10 ml syrup):

Weight	4–< 6 kg	6–< 10 kg	10 < 12 kg	12–< 14 kg	14–19 kg
Dosage	2 ml	2.5 ml	5 ml	7.5 ml	10 ml

HUMAN IMMUNODEFICIENCY VIRUS (HIV)

HIV-positive children commonly present with MAM or SAM. The exact causes are probably multifactorial but include altered glucose and lipid metabolism, raised basal metabolic rate, especially when opportunistic infections are present, multiple micronutrient deficiencies, higher rates of diarrhoea and malabsorption, frequent co-infections and higher rates of food insecurity and poverty. As a result of their compromised immune systems, HIV-positive children suffer high mortality rates. HIV-positive children with SAM have a three times higher risk of dying than HIV-negative 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 under 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 ribonucleic acid (RNA) or deoxyribonucleic acid (DNA) in white blood cells. Note that both RDT and PCR tests for HIV may have false positive and false negative results.

- Test all HIV-exposed infants and children with SAM for HIV where HIV infection is common.

Treatment of SAM is the same for both HIV-positive or HIV-negative children. Treatment of HIV is the same for children with or without SAM: Cotrimoxazole and ART regimens are provided in the same doses, and should follow the national or WHO guidelines. However, the start of treatment of HIV in children with SAM is slightly altered:

- Start lifelong antiretroviral therapy for all HIV-positive children under 2 years of age with SAM irrespective of clinical staging
- Start lifelong antiretroviral therapy for all HIV-positive children 2 to 5 years of age with SAM irrespective of their CD4 counts

For HIV-positive children with SAM who start on ART in OPD-SAM or IPD-SAM:

- Give immediate prophylactic treatment with cotrimoxazole against pneumocystis jiroveci pneumonia and other infections and start lifelong ART as soon as possible after stabilisation of metabolic complications and sepsis, indicated by return of appetite and resolving oedema.
- Give drug treatment, vitamin and mineral supplementation, and therapeutic feeding in the same way as for HIV-negative children.
- Monitor closely metabolic complications and opportunistic infections during the first 6–8 weeks after initiation of ART for early diagnosis and treatment.
- Investigate children with persistent diarrhoea that does not resolve with standard management to exclude carbohydrate intolerance and infective causes that may require different management such as modification of fluid and feed intake or antibiotics.
- Treat swallowing difficulties because of oesophageal candidiasis, herpes simplex or aphthous ulcers

- Evaluate children with symptoms of poor weight gain, fever, current cough or contact history with a TB case for TB and other conditions.

MALARIA

Malaria in children with SAM is routinely diagnosed on admission in endemic areas regardless of their body temperature, or later if signs of malaria appear (fever and no runny nose, no measles and no other cause of fever). Malaria is diagnosed by a RDT or microscopic examination of a blood smear for malarial parasites.

Prevent:

In endemic areas, use insecticide-treated bednets in young children and pregnant women, and provide to all children with SAM [65]

Treat uncomplicated malaria:

Confirmed malaria falciparum:

- Give sulphadoxine-pyramethamine (SP) 25 mg/kg sulpha component (maximum of 3 tablets) single dose plus artesunate (AS) 4 mg/kg (maximum 200 mg) daily for 3 days.

Confirmed malaria vivax:

- Give chloroquine 25 mg/kg (maximum 1500 mg) over 3 days plus primaquine 0.25 mg/kg (maximum 15 mg) daily for 14 days or 0.75 mg/kg (maximum 45 mg) weekly for 8 weeks.

Clinically diagnosed malaria:

- Give chloroquine 25 mg/kg (maximum 1500 mg) over 3 days and refer for confirmation of diagnosis and follow-up treatment.

Treat severe malaria:

- Give artemether 3.2 mg/kg (maximum 160 mg) by intramuscular injection on day 1, then 1.6 mg/kg (maximum 80 mg) daily for 5 days.
- Once tolerating oral medication, give a complete treatment course of AS+SP orally, or continue with oral quinine 10 mg salt/kg

(maximum 600 mg) three times per day plus clindamycine 10 mg/kg twice a day or doxycycline 3.5 mg/kg daily for a total of 7 days.

- Refer children with signs of very severe febrile disease (fever and any danger sign or stiff neck) for emergency treatment in hospital, refer all pregnant women with severe malaria to hospital.

Quinine should be avoided to use in children with SAM because quinine is toxic (artesunate is more effective and safer, reducing the risk of death and permanent disability).

MEASLES

Measles is a highly contagious viral disease with serious complications (e.g. blindness in children with pre-existing vitamin A deficiency) and high mortality. Because children with severe malnutrition (and/or HIV infection) may not present with clinical measles signs (fever, generalized maculopapular rash and either cough, runny nose or red eyes), diagnosis of measles may be difficult. Always look for danger signs, fever, clouding of cornea or pus, or deep or extensive mouth ulcers.

Prevent:

- Give measles vaccine to all children with SAM who are 6 months of age and older regardless of infection with measles now or within the last 3 months. This protects other children from catching the disease, which is associated with a high rate of mortality.
- Give a second dose of measles vaccine before discharge from hospital or at the end of treatment.
- If at the end of treatment an infant is under 9 months of age, make an appointment for measles vaccination after the age of 9 months.
- Complete the child's immunization schedule following the national immunization schedule.

Treat:

All children with SAM and recent measles (**now or within the last 3 months**) need immediate referral and treatment in hospital, and treatment is started in primary care before referral. There is no specific treatment for measles, but most children with current measles may

develop secondary systemic bacterial infections such as pneumonia, otitis media, diarrhoea, conjunctivitis, corneal and retinal damage and septic shock.

- Give vitamin A treatment.
- Give sugar water.
- Treat mouth ulcers with gentian violet.
- Give routine antibiotic for SAM.
- Examine and treat any infection immediately.
- If corneal clouding, apply eye ointment and bandage.
- Ensure continued breastfeeding.
- Start therapeutic feeding in small amounts every 2–3 hours.
- Advise the mother or carer to keep the child warm.
- Apply tepid sponging for fever, **only give paracetamol if high fever that is causing the child distress**.

Oral vitamin A treatment, given on day 1, 2 and 14:

Age or weight	<6 months 3–< 6 kg	6–12 months 6–< 10 kg	> 1 year 10–29 kg
Dosage	50,000 IU	100,000 IU	200,000 IU

MENINGITIS

Suspect meningitis in children with signs of serious bacterial infection (drowsiness, lethargic, unconsciousness, stiff neck, anorexia, irritability, high pitched cry, petechial or purpuric rash, and, in young infants, apnoeic episodes, convulsions or a bulging fontanelle). Children with meningitis are treated in hospital [16].

- If meningitis is suspected and where possible, do a lumbar puncture to confirm infection, unless the child is having apnea or there is no motor response to stimuli.
- Give ceftriaxone 50 mg/kg IM or IV every 12 hours (might cause biliary sludge leading to jaundice) – If there is no known significant resistance, use chloramphenicol 25 mg/kg IM or IV every 6 hours and ampicillin 50 mg/kg IM or IV every 6 hours for 10 days.
- If there are signs of hypoxaemia, give oxygen.
- If there are convulsions/fits, give phenobarbital loading dose of 15 mg/kg.

- If convulsion persists, give further doses of phenobarbital 10 mg/kg up to a maximum of 40 mg/kg and watch for apnea.
- If needed, continue with phenobarbital at a maintenance dose of 5 mg/kg per day.

- Check for hypoglycaemia.

MILK OR LACTOSE INTOLERANCE

Clinically significant milk or lactose intolerance is unusual in children with SAM. Intolerance should be diagnosed only if children have copious watery diarrhoea promptly after milk-based feeds are begun and the diarrhoea clearly improves when milk intake is reduced or stopped and recurs when milk is given again. Other signs of milk or lactose intolerance include increased levels of reducing substances in the faeces. Milk feeds can be replaced with yoghurt[5] or a lactose-free infant formula.

Osmotic diarrhoea may be suspected if the diarrhoea worsens substantially with hyperosmolar F75 and ceases when the sugar content and osmolality are reduced. In these cases,

- Use a cereal-based starter F75, or, if necessary, a commercially available isotonic starter F75.
- Gradually introduce F100 or ready-to-use therapeutic food (RUTF) for catch-up growth.

NOSOCOMIAL INFECTIONS

Children with SAM are susceptible to infection and exposed to other children with transmissible infections. Such children, especially when treated in inpatient care, have a high incidence of nosocomial infections (hospital-acquired).

- Put into place a high level of infection control, including hand washing for health workers, mothers, carers and children and hygiene measures for bedding and environment, see the *National Infection Control Guidelines* [2].
- Carefully consider the use of antibiotics that rapidly induce antimicrobial resistance of clinical importance.

[5] In some cases, yoghurt has been used to replace milk feeds, but there is no evidence from clinical trials that this works.

OTITIS MEDIA

Otitis media occurs frequently in children, often in connection with hospital-acquired upper respiratory infection. There are no specific clinical signs except when the eardrum has ruptured, causing drainage from the ear. Diagnosis usually requires examining the ears with an otoscope, looking for loss of the tympanic light reflex or perforation of the eardrum. Typical signs of inflammation may not be present.

- Give the routine antibiotic treatment for SAM.
- Examine and treat for other infections.
- Check for tender swelling behind the ear.
- Use a cotton wick to dry any drainage from the ear at least three times per day, remove the wick when wet and replace it with a clean one, and repeat these steps until the ear is dry.
- In case of signs of mastoïditis: ear pain, pus draining from ear and tender swelling behind the ear, refer the child immediately for treatment in hospital.

PNEUMONIA

Pneumonia in children who have SAM is manifested by fast breathing. Cough, coarse crackly breath sounds, nasal flaring and abnormalities on a chest X-ray are frequently absent. The cut-off for fast breathing is 50 times per minute or more in children 2–12 months of age and 40 times per minute or more in children 12−59 months of age.

- Give the routine antibiotic treatment for severe acute; examine and treat for other infections.
- If wheezing (even if it disappeared after rapidly acting bronchodilator), give an inhaled bronchodilator for 5 days, or if not available give oral salbutamol.
- If the child is coughing for more than 3 weeks or if having recurrent wheezing, refer for assessment for TB or asthma.

Severe pneumonia in children who have SAM is manifested by fast breathing and chest in-drawing or stridor in a calm child and need immediate referral and treatment in hospital (see ETAT, **Chapter 5**).

Aspiration pneumonia may develop because of aspiration of milk feeds, especially if the children have swallowing difficulties (e.g. cerebral palsy). Health workers should be aware of this complication, and should acknowledge this risk during the therapeutic milk feeds, but aspiration of feeds can also occur at home. Aspiration pneumonia is suspected if a child's condition suddenly deteriorates, and treatment should be given immediately because it can be fatal (see ETAT, **Chapter 5**).

RE-FEEDING SYNDROME

Re-feeding syndrome consists of metabolic disturbances caused by reinstituting nutrition in patients with SAM. Children with re-feeding syndrome may develop fluid and electrolyte disorders, especially hypophosphatemia, along with neurologic, pulmonary, cardiac, neuromuscular and hematologic complications. Re-feeding syndrome usually occurs within 4 days of the initiation of feeding with a high-calorie diet. Most effects result from a sudden shift from fat to carbohydrate metabolism and a sudden increase in insulin levels after re-feeding, which leads to increased cellular uptake of phosphate. The shift in fluid and electrolytes balance increases cardiac workload and heart rate that may lead to acute heart failure. Oxygen consumption is also increased, straining the respiratory system. Other significant risks arising from re-feeding syndrome include confusion, coma, convulsions and death.

- Prevent re-feeding syndrome by gradually introducing the high-protein and high-energy F100 (after stabilisation on a low-sodium, low-protein, low-energy and high in potassium F75) following the prescribed amounts of 150 Kcal/kg/day spread over five to six feeds a day, allowing limited weight gain (around 5 g/kg/day) in the first days.
- Manage re-feeding syndrome by treating danger signs, putting the patient back on a low protein-energy diet of F75 until stable again, and continuously monitoring the condition.

SKIN INFECTIONS

Bacterial skin infections include pustules, impetigo, infected fissures (especially behind the ears) and indolent ulcers.

- Wash the affected area with soap and water and gently remove debris and crusts by soaking in warm saline or clean warm water. Dry the child carefully.
- Apply 10% polyvidone iodine ointment, or 5% chlorhexidine lotion to the affected area.
- Verify widespread superficial and deep-seated infections that could be a sign of osteomyelitis that needs to be confirmed by X-ray and treat with cloxacillin (250 mg capsule), 15 mg/kg orally every 6hours (or flucloxacillin or oxacillin) as staphylococcus aureus is a common cause of skin infection.
- Drain any abscesses surgically.

Scabies is caused by a mite that burrows superficially into the skin and causes intense itching. The scratched lesions often become secondarily infected.

- Apply 0.3% lindane lotion, once daily for 2 days to the affected areas.
- Avoid 25% benzyl benzoate lotion, which is more irritating in children with SAM, unless there is no alternative.
- Treat family members to prevent infestation or re-infestation.

Skin lesions in kwashiorkor are characterized by hypo- or hyperpigmentation, shedding of the skin in scales or sheets and ulceration of the skin of the perineum, groin and limbs, behind the ears and in the armpits. There may be widespread weeping skin lesions, which easily become infected. Spontaneous resolution occurs as nutrition improves. The zinc supplement contained in therapeutic foods that comply with WHO specifications is particularly important in these children, as they are usually severely deficient in zinc.

- Give routine antibiotics to all children with SAM with or without kwashiorkor-related dermatosis and start therapeutic feeding.
- Bathe or soak the affected areas daily for 10 minutes in 0.01% potassium permanganate solution to dry the lesions, help prevent loss of serum and inhibit infection.

A 10% polyvidone iodine ointment can also be used, but sparingly if the lesions are extensive, as there is significant systemic absorption

- Apply a barrier cream (zinc-oxide, castor oil ointment, petroleum jelly or tulle gras) to the raw areas, and apply 1% gentian violet solution to skin sores to relieve pain and prevent infection
- Omit using nappies/diapers and leave the diaper area uncovered so that the perineum can stay dry (atrophy of the skin in the perineum may lead to severe diaper dermatitis).
- If the diaper area becomes colonized with candida sp., apply a barrier cream, or 1% gentian violet solution, or miconazole gel or nystatin cream

TUBERCULOSIS

Most children with tuberculosis (TB) have pulmonary TB, and likelihood of progression from TB infection to disease is more in case of children, and the more so when children are of a younger age, have malnutrition, HIV infection or measles. It is therefore important that children be diagnosed early on.

Diagnosis of TB in children is based on clinical features, supported by a chest X-ray and examination or culture of induced sputum (i.e. mucous secretion from the lungs, bronchi and trachea that is ejected through the mouth). Obtaining suitable sputum samples from children could be difficult, and the growth in culture of mycobacterium tuberculosis takes weeks. Moreover, the tuberculin skin test and other tests for immune memory response are often negative owing to anergy (i.e. inability of an immune cell to mount a response against its target) and may not distinguish between latent and active TB.

- If TB is strongly suspected (contacts with adult TB patient, poor growth despite good intake, unremitting chronic cough longer than 2 weeks, and chest infection not responding to conventional antibiotics), perform Mantoux test and a chest X-ray if possible, or the examination or culture of sputum or tracheal secretions.

  False negatives of the Mantoux test are frequent in SAM.

- If the test is positive or there is a strong suspicion of TB, treat according to the *National TB Guidelines* [66].

  Give pyridoxine supplementation (vitamin B6) 5–10 mg daily with the isoniazid treatment. Isoniazid may cause symptomatic

pyridoxine deficiency, particularly in children with SAM and HIV-positive children on highly active antiretroviral therapy.

Recommended TB drugs are hepatotoxic and should be used with caution in any child with an enlarged or tender liver.

Tuberculosis is an important cause of failure to respond to SAM treatment due to weight loss or failure to gain weight. Moreover, a child with HIV infection is at increased risk of tuberculosis.

URINARY TRACT INFECTIONS

Urinary tract infections occur frequently in children with SAM, with a similar incidence in boys and girls. Such infections are usually asymptomatic but clinical features could include fever, haematuria, strong smelling urine, increased frequency of urination, urinary incontinence, abdominal or back pain or painful urination. Infections are diagnosed using dip-stick tests or by finding large numbers of leukocytes on microscopic examination of fresh urine (at least 10 leukocytes per microscope field with X40 magnification). However, performance of the tests could be altered because of differing leukocytes responses to infection in children with SAM.

Routine testing for urinary tract infections could be considered, however, all children with SAM and medical complications should receive the routine broad-spectrum antimicrobial treatment routinely for systemic infections in SAM that covers urinary tract infections. For children who are still febrile after 48 hours of start of routine broad-spectrum antimicrobial:

- Give a second-line antibiotic targeting Gram negative organisms

VITAMIN AND MINERAL DEFICIENCIES

Many children with SAM are deficient in riboflavin, ascorbic acid, pyridoxine, thiamine; fat-soluble vitamins D, E and K, zinc, magnesium, potassium and selenium. Knowing the levels of serum electrolytes rarely changes the management of children with SAM. These values are often misinterpreted, leading to inappropriate treatment. It is recommended to use therapeutic foods that comply with WHO specifications, as they are sufficiently fortified with these minerals and vitamins.

Vitamin A deficiency

Vitamin A is essential for normal immune function because it maintains mucosal barriers and other humoral and cellular immune responses. In response to infections, inflammatory processes may disrupt vitamin A metabolism and release vitamin A from body stores. Clinical signs of vitamin A deficiencies are night blindness, conjunctival xerosis with Bitot's spots, corneal clouding or ulceration, or keratomalacia, and indicate a high risk of blindness and death.

Children with SAM are at high risk of vitamin A deficiency. Most children with SAM live in low-resource settings and already have a marginal deficiency because of poor dietary intake of pre-formed vitamin A or carotene. While vitamin A supplementation reduces mortality in children with SAM and measles-specific respiratory infections and diarrhoea, high doses are dangerous and may have adverse effects.

Prevent:
Children with SAM **without** clinical eye signs of vitamin A deficiency and on a therapeutic food diet that complies with WHO specifications: Do not give additional vitamin A, as the children receive sufficient vitamin A to cover the daily 5,000 IU needs.

Treat:

Children with SAM **with** clinical eye signs of vitamin A deficiency or with recent measles (now or in the past 3 months) are referred immediately to IPD-SAM

- Prior to referral, give a first treatment dose of vitamin A according (to be repeated on day 2 and 14).

- If eye signs, apply 1% tetracycline eye ointment every 6 hours until all signs of inflammation or ulceration resolve, and atropine eye drops 0.1% every 8 hours to relax the eye and prevent the lens from pushing out.
- Protect the eyes with pads soaked in 0.9% saline and bandage the affected eyes (scratching it with a finger can easily rupture an ulcerated cornea).

