



MINISTRY OF
MEDICAL SERVICES



MINISTRY OF
PUBLIC HEALTH & SANITATION

A close-up photograph of a young child with a severely thin, balding head, characteristic of acute malnutrition. The child is looking towards the camera with a neutral expression. They are wearing a blue patterned shirt. The background is a blurred outdoor setting with dirt ground and some structures.

National Guideline for Integrated Management of Acute Malnutrition

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Foreword

Malnutrition remains an important threat in developing countries. It is estimated that 2.2 million children below five years old die every year of malnutrition. Of importance is the high infant and under five mortality rates (currently at 77 and 115/1000 live births respectively in Kenya) of which half has malnutrition as the main underlying cause. Although national levels of acute malnutrition is at 6% in Kenya, levels of acute malnutrition in Arid and Semi Arid areas have consistently remained above the emergency threshold of 15%. It is important to note that HIV and AIDS pose a new and significant challenge in addressing acute malnutrition as the two are intrinsically related.

Traditionally, the Ministry of Health has rehabilitated severe acute malnourished patients within inpatient services, mainly through District and Provincial Hospitals. This posed a great challenge in ensuring successful treatment as malnourished patients were mixed with other ill patients, increasing the risk of cross infection and as a result of mortality. Experience from arid districts has shown that this approach also led to low program coverage and high defaulter rates.

Global emerging evidence has shown that mortality rates could be reduced when patients presenting with medical complications are admitted as inpatients, while others (with no complication) are admitted as outpatients and followed-up at community level. This coupled with active case finding and referral at community level could significantly reduce complicated cases of acute malnutrition and increase coverage.

The National Guideline for Integrated Management of Acute Malnutrition brings forth a new approach in the management of severe acute malnutrition for effective care and rehabilitation. It also addresses management of moderate acute malnutrition and management of acute malnutrition in the context of HIV and AIDS. The guideline provides an opportunity for all health care providers to realize the importance of proper management at health facility and community levels, ensure successful diagnosis and treatment and, consequently address one of the Millennium Development Goal (MDG) on reducing child mortality.


The Ministries of Medical services and Public Health and Sanitation will provide the necessary leadership and coordination to all partners in the field of nutrition in addressing the problem of malnutrition in a holistic manner.



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Contents

Acronyms

List of Tables and Figures

Introduction	1
Objectives of the Guidelines	2
Intended Readers	2
How to Use the Guidelines	2
Content of the Guidelines	3
Section One: Overview of Malnutrition	4
Definition of Malnutrition	4
Components of Nutrition	4
Categories of Malnutrition	5
Causes of Malnutrition	6
Diagnosis of Acute Malnutrition	7
Triage of Acute Malnutrition	9
Steps on Admission	12
Appendix 1.1: Checklist to Identify Reasons for Acute Malnutrition	14
Appendix 1.2: Appetite Test	16
Appendix 1.3: Taking Anthropometric Measurements	18
Appendix 1.4: Calculating Weight-for-height	21
Appendix 1.5: Weight-for-Length and Weight-for-Height WHO Charts 2006 (Boys)	22
Appendix 1.6: Weight-for-Length and Weight-for-Height WHO Charts 2006 (Girls)	31
Appendix 1.7: BMI-for-Age WHO Charts 2006 (Boys)	40
Appendix 1.8: BMI-for-Age WHO Charts 2006 (Girls)	41
Appendix 1.9: Weight-for-Height (z-scores) NCHS Chart for children aged 6-59 months	42
Appendix 1.10: Weight-for-Age WHO Chart 2006 (Boys and Girls)	44
Section Two: In-patient Management of Severe Acute Malnutrition	
For children over six months, adolescents and adults	
Overview	46
Requirement for the In-patient Setting	49
Admission Criteria for In-patient Care	50
In-patient Stabilization and Rehabilitation of Malnourished Patients	51

Contents

Phase One Treatment	52
Nutrition Support: Diet and Frequency	52
Preparation of F-75	52
Feeding Technique for Severely Malnourished Children	53
Routine Medication	54
Malaria Treatment	56
Measles Vaccination	57
De-worming	57
Summary of Medications	57
Surveillance	58
Criteria for Transfer: Phase 1 to Transition Phase	58
Transition Phase Treatment	58
Nutrition Support: Diet and Frequency	58
Preparation of F-100	59
Plans for Eventual Out-Patient Care – Use of RUTF	59
Routine Medication	60
Surveillance	61
Criteria for Transfer: Transition Phase to Phase 2	61
Criteria to Return to Phase 1 from Transition Phase	61
Phase Two: Treatment of Severe Acute Malnutrition	62
Nutrition Support: Diet and Frequency	62
Preparation of F100	62
Routine Medication	62
Surveillance	64
Discharge	64
Treatment of Medical Complications	65
Hypoglycemia	65
Hypothermia	66
Dehydration	67
Septic (or Toxic) Shock for All Malnourished Patients	74
Absent Bowel Sounds, Gastric Dilatation, Abdominal Distension	75
Heart Failure	76
Severe Anemia	77
Administration of Medication	78

Contents

Appendix 2.1: Multi-Chart	79
Appendix 2.2: Recipes for F75, F100 and ReSoMal using CMV	81
Appendix 2.3: Dietary Requirements for Older Children, Adolescents and Adults	82
Appendix 2.4: Medical History and Examination Patient History	83
Appendix 2.5: Transfer Form	85
Appendix 2.6: Register Format	87
Appendix 2.7: Dehydration	88
Appendix 2.8: Monthly Report Format for Management of SAM (In-patient/Out-patient)	89
Section Three: Management of Acute Malnutrition, Infants Less Than Six Months	90
Infants less Than 6 Months With a Prospect of Being Breastfed	
Overview	90
Nutrition Support: Diet, Frequency and Suckling Technique	94
Routine Medication	94
Surveillance	94
Care for Mothers	94
Discharge Criteria	95
Follow-up	95
Infants Less Than 6 Months Without a Prospects of Being Breastfed	95
Overview	95
Admission Criteria	95
Nutrition Support: Diet and Frequency	96
Preparation of F100 Diluted	96
Routine Medication	97
Surveillance	97
Criteria for Discharge	97
Follow-up	97
Section Four: Out-Patient Therapeutic Care for Severe Acute Malnutrition Children Over 6 Months	98
Overview	98
Admission Process	98
Requirements for Out-patient Therapeutic Care	99
Admission Criteria	99
Nutrition Support: Diet Frequency	100
Routine medication	100
Registration	101

Contents

Surveillance	102
Discharge Criteria	102
Home Care for the Malnourished Patient	102
Criteria for Transfer: Out-Patient Therapeutic Care to In-patient Phase 1	103
Failure to Respond	104
Estimating RUTF Monthly Requirements for a Health Facility	106
Appendix 4.1: RUTF Specification	107
Appendix 4.2: Admission Card for Outpatient Therapeutic Care	109
Appendix 4.3: Out-Patient Therapeutic Care Ration Card	111
Appendix 4.4: Medical Examination Checklist for OTP	112
Appendix 4.5: Key Messages for OTP	113
Appendix 4.6: Example of OTP Checklist for Field Support Visits	114
Section Five: Management of Moderate Acute Malnutrition	116
Overview	116
Selection Criteria	117
Admission and Discharge Criteria	118
Steps for Managing Moderate Acute Malnutrition	119
Data Collecting and Reporting	121
Requirements for Managing Moderate Malnutrition	122
Monitoring and Evaluation	123
Appendix 5.1: Energy and Protein Values of Commonly Used Foods in Kenya	124
Appendix 5.2: Recipes: Local Recipes	125
Appendix 5.3: Proportions of Premix	128
Appendix 5.4: Preparation of Porridge with Fortified Flour	129
Appendix 5.5: Supplementary Feeding Ration Card	130
Appendix 5.6: Monthly Report Format for Management of Moderate Acute Malnutrition	131
Appendix 5.7 Feeding Programme Stock Card	132
Section Six: Management of Malnutrition for Children in the Context of HIV and AIDS	133
Overview	133
Patients with HIV & AIDS	133
Objectives and Guidelines for Providing Nutritional Care for PLHIV (from GoK, MOH, 2007, National Guidelines for Nutrition and HIV and AIDS)	134
Summary of Critical Nutrition Practices for PLHIV	134

Contents

Clinical Guidelines for an Integrated Approach to the Nutritional Care of HIV-Infected Children (6 months to 14 years)	135
Deciding If and When to Refer a Child with HIV and AIDS	141
The HIV-infected Child with Special Needs	141
Children on Antiretroviral Treatment	143
Appendix 6.1: HIV and Infant Feeding	146
Appendix 6.2: Micronutrient Requirements for Children	147
Appendix 6.3: Nutritional Composition of Fortified Supplementary Blended Foods	148
Appendix 6.4: WHO Clinical Staging of HIV and AIDS for Children (2006)	149
Section Seven: Emergency Nutrition Response	151
Overview	151
Steps for Emergency Response	151
Nutrition Programme Beneficiary Selection Process for Children	154
Implementing Emergency Nutrition Interventions	155
Supplementary Feeding Programme: On-site Feeding and Take-home Feeding	155
Therapeutic Feeding Programme	155
Requirements for an Emergency Nutrition Intervention	156
Monitoring and Evaluation	159
Linking Nutrition Programmes with Other Interventions	159
Appendix 7.1: Stakeholders' Roles in Emergency Response	160
Appendix 7.2: Coordination Structure	161
Appendix 7.3: Determining Number of Beneficiaries	162
Appendix 7.4: Supply Procurement	163
Appendix 7.5: Performance Indicators for Nutrition Interventions	166
Section Eight: Community Mobilization	167
Overview	167
Community Mobilization	169
Appendix 8.1: Home Visit Checklist	171
Section Nine: Nutrition Information, Education and Communication	173
Overview	173

Contents

Approach to Nutrition Education	173
Channels of Communication	174
Guidelines on Key Nutrition Information	174
Nutrition Subjects and Message Content	175
Nutrition Counselling	178
Monitoring and Evaluation of Nutrition Education	179
Appendix 9.1: Nutrition Messages	180

Acronyms

ALRMP	Arid Lands Resource Management Project
ASAL.....	Arid and Semi Arid Lands
ART.....	Anti Retroviral Therapy (treatment course of drugs for HIV)
ARV	Anti-Retroviral (drugs used against HIV and AIDS)
CBO	Community Based Organisation
CHC	Community Health Committee
CHW	Community Health Worker
CHEW.....	Community Health Extension Worker
DHS	Demographic Health Survey
DTC.....	Diagnostic Testing and Counselling
F75	Special milk for stabilization of severe malnutrition
F100.....	Special milk for catch up growth for severe malnutrition
GM.....	Growth Monitoring
GoK.....	Government of Kenya
HIV	Human Immunodeficiency Virus
IEC.....	Information, Education and Communication
IMAM	Integrated Management of Acute Malnutrition
IMCI	Integrated Management of Childhood Illness
KEPI	Kenyan Extended Programme of Immunisation
MAM.....	Moderate Acute Malnutrition
MoH	Ministry of Health
MUAC	Mid-Upper Arm Circumference
NCHS	National Centre for Health Statistics (USA anthropometric standards)
ORS	Oral Rehydration Salts
OTP.....	Out-patient Therapeutic Programme
PLWHA	Person Living With HIV /AIDS
ReSoMal	Rehydration Solution for Malnourished
RUTF.....	Ready to Use Therapeutic Food
SAM.....	Severe Acute Malnutrition
SFP	Supplementary Feeding Programme
TB.....	Tuberculosis
UNICEF.....	United Nations Children's Fund
VCT.....	Voluntary Testing and Counselling
WFP	World Food Programme
WHO	World Health Organisation

List of Tables and Figures

Section One

Table 1.1 Characteristics of Marasmus and Kwashiorkor

Table 1.2 MUAC criteria to identify malnutrition of children under five years in the community

Table 1.3 Anthropometric criteria to identify severe, moderate and at risk categories of acute malnutrition for all age groups and pregnant/lactating women

Table 1.4 Triage to determine treatment of either severe or moderate malnutrition

Table 1.5 Admission criteria to determine in-patient or out-patient care

Table 1.6 Minimum amount of Plumpy'nut per kg of body weight required to pass Appetite Test

Figure 1.1 How to measure MUAC

Figure 1.2 Taking a child's weight

Figure 1.3 Taking a child's length

Figure 1.4 Taking a child's height

Figure 1.5 UNICEF Conceptual Framework: Causes of Malnutrition

Figure 1.6 District level structure required to support management of severe acute malnutrition

Section Two

Table 2.1 Admission Criteria

Table 2.2 Checklist for each phase of the management of acute malnutrition for in-patient treatment

Table 2.3 Quantity of F75 or prepared milk to give during Phase 1, per kg of body weight

Table 2.4 Vitamin A systematic treatment

Table 2.5 Dosage of Amoxicillin, Gentamycin and Chloramphenicol

Table 2.6 Dosage for de-worming, by age group

Table 2.7 Summary of routine medication for in-patient treatment of severe acute malnutrition

Table 2.8 Quantity of F100 to give during Transition Phase, per kg of body weight

Table 2.9 Quantity of RUTF to give during Transition Phase, quantity per kg of body weight

Table 2.10 Quantity of F100 to give during Phase 2, per kg body weight

Table 2.11 Phase 2 surveillance

Table 2.12 Discharge criteria for recovered patients

Table 2.13 Preparation of sugar water (10% dilution)

Table 2.14 Recipes for F-75 Formula

Table 2.15 Recipes for F-100 Formula

Table 2.16 Preparation of ReSoMal Solution with ORS

Table 2.17 Preparation of small quantities

Table 2.18 Preparation of F-100 diluted

Figure 2.1 Feeding technique

Figure 2.2 Treatment of dehydration – assessment

Figure 2.3 Treatment of dehydration – monitoring

Figure 2.4 Diagnosis and treatment of anaemia

Section Three

Table 3.1 Criteria of admission, infants with a prospect of being breastfed

Table 3.2 Quantity of F100 diluted to give to infants with a prospect of being breastfed, per kg of body weight

Table 3.3 Discharge criteria, infants with a prospect of being breastfed

Table 3.4 Criteria of admission, infants without a prospect of being breastfed

List of Tables and Figures

Table 3.5 Quantity of F100 diluted to give to infants without a prospect of being breastfed, in phase 1, per kg of body weight

Table 3.6 Quantity of F100 diluted to give to infants without a prospect of being breastfed, in phase 1, per kg of body weight

Table 3.7 Discharge criteria, infants without a prospect of being breastfed

Figure 3.1 Supplemental Sucking Technique

Section Four

Table 4.1 Summary of criteria for admission to out-patient care

Table 4.2 Quantity of RUTF per class of body weight, daily and weekly

Table 4.3 Drug regime for OTP patients

Table 4.4 Surveillance tasks and frequency

Table 4.5 Discharge criteria

Table 4.6 Failure to respond: out-patient criteria

Table 4.7 Checklist: possible causes for failure to respond

Table 4.8 Nutritional composition of RUTF

Table 4.9 Medical examination checklist (OTP to Inpatient Care) for Severe Acute Malnutrition

Section Five

Table 5.1 Nutritional status classification – use of cut off points

Table 5.2 Indicators for admission and discharge

Table 5.3 Food commodities and ration sizes per patient for 14 days

Table 5.4 Summary of routine medical treatment for children under five

Table 5.5 Summary of routine medical treatment for pregnant and lactating mothers

Figure 5.1 Summary to determine the nutritional status of a patient and the required action

Section Six

Table 6.1 Energy needs of HIV-infected children (kcal/day)

Table 6.2 Assess, clarify and decide a nutritional care plan

Table 6.3 Nutrition Care Plan A (WHO – nutritional care of HIV-infected children, 2006)

Table 6.4 Nutrition Care Plan B (WHO – nutritional care of HIV-infected children, 2006)

Table 6.5 Nutrition Care Plan C (WHO – nutritional care of HIV-infected children, 2006)

Table 6.6 Recommendations for follow-up of a child with HIV and AIDS

Table 6.7 Laboratory parameters for monitoring infants and children at baseline, before and during ART

Table 6.8 Micronutrient requirements for children 0-6 years

Table 6.9 Nutritional composition of fortified supplementary food

Table 6.10 WHO clinical staging of HIV and AIDS for children with confirmed HIV infection

Section Seven

Table 7.1 Take home (or dry ration) versus on-site feeding (or wet ration)

Table 7.2 Nutritive value of food commodities

List of Tables and Figures

Table 7.3 Stakeholders' roles in emergency response

Table 7.4 Supplementary feeding estimates: commodity requirement

Table 7.8 In-patient centre: semi-solid feeds

Table 7.9 RUTF requirements, estimated for a 10kg child

Table 7.10 Estimates of common drugs used in supplementary feeding centers

Table 7.11 Stock balance sheet (sample)

Table 7.12 Performance indicators for nutrition interventions

Figure 7.1 Flow chart outlining Kenya MOH supply system

Figure 7.2 Coordination structure

Section Eight

Table 8.1 Key community representatives

Table 8.2 Referral criteria for malnourished persons and the relevant actions

Figure 8.1 Levels of care in the Kenya Essential Package of Health (KEPH)

Figure 8.2 Community representation and linkage at the health facility

Figure 8.3 Process of community mobilization

Section Nine

Table 9.1 General guidance on counselling

Figure 9.1 Steps to conduct a nutrition education session

Introduction

Malnutrition is an important public health issue particularly for children under five years old who have a significantly higher risk of mortality and morbidity than well nourished children. Maternal and child under-nutrition is prevalent in low and middle income countries. New research estimates that the risks related to stunting, severe wasting and intrauterine growth retardation are linked to 2.2 million deaths and 21% of disability-adjusted life years worldwide for children under five years. Deficiencies in Vitamin A and zinc are estimated to be responsible for 600,000 and 400,000 childhood deaths respectively¹. Sub-optimum breast feeding, particularly for infants under-six months, is also a leading factor in childhood morbidity and mortality.

In Kenya, the infant and the under-five mortality rates are 77 and 115 per 1000 live births respectively. The national figure for acute malnutrition of children under five years old is estimated at 6%, however there are huge variations in different regions of the country². In the Arid and Semi Arid Areas (ASAL) where food insecurity and natural disaster have affected the population, rates of acute malnutrition are between 15-20% of children under five, and sometimes substantially higher.

HIV and AIDS and malnutrition are intrinsically linked. Although the prevalence of HIV in the general population reduced from 13.5% in 1999 to 5.9% in 2006³, the prevalence among pregnant women is approximately 7.8 %, resulting in an estimated 90,000 children at risk of mother-to-child (MTCT) transmission of HIV. It is estimated that between 33,500 and 65,500 children in Kenya are becoming infected with HIV from their parents each year, reversing the previous gains in child survival in the country over the past two decades⁴.

The Ministry of Health (MoH) in partnership with international and national non-governmental organizations (NGOs) has addressed the high rates of acute malnutrition in the ASAL areas, saving many lives and rehabilitating children. The cyclical nature of events in the ASAL calls for a systematic approach to build government health system capacity to address acute malnutrition in the long-term. The limited capacity of Government of Kenya (GoK) health staff to manage the growing burden of malnutrition, however, is a challenge. Therefore, strengthening the community for an integrated approach to acute malnutrition, especially to maintain sustainability and increase the access to services, is key in Kenya. To identify

1 Robert E Black et al, "Maternal and Child Under-Nutrition: Global and Regional Exposures and Health Consequences", The Lancet 2008; 371: 243-260.

2 The State of the World's Children 2006, Excluded and Invisible, UNICEF

3. Ministry of Health website, www.health.go.ke

4. 'Food and Nutrition Handbook', World Food Programme (2000).

malnutrition threats early on and manage malnutrition through existing health structures in the community is the ideal approach (opening selective feeding programmes should only occur when the health infrastructure is overwhelmed or has limited capacity to ensure adequate access and coverage).

There are two basic objectives of the management of acute malnutrition:

- 1) to prevent malnutrition by early identification, public health interventions and nutrition education;
- 2) to treat acute malnutrition to reduce associated morbidity and mortality.

These guidelines address both objectives, with emphasis on the identification and treatment of acute malnutrition. The Integrated Management of Acute Malnutrition National Guidelines for Health Workers at the health facilities will be instrumental in building capacity of the MoH health staff and their partners.

Objective of the Guidelines

The National Guideline for Integrated Management of Acute Malnutrition was developed as a tool to assist health workers in the assessment and appropriate management with services and/or counselling for the treatment of acute malnutrition both Moderate Acute Malnutrition (MAM) and Severe Acute Malnutrition (SAM). Although the guidelines will focus on children under five years, some information specific to older children, adolescents and adults is also included. There is no sufficient evidence-based research on the treatment of adult acute malnutrition to go into elaborate detail, but as evidence becomes available the guidelines will be updated. To treat acute malnutrition successfully, the guidelines must be used in their entirety. Strict implementation of the guidelines can significantly contribute towards reducing the under five mortality rate due to acute malnutrition.

Intended Readers

The National Guideline for Integrated Management of Acute Malnutrition is intended for use by health managers, clinicians, nutritionists and community workers supported by the required level of training and with adequate resources to perform the activities and deliver treatment in a safe and effective manner. Job aids will be developed to assist in the daily activities in the management of acute malnutrition. The guidelines can also be used by training institutions to standardize the management of acute malnutrition with new graduates joining the health force.

The guidelines will also help NGOs involved in nutrition rehabilitation during emergencies to guide and standardise treatment protocols established by the MoH. Whilst some local adaptations may be made, these should be done only with the collaboration and consent of MoH.

The guidelines complement other material developed by the MoH, including the Kenyan IMCI/IMAI (Integrated Management of Childhood Illness) and the Kenyan National Guidelines on Nutrition and HIV&AIDS, as well as complement national strategies and policies.

How to Use the Guidelines

The user should adapt The National Guideline for Integrated Management of Acute Malnutrition to his and her own operational settings, taking into consideration the following:

- Efforts to manage acute malnutrition must go hand in hand with efforts to curb the underlying causes of malnutrition in the target area.

- Access to other national guidelines that provide details on specific topics. All of the national guidelines can be obtained from the MoH.
- Consult with MoH technical officers for additional technical support if required (i.e. nutritionists, dieticians, nurses and medical doctors who are familiar with the support and management of acute malnutrition) and with staff from appropriate humanitarian agencies; United Nations agencies (UNICEF, WFP, WHO, FAO); and NGOs.
- Where resources are limited, diets can be modified according to food availability. However macro- and micro-nutrient specific requirements for treatment of acute malnutrition must be observed.
- Select the relevant section for the situation. One section may refer to another section for additional information.
- Make use of job aids such as posters, counselling cards, and flowcharts to explain aspects during counselling.

Note that these guidelines are subject to revision and updates. Please inform the Division of Nutrition (DoN) of the MoH and relevant technical staff of any useful information that may improve the guidelines

Content of the Guidelines

The guidelines are divided into eight sections, each with a relevant appendix.

Introduction: Gives an overview of malnutrition in Kenya, the purpose of the guidelines, the intended readers, and steps to use the guidelines.

Section 1: Defines malnutrition, classifications and triage. Also explains the principles of management of severe acute malnutrition.

Section 2: Guidelines on management of severe acute malnutrition in patients older than 6 months old in the in-patient setting.

Section 3: Guidelines on management of acute malnutrition for infants less than 6 months old in the in-patient setting.

Section 4: Guidelines on management of severe acute malnutrition in patients older than 6 months in the out-patient setting known as out-patient therapeutic care/programme (OTP).

Section 5: Guidelines on management of moderate acute malnutrition for children, adolescents and adults through the MoH infrastructure.

Section 6: Guidelines on management of acute malnutrition for children in the context of HIV and AIDS.

Section 7: Discuss the emergency nutrition response to increased levels of acute malnutrition.

Section 8: Discuss the community structure and the strategy for the management of acute malnutrition in the community.

Section 9: Discuss nutrition information, education and communication.

Section One:

Overview Of Malnutrition

Definition of Malnutrition

Malnutrition is defined as “a state when the body does not have enough of the required nutrients (under-nutrition) or has excess of the required nutrients (over-nutrition).

Components of Nutrition

Macronutrients

Protein, fat and carbohydrates are macronutrients that make up the bulk of a diet and supply the body’s energy. In resource-poor populations, carbohydrates (i.e. starches and sugars) are often a large part of the diet (80%) and the main source of energy. Fats, also an essential component in the diet, in resource-poor populations make-up about 10% of the diet. Fats also supply energy and are important in cell formation. Proteins are required to build new tissue and are derived mostly from animal origin such as milk, meat and eggs. These animal by-products contain essential amino acids that cannot be produced by the body but must be eaten. Protein from cereals and pulses alone do not provide the sufficient balanced essential amino acids. Therefore, to obtain the correct balance without requiring protein from animal sources, cereals and pulses must be combined when planning a meal.

Micronutrients

There are around forty different micronutrients that are essential for good health. Micronutrients are divided into two classes. Most micronutrients are classed as Type I, which includes iodine, iron, Vitamins A and C. Deficiencies in Type I micronutrients do not affect growth (i.e. the individual can have normal growth with appropriate weight and still be deficient in micronutrients) and thus deficiency in Type I micronutrients is not determined by anthropometric measurement. Deficiencies in Type I micronutrients will cause major illness such as anaemia, scurvy and impaired immunity.

Type II micronutrients, including magnesium, sulphur, nitrogen, essential amino-acids, phosphorus, zinc, potassium, sodium and chloride, are essential for growth and tissue repair. Type II micronutrients are required only in small quantities, but the correct balance is essential

1. The Sphere Project, Humanitarian Charter and Minimum Standards in Disaster Response, 2004

for good health. A deficiency in any of the Type II micronutrients will lead to growth failure, measured by stunting and wasting.



Categories of Malnutrition

There are two categories of malnutrition: Acute Malnutrition and Chronic Malnutrition. Children can have a combination of both acute and chronic. Acute malnutrition is categorised into Moderate Acute Malnutrition (MAM) and Severe Acute Malnutrition (SAM), determined by the patient's degree of wasting. All cases of bi-lateral oedema are categorized as SAM. These guidelines address management and treatment of acute malnutrition.

Chronic malnutrition is determined by a patient's degree of stunting, i.e. when a child has not reached his or her expected height for a given age. To treat a patient with chronic malnutrition requires a long-term focus that considers household food insecurity in the long run; home care practices (feeding and hygiene practices); and issues related to public health.

SAM is further classified into two categories: Marasmus and Kwashiorkor. Patients may present with a combination, known as Marasmic Kwashiorkor. Patients diagnosed with Kwashiorkor are extremely malnourished and at great risk of death. Table 1.1 lists the characteristics of Marasmus and Kwashiorkor.

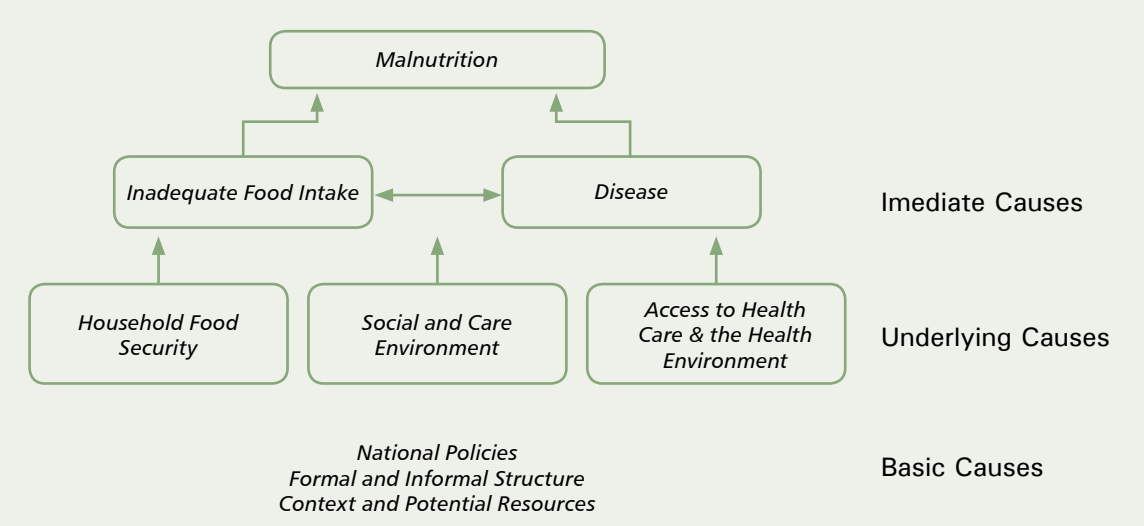
Table 1.1: Characteristics of Marasmus and Kwashiorkor

Marasmus	Kwashiorkor
	
<ul style="list-style-type: none"> • Severe weight loss and wasting • Ribs prominent • Limbs emaciated • Muscle wasting • May have good appetite • With correct treatment, good prognosis 	<ul style="list-style-type: none"> • Bi-lateral oedema and fluid accumulation • Loss of appetite • Brittle thinning hair • Hair colour change • Apathetic and irritable • Face may seem swollen • High risk of death

Causes of Malnutrition

The UNICEF conceptual framework, developed in the 1990s and shown below, summarizes the causes of malnutrition.

Figure 1.1: UNICEF Conceptual Framework: Causes of Malnutrition



Immediate Causes of Malnutrition

Lack of food intake and disease are immediate cause of malnutrition and create a vicious cycle in which disease and malnutrition exacerbate each other. It is known as the **Malnutrition-Infection Complex**. *Thus, lack of food intake and disease must both be addressed to support recovery from malnutrition.*

Underlying Causes of Malnutrition

Three major underlying causes of malnutrition include:

- **Food:** Inadequate household food security (limited access or availability of food).
- **Health:** Limited access to adequate health services and/or inadequate environmental health conditions.
- **Care:** Inadequate social and care environment in the household and local community, especially with regard to women and children.

Basic Causes of Malnutrition

The basic causes of malnutrition in a community originate at the regional and national level, where strategies and policies that affect the allocation of resources (human, economic, political and cultural) influence what happens at community level. Geographical isolation and lack of access to markets due to poor infrastructure can have a huge negative impact on food security. When conducting an assessment to determine the causes of malnutrition in a community, it is important to research the actions at each level and how these actions, or inactions, influence malnutrition rates.

Diagnosis of Acute Malnutrition

Selection Criteria for Acute Malnutrition

Admission criteria for acute malnutrition are determined by a child's weight and height, by calculating weight-for-height as "z-score" (using WHO Child Growth Standard, 2006)², and presence of oedema. All patients with bi-lateral oedema are considered to have severe acute malnutrition. See Table 1.3 for anthropometric criteria.

Mid-Upper Arm Circumference (MUAC) is often the screening tool used to determine malnutrition for children in the community under five years old. A very low MUAC (< 11.5cm for children under five years) is considered a high mortality risk and is a criteria for admission with severe acute malnutrition. See Table 1.2 below for MUAC criteria for children under-five years.

Table 1.2: MUAC criteria to identify malnutrition of children under five years in the community

Severely Malnourished	Moderately Malnourished	At Risk of malnutrition
less than 11.5cm	11.5cm to 12.4cm	12.5cm to 13.4cm

The admission criteria for infants below 6 months are substantially different than for infants over six months. See Section 3 (page 95).

A Note on Admission Criteria for Adolescents and Adults

International guidelines that recognize cut-off measurements to identify moderate acute malnutrition and severe acute malnutrition in adolescents and adults do not yet exist. Body Mass Index (BMI) varies considerably in different populations. In the adolescent age bracket (13 to 18 years) BMI-for-age can be used, but is not applicable in the event of growth retardation or when age is indeterminate. Adolescents experience growth spurts (rapid growth), therefore anthropometric measurements to determine wasting can be difficult.

For adults (older than 18 years), BMI is the main way to identify acute malnutrition, however it is important to include clinical signs such as bi-lateral oedema and dehydration that affect BMI results. Other underlying medical conditions, such as TB and HIV and AIDS, must also be considered. For adults, MUAC in combination with clinical signs can also identify patients who need specialized nutrition interventions.

During pregnancy MUAC does not change considerably, while a pregnant woman's weight should increase. A low MUAC of <21cm during pregnancy can indicate a need for extra nutritional support due to the pregnancy. A low MUAC for the mother during pregnancy increases the risk of growth retardation of the foetus³. Criteria for admission for nutrition rehabilitation of different age groups is gathered from the sources listed below.^{4, 5, 6}

Table 1.3 presents the criteria to identify at risk, moderate and severe malnutrition using MUAC, weight-for-height z-score, and BMI for adults. These criteria are used in a health facility where equipment is available and staff are trained to take weight and height measurements.