Oral vitamin A treatment, given on day 1, 2 and 14:

Age or weight	<6 months 3–< 6 kg	6–12 months 6–< 10 kg	> 1 year 10–29 kg
Dosage	50,000 IU	100,000 IU	200,000 IU

Oral vitamin A treatment is always preferred, except in children with severe anorexia, oedematous malnutrition or septic shock who should be given IM treatment. Water-miscible formulations should be used for IM treatment. Oil-based formulations are preferred for oral treatment but water-miscible formulations may be used if the oil-based are not available.

Hypernatraemia

Some children with diarrhoea develop hypernaetremic dehydration, especially when given drinks that are hypertonic owing to their excessive content of sugar (e.g. soft drinks, commercial fruit drinks, too-concentrated infant formula) or salt. These draw water from the child's tissues and blood into the bowel, raising the concentration of sodium in extra-cellular fluid. If the solute in the drink is not fully absorbed, the water remains in the bowel, causing osmotic diarrhoea. Children with hypernaetremic dehydration (serum Na >150 mmol/l) have thirst that is out of proportion to other signs of dehydration. Their most serious problem is convulsions, which usually occur when the serum sodium concentration exceeds 165 mmol/l, especially when IV therapy is given. Seizures are much less likely when hypernatraemia is treated with an oral rehydration solution, which usually causes the serum sodium concentration to become normal slowly. It is crucial to bring down the sodium very slowly to avoid the risk of central pontine myelinolysis.

Hyponatraemia

Children with diarrhoea who drink mostly water or watery drinks that contain little salt may develop hyponatraemia (serum Na <130 mmol/l). Hyponatraemia is especially common in children with Shigellosis and in children with oedema. Severe hyponatraemia can be associated with lethargy and, less often, seizures. Oral rehydration is safe and effective therapy for nearly all cases.

Hypokalaemia

Inadequate replacement of potassium losses during diarrhoea can lead to potassium depletion and hypokalaemia (serum K+ <3 mmol/l) especially in children with SAM. This can cause muscle weakness, paralytic ileus, impaired kidney function and cardiac arrhythmia. Giving a base (bicarbonate or lactate) to treat acidosis without simultaneously providing potassium worsens hypokalaemia. To prevent hypokalaemia and correct the potassium deficit in SAM, use therapeutic food, continue breastfeeding and give food rich in potassium during diarrhoea and after it has stopped.

Annex 3. Specialised Foods and Products for the Management of Acute Malnutrition

This annex provides information on therapeutic foods and products specifications and safety, and their use in the treatment of severe acute malnutrition (SAM): Therapeutic milk F75 and F100, ready-to-use therapeutic food (RUTF), rehydration solution for malnutrition (ReSoMal) and combined mineral-vitamin mix (CMV). Ready-to-use supplementary food (RUSF) and Super Cereal for the treatment of moderate acute malnutrition (MAM) in children 6–59 months and pregnant and lactating women (PLW) respectively are also covered. It also provides guidance on alternative recipes, calculating requirements and supply chain management.

Overview of therapeutic foods

F75	*Energy*	75 Kcal/100 ml
	Use	Inpatient care stabilisation of complicated severe acute malnutrition (SAM) in children ≥ 6 months of age, or in infants < 6 months of age with nutritional oedema until resolved
	Diet	100 Kcal/kg body weight/day (Also used in inpatient care transition to top up RUTF until full RUTF diet is taken)
F100	*Energy*	100 Kcal/100 ml
	Use	Inpatient care transition and rehabilitation of SAM (in exceptional cases)
	Diet	150–220 Kcal/kg body weight/day
F100-Diluted	*Energy*	66 Kcal/100 ml (obtained by adding 35 ml water per 100 ml of F100)
	Use	Inpatient care stabilisation of complicated SAM in infants < 6 months (no oedema) to complement breastfeeding; ideally, expressed breast milk is being used instead.
	Diet	130 Kcal/kg body weight/day

RUTF	*Energy*	500 Kcal/92 g
	Use	Outpatient care of uncomplicated SAM in children ≥ 6 months of age
	Diet	200 Kcal/kg body weight/day (Also used in inpatient care transition and rehabilitation in exceptional cases; 150–200 Kcal/kg body weight/day)
Overview of supplementary foods		
RUSF	*Energy*	535 Kcal/100 g
	Use	Outpatient care for moderate acute malnutrition (MAM) in children 6–59 months
	Diet	535 Kcal/day
Super Cereal	*Energy*	About 477 Kcal/100 g when uncooked
	Use	Outpatient care for moderate malnutrition in pregnant and lactating women
	Diet	200 g or 954 Kcal/day (50 g is added for sharing)

Breastfeeding

Breastfeeding is the best therapeutic food for infants under 6 months of age. The aim is always to restore exclusive breastfeeding (or replace breastfeeding with a wet nurse). In case no breastfeeding is possible, alternative plans are considered with care. Continued breastfeeding during treatment is being promoted for all children.

Therapeutic Milks

F75 and F100 are therapeutic milk products that are available commercially as powder formulations. They can also be prepared using basic ingredients of milk, sugar, cereal flour, vegetable oil and combined mineral and vitamin mix (CMV) for SAM (see below).

F75

- F75 provides adequate balance, density and bioavailability of nutrients to restore hydration, electrolyte, immune function and metabolic imbalance. It is low on protein, osmolarity and renal solute load. It is designed for maintenance needs and the restoration of the immune function of complicated SAM. F75 provides **75 kilocalories (Kcal) per 100 millilitres (ml).**
- The amount of F75 given during stabilisation is **100 Kcal or 130 ml/kg/day**.
- F75 is provided in inpatient care for stabilisation ONLY.
- Look-up tables for amounts of F75 to prescribe are provided in **Appendix 7**.

F100

- F100 provides adequate calories and balance, density, bioavailability of nutrients to promote catch-up growth in children recovering from SAM. F100 provides **100 Kcal/100 ml.**
- The amount of F100 given during transition, in case RUTF is not available, is **135–150 Kcal or 135–150 ml/kg/day**. It is preferably replaced by RUTF. The amount of F100 given during rehabilitation, in case RUTF is not available, is **150–200 Kcal or 150–200 ml/kg/day**.
- F100 may be used in inpatient care during transition and rehabilitation when RUTF is not available. It should NEVER be given in outpatient care or for use at home.
- Look-up tables for amounts of F100 to prescribe are provided in **Appendix 8**.

F100-Diluted

- F100-Diluted provides adequate calories and nutrients with lower osmolarity and renal solute load than F75 and F100, which is better

adapted for immature organs. F100-Diluted provides **74 Kcal/100 ml** by adding 35 ml water to 100 ml F100.

- The amount of F100-Diluted given in small quantities (**100 Kcal or 130 ml/kg/day)** restores electrolyte and metabolic balance and is gradually increased to **150 Kcal or 200ml/kg/day** for catch-up growth (weight gain)**.** In case of nutritional oedema, F100-Diluted is replaced by F75.
- F100-Diluted is provided in inpatient care for infants < 6 months or infants > 6 months and < 4 kg if no bilateral pitting oedema.
- For infants, adequate breastfeeding is supported and restored (plan A); in case this is not possible, expressed breast milk, a wet nurse is sought (plan B); in case breast milk is not available or insufficient, F100-Diluted (or an infant formula) is being used under strict control (plan C).
- Look-up tables for amounts of F100-Diluted to prescribe are provided in **Appendix 9**.

Table A3.1. Therapeutic milk specifications

Constituent	F75 Amount in 100 ml	F100 Amount in 100 ml	F100-Diluted Amount in 100 ml*
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

* *Approximation*

Guidance for preparing F75 and F100 feeds [67]

- Ensure the highest hygiene standards in the preparation of therapeutic milk: Wash hands and prepare the milk with clean equipment in a clean environment.

- Open a new tin and record the date of opening and the date when to discard the contents (after four weeks of opening). If an open tin is used, verify the dates of use.
- Boil water and cool it to 70 degrees. Use a thermometer in the preparation to mitigate the risk of contamination of therapeutic milk from the hospital environment. If a thermometer is not available, it is possible to time 3-5 minutes, which is the average time for boiling water to cool down to 70 degrees.
- Use the scoop that sits in the tin to reconstitute the milk, and verify the volumes of water required per scoop, which are standard scoops (**Table A3.2**). Note that the size of the scoops differs between F75 and F100, and may differ between F75 and F100 prepared by different suppliers due to differences in specific density of the therapeutic milk.
- Discard the prepared milk that is not used. Do not refrigerate the prepared milk because of the increased risk of bacteria forming when prepared milk is stored for over 2 hours in the refrigerator and re-used (the combination of milk powder with water allows bacteria formation).
- Do not mix milk powder of different tins therapeutic milk supplies from one supplier should not be mixed with the therapeutic milk from another supplier.

Table A3.2. Preparation of F75 and F100 for different amounts

Preparation of F75 (white scoop) and F100 (blue scoop) when using less than 1 tin	
1 levelled scoop	25 ml water
2 levelled scoops	50 ml water
4 levelled scoops	100 ml water
8 levelled scoops	200 ml water
10 levelled scoops	250 ml water
20 levelled scoops	500 ml water
Preparation of the FULL tin of F75	
Entire tin F75 of 400 g	2.2 litres (2,200 ml)
24 tins of F75 or 9.6 kg	+/- 52.8 litres
Preparation of the FULL tin of F100	
Entire tin F100 of 400 g	1.850 litres (1,850 ml)
24 tins of F75 or 9.6 kg	44 litres

Packaging:

Therapeutic milk is packaged in 400 g tins that ensure the highest level of compliance with international quality standards in packaging. Scoops come with the tin and stay in the tin, and as such are only exposed to dry powdered therapeutic milk that will not attain a biofilm to harbour bacteria so that contamination is minimised. The tins, once opened, can be used for four weeks and allow easy storage. The date when the tin is opened and the date when the content must be discarded is indicated on the tin (after four weeks) (**Table A3.3**). Information on packaging F75 and F100 is provided in **Table A3.4.**

Table A3.3. Contents of F75 and F100 tins

F75	F00
400 g tins for F75 + white scoop	400 g tins for F100 + blue scoop

Table A3.4. Summary information on packaging F75 and F100

	Tins in a carton	Gross weight of a carton	Volume of a carton
F75 400 g/tin	24	13.7–14.0 kg	0.0347 m^3
F100 400 g/tin	24	11.0–13.7 kg	0.0464 m^3

Safety:

The new packaging of therapeutic milks in tins minimises the risk of contamination and incorrect reconstitution during preparation of feeds, and adheres to the WHO's 2007 guideline "Safe preparation, storage and handling of powdered infant formula" and the Codex Code of Hygienic Practice for Infant Formula.

See specifications on the use of new packaging of therapeutic milk at: https://www.unicef.org/supply/files/Odile_Caron_RUTF_Product_Specifications.pdf;

And on safe preparations of therapeutic milks at: http://nutritioncluster.net/safe-preparation-f75-f100-therapeutic-milks-video/

Alternative Recipes for Therapeutic Milks

If no commercial therapeutic milks are available, F75 and F100 can be prepared from the following recipes. **Table A3.5** lists alternative recipes for F75. **Table A3.6** lists alternative recipes for F100.

To prepare F75:

- Add the milk, sugar, pre-boiled cereal powder and oil to one litre (L) water and mix.
- Boil for 5 to 7 minutes and allow to cool.
- Add the CMV and mix again.
- Make up the volume to 2,000 millilitres (ml) with cooled boiled water.

Table A3.5. Alternative recipes for F75

Type of milk	Milk (g)	Sugar (g)	Oil (g)	Cereal powder* (g)	CMV red scoop (6.35 g)	Water (ml)
Dry skim milk	50	140	54	70	1	Add cooled boiled water up to 2,000 ml
Dry whole milk	70	140	40	70	1	
Fresh cow milk	560	130	40	70	1	
Fresh goat milk	560	130	40	80	1	

**Cereal powder is cooked for about 10 minutes before the other ingredients are added.*

To prepare F100:

- Add the milk, sugar and oil to one litre water and mix.
- Boil for 5 to 7 minutes and allow to cool.
- Add the CMV and mix again.
- Make up the volume to 2,000 ml with cooled boiled water.

Table A3.6. Alternative recipes for F100

Type of milk	Milk (g)	Sugar (g)	Oil (g)	CMV red scoop (6.35 g)	Water (ml)
Dry skim milk	160	100	120	1	Add cooled
Dry whole milk	220	100	60	1	boiled water
Fresh cow milk	1,800	100	50	1	up to
Fresh goat milk	1,800	100	60	1	2,000 ml

Modifying animal milk for feeding infants under 6 months of age:

In case breastfeeding is not available or insufficient and F100-Diluted is not available, a commercial infant formula or local prepared infant formula may be used under strict control.

Modifying animal milk for feeding infants under 6 months of age raises difficult technical challenges. First, the currently recommended recipe would need an increased essential fatty acid content. This involves adding daily small amounts of seven vegetable oils in quantities that would need to be adjusted to their essential fatty acid composition and to the child's weight. The feasibility of this approach has never been tested in the field. Second, the present recommendation of adding a mineral and vitamin mix to the recipe may not be feasible. Giving a mineral and vitamin supplement once a day to the child as a drug or mixed with a feed might be possible, although the safety of this approach would be a concern if the supplement contains iron.

In view of both the technical difficulties of formulating and preparing a nutritionally adequate recipe for modified animal milk and the lack of data on the safety of this milk for replacement feeding of infants under 6 months of age, home-modified animal milk should not be recommended as a feasible and safe long-term replacement feeding option. Only in situations where access to commercial infant formula has been interrupted should modified animal milk be considered for short-term feeding of non-breastfed infants under 6 months of age [68] (**Table A3.7).**

Table A3.7. Recipes for infant formula prepared with fresh cow milk for feeding of infants < 6 months of age

Quantity of fresh cow milk (ml)	Added water (ml)	Added sugar (g)	Amount of prepared formula (ml)
40	20	4	60
60	30	6	90
100	50	10	150

Ready-to-Use Therapeutic Food (RUTF)

RUTFs are soft foods or pastes specifically developed with the right mix of Type 1 and Type 2 nutrients and caloric composition to treat a child over 6 months with SAM. It is easy for children to eat, and it requires no preparation and no mixing with water or other foods. It has a similar nutrient and caloric composition to F100 but has very low water activity, which means bacteria cannot grow in it. This allows it to be given as a take-home ration in outpatient care. It can also be provided in inpatient care during the transition and rehabilitation for children older than 6 months of age.

There are currently two commercial types of RUTF: A lipid-based paste or a dry bar. Several countries are producing their own RUTF using recipes with the same WHO specifications but adapted to locally available ingredients. Their products have similar nutritional quality as F100 and have been shown to be physiologically similar to commercial forms of F100 and RUTF. Lipid-based RUTF can come in 500 Kcal sachets weighing 92 g. RUTF can be produced locally with dried skim milk, sugar, oil, CMV and peanut paste.

The peanut-based RUTF is composed of vegetable fat, peanut butter, skimmed milk powder, lactoserum, maltodextrin, sugar, and mineral and vitamin complex (**Table A3.8**). Technical specifications on RUTF are accessible on: https://www.unicef.org/supply/files/Odile_Caron_RUTF_Product_Specifications.pdf.

Table A3.8. RUTF specifications and minimum values per 100 g

Nutrient	Amount	Nutrient	Amount
Moisture content	2.5% maximum	Retinol (vitamin A)	0.8 to 1.1 mg
Energy	520-550 Kcal	Thiamine (vitamin B1)	0.5 mg
Proteins*	13.6 g 10 to 12% total energy	Riboflavin (vitamin B2)	1.6 mg
Lipids	35.7 g 45 to 60% total energy	Niacin (vitamin B3)	5 mg
Sodium	290 mg (maximum)	Pantothenic acid (vitamin B5)	3 mg
Potassium	1100 to 1400 mg	Pyridoxine (vitamin B6)	0.6 mg
Calcium	300 to 600 mg	Biotin (vitamin B7)	60 µg
Iodine	70 to 140 µg	Folic acid (vitamin B9)	200 µg
Magnesium	80 to 140 mg	Cobalamine (vitamin B12)	1.6 µg
Iron	10 to 14 mg	Ascorbate (vitamin C)	50 mg
Zinc	11 to 14 mg	Cholecalciferiol (vitamin D)	15 to 20 µg
Copper	1.4 to 1.8 mg	Tocopherol acetate (vitamin E)	20 mg
Selenium	20 to 40 µg	Phytomenadione (vitamin K)	15 to 30 µg
Phosphorus	300 to 600 mg	n-6 fatty acids	3% to 10% of total energy
Sodium	< 290 mg	n-3 fatty acids	0.3 to 2.5% of total energy

*At least half of the proteins should come from milk products.

Instructions for use:

Clean drinking water must be made available to children while they consume ready-to-eat therapeutic spread. The product should be given only to children who can swallow soft food safely and express their thirst. Look-up tables for amounts of RUTF to prescribe are provided in **Appendix 6.**

Recommendations for use:

It is recommended to use the product in the rehabilitation phase in the dietetic management of SAM. In the stabilisation phase, a milk-based diet is used (F75). However, RUTF is contraindicated for children who are allergic to cow milk, proteins or peanut and for people with asthma due to risk of allergic response.

Storage and packaging:

Commercially produced RUTF has a shelf life of 24 months from manufacturing date and should be stored in a cool and dry place. It often comes in a 92 g sachet that contains 500 Kcal. A carton (around 15.1 kg) contains 150 sachets.

Local production of RUTF:

The required ingredients for producing RUTF are sugar, dried skim milk, oil and a vitamin and mineral supplement. Up to 25% of the weight of the product can come from vegetable sources such as oil seeds, groundnuts or cereals such as oats. In addition to good nutritional quality (protein, energy and micronutrients), RUTF should have the following attributes:

- Taste and texture suitable for young children
- No need for additional processing such as cooking before consumption
- Resistant to contamination by microorganisms and a long shelf life without sophisticated packaging
- Ingredients that are low cost and readily available in developing countries

Safety:

The food must be kept free from objectionable matter. It must not contain any substance originating from microorganisms or any other poisonous or deleterious substances like anti-nutritional factors, heavy metals or pesticides in amounts that might represent a hazard to health of severely malnourished patients.

The product should comply with the International Code of Hygienic Practice for Foods for Infants and Children of the *Codex Alimentarius* Standard

CAC/RCP 21-1979. All added mineral and vitamins should be on the *Advisory List of Mineral Salts and Vitamin Compounds for Use in Foods for Infants and Children of the Codex Alimentarius Standard CAC/GL 10-1979.* The added minerals should be water-soluble and should not form insoluble components when mixed together. More information on how to produce RUTF is available at: http://www.who.int/child-adolescent health/New_Publications/NUTRITION/CBSM/tbp_4.pdf.

Rehydration Solution for Malnutrition (ReSoMal)

Rehydration Solution for Malnutrition (ReSoMal) is a powder for the preparation of an oral rehydration solution used for the oral or nasogastric rehydration of people suffering from SAM. It is exclusively provided under medical supervision in inpatient care and is never given for free use to the mother or carer. The standard WHO ORS solution for general use has a high sodium and low potassium content, which is not suitable for children with SAM unless they have cholera or profuse watery diarrhoea. **Table A3.10** provides the specifications of ReSoMal, and **Table A3.11** compares the specifications of the various oral rehydration solutions.

Table A3.10. ReSoMal specifications

Per 1 litre constituent	Amount
Sodium	45 mmol
Chloride	70 mmol
Potassium	40 mmol
Citrate	7 mmol
Glucose	55 mmol
Saccharose	73 mmol
Magnesium	3 mmol
Zinc	300 µmol
Copper	4 µmol
Osmolarity	294 mmol/litre

Table A3.11. Standard and low osmolarity ORS, and ReSoMal specifications compared

	Standard Osmolarity ORS	Low-Osmolarity ORS	ReSoMal
Per 1 litre constituent	**Amount**	**Amount**	**Amount**
Sodium	90 mmol	75 mmol	45 mmol
Chloride	80 mmol	65 mmol	70 mmol
Potassium	20 mmol	20 mmol	40 mmol
Citrate	10 mmol	10 mmol	7 mmol
Glucose/Saccharose	111 mmol	75 mmol	125 mmol
Osmolarity	251 mmol/L	245 mmol/L	294 mmol/L

ReSoMal recipes:

ReSoMal can be bought commercially or prepared from WHO standard or low osmolarity oral rehydration solution (ORS). In the latter case, a commercial available combined mineral and vitamin mix (CMV) is needed (see below):

- To prepare ReSoMal from commercial sachets, add one sachet ReSoMal of 84 g to 2 litres water and mix.
- To prepare ReSoMal from the standard or low osmolarity WHO ORS (**Table A3.12**), add to one litre sachet of ORS 1 red scoop or 6.35 g commercial CMV (**Table A3.13**) 50 g or 40 g sugar and cooled boiled water up to 2 litre solution. If no CMV is available, add 40 ml electrolyte-mineral solution (**Table A3.14**).

Table A3.12. ReSoMal recipes from standard and low osmolarity ORS

Ingredient	Amount	Ingredient	Amount
Standard WHO ORS	1 litre sachet	Low Osmolarity WHO ORS	1 litre sachet
CMV	1 red scoop (6.35 g)	CMV	1 red scoop (6.35 g)
Sugar	50 g	Sugar	40 g
Water	Up to 2 litres	Water	Up to 2 litres

Combined Mineral and Vitamin Mix (CMV)

CMV or vitamin and mineral mix complies with the recommendations for vitamin and mineral enrichment in the dietetic treatment of SAM. It is used to prepare F100, F75 and ReSoMal (and RUTF/RUSF). It comes in a tin with a red measuring scoop that holds 6.35 g of mix, enough to prepare 2 litre of F75, F100 or ReSoMal. CMV has a shelf life of 24 months from manufacturing date. **Table A3.13** provides the nutritional value of CMV. In case no commercial CMV is available, an electrolyte-mineral solution could be prepared based on the ingredients specified in **Table A3.11,** which could be further enriched with a commercial vitamin mix.

Table A3.13. Nutritional value of commercial CMV (per 6.35 g or 1 levelled scoop)

Vitamin mineral mix composition	
Biotin: 0.2 mg	Vitamin D: 60 µg
Folic acid: 700 µg	Vitamin E: 44 mg
Niacin: 20 mg	Vitamin K: 80 µg
Pantothenic acid: 6 mg	Copper: 5.7 mg
Vitamin A: 3,000 µg	Iodine: 154 µg
Vitamin B1: 1.4 mg	Iron: 0 mg
Vitamin B12: 2 µg	Magnesium: 146 mg
Vitamin B2: 4 mg	Potassium: 2,340 mg
Vitamin B6: 1.4 mg	Selenium: 94 µg
Vitamin C: 200 mg	Zinc: 40 mg

Table A3.14. Electrolyte-mineral solution (for 2,500 ml)

Vitamin Mineral Mix Composition		
Ingredients	**Quantity (g)**	**Molar content of 20 ml**
Potassium chloride	224	24 mmol
Tripotassium citrate	81	2 mmol
Magnesium chloride	76	3 mmol
Zinc acetate	8.2	300 µmol
Copper sulphate	1.4	24 µmol
Water	Make up to 2,500 ml	

Ready-to-Use Supplementary Food (RUSF)

RUSF is a food supplement for the treatment of moderate acute malnutrition in children 6 months and older. It is eaten as a supplement to breastfeeding and home foods during two to three months. RUSF is eaten directly from the package with no necessary dilution, mixing or cooking. One package contains one daily dose of 100 g or about 535 Kcal. RUSF is generally made with heat-treated oil seeds/pulses/cereals, sugar, milk powder, vegetable oils, vitamins and minerals.

Lipid-based RUSF is similar in content and specifications (**Table A3.15)** to RUTF with the main differences that it contains less milk protein (10% in RUSF and 20% in RUTF); it is a supplement and not a replacement food; it is provided in smaller amounts, one sachet per day; sachets contain 100 g of RUSF. Instructions for use are similar. Technical specifications on RUSF are accessible on:
http://documents.wfp.org/stellent/groups/public/documents/manual_guide_proced/wfp281200.pdf

Table A3.15. RUSF specifications and minimum values per 100 g

Nutrient	Amount	Nutrient	Amount
Energy	510 Kcal	Retinol (vitamin A)	550 µg
Dry skimmed milk protein	3.6 g	Thiamine (vitamin B1)	1 mg
Lipids	26 g	Riboflavin (vitamin B2)	2.1 mg
Sodium	-	Niacin (vitamin B3)	13 mg
Potassium	900 mg	Pantothenic acid (vitamin B5)	4.0 mg
Calcium	535 mg	Pyridoxine (vitamin B6)	1.8 mg
Iodine	100 µg	Biotin (vitamin B7)	60 µg
Magnesium	150 mg	Folic acid (vitamin B9)	330 µg DFE
Iron	10 mg	Cobalamine (vitamin B12)	2.7 µg
Zinc	11 mg	Ascorbate (vitamin C)	60 mg
Copper	1.4 mg	Cholecalciferiol (vitamin D)	15 µg
Selenium	10 µg	Tocopherol acetate (vitamin E)	16 mg aTE
Phosphorus	550 mg	Phytomenadione (vitamin K)	27µg
Manganese	1.2 mg	n-6 fatty acids	2.6 g
		n-3 fatty acids	0.3 g

Super Cereal for Pregnant and Lactating Women

Super Cereal is a wheat soya blend with sugar used as a food supplement in the treatment of moderate malnutrition of pregnant and lactating women. The product is prepared from heat-treated wheat and soya beans, vitamins and minerals. It is consumed as a porridge or gruel, and it should be prepared by mixing an appropriate proportion of flour and clean water (i.e. 40 g of Super Cereal with 250 g of water) followed by a boiling time at simmering point from five to ten minutes. More specifications are found on: http://documents.wfp.org/stellent/groups/public/documents/manual_guide_proced/wfp251123.pdf

Supply Chain Management

The *Nutrition Supply Chain Management (SCM) Standard Operating Procedures [69]* provides guidance on ordering and dispatching nutrition supplies and includes standard forms for quarterly nutrition requests, stock card and good issues and end of use field monitoring facility indicators.

An uninterrupted supply of supplementary and therapeutic products is essential for the service to function effectively. Due to the decentralised nature of OPD-SAM and IPD-SAM and the fact that the products (RUTF and SuperCereal) are heavy, bulky, and high value products, supply chain is particularly challenging. A number of measures are required to support effective supply chain:

- Forecasting of needs
- Definition of minimum stock levels at facility and district levels –it is vital that each facility and district is supported to define their minimum stock levels to ensure orders are made in a timely fashion.
- Stock control–stocks must be closely and accurately monitored as influx of admissions can quickly deplete stores
- Appropriate storage conditions
- On the basis of forecasting and minimum stock level, the health facility will send the demand form and letter to the Provincial Nutrition Officer (PNO) who forwards it to the Public Health Directorate (PND). Supplies are dispatched from the central UNICEF or WFP warehouses to the Province where partners distribute them further.

Calculating supply requirements:

The *Quarterly Nutrition Request Form* is used to order and forecast supplies. For requirements to be estimated, the expected number of admissions needs to be estimated. Where the services are already in place, the previous admission reports and supply orders may be used with adjustments for:

- Per cent reporting, i.e. if only 75 per cent of facilities with IMAM services submit reports giving a total admissions of 362 children, a very rough estimate for 100 per cent of facilities would be (362/75) x 100
- Adding an estimated number of cases for any predictable surges in coverage and therefore admissions due to mobilization events or further decentralization of services.
- Any predicted increases in prevalence compared to the previous year (e.g. where early warning indicators predict higher than usual seasonal increases)

Calculation of targets for newly initiated IMAM services:

SAM (MAM) target = Population 6–59 months in geographical area x [Prevalence of SAM (MAM) +
(Prevalence of SAM (MAM) x 1.6)] x treatment coverage (%)

- Population 6–59 months of age in the geographical target area = total population in the geographical target area (n) x estimated proportion of children 6–59 months in the population (%).
- Prevalence SAM (MAM) = prevalence of SAM (MAM) from the latest survey in the area.
- 1.6 is an (estimated) conversion factor for calculating incidence of SAM (MAM) from prevalence allowing an estimation of numbers over a full year period.
- Treatment coverage = an estimate of the projected treatment coverage that will be attained in the first year.

For health facilities newly implementing IMAM, a very rough estimation of target admissions for a year period for the purposes of planning can be obtained by using the equation above. When the service is new, it is important to adjust supply forecasts after the first few months of implementation to reflect the caseload being experienced. Another way of obtaining a rough estimate would be to use the admissions figures from a neighbouring health facility already implementing IMAM and with similar population size. Once a service is functioning well, numbers can be calculated based on previous admissions.

A monthly supply stock report and balance matrix for OPD-MAM/SAM and IPD-SAM is part of the *OPD-MAM/SAM and IPD-SAM Monthly Report* (**Forms 12–14)** and is reproduced in **Table A3. 16.** The *Quarterly Nutrition Request* **(Form 20)** is an excel calculation sheet that automatically calculate supply needs by filling in some key parameters **(Table A3. 17).**

Table A3. 16. Monthly IPD-SAM report with supply stock report and balance matrix

Supply stock report and balance						
Items	Opening balance	Quantity received	Quantity Used	Closing Balance	Expected # of patients	Quantity needed
F75						
F100						
RUTF						
ReSoMal						
CMV						
Forms						

Table A3.17. Quarterly nutrition supply request form (Excel calculation sheet)

OPD-MAM/SAM ready-to-use food supplies:

Each child in OPD-SAM consumes approximately 20 sachets of RUTF per week, which corresponds to 15 kg per 6–8-week treatment. Note that the total requirement of RUTF depends on the treatment's duration and the child's weight at the beginning of treatment. The total amount required for a site may be corrected for defaulting.

Each child in OPD-MAM consumes 7 sachets of RUSF per week, which corresponds to about 5 kg per 6–8-week treatment. Note that the total requirement of RUSF depends on the treatment's duration. The total amount required for a site may be corrected for defaulting.

IPD-SAM therapeutic food supplies:

Assuming an average duration of treatment of 10 days, 2 kg (of F75 per child can be used for planning. Usually less than 5% of children admitted for complicated SAM will not be able to eat RUTF during rehabilitation and will require F100. For these children, a planning figure of 9 kg of F100 per child for the whole rehabilitation phase can be used. This is equivalent to 6 kg per month of dry F75 for each paediatric bed dedicated for the management of complicated forms of severe acute malnutrition. RUTF is needed for a few days for every child in the transition phase, and for all children in inpatient care (any phase) with appetite.

OPD-MAM for PLW supplementary food supplies:

Every PLW receives on a monthly basis 7.5 kg of *Super Cereal, and may receive this amount for a maximum of 12 months.*

Storage of nutrition products:

Nutrition products also have limited shelf life. Their shelf life is determined mostly by the stability of the vitamins and minerals contained in the finished product. Shelf life of RUTF and therapeutic milk is 24 months and it is indicated on the label as Best Before Date.

Best Before Date indicates the time until which the manufacturer guarantees the product's compliance with product specifications. Use of products after Best Before Date is not recommended. It is not possible to extend product shelf life based on analytical testing of product samples.

Inappropriate storage conditions can influence the shelf life. High humidity and high temperatures accelerate the degradation processes of vitamins. Therefore, it is important to comply with instructions provided by the manufacturers when storing nutritional products. The following should be considered:

- Store products in clean, dry and cool warehouses away from direct sunlight.
- Regularly check and record temperature and humidity in the warehouse.
- Store products in a way that ensures the circulation of air is not prevented and assures regular stock turnover.

Annex 4. Organisational Capacity for the Management of Acute Malnutrition Services

Like other health interventions, the integrated management of acute malnutrition (IMAM) approach is composed of a network of structures for decision-making and financing, supervision and support, information flow, discussion forums, services, workforce and so forth. Capacity strengthening interventions for IMAM are based on identified needs, and information obtained through supportive supervision or reviews, may be used in the gap analysis. **Figure A4.1** shows the four-tier hierarchy of capacity building, moving upward from complex socio-cultural elements to simple technical elements: 1) structures, systems and roles, 2) staff and facilities, 3) skills and 4) tools [70].

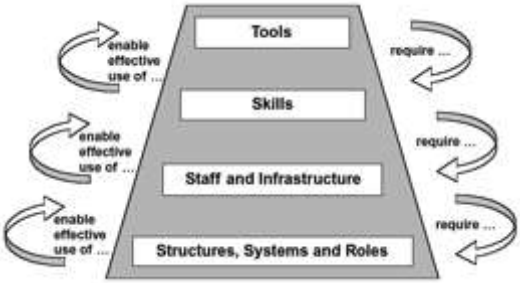


Figure A4.1. Capacity pyramid

Capacity interventions to improve the organisational management of IMAM should consider all the elements of capacity strengthening–based on a diagnostic of shortcomings and not only focus on workforce training–as the capacity pyramid moving downward indicates [70]:

- **Performance capacity:** Health workers have adequate diagnostic instruments, drugs, therapeutic supplies and job aids.
- **Personal capacity:** Health workers are sufficiently knowledgeable, skilled and confident to perform their tasks. They have been trained; are experienced and motivated; have access to new knowledge; and have technical, managerial, interpersonal, gender-sensitive and specific

role-related skills.

- **Health facility capacity:** Health facilities are of a size to cope with the patient workload, with the right staff in sufficient numbers. Staff residences are adequate, and there are enough offices, consultation rooms or wards and warehouses to support the caseload.
- **Workload capacity**: There are enough staff with skills broad enough to cope with the workload; job descriptions are practicable and skill mix is appropriate.
- **Supervisory capacity:** A recording, monitoring and reporting system with clear lines of accountability is in place. Supervisors have the physical means to monitor staff under them, can travel to supervise staff and have effective incentives and sanctions.
- **Support service capacity:** There are sufficient laboratories, training institutions, supply systems, building services, administrative staff, laundries and quality control services.
- **Role capacity:** Individuals, teams and structures have the authority and responsibility to make decisions essential to improve performance and share or shift tasks, or work in teams.
- **Systems capacity:** Flow of information, money and managerial decisions is timely and effective; purchases can be made without lengthy delays for authorization; a proper filing and information system is in use; private sector services can be contracted as required; there is good communication with the community; sufficient links exist with NGOs.
- **Structural capacity:** Decision-making forums exist for inter-sectoral discussion and corporate decision-making, records are kept and individuals can be called to account for non-performance.

Strengthening capacities for providing quality IMAM services at scale aims to improve health outcomes and ensures that services are sustainable and integrated into the health system. It is common to plan and monitor the quality of individual care for consistency with current professional

knowledge and technical quality [48] [49], and to plan and monitor the quality of services for e*ffectiveness,* e*fficiency*, *accessibility*, *people-centredness*, e*quity, coverage (and scale)* and *safe*ty [50].

It is less common to strengthen the integration and sustainability of services, for which organisational management of IMAM should plan and monitor along with quality.

- ***Integration*** is the capacity to provide comprehensive healthcare with continuity across the different levels and sites of care according to needs throughout the life course [71]. To achieve this, the different dimensions of integration should be considered [72]:

  At the micro (healthcare) level:

  - **Clinical integration:** Comprehensive care is provided to the client by coordinating actions of various professionals and providers in a single and coherent process**.**

  At the meso (organisational) level:

  - **Professional integration:** Both within and between services or organisations, professionals have a collective responsibility to provide continuous comprehensive and coordinated continuum of care.
  - **Organisational integration:** Organisations are formally brought together by mergers or collectives, or virtually through provider networks, or via contracts to work together to reach a common goal.

  At the macro (policy) level:

  - **Systemic integration:** Policies, rules and regulations are coherent and comprehensive.

  Across levels:

  - **Functional (or administrative) integration:** Non-clinical support and back-office functions and financial systems are aligned across units and levels.
  - **Normative integration:** Values, culture and vision are shared across organisations, professional groups and individuals, by, for example, developing common integration goals, identifying

communication gaps, building clinical relationships and trust through local events or involving service users and the wider community.

- **Horizontal and vertical integration:** System functions are integrated across various levels horizontally, linking different sectors at the same level of the health system, and vertically, linking different levels of the health system.

- ***Sustainability*** is the capacity of a health system to continue its normal activities well into the future [73] at a level that will provide ongoing prevention and treatment for health problems after termination of major financial, managerial and technical assistance from an external donor [74] [75]:

  - **Financial sustainability** is the capacity to maintain an adequate level of funding to continue activities (e.g., replace donor funds).

  - **Institutional sustainability** is the capacity to assemble and manage necessary nonfinancial resources to successfully carry on normal activities (e.g., capacity of government, communities and civil societies to support the health system with different aims but shared goals).

- ***Resilience capacity*** is the ability of individuals, communities and systems to resist, absorb and recover from the effects of a shock (a widespread infrequent event that can be positive or negative) in a timely and efficient manner [76]. Support interventions should consider system-effects and be designed to respond to context-specific shocks, and their processes and outcomes should be monitored.

Both interventions that support the health system (for IMAM-specific improvements) and interventions that strengthen the health system (for system-wide improvements) are needed to improve resilient capacities and reduce dependency.

Annex 5. Management of Severe Acute Malnutrition in other Age Groups

This annex provides guidance on the management of severe acute malnutrition (SAM) in school-age children, adolescents and adults in the treatment of individual cases (which is not part of the Integrated Management of Acute Malnutrition (IMAM) approach) [77-79].

Principles of Care

SAM in school-age children (5-9 years), adolescents (10-18 years) and adults (over 18 years) occurs as a consequence to illness or infection that impairs nutrient intake or the metabolism and an inadequate diet or both. It is a **primary disorder** in conditions of food insecurity, or in situations of dependency and deprivation, for example, in the elderly, mentally ill and prisoners.

Because malnutrition in older age groups is commonly associated with other illnesses, such as chronic infections, intestinal malabsorption, alcohol and drug dependence, liver disease, endocrine and autoimmune diseases, cancer, HIV and TB, a thorough investigation is essential to identify the cause of malnutrition and treat the primary disorder, which may resolve the related malnutrition. In case of active tuberculosis and HIV, both the malnutrition and the underlying illness must be treated.