2. The WHO Child Growth Standards were introduced in Kenya in 2008. The standards will replace the NCHS reference for measurement of child malnutrition. See Appendix 1.8 for the NCHS reference.
3. The Sphere Project, Humanitarian Charter and Minimum Standards in Disaster Response, 2004.
4. Woodruff, Bradley A. and Arabella Duffield. "Adolescents: Assessment of Nutritional Status in Emergency-Affected Populations", Secretariat of the UN ACC/Sub-Committee on Nutrition, July 2000. www.unsystem.org/SCN/archives/adolescents/index.htm
5. Adults, Assessment of Nutritional Status in Emergency-Affected Populations, Steve Collins, Arabella Duffield and Mark Myatt, July 2000.
6. The Sphere Project, Humanitarian Charter and Minimum Standards in Disaster Response, 2004

Table 1.3: Anthropometric criteria to identify severe, moderate and at risk categories of acute malnutrition for all age groups and pregnant/lactating women

Indicator	Severe Acute Malnutrition (SAM)	Moderate Acute Malnutrition (MAM)	At Risk of Acute Malnutrition
Infants less than 6 months			
W/L	W/L < - 3 Z-Score	Static weight or losing weight at home	Static weight or losing weight at home Z-Score
Oedema	Oedema Present	Oedema Absent	Oedema Absent
Other signs	Too weak to suckle or feed	Poor feeding	Poor feeding
Children 6 months to 10 years			
W/H Z-Scores	< -3 Z-Score	Between -3 to < -2 Z-Score	Between -2 to < -1 Z-Score
MUAC (6 - 59 months only)	< 11.5cm	11.5 to 12.4cm	12.5-13.4cm
Oedema	Oedema Present	Oedema Absent	Oedema Absent
Adolescent (10 years to 18 years)			
MUAC	< 16cm	N/A	N/A
Oedema	Oedema Present	Oedema Absent	Oedema Absent
Adults (older than 18 years)			
MUAC	< 16cm irrespective of clinical signs	16-18.5cm with no relevant clinical signs. Few relevant social criteria	N/A
MUAC	16-18.5cm plus one of the following: 1) Oedema 2) Inability to stand 3) Apparent dehydration	N/A	N/A
BMI	< 16 (Grade III chronic underweight)	16-17	17-18.5
Oedema	Oedema Present	Oedema Absent	Oedema Absent
Pregnant & lactating women			
MUAC	No available criteria	< 21 cm	

* Anthropometric criteria based on WHO Child Growth Standards (2006)

Steps to Identify Acute Malnutrition in Children

Children who are malnourished are at high risk of mortality and morbidity. It is important that malnourished children, or those at risk of malnutrition, are identified and appropriate care commenced. Community Health Workers (CHWs) may identify children at risk of malnutrition in the community. Health facility staff can determine if children who are brought for other reasons are in fact at risk of malnutrition.

Ministry of Health (MoH) programmes such as Integrated Management of Childhood Illness (IMCI) and Mother & Child Health (MCH) focus on children under five years old, and screening for malnutrition is part of the programme process. When nutrition screening is available in the community, CHWs identify children who are malnourished with anthropometric measurements (e.g. MUAC) or where oedema is evident. Malnourished children are referred to the nearest health facility, nutrition unit, health post, or hospital out-patient department. The child's anthropometric measurements are re-checked by a nurse or health worker. Those who appear very sick, weak, emaciated or underweight require fast-track admission.

For detailed information on the community structure in identifying malnourished individuals, refer to processes of community mobilization in Section Eight, "Community Nutrition Care" (page 172).

Children identified with bi-lateral pitting oedema must be referred to the nearest health facility.

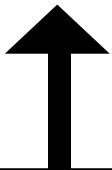
Triage of Acute Malnutrition

Community Health Workers (CHWs) can screen children in the community using MUAC and the presence of oedema. They refer those who are malnourished to a health facility. However, the diagnosis of malnutrition for children under five years old is the responsibility of health staff at a health clinic, health dispensary, or an out-patient department (OPD) and hospital casualty department.

The procedure to determine a patient's medical history, nutritional status and appropriate treatment is presented in Table 1.4. This procedure conforms to the Kenya IMCI Guidelines.

Table 1.4: Triage to determine treatment of either severe or moderate malnutrition

ASK:	1. Has there been any weight loss in previous month?
	2. Does the patient have an appetite.
	3. Does the patient have any medical condition that will impair nutritional status?
	4. Is the breast-feeding child suckling well?
LOOK AND FEEL FOR:	Visible signs of wasting
CHECK:	MUAC
	Weight
	Height/length
	Bilateral-oedema
DETERMINE:	Level of malnutrition using W/H reference charts
LOOK AT SHAPE OF GROWTH CURVE:	1. Has the child lost weight?
	2. Is the growth curve flattening?

Ask	Look & Feel		Look & Feel	Look & Feel		
1. Has there been any weight loss in previous month? 2. Does the patient have an appetite 3. Does the patient have any medical condition that will impair his nutritional status? 4. Is the breast feeding child suckling well?	Visible signs of wasting Check MUAC Weight, Height/length, Bilateral-oedema Determine BMI or WFH Look at the shape of the growth curve 1. Has the child lost weight? 2. Is the growth curve flattening?		Severely Acutely Malnourished	Visible signs of wasting Check MUAC Weight, Height/length, Bilateral-oedema Determine BMI or WFH Look at the shape of the growth curve 1. Has the child lost weight? 2. Is the growth curve flattening?	No Appetite ↑ With complications** Good Appetite ↑ No complications**	Refer patient to inpatient care Refer or admit patient for outpatient therapeutic care (OTP) Refer or admit patient for management of moderate malnutrition and nutrition counselling
			Moderately Acutely Malnourished or 'at risk'			
			Healthy			

** See table 1.5

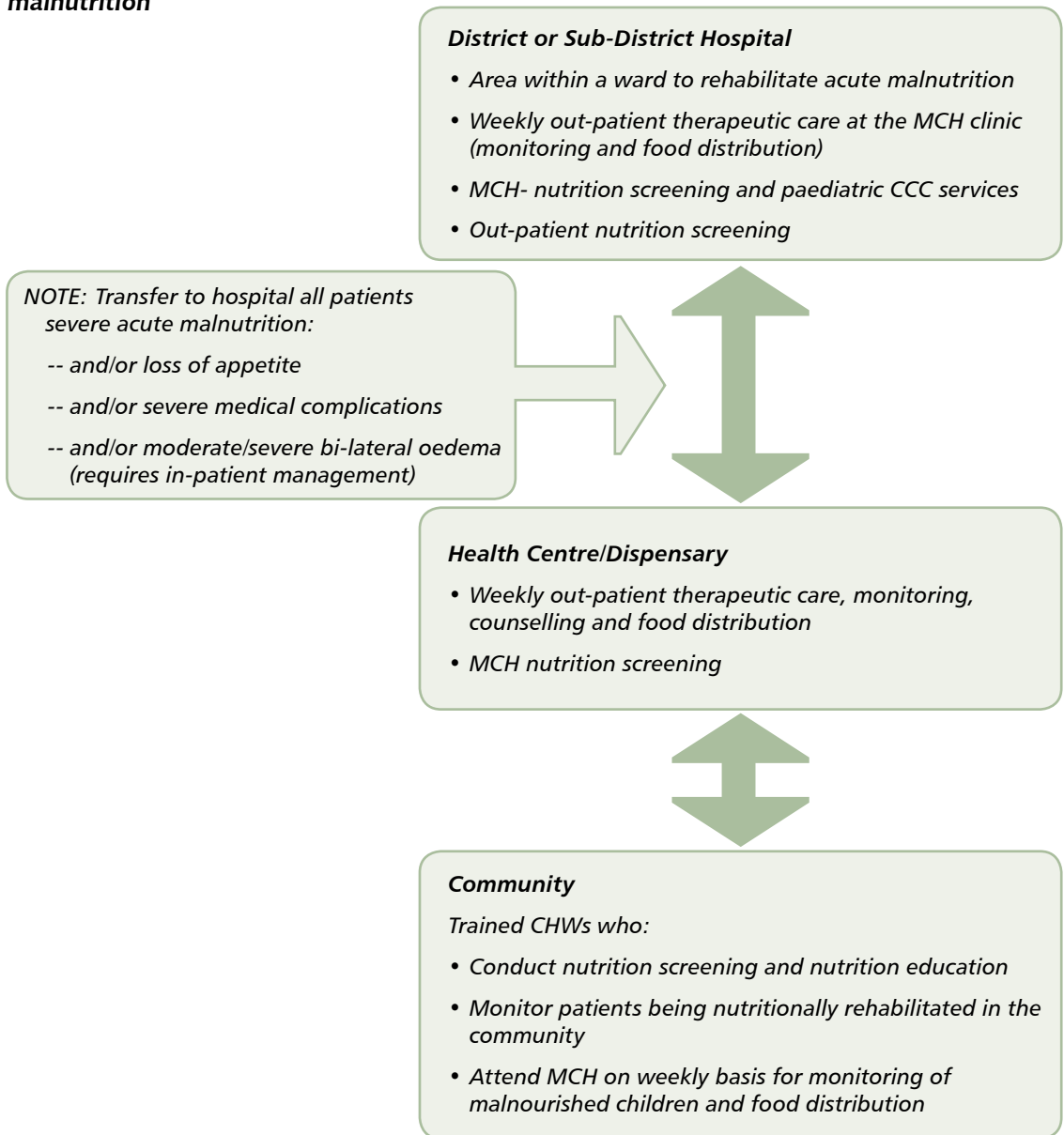
When severe acute malnutrition is identified, the anthropometric admission criteria are the same whether the child can access an in-patient facility or out-patient therapeutic care. If there is no out-patient therapeutic care available, all patients who have a criteria in the red column (severe malnutrition) of Table 1.3 - with or without complications - are admitted to the health centre's in-patient section where they are to stay for each phase of the treatment of severe acute malnutrition. Also, patients with medical complications and/or ++, +++ oedema and lack of appetite require in-patient treatment of acute severe malnutrition.

When out-patient therapeutic care service is available, the health staffs determine the patients who are eligible for it. Patients without complications and with good appetite may go directly for out-patient treatment. It is important to conduct an Appetite Test (see Appendix 1.2) to confirm if the child has a good appetite.

Based on the information gathered above, health workers should classify if the patient is severe acute malnourished (SAM), moderate acute malnourished (MAM) at risk of acute malnutrition or healthy, and follow criteria below accordingly to determine if severely malnourished children should receive in-patient or out-patient care.

Table 1.5: Admission criteria to determine in-patient or out-patient care

Factor	Criteria for all admissions with severe acute malnutrition	
Anthropometric criteria for infants 6 months to children 18 years	W/H < -3 Z-score MUAC < 11.5cm - 6 months to 5 years only	
Anthropometric criteria for adults (older than 18 years)	BMI < 16 MUAC < 16cm OR MUAC 16.1cm to 18.5cm with clinical complications	
Factor	In-Patient Care	Out-patient Care
Bi-lateral oedema	<ul style="list-style-type: none"> • Bilateral pitting oedema Grade 2 (++) and Grade 3 (+++) • Both Marasmus and Kwashiorkor present 	Bilateral pitting oedema Grade 1 (+)
Appetite Test	Failed or border-line	Passed
Caregiver	No suitable or willing caregiver	Suitable and willing caregiver
Skin	Open skin lesions present	No open skin lesions
Medical Complications	<ul style="list-style-type: none"> • Severe vomiting • Hypothermia with temperature <35°C (axillary) or <35.5°C (rectal) • Fever >39°C • Pneumonia • Respiration <ul style="list-style-type: none"> -> 60 resps/minute under 2 months - >50 resps/minute from 2-12 months - 40 resps/minute from 1-5 years - >30 resps/minute over 5 years old - Or any chest in-drawing • Extensive infection • Very weak, apathetic, unconscious • Fitting or convulsions • Severe dehydration based on history and clinical signs • Any condition that requires an infusion or NG tube feeding • Very pale (severe anaemia) 	<ul style="list-style-type: none"> • Alert • No medical complications

Figure 1.2: District level structures required to support management of severe acute malnutrition

Steps on Admission

Step 1: Check for general signs of malnutrition

Health facility staff must check the patient for general signs of malnutrition.

Step 2: Gather patient information

Refer to Appendix 1.3 at the end of this section for anthropometric measurements

Health facility staff:

- Carry-out the patient's anthropometric measurements.
- Measure weight and height (if the patient's height is less than 87cms, or if the patient is younger than two years old, measure length instead), and calculate weight-for-height (z-score).
- Take a MUAC measurement.
- Check for bi-lateral oedema.
- Record all measurements on patient card and register.

Step 3: Identify cause of malnutrition

Fill out a brief checklist to assist to identify why the child is malnourished. See Appendix 1.1 “Checklist to Identify Reasons for Acute Malnutrition” for details.

- Is there an illness that leads to the child’s weight loss?
- Are there economic issues in the family that reduces food availability and/or access?
- Is there dynamics within the household contributing to the situation? (e.g. the mother sick)

Step 4 : Conduct Appetite Test

If outpatient therapeutic care is available, conduct the Appetite Test. The Appetite Test is one of the main criteria to determine if a severe acute malnourished patient requires in-patient or out-patient treatment. See Appendix 1.2 “Appetite Test” for details.

Step 5: Determine appropriate treatment

A triage process must be established so that the acutely ill are examined and admitted quickly to the in-patient facility to start treatment immediately. In other words, a “fast track system” must be in place.

Establish the following parameters:

- Any child older than six months and a MUAC < 11.5cm must be admitted to the nutrition programme for treatment of severe acute malnutrition as low MUAC has a high mortality risk
- If out-patient treatment of malnutrition is not available, the patient must be admitted to an in-patient facility for nutrition management. If out-patient management of malnutrition is available, determine if the patient can be managed in the community or requires admission to an in-patient facility using Table 1.6 “Admission Criteria to determine in-patient or out patient care”.
- A child identified as malnourished by the MUAC community screening process but whose anthropometric measurements taken at the health facility are not considered severely malnourished is referred for Supplementary Feeding if it is available. (The community screening process may include higher MUAC cut-offs such as between 11.5 to 13.4cm for “the moderate” and “at risk” groups.)

SAM patients who are waiting for admission in the health facility waiting area should receive 50ml glucose 10% to prevent hypoglycaemia (1 rounded 5ml teaspoon of sugar in 50ml water) by a member of the health staff. See section two, table 2.13 “preparation of sugar water 10% dilution,”

It is important that the parent or caregiver who attends the health facility with a child screened by a CWH is acknowledged for the visit. This is particularly important when the child is not considered malnourished by the weight and height anthropometry taken at the health centre. Otherwise, the community can become disgruntled with the service, particularly if mothers travel a long distance. It can seriously affect uptake of the services and negatively impact on coverage. Every mother should be congratulated for taking good care of her child.

If there are consistent errors in the recorded MUACs when children who have been referred from the community arrive at the health facility, it is necessary to re-train CHWs on the measurement techniques. This will avoid patients attending health centres unnecessarily.

Appendix 1.1: Checklist to Identify Reasons for Acute Malnutrition

Child Name: _____

Child Age: _____

Illness:

Has the child been sick in the past week? Yes No

If Yes:

What was the sickness? _____

Did the child go for treatment for the illness? Yes No

If Yes:

Where did the child go for treatment? _____

What treatment did the child receive? _____

Nutrition

1. Is the child still breastfeeding? Yes No

If No, when did the breast feeding stop? _____

If yes:

Has there been a change in breastfeeding pattern in the last 2 weeks? _____

Feeding less because the child is not interested in breast milk? _____

Mother has been away from the home so breast milk not available? _____

List any other reasons: _____

2. Has the child commenced complementary feeding Yes No

If yes, how often did you feed the child yesterday:

1 time 2 times 3 times More frequently

3. List the foods given yesterday at each meal:

Meal 1: _____

Meal 2: _____

Meal 3: _____

Other meals: _____

4. Does the child eat from own plate? Yes No

5. Has the feeding pattern of the child changed in the last 1-2 weeks? Yes No

If yes how has it changed? _____

Why has it changed? _____

Family Illness

Has any other member of the family been ill in the last month? Yes No

If Yes, who was sick? _____

What was the illness? _____

Environment

What is your water source?

Piped water/river/stream/pond/deep well/shallow well/other (circle)

Have you a latrine or access to latrine/toilet? Yes No

Economic Issues

Who is the main income generator? _____

How does this person make an income? _____

Has access to work changed in the last month? Yes No

In what way has it changed?

Is there less money for basic foods?

Do you plant anything at home? Yes No

If yes, list what you plant:

When is it harvested?

Have you any domestic animals? Yes No (cows, goats, sheep, camels)

If Yes, how many of each animal:

- Number of Cattle? _____
- Number of goats? _____
- Number of sheep? _____
- Number of camels? _____

Analysis

What is the main reason for malnutrition for this child?

Appendix 1.2: Appetite Test

Why do the appetite test?

- Malnutrition changes the way infections and other diseases express themselves. Children who are malnourished and severely affected by a classical childhood illness will frequently show no signs of disease. However, major medical complications lead to a loss of appetite.
- Even though the definition and identification of the severely malnourished is by anthropometric measurements, there is not a perfect correlation between anthropometric and metabolic malnutrition. It is mainly metabolic malnutrition that causes death. Often the only sign of severe metabolic malnutrition is a reduction in appetite. By far the most important criterion to decide if a patient should be sent to in- or out-patient management is the Appetite Test.
- A poor appetite means that the child has a significant infection or a major metabolic abnormality such as liver dysfunction, electrolyte imbalance, and cell membrane damage or damaged biochemical pathways. These patients are at immediate risk of death. A child with a poor appetite will not take the diet at home and will continue to deteriorate or die. As the patient does not eat the special therapeutic food (RUTF) the family will take the surplus and become habituated to sharing.

How to conduct the Appetite Test

- The appetite test should be conducted in a separate quiet area.
- Explain to the caregiver the purpose of the Appetite Test and how it will be carried out.
- The caregiver washes her hands, and the child's hands and face, with soap and water.
- The caregiver sits comfortably with the child on her lap and either offers the RUTF from the packet or puts a small amount on her finger and gives it to the child.
- The caregiver offers the child the RUTF gently, encouraging the child all the time. If the child refuses, the caregiver continues to quietly encourage the child and takes time over the test. The test usually takes a short time, but may take up to one hour. The child must not be forced to take the RUTF.
- The child needs to be offered plenty of water to drink from a cup while he/she is taking the RUTF.

Results of the Appetite Test

Pass:

- A child who takes at least the minimum amount for their weight in Table 1.8 passes the appetite test.
- The patient is now seen by the nurse to determine any major medical complication (e.g. pneumonia, acute watery diarrhoea, etc.). If there is no medical complication, no open skin lesions, no oedema ++ or +++ (moderate or severe oedema) or wasting and oedema together, then the patient is normally treated as an outpatient if an out-patient community nutrition rehabilitation is available.
- Explain to the caregiver the choices of treatment options and decide with the caregiver whether the child should be treated as an out-patient or in-patient (nearly all caregivers will opt for out-patient treatment).
- Start admission process and treatment appropriate for out-patient therapeutic care (see section four, page 98).

Table 1.6: Minimum amount of Plumpy'nut per kg of body weight required to pass the Appetite Test

<i>Plumpy'nut</i>	
Body weight (Kg)	Sachets
Less than 4 kg	$\frac{1}{8}$ to $\frac{1}{4}$
4 – 6.9	$\frac{1}{4}$ to $\frac{1}{3}$
7 – 9.9	$\frac{1}{3}$ to $\frac{1}{2}$
10 – 14.9	$\frac{1}{2}$ to $\frac{3}{4}$
15 - 29	$\frac{3}{4}$ to 1
Over 30 kg	> 1

Fail:

- A child that does not take at least the amount of RUTF in Table 1.8 is referred for in-patient care.
- Explain to the caregiver the choices of treatment options and the reasons for recommending in-patient care.
- Refer the patient to the nearest paediatric unit for Phase 1 management.
- Start the admission process and treatment of Phase 1 and address medical complications appropriate for in-patients.

Notes

- Even if the caregiver and health worker thinks the child is not taking the RUTF because of the taste or is frightened, the child still needs to be referred to in-patient care for at least a short time. If later the child takes sufficient RUTF to pass the Appetite Test then he can be immediately transferred to the community out-patient treatment.
- The Appetite Test is always performed carefully. Patients who fail the Appetite Test are always offered treatment as in-patients. If there is any doubt then the patient should be referred for in-patient treatment until the appetite returns (this is also the main criterion for an in-patient to continue treatment as an out-patient).
- Ideally, if there is a small weighing scale (the sort used in a domestic kitchen to weigh portions of food) then the sachet of RUTF is weighed before given to the malnourished child to check for appetite. At the end of the Appetite Test the RUTF package is weighed again to calculate how much the child has eaten. When a weighing scale is not available and commercial RUTF is being used, the amount taken from the package can be estimated despite risk of inaccuracies. Table 1.8 is the minimum amount that must be taken.
- The Appetite Test must be carried out at each visit for patients treated in the community.
- Failure of an Appetite Test at any time is an indication for full evaluation and probably transfers for in-patient assessment and treatment.
- If the appetite is "good" during the Appetite Test and the rate of weight gain at home is poor then a home visit should be arranged. It may be necessary to bring a child into in-patient care to do a simple "trial of feeding" in order to differentiate a metabolic problem with the patient from a difficulty with the home environment. A trial of feeding can be the first step to help determine a failure to respond to treatment.

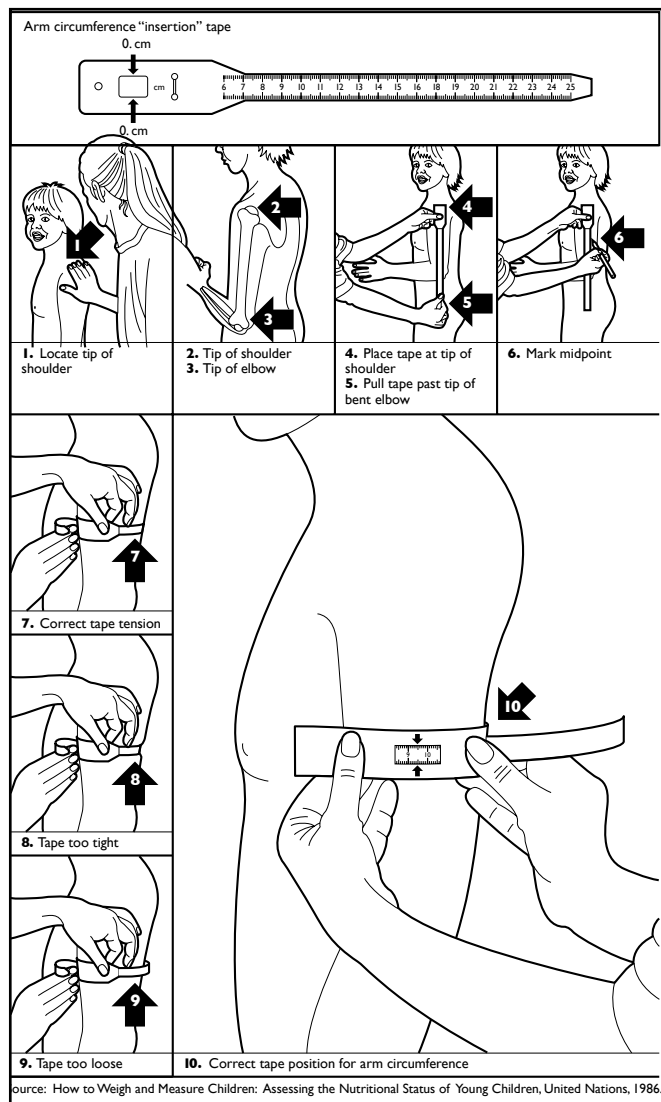
Appendix 1.3: Taking Anthropometric Measurements

Taking a Child's Middle Upper Arm Circumference (MUAC)

MUAC is an alternative way to measure "thinness" (alternative to weight-for-height). It is especially used for children six months old to five years old.

Figure 1.1: How to Measure MUAC

- Ask the mother to remove any clothing covering the child's left arm.
- Calculate the midpoint of the child's left upper arm: first locate the tip of the child's shoulder (arrows 1 and 2 in diagram below) with your finger tips.
- Bend the child's elbow to make the right angle (arrow 3).
- Place the tape at zero, which is indicated by two arrows, on the tip of the shoulder (arrow 4) and pull the tape straight down past the tip of the elbow (arrow 5).
- Read the number at the tip of the elbow to the nearest centimetre. Divide this number by two to estimate the midpoint. As an alternative, bend the tape up to the middle length to estimate the midpoint. A piece of string can also be used for this purpose; it is more convenient and avoids damage to the tape.
- Mark the midpoint with a pen on the arm (arrow 6).
- Straighten the child's arm and wrap the tape around the arm at the midpoint. Make sure the numbers are right side up. Make sure the tape is flat around the skin (arrow 7).
- Inspect the tension of the tape on the child's arm. Make sure the tape has the proper tension (arrow 7) and is not too tight or too loose (arrows 8 and 9). Repeat any step as necessary.
- When the tape is in the correct position on the arm with correct tension, read and call out the measurement to the nearest 0.1cm (arrow 10).
- Immediately record the measurement.



Taking a Child's Weight

Children are weighed with a 25 kg hanging spring scale, graduated to 0.100 kg. Do not forget to re-adjust the scale to zero before each weighing.

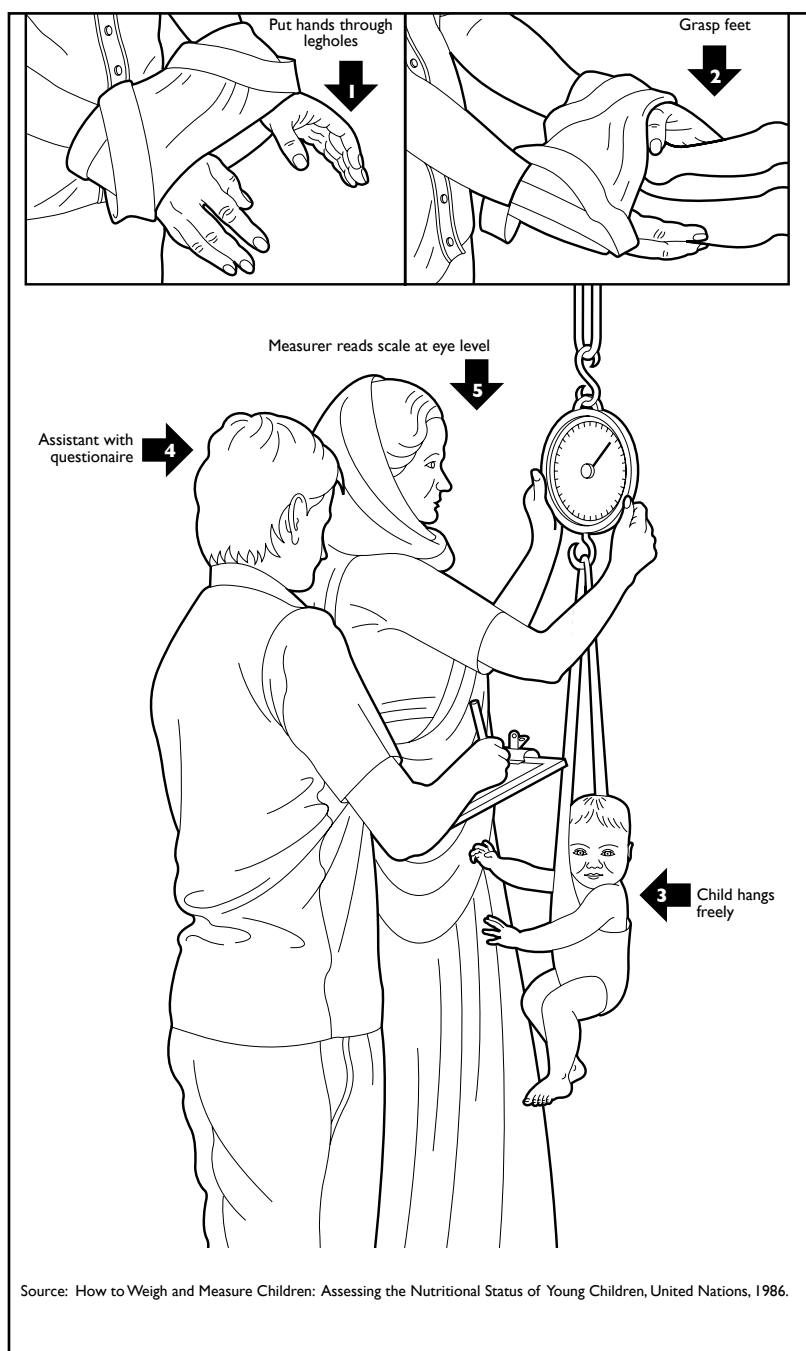
A plastic wash basin should be supported by four ropes that attach (are knotted) underneath the basin. The basin is close to the ground in case the child falls out and to make the child feel secure during weighing. If the basin is soiled, first clean it with disinfectant. The basin is more comfortable and familiar for the child, can be used for ill children, and is easily cleaned. In the absence of a basin, weighing pants can be used although are sometimes inappropriate for very sick children. When the pant is soiled, it can be cleaned and disinfected to reduce the risk to pass an infection to the next patient.

When the child is steady in the basin or pant, record the measurement to the nearest 100 grams, recording with the frame of the scale at eye level. The scales must be checked for accuracy by using a known weight on a regular basis, i.e. weekly.

Figure 1.2: Taking a child's weight

Instructions on Taking the Weight

1. Before weighing the child, take all his/her clothes off
2. Zero the weighing scale (i.e. make sure the arrow is on 0)
3. Ensure that the weighing scale is at eye level
4. Place the child in the weighing pans
5. Make sure the child is not holding onto anything
6. Read the child's weight. The arrow must be steady.
7. Record the weight in kg to the nearest 100g e.g. 6.6 kg
8. Do not hold the scale when reading the weight



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

Taking a Child's Length

Figure 1.3: Taking a child's length

For children less than 87 cm the measuring board is placed on the ground.

1. The child is placed lying down along the middle of the board.
2. The assistant holds the sides of the child's head and positions the head until it firmly touches the fixed headboard with the hair compressed.
3. The measurer places her hands on the child's legs, gently stretches the child and then keeps one hand on the thighs to prevent flexion.
4. While positioning the child's legs, the sliding foot-plate is pushed firmly against the bottom of the child's feet.
5. To read the height measurement, the foot-plate must be perpendicular to the axis of the board and vertical.
6. The height is read to the nearest 0.1 cm

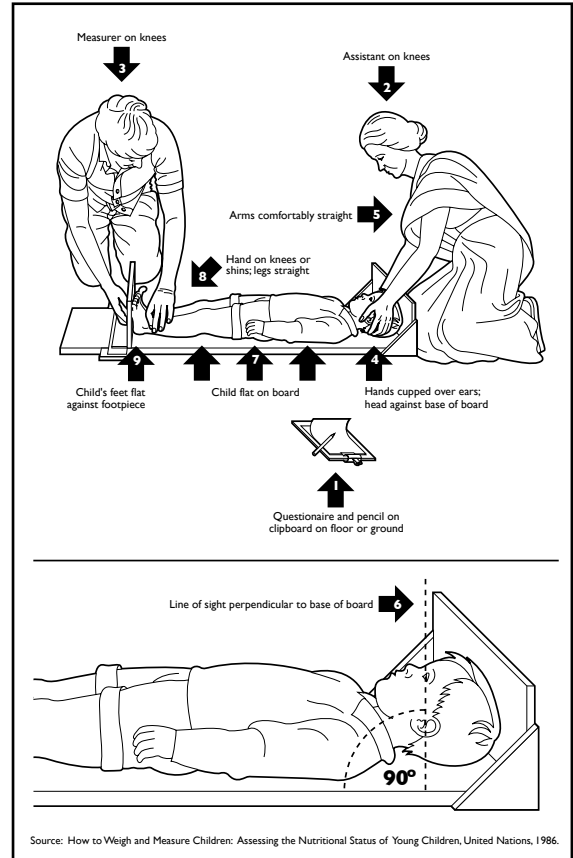
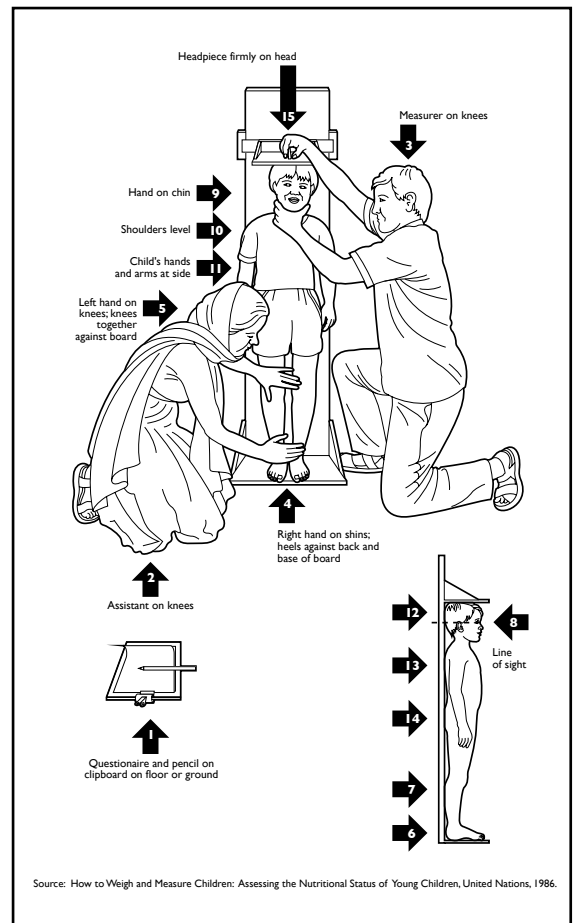


Figure 1.4: Taking a child's height

For children taller than 87 cm the measuring board is fixed upright on level ground.