SAM in school-age children, adolescents and adults gives the same physiological changes and has similar treatment protocols–with age-adapted anthropometric indicators, amount of food requirements and drug dosages–as for severe acute malnutrition in children 6-59 months of age.

In case of moderate malnutrition, counselling and support for improved quality and dietary diversity and hygiene practices may be given. In case of moderate malnutrition with active tuberculosis or HIV in this age group, a food supplement may be considered. Especially, if there is loss of weight during tuberculosis treatment or failure to gain weight after 2 months of treatment, affected persons should be provided with a nutrient-rich or fortified food supplement.

One most difficult problem in treating adolescents and adults–except in famine conditions–is that nutritional oedema, SAM (also known as thinness in this age group) is rarely associated with the diet and that altering the diet may help. Adolescents and adults are often reluctant to take therapeutic foods unless they can be persuaded that such feeds are a form of medicine. They may often be reluctant to eat anything except traditional foods; also, some foods may be restricted by cultural and religious beliefs.

Identification of Severe Acute Malnutrition

Different indicators can be used to define severe acute malnutrition in school-age children, adolescents and adults based on the presence of oedema and assessment of mid-upper arm circumference (MUAC), weight-for-height z-score (WHZ) and body mass index (BMI).

Nutritional oedema

The presence of nutritional oedema is identified in the same way as for children under 5 by examining the ankles and lower legs for bilateral pitting oedema, including the severity of grade (+), (++) and (+++).

MUAC

MUAC is measured in the same way as for children under 5, but MUAC cut-offs indicating severity differs by age [80, 81].

> MUAC < 130 mm in school-age children, < 160 mm in adolescents and < 185 mm in adults indicates severe malnutrition

WHZ-for-age

School-age children and adolescents are still growing and developing. Therefore, age and sex have to be considered when using WHZ to determine their nutritional status. WHZ-for-age describes how far and in what direction a person's anthropometric measurement deviates from the median standard reference value for people of the same age and sex of the WHO 2007 Growth Reference [82].

> WHZ-for-age < –3 in school-age children and adolescents (5–18 years of age) indicates severe malnutrition

Body mass index (BMI)

BMI measures thinness and is considered a good index of body fat and protein stores. Body stores are of interest because they reflect the stores needed to cope with physiological stress due to reduced intake and increased demands due to increased activity, pregnancy and diseases.

BMI is calculated by dividing weight in kg by height in metres squared: *BMI = weight/(height)* ^{2}
Example: A man who weighs 55.5 kg with a height of 162.5 cm would have a BMI of (55.5/(1.625x1.625)) = 20.9.

When an adult is too ill to stand or has a spinal deformity, the half-arm span should be measured to estimate the height. This is the distance from the middle of the sternal notch to the tip of the middle finger with the arm held out horizontally to the side. Both sides should be measured. If there is a discrepancy, the measurements should be repeated and the longest one taken.

Height (in m) can then be calculated as follows: *Height = [0.73 x (2 x half arm span)] + 0.43*
The BMI is then calculated from the adapted height and measured weight.

BMI can be used for adults because most people over 18 years of age have finished their physical development. BMI is not used for pregnant women. **Table A5.1** shows BMI cut-offs for the nutritional status of adults.

BMI < 16 in (non-pregnant) adults indicates severe malnutrition.

Table A5.1 BMI cut-off for nutritional status of adults over 18 years of age (excluding pregnant women)

BMI cut-off for adults

Severe thinness	Moderate thinness	Normal	Overweight	Obesity
< 16.0	≥ 16.0 to < 18.5	≥ 18.5 to < 25.0	≥ 25.0 to < 30.0	≥ 30.0

BMI-for-age

Because school-age children and adolescents are still growing and developing, their age and sex have to be considered when using BMI to determine nutritional status. BMI-for-age is expressed in z-score, which describe how far and in what direction a person's anthropometric measurement deviates from the median standard reference value for people of the same age and sex [83, 82].

> BMI-for-age z-score < –3 in school-age children and adolescents (5–18 years of age) indicates severe malnutrition

To facilitate the use of BMI and BMI-for-age, look-up tables or a BMI wheel© can be used.

Initial Assessment and Diagnosis

A thorough medical examination and medical and dietary history, and laboratory tests should be conducted to identify (or exclude) illness or conditions that give rise to secondary malnutrition.

> Non-nutritional causes of bilateral pitting oedema and weight loss could be identified by clinical examination, history and laboratory tests. For example, blood sugar may exclude diabetes mellitus; urine analysis may be due to severe proteinuria (nephrotic syndrome), nephritis, acute filariasis (the limb is hot and painful), heart failure and wet beriberi; in pregnant women, a common cause of oedema is preeclampsia.
>
> Nutritional causes of bilateral pitting oedema and weight loss, for example, could be severe food insecurity due to severe drought or civil strife, resulting in an increased incidence of severe malnutrition in the other age groups than children under 5 years.

Assessment for SAM:

> ***School-age children (5–9 years of age)***
> Presence of nutritional oedema or severe thinness define SAM. Thinness is assessed by either:

- MUAC < 130 mm, or
- WHZ-for-age < –3, or
- BMI-for-age z-score < –3

Adolescents (10–18 years)
Presence of nutritional oedema or severe thinness with recent weight loss in the past 4 weeks define SAM. Thinness is assessed by either:

- MUAC < 160 mm, or
- WHZ-for-age < –3, or
- BMI-for-age z-score < –3

Pregnant and lactating women
Presence of nutritional oedema or severe thinness, assessed by MUAC reading < 185 mm, define SAM.

Adults (over 18 years) (excluding pregnant women)
Presence of nutritional oedema or severe thinness with recent weight loss in the past 4 weeks define SAM. Thinness is assessed by either:

- MUAC < 185 mm, or
- BMI < 16

Table A5.2 gives on overview of the indicators used to assess SAM for treatment.

Table A5.2. Classification of malnutrition for treatment in school-age children, adolescents and adults

Population group	Malnutrition indicators		Comments
	Moderate malnutrition	Severe malnutrition	
School-age children 5–9 years of age	Not applicable*	Bilateral pitting oedema, or MUAC < 130 mm, or WHZ for-age < –3, or BMI-for-age z-score < –3	The use of MUAC in these age groups has not been field tested [80, 81]. Weight-for-height (WHZ)-for-age and

Adolescents 10–18 years of age	Not applicable*	Bilateral pitting oedema, or MUAC < 160 mm, or WHZ for-age < –3, or BMI-for-age z-score < –3	body mass index (BMI)-for-age z-scores are calculated from the median of the WHO 2007 Growth Reference [84, 82].
Pregnant and lactating women with infant < 6 months	MUAC < 230 mm	Pregnant and lactating women with infant < 6 months	The management of moderate malnutrition in pregnant and lactating women with infant < 6 months is part of IMAM.
Adults 18 years and above (not pregnant)	Not applicable*	Bilateral pitting oedema, or MUAC < 185 mm, or BMI < 16	MUAC cutoff reference [81].
Frail elderly people	Not applicable*	Bilateral pitting oedema, or MUAC < 185 mm	BMI may not be reliable and BMI adjusted for height is complicated for clinical use. In emergency situations, moderate and severe malnourished elderly people may be actively targeted.

** Moderate malnutrition is not targeted for treatment but counselling to improve quality of diets with home foods is being provided.*

General Case Management

Start therapeutic feeding:

School-age children, adolescents and adults, including PLW, with SAM will start therapeutic feeding and other treatment as indicated by the diagnosis.

They are given the same therapeutic foods that comply with WHO specifications as for children 6–59 months of age, and a ready-to-use therapeutic food (RUTF) is preferred when appetite has been preserved. The amount of feed given per kg of body weight is much less than for children

up to 7 years of age and decreases with increasing age, reflecting the lower energy requirements of adults. Recommended therapeutic feeding amounts that meet the nutrient requirements are shown in **Table A5.3.**

Table A5.3. Therapeutic feeding regimen

Age (years)	Daily energy* requirement	Daily volume of diet		
	(Kcal/kg)	F75 (ml/kg)	F100 (ml/kg)	RUTF (g/kg)°
7–10	75	4,2	3,0	13,8
11–14	60	3,5	2,5	11,0
15–18	50	2,8	2,0	9,2
19–75	40	2,2	1,7	7,4
> 75	35	2,0	1,5	6,4

** Individual needs may vary by up to 30% from these figures; ° RUTF has 5.4 Kcal/g.*

School-age children, adolescents and adults with SAM may be anorexic for which the formula feed is given by nasogastric tube during the first few days. They are also susceptible to hypoglycaemia and hypothermia. The latter condition is managed as described for children 6–59 months of age. They should also be given immediate systemic antibiotics and anthelminthics after one week of treatment. As soon as appetite returns, RUTF should be offered, and family foods will be gradually introduced.

Monitor progress of treatment:

An improving appetite indicates the beginning of rehabilitation. During rehabilitation, it is usual for adolescents and adults to become very hungry, often refusing the formula feed and demanding enormous amounts of solid food. When this happens, RUTF will be introduced (if not done earlier), supplemented with a diet based on traditional foods, but with added oil, mineral and vitamin mix. As soon as a variety of foods are tolerated, prepare the patient for discharge. Allow the patients to eat as much as they want.

Failure to respond to treatment:

Failure to respond to treatment in adolescents and adults is usually due to an unrecognized underlying illness, a nutrient deficiency or refusal to follow the treatment regimen or other quality of care issues.

Decide end of treatment (discharge from hospital):

School-age children can be discharged from inpatient care when they are eating well and gaining weight. They should continue to receive a supplemented diet as outpatients until their MUAC is ≥ 165 mm or WHZ-for-age or BMI-for-age z-score is ≥ –2. The same indicator used in the diagnosis to start treatment is used to decide end of treatment.

Adolescents and adults can be discharged from inpatient care when they are eating well and gaining weight, have a reliable source of nutritious food outside the hospital and any have other health problems been diagnosed and treated. They should continue to receive a supplemented diet until adolescents have their MUAC ≥ 185 mm or BMI-for-age z-score ≥ –2, and adults have their MUAC ≥ 230 mm or BMI ≥ 18.5. The same indicator used in the diagnosis to start treatment is used to decide end of treatment.

Appendix 1. Assessing Nutritional Oedema

Nutritional oedema is identified by bilateral pitting oedema in both feet by applying a firm pressure to both feet simultaneously for a period of 3 seconds (counting "one thousand ONE, one thousand TWO, one thousand THREE"). If oedema is found in the feet, this is repeated on the lower legs and hands. Periorbital oedema is assessed visually; no pressure is put around the eyes.
Steps to identify severity of bilateral pitting oedema:

Step 1:
Look and feel for a pit in each foot.
Bilateral pitting oedema in the feet only is classified as **mild oedema grade (+).**
If there is no oedema in the feet, STOP.
Nutritional oedema always spreads from the feet upwards.

Step 2:
If oedema is present in the feet, check the lower legs. Use the same technique as for the feet checking both sides.

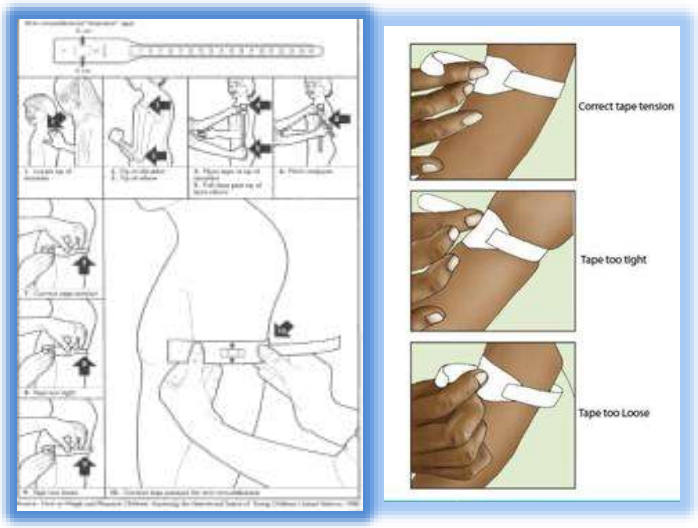
Bilateral pitting oedema in the feet AND the lower legs is classified as **moderate oedema grade (++).**

Step 3:
If oedema is present in the feet and lower legs, check the hands. Use the same technique.
Bilateral pitting oedema in the feet, lower legs and hands is also classified as **moderate oedema grade (++).**

Step 4:
If moderate oedema is diagnosed, check for oedema around the eyes (periorbital oedema). Do not press on the eyes to look for pitting.

Bilateral oedema in the feet, legs and hands and oedema around the eyes is classified as **severe oedema grade (+++)**. Children with grade (+++) oedema are at high risk of mortality and need urgent attention in inpatient care.

Appendix 2. Measuring Mid-Upper Arm Circumference (MUAC)



- Ensure a MUAC tape for children with the correct cut-off points is used. Discard any other MUAC bands. The MUAC band should indicate:
  - RED or less than 115mm To indicate SAM
  - YELLOW or 115mm to less than 125mm To indicate MAM
  - GREEN or equal or greater than 125mm To indicate normal
- Remove the child's clothing to expose the left arm.
- Identify the mid-point of the left arm between the tip of the shoulder and tip of the elbow.
- Mark the position of the mid-point with a marker pen or keep the finger over the location.
- Wrap the MUAC tape around the mid-point of the left arm.

- Ensure the tape lies comfortably against the skin with no gaps (too loose).
- Ensure the tape is not pinching the skin of the arm even slightly (too tight).
- Take the reading where the arrow on the tape indicates.

MUAC reading at the arrow

Measuring MUAC in older children and adults follow the same procedures.

Appendix 3. Measuring Weight

Weight can be measured using a Salter-type hanging spring scale or an electronic scale (e.g. SECA scale or UNISCALE), which enables a child to be measured in the mother/caregiver's arms.

A 25 kg hanging spring scale accurate to 100g should be used. In the field setting, the scale is hooked to a tree, a tripod or a stick held by two people. In a clinic, it is attached to the ceiling or a stand. The important factors here are that when being weighed, the child should be hanging freely without touching other objects and that the scale should be able to be read at eye level.

The child should be weighed naked and ideally a separate room to allow privacy should be used. If clothing is worn it must be the absolute minimum (light underwear only). A misdiagnosis of weight can adversely affect the classification of malnutrition and subsequent treatment.

*How to use the Salter scale (**Figure 1**):*

1. Before weighing the child, take all his/her clothes off.
2. Zero the weighing scales: make sure the arrow is at zero (with the weighing pants attached).
3. Place the child in the weighing pants/hammock.
4. Hang the child in the weighing pants from the scale ensuring the child is not touching any objects.
5. Read the child's weight. The arrow should be steady and the weight/scale should be read at eye level.
6. If the child is very agitated, the arrow may move considerably. Either wait until the child is calm or take an average weight which is between the two extremes.
7. Record the weight in kg and to the nearest 100 g (e.g., 6.4 kg).

Considerations:

- Make sure the child is safely in the weighing pants or hammock with one arm in front and one arm behind the straps to help maintain balance, hanging upright.

- In cold climates, ensure the weighing area is heated and the child is undressed for the minimum time.

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., 1, 2, 5 and 10kg). If the measure does not match the weight to within 100 grams, the scale must be recalibrated or the scale should be replaced.

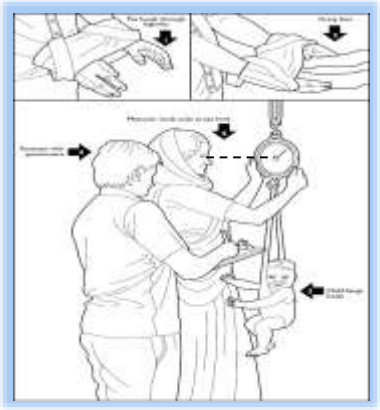


Figure 1. How to weigh a child using a Salter scale

*How to use the UNISCALE (**Figure 2**)*

1. Turn on the scale. Cover the solar panel for 2 seconds. When 'zero' appears, the scale is ready.
2. The mother should remove her shoes. The weighing assistant should hold the infant / child.
3. Ask the mother to stand in the middle of the scale, feet slightly apart, and remain still.
4. Remind the mother to stay still on the scale until told the weighing is complete.
5. With the mother remaining still on the scale and her weight displayed, zero the scale by covering the solar panel for 2 seconds. The scale should now read zero with the mother standing alone.
6. Tell the mother to remain still and gently hand the naked infant / child to the mother.

7. The baby's weight appears on the display. Record the weight being careful to read the numbers correctly.
8. If the child is 2 years of age or able to stand still the child may be weighed alone on the scale.

Mother's weight alone. *Zero the scale.* *Infant's weight appears on display.*

Figure 2. How to weigh a child using a UNISCALE

*How to use the electronic infant scale (**Figure 3**)*

- Have the caregiver remove the infant's clothes and hold the child.
- Put a soft cloth or the infant's wrapping on the scale and turn it on. Wait until the scale shows zeros.
- 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.
- Read and write down the infant's weight with a 10-gram precision (e.g., 3 kg 470 g).
- Turn off the scale and remove the infant.

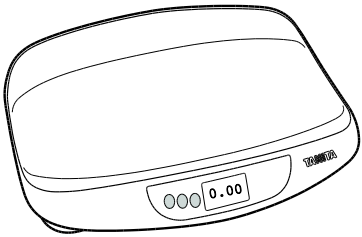


Figure 3. Electronic scale

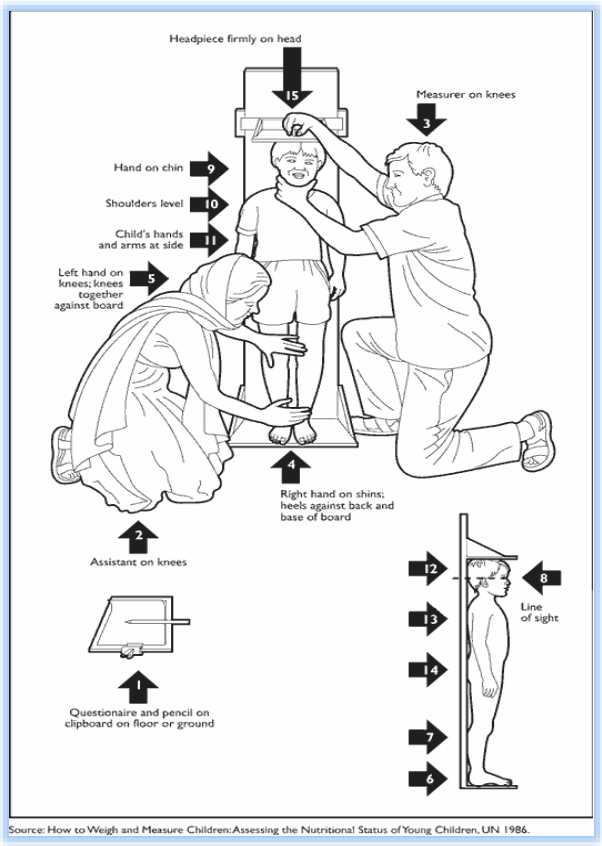
Appendix 4. Measuring Height or Length

To increase accuracy and precision, two people are always needed to measure length and height.

Children 2 years of age and older are measured standing up, while those under 2 years of age are measured lying down. If age is difficult to assess, children at least 87 cm tall (using WHO 2006 growth standards) are measured standing, and those less than 87 cm are measured lying down. If children 2 years of age or older or at least 87 cm tall are measured lying down, 0.7 cm is subtracted from the measurement.

For children 2 years of age:

1. The child's shoes are removed.
2. The child is placed on the height board, standing upright in the middle of the board with arms at his/her sides.
3. The assistant firmly presses the child's ankles and knees against the board while the measurer holds the child's head straight.
4. The child's head, shoulders, buttocks and heels should be touching the board, and his/her feet should be close together.
5. The measurer positions the sliding board and takes the measurement to the nearest 0.1 cm.
6. The measurer announces the measurement, and the assistant repeats it for verification and records it on the anthropometric form or health card.

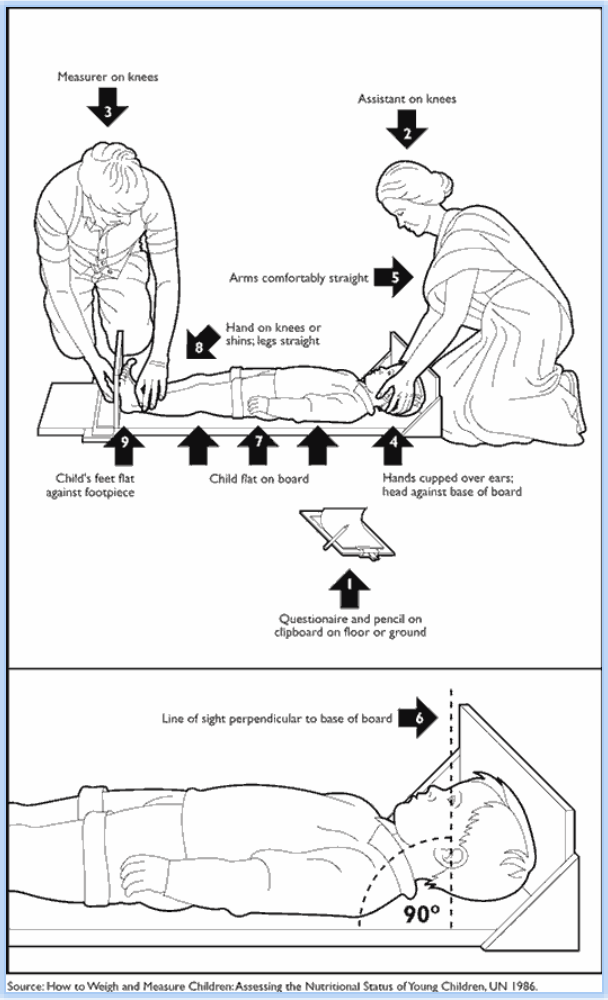


Source: How to Weigh and Measure Children: Assessing the Nutritional Status of Young Children, UN 1986.

For children aged under 2 years of age:

1. The height board is placed flat/horizontal on the ground.
2. The child's shoes are removed.
3. The child is gently placed on his/her back on the middle of the board, facing straight up with arms at his/her sides and feet at right angles.
4. The assistant holds the sides of the child's head and positions it on the board.
5. While holding down the child's ankles or knees, the measurer moves the sliding board up against the bottom of the child's feet and takes the measurement to the nearest 0.1 cm.

6. The measurer announces the measurement, and the assistant repeats it for verification and records it on the anthropometric form or health card.



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

Appendix 5. Weight-for-Height Look-up Tables (WHO Child Growth Standards)

Weight-for-Length Look-up Table Children 6–23 Months

If a child is under 2 years of age or is less than 87 cm tall and his/her age is not known, measure length while the child is lying down (recumbent). Use the weight-for-length look-up table.

Boys' weight (kg)				Length	Girls' weight (kg)			
−3 SD	−2 SD	−1 SD	Median	(cm)	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 Children 24–59 Months

If a child is 2 years of age 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 of age or older or at least 87 cm tall is unable to stand, measure length while the child is lying down (recumbent) and subtract 0.7 cm from the length to arrive at a comparable height. Use the weight-for-height look-up table.

Boys' weight (kg)				Height	Girls' weight (kg)			
−3 SD	−2 SD	−1 SD	Median	(cm)	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

Appendix 6. RUTF Look-up Table and Advice

RUTF in IPD-SAM (500 Kcal/92 g sachet)

	Transition 150 Kcal/kg/day	Rehabilitation 200 Kcal/kg/day
Child's weight (kg)	**Sachets per Day**	**Sachets per Day**
3.5–3.9	1.2	2
4.0–4.9	1.5	2.5
5.0–6.9	2.1	3
7.0–8.4	2.5	3.5
8.5–9.4	2.8	4
9.5–10.4	3.1	4.5
10.5–11.9	3.6	5
≥ 12	4	2

* Infants above 6 months of age and < 4 kg are treated in IPD-SAM following the treatment protocol for infants under 6 months of age.

RUTF messages

The following messages should be given to the mother or carer when RUTF is introduced in OPD and repeated during follow-up visits:

1. Do not share RUTF. RUTF is a food and medicine for very thin and swollen children only.
2. Give small, regular meals of RUTF and encourage the child to eat often (5–6 meals per day). Your child should have ___ packets per day.
3. Continue to breastfeed regularly (if applicable). Offer breast milk first before every RUTF feed.
4. Offer the child plenty of clean water to drink while he/she is eating RUTF. Children will need more water than normal.
5. Do not give other food. RUTF is the only food apart from breast milk that the ill children need to recover. Other foods, such as homemade foods (use local name or porridge), will be introduced when the child is recovering well.
6. Wash the child's hands and face with soap before feeding if possible. Clean the RUTF package.
7. Keep food clean and covered.

8. Do not stop feeding when a child has diarrhoea. Continue to feed RUTF and (if applicable) breast milk.
9. Keep the child covered and warm.
10. Return to the health facility whenever the child's condition deteriorates or if the child is not eating sufficiently.

Advise the mother or carer to start giving nutritious homemade complementary foods when the child is recovering well, and after the RUTF daily amount is taken.

Appendix 7. F75 Look-up Tables

Volume of F75 for Children with Severe Wasting and Oedema + and ++

Weight of Child (kg)	Volume of F75 per feed (ml)[a]			Daily total (130 ml/kg)	80% of daily total [a] (minimum)
	Every 2 hours[b] (12 feeds)	Every 3 hours[c] (8 feeds)	Every 4 hours (6 feeds)		
2.0	20	30	45	260	210
2.2	25	35	50	286	230
2.4	25	40	55	312	250
2.6	30	45	55	338	265
2.8	30	45	60	364	290
3.0	35	50	65	390	310
3.2	35	55	70	416	335
3.4	35	55	75	442	355
3.6	40	60	80	468	375
3.8	40	60	85	494	395
4.0	45	65	90	520	415
4.2	45	70	90	546	435
4.4	50	70	95	572	460
4.6	50	75	100	598	480
4.8	55	80	105	624	500
5.0	55	80	110	650	520
5.2	55	85	115	676	540
5.4	60	90	120	702	560
5.6	60	90	125	728	580
5.8	65	95	130	754	605
6.0	65	100	130	780	625
6.2	70	100	135	806	645
6.4	70	105	140	832	665
6.6	75	110	145	858	685
6.8	75	110	150	884	705
7.0	75	115	155	910	730
7.2	80	120	160	936	750
7.4	80	120	160	962	770
7.6	85	125	165	988	790

7.8	85	130	170	1014	810
8.0	90	130	175	1040	830
8.2	90	135	180	1066	855
8.4	90	140	185	1092	875
8.6	95	140	190	1118	895
8.8	95	145	195	1144	915
9.0	100	145	200	1170	935
9.2	100	150	200	1196	960
9.4	105	155	205	1222	980
9.6	105	155	210	1248	1000
9.8	110	160	215	1274	1020
10.0	110	160	220	1300	1040

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

[b] *Feed 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.*

[c] *After a day on three-hourly feeds: If no vomiting, less diarrhoea, and finishing most feeds, change to four-hourly feeds.*

Volume of F75 for Children with Severe Bilateral Pitting Oedema (+++)

Weight with +++ oedema (kg)	Volume of F75 per feed (ml)[a]			Daily total (100 ml/kg)	80% of daily total[a] (minimum)
	Every 2 hours[b] (12 feeds)	Every 3 hours[c] (8 feeds)	Every 4 hours (6 feeds)		
3.0	25	40	50	300	240
3.2	25	40	55	320	255
3.4	30	45	60	340	270
3.6	30	45	60	360	290
3.8	30	50	65	380	305
4.0	35	50	65	400	320
4.2	35	55	70	420	335
4.4	35	55	75	440	350
4.6	40	60	75	460	370
4.8	40	60	80	480	385
5.0	40	65	85	500	400
5.2	45	65	85	520	415
5.4	45	70	90	540	430
5.6	45	70	95	560	450
5.8	50	75	95	580	465
6.0	50	75	100	600	480
6.2	50	80	105	620	495
6.4	55	80	105	640	510
6.6	55	85	110	660	530
6.8	55	85	115	680	545
7.0	60	90	115	700	560
7.2	60	90	120	720	575
7.4	60	95	125	740	590
7.6	65	95	125	760	610
7.8	65	100	130	780	625
8.0	65	100	135	800	640
8.2	70	105	135	820	655
8.4	70	105	140	840	670
8.6	70	110	145	860	690
8.8	75	110	145	880	705
9.0	75	115	150	900	720
9.2	75	115	155	920	735

9.4	80	120	155	940	750
9.6	80	120	160	960	770
9.8	80	125	165	980	785
10.0	85	125	165	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

[a] Volumes in these columns are rounded to the nearest 5 ml.
[b] 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.
[c] After a day on three-hourly feeds: If no vomiting, less diarrhoea, and finishing most feeds, change to four-hourly feeds.

Appendix 8. Therapeutic Feeding F100 Look-up Table

Range of Volumes for Free-Feeding With F100

Weight of Child (kg)	Range of volumes per four-hourly feed of F100 (6 feeds daily)		Range of daily volumes of F100	
	Minimum (ml)	Maximum (ml) [a]	Minimum (150 ml/kg/day)	Maximum (220 ml/kg/day)
2.0	50	75	300	440
2.2	55	80	330	484
2.4	60	90	360	528
2.6	65	95	390	572
2.8	70	105	420	616
3.0	75	110	450	660
3.2	80	115	480	704
3.4	85	125	510	748
3.6	90	130	540	792
3.8	95	140	570	836
4.0	100	145	600	880
4.2	105	155	630	924
4.4	110	160	660	968
4.6	115	170	690	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

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

Appendix 9. Therapeutic Feeding Look-Up Tables for Infants under 6 Months of Age

Look-up table for amounts of supplements of formula milk, F100-Diluted (severe wasting) or F75 (bilateral pitting oedema) for breastfed infants

Infant's weight (kg)	Formula milk, F100-Diluted (or F75 in case of oedema) (ml per feed if 12 feeds per day)	Formula milk, F100-Diluted (or F75 in case of oedema) (ml per feed if 8 feeds per day)
< 1.3	20	25
1.3–1.5	25	30
1.6–1.8	30	35
1.9–2.1	30	40
2.2–2.4	35	45
2.5–2.7	40	50
2.8–2.9	40	55
3.0–3.4	45	60
3.5–3.9	50	65
4.0–4.4	50	70

Look-up table for amounts of formula milk, F100-Diluted (severe wasting) or F75 (bilateral pitting oedema) for non-breastfed infants in stabilisation

Infant's weight (kg)	Formula milk, F100-Diluted (or F75 in case of oedema) (ml per feed if 12 feeds per day)	Formula milk, F100-Diluted (or F75 in case of oedema) (ml per feed if 8 feeds per day)
< 1.3	20	25
1.3–1.5	25	30
1.6–1.8	30	35
1.9–2.1	30	40
2.2–2.4	35	45
2.5–2.7	40	50
2.8–2.9	40	55

3.0–3.4	45	60
3.5–3.9	50	65
4.0–4.4	50	70

Look-up table for amounts of formula milk, F100-Diluted (severe wasting) or F75 (bilateral pitting oedema) for non-breastfed infants in transition and stabilisation

Infant's Weight (kg)	Transition Formula milk, F100-Diluted (ml per feed if 8 feeds per day)	Rehabilitation Formula milk, F100-Diluted (ml per feed if 6–8 feeds per day)
< 1.6	45	60
1.3–1.5	53	70
1.6–1.8	60	80
1.9–2.1	68	90
2.2–2.4	75	100
2.5–2.7	83	110
2.8–2.9	90	120
3.0–3.4	96	130
3.5–3.9	105	140

Appendix 10. Minimum Materials for OPD-MAM/SAM

The materials listed here suggest a start-up quantity for the daily treatment in OPD-MAM/SAM of on average **10 children with MAM or SAM** for a period of **3 months**. Nneeds per site may be adjusted according to current and projected caseload. Always check the health facility's drug and equipment list to identify items that are needed in addition to their regular supply.

MEDICINES AND DRESSING

Item	Quantity	Unit
Amoxicillin 250 mg	750	tabs
Cotrimoxazole 120 mg	75	tabs
Mebendazole 100 mg	100	tabs
Paracheck	30	test
ACT	50	treatment dose
Metronidazole 250 mg	50	tabs
Nystatin 100,000 IU	50	tabs
Paracetamol 100 mg	50	tabs
Benzyl benzoate 90% 1L	0.5	L
Tetracycline HCl 1% eye ointment 5 g	30	tubes
Witfields ointment	30	tubes
Gentian violet crystals 25 g	1	pot of 25 g
Zinc oxide 10% ointment	1	tube of 100 g
Nystatin ointment 100,000 IU/g	25	tube of 30 g
Betadine solution	2	bottle
Cotton wool	3	Rolls
Examination gloves, medium, disposable	30	pieces
Bags for medicines	50	pieces
Thermometer	10	pieces
Gauze	20	packets
Small bandage	10	pieces
Tape	2	pieces
Normal saline for wounds 100 ml	5	pieces
Dressing scissors	2	pieces

EQUIPMENT

Item	Quantity
OPD-MAM/SAM records	100
Markers, pens	2
Clipboards	2
Stapler and box of staples	1
Pens	few
Scissors	1 pair
Notebook	1
Calculator	1
Small clock with second hand	1
Bucket with lid	2
Soap for hand washing	3 bars
Small bowl	1
Small jug	1
Hand towels	2
Water jug (with lid)	2
Plastic cups	20
Metal spoons	2
Teaspoons or medicine cups	6
Thermometer	5
Salter scale (25 kg) plus weighing pants	1
Uniscale	1
Height board	1
MUAC tape	10
Nail clippers	1

SUPPLIES TO KEEP IN STOCK

Item	Quantity
Bags for carrying RUTF (if required)	50
Drinking water	1 jerry can
Sugar to make 10% sugar solution	500 g
Soap for distribution	20 bars

RUTF

Monthly calculation:

Number of beneficiaries (A)

Monthly sachet consumption per child 80 (for 20 sachets per child per week)

Monthly carton consumption: A x 80/150 (for 150 sachets in one carton)

RUSF

Monthly calculation:

Number of beneficiaries (A)

Monthly sachet consumption per child 28 (for 7 sachets per child per week)

Monthly carton consumption: A x 28/150 (for 150 sachets in one carton)

SuperCereal

Monthly calculation:

Number of beneficiaries (A)

Monthly amount per PLW 7.5 kg

Monthly amount per site: A x 7.5 kg

Appendix 11. Minimum Materials for IPD-SAM

Medicines	
Cap	Vitamin A 200,000 IU
Tab	Folic Acid, 5mg
Tab	Ferrous Sulphate, 60mg
Susp	Amoxicillin 250mg
Susp	Cotrimoxazol
Vial	Ampicillin , 500mg
Vial	Ceftriaxone 1gr
Amp	Gentamycin 40mg
Susp	Ciprofloxacin
Susp	Nalidexic acide 250mg
Susp	Metronidazol 200mg
Amp	Magnesium Sulphate 50%
Amp	Furosemide 10mg
Serum	Dextrose 5% 500ml
Serum	Ringer 500ml
Serum	Normal saline 500ml
Syrup	Paracetamol 125mg
Amp	Digoxine
Amp	Adrenaline 1mg/1ml
Amp	Calcium Gluconat 10ml
Amp	Aminoghyllin 250mg
Amp	Water for injection 5cc.
Vial	Glucose 50% 50cc
Skin oint	Nystatine
Eye oint	Tetracyclin
Eye drop	Atropin
Eye drop	Chloraphenicol
Solution	Povidon iodine (500ml)
Solution	Gention violet 25 gr
Solution	Zinc Oxide 0.1%
Sachet	ReSoMal
Sachet	RUTF
Tin	F75
Tin	F100
Psychosocial activities items	
Sewing machine for mothers	
Washable toys for children	

Equipment
Stethoscope
Sphangomanometer (children)
Otoscope (children)
Thermometer for patient
Thermometer for ward
Safety box
Scissor medium size
Nasogastric tube 6-8 gage
Mask and Ambubag (children)
IV Canola 24
Syringes 2 ml, 5 ml and 10 ml
Gloves 7 & 7.5
Forceps
Baby weighing scale
Height measuring board
MUAC Tape
Uniscale, electronic weighing scale
Kitchen utensils
Cooking pot 10 liter
Bucket (food proof plastic)
Water flask 50 liter
Cups and plate ceramic high quality
Ladle stainless steel
Measuring Jugs 1liter, 2 liter
Serving spoon stainless steel
Scale Kitchen Type
Hand mixer
Brush
Aprons for children
Aprons for cook
Juice blender
Serving bowls
Cup stainless steel
Refrigerator 16 f
Electronic kettle

FORM 1. CHILD NUTRITION TRACKING REGISTER

Islamic Republic of Afghanistan
Ministry of Public Health
G. D. Preventive medicines
Public Nutrition Directorate

COMMUNITY BASED NUTRITION PROGRAMME

CHILD NUTRITION TRACKING REGISTER

Name of Province	: _____
Name of District	: _____
Name of Health Facility	: _____
Type of Health Facility	: _____
Health Facility Code	: _____
Name of the Health Post	: _____

Names of CHSs	:	1. _____
		2. _____
Names of CHWs	:	1. _____
		2. _____

CHILD WEIGHING TRACKING SHEET

Name of the child:							Date of birth:			
Father's Name:							House No:			
Date of weighing	Weight of the child	Nutritional status			Action agreed upon			Action practiced or not		
										

FORM 2. OPD-MAM, OPD-SAM, IPD-SAM REGISTER

Ministry of Public Health

General Directorate of Preventive Medicine

Public Nutrition Department

Acute Malnutrition Register Book for Children

Province:

District:

HF Name and type:

HF code:

Type of service: OPD-MAM, OPD-SAM, IPD-SAM

Registration number	General information									Admission criteria					Type of admission					
										OPD-MAM		OPD-SAM/IPD-SAM			OPD-MAM			OPD-SAM/IPD-SAM		
	Child Name	F/Name	Sex	Age (M)	Date of admission	Address (village, Street)	Home/ Father phone number	Weight (kg)	Height (cm)	MUAC< 125- 115	WHZ< -2	Odema (0,+,++,+++)	MUAC< 115 mm	WHZ< -3	New case	Return defaulter	Refer from other OPD-MAM	New case	Refer-in (OPD-MAM, OPD-SAM/IPD-SAM/	Return defaulter

1	Awrangzaib	Akram Khan	M	26	12.12.2017	speen kalay, Mia dera	077xxxxxxx	5.3	84		112.0			<-3	yes	0.0	0.0			
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				

Ministry of Public Health

Province: **General Directorate of Preventive Medicine**

District: **Public Nutrition Directorate**

HF Name and type

HF Code: **Acute Malnutrition Register Book for Children**

Type of service: OPD-MAM, OPD-SAM, IPD-SAM

General information							End of treatment					Stay and weight gain			Remarks
Date	Age (M)	Odema (0,+,++,+++)	MUAC mm	Weight (kg)	Height (cm)	WHZ	Cured	Default	Death	Refer/ Transfer out	Non-cured	Total stay/Day	Wigh gain during stay (gr)	Average weight gain	

FORM 3. OPD-MAM FOR PLW REGISTER

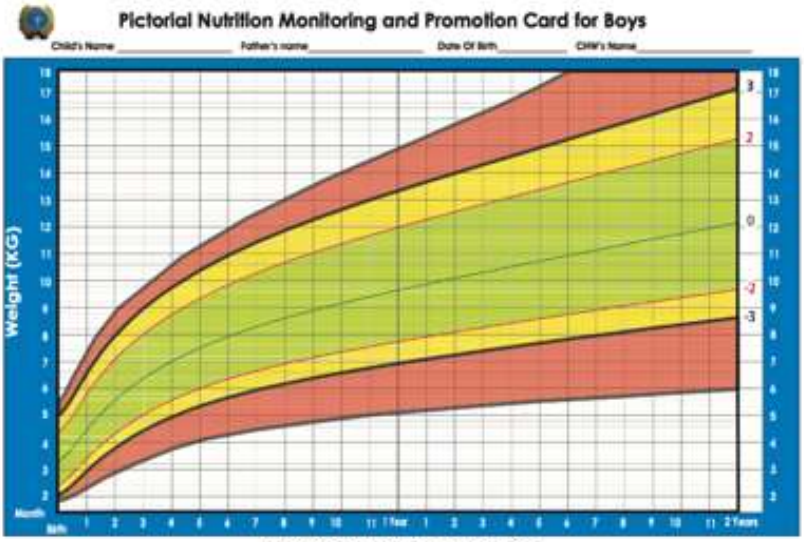
Ministry of Public Health
General Directorate of Preventive Medicine
Public Nutrition Directorate
OPD-AM-PLW Registration Book for Acute Malnourished Pregnant and Lactating Women

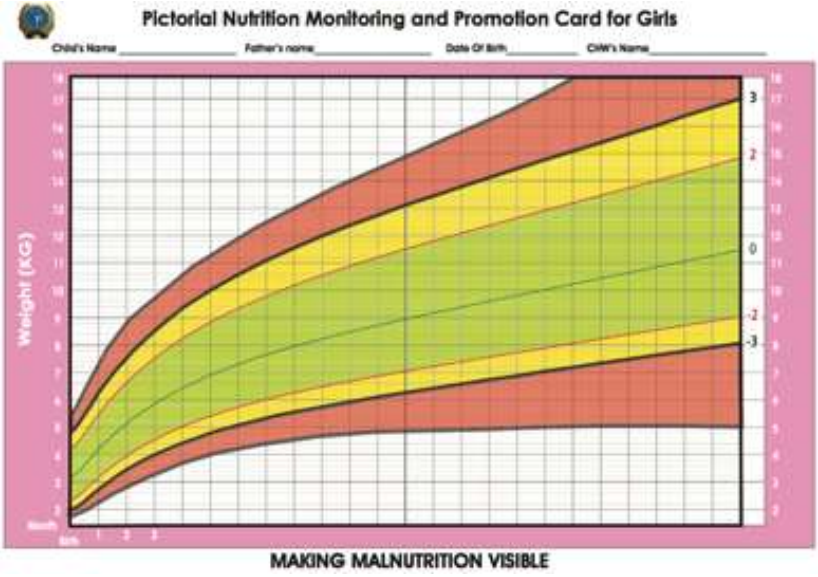
Province Name: **District Name:** **HF Name and Type:** **Implementing Agency** موءسسه تطبیق کننده **HF code:**

Regestration number	Name	Husband Name	Address	PW/LW	Pregnancy or Lactation Months	Age	Type of admission			Admission		Distribution-2		Distribution-3	Distribution-...		
							New case	Return defaluter	Transfer in/ refer in	Date	MUAC	Date	MUAC	Date	MUAC	Date	MUAC

FORM 4. PICTORIAL NUTRITION PROMOTION AND MONITORING CARD

Date of Weighing	Weight of the Child	Nutritional Status			Action agreed upon			Agreement Practiced or not		
		G	Y	R						





FORM 5. CHILD GROWTH MONITORING CARD

The blue card is for boys, and a pink card is for girls.

FORM 6. OPD-MAM/SAM RECORD

Ministry of Public Health
General Directorate of preventive Medicine
Public Nutrition Directorate

Acute Malnutrition treatment card for children

Province		District		Village	
Type of service	OPD-SAM / OPD-MAM	HF Name		Registeration Number	
Full Name		Age		Sex	
Father Name		Phone number		Admission date	

Admission criteria

For OPD-MAM	Put sign of(√) in one of the box		MUAC		WHZ	
For OPD-SAM	Odema (0, +, ++, +++)		MUAC		WHZ	

Type of Admission		New	Return defaulter	Refer in			Transfer in
				From OP-MAM	From OPD-SAM	From IPD-SAM	
Weight (Kg)		Height (cm)		WHZ		MUAC (cm)	

Routine drugs and vaccination

Drug	Date	Dosage	Drug	Date	Dosage
Amoxycillin			Mebendazole		
Measles Vaccination	yes	No	Remarks:		

Follow up visits

Week	ADM.	2	3	4	5	6	7	8	9	10	11	12
Date												
Progress												
Weight (kg)												
Weight change (+, 0, 1)												
Height(cm)												
WHZ												
MUAC(cm)												
Oedema (0, +, ++, +++)												
Medical history												
Diarrhoea												
Vomiting												
Fever												
Cough												
Physical eximination												
Appetite test (good, poor)												
# of RUTF/RUSF sachets												
Name of Examiner												

Remarks :

FORM 7. IPD-SAM RECORD

کارت تداوی داخل بستر طفل سو تغذی حاد شدید
IPD-SAM Initial Management CARD

وزارت صحت عامه

کارت تداوی داخل بستر طفل سو تغذی حاد شدید
IPD-SAM DAILY CARE CARD

نمبر شیت:

نام تسهیل صحی:	تاریخ بستر شدن:	جنس (علامه بگذارید): دختر / پسر	سن طفل:
نام طفل:	نام پدر طفل:		

DAILY CARE (مراقبت روزانه)

WEEK (هفته)	Week 1 (هفته اول)							Week 2 (هفته دوم)							Week 3 (هفته سوم)						
روزها در شفاخانه	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
تاریخ																					
وزن روزانه (Kg)																					
افزایش وزن (g/kg/d)	محاسبه در شروع مرحله دوم																				
[illegible]																					
اسهال استفراغ D, V																					
پلان تغذیه نوع تغذیه																					
تعداد تغذیه در روز																					
مقدار که در هر وعده بدهید																					
مجموع مقدار گرفته شده																					
NGT بلی/خیر																					
تغذیه با شیر مادر																					
انتی بیوتیک	[illegible]																				
اسید فولیک	[illegible] WHO [illegible]																				
ویتامین A	[illegible]																				
دوا ضد کرم های معایی																					
آهن روزانه دو مرتبه	[illegible] 200 [illegible]																				
التهابات چشمی	[illegible]																				
مشکلات گوش دهن و گلو																					
[illegible]																					
[illegible]																					

% Meal Taken فیصدی غذای گرفته شده	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
100%																					
%																					
%																					
%																					
Absent / غایب																					
NGT تیوب معده																					
Vomiting / استفراغ																					

شماره ثبت :

معلومات زمان بستری		تاریخچه طبی (حلقه نمایید)	
نام تسهیل صحی :	تاریخ بستری:	اشتها طفل : نورمال خراب	استفراغ : بلی نخیر
نام طفل:	نام پدر طفل:	اسهال : بلی نخیر	اگر دارد چند بار در روز ______
تاریخ تولد طفل :	سن طفل:	Stool appearance (circle one): Bloody / Mucoid / Watery / Soft / Solid /	
جنس (حلقه نمایید): دختر پسر	بستری دوباره : بلی نخیر	اخیراً فرورفتگی چشمها : بلی نخیر	دفع ادرار: بلی نخیر
مراقبت کننده طفل (حلقه نمایید): مادر پدر خواهر مادر بزرگ سایر		تب : بلی نخیر	تغییرات مو: بلی نخیر
آدرس:		سرفه : بلی نخیر	نفس کوتاهی : بلی نخیر
شماره تیلفون:		شب کوری : بلی نخیر	برازیت مغایی : بلی نخیر

تاریخچه غذایی (DIETARY HISTORY)	
طفل با شیر مادر تغذیه میشود؟ بلی نخیر	اگر بلی :خلص باشیر مادر/ مخلوط
اگر نخیر:کدام نوع شیر میدادید؟ بز گاو شیر پودری سایر: ______	
آیا قبلا شیر مادر میدادید؟ بلی نخیر	سن که شیر مادر را توقف دادید:
در کدام سن غذایی نیمه جامد را شروع نمودید؟ ______	

تاریخچه واکسیناسیون (Immunisation History) حلقه نمایید

آیا کارت واکسیناسیون در دسترس است (حلقه نمایید)؟ بلی نخیر

نوع واکسن	هنگام تولد	دوره اول	دوره دوم	دوره سوم
BCG	هنگام تولد			
Polio	هنگام تولد	هفته ششم	هفته دهم	هفته 14
Penta		هفته ششم	هفته دهم	هفته 14
Rotavirus		هفته ششم	هفته دهم	-
Measles		هفته نهم	-	-

1. منجمنت ابتدایی (INITIAL MANAGEMENT)

علایم شوک SIGNS OF SHOCK (حلقه نمایید): علایم موجود نیست دست سرد
بیحالی/ عدم موجودیت شعور پر شدن آهسته دوباره شعریه بیشتر از ۳ ثانیه
نبض ضعیف/سریع

اگر بیحالی ، عدم موجودیت شعور ،دست های سرد همراه با پر شدن بطی شعریه یا نبض ضعیف/سریع موجود باشد، آکسیجن بدهید. اگر طفل بیدار است، گلوکوز را از طریق فمی یا انفی معدی بدهید. قسمی که تحت عنوان گلوکوز شرح شده است؛ مایعات داخل وریدی ندهید. اگر طفل بیحال یا بیهوش است، گلوکوز داخل وریدی را قسمی که تحت عنوان گلوکوز تشریح شده است بدهید؛ بعد مایعات داخل وریدی بدهید.

مقدار مایعات داخل وریدی فی ساعت : 15 ملی لیتر x ______ کیلوگرام (وزن طفل) = ______ ملی لیتر

	شروع	هر 10 دقیقه مانیتور کنید					ساعت دوم*	هر 10 دقیقه مانیتور کنید				
وقت							*					
تعداد تنفس							*					
تعداد نبض							*					

• اگر تعداد تنفس و نبض بعد از 1 ساعت آهسته تر بود. عین مقدار مایع داخل وریدی را برای ساعت دوم نیز تکرار کنید؛ بعد ReSoMal و F-75 را طور متناوب قسمی که در قسمت راست چارت زیر آمده است تا 10 ساعت تطبیق کنید. اگر با مایعات داخل وریدی بهبودی حاصل نشد، خون مکمل تازه را تطبیق نمائید (به چپ، بخش هیموگلوبین بنگرید.)

علایم سوتغذی شدید : Severe wasting (لوپ شدگی شدید): بلی نخیر
Oedema (پرائیوز) ؟ الیسیک ++ +++
Dermatosis (التهابات جلدی)؟ الیسیک ++ +++ (جلد خشن/لیشر)
Weight (وزن کیلوگرام) ______ Height/Length (قد سانتی متر): ______
SD score ______
TEMPERATURE (درجه حرارت) مقعدی °C ______ زیر بغل _ °C ______
اگر مقعدی < 35.5 درجه سانتی گرید (95.5 درجه فارنهایت) یا ابطی < 35 درجه سانتی گرید (95 درجه فارنهایت) باشد طفل را به شکل فعال گرم سازید. درجه حرارت را هر 30 دقیقه بعد چک نمائید.
BLOOD GLUCOSE (گلوکوز خون) mmol/l): (...................
اگر < 3 ملی مول فی لیتر و بیدار باشد، 50 ملی لیتر گلوکوز یا سکروز 10% بدهید (فمی یا انفی معدی) . اگر < 3 ملی مول فی لیتر و بیحال، بیهوش یا اختلاجی باشد گلوکوز 10% معقم را از طریق وریدی بدهید: 5 ملی لیتر * ______ کیلو گرام (وزن طفل) = ______ ملی لیتر. بعد 50 ملی لیتر را از طریق انفی معدی بدهید. زمان دادن گلوکوز: ______ فمی انفی معدی داخل وریدی
هموگلوبین [Hb] : یا Packed cell vol (PCV) گروپ خون:
اگر هیموگلوبین < 40 گرام فی لیتر یا حجم حجرات فشرده < 12% باشد، خون مکمل تازه 10 ملی لیتر فی کیلوگرام به آهستگی در ظرف 3 ساعت بدهید. مقدار داده شده: زمان شروع: زمان ختم
FEEDING (تغذیه) : هر چه زودتر تغذی با شیر F-75 را شروع نمایید (اگر طفل rehydrate می شود ، قبل از اینکه مقدار شیر F-7 او را تعیین نمایید دوباره او را وزن نمایید . وزن جدید ------(kg) □□□□ □□□□□□□□□□□□□□□:□□□□□ □□□□ □□ □□ □□□□ □□□□□ □□□□ *F-75 ، زمان اولین تغذیه:-------- ، اگر طفل هایپو گلایسمیک باشد ، یک چهارم این غذا را هر نیم ساعت برای دو ساعت اول بدهید، و

DIARRHOEA (اسهالات)	اسهال آبکی ؟ بلی نخیر خون در مدفوع ؟ بلی نخیر استفراغ ؟ بلی نخیر	← اگر اسهال بلی : علایم موجود را حلقه کنید	چشم های فرو رفته دهان و زبان خشک نبودن اشک چندک جلد به آهستگی بر میگردد ناآرامی/ تخرشیت
□اگر طفل اسهال و یا استفراغ دارد ریزومل بدهید:هر ۳۰ دقیقه برای دو ساعت اول، مانیتور نماید و بدهید*: 5 ml x ____ kg (child's wt) = ____ ml ReSoMal		برای ۱۰ ساعت ریزومل و F-75 □□□□□ □□□□□□ □□□□□□ □□ □□ ،□□□□ مانیتور نمایید. مقدار ریزومل که پیشکش شود: 5 to 10 ml x ____ kg (child's wt) = ____ to ____ ml ReSoMal	

وقت	شروع													
تعداد تنفس														
تعداد نبض														
دفع ادرار داشته؟ بلی نخیر														
تعداد دفعات مدفوع														
تعداد دفعات استفراغ														
علایم ریهایدریشن														
مقدار □رفته شد(ملی لیتر)						F-75		F-75		F-75		F-75		F-75

*ریزومل را توقف دهید اگر: ....پرجیگر □ی ورید ج□ولار افزایش سرعت نبض و تنفس پندیده □ی پلکها اذیما افزایش یابد

تشخیص احتمالی:	تشخیص نهایی :	
Daily Progressive Notes	Daily Progressive Notes	Daily Progressive Notes
State (جزئیات) Treatment (تداوی)	State (جزئیات) Treatment (تداوی)	State (جزئیات) Treatment (تداوی)

وزارت صحت عامه

کارت تداوی داخل بستر طفل سو تغذی حاد شدید
IPD-SAM DAILY CARE CARD

نمبر شیت: [ ]

نام تسهیل صحی :	تاریخ بستری:	جنس (حلقه نمایید): دختر پسر	سن طفل:
نام طفل:	نام پدر طفل:		

DAILY CARE (مراقبت روزانه)

WEEK (هفته)	Week 1 (هفته اول)							Week 2 (هفته دوم)							Week 3 (هفته سوم)						
روزها در شفاخانه	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
تاریخ																					
وزن روزانه (Kg)																					
افزایش وزن (g/kg)	محاسبه در شروع مرحله دوم																				
انیما 0,+,++,+++																					
اسهال /استفراغ 0, D,V																					
پلان تغذیه /نوع تغذیه																					
تعداد تغذیه در روز																					
مقدار که در هر وعده بدهید																					
مجموع مقدار گرفته شده																					
NGT بلی/ نخیر																					
تغذیه با شیر مادر																					
انتی بیوتیک	انتی بیوتیک های تجویز شده را در ستون راست ثبت نمایید. برای هر دوز روزانه یک ردیف بگذارید. دور روزها/دفعات اینکه هر دوا باید داده شود حلقه بکشید. زمانیکه دوا داده شد امضا بکنید.																				
اسید فولیک	[illegible]	اگر غذا های تغذیوی مطابق معیار های WHO نباشد روزانه 1 ملی گرام اسید فولیک بدهید																			
ویتامین A		ویتامین ای تنها به اطفال سوتغذی حاد شدید که با علایم کمبود ویتامین ای مراجعه می نماید باید سه دوز در روزهای اول دوم و چهاردهم داده شود															اگر غذا های تغذیوی مطابق معیار های WHO نباشد یک دوز A را در هنگام بستری داده شود					
دوا ضدکرم های معایی																					
آهن روزانه دو مرتبه	200 mg فیرس سلفات میده شده در بین 2 2.4 لیتر F-100 یا D F-100																				
انتانات چشمی: مرهم تتراسایکلین 3بار در روز یا کلورامفنیکول یک قطره چهار مرتبه در روز برای 7 10 روز															بعد از 7 10 روز زمانیکه قطره چشم دیگر ضرورت نیست خانه ها برای قطره های چشم را سیاه کنید						
زخم قرنیه : دوا انتان چشمی + اتروپین یک قطره سه مرتبه در روز																					
مشکلات گوش دهن و گلو																					
التهابات جلدی 0,+,++,+++																					
حمام با پرمنگنات ۱٪																					