1. The child stands, upright against the middle of the measuring board.
2. The child's head, shoulders, buttocks, knees, and heels are held against the board by the assistant.
3. The measurer positions the head and the cursor.
4. The height is read to the nearest 0.1 cm
5. Measurement is recorded immediately



Appendix 1.4: Calculating Weight-for-Height

Refer to Appendix 1.5 and 1.6 for examples below.

Example 1: A child (boy) is 63 cm tall and weighs 6.8 kg.

- Look in the table’s first column for the figure 63 (the height).
- Take a ruler or a piece of card, place it under the figure 63 and look across to the other figures on the same line.
- Find the figure corresponding to the weight of the child, in this case 6.8kg.
- Look to see what column this figure is in. In this case it is in the “Weight Normal” column. In this example the child’s weight is normal in relation to his height. He therefore has an appropriate weight for height.

Example 2: A child (boy) is 78 cm tall and weighs 8.2 kg.

This child’s weight is between the -3SD and -2SD column. He is too thin in relation to his height. He is moderately malnourished.

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


Example 3: A child (boy) is 80.4 cm tall and weighs 7.9 kg. These exact figures are not in the table.


For the height: The height measurement has to be rounded to the nearest 0.5cm, see example below.


<i>Height in cm</i>		
	80.0	80.0cm is used for 80.1 and 80.2cm
	80.1	
	80.2	
	80.3	
	80.4	
80.5cm is used for 80.6 and 80.7cm	80.5	80.5cm is used for 80.3 and 80.4cm.
	80.6	
	80.7	
	80.8	
	80.9	
81.0cm is used for 80.8, 80.9cm as well as 81.1 and 81.2 cm	81.0	
	81.1	
	81.2	


For the weight: Looking at the chart, for a height of 80.5 cm the weight is 7.9 kg, this is below 8.3 kg. The child is severely malnourished.


Appendix 1.5: Weight-for-Length and Weight-for-Height WHO Charts 2006 (Boys).


Weight-for-length BOYS		 World Health Organization					
Birth to 2 years (z-scores)							
cm	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
45.0	1.9	2.0	2.2	2.4	2.7	3.0	3.3
45.5	1.9	2.1	2.3	2.5	2.8	3.1	3.4
46.0	2.0	2.2	2.4	2.6	2.9	3.1	3.5
46.5	2.1	2.3	2.5	2.7	3.0	3.2	3.6
47.0	2.1	2.3	2.5	2.8	3.0	3.3	3.7
47.5	2.2	2.4	2.6	2.9	3.1	3.4	3.8
48.0	2.3	2.5	2.7	2.9	3.2	3.6	3.9
48.5	2.3	2.6	2.8	3.0	3.3	3.7	4.0
49.0	2.4	2.6	2.9	3.1	3.4	3.8	4.2
49.5	2.5	2.7	3.0	3.2	3.5	3.9	4.3
50.0	2.6	2.8	3.0	3.3	3.6	4.0	4.4
50.5	2.7	2.9	3.1	3.4	3.8	4.1	4.5
51.0	2.7	3.0	3.2	3.5	3.9	4.2	4.7
51.5	2.8	3.1	3.3	3.6	4.0	4.4	4.8
52.0	2.9	3.2	3.5	3.8	4.1	4.5	5.0
52.5	3.0	3.3	3.6	3.9	4.2	4.6	5.1
53.0	3.1	3.4	3.7	4.0	4.4	4.8	5.3
53.5	3.2	3.5	3.8	4.1	4.5	4.9	5.4
54.0	3.3	3.6	3.9	4.3	4.7	5.1	5.6
54.5	3.4	3.7	4.0	4.4	4.8	5.3	5.8
55.0	3.6	3.8	4.2	4.5	5.0	5.4	6.0
55.5	3.7	4.0	4.3	4.7	5.1	5.6	6.1
56.0	3.8	4.1	4.4	4.8	5.3	5.8	6.3
56.5	3.9	4.2	4.6	5.0	5.4	5.9	6.5
57.0	4.0	4.3	4.7	5.1	5.6	6.1	6.7
57.5	4.1	4.5	4.9	5.3	5.7	6.3	6.9
58.0	4.3	4.6	5.0	5.4	5.9	6.4	7.1
58.5	4.4	4.7	5.1	5.6	6.1	6.6	7.2
59.0	4.5	4.8	5.3	5.7	6.2	6.8	7.4
59.5	4.6	5.0	5.4	5.9	6.4	7.0	7.6


Weight-for-length BOYS							
Birth to 2 years (z-scores)							
cm	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
60.0	4.7	5.1	5.5	6.0	6.5	7.1	7.8
60.5	4.8	5.2	5.6	6.1	6.7	7.3	8.0
61.0	4.9	5.3	5.8	6.3	6.8	7.4	8.1
61.5	5.0	5.4	5.9	6.4	7.0	7.6	8.3
62.0	5.1	5.6	6.0	6.5	7.1	7.7	8.5
62.5	5.2	5.7	6.1	6.7	7.2	7.9	8.6
63.0	5.3	5.8	6.2	6.8	7.4	8.0	8.8
63.5	5.4	5.9	6.4	6.9	7.5	8.2	8.9
64.0	5.5	6.0	6.5	7.0	7.6	8.3	9.1
64.5	5.6	6.1	6.6	7.1	7.8	8.5	9.3
65.0	5.7	6.2	6.7	7.3	7.9	8.6	9.4
65.5	5.8	6.3	6.8	7.4	8.0	8.7	9.6
66.0	5.9	6.4	6.9	7.5	8.2	8.9	9.7
66.5	6.0	6.5	7.0	7.6	8.3	9.0	9.9
67.0	6.1	6.6	7.1	7.7	8.4	9.2	10.0
67.5	6.2	6.7	7.2	7.9	8.5	9.3	10.2
68.0	6.3	6.8	7.3	8.0	8.7	9.4	10.3
68.5	6.4	6.9	7.5	8.1	8.8	9.6	10.5
69.0	6.5	7.0	7.6	8.2	8.9	9.7	10.6
69.5	6.6	7.1	7.7	8.3	9.0	9.8	10.8
70.0	6.6	7.2	7.8	8.4	9.2	10.0	10.9
70.5	6.7	7.3	7.9	8.5	9.3	10.1	11.1
71.0	6.8	7.4	8.0	8.6	9.4	10.2	11.2
71.5	6.9	7.5	8.1	8.8	9.5	10.4	11.3
72.0	7.0	7.6	8.2	8.9	9.6	10.5	11.5
72.5	7.1	7.6	8.3	9.0	9.8	10.6	11.6
73.0	7.2	7.7	8.4	9.1	9.9	10.8	11.8
73.5	7.2	7.8	8.5	9.2	10.0	10.9	11.9
74.0	7.3	7.9	8.6	9.3	10.1	11.0	12.1
74.5	7.4	8.0	8.7	9.4	10.2	11.2	12.2
75.0	7.5	8.1	8.8	9.5	10.3	11.3	12.3


Weight-for-length BOYS		 World Health Organization					
Birth to 2 years (z-scores)							
cm	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
75.5	7.6	8.2	8.8	9.6	10.4	11.4	12.5
76.0	7.6	8.3	8.9	9.7	10.6	11.5	12.6
76.5	7.7	8.3	9.0	9.8	10.7	11.6	12.7
77.0	7.8	8.4	9.1	9.9	10.8	11.7	12.8
77.5	7.9	8.5	9.2	10.0	10.9	11.9	13.0
78.0	7.9	8.6	9.3	10.1	11.0	12.0	13.1
78.5	8.0	8.7	9.4	10.2	11.1	12.1	13.2
79.0	8.1	8.7	9.5	10.3	11.2	12.2	13.3
79.5	8.2	8.8	9.5	10.4	11.3	12.3	13.4
80.0	8.2	8.9	9.6	10.4	11.4	12.4	13.6
80.5	8.3	9.0	9.7	10.5	11.5	12.5	13.7
81.0	8.4	9.1	9.8	10.6	11.6	12.6	13.8
81.5	8.5	9.1	9.9	10.7	11.7	12.7	13.9
82.0	8.5	9.2	10.0	10.8	11.8	12.8	14.0
82.5	8.6	9.3	10.1	10.9	11.9	13.0	14.2
83.0	8.7	9.4	10.2	11.0	12.0	13.1	14.3
83.5	8.8	9.5	10.3	11.2	12.1	13.2	14.4
84.0	8.9	9.6	10.4	11.3	12.2	13.3	14.6
84.5	9.0	9.7	10.5	11.4	12.4	13.5	14.7
85.0	9.1	9.8	10.6	11.5	12.5	13.6	14.9
85.5	9.2	9.9	10.7	11.6	12.6	13.7	15.0
86.0	9.3	10.0	10.8	11.7	12.8	13.9	15.2
86.5	9.4	10.1	11.0	11.9	12.9	14.0	15.3
87.0	9.5	10.2	11.1	12.0	13.0	14.2	15.5
87.5	9.6	10.4	11.2	12.1	13.2	14.3	15.6
88.0	9.7	10.5	11.3	12.2	13.3	14.5	15.8
88.5	9.8	10.6	11.4	12.4	13.4	14.6	15.9
89.0	9.9	10.7	11.5	12.5	13.5	14.7	16.1
89.5	10.0	10.8	11.6	12.6	13.7	14.9	16.2
90.0	10.1	10.9	11.8	12.7	13.8	15.0	16.4
90.5	10.2	11.0	11.9	12.8	13.9	15.1	16.5


Weight-for-length BOYS							
Birth to 2 years (z-scores)		World Health Organization					
cm	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
91.0	10.3	11.1	12.0	13.0	14.1	15.3	16.7
91.5	10.4	11.2	12.1	13.1	14.2	15.4	16.8
92.0	10.5	11.3	12.2	13.2	14.3	15.6	17.0
92.5	10.6	11.4	12.3	13.3	14.4	15.7	17.1
93.0	10.7	11.5	12.4	13.4	14.6	15.8	17.3
93.5	10.7	11.6	12.5	13.5	14.7	16.0	17.4
94.0	10.8	11.7	12.6	13.7	14.8	16.1	17.6
94.5	10.9	11.8	12.7	13.8	14.9	16.3	17.7
95.0	11.0	11.9	12.8	13.9	15.1	16.4	17.9
95.5	11.1	12.0	12.9	14.0	15.2	16.5	18.0
96.0	11.2	12.1	13.1	14.1	15.3	16.7	18.2
96.5	11.3	12.2	13.2	14.3	15.5	16.8	18.4
97.0	11.4	12.3	13.3	14.4	15.6	17.0	18.5
97.5	11.5	12.4	13.4	14.5	15.7	17.1	18.7
98.0	11.6	12.5	13.5	14.6	15.9	17.3	18.9
98.5	11.7	12.6	13.6	14.8	16.0	17.5	19.1
99.0	11.8	12.7	13.7	14.9	16.2	17.6	19.2
99.5	11.9	12.8	13.9	15.0	16.3	17.8	19.4
100.0	12.0	12.9	14.0	15.2	16.5	18.0	19.6
100.5	12.1	13.0	14.1	15.3	16.6	18.1	19.8
101.0	12.2	13.2	14.2	15.4	16.8	18.3	20.0
101.5	12.3	13.3	14.4	15.6	16.9	18.5	20.2
102.0	12.4	13.4	14.5	15.7	17.1	18.7	20.4
102.5	12.5	13.5	14.6	15.9	17.3	18.8	20.6
103.0	12.6	13.6	14.8	16.0	17.4	19.0	20.8
103.5	12.7	13.7	14.9	16.2	17.6	19.2	21.0
104.0	12.8	13.9	15.0	16.3	17.8	19.4	21.2
104.5	12.9	14.0	15.2	16.5	17.9	19.6	21.5
105.0	13.0	14.1	15.3	16.6	18.1	19.8	21.7
105.5	13.2	14.2	15.4	16.8	18.3	20.0	21.9
106.0	13.3	14.4	15.6	16.9	18.5	20.2	22.1

Weight-for-length BOYS		 World Health Organization					
Birth to 2 years (z-scores)							
cm	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
106.5	13.4	14.5	15.7	17.1	18.6	20.4	22.4
107.0	13.5	14.6	15.9	17.3	18.8	20.6	22.6
107.5	13.6	14.7	16.0	17.4	19.0	20.8	22.8
108.0	13.7	14.9	16.2	17.6	19.2	21.0	23.1
108.5	13.8	15.0	16.3	17.8	19.4	21.2	23.3
109.0	14.0	15.1	16.5	17.9	19.6	21.4	23.6
109.5	14.1	15.3	16.6	18.1	19.8	21.7	23.8
110.0	14.2	15.4	16.8	18.3	20.0	21.9	24.1
WHO Child Growth Standards							

Weight-for-height BOYS							
2 to 5 years (z-scores)							
cm	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
65.0	5.9	6.3	6.9	7.4	8.1	8.8	9.6
65.5	6.0	6.4	7.0	7.6	8.2	8.9	9.8
66.0	6.1	6.5	7.1	7.7	8.3	9.1	9.9
66.5	6.1	6.6	7.2	7.8	8.5	9.2	10.1
67.0	6.2	6.7	7.3	7.9	8.6	9.4	10.2
67.5	6.3	6.8	7.4	8.0	8.7	9.5	10.4
68.0	6.4	6.9	7.5	8.1	8.8	9.6	10.5
68.5	6.5	7.0	7.6	8.2	9.0	9.8	10.7
69.0	6.6	7.1	7.7	8.4	9.1	9.9	10.8
69.5	6.7	7.2	7.8	8.5	9.2	10.0	11.0
70.0	6.8	7.3	7.9	8.6	9.3	10.2	11.1
70.5	6.9	7.4	8.0	8.7	9.5	10.3	11.3
71.0	6.9	7.5	8.1	8.8	9.6	10.4	11.4
71.5	7.0	7.6	8.2	8.9	9.7	10.6	11.6
72.0	7.1	7.7	8.3	9.0	9.8	10.7	11.7
72.5	7.2	7.8	8.4	9.1	9.9	10.8	11.8
73.0	7.3	7.9	8.5	9.2	10.0	11.0	12.0
73.5	7.4	7.9	8.6	9.3	10.2	11.1	12.1
74.0	7.4	8.0	8.7	9.4	10.3	11.2	12.2
74.5	7.5	8.1	8.8	9.5	10.4	11.3	12.4
75.0	7.6	8.2	8.9	9.6	10.5	11.4	12.5
75.5	7.7	8.3	9.0	9.7	10.6	11.6	12.6
76.0	7.7	8.4	9.1	9.8	10.7	11.7	12.8
76.5	7.8	8.5	9.2	9.9	10.8	11.8	12.9
77.0	7.9	8.5	9.2	10.0	10.9	11.9	13.0
77.5	8.0	8.6	9.3	10.1	11.0	12.0	13.1
78.0	8.0	8.7	9.4	10.2	11.1	12.1	13.3
78.5	8.1	8.8	9.5	10.3	11.2	12.2	13.4
79.0	8.2	8.8	9.6	10.4	11.3	12.3	13.5
79.5	8.3	8.9	9.7	10.5	11.4	12.4	13.6


Weight-for-height BOYS		 World Health Organization					
2 to 5 years (z-scores)							
cm	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
80.0	8.3	9.0	9.7	10.6	11.5	12.6	13.7
80.5	8.4	9.1	9.8	10.7	11.6	12.7	13.8
81.0	8.5	9.2	9.9	10.8	11.7	12.8	14.0
81.5	8.6	9.3	10.0	10.9	11.8	12.9	14.1
82.0	8.7	9.3	10.1	11.0	11.9	13.0	14.2
82.5	8.7	9.4	10.2	11.1	12.1	13.1	14.4
83.0	8.8	9.5	10.3	11.2	12.2	13.3	14.5
83.5	8.9	9.6	10.4	11.3	12.3	13.4	14.6
84.0	9.0	9.7	10.5	11.4	12.4	13.5	14.8
84.5	9.1	9.9	10.7	11.5	12.5	13.7	14.9
85.0	9.2	10.0	10.8	11.7	12.7	13.8	15.1
85.5	9.3	10.1	10.9	11.8	12.8	13.9	15.2
86.0	9.4	10.2	11.0	11.9	12.9	14.1	15.4
86.5	9.5	10.3	11.1	12.0	13.1	14.2	15.5
87.0	9.6	10.4	11.2	12.2	13.2	14.4	15.7
87.5	9.7	10.5	11.3	12.3	13.3	14.5	15.8
88.0	9.8	10.6	11.5	12.4	13.5	14.7	16.0
88.5	9.9	10.7	11.6	12.5	13.6	14.8	16.1
89.0	10.0	10.8	11.7	12.6	13.7	14.9	16.3
89.5	10.1	10.9	11.8	12.8	13.9	15.1	16.4
90.0	10.2	11.0	11.9	12.9	14.0	15.2	16.6
90.5	10.3	11.1	12.0	13.0	14.1	15.3	16.7
91.0	10.4	11.2	12.1	13.1	14.2	15.5	16.9
91.5	10.5	11.3	12.2	13.2	14.4	15.6	17.0
92.0	10.6	11.4	12.3	13.4	14.5	15.8	17.2
92.5	10.7	11.5	12.4	13.5	14.6	15.9	17.3
93.0	10.8	11.6	12.6	13.6	14.7	16.0	17.5
93.5	10.9	11.7	12.7	13.7	14.9	16.2	17.6
94.0	11.0	11.8	12.8	13.8	15.0	16.3	17.8
94.5	11.1	11.9	12.9	13.9	15.1	16.5	17.9
95.0	11.1	12.0	13.0	14.1	15.3	16.6	18.1


Weight-for-height BOYS							
2 to 5 years (z-scores)							
cm	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
95.5	11.2	12.1	13.1	14.2	15.4	16.7	18.3
96.0	11.3	12.2	13.2	14.3	15.5	16.9	18.4
96.5	11.4	12.3	13.3	14.4	15.7	17.0	18.6
97.0	11.5	12.4	13.4	14.6	15.8	17.2	18.8
97.5	11.6	12.5	13.6	14.7	15.9	17.4	18.9
98.0	11.7	12.6	13.7	14.8	16.1	17.5	19.1
98.5	11.8	12.8	13.8	14.9	16.2	17.7	19.3
99.0	11.9	12.9	13.9	15.1	16.4	17.9	19.5
99.5	12.0	13.0	14.0	15.2	16.5	18.0	19.7
100.0	12.1	13.1	14.2	15.4	16.7	18.2	19.9
100.5	12.2	13.2	14.3	15.5	16.9	18.4	20.1
101.0	12.3	13.3	14.4	15.6	17.0	18.5	20.3
101.5	12.4	13.4	14.5	15.8	17.2	18.7	20.5
102.0	12.5	13.6	14.7	15.9	17.3	18.9	20.7
102.5	12.6	13.7	14.8	16.1	17.5	19.1	20.9
103.0	12.8	13.8	14.9	16.2	17.7	19.3	21.1
103.5	12.9	13.9	15.1	16.4	17.8	19.5	21.3
104.0	13.0	14.0	15.2	16.5	18.0	19.7	21.6
104.5	13.1	14.2	15.4	16.7	18.2	19.9	21.8
105.0	13.2	14.3	15.5	16.8	18.4	20.1	22.0
105.5	13.3	14.4	15.6	17.0	18.5	20.3	22.2
106.0	13.4	14.5	15.8	17.2	18.7	20.5	22.5
106.5	13.5	14.7	15.9	17.3	18.9	20.7	22.7
107.0	13.7	14.8	16.1	17.5	19.1	20.9	22.9
107.5	13.8	14.9	16.2	17.7	19.3	21.1	23.2
108.0	13.9	15.1	16.4	17.8	19.5	21.3	23.4
108.5	14.0	15.2	16.5	18.0	19.7	21.5	23.7
109.0	14.1	15.3	16.7	18.2	19.8	21.8	23.9
109.5	14.3	15.5	16.8	18.3	20.0	22.0	24.2
110.0	14.4	15.6	17.0	18.5	20.2	22.2	24.4
110.5	14.5	15.8	17.1	18.7	20.4	22.4	24.7


Weight-for-height BOYS							
2 to 5 years (z-scores)		World Health Organization					
cm	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
111.0	14.6	15.9	17.3	18.9	20.7	22.7	25.0
111.5	14.8	16.0	17.5	19.1	20.9	22.9	25.2
112.0	14.9	16.2	17.6	19.2	21.1	23.1	25.5
112.5	15.0	16.3	17.8	19.4	21.3	23.4	25.8
113.0	15.2	16.5	18.0	19.6	21.5	23.6	26.0
113.5	15.3	16.6	18.1	19.8	21.7	23.9	26.3
114.0	15.4	16.8	18.3	20.0	21.9	24.1	26.6
114.5	15.6	16.9	18.5	20.2	22.1	24.4	26.9
115.0	15.7	17.1	18.6	20.4	22.4	24.6	27.2
115.5	15.8	17.2	18.8	20.6	22.6	24.9	27.5
116.0	16.0	17.4	19.0	20.8	22.8	25.1	27.8
116.5	16.1	17.5	19.2	21.0	23.0	25.4	28.0
117.0	16.2	17.7	19.3	21.2	23.3	25.6	28.3
117.5	16.4	17.9	19.5	21.4	23.5	25.9	28.6
118.0	16.5	18.0	19.7	21.6	23.7	26.1	28.9
118.5	16.7	18.2	19.9	21.8	23.9	26.4	29.2
119.0	16.8	18.3	20.0	22.0	24.1	26.6	29.5
119.5	16.9	18.5	20.2	22.2	24.4	26.9	29.8
120.0	17.1	18.6	20.4	22.4	24.6	27.2	30.1


WHO Child Growth Standards


Appendix 1.6: Weight-for-Length and Weight-for-Height WHO Charts 2006 (Girls)


Weight-for-length GIRLS Birth to 2 years (z-scores)				World Health Organization			
cm	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
45.0	1.9	2.1	2.3	2.5	2.7	3.0	3.3
45.5	2.0	2.1	2.3	2.5	2.8	3.1	3.4
46.0	2.0	2.2	2.4	2.6	2.9	3.2	3.5
46.5	2.1	2.3	2.5	2.7	3.0	3.3	3.6
47.0	2.2	2.4	2.6	2.8	3.1	3.4	3.7
47.5	2.2	2.4	2.6	2.9	3.2	3.5	3.8
48.0	2.3	2.5	2.7	3.0	3.3	3.6	4.0
48.5	2.4	2.6	2.8	3.1	3.4	3.7	4.1
49.0	2.4	2.6	2.9	3.2	3.5	3.8	4.2
49.5	2.5	2.7	3.0	3.3	3.6	3.9	4.3
50.0	2.6	2.8	3.1	3.4	3.7	4.0	4.5
50.5	2.7	2.9	3.2	3.5	3.8	4.2	4.6
51.0	2.8	3.0	3.3	3.6	3.9	4.3	4.8
51.5	2.8	3.1	3.4	3.7	4.0	4.4	4.9
52.0	2.9	3.2	3.5	3.8	4.2	4.6	5.1
52.5	3.0	3.3	3.6	3.9	4.3	4.7	5.2
53.0	3.1	3.4	3.7	4.0	4.4	4.9	5.4
53.5	3.2	3.5	3.8	4.2	4.6	5.0	5.5
54.0	3.3	3.6	3.9	4.3	4.7	5.2	5.7
54.5	3.4	3.7	4.0	4.4	4.8	5.3	5.9
55.0	3.5	3.8	4.2	4.5	5.0	5.5	6.1
55.5	3.6	3.9	4.3	4.7	5.1	5.7	6.3
56.0	3.7	4.0	4.4	4.8	5.3	5.8	6.4
56.5	3.8	4.1	4.5	5.0	5.4	6.0	6.6
57.0	3.9	4.3	4.6	5.1	5.6	6.1	6.8
57.5	4.0	4.4	4.8	5.2	5.7	6.3	7.0
58.0	4.1	4.5	4.9	5.4	5.9	6.5	7.1
58.5	4.2	4.6	5.0	5.5	6.0	6.6	7.3
59.0	4.3	4.7	5.1	5.6	6.2	6.8	7.5
59.5	4.4	4.8	5.3	5.7	6.3	6.9	7.7


Weight-for-length GIRLS Birth to 2 years (z-scores)				World Health Organization			
cm	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
60.0	4.5	4.9	5.4	5.9	6.4	7.1	7.8
60.5	4.6	5.0	5.5	6.0	6.6	7.3	8.0
61.0	4.7	5.1	5.6	6.1	6.7	7.4	8.2
61.5	4.8	5.2	5.7	6.3	6.9	7.6	8.4
62.0	4.9	5.3	5.8	6.4	7.0	7.7	8.5
62.5	5.0	5.4	5.9	6.5	7.1	7.8	8.7
63.0	5.1	5.5	6.0	6.6	7.3	8.0	8.8
63.5	5.2	5.6	6.2	6.7	7.4	8.1	9.0
64.0	5.3	5.7	6.3	6.9	7.5	8.3	9.1
64.5	5.4	5.8	6.4	7.0	7.6	8.4	9.3
65.0	5.5	5.9	6.5	7.1	7.8	8.6	9.5
65.5	5.5	6.0	6.6	7.2	7.9	8.7	9.6
66.0	5.6	6.1	6.7	7.3	8.0	8.8	9.8
66.5	5.7	6.2	6.8	7.4	8.1	9.0	9.9
67.0	5.8	6.3	6.9	7.5	8.3	9.1	10.0
67.5	5.9	6.4	7.0	7.6	8.4	9.2	10.2
68.0	6.0	6.5	7.1	7.7	8.5	9.4	10.3
68.5	6.1	6.6	7.2	7.9	8.6	9.5	10.5
69.0	6.1	6.7	7.3	8.0	8.7	9.6	10.6
69.5	6.2	6.8	7.4	8.1	8.8	9.7	10.7
70.0	6.3	6.9	7.5	8.2	9.0	9.9	10.9
70.5	6.4	6.9	7.6	8.3	9.1	10.0	11.0
71.0	6.5	7.0	7.7	8.4	9.2	10.1	11.1
71.5	6.5	7.1	7.7	8.5	9.3	10.2	11.3
72.0	6.6	7.2	7.8	8.6	9.4	10.3	11.4
72.5	6.7	7.3	7.9	8.7	9.5	10.5	11.5
73.0	6.8	7.4	8.0	8.8	9.6	10.6	11.7
73.5	6.9	7.4	8.1	8.9	9.7	10.7	11.8
74.0	6.9	7.5	8.2	9.0	9.8	10.8	11.9
74.5	7.0	7.6	8.3	9.1	9.9	10.9	12.0
75.0	7.1	7.7	8.4	9.1	10.0	11.0	12.2


Weight-for-length GIRLS							
Birth to 2 years (z-scores)							
cm	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
75.5	7.1	7.8	8.5	9.2	10.1	11.1	12.3
76.0	7.2	7.8	8.5	9.3	10.2	11.2	12.4
76.5	7.3	7.9	8.6	9.4	10.3	11.4	12.5
77.0	7.4	8.0	8.7	9.5	10.4	11.5	12.6
77.5	7.4	8.1	8.8	9.6	10.5	11.6	12.8
78.0	7.5	8.2	8.9	9.7	10.6	11.7	12.9
78.5	7.6	8.2	9.0	9.8	10.7	11.8	13.0
79.0	7.7	8.3	9.1	9.9	10.8	11.9	13.1
79.5	7.7	8.4	9.1	10.0	10.9	12.0	13.3
80.0	7.8	8.5	9.2	10.1	11.0	12.1	13.4
80.5	7.9	8.6	9.3	10.2	11.2	12.3	13.5
81.0	8.0	8.7	9.4	10.3	11.3	12.4	13.7
81.5	8.1	8.8	9.5	10.4	11.4	12.5	13.8
82.0	8.1	8.8	9.6	10.5	11.5	12.6	13.9
82.5	8.2	8.9	9.7	10.6	11.6	12.8	14.1
83.0	8.3	9.0	9.8	10.7	11.8	12.9	14.2
83.5	8.4	9.1	9.9	10.9	11.9	13.1	14.4
84.0	8.5	9.2	10.1	11.0	12.0	13.2	14.5
84.5	8.6	9.3	10.2	11.1	12.1	13.3	14.7
85.0	8.7	9.4	10.3	11.2	12.3	13.5	14.9
85.5	8.8	9.5	10.4	11.3	12.4	13.6	15.0
86.0	8.9	9.7	10.5	11.5	12.6	13.8	15.2
86.5	9.0	9.8	10.6	11.6	12.7	13.9	15.4
87.0	9.1	9.9	10.7	11.7	12.8	14.1	15.5
87.5	9.2	10.0	10.9	11.8	13.0	14.2	15.7
88.0	9.3	10.1	11.0	12.0	13.1	14.4	15.9
88.5	9.4	10.2	11.1	12.1	13.2	14.5	16.0
89.0	9.5	10.3	11.2	12.2	13.4	14.7	16.2
89.5	9.6	10.4	11.3	12.3	13.5	14.8	16.4
90.0	9.7	10.5	11.4	12.5	13.7	15.0	16.5
90.5	9.8	10.6	11.5	12.6	13.8	15.1	16.7


Weight-for-length GIRLS		 World Health Organization					
Birth to 2 years (z-scores)							
cm	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
91.0	9.9	10.7	11.7	12.7	13.9	15.3	16.9
91.5	10.0	10.8	11.8	12.8	14.1	15.5	17.0
92.0	10.1	10.9	11.9	13.0	14.2	15.6	17.2
92.5	10.1	11.0	12.0	13.1	14.3	15.8	17.4
93.0	10.2	11.1	12.1	13.2	14.5	15.9	17.5
93.5	10.3	11.2	12.2	13.3	14.6	16.1	17.7
94.0	10.4	11.3	12.3	13.5	14.7	16.2	17.9
94.5	10.5	11.4	12.4	13.6	14.9	16.4	18.0
95.0	10.6	11.5	12.6	13.7	15.0	16.5	18.2
95.5	10.7	11.6	12.7	13.8	15.2	16.7	18.4
96.0	10.8	11.7	12.8	14.0	15.3	16.8	18.6
96.5	10.9	11.8	12.9	14.1	15.4	17.0	18.7
97.0	11.0	12.0	13.0	14.2	15.6	17.1	18.9
97.5	11.1	12.1	13.1	14.4	15.7	17.3	19.1
98.0	11.2	12.2	13.3	14.5	15.9	17.5	19.3
98.5	11.3	12.3	13.4	14.6	16.0	17.6	19.5
99.0	11.4	12.4	13.5	14.8	16.2	17.8	19.6
99.5	11.5	12.5	13.6	14.9	16.3	18.0	19.8
100.0	11.6	12.6	13.7	15.0	16.5	18.1	20.0
100.5	11.7	12.7	13.9	15.2	16.6	18.3	20.2
101.0	11.8	12.8	14.0	15.3	16.8	18.5	20.4
101.5	11.9	13.0	14.1	15.5	17.0	18.7	20.6
102.0	12.0	13.1	14.3	15.6	17.1	18.9	20.8
102.5	12.1	13.2	14.4	15.8	17.3	19.0	21.0
103.0	12.3	13.3	14.5	15.9	17.5	19.2	21.3
103.5	12.4	13.5	14.7	16.1	17.6	19.4	21.5
104.0	12.5	13.6	14.8	16.2	17.8	19.6	21.7
104.5	12.6	13.7	15.0	16.4	18.0	19.8	21.9
105.0	12.7	13.8	15.1	16.5	18.2	20.0	22.2
105.5	12.8	14.0	15.3	16.7	18.4	20.2	22.4
106.0	13.0	14.1	15.4	16.9	18.5	20.5	22.6