%Meal Taken فیصدی غذای گرفته شده	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
100% ☒ ☒ ☒ ☒																					
¾ ☒ ☒ ☒ ☐																					
½ ☒ ☒ ☐ ☐																					
¼ ☒ ☐ ☐ ☐																					
Absent (غایب)																					
NGT تیوب معده																					
Vomiting استفراغ																					

ریکارد مانیتورنگ Monitoring Record

تعداد تنفس

تعداد ضربان قلب

	39
	38.5
	38
	37.5
	37
	36.5
	36
	35.5
	35
	34.5

درجه حرارت بدن

(چارت وزن) WEIGHT CHART

2	20	19	18	17	16	15	14	13	12	11	10	9	8	7

Admission Weight ________kg

Admission Height ________cm

Oedema on admission 0, +, ++, +++

Desired weight at discharge(-2 SD WFH) ---------kg

Actual weight at discharge: ________kg

(نظر یاک نتیجه) COMMENTS /OUTCOMES

Special Discharge and Follow up Instructions: هدایات اختصاصی مرخصی و تعقیب

- حفظالصحه : بلی ☐ نخیر ☐
- تغذی طفل : بلی ☐ نخیر ☐
- اسهالات ، سینه وبغل و تب : بلی ☐ نخیر ☐

اوسط افزایش وزن:
______ گرام/ کیلو گرام

اوسط مدت ماندن در مرکز:
________روز ها

نتیجهٔ مریض PATIENT OUTCOME (End of treatment)

به دور نتیجه حلقه بکشید:	تاریخ	شرایط/نظریات
(شفایاب) Cured ≥WHZ-2 or MUAC> 125 mm		
(غایب)Default		:WHZ ______
(ارجاع) Referral		:WHZ ______
(فوت)Death		تعداد روز ها بعد از بستر شدن (حلقه بکشید) : کمتر از 24 ساعت 1 تا 3 روز 4 تا 7 روز بیشتر از 7 روز وقت تقریبی مرگ : روز شب اسباب آشکار: .... آیا طفل مایعات داخل وریدی گرفته است؟ بلی نخیر
(سایر)Others		:Z-score ______

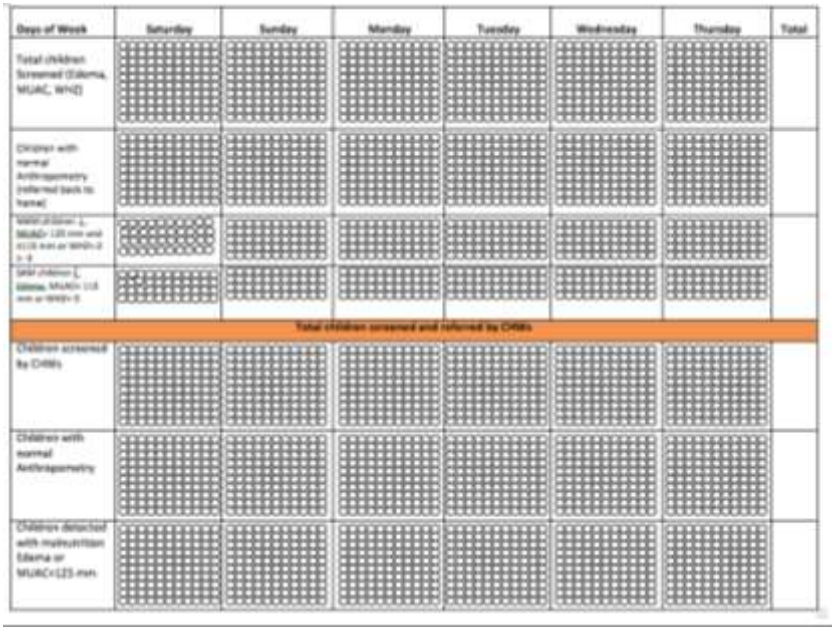
FORM 8. OPD-MAM FOR PLW RECORD

Ministry of Public Health
General Directorate of Preventive Medicine
Public Nutrition Directorate

AM-PLWs treatment card												
General information												
Province				District								
HF Name				HF type								
Target Group (**mark)**	O Pregnant O Lactating			Registration number								
Identification of beneficiary												
Name:		MCH-ANC/PNC card #										
Husband's name		Age of women:										
Address/village												
Admission criteria	MUAC (mm)		*Admission date*									
Admission type												
O New case O Return defaulter O Transferred in												
IFA supplementation In each visit	Make sure that mother get IFA from MCH section. use (√)											
	1	2	3	4	5	6	7	8	9	10	11	12
Other medications:	Details and Date:											
End of treatment information:	**Date:**											
Exit as:	**Mark outcome:** Cured Default Died Non-cured Referred/tra											
MUAC *(mm)*												

Form 9. Screening Tally Sheet

Tally Sheet for Recording Children under 5 Years of Age Screened in Health Facilities and Referred by Community Health Workers



FORM 10. CBNP MONTHLY HEALTH POST PICTORIAL MONITORING REPORT

Community Base Nutrition Programme
Monthly Health Post Pictorial Monitoring Report
For the Month of _____

Province: _____ District: _____ Village: _____

Name of HP: _____ Name of CHW 1 _____ CHW 2 _____

S. No		Activities	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
1		Total number of children registered												
2		Number of new children registered												
3		Number of children weighed during this month												
4		Number of children in Green zone												
5		Number of Children in yellow zone												
6		Number of children in red zone												
7		Number of home visits made												
8		Number of families counselled during the month												
9		Number of Deliveries during the month												
10		Number of Nutrition Education sessions held in the community												
11		Number of sessions conducted in health facility												
12		Number of Cooking Demonstration sessions held												
13		Number of children referred to the health facility												

Signature of CHW 1 _____ Date: _____

CHW 2 _____

Form 11. Pictorial Monitoring Report for Community Health Supervisors

Community Based Nutrition Programme
Public Nutrition Department, Ministry of Public Health

CBNP Monitoring Report for Community Health Supervisors

Province: _____ **District:** _____

Name of Health Facility: _____ **Code of Health Facility:** _____

Report for the month of _____

Sl. No	Description	HP 1	HP 2	HP 3	HP 4	HP 5	HP 6	HP 7	HP 8	HP 9	HP 10	HP 11	HP 12
1	No: of children registered												
2	No: of children weighed												
3	No: of children newly added												
4	No: of children who have moved out												
3	No: of children in green zone												
4	No: of children in yellow zone												
5	No: of children in red zone												
6	No: of deliveries during the month												
7	No: of home visits made												
8	No: of Nutrition Education sessions held in the community												
9	No: of Nutrition Education sessions held in the HP												
10	No: of cooking demonstrations conducted												
11	No: of mothers participated in the cooking demonstrations												
12	No: of referral cases sent to HF												
13	No: of Shura meetings held												

Remarks, if any: _____

Signature of the CHS: _____

Name of the CHS: _____ **Date of submission:** _____

FORM 12. IPD-SAM MONTHLY REPORTING FORM

Province	
District	
Implementing Agency	
Type of program	
Level	

Ministry of Public Health
General Directorate of Preventive Medicine
Public Nutrition Department

Management of Severe Acute Malnutrition Programme

Monthly Reporting Format

HF Name	
Facility Code	
Prepared by	
Month/Year	

Age Group	Total at the beginning of month (A)	New Admission						Refer in			Total Refer in	Total Admissions (B)	End of treatment						Total at end of month(D)
		Oedema	WHZ <-3	MUAC <115 mm	Male	Female	Total	From IPD-SAM/OPD-SAM	From OPD-MAM	Return Default			Cured	Death	Defaulters	Refer Out	Non Cured	Total Exits(C)	
< 6 Month							0				0	0						0	0

6-23 Months							0				0	0						0	0
24-59 Months							0				0	0						0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cured, Death ,Default,Non Cured and Transfer Rates													#DIV /0!	#DIV /0!	#DIV /0!	#DIV /0!	#DIV/0 !		
Standard (Sphere)												IPD-SAM	>75%	<10%	<15%		D=(A+ B)-C		

	Kwashiorkor	Marasmus
Average Weight Gain (AWG)		
Average Length of Stay (ALS)		

A.L.S = sum of length of stay (in days) / number of curds in the group.

Weight Gain = {dischage weight in g - minimumweight in g} / {minimum weight in kg x number of days between date of minimum weight and discharge day}

A.W.G = sum of weight gains(g/kg/d)/number of curds in the group

Supply stock report and balance

FORM 13. OPD-SAM MONTHLY REPORTING FORM

Province	
District	
Implementing Agency	
Type of program	
Level	

Ministry of Public Health
General Directorate of Preventive Medicine
Public Nutrition Department

Management of Severe Acute Malnutrition Programme

Monthly Reporting Format

HF Name	
Facility Code	
Prepared by	
Month/Year	

Age Group	Total at the beginning of month (A)	New Admission						Refer in			Total Refer in	Total Admissions (B)	End of treatment						Total at end of month(D)
		Oedema	WHZ <-3	MUAC <115 mm	Male	Female	Total	From IPD-SAM/OPD-SAM	From OPD-MAM	Return Default			Cured	Death	Defaulters	Refer Out	Non Cured	Total Exits(C)	

children<6 months							0				0	0						0	0
6-23 months							0				0	0						0	0
24-59 months							0				0	0						0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cured, Death ,Default,Non Cured and Transfer Rates													#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		
Standard (Sphere)												OPD-SAM	>75%	<10%	<15%				

D=(A+B)-C

	Kwashiorkor	Marasmus
Average Weight Gain (AWG)		
Average Length of Stay (ALS)		

A.L.S = sum of length of stay (in days) / number of curds in the group.

Weight Gain = {dischage weight in g - minimumweight in g} / {minimum weight in kg x number of days between date of minimum weight and discharge day}
A.W.G = sum of weight gains(g/kg/d)/number of curds in the group

Supply stock report and balance

FORM 14. OPD-MAM MONTHLY REPORTING FORM

Province	
District	
Implementing Agency	
Project start date	

Ministry of Public Health
General Directorate of Preventive Medicine
Public Nutrition Department

OPD-MAM & OPD-AM PLW

Monthly Reporting Format

HF Name	
Facility Code	
Month/Year	
FLA #	
FRN #	

Beneficiaries	Total at the beginning of the month (A)	New Admissions						Refer-in	Total Admission (B)	End of treatment						Total food recipients (D)	Total at the end of the month (E)
		WHZ < -2 to ≥-3	MUAC <125mm ≥ 125mm	MUAC < 230mm	Male	Female	Total			Cured	Deaths	Defaulter	Refer Out	Non-Cured	Total Exits (C)		
Children 6-23 months				NA			0		0						0	#REF!	0
Children 24-59 months				NA			0		0						0	#REF!	0
Pregnant women		NA	NA			NA	0		0						0	#REF!	0
Lactating women		NA	NA			NA	0		0						0	#REF!	0

GRAND TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#REF!	0
Performance indicators									MAM-CH	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!			
									AM-PLW	#DIV/0!	#DIV/0!	#DIV/0!					
									SPHERE Standards	>75%	<3%	<15 %					

Average length-of-stay (ALS*) for children only	Average Weight Gain (AWG**) for children only

ALS* = sum of length-of-stay (in days) of all children discharged cured during the month / total # of children discharged cured during the month
AWG** = sum of all weight gains (grams/kg/day) during the month / total # of children discharged cured during the month
Weight gain = (discharge weight in grams - admission weight in grams)/admission weight (in kg)/total length of stay in days

Remarks:

Food stock report and balance (Kg)

Food item	Opening balance	Quantity Received	Quantity Distributed	Quantity transfer-out***	Losses	Quantity returned	Closing Balance	Expected recipients next month	Quantity needed next month
Super cerial	Super cerial						#REF!		#REF!
RUSF	RUSF						#REF!		#REF!
Total	0	0.0	0.0	0.0	0.0	0.0	#REF!	0.0	#REF!

E = (A + B) - C

***Quantity transfer out = food transferred from one program site to another

FORM 15. BNA QUESTIONS MONTHLY REPORTING FORM

Province		Ministry of Public Health General Directorate of Preventive Medicine Public Nutrition Department		**HF Name**	
District				**Health Facility Code**	
Implementing Agency				**Report prepared by**	
Type of program		BNA questions		**Month/Year**	

In SAM inpatient form:	
1 - How many weeks did the site encountered stock out of RUTF	0
2 - Number of new admissions referred by CHWs	0
In SAM outpatient form:	
1- How many weeks did the site encountered stock out of RUTF	0
2- Number of new admissions referred by CHWs	0
In MAM form:	
1 - How many weeks did the site encountered stock out of RUSF	0
2- Number of new admissions referred by CHWs	0
Screening	
How many children Under 5 years and PLW screened during the month at the health Facility?	
1- Girls	0
2- Boys	0
3- PLW	0

FORM 16. COMMUNITY HEALTH WORKER REFERRAL SLIP

Name of CHW.....Health Post Name/Code #.....
Village Name.....

Serial No.

For patient to carry to clinic **Date:** / / / **referral slip of CHW**

Malaria	Respiratory infections	Diarrhea	TB	Vaccine	Malnutrition	Antenatal care	Normal delivery	Delivery complication	Postnatal care	Vaccine
										

FORM 17. HEALTH FACILITY REFERRAL SLIP

Ministry of Public Health
General Directorate of Curative Medicine

Referral Slip

A	Patient Specification: Name and last Name: Birth date/Age:	Current address: Sex:
B	Name of HF refer the patient: Date: Name of person who refer the patient: Email address: Is there need for ambulance Yes No	Address of Hospital: Referral time: Phone #: Patient registration #:
	Name of HF get the referral: Address:	Phone #: Date of referral Time of referral
	Level of emergency for referral: Immediate (within 8 hours) Emergency (within 24 hours) Routine case (2 days to 2 weeks)	
	General information (chief complaint, clinical findings, laboratory findings and primary diagnosis)	
	Previous history:	
	History of drug sensitivity:	
	Reasons for referral:	
	Name of doctor..... Signature..... Date: / / Do you send the patient treatment record along with this referral slip? Yes: No:	

FORM 18. HOME VISIT QUESTIONNAIRE

Questionnaire for Home Visit

1. When was your child enrolled in the treatment? _____

2. How did you know that your child needed treatment? _____

3. Has the care and advice you received at the health facility been satisfactory and sufficient to care for your child at home?

_____

4. If the child is not responding well to the treatment: Could you apply the advice you received at the health facility? What has been difficult for you as carer?

_____

_____

5. If the child defaulted: Why did you stop taking your child to the health facility for treatment)? (List reasons):

_____

_____

6. Would you return your child to the health facility to continue treatment? Yes/No
If no, why not? _____

7. If the child died, what was the perceived cause of death> _____

FORM 19. PRESCRIPTION CARD

Ministry of Public Health
General Directorate of Preventive Medicine
Public Nutrition Directorate

IMAM prescription card for children and PLWs					
Name:		Age		Province	
F/H/Name		Sex		District	
HF Name		Registration #		Village	
Type of service:		OPD-MAM	OPD-SAM		
Commodities Specification: RUSF:		RUTF:	Super Cereal:		
Visit #	Date	Type of ration	Quantity of ration	Date of next visit	Signature
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

FORM 20. HEALTH FACILITY SUPERVISORY CHECKLISTS

The Ministry of Public Health
General Directorate of Preventive Medicine
Department of Public Nutrition

Monitoring Checklist for nutrition activities in Health Facilities

Identification				
q1	**Date:** Year ( )/ Month ( )/ Day ( )			
q2	**Location:** Province ( )/ District ( )			
q3	**Health Facility Type**: 1. PH, 2. DH, 3. CHC, 4. BHC, 5. SHC, 6. Other ( ), HF ID: _____			
SN	**Questions**	**Answers**	**Remarks**	**Comments**
q4	Is there staff who received training on IYCF counseling?	1. No 2. Yes (but not present) 3. Yes (present)	A trained IYCF counselor should have received one week training on IYCF counseling skills.	
q5	Is there IEC materials available/ visible on nutrition topics?	1. No 2. Yes but not for all topics, 3. Yes for all	Including posters visible to all, brochures to be distributed,	
q6	Average number of Breastfeeding counseling/ day during the last month:	_____		
q7	Do the children and mothers receive micronutrient supplements registered and recorded correctly	1. No 2. Yes, not properly 3. Yes, properly		
q8	Average number of Severe Acute Malnutrition and Moderate Acute Malnutrition admission/ day during the last month:	_____SAM _____MAM		

q9	Is there enough therapeutic food available to treat severely malnourished children?	1. No 2. Yes, but not enough, 3. Yes, enough		
q10	Do the staff measure weight and height of children correctly?	1.No do not measure at all 2. Yes, but not correctly, 3. Yes		
q11	Is there the flow chart of operational guideline of management of acute malnutrition visible in the wall?	1. No, 2. Yes, but not appropriate 3. Yes appropriately	Appropriate: Visible, readable,	
q12	Are the Midwives prescribe Iron Folic Acid supplementation for pregnant and post partum women appropriately ?	1. No, 2. Yes, but not appropriate 3. Yes appropriately	Appropriate: for children > 6 M 20 mg/day for 10 days. and for children < 6M 10 mg/day for 10 days.	
q13	Are the Doctors prescribe Zinc+ ORS for children with diarrhea cases appropriately ?	1. No, 2. Yes, but not appropriate 3. Yes appropriately	Appropriate: Iron & Folic Acid (60mg+400mic) a Tablet/day	

Suggestion:

This checklist is filled in by the Supervisor/ Monitor:

Name/ Signature:

Position:

---

and witnessed or certified by the in-charge of the health facility:

Name/ Signature:

Position:

Ministry of Public Health
General Directorate of Preventive Medicine
Public Nutrition Department