Weight-for-length GIRLS Birth to 2 years (z-scores)		 World Health Organization					
cm	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
106.5	13.1	14.3	15.6	17.1	18.7	20.7	22.9
107.0	13.2	14.4	15.7	17.2	18.9	20.9	23.1
107.5	13.3	14.5	15.9	17.4	19.1	21.1	23.4
108.0	13.5	14.7	16.0	17.6	19.3	21.3	23.6
108.5	13.6	14.8	16.2	17.8	19.5	21.6	23.9
109.0	13.7	15.0	16.4	18.0	19.7	21.8	24.2
109.5	13.9	15.1	16.5	18.1	20.0	22.0	24.4
110.0	14.0	15.3	16.7	18.3	20.2	22.3	24.7
WHO Child Growth Standards							

Weight-for-height GIRLS 2 to 5 years (z-scores)		 World Health Organization					
cm	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
65.0	5.6	6.1	6.6	7.2	7.9	8.7	9.7
65.5	5.7	6.2	6.7	7.4	8.1	8.9	9.8
66.0	5.8	6.3	6.8	7.5	8.2	9.0	10.0
66.5	5.8	6.4	6.9	7.6	8.3	9.1	10.1
67.0	5.9	6.4	7.0	7.7	8.4	9.3	10.2
67.5	6.0	6.5	7.1	7.8	8.5	9.4	10.4
68.0	6.1	6.6	7.2	7.9	8.7	9.5	10.5
68.5	6.2	6.7	7.3	8.0	8.8	9.7	10.7
69.0	6.3	6.8	7.4	8.1	8.9	9.8	10.8
69.5	6.3	6.9	7.5	8.2	9.0	9.9	10.9
70.0	6.4	7.0	7.6	8.3	9.1	10.0	11.1
70.5	6.5	7.1	7.7	8.4	9.2	10.1	11.2
71.0	6.6	7.1	7.8	8.5	9.3	10.3	11.3
71.5	6.7	7.2	7.9	8.6	9.4	10.4	11.5
72.0	6.7	7.3	8.0	8.7	9.5	10.5	11.6
72.5	6.8	7.4	8.1	8.8	9.7	10.6	11.7
73.0	6.9	7.5	8.1	8.9	9.8	10.7	11.8
73.5	7.0	7.6	8.2	9.0	9.9	10.8	12.0
74.0	7.0	7.6	8.3	9.1	10.0	11.0	12.1
74.5	7.1	7.7	8.4	9.2	10.1	11.1	12.2
75.0	7.2	7.8	8.5	9.3	10.2	11.2	12.3
75.5	7.2	7.9	8.6	9.4	10.3	11.3	12.5
76.0	7.3	8.0	8.7	9.5	10.4	11.4	12.6
76.5	7.4	8.0	8.7	9.6	10.5	11.5	12.7
77.0	7.5	8.1	8.8	9.6	10.6	11.6	12.8
77.5	7.5	8.2	8.9	9.7	10.7	11.7	12.9
78.0	7.6	8.3	9.0	9.8	10.8	11.8	13.1
78.5	7.7	8.4	9.1	9.9	10.9	12.0	13.2
79.0	7.8	8.4	9.2	10.0	11.0	12.1	13.3
79.5	7.8	8.5	9.3	10.1	11.1	12.2	13.4

Weight-for-height GIRLS 2 to 5 years (z-scores)		 World Health Organization					
cm	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
80.0	7.9	8.6	9.4	10.2	11.2	12.3	13.6
80.5	8.0	8.7	9.5	10.3	11.3	12.4	13.7
81.0	8.1	8.8	9.6	10.4	11.4	12.6	13.9
81.5	8.2	8.9	9.7	10.6	11.6	12.7	14.0
82.0	8.3	9.0	9.8	10.7	11.7	12.8	14.1
82.5	8.4	9.1	9.9	10.8	11.8	13.0	14.3
83.0	8.5	9.2	10.0	10.9	11.9	13.1	14.5
83.5	8.5	9.3	10.1	11.0	12.1	13.3	14.6
84.0	8.6	9.4	10.2	11.1	12.2	13.4	14.8
84.5	8.7	9.5	10.3	11.3	12.3	13.5	14.9
85.0	8.8	9.6	10.4	11.4	12.5	13.7	15.1
85.5	8.9	9.7	10.6	11.5	12.6	13.8	15.3
86.0	9.0	9.8	10.7	11.6	12.7	14.0	15.4
86.5	9.1	9.9	10.8	11.8	12.9	14.2	15.6
87.0	9.2	10.0	10.9	11.9	13.0	14.3	15.8
87.5	9.3	10.1	11.0	12.0	13.2	14.5	15.9
88.0	9.4	10.2	11.1	12.1	13.3	14.6	16.1
88.5	9.5	10.3	11.2	12.3	13.4	14.8	16.3
89.0	9.6	10.4	11.4	12.4	13.6	14.9	16.4
89.5	9.7	10.5	11.5	12.5	13.7	15.1	16.6
90.0	9.8	10.6	11.6	12.6	13.8	15.2	16.8
90.5	9.9	10.7	11.7	12.8	14.0	15.4	16.9
91.0	10.0	10.9	11.8	12.9	14.1	15.5	17.1
91.5	10.1	11.0	11.9	13.0	14.3	15.7	17.3
92.0	10.2	11.1	12.0	13.1	14.4	15.8	17.4
92.5	10.3	11.2	12.1	13.3	14.5	16.0	17.6
93.0	10.4	11.3	12.3	13.4	14.7	16.1	17.8
93.5	10.5	11.4	12.4	13.5	14.8	16.3	17.9
94.0	10.6	11.5	12.5	13.6	14.9	16.4	18.1
94.5	10.7	11.6	12.6	13.8	15.1	16.6	18.3
95.0	10.8	11.7	12.7	13.9	15.2	16.7	18.5

Weight-for-height GIRLS 2 to 5 years (z-scores)				World Health Organization			
cm	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
95.5	10.8	11.8	12.8	14.0	15.4	16.9	18.6
96.0	10.9	11.9	12.9	14.1	15.5	17.0	18.8
96.5	11.0	12.0	13.1	14.3	15.6	17.2	19.0
97.0	11.1	12.1	13.2	14.4	15.8	17.4	19.2
97.5	11.2	12.2	13.3	14.5	15.9	17.5	19.3
98.0	11.3	12.3	13.4	14.7	16.1	17.7	19.5
98.5	11.4	12.4	13.5	14.8	16.2	17.9	19.7
99.0	11.5	12.5	13.7	14.9	16.4	18.0	19.9
99.5	11.6	12.7	13.8	15.1	16.5	18.2	20.1
100.0	11.7	12.8	13.9	15.2	16.7	18.4	20.3
100.5	11.9	12.9	14.1	15.4	16.9	18.6	20.5
101.0	12.0	13.0	14.2	15.5	17.0	18.7	20.7
101.5	12.1	13.1	14.3	15.7	17.2	18.9	20.9
102.0	12.2	13.3	14.5	15.8	17.4	19.1	21.1
102.5	12.3	13.4	14.6	16.0	17.5	19.3	21.4
103.0	12.4	13.5	14.7	16.1	17.7	19.5	21.6
103.5	12.5	13.6	14.9	16.3	17.9	19.7	21.8
104.0	12.6	13.8	15.0	16.4	18.1	19.9	22.0
104.5	12.8	13.9	15.2	16.6	18.2	20.1	22.3
105.0	12.9	14.0	15.3	16.8	18.4	20.3	22.5
105.5	13.0	14.2	15.5	16.9	18.6	20.5	22.7
106.0	13.1	14.3	15.6	17.1	18.8	20.8	23.0
106.5	13.3	14.5	15.8	17.3	19.0	21.0	23.2
107.0	13.4	14.6	15.9	17.5	19.2	21.2	23.5
107.5	13.5	14.7	16.1	17.7	19.4	21.4	23.7
108.0	13.7	14.9	16.3	17.8	19.6	21.7	24.0
108.5	13.8	15.0	16.4	18.0	19.8	21.9	24.3
109.0	13.9	15.2	16.6	18.2	20.0	22.1	24.5
109.5	14.1	15.4	16.8	18.4	20.3	22.4	24.8
110.0	14.2	15.5	17.0	18.6	20.5	22.6	25.1
110.5	14.4	15.7	17.1	18.8	20.7	22.9	25.4

Weight-for-height GIRLS 2 to 5 years (z-scores)				World Health Organization			
cm	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
111.0	14.5	15.8	17.3	19.0	20.9	23.1	25.7
111.5	14.7	16.0	17.5	19.2	21.2	23.4	26.0
112.0	14.8	16.2	17.7	19.4	21.4	23.6	26.2
112.5	15.0	16.3	17.9	19.6	21.6	23.9	26.5
113.0	15.1	16.5	18.0	19.8	21.8	24.2	26.8
113.5	15.3	16.7	18.2	20.0	22.1	24.4	27.1
114.0	15.4	16.8	18.4	20.2	22.3	24.7	27.4
114.5	15.6	17.0	18.6	20.5	22.6	25.0	27.8
115.0	15.7	17.2	18.8	20.7	22.8	25.2	28.1
115.5	15.9	17.3	19.0	20.9	23.0	25.5	28.4
116.0	16.0	17.5	19.2	21.1	23.3	25.8	28.7
116.5	16.2	17.7	19.4	21.3	23.5	26.1	29.0
117.0	16.3	17.8	19.6	21.5	23.8	26.3	29.3
117.5	16.5	18.0	19.8	21.7	24.0	26.6	29.6
118.0	16.6	18.2	19.9	22.0	24.2	26.9	29.9
118.5	16.8	18.4	20.1	22.2	24.5	27.2	30.3
119.0	16.9	18.5	20.3	22.4	24.7	27.4	30.6
119.5	17.1	18.7	20.5	22.6	25.0	27.7	30.9
120.0	17.3	18.9	20.7	22.8	25.2	28.0	31.2
WHO Child Growth Standards							

Appendix 1.7: BMI-for-age, WHO Charts 2006 (Boys)



BMI-for-age BOYS 5 to 19 years (z-scores)

Year: Month	Month	L	M	S	Z-scores (BMI in kg/m ²)						
					-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
5: 1	61	-0.7387	15.2641	0.08390	12.1	13.0	14.1	15.3	16.6	18.3	20.2
5: 2	62	-0.7621	15.2616	0.08414	12.1	13.0	14.1	15.3	16.6	18.3	20.2
5: 3	63	-0.7856	15.2604	0.08439	12.1	13.0	14.1	15.3	16.7	18.3	20.2
5: 4	64	-0.8089	15.2605	0.08464	12.1	13.0	14.1	15.3	16.7	18.3	20.3
5: 5	65	-0.8322	15.2619	0.08490	12.1	13.0	14.1	15.3	16.7	18.3	20.3
5: 6	66	-0.8554	15.2645	0.08516	12.1	13.0	14.1	15.3	16.7	18.4	20.4
5: 7	67	-0.8785	15.2684	0.08543	12.1	13.0	14.1	15.3	16.7	18.4	20.4
5: 8	68	-0.9015	15.2737	0.08570	12.1	13.0	14.1	15.3	16.7	18.4	20.5
5: 9	69	-0.9243	15.2801	0.08597	12.1	13.0	14.1	15.3	16.7	18.4	20.5
5:10	70	-0.9471	15.2877	0.08625	12.1	13.0	14.1	15.3	16.7	18.5	20.6
5:11	71	-0.9697	15.2965	0.08653	12.1	13.0	14.1	15.3	16.7	18.5	20.6
6: 0	72	-0.9921	15.3062	0.08682	12.1	13.0	14.1	15.3	16.8	18.5	20.7
6: 1	73	-1.0144	15.3169	0.08711	12.1	13.0	14.1	15.3	16.8	18.6	20.8
6: 2	74	-1.0365	15.3285	0.08741	12.2	13.1	14.1	15.3	16.8	18.6	20.8
6: 3	75	-1.0584	15.3408	0.08771	12.2	13.1	14.1	15.3	16.8	18.6	20.9
6: 4	76	-1.0801	15.3540	0.08802	12.2	13.1	14.1	15.4	16.8	18.7	21.0
6: 5	77	-1.1017	15.3679	0.08833	12.2	13.1	14.1	15.4	16.9	18.7	21.0
6: 6	78	-1.1230	15.3825	0.08865	12.2	13.1	14.1	15.4	16.9	18.7	21.1
6: 7	79	-1.1441	15.3978	0.08898	12.2	13.1	14.1	15.4	16.9	18.8	21.2
6: 8	80	-1.1649	15.4137	0.08931	12.2	13.1	14.2	15.4	16.9	18.8	21.3
6: 9	81	-1.1856	15.4302	0.08964	12.2	13.1	14.2	15.4	17.0	18.9	21.3
6:10	82	-1.2060	15.4473	0.08998	12.2	13.1	14.2	15.4	17.0	18.9	21.4
6:11	83	-1.2261	15.4650	0.09033	12.2	13.1	14.2	15.5	17.0	19.0	21.5
7: 0	84	-1.2460	15.4832	0.09068	12.3	13.1	14.2	15.5	17.0	19.0	21.6
7: 1	85	-1.2656	15.5019	0.09103	12.3	13.2	14.2	15.5	17.1	19.1	21.7
7: 2	86	-1.2849	15.5210	0.09139	12.3	13.2	14.2	15.5	17.1	19.1	21.8

2007 WHO Reference

Appendix 1.8: BMI-for-age, WHO Charts 2006 (Girls)



BMI-for-age GIRLS 5 to 19 years (z-scores)

Year: Month	Month	L	M	S	Z-scores (BMI in kg/m ²)						
					-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
5: 1	61	-0.8886	15.2441	0.09692	11.8	12.7	13.9	15.2	16.9	18.9	21.3
5: 2	62	-0.9068	15.2434	0.09738	11.8	12.7	13.9	15.2	16.9	18.9	21.4
5: 3	63	-0.9248	15.2433	0.09783	11.8	12.7	13.9	15.2	16.9	18.9	21.5
5: 4	64	-0.9427	15.2438	0.09829	11.8	12.7	13.9	15.2	16.9	18.9	21.5
5: 5	65	-0.9605	15.2448	0.09875	11.7	12.7	13.9	15.2	16.9	19.0	21.6
5: 6	66	-0.9780	15.2464	0.09920	11.7	12.7	13.9	15.2	16.9	19.0	21.7
5: 7	67	-0.9954	15.2487	0.09966	11.7	12.7	13.9	15.2	16.9	19.0	21.7
5: 8	68	-1.0126	15.2516	0.10012	11.7	12.7	13.9	15.3	17.0	19.1	21.8
5: 9	69	-1.0296	15.2551	0.10058	11.7	12.7	13.9	15.3	17.0	19.1	21.9
5:10	70	-1.0464	15.2592	0.10104	11.7	12.7	13.9	15.3	17.0	19.1	22.0
5:11	71	-1.0630	15.2641	0.10149	11.7	12.7	13.9	15.3	17.0	19.2	22.1
6: 0	72	-1.0794	15.2697	0.10195	11.7	12.7	13.9	15.3	17.0	19.2	22.1
6: 1	73	-1.0956	15.2760	0.10241	11.7	12.7	13.9	15.3	17.0	19.3	22.2
6: 2	74	-1.1115	15.2831	0.10287	11.7	12.7	13.9	15.3	17.0	19.3	22.3
6: 3	75	-1.1272	15.2911	0.10333	11.7	12.7	13.9	15.3	17.1	19.3	22.4
6: 4	76	-1.1427	15.2998	0.10379	11.7	12.7	13.9	15.3	17.1	19.4	22.5
6: 5	77	-1.1579	15.3095	0.10425	11.7	12.7	13.9	15.3	17.1	19.4	22.6
6: 6	78	-1.1728	15.3200	0.10471	11.7	12.7	13.9	15.3	17.1	19.5	22.7
6: 7	79	-1.1875	15.3314	0.10517	11.7	12.7	13.9	15.3	17.2	19.5	22.8
6: 8	80	-1.2019	15.3439	0.10562	11.7	12.7	13.9	15.3	17.2	19.6	22.9
6: 9	81	-1.2160	15.3572	0.10608	11.7	12.7	13.9	15.4	17.2	19.6	23.0
6:10	82	-1.2298	15.3717	0.10654	11.7	12.7	13.9	15.4	17.2	19.7	23.1
6:11	83	-1.2433	15.3871	0.10700	11.7	12.7	13.9	15.4	17.3	19.7	23.2
7: 0	84	-1.2565	15.4036	0.10746	11.8	12.7	13.9	15.4	17.3	19.8	23.3
7: 1	85	-1.2693	15.4211	0.10792	11.8	12.7	13.9	15.4	17.3	19.8	23.4
7: 2	86	-1.2819	15.4397	0.10837	11.8	12.8	14.0	15.4	17.4	19.9	23.5

2007 WHO Reference

Appendix 1.9: Weight-for-height (z-scores) NCHS charts for children aged 6 - 59 months (now replaced by WHO)

The table below is based on the NCHS standards. The height-for-age and weight-for-age standards were amalgamated to determine the median weight for height. The sexes were combined when the uni-sex standard is within 1.5% of the body weight of the standard for either sex.

Boys' Weight (kg)					Length (cm)	Girls' Weight (kg)				
-4 SD	-3SD	-2SD	-1SD	Median		Median	-1SD	-2SD	-3SD	-4SD
1.8	2.1	2.5	2.8	3.1	49	3.3	2.9	2.6	2.2	1.8
1.8	2.2	2.5	2.9	3.3	50	3.4	3.0	2.6	2.3	1.9
1.8	2.2	2.6	3.1	3.5	51	3.5	3.1	2.7	2.3	1.9
1.9	2.3	2.8	3.2	3.7	52	3.7	3.3	2.8	2.4	2.0
1.9	2.4	2.9	3.4	3.9	53	3.9	3.4	3.0	2.5	2.1
2.0	2.6	3.1	3.6	4.1	54	4.1	3.6	3.1	2.7	2.2
2.2	2.7	3.3	3.8	4.3	55	4.3	3.8	3.3	2.8	2.3
2.3	2.9	3.5	4.0	4.6	56	4.5	4.0	3.5	3.0	2.4
2.5	3.1	3.7	4.3	4.8	57	4.8	4.2	3.7	3.1	2.6
2.7	3.3	3.9	4.5	5.1	58	5.0	4.4	3.9	3.3	2.7
2.9	3.5	4.1	4.8	5.4	59	5.3	4.7	4.1	3.5	2.9
3.1	3.7	4.4	5.0	5.7	60	5.5	4.9	4.3	3.7	3.1
3.3	4.0	4.6	5.3	5.9	61	5.8	5.2	4.6	3.9	3.3
3.5	4.2	4.9	5.6	6.2	62	6.1	5.4	4.8	4.1	3.5
3.8	4.5	5.2	5.8	6.5	63	6.4	5.7	5.0	4.4	3.7
4.0	4.7	5.4	6.1	6.8	64	6.7	6.0	5.3	4.6	3.9
4.3	5.0	5.7	6.4	7.1	65	7.0	6.3	5.5	4.8	4.1
4.5	5.3	6.0	6.7	7.4	66	7.3	6.5	5.8	5.1	4.3
4.8	5.5	6.2	7.0	7.7	67	7.5	6.8	6.0	5.3	4.5
5.1	5.8	6.5	7.3	8.0	68	7.8	7.1	6.3	5.5	4.8
5.3	6.0	6.8	7.5	8.3	69	8.1	7.3	6.5	5.8	5.0
5.5	6.3	7.0	7.8	8.5	70	8.4	7.6	6.8	6.0	5.2
5.8	6.5	7.3	8.1	8.8	71	8.6	7.8	7.0	6.2	5.4
6.0	6.8	7.5	8.3	9.1	72	8.9	8.1	7.2	6.4	5.6
6.2	7.0	7.8	8.6	9.3	73	9.1	8.3	7.5	6.6	5.8
6.4	7.2	8.0	8.8	9.6	74	9.4	8.5	7.7	6.8	6.0
6.6	7.4	8.2	9.0	9.8	75	9.6	8.7	7.9	7.0	6.2
6.8	7.6	8.4	9.2	10.0	76	9.8	8.9	8.1	7.2	6.4
7.0	7.8	8.6	9.4	10.3	77	10.0	9.1	8.3	7.4	6.6
7.1	8.0	8.8	9.7	10.5	78	10.2	9.3	8.5	7.6	6.7
7.3	8.2	9.0	9.9	10.7	79	10.4	9.5	8.7	7.8	6.9
7.5	8.3	9.2	10.1	10.9	80	10.6	9.7	8.8	8.0	7.1
7.6	8.5	9.4	10.2	11.1	81	10.8	9.9	9.0	8.1	7.2
7.8	8.7	9.6	10.4	11.3	82	11.0	10.1	9.2	8.3	7.4
7.9	8.8	9.7	10.6	11.5	83	11.2	10.3	9.4	8.5	7.6
8.1	9.0	9.9	10.8	11.7	84	11.4	10.5	9.6	8.7	7.7
7.8	8.9	9.9	11.0	12.1	85	11.8	10.8	9.7	8.6	7.6
7.9	9.0	10.1	11.2	12.3	86	12.0	11.0	9.9	8.8	7.7

Boys' Weight (kg)					Length (cm)	Girls' Weight (kg)				
-4 SD	-3SD	-2SD	-1SD	Median		Median	-1SD	-2SD	-3SD	-4SD
8.1	9.2	10.3	11.5	12.6	87	12.3	11.2	10.1	9.0	7.9
8.3	9.4	10.5	11.7	12.8	88	12.5	11.4	10.3	9.2	8.1
8.4	9.6	10.7	11.9	13.0	89	12.7	11.6	10.5	9.3	8.2
8.6	9.8	10.9	12.1	13.3	90	12.9	11.8	10.7	9.5	8.4
8.8	9.9	11.1	12.3	13.5	91	13.2	12.0	10.8	9.7	8.5
8.9	10.1	11.3	12.5	13.7	92	13.4	12.2	11.0	9.9	8.7
9.1	10.3	11.5	12.8	14.0	93	13.6	12.4	11.2	10.0	8.8
9.2	10.5	11.7	13.0	14.2	94	13.9	12.6	11.4	10.2	9.0
9.4	10.7	11.9	13.2	14.5	95	14.1	12.9	11.6	10.4	9.1
9.6	10.9	12.1	13.4	14.7	96	14.3	13.1	11.8	10.6	9.3
9.7	11.0	12.4	13.7	15.0	97	14.6	13.3	12.0	10.7	9.5
9.9	11.2	12.6	13.9	15.2	98	14.9	13.5	12.2	10.9	9.6
10.1	11.4	12.8	14.1	15.5	99	15.1	13.8	12.4	11.1	9.8
10.3	11.6	13.0	14.4	15.7	100	15.4	14.0	12.7	11.3	9.9
10.4	11.8	13.2	14.6	16.0	101	15.6	14.3	12.9	11.5	10.1
10.6	12.0	13.4	14.9	16.3	102	15.9	14.5	13.1	11.7	10.3
10.8	12.2	13.7	15.1	16.6	103	16.2	14.7	13.3	11.9	10.5
11.0	12.4	13.9	15.4	16.9	104	16.5	15.0	13.5	12.1	10.6
11.2	12.7	14.2	15.6	17.1	105	16.7	15.3	13.8	12.3	10.8
11.4	12.9	14.4	15.9	17.4	106	17.0	15.5	14.0	12.5	11.0
11.6	13.1	14.7	16.2	17.7	107	17.3	15.8	14.3	12.7	11.2
11.8	13.4	14.9	16.5	18.0	108	17.6	16.1	14.5	13.0	11.4
12.0	13.6	15.2	16.8	18.3	109	17.9	16.4	14.8	13.2	11.6
12.2	13.8	15.4	17.1	18.7	110	18.2	16.6	15.0	13.4	11.9
12.5	14.1	15.7	17.4	19.0	111	18.6	16.9	15.3	13.7	12.1
12.7	14.4	16.0	17.7	19.3	112	18.9	17.2	15.6	14.0	12.3
12.9	14.6	16.3	18.0	19.6	113	19.2	17.5	15.9	14.2	12.6
13.2	14.9	16.6	18.3	20.0	114	19.5	17.9	16.2	14.5	12.8
13.5	15.2	16.9	18.6	20.3	115	19.9	18.2	16.5	14.8	13.0
13.7	15.5	17.2	18.9	20.7	116	20.3	18.5	16.8	15.0	13.3
14.0	15.8	17.5	19.3	21.1	117	20.6	18.9	17.1	15.3	13.6
14.3	16.1	17.9	19.6	21.4	118	21.0	19.2	17.4	15.6	13.8
14.6	16.4	18.2	20.0	21.8	119	21.4	19.6	17.7	15.9	14.1
14.9	16.7	18.5	20.4	22.2	120	21.8	20.0	18.1	16.2	14.3
15.2	17.0	18.9	20.7	22.6	121	22.2	20.3	18.4	16.5	14.6
15.5	17.4	19.2	21.1	23.0	122	22.7	20.7	18.8	16.8	14.9
15.8	17.7	19.6	21.5	23.4	123	23.1	21.1	19.1	17.1	15.1
16.1	18.0	20.0	21.9	23.9	124	23.6	21.6	19.5	17.4	15.4
16.4	18.4	20.4	22.3	24.3	125	24.1	22.0	19.9	17.8	15.6
16.7	18.7	20.7	22.8	24.8	126	24.6	22.4	20.2	18.1	15.9
17.0	19.1	21.1	23.2	25.2	127	25.1	22.9	20.6	18.4	16.2
17.3	19.4	21.5	23.6	25.7	128	25.7	23.3	21.0	18.7	16.4
17.6	19.8	21.9	24.1	26.2	129	26.2	23.8	21.4	19.0	16.7
17.9	20.1	22.3	24.5	26.8	130	26.8	24.3	21.8	19.4	16.9

Appendix 1.10: Weight for Age WHO Chart 2006 (Boys & Girls)

Boys' Weight (kg)					Length (cm)	Girls' Weight (kg)				
-4 SD	-3SD	-2SD	-1SD	Median		Median	-1SD	-2SD	-3SD	-4SD
1.70	2.08	2.46	2.88	3.35	0	3.23	2.79	2.39	2.03	1.67
2.47	2.93	3.39	3.90	4.47	1	4.19	3.64	3.16	2.73	2.30
3.25	3.79	4.32	4.91	5.57	2	5.13	4.50	3.94	3.45	2.95
3.85	4.44	5.02	5.66	6.38	3	5.85	5.15	4.54	3.99	3.45
4.32	4.94	5.56	6.25	7.00	4	6.42	5.67	5.01	4.43	3.85
4.69	5.34	6.00	6.72	7.51	5	6.90	6.10	5.40	4.79	4.17
4.99	5.67	6.35	7.11	7.93	6	7.30	6.46	5.73	5.09	4.44
5.24	5.95	6.65	7.43	8.30	7	7.64	6.77	6.01	5.34	4.67
5.45	6.18	6.91	7.72	8.62	8	7.95	7.04	6.25	5.56	4.87
5.64	6.39	7.14	7.98	8.90	9	8.23	7.29	6.47	5.76	5.05
5.81	6.58	7.36	8.22	9.16	10	8.48	7.51	6.67	5.94	5.21
5.96	6.76	7.55	8.44	9.41	11	8.72	7.72	6.86	6.11	5.36
6.11	6.93	7.74	8.65	9.65	12	8.95	7.93	7.04	6.27	5.51
6.25	7.09	7.92	8.85	9.87	13	9.17	8.12	7.22	6.43	5.65
6.39	7.24	8.10	9.04	10.10	14	9.39	8.32	7.39	6.59	5.79
6.52	7.39	8.27	9.23	10.31	15	9.60	8.50	7.56	6.74	5.92
6.65	7.54	8.43	9.42	10.52	16	9.81	8.69	7.73	6.89	6.06
6.78	7.69	8.59	9.60	10.73	17	10.02	8.88	7.89	7.04	6.19
6.90	7.83	8.75	9.79	10.94	18	10.23	9.06	8.06	7.19	6.33
7.02	7.97	8.91	9.97	11.14	19	10.44	9.25	8.22	7.34	6.46
7.14	8.10	9.07	10.14	11.35	20	10.65	9.43	8.39	7.49	6.59
7.25	8.24	9.22	10.32	11.55	21	10.85	9.61	8.55	7.63	6.72
7.37	8.37	9.37	10.49	11.75	22	11.06	9.80	8.71	7.78	6.84
7.48	8.50	9.52	10.67	11.95	23	11.27	9.98	8.87	7.92	6.97
7.59	8.63	9.67	10.84	12.15	24	11.48	10.16	9.04	8.07	7.10
7.70	8.76	9.82	11.01	12.35	25	11.69	10.35	9.20	8.21	7.22
7.81	8.89	9.97	11.18	12.55	26	11.89	10.53	9.36	8.35	7.34
7.91	9.01	10.11	11.35	12.74	27	12.10	10.71	9.52	8.49	7.47
8.01	9.13	10.25	11.51	12.93	28	12.31	10.88	9.67	8.63	7.58
8.11	9.25	10.39	11.67	13.12	29	12.51	11.06	9.82	8.76	7.70
8.21	9.37	10.52	11.83	13.30	30	12.71	11.23	9.97	8.89	7.81
8.30	9.48	10.65	11.98	13.48	31	12.90	11.40	10.12	9.02	7.92
8.40	9.59	10.78	12.13	13.66	32	13.09	11.56	10.26	9.14	8.02
8.49	9.70	10.91	12.28	13.83	33	13.28	11.72	10.40	9.26	8.12
8.58	9.81	11.03	12.42	14.00	34	13.47	11.89	10.53	9.38	8.22
8.67	9.91	11.16	12.57	14.17	35	13.66	12.04	10.67	9.50	8.32
8.75	10.02	11.28	12.71	14.34	36	13.85	12.20	10.81	9.61	8.42
8.84	10.12	11.40	12.86	14.51	37	14.04	12.36	10.94	9.73	8.51
8.93	10.23	11.52	13.00	14.68	38	14.23	12.52	11.07	9.84	8.60
9.02	10.33	11.64	13.14	14.85	39	14.41	12.67	11.20	9.95	8.69
9.10	10.43	11.76	13.28	15.01	40	14.60	12.83	11.33	10.06	8.78
9.19	10.54	11.88	13.42	15.18	41	14.79	12.98	11.46	10.16	8.87
9.27	10.64	12.00	13.56	15.35	42	14.97	13.14	11.59	10.27	8.95
9.36	10.74	12.12	13.71	15.52	43	15.16	13.29	11.71	10.37	9.04

Boys' Weight (kg)					Length (cm)	Girls' Weight (kg)				
-4 SD	-3SD	-2SD	-1SD	Median		Median	-1SD	-2SD	-3SD	-4SD
9.44	10.84	12.24	13.85	15.68	44	15.34	13.44	11.84	10.48	9.12
9.52	10.94	12.36	13.99	15.85	45	15.52	13.59	11.96	10.58	9.20
9.61	11.04	12.48	14.13	16.02	46	15.71	13.74	12.08	10.68	9.28
9.69	11.14	12.60	14.27	16.18	47	15.89	13.88	12.20	10.78	9.36
9.77	11.24	12.71	14.40	16.35	48	16.07	14.03	12.32	10.88	9.44
9.85	11.34	12.83	14.54	16.52	49	16.25	14.18	12.44	10.98	9.52
9.92	11.43	12.94	14.68	16.68	50	16.43	14.32	12.56	11.08	9.60
10.00	11.53	13.06	14.82	16.85	51	16.61	14.47	12.68	11.18	9.68
10.08	11.62	13.17	14.95	17.01	52	16.79	14.62	12.80	11.28	9.75
10.15	11.72	13.29	15.09	17.18	53	16.97	14.76	12.92	11.38	9.83
10.23	11.81	13.40	15.23	17.35	54	17.16	14.91	13.04	11.48	9.91
10.30	11.91	13.51	15.36	17.51	55	17.33	15.06	13.16	11.57	9.99
10.38	12.00	13.62	15.50	17.68	56	17.51	15.20	13.28	11.67	10.06
10.45	12.09	13.74	15.64	17.84	57	17.69	15.34	13.40	11.77	10.14
10.53	12.19	13.85	15.77	18.01	58	17.87	15.49	13.51	11.86	10.22
10.60	12.28	13.96	15.91	18.17	59	18.04	15.63	13.63	11.96	10.29
10.67	12.37	14.07	16.04	18.34	60	18.22	15.77	13.74	12.05	10.36

Section Two:

In-patient Management of Severe Acute Malnutrition

For children over six months, adolescents and adults

Overview

Severe acute malnutrition (SAM) is identified by severe thinness or wasting. Sometimes patients also present with bi-lateral oedema, called nutritional oedema. Severe acute malnutrition is often a life-threatening condition. These patients are very fragile, often with a serious electrolyte imbalance. They do not always present with the typical symptoms of an illness (e.g. fever, rapid pulse or rapid respirations). Also, it can be very difficult to diagnose dehydration or anaemia however it is extremely important to do so accurately. A misdiagnosis can lead to a high risk of mortality.

Traditionally the treatment of severe acute malnutrition has been in-patient, health-facility based. However, recent research in emergency settings has revealed that severe uncomplicated acute malnutrition can be treated at home with weekly visits to a health facility for monitoring and re-placement of specialized food. There must also be a community component to managing severe acute malnutrition at home. Relevant people in the community must be aware of the risks of acute malnutrition for children, and how to identify children with acute malnutrition. There must be Community Health Workers (CHWs) who are trained on screening procedures for acute malnutrition in the community. They are responsible for monitoring and supporting children at home who are receiving nutrition support from Out-patient Therapeutic Care. Specialized food products designed to support nutrition rehabilitation, referred to as ready-to use therapeutic food (RUTF), must also be available (see section four for more details on out-patient therapeutic care).

Pathophysiology of Severe Acute Malnutrition

Severe acute malnutrition can result in profound metabolic, physiological and anatomical changes. Virtually all physiological processes are altered due to severe acute malnutrition. Every organs and systems are involved in reductive adaptation. Reductive adaptation is the physiological response of the body to under nutrition i.e. systems slowing down to survive on limited macro and micro-nutrients intake.

Cardiovascular system:

- Cardiac output and stroke volume are reduced.
- Infusion of saline may cause an increase in venous pressure.
- Any increase in blood volume can easily produce acute heart failure.

- Any decrease will further compromise tissue perfusion.
- Blood pressure is low.
- Renal perfusion and circulation time are reduced.
- Plasma volume is usually normal and red cell volume is reduced.

Gastro-intestinal system

- Production of gastric acid is reduced.
- Intestinal motility is reduced.
- Pancreas is atrophied and production of digestive enzymes is reduced.
- Small intestinal mucosa is atrophied; secretion of digestive enzymes is reduced.
- Absorption of nutrients is reduced.

Liver function

- Synthesis of all proteins is reduced.
- Abnormal metabolites of amino acids are produced.
- Capacity of liver to take up, metabolize and excrete toxins is severely reduced.
- Energy production from substrates such as galactose and fructose is much slower than normal.
- Gluconeogenesis is reduced, which increases the risk of hypoglycemia during infection.
- Bile secretion is reduced.

Genitourinary system

- Glomerular filtration is reduced.
- Capacity of kidney to excrete excess acid or a water load is greatly reduced.
- Urinary phosphate output is low.
- Sodium excretion is reduced.
- Urinary tract infection is common.

Immune system

- All aspects of immunity are diminished.
- Lymph glands, tonsils and the thymus are atrophied Cell-mediated (T-cell) immunity is severely depressed.
- IgA levels in secretions are reduced.
- Complement components are low.
- Phagocytes do not kill ingested bacteria efficiently.
- Tissue damage does not result in inflammation or migration of white cells to the affected area.
- Acute phase immune response is diminished.
- Typical signs of infection, such as an increased white cell count and fever, are frequently absent.
- Hypoglycaemia and hypothermia are both signs of severe infection and are usually associated with septic shock.

Endocrine system

- Insulin levels are reduced and the child has glucose intolerance.
- Insulin growth factor 1 (IGF-1) levels are reduced.
- Growth hormone levels are increased.
- Cortisol levels are usually increased.

Circulatory system

- Basic metabolic rate is reduced by about 30%.
- Energy expenditure due to activity is very low.
- Both heat generation and heat loss are impaired; the child becomes hypothermic in a cold environment and hyperthermic in a hot environment.

Treatment Process

Severe acute malnutrition requires specialized treatment to ensure rapid recovery and reduce the risk of mortality. The management of severe acute malnutrition in the in-patient setting is divided into three phases: Phase 1, Transition Phase and Phase 2. Phase 1 covers nutrition and medical stabilization, treatment of medical complications, and commences nutritional rehabilitation. Transition Phase covers a gradual increase in diet leading to some weight gain while preventing complications of over-feeding. Phase 2 is a rapid weight-gain phase (catch-up growth), and covers preparation for discharge.

For children, the in-patient treatment of severe acute malnutrition is conducted in a section of a ward in the district or sub-district hospital (preferably a pediatric ward). For older patients, severe acute malnutrition treatment is handled in the adult ward. An in-patient facility can offer 24 hour care: the patient is admitted and remains in the facility for the entire treatment. Sometimes a daycare facility is the best approach. The malnourished patient attends daily for treatment and returns home each evening. This may be preferable during emergency or insecure situations, or for parents/caregivers who must attend to family demands at home. For out-patient management of severe acute malnutrition, nutrition recovery is handled at home and the patient attends a health facility weekly for monitoring and re-placement food.

Severe malnourished cases with complications, oedema and lack of appetite require admission to an in-patient facility for initial stabilization. Once recovering in Transition Phase the patient can be transferred to the Outpatient Therapeutic Programme (OTP) for the remainder of nutrition rehabilitation.

Phase 1: Nutrition and Medical Stabilization

Patients without an adequate appetite and/or a major medical complication are initially admitted to an in-patient facility for Phase 1 treatment. Also, when there is limited or no community capacity to handle out-patient treatment of severe acute malnutrition, and only in-patient care is available, patients with severe acute malnutrition are admitted to in-patient for Phase 1 nutrition.

The formula used during this phase (F75) promotes recovery of normal metabolic function and nutrition-electrolytic balance. In Phase 1, the patient receives F75 formula at 100kcal/kg/day. Rapid weight gain at this stage is dangerous, that is why the quantities and formula are formulated so that patients do not gain weight during this stage.

A routine, systematic medical treatment is commenced in Phase 1, and medical complications are treated. It is important in Phase 1 that oedema, if present, reduces. When oedema is reduced from +++ to ++, only then can these patients graduate from Phase 1 to Transition Phase. Patients who initially require intravenous (IV) therapy or naso-gastric (NG) feeding must have completed these therapies and the tube/cannula removed before transfer to Transition Phase.

In many of settings in Kenya, HIV testing or Diagnostic Counselling and Testing (DCT) is considered on admission to care for severe malnutrition in order to identify the need for chemo-prophylaxis and early assessment for the staging of HIV and AIDS disease progression and readiness for paediatric ART care. Malnutrition or growth failure can be an important point of diagnosis for clinical staging of HIV and AIDS in children – particularly in resource limited settings.

The patient remains in Phase 1 until the medical complications stabilize and until the appetite

improves and the patient completes the designated quantity of F75 or equivalent diet at each mealtime.

Transition Phase: Increase Diet and Prevent Complications

Patients normally remain in Transition Phase for two to three days. This phase is designed to slowly increase the diet and prevent complications of over-feeding for the stabilized, severely acute malnourished patient.

F75 is replaced with F100 or a locally made-up milk of the equivalent nutritional value. The patient's diet is increased from 100kcal/kg/day to 130kcal/kg/day for children. (See Appendix 2.3 for calorie requirements for other age groups). The quantity of milk remains the same, but the calorie content changes by changing milk formulas from 75kcal to 100kcal per 100ml of milk.

The patient in Transition Phase receives around 30% more calories than when in Phase 1. Daily weight gain can be expected at about 6gm/kg/day. For example, a child who weighs 4kg should gain about 24g a day.

For patients qualified and willing to be discharged from Transition Phase to Outpatient Therapeutic Care for the remainder of nutrition treatment, the equivalent calories are given to the patient in the form of Ready-to-Use-Therapeutic Food (RUTF).

: Catch-up Growth and Discharge

In the in-patient setting for the treatment of severe acute malnutrition, patients move from Transition Phase into Phase 2 when they have a good appetite; are tolerating the diet given; have no major medical complications; and oedema is resolved. This is usually after about two to three days in Transition Phase.

In Phase 2, the patient receives F100 at 200kcal/kg/day or the equivalent in the form of RUTF. Those formulas are designed for patients to rapidly gain weight (more than 8g/kg/day). Recovered patients are discharged for supplementary feeding if available at the nearest health facility.

Requirements for the In-patient Setting

Treatment Area

Patients are admitted into the paediatric ward if available or other in-patient ward in the district or sub-district hospital.

Staff

The management of severe acute malnutrition requires a variety of staff positions. Staff fully trained in management of acute malnutrition should be available at all times in the ward. New staff should receive training and be closely supervised until they have the required skills to take charge or work alone at night. All staff must be familiar with these guidelines and have received appropriate training.

Individual Roles and Responsibilities

The **parent, caregiver, or guardian** is the main caretaker of the malnourished patient. He/she may be the mother, the father, a sibling, a relative or a family friend.

Nutritionists, nurses and nurse assistants are responsible for most of the medical and nursing care. Their responsibilities include:

- Conduct regular weight and height measurements of malnourished children;
- Prepare diet, calculate the amounts of feeds, and distribute and record the amount of food taken by the malnourished child;
- Administer oral medication, assess and record clinical signs, and record all information in the Multi-chart. (See Appendix 2.1 for Multi-chart)
- Support mothers to feed the child.

The **nurse in charge** is the manager who teaches and supervises the medical and nursing assistants. The nurses are responsible for all technical procedures, such as giving intravenous medication and other invasive procedures.

The doctor supports the nurses and nutritionists. They work closely together as a team. The doctor is specifically responsible for the care of the very sick severely malnourished children, those who are failing to respond to routine management, or are having diagnostic difficulty.

Materials and Equipment

- Medicines and medical equipment including antibiotics, anthelmintics, minerals and vitamins, NG tubes.
- Therapeutic milks (F75, F100) or the ingredients required to produce locally-made milks including combined mineral vitamin mix (CMV).
- Anthropometric equipment: height board, salter scales, infant scales, MUAC tapes, baby scales.
- Laboratory and diagnostic services is important but not essential.

Documentation

For severely malnourished patients admitted to the in-patient facility, health staff should use the Multi-chart (see Appendix 2.1) to record all medical information, food quantities and type of diet. All daily activities such as daily weights, measurement of vital signs (temperature, pulse and respirations) are also recorded in the Multi-chart. Fluid intake and output is also recorded in the Multi-chart. All staff, regardless of position, should use the same documentation for the patient to ensure consistency.

Admission Criteria for In-patient Care

Phase 1 treatment is always given in an in-patient setting. This phase of the treatment is intended to:

- Stabilise patients with complications
- Restore metabolic functions
- Prevent and/or treat associated conditions and complications and,
- Intensively monitor patients

Table 2.1: Admission Criteria

Criteria for admission with severe acute malnutrition	
Infants 6 months to children 18 years	W/H < -3 Z-score MUAC < 11.5cm - 6 months to 5 years only And/or Bi-lateral Oedema
Adults	BMI < 16 MUAC < 16cm MUAC 16 cm - 18.5cm with clinical complications

Even if an out-patient therapeutic care service exists for the management of severe acute malnutrition, patients with the above criteria and lack of appetite and/or severe medical complications are admitted to the in-patient facility. (See Section One, Table 1.6 “Admission criteria to determine in-patient or out-patient care” for a detailed list of medical complications). Check the Appetite Test results to help decide if the patient can be transferred to out-patient therapeutic care. A poor appetite requires admission to an in-patient facility (see Appendix 1.2 for Appetite Test)

In-patient Stabilization and Rehabilitation of Malnourished Patients

Not all children presenting with severe acute malnutrition will have severe complications. The ten steps in Table 2.2 are a guide for the stabilization and rehabilitation of severe acute malnutrition.

When a malnourished patient is admitted to the in-patient facility, particularly during the initial stabilization phase, check for severe infections as well as hypoglycaemia, hypothermia, and dehydration (Table 2.2, steps 1-3). These usually occur soon after admission and need to be addressed urgently to prevent death. Infections and electrolyte imbalance may manifest at any time during treatment (Table 2.2, steps 4-5). If any of these complications present, refer to the latter part of Section Two "Treatment of Medical Complications" page 70 for the management of severe medical complications. The remainder of the steps address the nutrition care at different stages, micro-nutrient support, sensory stimulation and planning for discharge.

Table 2.2: Checklist for each phase of the management of acute malnutrition for in-patient treatment

PHASES				
		Stabilization		Rehabilitation
Checklist		Days 1-2	Days 3-7	Weeks 2-6
1	Prevent or treat hypoglycaemia			
2	Prevent or treat hypothermia			
3	Prevent or treat dehydration			
4	Correct electrolyte balance			
5	Check for infection			
		No iron supplementation		Iron supplementation
6	Monitor micronutrients			
7	Assure cautious feeding			
8	Monitor catch-up growth			
9	Assure sensory stimulation			
10	Prepare for follow-up			

PHASE ONE TREATMENT

Nutrition Support: Diet and Frequency

When the malnourished patient is in Phase 1, administer a milk diet only: either F75 or an equivalent locally-produced milk product (see Appendix 2.2). The quantity of milk a child needs to receive in phase one is equivalent to 130ml/kg/day. For older children and adults, the quantity of milk per kg of body weight is different than for children younger than five years.

The milk diet is given at regular intervals throughout the day (approximately every two to three hours). The quantity required for each 24 hour period is determined by the child's weight. To determine the amount per feed, divide the 24-hour required quantity by the number of feeds per day.

In Phase 1 the number of daily feeds is determined by the following:

- In 24-hour care with sufficient trained staff to prepare and distribute the feeds overnight give: eight (8) feeds per day.
- If night feeds are problematic (e.g. limited night staff available for feeds, lack of kitchen equipment) give: five to six (5-6) feeds per day. For example, every three hours from 6am to 9pm.¹
- For daycare situations: five to six (5-6) feeds during the day.²

Rarely, if a child has severe vomiting or refuses adequate diet quantities, it may be necessary to give the diet continuously by NG tube. Occasionally, a patient may have osmotic diarrhoea and may require more frequent feeds (feed every two to three hours, and overnight).

For severely malnourished patients with severe oedema (+ + +), reduce the quantity of F75 by up to 20% until the oedema begins to subside. See Table 2.3 for quantities of milk to give for different body weights and reduce quantities by 20%.

Breastfed children are always offered breast milk before the diet, and always on demand.

Preparation of F75

If F75 is available, add one packet (410g) of F75 to two (2) litres of water. (Water must be boiled and cooled prior to mixing.) If five or less children are being treated for severe acute malnutrition, less quantities of F75 milk are necessary. Smaller volumes can be mixed using the red scoop (4.1g) included with the F75 package (20 ml water per red scoop/4.1g of F75). Prepare enough milk for the next three hours, not longer, to assure that it will not spoil. If there is access to a refrigerator, milk can be stored for a maximum of 12 hours. When F75 is not available, refer to Appendix 2.2 for alternative recipes. Recipes can be made by using either dry skimmed milk (DSM), dried whole milk (DWM), fresh cow's milk, fresh goat's milk, with other ingredients including oil, sugar and cereals. Cereals must be

1. It is better to organize the service so that 5 or 6 feeds are actually given, than to try to give 8 or more feeds per day and find that the night feeds are not supervised or not given at all. With staff shortages and junior staff at night, the latter strategy can lead to systematic underfeeding of the children and incorrect information recorded on the Multi-chart.

2. Hypoglycaemia is only a risk if the daytime intake is very low.

cooked. Combined mineral vitamin mix (CMV) must be added to locally made-up milks to achieve micro-nutrient requirements.

Table 2.3: Quantity of F75 or prepared milk to give during Phase 1, per kg of body weight

Class of Weight (kg)	8 feeds per day (ml for each feed)	6 feeds per day (ml for each feed)	5 feeds per day (ml for each feed)
2.0 to 2.1 kg	40 ml per feed	50 ml per feed	65 ml per feed
2.2 - 2.4	45	60	70
2.5 - 2.7	50	65	75
2.8 - 2.9	55	70	80
3.0 - 3.4	60	75	85
3.5 - 3.9	65	80	95
4.0 - 4.4	70	85	110
4.5 - 4.9	80	95	120
5.0 - 5.4	90	110	130
5.5 - 5.9	100	120	150
6 - 6.9	110	140	175
7 - 7.9	125	160	200
8 - 8.9	140	180	225
9 - 9.9	155	190	250
10 - 10.9	170	200	275
11 - 11.9	190	230	275
12 - 12.9	205	250	300
13 - 13.9	230	275	350
14 - 14.9	250	290	375
15 - 19.9	260	300	400
20 - 24.9	290	320	450
25 - 29.9	300	350	450
30 - 39.9	320	370	500
40 - 60	350	400	500

Feeding Technique for Severely Malnourished Children

Due to muscle weakness and slow swallowing, the risk of aspiration pneumonia is high for malnourished children. Therefore, great care must be taken while feeding. The following information lessens the risk of aspiration pneumonia.

Sitting Position

The child sits straight up (vertical) on the mother's lap, leaning against her chest with one arm behind her back. The mother's arm encircles the child. She holds a saucer under the child's chin.

Figure 2.1: Feeding technique



Appropriate Feeding

- The milk feed is given by cup. Any dribbles that fall into the saucer are returned to the cup.
- The child is never force fed, never has his/her nose pinched, and never lies back and has the milk poured into the mouth.
- Meal times are best to be social. The mothers can sit together in a semi-circle around an assistant who encourages the mothers, talks to them, corrects any faulty feeding technique, and observes how the children are taking the milk.
- Caretakers do not take their meals beside the patient. The child is likely to demand some of the mother's meal and this sharing is not recommended as the child's appetite will reduce and then the milk will be refused.

Naso-gastric Feeding

Naso-Gastric (NG) tube feeding is required **only** when a patient is not taking a sufficient diet orally, which is **less than 75% of the prescribed diet per day**.

NG tube feeding is required when one or more of the following is true:

- The patient takes less than 75% of the prescribed diet per 24 hours in Phase 1
- The patient presents with pneumonia with a rapid respiration rate
- The patient has painful lesions of the mouth
- The patient has a cleft palate or other physical deformity
- The patient is experiencing disturbances of consciousness

Each day, try patiently to give the patient F75 by mouth before using the NG tube. NG tube feeding should not exceed three days, and is only used in Phase 1.

Routine Medication

Vitamin A

F75, F100, RUTF and locally-developed milk with CMV provide the adequate amount of Vitamin A to manage mild Vitamin A deficiency and to replace low liver stores of Vitamin A during treatment.³ However, many malnourished patients have a serious Vitamin A deficiency, therefore:

- Administer a dose of Vitamin A to all new admissions **except**:
 - ⇒ Patients who have received Vitamin A within the last month, or
 - ⇒ For children admitted with oedema:
 - administer a single dose of Vitamin A at discharge from in-patient facility after completion of Phase 2, or
 - Administer a single dose of Vitamin A on week four of OTP management, when the patient is transferred from in patient to out patient care.
- If patient has signs of severe vitamin A deficiency (clinical signs such as night blindness, conjunctival xerosis with Bibot's spots, corneal xerosis or ulceration or keratomalacia), give a dose of vitamin A according to Table 2.4, for two consecutive days, followed by an additional dose two weeks later.
- Administer a dose of Vitamin A to all in-patients on the day of discharge⁴ (i.e. completion of Phase 2). For patients managed at OTP, including those transferred from in-patients,

3. A 10kg child taking maintenance amounts of F75 (1000kcal) will receive 7300 IU (2.2mg) of Vitamin A per day. The Recommended Daily Allowance (RDA) USA for such a child is 1700 IU (0.5mg) per day.

4. "In-patients" refer to patients admitted to in-patient facility for their entire treatment. It does not refer to patients transferred to OTP.

administer a dose of vitamin A at week four after admission.

Table 2.4: Vitamin A systematic treatment

Age	Vitamin A/IU orally on Day 1
6 to 12 months	1 blue capsule 100,000IU = 30,000ug
12 months and older	2 blue capsules 200,000IU = 60,000ug

Folic Acid

There is sufficient folic acid in F75, F100 and RUTF to treat mild folate deficiency.⁵ If a patient shows clinical signs of anaemia give 5mgs of folic acid. Moderate Anaemia is identified by palmer paler (very pale palms of the hands), and/or check conjunctiva colour. A very pale conjunctiva is a sign of moderate or severe anaemia.

Iron Supplementation

High-dose iron tablets are contraindicated as they can increase the risk of severe infection in severe acute malnourished patients due to the presence of free iron in the blood.

If moderate anaemia is identified:

- For in-patients receiving entire treatment of acute malnutrition in the in-patient health facility: Add iron to the F100 in Phase 2.

If severe anaemia is identified, see “Treatment of Medical Complications” at the latter part of this Section (page 70).

Other Nutrients

F75, F100, RUTF and locally-developed milks with CMV contain the micro-nutrients required to treat the malnourished child. Additional potassium, magnesium or zinc **is not administered**. A “double dose”---one coming from the diet and the other prescribed---is potentially toxic. Additional potassium should never be given with these diets. Even for the severe acute malnourished patient with diarrhoea, it is not advisable to give additional zinc.

Systematic Antibiotics

All severe acute malnourished children receive antibiotic treatment upon admission, regardless if they have clinical signs and symptoms of systemic infection or not. Nearly all these children have infections even if they are not symptomatic. Children who have a poor appetite and require admission to Phase 1 should be treated blindly for infections.

Small bowel bacterial over-growth occurs in all severe acute malnourished children (including those with moderate appetite and some with good appetite). Enteric bacteria are frequently the source of systemic infection by translocation across the bowel wall. This can also cause mal-absorption of nutrients and failure to eliminate the substances excreted in the bile, fatty liver, intestinal damage, and can cause chronic diarrhoea. The antibiotic administered for routine treatment must be active against small bowel bacterial overgrowth. Children with Kwashiorkor have free iron in their blood: this can lead to bacteria that are not normally invasive, such as *Staphylococcus epidermidis*, and “exotic bacteria” to trans-locate and can cause systemic infection or septicaemia. Amoxicillin is identified in Kenya as the first line antibiotic to give systematically. If Amoxicillin is not available then the doctor will decide on the most appropriate antibiotic to give instead. If staphylococcus is suspected, administer an antibiotic that is active against staphylococcus.

5. A 10kg child taking maintenance amounts of RUTF will receive 400 micrograms of folic acid per day. The RDA (USA) for such a child is 80 micrograms per day.

Antibiotic Regime

First line antibiotic treatment:

Oral Amoxicillin⁶. (If not available, doctor to decide appropriate alternative)

Second line antibiotic treatment:

- Add chloramphenicol (do not stop amoxicillin) **OR**
- Add gentamycin (do not stop amoxicillin) **OR**
Switch to amoxicillin/clavulanic acid (Augmentin®). **In in-patient settings where severe infection is common, this may sometimes be considered as the first line antibiotic combination.**

Third line antibiotic treatment:

Third line treatment is at the discretion of the medical doctor and is dependent on each patient's medical condition or complications. Frequently, a systemic anti-fungal (fluconazole) is added for patients who have signs of severe sepsis or systemic candidiasis.

Important note: Co-trimoxazole is not active against small bowel bacterial overgrowth and is not adequate for the severely malnourished child. If Co-trimoxazole is administered as a prophylaxis against pneumocystis pneumonia in HIV-positive patients, the above recommended antibiotics should be administered in addition.

Table 2.5: Dosage of Amoxicillin, Gentamycin and Chloramphenicol

Patient Weight Range	Amoxicillin Dosage twice per day		Gentamycin Dosage once daily IM	Chloramphenicol Dosage three times daily	
	In mg	cap/tab	In mg	In mg	cap/tab
<5kg	125mg	½ cap	5mg/kg IM daily	62.5mg	¼ cap
5 - 10kg	250mg	1cap	As above	125mg	½ cap
10 – 20kg	500mg	2cap	As above	250mg	1 cap
20 – 35kg	750mg	3cap	As above	500mg	2cap
>35kg	1000mg	4cap	As above	1000mg	4cap

Note: Use the 20mg ampoule of Gentamycin. It is most accurate for small doses for children with a low body weight. Chloramphenicol should never be used for infants under two (2) months old, and used only with caution in infants under six (6) months (if other antibiotics not available).

Duration of Antibiotic Treatment

Antibiotics are administered every day of Phase 1 plus an additional four (4) days or until transfer to community nutrition care.

Malaria Treatment

Refer to Kenya National Guidelines for Malaria Treatment. Test all malnourished patients who are at risk of malaria before commencing treatment. The usual signs and symptoms for malaria may not be present in the malnourished child, therefore in malaria endemic areas all severely malnourished children are tested for malaria.

6. This is recommended as second-line antibiotic by IMCI. It is given to grossly immuno-compromised patients who are severe enough to be admitted to a treatment programme. Amoxicillin is active against small bowel bacterial overgrowth in most patients. Where this is used as the first line antibiotic, metronidazole does not need to be given. WHO (Technical meeting, Geneva, June 2007) also recommends the use of Amoxicillin as first line systematic antibiotic therapy on admission for all SAM cases.

Never give intravenous infusions of quinine to a severely malnourished patient in the first two weeks of treatment. Impregnated bed nets should always be used in malaria endemic regions.

Measles Vaccination

In-patient setting, all children older than six months and also all children above nine months who do not have a vaccination card are given a measles vaccine both on admission and after a month, or at discharge after Phase 2 (if this is after a month).⁷

De-worming

Children who play outdoors are susceptible to worm infestation. Deworming is necessary for in-patient malnourished children, but should be delayed until they are recovering in Phase 2 or discharged to OTP.

Children younger than one year old should not receive anthelmintics. New research by WHO indicates that all children older than one year can receive a full stat dose of either Albendazole or Mobendazole for treatment of worm infestation.

Table 2.6: Dosage for deworming, by age group

	Children less than one (1) year old	Children one year and above
Albendazole 1 - 2 Years 200mg > 2 years 400mg	Not given	1 dose on admission to Phase 2
Mebendazole 500mgs	Not given	1 dose on admission to Phase 2

Summary of Medications

Table 2.7 summarizes the routine medications for severely malnourished children. There are some differences between the in-patient and out-patient drug regime, but in general they are very similar. The main difference is that iron is not administered to children who receive RUTF in the out-patient setting, as there is already sufficient iron in the diet.

Table 2.7: Summary of routine medication for in-patient treatment of severe acute malnutrition

	Direct admission to in-patient treatment
Vitamin A	1. One (1) dose at admission (conditional)* 2. One (1) dose on discharge. Do not administer discharge dose when the patient is transferring from Transition Phase to OTP management. (It will be given there.)
Folic Acid	One (1) dose at admission, if there are definite signs of anaemia
Amoxicillin	Everyday in Phase 1, plus four (4) days during Transition/Phase 2
Malaria	According to national protocol
Measles Six (6) months and older	1. One (1) vaccine at admission if no vaccination card 2. One (1) vaccine at discharge (after a month)
Iron	Add to F100 or milk formula in Phase 2

*Ensure patient has not received Vitamin A within the previous month and do not give to patients with Oedema.

7. The first measles dose often does not give a protective antibody response. It is administered to ameliorate the severity of incubating measles and partially protects from nosocomial measles. This is usually unnecessary with out-patient treatment. The second dose, or week four dose, is given to provoke protective

Surveillance

Each Day:

- Take patient's body temperature twice a day.
- Weigh the patient and record the weight. Plot weight on the Multi-chart. (See Appendix 2.1 for multi-chart).
- Assess and record the degree of oedema (0, +, ++, +++).
- Record the patient's fluid intake and source (oral, NG tube or IV fluids). Record if patient is absent at mealtime, has refused diet or has vomited. Document the information in the multi-chart to monitor ongoing progress.
- Assess and note in the Multi-chart standard clinical signs (number of stools passed, vomiting, dehydration, cough, respiration, and liver size).

Once a week, MUAC is measured.

On admission and after 21 days (with each new Multi-chart), measure length for children who are less than 87cms, or height for children who are greater than or equal to 87cms.

Criteria for Transfer: Phase 1 to Transition Phase

The patient must meet the following criteria to transfer from Phase 1 to Transition Phase:

- Appetite has improved and taking all prescribed quantity of milk.
- Oedema, if present, reduced from severe +++ to moderate ++.
- Treatment for any medical complication has commenced and patient is recovering.
- IV fluids and NG feeding completed and cannula/tube removed.

TRANSITION PHASE TREATMENT

A patient usually remains in Transition Phase for two to three days. In this phase the patient begins to gain some weight slowly. The objective of Transition Phase is to gradually increase the amount of calorie intake, increasing from 100kcal/kg to 130kcal/kg. This is to prevent overload and its potential complications. Transition Phase prepares the patient for Phase 2 treatment or, if an out-patient facility for treatment of acute malnutrition exists, for transfer to the Outpatient Therapeutic Care.

Nutrition Support: Diet and Frequency

The ONLY change in the diet when transferring from Phase 1 to Transition Phase is that **F75 is replaced by either F100 or equivalent made-up milk, ready to use therapeutic food (RUTF), or a combination of the two**. The number of feeds, the timing, and the volume of the diet remains exactly the same in Transition Phase as in Phase 1 (130ml/kg/day).

The decision whether to give specialized milk or RUTF depends on the patient's discharge plan and on availability of specialized foods. If there is only the in-patient option, then milk can be given alone or a combination of the milk and RUTF. Where the patient will discharge to the OTP then the child takes RUTF during Transition Phase, in preparation for discharge. RUTF can be given inter-changeably with F100 depending on the availability of RUTF and staffing levels. In the in-patient facility, F100 can be given during the day and RUTF given overnight or on week-ends (especially during times staffing levels are low).

Transition Phase: Feed 5-6 times daily and not overnight

In all cases, breastfed children should always be breastfed before taking F100 or RUTF, and always on demand.

Preparation of F100

Prepare F100 by adding a sachet of F100 milk powder to two (2) litres of boiled cooled water. If small quantities of milk are required (few children in need of nutritional rehabilitation), add one (1) red scoop (4.1g) powder milk to 18ml boiled and cooled water. For small quantities of locally made-up milk see recipes Appendix 2.2.

Table 2.8: Quantity of F100 to give during Transition Phase, per kg of body weight

Class of Weight (kg)	8 feeds per day	6 feeds per day	5 feeds per day
Less than 3kg	F100 full strength should not be given. Only F100 Diluted is given.		
3.0 to 3.4 kg	60 ml per feed	75 ml per feed	85 ml per feed
3.5 – 3.9	65	80	95
4.0 – 4.4	70	85	110
4.5 – 4.9	80	95	120
5.0 – 5.4	90	110	130
5.5 – 5.9	100	120	150
6 – 6.9	110	140	175
7 – 7.9	125	160	200
8 – 8.9	140	180	225
9 – 9.9	155	190	250
10 – 10.9	170	200	275
11 – 11.9	190	230	275
12 – 12.9	205	250	300
13 – 13.9	230	275	350
14 – 14.9	250	290	375
15 – 19.9	260	300	400
20 – 24.9	290	320	450
25 – 29.9	300	350	450
30 – 39.9	320	370	500
40 – 60	350	400	500

Warning: F100 is never given out for use at home. It is always prepared and distributed in an in-patient unit. F100 is not kept in liquid form at room temperature for more than three hours before it is consumed.

Plans for Eventual Out-Patient Care – Use of RUTF

If out-patient management of malnutrition is available, use RUTF in the Transition Phase. Initially RUTF and F100 meals can alternate with RUTF given every other feed (20g of RUTF is equivalent to 100ml of F100). If the RUTF is tolerated, the patient's diet changes to RUTF for the remainder of Transition Phase. Patients may initially refuse RUTF. If this is the case, give the patient the F100 diet and offer RUTF again the next day. Discharge to out-patient treatment of acute malnutrition is only advised when the patient tolerates at least 75% of the amount of RUTF calculated for the individual child (see Table 2.9).