Monitoring Checklist for the Public Nutrition Trainings				
Identification				
q1	**Date:** Year ( )/ Month ( )/ Day ( )			
q2	**Location:** Province ( )/ District ( )/ Training Center ( )			
q3	**Title of Training: 1)** Nutrition Training for MD, **2)** Nutrition Training for Nurse and Midwife, **3)** Nutrition Training for Supervisor, **4)** Nutrition Training for CHS, **5)** Nutrition Training for CHW, **6)** IPD-SAM Training, **7)** NiE Training, **8)** SMART Training, **9)** RNA Training, **10)** Others_____			
q4	**Type of Training: 1.** Initial, **2.** Refresher, **3.** TOT			
q5	**Date of Training: ../ ../ ..**			
q6	**Supported by: _____**			
q7	**Conducted by: _____**			
q8	**Number of Participants: _____**			
q9	**Number of Facilitators: _____**			
SN	**Questions**	**Answers**	**Remarks**	**Comments**
Pre Training:				

q10	Does the training Planned based on Training Need Assessment (TNA)?	1. No 2. Yes	Based on Training Need Assessment	
q11	Does the training plan shared and approved by MoPH/ PND?	1. No 2. Yes	Training Micro-Plan According ot PND`s Format	
q12	Does the training coordinated and communicated with PPHD?	1. No 2. Yes	Required to be advanced communicated and coordinated with PPHD	
During the Training:				
q13	Is there appropriate training center available for the training?	1. No 2. Yes		
q14	Are the training required equipment available?	1. No 2. Yes, not complete 3. Yes, complete	**Required Equipment:** Laptop, Projector, Screen, Pointer, Marker, Flipchart, Stand, Printer, Stabler (pin), Camera, (and any other materials based on training title)	
q15	Are the training required materials according to the training session plan available?	1. No 2. Yes, not complete 3. Yes, complete	**Required Materials:** IYCF Toys, food demonstration materials, milk preparation materials, MUAC, Z-Score Tables, Hieght board and etc…	
q16	Are there training materials including training manual (SOP), and stationary available for the participants?	1. No 2. Yes, only training manual (SOP) 3. Yes, only stationary	**Stationary:** Bag or file holder, Note book, Pen, Pencil, Sharpener, Rubber, Highlighter	

q17	Is there registration sheet, attendance sheet and schadule available and follow regularly?	1. Yes 2. Only Schadule 3. Only Registration 4 Only Attendance Sheet		
q18	Are there adequate number of participants and facilitators in the class?	1. No 2. Yes, only participants 3. Yes, only facilitators 4. Yes, participants and facilitators	**Adequate number of Participants:** 20-30 Participants per Class **Adequate number of Facilitators:** 2-4 Facilitators per class	
q19	Do the sessions follow the schadule correctly?	1. No 2. Yes		
q20	Do the facilitators follow the training methodology according to the facilitator`s guideline appropriately?	1. No 2. Yes		
q21	Are the facilitators able to facilitate the sessions appropriately?	1. No 2. Yes	1. Technical Explanation of sessions 2. Time Management 3. Self trust 4. Control of Class	
q22	Did they conduct the field visit for practical work?	1. No 2. Yes	Practical work according to the facilitator guideline in the health facility	
q23	Do the participants met the pre and posttest?	1. No 2. Yes		
q24	Does the perdiem and transportation cost meet the training budget plan?	1. No 2. Yes		
q25	Do they distribute the certificates for the participants?	1. No 2. Yes		

q26	Do they add the serial number for the certificates>	1. No 2. Yes		
Post Training:				
q27	Was there a significant changes considered from pre-test to post-test.		Compare average percentage of pre-test with post-test	
q28	Do they send the training report for MoPH/ PND?	1. No 2. Yes		

Suggestion:

This checklist is filled in by the Supervisor/ Monitor:

Name/ Signature:

Position:

and witnessed or certified by the in-charge person:

Name/ Signature:

Position:

The Ministry of Public Health
General Directorate of Preventive Medicine
Department of Public Nutrition

Monitoring Checklist for Inpatient Department of Severe Acute Malnutrition (IPD-SAM)				
Identification				
q1	**Date:** Year ( )/ Month ( )/ Day ( )			
q2	**Location:** Province ( )/ District ( )			
q3	**Health Facility Type**: 1. PH, 2. DH, 3. CHC, 4. BHC, 5. SHC, 6. Other ( ), HF ID: _____			
SN	**Questions**	**Answers**	**Remarks**	**Comments**
Input indicators				
q4	Are there adequate staff for the IPD-SAM?	1. No 2. Yes	0 doctor, 2 nurse, 1 cleaner/ cook at all time	
q5	Have Health facility staff received training on management of severe acute malnutrition?	1. No 2. Yes, but not certificate 3. Yes, certificate	One week standard training according to MoPH guideline	
q6	Is there at least one copy accessible MoPH guidelines on management of	1. No 2. Yes		

	severe acute malnutrition?			
q7	Are there IEC materials (posters, take-home-brochures, flipcharts) on management of severe malnutrition available in the HF?	1. No 2. Yes, not appropriate/Adequate 3. Yes, appropriate/ Adequate	Appropriate: Visible, readable, Adequate: enough for distribution(based on case load)	
q8	Are there adequate number of forms and formats necessary for MSM?	1. No 2. Yes, not adequate/complete 3. Yes, adequate/complete	TSS, MSS, home treatment card, Follow up card, register book, W/H table (z-score),	
q9	Is there the flow chart of operational guideline visible in the wall?	1. No, 2. Yes, but not appropriate 3. Yes appropriately	Appropriate: Visible, readable,	
q10	Are there adequate equipment for the center?	1. No 2. Yes, not adequate/complete* 3. Yes, adequate/complete	Baby scale, measuring board, Salter scale, MUAC tape, Beds, toys.	
q11	Are there enough supplies for management of severe malnutrition available in the health facility?	1. No2. Yes, not adequate/complete*3. Yes, adequate/complete	F75, F100, Plumpy nut,CMV, Resomal(at least for one month)	
q12	Are there enough pharmaceuticals available to treat severe malnutrition?	1. No 2. Yes, not adequate/complete* 3. Yes, adequate/complete	Regular drug supplly,Antibiotics 1st and 2nd line, (based on monthly case load),Vit A,Iron,Folic acid	

q13	Are there enough utensil to prepare food for children?	1. No 2. Yes, not adequate/complete 3. Yes, adequate/complete		
q14	Is there appropriate facilities for mothers to bath and do laundry?	1. No 2. Yes, but not appropriate 3. Yes appropriate		
Process				
q15	Are the admission and discharge criteria followed correctly according to the protocol?	1. No, 2. Yes, admission, not discharge 3. Yes discharge not admission 4. Yes admission and discharge		
q16	Are transfer of patients from phase I to phase II and so on done correctly according to the protocol?	1. No, 2. Yes		
q17	Do the health staffs provide counseling to the clients	1. No 2. Yes, not adequate 3. Yes, adequate	(cause of malnutrition, consequences, prevention, management, follow up…)	
q18	Does the doctor:			
a	Make good interview of the mothers	1. No 2. Yes		
b	Make complete clinical examination	1. No 2. Yes		

c	Write the complete feeding prescription	1. No 2. Yes		
q19	Are the rooms' temperature adequate for malnourished children?	1. No 2. Yes	27-30 oC	
q20	Are children weight and height measured and interpreted correctly?	1. No 2. Yes	According to z-score table	
q21	Is therapeutic milk prepared properly(based on protocol)?	1. No2. Yes	**Properly:** Measurements correct, dishes clean, safe water, ingredients available	
q22	Are children fed according to the schedule and recorded correctly?	1. No 2. Yes, feeding or recording not correct 3. Yes, feeding and recording correct	According to the patients file	
q23	Are the staff able to wash their hands with water and soap?	1. No 2. Yes	Availablity,soap,water,sink, clean towel,	
q24	Do the children have access to adequately equipped play room?	1. No 2. Yes appropriate, no enough toys 3. Yes appropriate, enough toys		
q25	Are mothers able to wash their hands with soap and water?	1. No 2. Yes		
Output				

q26	Check the registers for:			
a	Average number of admission/ day during the last month:	_____		
b	Correct registration of clients according to the standard form	1. No, 2. Yes, but not appropriate 3. Yes appropriately	Appropriate: clear, filling all required fields	
c	Cure rate:	_____		
d	Length of stay	_____		
e	Defaulter rate	_____		
q27	Are children's filing system completed correctly?	1. No, 2. Yes		

Suggestion:

This checklist is filled in by the Supervisor/ Monitor:

Name/ Signature:

Position:

and witnessed or certified by the in-charge of the health facility:Name/ Signature:Position:

The Ministry of Public Health
General Directorate of Preventive Medicine
Department of Public Nutrition

Monitoring Checklist for Outpatient Department of Severe Acute Malnutrition (OPD-SAM)

Identification				
q1	**Date:** Year ( )/ Month ( )/ Day ( )			
q2	**Location:** Province ( )/ District ( )			
q3	**Health Facility Type**: 1. PH, 2. DH, 3. CHC, 4. BHC, 5. SHC, 6. Other ( ), HF ID: _____			
SN	**Questions**	**Answers**	**Remarks**	**Comments**
Input indicators				
q4	Are there adequate staff for the OPD-SAM?	1. No 2. Yes	0 doctor, 1 nurse, 1 cleaner	
q5	Have Health facility staff received training on management of severe acute malnutrition?	1. No 2. Yes, but not certificate 3. Yes, certificate	One week standard training according to MoPH guideline	
q6	Is there at least one copy accessible MoPH guidelines on management of severe acute malnutrition?	1. No 2. Yes		

q7	Are there IEC materials (posters, take-home-brochures, flipcharts) on management of severe malnutrition available in the HF?	1. No 2. Yes, not appropriate/Adequate 3. Yes, appropriate/ Adequate	Appropriate: Visible, readable, Adequate: enough for distribution	
q8	Are there adequate number of forms and formats necessary for OPD-SAM?	1. No 2. Yes, not adequate/complete 3. Yes, adequate/complete	Home treatment card, Follow up card, Register book, W/H table (z-score),	
q9	Is there the flow chart of operational guideline visible in the wall?	1. No, 2. Yes, but not appropriate 3. Yes appropriately	Appropriate: Visible, readable,	
q10	Are there adequate equipment for the center?	1. No 2. Yes, not adequate/complete* 3. Yes, adequate/complete	Baby scale, measuring board, Salter scale, MUAC tape	
q11	Are there enough supplies for management of severe malnutrition available in the health facility according monthly case load?	1. No 2. Yes, not adequate/complete* 3. Yes, adequate/complete	Plumpy nut	
q12	Are there enough pharmaceuticals available to treat severe malnutrition according monthly case load?	1. No2. Yes, not adequate/complete*3. Yes, adequate/complete	Antibiotics and other necessary drugs	
Process				

q13	Are the admission and discharge criteria followed correctly according to the protocol?	1. No, 2. Yes, admission, not discharge 3. Yes discharge not admission 4. Yes admission and discharge		
q14	Do all counselor have MoPH certificate	1. No 2. Yes, not adequate 3. Yes, adequate		
q15	**Does the doctor:**			
a	Make good interview of the mothers	1. No 2. Yes		
b	Make complete clinical examination	1. No 2. Yes		
c	Write the complete feeding prescription	1. No 2. Yes		
d	Assess the appetite of the child correctly	1. No, 2. Yes,		
e	Provide counseling.	1. No 2. Yes		
q16	Are the rooms' temperature adequate for malnourished children?	1. No 2. Yes	27-30 oC	
q17	Are children weight and height measured and interpreted correctly?	1. No 2. Yes	According to z-score table	
q18	Are the staff able to wash their hands with soap and water?	1. No 2. Yes		
q19	Are mothers able to wash their hands with soap and water?	1. No 2. Yes		

q20	Are children referred correctly to IPD-SAM or OPD-MAM?	1. No 2. Yes		
Output				
q21	Check the registers for:			
a	Average number of admission/ day during the last month:	_____		
b	Correct registration of clients according to the standard form	1. No, 2. Yes, but not appropriate 3. Yes appropriately	Appropriate: clear, filling all required fields	
c	Cure rate:	_____		
d	Defaulter rate	_____		
q22	Are children's filing system completed correctly?	1. No, 2. Yes		

Suggestion:

** If not complete, please circle the item which is not available.*

This checklist is filled in by the Supervisor/ Monitor:

Name/ Signature:

Position:

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and witnessed or certified by the in-charge of the health facility:

Name/ Signature:

Position:

The Ministry of Public Health
General Directorate of Preventive Medicine
Department of Public Nutrition

Monitoring Checklist for OPD-MAM/ OPD-AM-PLW			
General information			
Date of visit: Year ( )/ Month ( )/ Day ( ) -- **Implementer Partner**: ( )			
Supervisor/monitor: Name ( ) Position ( ) Organization ( )			
Location: Province name and code ( )/ District name and code ( )			
Health Facility Type: 1. PH, 2. DH, 3. CHC, 4. BHC, 5. SHC, 6. Other ( ), HF Code: _____and HF name:			
SN	**Questions** **Input indicators**	**Answers (1=Yes, 0=No)**	**Remarks**
q1	Are appropriate number of staff available for delivering OPD-MAM ?		
q2	Is qualified female staff available for measuring nutrition status of PLW?		
q3	Have the relevant staff received initial and refresher (every 3-6 months) training?		
q4	Is clear job description available for each OPD-MAM staff?		
q5	Is feeding centre register book filled properly and regularly ?		
q6	Are the information cosistent in register book, monthly report, stock report, patient cards, etc?		
q7	Does the filing/record keeping system exist for OPD-MAM?		
q8	Are tables, charts/graphs put on the wall showing the key information (monthly admissio,		

	cure, default, death, coverage area map, etc)?		
q9	Is the map of program coverage area available?		
q10	Does OPD-MAM work-plan distribution plan/schdule exist and used?		
q11	Does the Nutrition guideline & SOP present and used by relevant staff?		
q12	Does the relevant staff regularly review OPD-MAM data/performance indicators and take action in weekly and monthly meeting?		
q13	Are the required equipment available for nutrition status assessment and food measurement?		
q14	Are measuring equipment accurate and checked daily?		
q15	Is there safe water available for staff, beneficiaries and caretakers?		
q16	Is soap and water available for hand washing?		
q17	Are OPD-MAM rooms and courtyard clean?		
q18	Are latrines clean and sufficient in number for demand?		
q19	Is sufficient space available for OPD-MAM service delivery?		
q20	Are shelves and floor free of food scraps/refuse?		
q21	Are equipment/ utensils washed and dried properly, and stored in clean, dry place?		
Process			
q22	Do MUAC measure correctly?		
q23	Do wieght and hight measure correctly?		

q24	Is anthropometric index calculated correctly and nutrition status correctly assessed?		
q25	Are admission and discharge criteria applied correctly?		
q26	Are the 5 steps for admission of MAM-CH and AM-PLW followed properly?		
q27	Are the MAM-CH and AM-PLW referred to required medical care (vaccination, deworming, ANC, PNC, etc)?		
q28	Is health and nutrition education provided regularly to PLW and child caregivers?		
q29	Is ration size meets MOPH protocol (nutrient quality and quantity)		
q30	Are food commodities stored in clean, controlled area?		
q31	Is the food stock managed properly (FIFO, LIFO, stock-cards, etc)?		
q32	Are the defaulted/absent cases regularly and tiemly followed-up?		
	Output		
q33	Is released ration appropriate according to the ration size and consistent with number of beneficiaries?		
q34	Are community agree with objectives and design of OPD-MAM?		
	Overall scores (%)	0%	
	Gaps/Problmes	**Solutions/Recommendations**	

The Ministry of Public Health
General Directorate of Preventive Medicine
Department of Public Nutrition

Monitoring Checklist for IYCF activities in Health Facilities

Identification			
q1	**Date:** Year ( )/ Month ( )/ Day ( )		
q2	**Location:** Province ( )/ District ( )		
q3	**Health Facility Type**: 1. PH, 2. DH, 3. CHC, 4. BHC, 5. SHC, 6. Other ( ), HF ID: _____		
SN	**Questions**	**Answers**	**Remarks**
Input indicators			
q4	Is there a trained IYCF counselor in the HF?	1. No 2. Yes (but not present) 3. Yes (present)	A trained IYCF counselor should have received one week training on IYCF counseling skills.
q5	Is there at least one copy accessible MoPH guidelines on IYCF in the clinic?		
a	Breastfeeding counseling guideline:	1. No 2. Yes	
b	Baby friendly Hospital initiative	1. No 2. Yes 3. Not required	
c	Complementary feeding	1. No 2. Yes	

q6	Are there posters on IYCF visible in the HF?	1. No 2. Yes but not appropriate 3. Yes, appropriate	Appropriate: Readable, clean and in a visible place for clients.
q7	Are there brochures on IYCF available in the health facility to be distributed to clients?	1. No 2. Yes but not enough for distribution 3. Yes, distributed	Take home brochures should be available and distributed to those who come for counseling
q8	Are there other IEC materials on IYCF available in the HF?	1. No 2. Yes but not used, 3. Yes, used	Other IYCF IEC materials include flipcharts, flipcards, models etc.
q9	Are there recording and reporting forms and formats available for IYCF counseling?	1. No 2. Yes but not complete 3. Yes, complete	Including register form, reporting form approved by MoPH
Process indicators			
q10	Are the health staff know the following key messages of IYCF?		Health staffs (Medical doctor, Nurse and midwife)
a	Early initiation	1. No, 2. Yes	Initiation of breastfeeding within first hour after birth.
b	Exclusive breastfeeding	1. No,2. Yes	Exclusive breastfeeding for the first six months of life
c	Complementary feeding	1. No, 2. Yes	Introducing nutrients rich food at the age of six months
d	Code of breast milk substitutes	1. No, 2. Yes	No promotion and free distribution of breast milk substitutes
q11	Does the counselor provide Breast feeding counseling to pregnant and lactating mothers?	1. No, 2. Yes, but not appropriate 3. Yes appropriately	Appropriate counseling: includes proper listening to mothers, explaining clearly and helping/ showing some important methods
q12	Does the counselor provide appropriate counseling on complementary feeding?	1. No, 2. Yes, but not appropriate 3. Yes appropriately	Appropriate counseling: indicating of proper timing, frequency and types of food e.g. semi solid or solid food

Output indicators			
q13	**Check the register of IYCF counseling for:**		
a	Average number of counseling/ day during the last month:	_____	
b	Correct registration of clients according to the standard form	1. No, 2. Yes, but not appropriate 3. Yes appropriately	Appropriate: clear, filling all required fields
c	Is there referred-in women from the community for counseling?	1. No, 2. Yes	Referred by CHWs, support groups or Family action groups.
q14	Are women give birth in the HFs start immediately breastfeeding?	1. No, 2. Yes within 6 hour 3. Yes, within 1 hour	

Suggistion:

This checklist is filled in by the Supervisor/ Monitor:

Name/ Signature:

Position:

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and witnessed or certified by the in-charge of the health facility:

Name/ Signature:

Position:

FORM 21. QUARTERLY NUTRITION SUPPLY REQUEST FORM

!!!! Please go to a separate row for each province, each item and each partner !!!!

Quarterly Nutrition Supply Request Form 0

Province	Implementing Partner Name	Item numb	Item description	Program	For IPD_SAM (Select TFU or SC	Quarter	Request Date dd-mm-yy	Current balance from last release (cartons for therapeutic, units for non-consumable items)	# children expected to be admitted in next quarter (Last quarter admissions from Nut.database)	Needed quantity for next 3 months (in cartons and ONLY for therapeutic Supply)	BUFFER stock (20% buffer stock)	Total quantity to be allocated (Needs + Buffer - Current balance)	Request quantity of Non-consumable items (heightboard, scales, ..)	Comments
0	0		0	0	0	0	1/0/00	0	0				0	0
0	0		0	0	0	0	1/0/00	0	0				0	0
0	0		0	0	0	0	1/0/00	0	0				0	0
0	0		0	0	0	0	1/0/00	0	0				0	0
0	0		0	0	0	0	1/0/00	0	0				0	0
0	0		0	0	0	0	1/0/00	0	0				0	0
0	0		0	0	0	0	1/0/00	0	0				0	0
0	0		0	0	0	0	1/0/00	0	0				0	0

CONSIGNEE REGISTRATION FORM

Organization Name:	
Complete Address:	
City:	
District:	
Province:	
Country:	
Full name & Phone No. of Contact Person	
Full name of Contact Person:	

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