The daily amount of RUTF is given to the caregiver with directions to give small portions of feeds frequently. The quantity consumed by the child is checked regularly during the day. Table 2.9 outlines the quantities to give in Transition Phase based on the child's body weight. Children who are not taking 75% RUTF are given F100 to make up any deficit in intake. No other food is given to the patient during this period.

Patients should drink as much clean water as possible while taking and after consumption of RUTF.

Table 2.9: Quantity of RUTF to give during transition phase, per kg of body weight

Class of weight (kg)	RUTF (Plumpy'nut®)	
	sachet per day	sachets per week
3.0 - 3.4	1 ¼	8
3.5 - 4.9	1 ½	10
5.0 - 6.9	2	15
7.0 - 9.9	3	20
10.0 - 14.9	4	30
15.0 - 19.9	5	35
20.0 - 29.9	6	40
30.0 - 39.9	7	50
40 - 60	8	55

Currently in Kenya, Plumpy'nut® is the only product available and is only available for emergency response programmes. Plumpy'nut® is a commercial product of Nutriset. It comes in sachets of 500kcal each weighting 92g. However local RUTF may be produced in Kenya in the future.

Plumpy'nut® is nutritionally equivalent to F100, with the exception that it has an appropriate amount of iron added for children in Phase 2 or children who pass the appetite test.

Note: If both F100 and RUTF are being given they can be substituted on the basis that about 100ml of F100 = 20g of RUTF.⁸

Routine Medication

Routine antibiotic therapy should be continued for four days after Phase 1 or until the patient is transferred to outpatient therapeutic care or inpatient care phase 2. This is to ensure that any infection is treated. Patients being discharged to out-patient therapeutic care at the end of Transition Phase do not need to be given antibiotics on admission into the out-patient therapeutic care. They already have received a course of antibiotics. Antihelmits are administered to malnourished children who are one year or older on transfer to either Phase 2 in-patient, or to out-patient.

8. This is an acceptable approximation. If tables are to be constructed then 100 ml of F100 = 18.5g of RUTF: 10g of RUTF = 54ml of F100 should be used and the resulting values rounded to the nearest 5 or 10 ml

Surveillance

The surveillance in Transition Phase is the same as surveillance in Phase 1. As the patient is now taking more than maintenance amounts of food, weight gain is expected. It takes an average of about five (5) kcal to make one (1) gram of new tissue. Thus, if the patient takes all food and there is not excessive mal-absorption, the expected rate of weight gain for marasmic patients during Transition Phase is about 6g/kg/day.

Each Day:

- Take patient's body temperature twice a day.
- Weigh the patient and record the weight. Plot weight on the Multi-chart. (See Appendix 2.1 for multi-chart).
- Assess and record the degree of oedema (0 to + + +).
- Record the patient's fluid intake. Record if patient is absent at mealtime, has refused diet or has vomited. Document the information in the multi-chart to monitor ongoing progress.
- Assess and note in the Multi-chart standard clinical signs (number of stools passed, vomiting, dehydration, cough, respiration and liver size).

Once a week, MUAC is measured.

Criteria for transfer: Transition Phase to Phase 2

- If the patient has a good appetite and is taking at least 75% of the RUTF or all F100 prescribed for Transition Phase, he/she may progress to Phase 2 in the in-patient facility or the out-patient therapeutic care. The daily ration of RUTF in Transition Phase is the same for a patient of the same weight directly admitted to out-patient therapeutic care. Therefore, if they are eating at least 75% of the RUTF prescribed, it is a similar calorie amount as what is given when using F100 in the Transition Phase.
- Oedematous patients (kwashiorkor) discharged to the out-patient management of malnutrition remain in Transition Phase until there is a definite and steady reduction in oedema (+ level). Patients who remain as in-patients should remain in Transition Phase until they have lost their oedema entirely.
- Severe medical complications must be resolved before the patient progresses to out-patient therapeutic care or to Phase 2.

Criteria for Return to Phase 1 from Transition Phase

Move the severely malnourished child back to Phase 1 if any one of the following occurs:

- There is increasing oedema.
- A child who does not have oedema develops oedema.
- There is a rapid increase in the size of the liver.
- Any signs of fluid overload develop.
- Tense abdominal distension develops.
- The patient gets significant re-feeding diarrhoea so that there is weight loss.
- A complication arises that necessitates an intravenous infusion.

If a severe medical complication becomes apparent, such as hypothermia, hypoglycaemia, dehydration, septic shock, acute vomiting, acute diarrhoea with weight loss and possible reduced bowel sounds/abdominal distension or heart failure then transfer the patient back to Phase 1.

It is common for some change in stool frequency when there is a change in diet. This does not need to be treated unless the children lose weight. Several loose stools without weight loss are not a criterion to move back to Phase 1.

PHASE TWO TREATMENT

In Phase 2, the main objective is to achieve catch-up growth and resolve micronutrient deficiencies. However there are some variations in workload. As the patients are recovering the frequency of meals and some of the routine surveillance is less frequent as in Phase 1 and Transition Phase.

Criteria for Transfer to Phase 2 from Transition Phase

- Good appetite (taking all diet in Transition Phase)
- Loss of oedema
- Medical complications have resolved

Nutrition Support: Diet and Frequency

When patients are transferred from Transition Phase to Phase 2, the main change in the diet is an increase in the amount of F100 or made-up milk formulas. The volume of milk is increased from 130ml/kg/day to 200ml/kg/day (equivalent to 200kcal/kg/day). The objective of Phase 2 is to achieve catch-up growth. Thus, if the child remains hungry after completing a feed, more milk can be offered. Either F100 or RUTF can be given, or a combination of both.

F100 (100ml = 100 kcal)

- Give five feeds of F100 per day to patients who weigh less than 8kg (see Table 2.10 for F100 quantities to give for body weight).
- One porridge meal may be given to patients who weigh more than 8kg (approximately 24 months of age); it is not necessary to give porridge unless the patient asks for it.

RUTF: Can be used in the in-patient setting. 20g of RUTF is equivalent to approximately 100ml of F100.

Breastfed children always nurse (receive breast milk) before they are given F100 or RUTF, and also always on demand.

Preparation of F100

Prepare F100 by adding a sachet of F100 powdered milk (net weight 456gms) to two (2) litres of boiled, cooled water. See Appendix 2.2 for recipes of locally made milk formulas.

Table 2.10: Quantity of F100 to give during Phase 2, per kg body weight

Class of weight (kg)	6 feeds/day F100 ml/feed	5 feeds/day F100 ml/feed
<3 kg	Full strength F100 and RUTF not given to infants who weigh less than 3kg	
3.0 to 3.4	110	130
3.5 - 3.9	120	150
4.0 - 4.9	150	180
5.0 - 5.9	180	200
6.0 - 6.9	210	250
7.0 - 7.9	240	300
8.0 - 8.9	270	330
9.0 - 9.9	300	360
10.0 - 11.9	350	420
12.0 - 14.9	450	520
15.0 - 19.9	550	650
20.0 - 24.9	650	780
25.0 - 29.9	750	900
30.0 - 39.9	850	1000
40 - 60	1000	1200

Routine Medication

Iron

Iron is given to malnourished children in Phase 2. For convenience and ease for staff it is added to the F100 diet or locally made-up milk: Crush an iron tablet and add to 4mls of water and mix well (Iron Solution).

- For one sachet of F100 (makes 2.4 litres of F100), add one (1) crushed tablet of ferrous sulphate (200mg) in the 4mls of water (Iron Solution).
- For half a sachet of milk (1200ml of F100), add 2mls of the iron solution.
- For 600ml of F100, add 1ml of the iron solution.

If using locally made-up formulas add iron solution as above to the milk. RUTF already contains the necessary iron.

De-worming

Children that are 1 year old and older are given 1 dose of de-worming medication at the start of Phase 2.

Surveillance

Patient surveillance in Phase 2 is less intensive and less frequent than during Phase 1 and Transition Phase. However, it is important to routinely monitor progress. See Table 2.11 for surveillance duties and frequency.

Table 2.11: Phase 2 surveillance

Surveillance Tasks	Frequency
Check weight and oedema	Three (3) times per week
Measure height (length)	Every three (3) weeks, with each new Multi-chart
Take body temperature	Every morning
Assess standard clinical signs (stool, vomiting)	Every day
Take MUAC	Every week
Record diet intake	Record daily all intake in Multi-Chart

Discharge

Preparation for Discharge

- Throughout in-patient care, keep the patient's family informed of the patient's progress and the discharge plan. Schedule routine health and nutrition education in groups and individually as necessary.
- If possible, during Phase 2 conduct cooking demonstrations with parents/caregivers on how to use local foods and maintain balanced diets. This is an effective way to transfer knowledge, especially where literacy is an issue.
- Discharge patient for Supplementary Feeding if available and with a food ration if possible. If there is no SFP, schedule a follow-up visit to the mother and child health clinic (MCH) with the mother/caregiver in order to monitor patient's progress.

Table 2.12: Discharge criteria for recovered patients⁹

The patient is...	If the following exists...
Cured	<ul style="list-style-type: none"> • < -2 Z-score¹⁰. • MUAC > 11.5cm (6 months - 5 years) and • No oedema for 10 days.

Medications to Administer on Discharge

- One dose of Vitamin A.
- Measles vaccine if the patient is older 6 months (this needs to be a month apart from the measles vaccine that was given on admission).

9. Discharge criteria based on percentage of weight gain is currently being developed

10. Ideally, patients should be referred for supplementary feeding once discharged from inpatient and out patient therapeutic care.

TREATMENT OF MEDICAL COMPLICATIONS

This section outlines the most common medical complications associated with severe malnutrition that require careful diagnosis, management and appropriate treatment. Often severely malnourished patients have underlying medical conditions that can be asymptomatic on admission. Certain symptoms present early in the treatment of severe malnutrition, others are masked and present later.

Hypoglycaemia and hypothermia may present in the early stages of recovery. Hypoglycaemia can be prevented by feeding small amounts of the specialized diet frequently. Hypothermia is prevented by keeping the patient warm. Dehydration is not common but needs to be treated correctly if diagnosed. History of fluid loss is an important consideration as other clinical signs such as non-elastic skin with skin in folds and sunken eyes are often present in the severely malnourished patient regardless of hydration status.

Infections are common for the malnourished patient. The normal signs and symptoms, such as fever and increased respiration or increased pulse rate, may not be present. It is extremely important to closely monitor the medical status of severely malnourished patients by recording vital signs (such as pulse, temperature, and respiration rate), diet, fluid intake and incidence of vomiting and/or diarrhoea. It is important to have base-line patient information, such as vital signs, by recording them on admission and twice daily after admission. If the vital signs are abnormal or change, it may indicate deterioration in the patient's condition related to an underlying medical complication.

If a patient treated by out-patient therapeutic care, or a patient who is transferred out of Phase 1, develops a serious medical complication always transfer the patient back to Phase 1.

Hypoglycaemia

Though uncommon, severely malnourished patients can develop hypoglycaemia. All children who have travelled long distances to attend a health centre should be given sugar-water as soon as they arrive: 1 heaped teaspoon of sugar in 50ml of water. Children who have hypothermia or septic shock should be given 50-100ml of sugar water, whether or not they have low blood glucose.

A child who has taken the prescribed quantity of F75 diet each day (with 5-6 feedings per day) will not develop hypoglycaemia overnight and does not need to be woken for night time feeding. If the diet is not completely taken during the day (due to vomiting or refusal of milk), the health worker should encourage the caregiver to give at least one prescribed quantity of F75 during the night.

Clinical Signs of Hypoglycaemia

- Low body temperature
- Lethargy or limpness
- Possible loss of consciousness
- Eyelid retraction is one sign of over-active, sympathetic nervous system, which starts before actual hypoglycaemia develops. If a child is sleeping with his eyes slightly open, wake the child up and give sugar-water to drink. Health staff and caretakers should be taught to look for this sign during the night.

Table 2.13: Preparation of sugar water (10% dilution)

Quantity of Water	Quantity of Sugar	
100 ml	10g	2 heaped teaspoons
200 ml (average cup)	20g	4 heaped teaspoons
500 ml (small bottle)	50g	10 heaped teaspoons
1 litre	100 g	20 heaped teaspoons

Notes:

- Take clean drinking water (slightly warm if possible to help dilution). Add required amount of sugar and shake or stir vigorously.
- Give immediately to ALL ADMISSIONS IF MILK CAN NOT BE GIVEN IMMEDIATELY.

Treatment of Hypoglycaemia

- **Patients who are conscious** and able to drink are given about 50ml (approximately 5-10ml/kg) of sugar-water (10% glucose: 1 heaped spoon of ordinary sugar in 50mls of potable water). Or they can be given F75 diet or F100 (depending on what is immediately available) orally. The actual amount given is not critical.
- **Patients losing consciousness** are given 50ml (or 5-10ml/kg) of sugar-water by NG tube immediately. When consciousness is regained, give milk feed frequently.
- **Unconscious patients** are given sugar-water by NG tube. They should also be given glucose as a single intravenous injection (5ml/kg of a sterile 10% glucose solution).
- All **severely malnourished patients** with suspected hypoglycaemia should be treated with second-line antibiotics.

Monitoring Hypoglycaemia

The patient response to treatment should be dramatic and rapid. If a very lethargic or unconscious patient does not respond, it indicates a different cause for the clinical condition such as an infection. The different source of the lethargy must be determined and treated. If consciousness drops or temperature falls, re-test the blood glucose level and give another dose of glucose 50ml by NG tube or IV. (10% glucose as above)

Prevention of Hypoglycaemia

Make sure that the severely malnourished patient receives sugar water on admission, if it is not close to a feed time or the patient is waiting in the casualty/emergency department for over one hour

For patients at risk of hypoglycaemia (very sick children with poor appetite, with vomiting or diarrhoea), give frequent, regular feeds every three (3) hours.

Hypothermia

Clinical signs of Hypothermia

Severely acutely malnourished patients are highly susceptible to hypothermia. Hypothermia is indicated by a rectal temperature below 35.5°C, or an under-arm temperature below 35°C.

Treatment of Hypothermia

- Do not bathe severely malnourished patients on admission. Later, when the patient is stabilized, bathe patient only during the warmest part of the day with warm water. Dry patients quickly and gently after washing.
- Use the “kangaroo technique” for children with a caretaker. (See box page 82 “Kangaroo care”.)
- Put a hat on the child and wrap mother and child together.
- Offer hot drinks for the mother to drink to keep her skin warmer (plain water, tea or any other hot drink).

“Kangaroo Care”

Kangaroo care means keeping an infant in continuous skin-to-skin contact with the mother or adult caregiver. The infant is kept near the mother’s breast.

1. The mother removes inner clothing
2. The infant only wears a nappy and head covering
3. The infant is held close against the mother’s bare chest by wrapping a culturally-appropriate cloth
4. The mother wears enough usual outer clothing to keep warm, adjusting so that the infant’s face is exposed to the air and the mother can see the infant.

Monitoring Hypothermia

- Monitor a patient’s body temperature during re-warming.
- The room should be kept warm, especially at night (between 28°C and 32°C). A maximum-minimum thermometer should be on the wall in the Phase 1 area to monitor the temperature.
- Treat for hypoglycaemia and give second-line antibiotic treatment.

Note: The thermo-neutral temperature range for malnourished patients is 28°C to 32°C. This is often uncomfortably warm for the staff and caretakers who may want to adjust the room to suit them. Staff and caregivers should not reduce the room temperature as it will be too cold for severely malnourished children. Children should sleep with their mothers or caregivers and not in the traditional hospital child-cots/cages. There should be adequate blankets and a thick sleeping mat or adult bed. Most heat is lost through the head; hats should be worn by malnourished children. Windows and doors should be kept closed at night.

Dehydration

Misdiagnosis and inappropriate treatment for dehydration is the most common cause of death of the severely malnourished patient. It is difficult to diagnose dehydration in these patients. The signs of dehydration - such as non-elastic skin and sunken eyes - are often present in the severely malnourished patient regardless of hydration status. It is important to take a detailed medical history and determine if there was a recent fluid loss from acute diarrhoea or vomiting.

During treatment of severe acute malnutrition, be aware of the following: **The standard protocol for the dehydrated child (who is not malnourished) should not be used.**

A severely malnourished dehydrated child has a different protocol.

- With severe malnutrition, the “therapeutic window” is narrow: even dehydrated children can quickly go from having a depleted circulation to experiencing over-hydration with fluid overload and cardiac failure.
- In malnutrition, both marasmus and to greater extent kwashiorkor, IV infusions are rarely used because there is a particular renal problem that makes the children sensitive to salt (sodium) overload and at high risk of fluid overload.
- To prevent overuse of oral rehydration salts i.e. ReSoMal, do not leave these products accessible in the ward for the caretakers to give freely to children. An over-supply of ReSoMal can lead directly to heart failure, as well as failure to lose re-feeding oedema with the commencement of re-feeding.
- If there is no dehydration, **do not** treat diarrhoea with rehydration fluids with the intention to prevent the onset of dehydration. This will again lead to over-hydration and heart failure.

Diagnosis of Dehydration with the Marasmic Patient

For the patient with marasmus, all the classical signs of dehydration are unreliable and should not be used to make the diagnosis of dehydration:

- **Do NOT use the skin pinch test to diagnose dehydration in malnourished children.** Marasmic skin often lies in folds and is inelastic, thus the “skin pinch” test is generally positive regardless if the patient is hydrated or not.
- **Do NOT assume that patients with marasmus who have sunken eyes are dehydrated.** Marasmic eyes are normally sunken regardless of dehydration¹¹.
- **Do NOT** make a definitive diagnosis of dehydration. If the child seems to be dehydrated, make a *provisional* diagnosis and observe the response to treatment before confirming the diagnosis.

The diagnosis is determined by the patient’s history rather than by examination.

There needs to be:

- A definite history of significant and recent fluid loss. Usually this is a watery diarrhoea (not just soft or mucus), frequent, and with a sudden onset within the past few hours or days.
- There should also be a history noted of a recent change in the child’s appearance.
- If the eyes are sunken, the caretaker must be able to report that the eyes have become sunken since the diarrhoea started.
- The child must not have any oedema.

Children with persistent or chronic diarrhoea (without an acute watery exacerbation) are not considered dehydrated.

Treatment of Dehydration for the Marasmic Patient

When possible and feasible, rehydrate the patient orally with ReSoMal. Intravenous infusions are dangerous and NOT recommended unless there is: 1) severe shock with 2) loss of consciousness from 3) confirmed dehydration.

The management of dehydration is based on the accurate measurements of a patient’s weight which is the best measurement of fluid balance. The patient should be weighed without any items of clothing on (naked).

Before starting any rehydration treatment:

1. Weigh the child;
2. Take and record the child’s pulse;
3. Record the child’s respiration rate and;
4. Mark the edge of the liver and the costal margin on the skin with an indelible marker pen (skilled staff).

If the staff is qualified to do so, record the patient’s heart sounds (presence or absence of gallop rhythm).

The marasmic malnourished dehydrated child is managed entirely by:

- Weight changes
- Clinical signs of improvement such as alertness
- Clinical signs of over-hydration (engorged veins, rapid pulse, respiratory distress)

11. The orbit contains the eye, small muscles and nerves, fat, the lachrymal gland and a venous plexus. In marasmus the fat and lachrymal gland atrophy, so that the eyes sink. In dehydration there is contraction of the venous plexus forcing blood out of the orbit so that the eyes sink.

Step 1: Determine 5% of patient's body weight

For the severely malnourished, dehydrated child, a maximum of 5% of the child's body weight is replaced in the form of fluids. To determine 5% of body weight, equate: body weight in grams/100 x 5.

Therefore, 5% body weight of a 4kg child equals: $4000\text{g}/100 \times 5 = 200\text{g}$ which then equates to 200ml of re-hydration fluid.

It is estimated that a severely dehydrated marasmic child will lose a maximum of 5% of body weight so it is important to only replace a maximum of this amount otherwise there is a danger of over-hydration.

Step 2: Administer re-hydration fluid

The fluid must be given slowly over time to prevent complications such as overload or heart failure.

- Give ReSoMal orally or by NG tube
- Give: 5ml/kg every 30 minutes for first two (2) hours
- Give 5-10mls hourly until weight gain has been achieved

Case Study:

For a 4kg child, over the first two hours give the following orally or by NG tube:

- ⇒ 5ml/kg ReSoMal every 30 minutes for two hours = 20ml x four (there are four 30 minute intervals in two hours) = 80ml. (This is 2% of a 4kg child's body weight).
- ⇒ Over the next number of hours give 5 to 10ml/kg/hour ReSoMal until weight gain is achieved and the patient shows clinical signs of improvement. Therefore for a 4kg child, give 20 to 40ml per hour after the initial two hours.

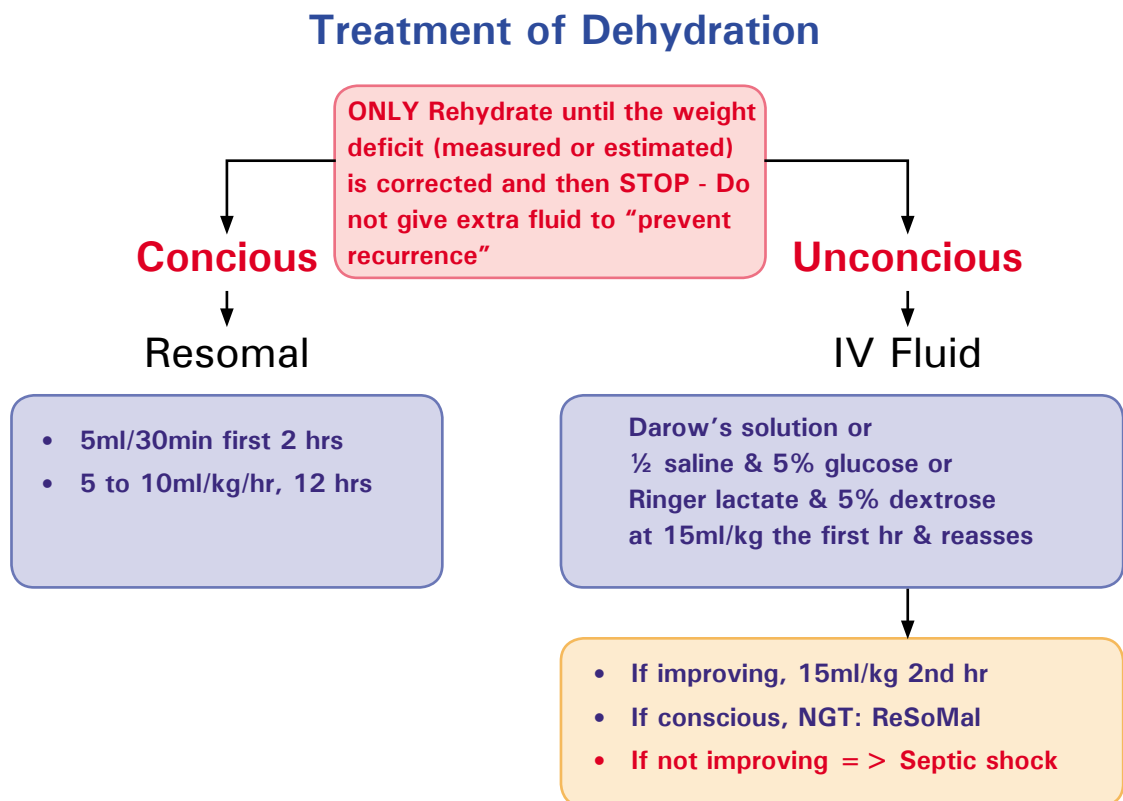
It is important to re-assess frequently to make sure that the patient does not become over-hydrated. Fluid balance is measured at frequent intervals by weighing the child.

Step 3: Complete the re-hydration

Give re-hydration fluid until the weight deficit (measured or estimated) is corrected (maximum of 5% body weight). Stop as soon as the child is re-hydrated, having reached the target rehydrated-weight.

As the child gains weight during re-hydration, definite clinical improvement should be obvious. The signs of dehydration should disappear. If there is no improvement with weight gain, the initial diagnosis of dehydration was wrong and rehydration therapy must be stopped.

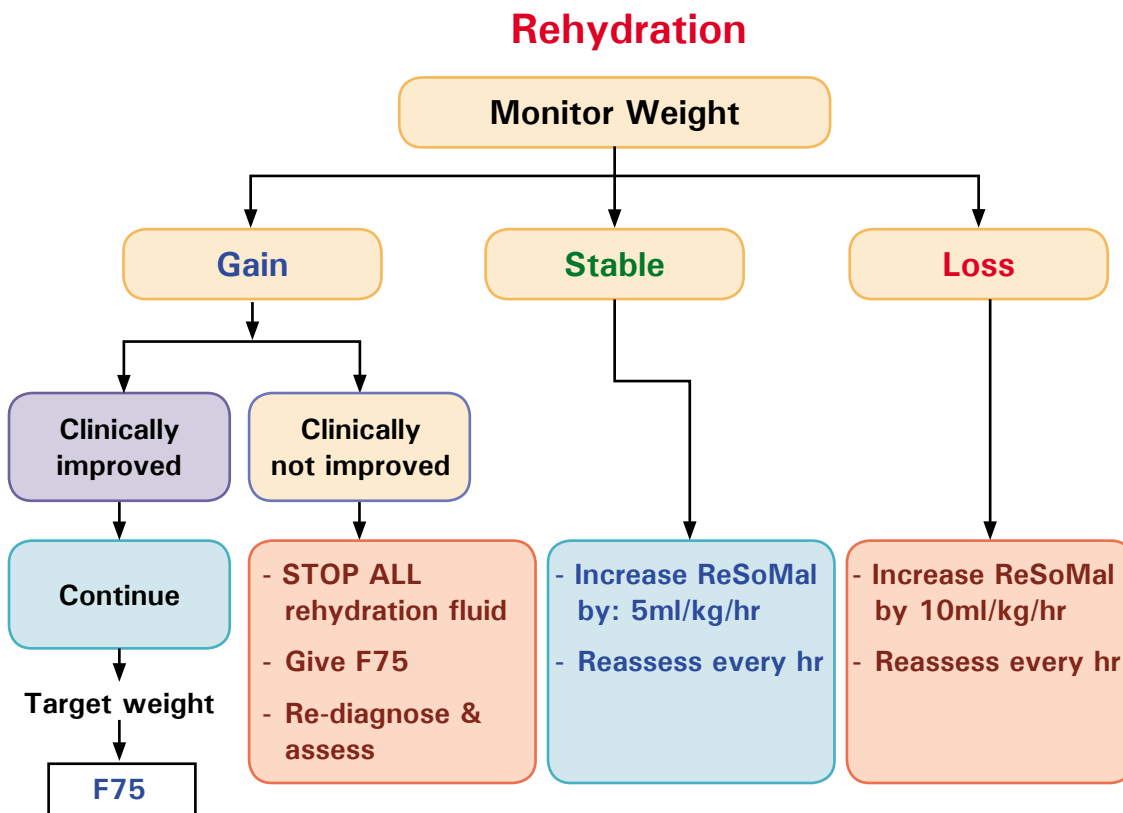
Figure 2.2: Treatment of dehydration - assessment



Step 4: After re-hydration

After rehydration, usually no further treatment is given. However, for severe acute malnourished children from 6 to 24 months, 30ml of ReSoMal can be given for each incidence of a watery stool. **The standard instructions to give 50-100ml for each stool should not be applied. It may cause fluid overload which is dangerous.**

Figure 2.3: Treatment of dehydration - monitoring



Two hours after commencing re-hydration therapy, make a major medical reassessment.

- Check all vital signs such as body temperature, pulse and respiration rate.
- Check heart sounds.
- Check for clinical signs of respiratory distress.
- Check consciousness levels and weight gain.
- Check for vomiting and/or diarrhoea.

If there is:

- **Continued weight loss:** Increase ReSoMal by 10ml/kg/hour and re-assess the patient in one hour.
- **No weight gain:** Increase ReSoMal by 5ml/kg/hour and re-assess the patient in one hour.
- **Weight gain and...**
 - ⇒ ...deterioration of the child's condition with the re-hydration therapy:
 - The diagnosis of dehydration was definitely wrong. (Even senior clinicians make mistakes in the diagnosis of dehydration in malnutrition.)
 - Stop the ReSoMal and start the child on F75 diet.
 - ⇒ ...no improvement in the mood and look of the child, or reversal of the clinical signs:
 - The diagnosis of dehydration was probably wrong.
 - Change to F75.
 - ⇒ ...clinical improvement, but signs of dehydration:
 - Continue with treatment until the appropriate weight gain is achieved.
 - Continue with ReSoMal alone. Or F75 and ReSoMal can be alternated.
 - ⇒ ...resolution of the signs of dehydration:
 - Stop re-hydration treatment and start the child on F75 diet.

During re-hydration, breastfeeding should not be interrupted.

Begin to give F75 as soon as possible after rehydration has been completed. The F75 can be given orally or by NG tube. ReSoMal and F75 can be alternated each hour in the case of a patient with mild dehydration and continuing diarrhoea. The introduction of F75 is usually achieved within two to three hours after starting the re-hydration process when the patient should be improving. The re-commencement of F75 will also help to prevent development of hypoglycaemia

Monitoring Re-hydration

Rehydration (oral or intravenous) therapy must **immediately stop** if any of the following are observed:

- The target weight for rehydration is achieved (start F75).
- Visible veins are full (start F75).
- The development of oedema (indicates over-hydration: start F75).
- The development of prominent neck veins.
- The neck veins engorge when the abdomen (liver) is pressed.
- An increase in the liver size by more than one centimetre.
- The development of tenderness over the liver.
- An increase in the respiration rate by 5 breaths per minute or more.
- The development of a "grunting" respiration (this is a noise on expiration not inspiration).*
- The development of râles or crepitations in the lungs.
- The development of a triple rhythm.

** This sign indicates that the child has fluid overload, an over-expanded circulation, and is going into heart failure.*

Diagnosis of Shock from Dehydration for the Marasmic Patient

The marasmic patient is going into shock when:

- There is definite dehydration determined by the patient's history and the medical examination, **AND**
- There is a weak or absent radial or femoral pulse, **AND**
- The patient has cool or cold hands and feet (check with back of hand gently for five seconds).

The patient is going into severe shock when, in addition to the above signs, there is a decrease in the level of consciousness, the patient is semi-conscious or cannot be roused. The treatment of cardiogenic shock or liver failure is not the same as shock due to dehydration. With cardiogenic shock or liver failure, fluid given is severely restricted or it can cause serious deterioration and the treatment itself could lead to death.

Treatment of Shock from Dehydration for the Marasmic Patient

If the patient is definitely dehydrated (a history of fluid loss, a change in the appearance of the eyes), and shows all of the following three bullets, then the patient should be treated with intravenous fluids:

- Semi-conscious or unconscious and
- Rapid weak pulse and
- Cold hands and feet

The amount of IV fluid given is half or less of that used for nourished, dehydrated children.

Use one of the following solutions:

- Half strength Darrow's solution
- Ringer-Lactate with 5% dextrose
- Half strength saline with 5% dextrose

Re-hydration needs to be done slowly and monitored closely to prevent over-hydration. Administer 15 ml/kg IV over the first hour and reassess the child.

- **If there is continued weight loss, or the weight is stable**, repeat the 15ml/kg IV over the next hour. Continue until there is weight gain with the infusion. (15mg/kg is 1.5% of body weight, so the expected weight gain after two (2) hours is up to 3% of body weight.)
- **If the child has gained weight but there is no improvement**, assume that the child has toxic, septic or cardiogenic shock or liver failure. Stop rehydration treatment. Look and assess for other causes of loss of consciousness.

As soon as the child regains consciousness, or the pulse rate drops to a normal level, then stop the intravenous fluids and treat the child orally or by NG tube with 10ml/kg/hour of ReSoMal. Continue with the protocol above for re-hydration of the child orally, using weight change as the main indicator of progress.

Note: Other Causes of Shock

Apart from the shock related to dehydration, there are four other causes of shock in the severe acutely malnourished child.

- 1) Toxic shock¹²
- 2) Septic shock¹³
- 3) Liver failure
- 4) Cardiogenic shock.

Diagnosis of Dehydration for the Kwashiorkor Patient

Patients with bi-lateral oedema are over-hydrated and have increased total body water and increased sodium levels. Oedematous patients thus cannot be dehydrated, although they are frequently hypovolaemic. The hypovolaemia (relatively low circulating blood volume) is due to a dilatation of the blood vessels with a low cardiac output. The treatment of hypovolaemia in kwashiorkor is the same as the treatment for septic shock (see below).

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

12. Toxic shock may be caused by traditional medicines, self-treatment with other medication such as aspirin, paracetamol, metronidazole, etc.

13. Septic shock is a specific type of toxic shock where the damage is caused by overwhelming sepsis. These are frequently associated with liver failure.

Septic (or Toxic) Shock for All Malnourished Patients

Septic shock is a serious medical condition. It is caused by decreased tissue perfusion and oxygen delivery as a result of infection and sepsis. It can cause multiple organ failure and death. Children, immuno-compromised individuals, and the elderly are most susceptible as their immune systems cannot cope with infection as well as healthy adults do. The mortality rate from septic shock can be as high as 50%.

Septic shock presents with some of the signs of true dehydration and also of cardiogenic shock. The differential diagnosis is often very difficult.

Children who appear very ill may have septic shock, cardiogenic shock, liver failure, poisoning with traditional medicines, malaria, acute viral infection or other severe conditions. All “very ill” children should not be automatically diagnosed as having septic shock; the true reason for the condition should be sought.

If septic shock develops after admission, treatment must be carefully reviewed to determine if the treatment is the cause of the clinical deterioration. Any unnecessary drugs should be stopped.

Diagnosis of Septic Shock

To diagnose septic shock, signs of hypovolaemic shock are present. There is a fast, weak pulse with **all three** of the following:

- Cold peripheries
- Disturbed consciousness
- Absence of signs of heart failure

Treatment of Septic Shock

All patients with **signs of early or developed septic shock** should immediately:

- Be given broad-spectrum antibiotics
- Therefore continue first-line antibiotic and add second-line antibiotics. (See “Systematic Antibiotics” under Routine Medication earlier in Section Two)

For incipient (early) septic shock, give the standard F75 diet by NG tube.

For **developed septic shock**: Consider third-line antibiotics, antifungal treatment and anti-staphylococcal treatment. (See “Systematic Antibiotics” under Routine Medication earlier in Section Two)

- Keep the patient warm to prevent or treat hypothermia.
- Give patient sugar-water (1 teaspoon sugar in 50ml water) by mouth or NG tube as soon as the diagnosis is made (to prevent hypoglycaemia).
- Do not physically disturb the patient (no washing, excess examination, investigations in other departments, etc.)
- Do not transport patient to another facility. The stress of transport leads to dramatic deterioration.

If the patient is unconscious because of poor brain perfusion, then a slow IV infusion of one of the following can be given:

- Whole blood of 10ml/kg over at least three hours. Nothing is given orally during the blood transfusion.
- **Or** 10ml/kg/hour for two hours of the following (do not give if there is a possibility of cardiogenic shock):
 - Half-strength Darrow’s solution with 5% glucose
 - Ringer’s lactate solution with 5% glucose
 - Half-normal (0.45%) saline with 5% glucose

Monitor the patient every ten minutes for signs of deterioration. Especially watch for over-hydration and heart failure indicated by signs such as:

- Increasing respiratory rate,
- Development of grunting respiration,
- Increasing liver size,
- Vein engorgement.

As soon as the patient improves (stronger radial pulse, regain of consciousness), stop all IV intake. Continue with F75 diet.

Absent Bowel Sounds, Gastric Dilatation, Abdominal Distension

Bowel sounds in the severe acute malnourished patient may be reduced or absent. The severe acute malnourished patient will often experience impaired bowel functions, mainly as a result of bowel infections.

Signs and symptoms of impaired bowel function:

- Abdominal distension
- Loss of bowel sounds
- Vomiting

Treatment

- Give first-line and second-line antibiotic treatment by intra-muscular injection.
- Consider adding third-line antibiotics, at doctor's discretion.
- Stop all other drugs that may be causing toxicity (such as metronidazole).
- Give a single IM injection of magnesium sulphate (2ml of 50% solution).
- Pass an NG tube, and aspirate the contents of the stomach. Then "irrigate" the stomach with isotonic clear fluid (5% dextrose or 10% sucrose. The solution does not need to be sterile). Do this by introducing 50ml of solution into the stomach and then gently aspirating all the fluid back again. This should be repeated until the fluid that returns from the stomach is clear.
- Put 5 ml/kg of sugar-water (10% sucrose solution) into the stomach and leave it for one hour. Then aspirate the stomach and measure the volume that is retrieved. If the volume is less than the amount that was introduced, either give a further dose of sugar-water or return the fluid to the stomach.
- There is frequently gastric and oesophageal candidiasis: give oral Nystatin suspension or Fluconazole
- Keep the child warm.

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

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

If there is intestinal improvement, begin to give small amounts of F75 by NG tube (half the quantities given per kg listed in Table 2.3. Subsequently adjust by the volumes of gastric aspirated).

If there is no improvement after six (6) hours:

- Consider putting up an IV drip. It is crucial that the administered fluid contains adequate amounts of potassium. Add Sterile Potassium Chloride (20mmol/l) to all solutions that do not contain potassium. If it is available, use one-fifth normal saline in 5% dextrose,

otherwise use Ringer-Lactate in 5% dextrose or half-strength saline in 5% dextrose. The drip should be run VERY SLOWLY. The amount of fluid that is given should be NO MORE THAN 2 to 4 ml/kg/hour.

- Start to give the first and second line antibiotics intravenously.
- When the gastric aspirates decrease so that one half of the fluid given to the stomach is absorbed, discontinue the IV treatment and continue with oral treatment only.

Heart Failure

For the severely malnourished patient, congestive heart failure is usually a complication of over-hydration (when IV fluids or standard ORS solution is given). It can also manifest when there is very severe anaemia; after a blood or plasma transfusion; or with a diet high in sodium. It is important to differentiate heart failure from respiratory infection and septic shock.

Signs and Symptoms of Heart Failure

Heart failure is diagnosed when the patient has a few of the following symptoms (do not wait for all symptoms to occur, as the patient will continue to deteriorate):

- An increase in respiration rate:
 - ⇒ An acute increase in respiration rate of more than 5 breaths per minute (particularly during rehydration treatment).
 - ⇒ More than 50 breaths/minute in infants (0-12 months)
 - ⇒ More than 40 in children one to five years old.
- Physical deterioration with a gain in weight.
- A sudden increase in liver size with tenderness developing over the liver. (The liver is marked before starting any infusion to determine change in size).
- Respiration that has or develops a “grunting” sound during each expiration
- Crepitations or râles in the lungs.
- Prominent superficial and neck veins.
- Engorgement of the neck veins when the abdomen (liver) is pressed.
- Increasing oedema or reappearance of oedema during treatment.
- An acute fall in haemoglobin concentration¹². (Requires laboratory).

If heart failure progress, and the patient further deteriorates, there is either

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

This is cardiogenic shock. Severely malnourished patients are fragile and can go from dehydration to over-hydration quickly after treatment has started. Patients can be admitted with heart failure: it is important that it's differentiated from shock due to dehydration or sepsis because the treatment is quite different.

For patients who have already been admitted, there is usually also weight gain. As heart failure usually starts after treatment, there is nearly always a record of the weight of the patient that was taken before the onset of heart failure.

Heart failure and pneumonia are clinically similar, and very difficult to tell apart:

- If there is an increased respiratory rate and any gain in weight, then heart failure is the first diagnosis.
- If there is an increased respiratory rate with a loss of weight, then pneumonia is diagnosed.
- If there is no change in weight (fluid balance) then the differentiation has to be made using the v other signs of heart failure.
- Pneumonia is NOT diagnosed if there has been any weight gain before the onset of respiratory distress.

Heart Failure and Oedema

- Children with oedema can go into heart failure without a gain in weight, when the expanded circulation is due to oedema fluid moving from the tissues to the vascular space.
- During the initial treatment of severe acute malnutrition, any fluid containing sodium that has been given will have to be safely excreted later. Initial over-treatment can lead to death from heart failure several days later, when intracellular sodium (marasmus and kwashiorkor) and oedema fluid are being mobilised.
- As oedema fluid is mobilised (kwashiorkor) and the sodium is coming out of the cells (both kwashiorkor and marasmus), the plasma volume expands and there is a fall in haemoglobin concentration. This dilutional anaemia happens to some extent in nearly all children as they recover. A substantial fall in haemoglobin, as a sign of an expanding circulation, is also a sign of impending or actual heart failure. These children should never be transfused.

Treatment of Heart Failure

When heart failure is diagnosed:

- Stop all intakes of oral or IV fluids. **No fluid or food** is given to the patient until signs of heart failure are improved which may take 24 to 48 hours. Small amounts of sugar-water can be given orally to prevent hypoglycaemia.
- Administer frusemide (1mg/kg) stat, as a single dose.
- Digoxin can be given in a single dose of 5 micrograms/kg. Note that this is lower than the normal dose of digoxin. A loading dose is not given. Use the paediatric preparation, not small quantities of the adult preparation.
- If the heart failure is associated with severe anaemia, treatment of the heart failure takes precedence over the treatment of the anaemia.
- A patient with heart failure should never be transfused (unless there are facilities and experience with exchange-transfusion).

Severe Anaemia

Diagnosis of Anaemia

If the haemoglobin concentration is less than 40g/l, or the packed-cell volume is less than 12% in the first 24 hours after admission, the child has very severe anaemia which can cause heart failure.

All children have a fall in Hb during the early phase of treatment. This 'dilutional anaemia' is due to the sodium coming of the cells and mobilization of oedema – it must not be treated. All children have a fall in Hb during the early phase of treatment. This 'dilutional anaemia' is due to the sodium coming of the cells and mobilization of oedema – it must not be treated.

Treatment of Anaemia

- Give 10ml per kg body weight of packed red cells or whole blood, slowly over three (3) hours.
- The patient fasts during blood transfusion and for at least three (3) hours after blood transfusion.
- After the start of nutritional rehabilitation with F75, do NOT transfuse a child after 48 hours and up to 14 days.
- Do NOT give iron during Phase 1 and Transition Phase of treatment.
- If the facilities and staff expertise exist (i.e. neonatal units), it is preferable to give an exchange transfusion to SAM children with severe anaemia.

If there is heart failure with very severe anaemia, transfer the patient to a centre with facilities to do an exchange transfusion. Heart failure due to anaemia is clinically different from "normal" heart failure. With anaemia there is "high output" failure with an over-active

circulation.

Increasing anaemia and heart failure or respiratory distress is a sign of fluid overload and an expanding plasma volume. The heart failure is not being “caused” by the anaemia; these patients should never be given a straight transfusion of blood or even packed cells.

Administration of Medication

Great care should be exercised in prescribing drugs to severely malnourished patients.

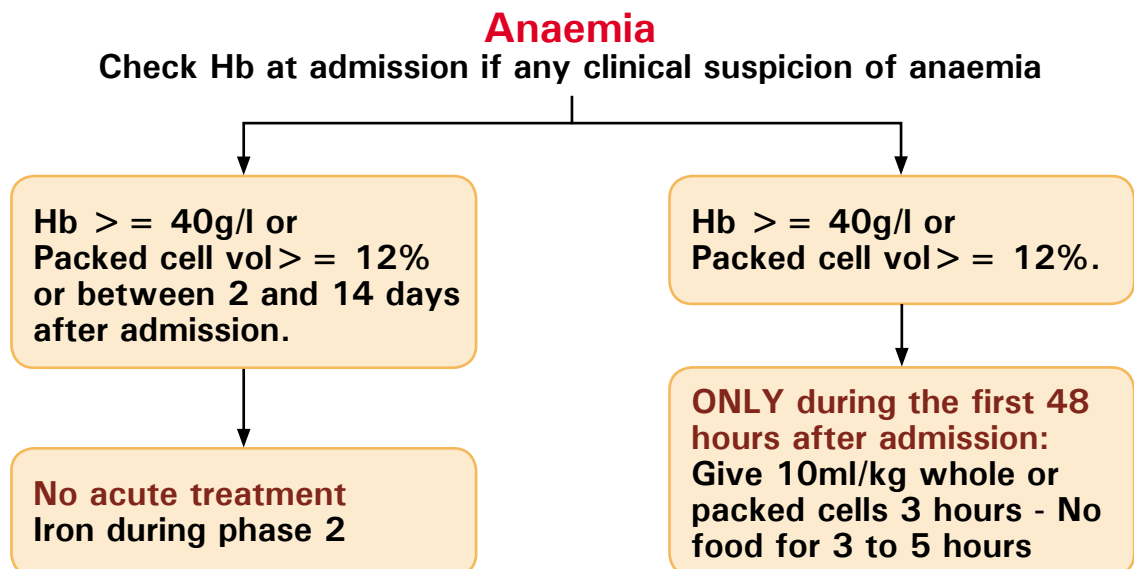
Severely malnourished patients have: abnormal kidney and liver function; changed levels of the enzymes that metabolise and excrete drugs; excess enterohepatic circulation (re-absorption) of drugs that are excreted in the bile; a decreased body fat which increases the concentration of fat-soluble drugs; and, in kwashiorkor, a possible defective blood-brain barrier. Few drugs have been examined for pharmacokinetics, metabolism or side effects in Severe Acute Malnourished (SAM) patients.

It is strongly advised that severe malnutrition is treated first, before standard doses of drugs are given. Drugs used for HIV and TB can damage the liver and pancreas. HIV and TB are not considered rapidly fatal (except military TB and TB meningitis) so treatment can be delayed for up to one week. During that time, nutritional treatment returns the patient’s metabolism to normalcy.

Common drugs such as Paracetamol do not work for most severely malnourished children during Phase 1, and can cause serious hepatic damage.

Any required drugs can usually be given in standard doses to patients who are Phase 2 and out-patients in community nutrient care.

Figure 2.4: Diagnosis and treatment of anaemia



Appendix 2.1 Multi-Chart



MINISTRY OF
MEDICAL SERVICES

INPATIENT THERAPEUTIC FEEDING CARD (Front)

	Hospital							REG.N°						
	Name							Referred from						
Date of Admission		Age		Sex		M	F	Admission criteria						

	DATE	1	2	3	4	5	6	7	8	9	10	11	12
MEASUREMENTS	Height (cm)												
	Weight (kg)												
	WHZ												
	MUAC (cm)												
	Oedema (+ ++ ++++)												
WEIGHT CHART	ADMISSION WT =>												

MEAL TIMES & FOOD INTAKE	Milk/RUTF	1	2	3	4	5	6	7	8	9	10	11	12
	Amount per meal												
	Total per day												
	A=absent	1											
	V=vomit	2											
	R=refuse	3											
	ng=tube	4											
	5												
	6												
indicate if ReSoMal or other fluids given	7												
8													
PORRIDGE (Y/N)													

INPATIENT THERAPEUTIC FEEDING CARD (Back)

Name													REG. No			
ROUTINE MEDICINES	DATE	1	2	3	4	5	6	7	8	9	10	11	12			
	Antibiotic															
	Antimalarial															
	Vitamin A	Date									Tests					
	Albendazole / Mebendazole			RESULTS												
Measles Vaccine	Yes	No	on discharge													
OTHER MEDICINES	ART	Yes	No	TB Therapy	Yes	No	Cotrimoxazole prophylaxis	Yes	No	FBP / Food Support	Yes	No				
MEDICAL CHECKS	Temperature															
	Respirations															
	Stools															
	Vomit															
Clinical Notes																
DATE														SIGNATURE		
Date of Discharge							OTP of Discharge									

Appendix 2.2 Recipes for F75, F100 and ReSoMal using CMV

Table 2.14: Recipes for F-75 Formula

Type of milk	Milk (g)	Sugar (g)	Oil (g)	Cereal flour* (g)	CMV** red scoop = 6.35g	Water (ml)
Dry Skim Milk	50	140	54	70	1	Up to 2000
Dry Whole Milk	70	140	40	70	1	Up to 2000
Fresh cow milk	560	130	40	70	1	Up to 2000
Fresh goat milk	560	130	40	80	1	Up to 2000

* Cereal flour is cooked for about 10 minutes and then the other ingredients added.

** CMV = Special Mineral and Vitamin mix adapted to severe acute malnutrition treatment (® Nutriset)

To prepare the F75 diet, add the dried skim milk, sugar, cereal flour, and oil to some water and mix. Boil for 5 to 7 minutes. Allow to cool, then add the mineral mix and vitamin mix and mix again. Make up the volume to 1000ml with water.

Table 2.15: Recipes for F-100 Formula

Type of milk	Milk (g)	Sugar (g)	Oil (g)	CMV** red scoop = 6.35g	Water (ml)
Dry Skim Milk	160	100	120	1	Up to 2000
Dry Whole Milk	220	100	60	1	Up to 2000
Fresh cow milk	1800	100	50	1	Up to 2000
Fresh goat milk	1800	100	60	1	Up to 2000

Table 2.16: Preparation of ReSoMal Solution with ORS

Standard WHO-ORS → One litre packet
 CMV (mineral and vitamin mix) → 1 Red scoop (6.35g)
 Sucrose (Sugar) → 50g
 Water → 2000ml

Table 2.17: Preparation of small quantities

To make smaller quantities of ReSoMal, F75 or F100, using the red scoop in the container:

Product	One red scoop	Water to add
ReSoMal	5.9 g	140 ml
F75 (powder)	4.1 g	20 ml
F100 (powder)	4.1 g	18 ml

Table 2.18: Preparation of F-100 diluted

1 sachet → Add 2.8 L clean water
 ½ sachet → Add 1.4 L clean water
 1 red scoop → Add 25ml of clean water

Appendix 2.3: Dietary Requirements for Older Children, Adolescents and Adults

Initial Treatment for Adolescents and Adults

Critically sick severe acute malnourished adolescents and adults who are admitted to a health facility require careful nutritional management as well as medical treatment to prevent further weight loss and increased levels of malnutrition. Adolescents and adults are given the same formula feeds (F75, F100, or a locally-made equivalent) as children. The initial goal of treatment is to prevent further loss of weight. See Table 2.16 below for precise dietary requirements.

Table 2.19: Dietary requirements for initial treatment of SAM adolescents and adults¹⁴

Age (years)	Total energy requirement (Kcal/kg of bodyweight/ day)	Volume of diet over a 24 hour period (ml/kg of bodyweight/hour)	
		F75	F100
7-10	75	4.2	3.0
11-14	60	3.5	2.5
15-18	50	2.8	2.0
19-75	40	2.2	1.7
>75	35	2.0	1.5

If an adult or adolescent is anorexic (refuses food or shows no appetite), the patient may require NG tube feeding for the first feeds. For adolescents and adults, large quantities of milk or formula can be difficult to tolerate (a 50kg adult in Phase 1 requires 2.64 litres of F75 milk over each 24 hour period). Often milk is not considered a full meal by adult and adolescent patients, and once the patient has stabilized it may be possible to give a combination of milk and RUTF which sometimes is better tolerated.

Example: A 60-year-old adult, with a weight of 45kgs in Phase 1, requires:

$$2.2\text{mls (from F75 column, Table 2.16)} \times 45\text{kg} \times 24\text{ hours} = 2,376\text{ ml of F75}$$

$$2,376\text{ml}/100 \times 75 = 1,782\text{ Kcal a day}$$

$$1782 / 45\text{kgs} = 39.6\text{ kcal/kg/day.}$$

The second column "Total Energy Requirement" shows that a 60-year-old needs 40kcal per kg of body weight each day.

14. The Management of nutrition in major emergencies, World Health Organization, Geneva 2000

Appendix 2.4: Medical History and Examination

Patient History

Medical History

What are the complaints and how long has each been present?

1. _____
2. _____
3. _____
4. _____

Breast feeding alone for how long? _____

Age stopped breast feeding: _____

How has the patient been eating and drinking? _____

Appetite good poor none

Diarrhoea yes no

Stools per day: _____ Normal watery soft blood mucus green pale

Vomiting yes no

Number of times per day: _____

Breathing: normal fast noisy difficult for how long: _____

Cough: _____

Fever: _____

Convulsions: yes no

Unconsciousness: yes no

Medical Examination

	<i>In-patient and out-patient</i>	<i>In-patient only</i>
Does the patient look:	not-ill / ill / very ill / comatose	
Mood and behaviour	Normal / apathetic / inactive / irritable /	repeated movements
Eyes	normal / sunken / staring / conjunctivitis	xerosis / keratomalacia mild, moderate, severe
Ears	normal / discharging	
Mouth	normal / sore / red / candida	smooth tongue / herpes / angular stomatitis
Membrane colour		normal / pale / jaundiced / cyanosed
Gums		normal / bleeding
Breathing	normal /noisy / asymmetrical / laboured / wheeze / indrawing	
Chest		normal / asymmetric / pigeon / sulcus
Oedema	none / + / ++ / +++	pretibial / hands / face / generalised
Hydration	normal / dehydrated / shock / uncertain	
Passing urine	yes / no	
Peripheries		normal / warm / cold
Pulse rate		min / normal / strong / weak
Heart sounds		normal / gallop / murmur
Stool		not seen / normal / soft / watery / green / pale / mucus / blood
Abdomen		normal / distended / tender / visible / peristalsis
Bowel		sounds normal / active / quiet / absent
Splash		no / yes
Liver	cm below costal margin, normal / firm / hard / smooth / irregular
Spleen		not felt / felt / large – normal / firm / hard – tender / painless
Tone		normal / stiff / floppy
Meninges		normal / stiff neck / Brudzinski / fontanelle bulging
Reflexes		normal / increased / decreased / absent
Skin change	none / mild / mod / severe	peeling / raw / ulcers / infection / cuts / bruises
Perineum		normal / rash / raw / candida
Purpura		no / yes
Hair		black / brown / red / blond normal / easily plucked / balding
Scabies	none / local / generalised	
Lymph nodes	none / groin / axilla / neck tender / painless soft / firm / hard / fixed	
Rib ends		normal / swollen / displaced

Appendix 2.5: Transfer Form

Outpatient to In-Patient Care

Transfer Form: Outpatient Therapeutic Care to Inpatient Therapeutic Care

Name: _____

Age: _____ Sex: _____ Date of Admission: _____

Admission Data: Weight (kg): _____ MUAC (cm): _____ Facility: _____

Height (cm): _____ WHZ: _____

Oedema: (circle) + ++ +++ REG. No: _____

Date of Transfer: _____

Criteria for Transfer: Anorexia Acutely Ill Oedema No Weight Gain Other:

Treatment given: _____

Comments: _____

In-Patient to Out-patient Care

Transfer Form: Inpatient Therapeutic Care to Outpatient Therapeutic Care

Name: _____

Age: _____ Sex: _____ Date of Admission: _____

Admission Data Weight (kg): _____ MUAC (cm): _____ Facility: _____

Height (cm): _____ WHZ: _____

Oedema: (circle) + + + + + REG. No: _____

Date of Transfer: _____

Criteria for Transfer: (circle) _____

Good appetite

Medically stable

Oedema reduced to +

Weight Gain

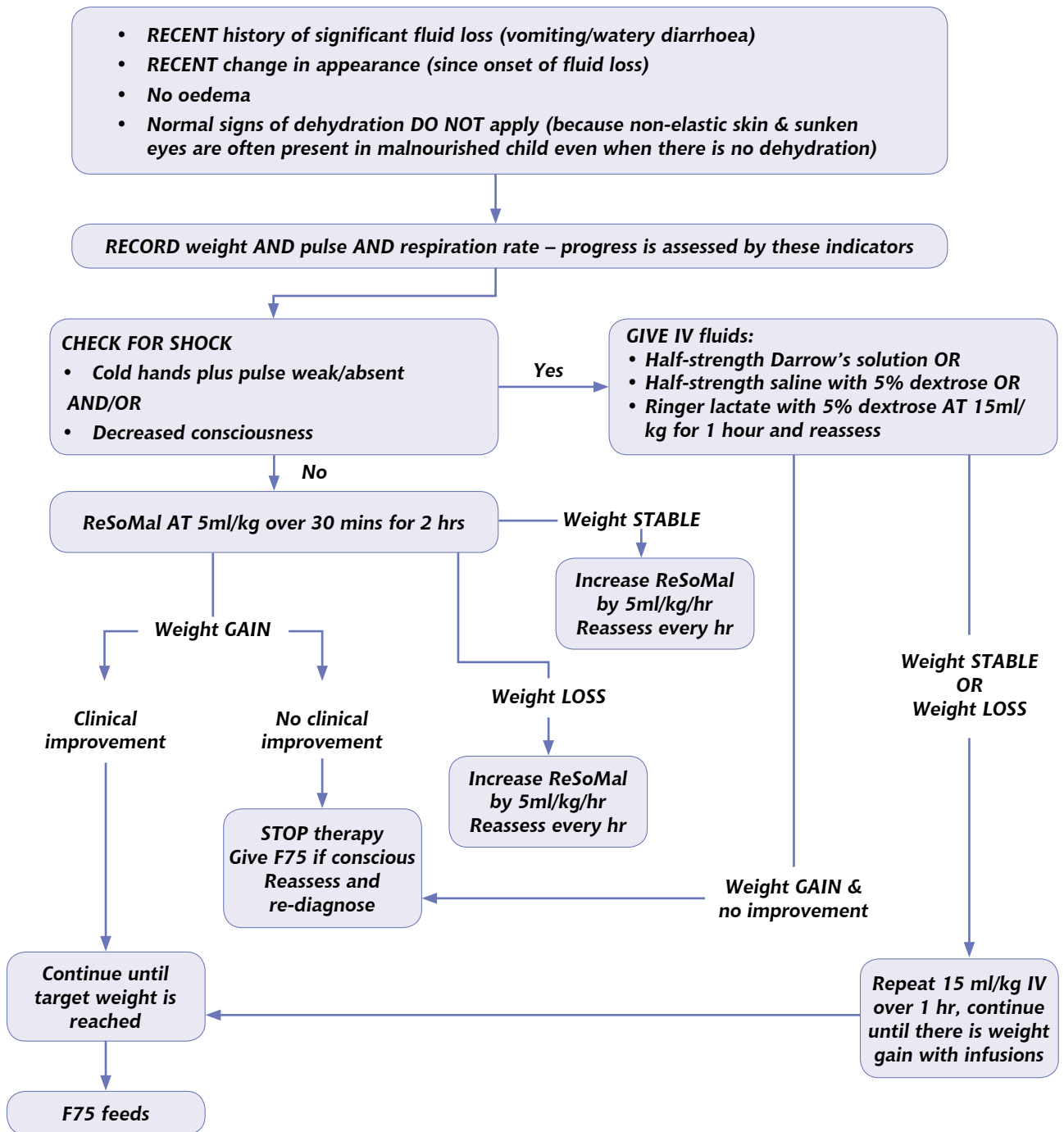
Other: _____

Treatment given: _____

Comments: _____

Appendix 2.7: Dehydration

Dehydration Protocol



STOP immediately all rehydration therapy if any of the following are observed:

- Vein engorgement*
- Development or increase of oedema
- Increase in liver size (> 1cm) and/or liver tenderness*
- Increase in respiration rate by ≥ 5 breaths per minute*
- Development of grunting respiration*
- Development of râles or crepitations in the lungs*
- Development of triple rhythm*

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

Appendix 2.8: Monthly Report Format for Management of SAM (inpatient/outpatient)

REPORTING FORMAT - MANAGEMENT OF SEVERE ACUTE MALNUTRITION

PROVINCE	IMPLEMENTING PARTNER(S)					
DISTRICT	MONTH	NAME & POSITION OF REPORTING OFFICER				
HEALTH FACILITY	YEAR					
OUTPATIENT	ESTIMATED TARGET malnourished <5's (based on latest survey data and admission criteria)					
INPATIENT				ESTIMATED COVERAGE (from coverage survey or estimated from target and admissions)		
				RUTF Consumption (Boxes)		

Total at beginning of reporting period (A)	NEW CASES (B)		NEW CASES (C) From Outpatient or Inpatient care Returned defaulters	TOTAL NEW CASES (D) (B + C)	Discharges (E)			Transfers (F) To inpatient or outpatient care	TOTAL EXITS (G) = (E + F)	Total end of reporting period (A+D-G=H)
	6-59m (According to admission criteria) (B1)	Other (adults, infants, adolescents) (B2)			CURED (E1)	DEATH (E2)	DEFAULTER (E3)			
					%	%	%	%		
					>75%	<10%			<15%	

TARGET (Sphere Standards)

NB: Old Cases and Transfers are excluded from national/programme reporting as they are movements within the programme rather than entries and exits

E1: Cured = reaches discharge criteria

E3: Defaulter = absent for 3 consecutive visits

E4: Non recovered = does not reach the discharge criteria after 4 months in OTP

Section Three: Management of Acute Malnutrition

Infants Less Than Six Months

Infants Less Than Six Months with a Prospect of Being Breastfed

Overview

Mothers should exclusively breastfeed their babies for the first six months of life. This means that the babies should not get any other milks, foods or liquids, not even sips of water. After six months breast milk alone is not enough. Babies need to gradually start eating a variety of foods to continue growing well. Breast milk continues to be an important part of the diet until the baby is at least two years. Mothers who are HIV-positive should be referred to a health worker for appropriate support and counselling on infant feeding options. Exclusive breastfeeding is recommended for HIV-infected women for the first six months of life unless replacement feeding is acceptable, feasible, affordable, sustainable and safe (AFASS) for them and their infants before that time. When replacement feeding is acceptable, feasible, affordable, sustainable and safe, avoidance of all breastfeeding by HIV-infected women is recommended¹. Children younger than six months who are malnourished are always treated in an in-patient unit. They should not be admitted to an out-patient treatment facility. RUTF is not suitable for infants less than six months.

Infants who are malnourished are weak and often do not suckle strongly enough to stimulate an adequate production of breast milk. The mother often thinks that she herself has insufficient breast milk and is apprehensive about her ability to adequately feed her child. The low output of milk is due to inadequate stimulation by the feeble infant. Breast milk supply is demand-led, the more the baby breastfeeds, the more breast milk the mother will produce.

The objective of treatment of acute malnourished infants less than six months is to return them to full exclusive breast feeding.

1. HIV AND Infant Feeding: New Evidence and Programmatic Experience. Report of a technical consultation held on behalf of the Inter-agency Task Team (IATT) on Prevention of HIV Infections in Pregnant Women, Mothers and their Infants, Geneva, Switzerland, 25–27 October 2006 (WHO, UNICEF, UNAIDS, UNFPA).

For children under the age of six months, the main admission criterion is failure of effective breast feeding and the main discharge criterion is gaining weight on breast milk alone.

Table 3.1: Criteria of admission, Infants with a prospect of being breastfed

AGE	ADMISSION CRITERIA
Infant less than 6 months or less than 3kg being breast-fed	The infant is too weak or feeble to suckle effectively (independently of his/her weight-for-length) or The infant is not gaining weight at home or W/L is -3 z-scores or Presence of bilateral oedema

Nutrition Support: Diet, Frequency and Suckling Technique

The aim of nutrition rehabilitation is to stimulate breast-feeding and to supplement the breast milk until the breast milk is sufficient enough alone to allow the child to grow properly. Breast milk output is normally stimulated by the baby feeding at the breast. When the baby has not been feeding well and lactation has reduced, there is a need to support breastfeeding with the Supplemental Suckling (SS) technique (see figure 3.1). It is important to put the infant to the breast as often as possible.

- Breastfeed every three hours for at least 20 minutes, more often if the child cries or seems to want more.
- Between 30 minutes and one hour after a normal breastfeed give maintenance amounts of F100 Diluted using the SS technique.
- F100 Diluted: 130ml/kg/day (100kcal/kg/day), divided in eight meals (see Table 3.2).
- Infants should be nursed in a separate space from the older malnourished children. This can be in a “breast-feeding corner”. It is important not to admit infants into the in-patient facility where the severely complicated cases are admitted. It is important that these infants are not put at high risk of cross infection from older sick children.

There are no separate phases in the treatment of infants with the SS technique. There is no need to start with F75 and then switch to F100 Diluted unless the infant has severe oedema.

Preparation of F100 Diluted

When the ready made-up formulas are available: Dilute F100 (one packet) into 2.7l litres of water (instead of 2 litres) to make F100 Diluted.

To make small quantities of F100 Diluted:

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

If F100 Diluted is not readily available, the infant can be fed with the same quantities of commercial infant formula, diluted according to the instructions on the tin.

However, infant formula is not designed to promote rapid catch up growth. **Unmodified powdered whole milk should not be used.**

Quantity of F100 Diluted

It is important to feed these children often as they are small and will only take small quantities. Feed every three hours. The quantity of F100 diluted to give to a malnourished infant is calculated depending on the body weight (see Table 3.2). The quantity is **NOT** increased as the infant starts to gain weight.

Table 3.2: Quantity of F100 Diluted to give to infants with a prospect of being breastfed, per Kg of body weight

Class of Weight (kg)	ml of F100 Diluted per feed (8 feeds/day)
Wt of Child	Diluted F100
>=1.2 kg	25 ml per feed
1.3 to 1.5 kg	30
1.6 – 1.7	35
1.8 – 2.1	40
2.2 - 2.4	45
2.5 - 2.7	50
2.8 - 2.9	55
3.0 - 3.4	60
3.5 – 3.9	65
4.0 – 4.4	70

Children less than six months **with oedema** are started on F75 and not on F100 Diluted. When the oedema has resolved and the child suckles strongly, he/she is changed to F100 Diluted or infant formula.

Note: F100 undiluted is never used for infants less than 3kg.

Regulating Quantity of F100 Diluted

The child's progress is monitored by his/her daily weight:

- If the child loses weight over three consecutive days yet seems hungry and is taking all the F100 Diluted, add 5mls to each feed.²
- In general the supplementation is not increased during the stay in the centre. If the child grows regularly with the same quantity of milk, it means the quantity of breast milk is increasing.
- If after some days, the child does not finish all the supplemental food, but continues to gain weight, it means that the breast milk is increasing and that the child has enough.
- Weigh the child daily with a scale graduated to within 10g or 20g.

When a baby is gaining weight at 20g per day (whatever his weight):

- Decrease the quantity of F100 Diluted to one half of the maintenance intake.
- If the weight gain is maintained (10g per day whatever his weight) then stop supplemental suckling completely.
- If the weight gain is not maintained then increase the amount given to 75% of the maintenance amount for two to three days and then reduce it again if weight gain is maintained.
- If the mother is agreeable, it is advisable to keep the child in the centre for a further few days on breast milk alone to make sure that s/he continues to gain weight. If the mother wishes to go home as soon as the child is taking the breast milk greedily then they should be discharged.
- When it is certain that the child is gaining weight on breast milk alone s/he should be discharged, no matter what his current weight or weight-for-length.

2. The Supplemental Suckling feed is giving maintenance amounts. If it is being taken and there is weight loss, either the maintenance requirement is higher than calculated or there is significant mal-absorption.

Supplemental Suckling Technique

The supplementation is given using a tube the same size as n°8 NGT (a size n°5 tube can be used, but the milk should be strained through cotton wool to remove any small particles that would block the tube). Cut the tip of the NG tube back beyond side ports on the tube, if these ports exist

1. F100 Diluted or formula milk is put in a cup. The mother holds it.
2. The end of the tube is put in the cup.
3. The tip of the tube is put on the breast at the nipple and the infant is offered the breast in the normal way so that the infant attaches properly. Sometimes at the beginning the mothers find it better to attach the tube to the breast with a piece of tape.
4. When the infant suckles on the breast with the tube in his mouth, the milk from the cup is sucked up through the tube and taken by the infant. It is like taking a drink through a straw.
5. At first an assistant needs to help the mother by holding the cup and the tube in place. She encourages the mother confidently. Later the mother nearly always manages to hold the cup and tube without assistance.
6. At first, the cup should be placed at about 5 to 10cm below the level of the nipple so the milk does not flow too quickly and distress the infant, and so the weak infant does not have to suckle excessively to take the milk. As the infant becomes stronger the cup should be lowered progressively to about 30cm below the breast.
7. The mother holds the tube at the breast with one hand and uses the other for holding the cup.

Notes:

- It may take one or two days for the infant to get used of the tube and the taste of the mixture of milks, but it is important to persevere.
- By far the best person to show the mother the technique is another mother who is using the technique successfully. Once one mother is using the SS technique successfully the other mothers find it quite easy to copy her.
- The mother should be relaxed. Excessive or officious instructions about the correct positioning or attachment positions often inhibit the mother and make her think the technique is much more difficult than it is. Any way in which the mother is comfortable and finds that the technique works is satisfactory.
- If the formula diet is changed then the infant normally takes a few days to become used to the new taste. It is preferable to continue with the same supplementary diet throughout the treatment.

Figure 3.1: Supplemental Suckling Technique



This infant is suckling the breast and also getting the F100 Diluted (130ml/kg/day) by the Supplemental Suckling (SS) technique.

Raising or lowering the cup determines the ease with which the infant gets the supplement: for very weak infants it can be at the level of the infant's mouth. If it is above this level the feed can go into the child by siphonage when there is a danger of aspiration

Cleaning the tube:

After feeding is completed the tube is flushed through with clean water using a syringe. It is then spun (twirled) rapidly to remove the water in the lumen of the tube by centrifugal force. If convenient the tube is then left exposed to direct sunlight.

Routine Medication

Vitamin A: 50,000UI at admission only

Folic acid: 2.5mg (1/2 tab) in one single dose

Ferrous sulphate: when the child suckles well and starts to gain weight. Use the F100, which is enriched with ferrous sulphate (phase II). Dilute it with 1/3 water to obtain the correct dilution. There are relatively few children younger than six months so it is easier and safer to use the F100 prepared for the older patients than to calculate and add ferrous sulphate to very small amounts of diet.

Antibiotics: First line: Amoxicillin (from 2kg): 30mg/kg two (2) times a day (60mg/day). Second line if required: Gentamycin for severe infections (do not use Chloramphenicol in young infants).

Surveillance

Each Day:

- These children must be seen by a nurse everyday because they are vulnerable.
- Take patient's body temperature twice a day.
- Weigh the patient and record the weight. Plot weight on the Multi-chart. (See Appendix 2.1 for Multi-chart).
- Assess and record the degree of oedema (0, +, ++, +++).
- Record the patient's fluid intake and source (oral, NG tube or IV fluids). Record if patient is absent at mealtime, has refused diet or has vomited. Document the information in the multi-chart to monitor ongoing progress.
- Assess and note in the Multi-chart standard clinical signs (number of stools passed, vomiting, dehydration, cough, respiration and liver size).

Care for the Mother

As the aims are to increase breast milk and for the mothers learn from each other, and because the treatment is different from older patients, the infants should be together in a specific room that can be monitored and kept quiet.

- Check mother's MUAC and the presence of oedema.
- Explain to the mother what the aim of treatment is and what is expected of her.
- Do not make the mother feel guilty for the state of her child or blame her for giving other foods.
- Strongly reassure the mother that the technique works and that she will produce enough milk herself to make her baby better.
- Be attentive to her and introduce her to the other mothers in the phase.
- She should drink at least two (2) litres of fluids per day.
- She must eat enough - about 2500kcal/day (one porridge in the morning, one or two family meals, one porridge in the afternoon).
- The **mother** who is admitted in the centre with her child receives Vitamin A:
 1. If the child is below 1 month old 200.000IU (there should be no risk of pregnancy)
- Micronutrients' supplementation must also be given to the mother. The quality of the milk depends upon the mother's nutritional status. It is critical that the mother receives meals while the child is an in-patient. The mother's diet is important for the recovery of the infant from malnutrition.
- The length of stay in the in-patient facility should be as short as possible.

Discharge Criteria

Table 3.3: Discharge criteria, infants with a prospect of being breastfed

AGE	DISCHARGE CRITERIA
Infant less than 6 months or less than 3kg being breast-fed	<ul style="list-style-type: none"> It is clear that he/she is gaining weight on breast milk alone after the Supplemented Suckling technique has been stopped. There is no medical problem.

Note: there are no anthropometric criteria for discharge of the fully breast-fed infant who is gaining weight.

Follow-Up

The follow-up for these children is very important. The mother should be enrolled for a supplementary feeding programme if it exists and receive high quality food ration to improve the quantity and quality of breast milk. It is also important to monitor the infant's progress, support exclusive breastfeeding and inform the mother on when to introduce appropriate complementary food at the age of six months.

Infants Less Than Six Months without Prospect of Being Breastfed

Overview

There are special circumstances where a child less than six months can not be exclusive breastfed (these include abandonment, a child being orphaned, medical conditions or when a mother who is HIV positive meets the criteria for and chooses exclusive replacement feeding). The criteria for exclusive replacement feeding - Accessible, Feasible, Acceptable, Safe and Sustainable (AFASS) - is detailed in national job aids, counselling cards and IEC materials on Infant Feeding and HIV.

When there is no prospect of being given breast milk then severely malnourished, less than six month old infants are treated according to the standard protocols of management of severe acute malnutrition in Phase 1, Transition and Phase 2 detailed in Section Two. However, the following dietary modifications explained here must be applied. The admission criteria are the same as the other malnourished infants; however discharge criteria are different, as explained below.

Admission Criteria

Table 3.4: Criteria of admission³, infants without a prospect of being breastfed

AGE	ADMISSION CRITERIA
Infants less than six months old or less than 3kg with no prospect of being breast-fed	W/L (weight-for-length) < -3 Z scores or Presence of bilateral oedema.

3. There are no standards for infants below 49cm and the increments to judge nutritional status require precise scales that are not generally available. The in-patient therapeutic unit is not appropriate for treating premature and low-birth-weight non-breast-fed infants below 49cm in length. These infants should be referred to the nursery and given infant formula.

Nutrition Support: Diet and Frequency

Phase 1

- Wasted, marasmic infants of less than six months old can be given F100 Diluted in Phase 1.
- Oedematous infants of less than six months are always be given F75 in Phase 1.

Table 3.5: Quantity of F100 Diluted or F75 to give to infants without a prospect of being breastfed in Phase 1, per kg of body weight

Class of Weight (kg)	ml of F100 per feed in Phase 1 (8 feeds/day)
Wt of Infant	Diluted F100
= < 1.5 kg	30 ml per feed
1.6 to 1.8 kg	35
1.9 – 2.1	40
2.2 - 2.4	45
2.5 - 2.7	50
2.8 – 2.9	55
3.0 - 3.4	60
3.5 – 3.9	65
4.0 – 4.4	70

Children less than six months, with oedema, should be given F75 and not F100 Diluted.

Transition Phase

During Transition Phase, only F100 Diluted is used. The volume of the diet is increased by one third. These small infants are not treated with full-strength F100.

Phase 2

During Phase 2, double the volume of F100 Diluted that was given during Phase 1.

Table 3.6: Amounts of F100 to give to infants without a prospect of being breastfed in Phase 2, per kg of body weight

Class of Weight (kg)	ml of F100 per feed in Phase 2 (8 feeds/day)
	Diluted F100
= < 1.5 kg	60 ml
1.6 to 1.8 kg	70
1.9 – 2.1	80
2.2 - 2.4	90
2.5 - 2.7	100
2.8 – 2.9	110
3.0 - 3.4	120
3.5 – 3.9	130
4.0 – 4.4	140

Preparation of F100 Diluted

See section 2, Appendix 2.2 for instructions to make F100 Diluted.

Routine Medication

Routine medicine is the same as for infants under six months who are breastfed. See page 99 for details.

Surveillance

Surveillance is the same as for phase 1, in-patient care. Please see 62, Section Two.

Criteria for Discharge

Table 3.7: Discharge criteria, infants without a prospect of being breastfed

AGE	DISCHARGE CRITERIA
Infant less than six months or less than 3 kg with no prospect of being breast-fed	When infant reaches weight-for-length is > -2 Z-scores, he/she can be switched to infant formula.

Follow - up

Follow up for these children is very important and needs to be organized between the carer and the health staff at the MCH clinic. With the absence of breast-milk, other milks need to be included in the diet to prevent relapse. Nutrition counselling for the mother or caregiver is essential. A child that has been exposed to HIV through the perinatal period, should be tested for HIV at six weeks of age (through DNA PCR testing), receive close follow-up for prevention and growth monitoring, prophylaxis and early referral to assess the need for ART support.

Section four: Out-patient Therapeutic Care for Severe Acute Malnutrition

For Children Over Six Months

Overview

Under certain conditions, patients with severe acute malnutrition can be treated as out-patients in the community. However the relevant community members must be informed and confident on issues related to acute malnutrition, treatment, and how outpatient therapeutic care or out-patient therapeutic programme (OTP) assists in the management of acute malnutrition.

The objective of out-patient management of severe acute malnutrition is a more widespread access to treatment, establishing the appropriate facilities within or closer to more communities. Community Health Workers (CHWs) and other community volunteers must be trained to screen, monitor and follow-up malnourished children in the community. Uncomplicated cases of severe malnutrition - patients who have a good appetite; are free from medical complications; and do not have moderate/severe oedema - can be treated with routine drugs and the relevant quantity of ready to use therapeutic food (RUTF) at home.

Out-patients attend a health facility weekly for monitoring and to replenish RUTF supply. Health staff at the health facility must be trained on the treatment of severe acute malnutrition in the community.

Admission Process

Assessment

- Take the patient's weight and height, and calculate weight-for-height (Z-scores).
- Check for oedema
- Measure and record MUAC.
- Assign special registration number and register in the registration book.
- Check immunisation status.
- Give routine medications according to Table 4.3.
- Complete the OTP ration card (Appendix 4.3).
- Fill in the ration card (See Appendix 4.3 for ration card).

Requirements for Out-patient Therapeutic Care

Health Facility Requirements

- A health worker trained in the management and treatment of acute malnutrition in the community, ideally a qualified nurse.
- The health staff at the health facility must have the capacity to conduct weekly assessment, monitoring, and treatment services for patients with severe acute malnutrition.
- Medical and anthropometric equipment including weighing scales, height boards, weight-for-height reference charts, and MUAC tapes.
- Routine medicines including antibiotics, antihelminths and vitamin A. Medical equipment such as a thermometer and a stethoscope or clock to count respirations.
- OTP registration book, patient cards for recording patient information and monthly statistical forms
- An adequate supply of ready-to-use therapeutic food (RUTF) (see “Estimating RUTF Monthly Requirements for a Health Facility” at the end of Section Three to calculate monthly requirements depending on number of patients).

Community Requirements

- Community members who are committed and who understand the risks of acute malnutrition; the importance of nutrition rehabilitation for malnourished children; and the benefits of out-patient treatment of acute malnutrition in the community.
- Well-trained, motivated CHWs.

Admission Criteria

The anthropometric criteria that determines the extent of severe acute malnutrition is consistent, irrespective of whether the patient is then admitted to an in-patient or out-patient facility.

Having determined the patient’s medical situation, one is eligible for out-patient therapeutic care when the patient has:

- A good appetite (conduct the Appetite Test, Appendix 1.2)
- No medical complications
- No severe oedema (do not have ++ or +++ Oedema)

In-patients who are recovering sufficiently and meet the above criteria may be transferred to out-patient therapeutic care after completing Transition Phase.

Table 4.1: Summary of criteria for admission to out-patient therapeutic care

Criteria for admission	Out-patient therapeutic care
Anthropometric criteria 6 months to 18 years	<ul style="list-style-type: none"> • W/H < -3 Z-score • MUAC < 11.5cm (age >6 months)
Anthropometric criteria Adults	<ul style="list-style-type: none"> • BMI <16 • MUAC <16cm • MUAC 16.1cm to 18.5cm with clinical complications
Bi-lateral oedema	Bi-lateral pitting oedema Grade 1 (+) only
Appetite Test	Passes Appetite Test
Home care situation	Reasonable home circumstances and a willing caregiver
Skin	No open skin lesions
Medical complications	Alert and no medical complications
Others	Visually emaciated second twin, HIV positive child losing weight, infants < 6 months for monitoring purposes

Nutrition Support: Diet and Frequency

Nutrition rehabilitation in the community is effective when the patient receives a weekly supply of take home Ready to Use Therapeutic Food (RUTF). This is a specialized food developed specifically for the recovery of severe malnutrition at home. It is an energy-dense, mineral/vitamin-enriched product that is equivalent to F100 with added iron. It contains the required energy and micronutrients to meet the nutritional needs of the severely malnourished child. RUTF is an oil-based, ready-to-use product that has a low risk of contamination. It provides approximately 530Kcal per 100g. The ration given to a severely malnourished child is based on the intake requirement of between 150-200 kcal/kg/day. The amount of RUTF to be consumed per day is based on the weight of the child (see Table 4.2).

Preparation of RUTF

RUTF is pre-cooked thus does not require preparation. It can be eaten directly from the container or packet.

Quantity of RUTF

The caregiver is given a week's supply of RUTF at each weekly health facility visit. The caregiver is informed how much to give daily. See Table 3.2 for quantities of RUTF to feed for class of body weight. It is better to give the whole packet/sachet to the child rather than taking it out and putting on a plate or other container. Cut the top of the packet and the child can eat directly from the packet. This is safer and more hygienic. Encourage the child to take the RUTF slowly through the day and to drink plenty of water. If the child is still breast feeding, breastfeed before giving RUTF.

Table 4.2: Quantity of RUTF per class of body weight, daily and weekly¹

Class of weight (kg)	RUTF (Plumpy'nut®) *		RUTF (BP - 100)	
	sachet per day	sachet per week	Bars per day	Bars per week
3.5 - 3.9	1.5	11	2	14
4.0 - 5.4	2	14	3	21
5.5 - 6.9	2.5	18	4	28
7.0 - 8.4	3	21	5	35
8.5 - 9.4	3.5	25	6	42
9.5 - 10.4	4	28	7	49
10.5 - 11.9	4.5	32	8	56
≥ 12	5	35	9	63

*Table from *Community-based Therapeutic Care, A Field Manual, first edition, 2006*

Routine Medication

Give routine medication to all severe acutely malnourished children admitted to out-patient therapeutic care (see Table 3.3). Where possible, medications are given as a single-dose treatment so that the health worker can observe administration and avoid problems with compliance. The one exception is the first-line antibiotic (amoxicillin): the first dose should be given in front of the health worker who explains to the parent/caregiver how to continue treatment at home.

Additional medication may be prescribed to treat other medical problems as required.

1. Quantities may vary and will be raised when RUTF will be produced and supplied locally.

Table 4.3: Drug regime for OTP patients

Direct admission to out-patient therapeutic care	
Vitamin A	One (1) dose on the fourth week (fourth visit) Do not give to children with oedema
Amoxicillin	Give first dose at the health facility and give remainder of treatment to the parent/caregiver with instructions to give twice daily for seven days at home
Malaria	According to national protocol
Measles (children 6 months and older)	1 vaccine on the fourth week (fourth visit)
Deworming (children >1 year old)	1 dose (Mebendazole or Albendazole) on the second week (second visit)

Iron and Folic Acid: Not to be given routinely. Where anaemia is identified according to IMCI guidelines, treatment should begin after 14 days care and not before. It should be given according to National/WHO Guidelines. For severe anaemia, refer to inpatient care.

Antibiotic: First line choice is amoxicillin as effective against small bowel overgrowth associated with malnutrition. If a child is on cotrimoxazole prophylaxis, this should continue throughout at the same dose, while amoxicillin one-week-dose is added.

Registration

All admission and discharges should be noted in the register (see Appendix 2.6). The observation column should be used to add information about the home situation (e.g. orphan, twin, IDP) or additional medical information (e.g. HIV status, if on TB treatment).

A unique registration number is given to each child when the child is first admitted for supplementary feeding, out-patient therapeutic care or inpatient therapeutic care. Each registration number is made of 3 parts, for example:

NYL/003/OTP

- **NYL:** refers to the name of the health facility (or site) where treatment is provided
- **003:** is the number allocated to the child (this runs in sequence from the previous child registered at that health facility or site)
- **OTP:** refers to the programme component where the child entered. This could equally be Inpatient or SFP.

To ensure that the children can be tracked, the full number allocated when a child enters a programme is retained until the child is discharged

To facilitate tracing and follow-up in the community, all registrations should follow this numbering system. It should be quoted on all records concerning the child i.e. OTP, SFP cards, registration books, ration cards, transfer slips and identity bracelets if any.

Returning defaulters retain the same number that they were first given, as they are still suffering from the same episode of malnutrition. Their treatment continues on the same monitoring card.

Readmissions after relapse are given a new number and a new card as they are suffering from a separate episode of malnutrition and therefore require full treatment again.

Surveillance

Table 4.4: Surveillance tasks and frequency

Task	Frequency
Patient attends health facility	weekly
Patient receives replacement RUTF	weekly
Health worker checks weight	weekly
Health worker checks MUAC	weekly
Health worker checks height	monthly
Health worker checks vital signs: temperature, respiration rate	weekly
Health worker conducts Appetite Test	weekly
Health worker does medical check and history	weekly
Health worker fills in OTP card and ration card	weekly

Discharge Criteria

Table 4.5: Discharge criteria

The patient is:	If:
Cured ²	<ul style="list-style-type: none"> • MUAC >11.5cm and • No oedema for two consecutive visits. • W/H -2 Z-score • Children admitted on MUAC, are discharged from outpatient therapeutic care after a minimum of two months.
Defaulted	Absent for three consecutive visits
Died	Died while registered in the out-patient therapeutic care
Non-recovered	Has not achieved discharge criteria within four months. Link the child to other programmes e.g. IMCI, OVC, HBC, ART Clinics, or targeted food distributions.

Discharge Procedures

- Give feedback to the parent/caregiver on the patient's final outcome.
- Ensure the parent/caregiver understands importance of follow-up care (supplementary feeding or other programme).
- Give a final ration of seven (7) packets as a weaning off ration.
- Fill in date of discharge on the register.
- Advise parent/caregiver on good nutrition and cooking practices.
- Advise parent/caregiver to return to the health facility if child becomes sick or is losing weight again.
- Refer patient to the nearest supplementary feeding programme if available.

Home Care for the Malnourished Patient

The Role of the Parent or Caregiver

Discuss with the parent/caregiver the following points, and make sure they feel confident of their role.

- The quantity of RUTF to give the patient daily.
- The severely malnourished patient must eat the RUTF ration before other family food is offered.
- Wash patient's hands and face with soap before giving RUTF.

2. Discharge criteria based on percentage of weight gain is currently being developed.

- Each morning give a sachet of RUTF to the child and encourage child to take small amounts frequently during the day. Once the sachet is finished give the remainder of the quantity of RUTF prescribed for the day depending on the child's body weight. (See Table 4.2 for quantities of RUTF per kg of body weight.)
- Give plenty of safe drinking water to the child throughout the day (on demand).
- RUTF is never shared with other members of the family.
- Seek the CHW if concerned with the patient's condition (not eating, losing weight, vomiting, diarrhoea, sick, increasing oedema); or go directly to the health centre for medical review and advise.
- Give routine medicines as advised by the health worker.
- Attend the health centre weekly for monitoring and to receive more RUTF supplies.
- Return empty RUTF containers weekly to replenish RUTF.
- Malnourished children need to be kept warm (ensure child wears plenty of clothes).
- Children with diarrhoea should continue to feed and drink plenty of water.

Role of Health Workers - General Reminders

- Look over the child's monitoring card with the assigned CHW and highlight areas that will require special attention during the home visits.
- Conduct group health/nutrition education with all the patients attending for weekly review and replacement food before seeing each patient individually.
- Link with other community-based support programmes.
- Promote RUTF as medicine and NOT as food to be shared.
- A child who has been in the programme for four weeks with no weight gain, or with weight fluctuating between small gains and losses should be investigated further for medical or social reasons. Special attention must be paid to these children during medical assessment. (See table 4.6 "Failure to Respond" page 92 Section Three)
- If a child has any clinical signs that suggest HIV and AIDS, encourage the parent or caretaker to bring the child to early referral for VCT or TB screening.

Note: If there is food insecurity in the area, or there is an emergency situation, a "protection" ration (usually CSB or UNIMIX-equivalent to a supplementary feeding ration) should be given to the severely malnourished patient's family. This is to assist the family and also minimize the risk that the RUTF is shared with other family members as well as the patient. It is important that the family is registered for a general ration if present (in an emergency context). The parent/caretaker must be reminded that the general ration is not for the patient but only for the rest of the family.

Criteria for Transfer: Out-Patient Therapeutic Care to In-patient Phase 1

Patients who develop any sign of a serious medical complication during out-patient therapeutic treatment should be transferred to in-patient Phase 1 until stabilized. Medical complications are listed in Section One, Table 1.6.

If the patient develops any of the following, he/she is transferred to the in-patient facility:

- Failure of the Appetite Test.
- Increase or development of oedema.
- Development of re-feeding diarrhoea sufficient enough to lead to weight loss.
- Weight loss for three consecutive weighing, or two weeks.
- Weight loss of more than 5% of body weight at any visit.
- Static weight for three consecutive weighing.
- Fulfilling any of the criteria of "failure to respond" in Table 4.6.

Phase 1 protocol is followed when a patient is transferred back to the in-patient unit (see Section 2).

Failure to Respond

For out-patient therapeutic care, a failure to respond diagnosis usually warrants referral to in-patient care for full assessment. If inadequate social circumstances are suspected as the cause, a home visit can be performed before transfer to the in-patient facility.

The CHW should discuss with the parent/caregiver the conditions of the home environment that may be affecting the child's recovery progress. At each visit to the health facility, the health staff will routinely take vital signs (temperature, pulse and respiration rate) and weight and conduct the Appetite Test. They will note any issues and work to resolve problems.

A follow-up home visit is essential when:

- The caregiver/parent has refused admission to in-patient care despite advice.
- The caregiver/parent does not bring the patient for scheduled appointments at the out-patient programme.

Table 4.6: Failure to respond: out-patient criteria

Out Patient Therapeutic Care	
Criteria for failure to respond	Time admitted
Primary failure to respond	
Failure to gain any weight (non-oedematous children)	3 weeks
Failure to start to lose oedema	3 weeks
Oedema still present	3 weeks
Weight loss since admission to programme (non-oedematous children)	2 weeks
Secondary failure to respond	
Failure of Appetite test	At any visit
Weight loss of 5% of body weight	At any visit
Weight loss for two successive visits	2 weeks

Primary Failure to Respond

For every unexplained primary failure to respond, a detailed history and examination is performed. In particular, check carefully for infection as follows:

1. Examine the child carefully. Re-measure all vital signs including the temperature and respiration rate for signs of infection or underlying medical conditions.
2. Depending on patient's signs and symptoms of illness or disease, the following examinations can be considered as appropriate and where laboratory facilities exist. Routine urinalysis and culture to examine urine for infection; hematology, blood, spinal fluid and/or sputum cultures for infection; screening sputum or tracheal aspirate for signs of TB; do radiography and chest x-ray.¹ Further, with specific symptoms of enteric conditions, examination of the stool for blood, ova, parasites or culture for type of infection needs to be considered. Examine stool for blood, look for trophozoites or cysts of Giardia; culture stool for bacterial pathogens. Further, diagnostic counselling and testing (DCT) for HIV (or infantile diagnosis using DNA PCR testing), haematological screening for malaria should be considered with related clinical symptoms. HIV, Tuberculosis or Kala Azar can underline malnutrition.

1. Gastric aspirates are very rarely positive in the malnourished child with active TB, particularly if there is overnight feeding; this test should not be relied on, is difficult to perform well and is traumatic for the child. If it is used, overnight feeds should not be given.

Secondary Failure to Respond

Secondary failure to respond is considered when there is a deterioration in the patient's condition *after* an initial response to recovery.

Common causes of a secondary failure to respond:

- Inhalation of diet into the lungs. There is a poor neuro-muscular coordination between the muscles of the throat and the oesophagus in malnutrition. It is common for a child to inhale food into the lungs during recovery. An advantage to RUTF is that it is less likely to be force-fed and thus inhaled.
- An acute infection contracted or infections limiting food intake and nutrients absorption.
- Sometimes as the immune and inflammatory systems recover, there appears to be "reactivation" of infection during recovery. This means that initially the illness is asymptomatic, but as the child starts to recover these signs become present. This may present with increased temperature, fevers, increased respirations and increased pulse rate. In other words an underlying infection is initially masked but becomes evident after starting a therapeutic diet. Malnourished children often do not have the same immune responses to disease until nutrition rehabilitation is in progress.
- A limiting nutrient in the body that has been "consumed" by the rapid growth, and is not supplied in adequate amounts by the diet. This is not common with F100 or RUTF, but may occur with home-made diets or with the introduction of other foods. Frequently, introduction of "family plate," UNIMIX, or CSB will slow the recovery rate of a severely malnourished child. Recovery rate may slow if the child at home is given family food (the same food that the child was taking when malnutrition developed) or traditional complementary foods such as a watery porridge
- For children in the out-patient setting, administering of traditional medicine or a change in home circumstances can significantly deter recovery.

It is important to systematically determine the cause of the child's failure to recover from severe acute malnutrition. Table 4.8 (following page) is a checklist of possible reasons for failure to respond. When a child fails to respond to treatment, the common causes must be investigated first.

Table 4.7: checklist: possible causes for failure to respond

Out-patient therapeutic care

Inappropriate for patient to go directly to out-patient therapeutic care

Poorly conducted Appetite Test

Inadequate instructions given to parent/caretaker

Inaccurate quantity of RUTF dispensed to children

Health facility long distance from child's home thus patients are unable to attend regularly (high rates of absence)

The Patient

Insufficient food received

Sharing RUTF with other siblings or caregiver

Sharing parent/caregiver's food

Vitamin or mineral deficiency

Mal-absorption

Psychological trauma (particularly refugee situations and families living with HIV and AIDS)

Rumination

Infection, especially: malaria, diarrhoea/enteric conditions, respiratory infections/conditions/pneumonia/tuberculosis, HIV and AIDS, urinary infection/ otitis media, skin or oral conditions/lesions.

Other serious underlying disease: congenital abnormalities (e.g. Down's syndrome), neurological damage (e.g. cerebral palsy), inborn errors of metabolism.

Unwilling parent/caregiver

Parent/caregiver overwhelmed with other work and responsibilities

Children who fail to respond to the out-patient therapeutic care are followed up at home to

determine the family circumstances, and if there are concerns with the care or sharing of food. After three months of non-response to treatment, these patients are referred for further medical review and laboratory tests as required. This will assist in diagnosing underlying illnesses if present. Discharged, non-recovered children must be sent for supplementary feeding, if available, or other support programmes. For children who are HIV positive, care and support for HIV and AIDS is an important part of recovery (see section 7).

A General Failure to Respond

When failure to respond is common among severe acute malnourished patients in one health facility, the potential causes in Table 3.7 must be systematically examined to determine and rectify any sweeping problems.

- Review staff qualifications and conduct refresher training as required.
- Re-calibrate scales and length-boards.
- Visit centre to assess routine procedures carried out by staff.
- Monitor routine procedures such as taking weights and heights, giving medications and taking vital signs (temperature, pulse, respirations).

Health workers should be aware of the possible co-existence of HIV, tuberculosis or, in some areas of the countries, Kala Azar, when assessing children and screen more systematically in areas of high prevalence.

Estimating RUTF Monthly Requirements for a Health Facility

It is important to accurately estimate the RUTF monthly requirements in each health facility to manage severe acute malnutrition. The health facility should not run out of RUTF stocks or end up with a large surplus of stock.

In general, estimate the stock requirement by assuming 10kg is the average weight of a child admitted with severe acute malnutrition. Therefore, each child will require 112 sachets of RUTF a month. Round this up to 120 sachets required monthly. (Each sachet weighs 92gms.) There are 150 sachets in a carton of RUTF (Plumpy'nut). A health facility requires at least three months buffer stock as well. Therefore, five severely malnourished children will require four cartons of RUTF per month, and there should be a buffer stock of 8 to 12 cartons of RUTF.

Appendix 4.1: RUTF Specification

Ready to Use Therapeutic Food (RUTF)

Severely malnourished children and adults require specialised therapeutic food to recover, such as Formula 100 (F100), Formula 75 (F75), or milk made with recommended formulas according to WHO protocol. Ready-to-use therapeutic food (RUTF) is an integral part of out-patient therapeutic care as it allows children and adults to be treated at home rather than by milks in a health facility. RUTF is an energy dense mineral/vitamin enriched food, which is equivalent to Formula 100 (F100).

There are currently two commercial types of RUTF used in Kenya: Plumpy'nut® and BP 100®. Several countries produce a local RUTF that are nutritionally the same as F100, and similar to both F100 and the commercial RUTFs. Plans for local production of RUTF (peanut-based paste) are being discussed for Kenya.

Plumpy'nut®

Plumpy'nut is a RUTF spread, presented in individual sachets. It is a paste of groundnut, composed of vegetable fat, peanut butter, skimmed milk powder, lactoserum, maltodextrin, sugar, mineral and vitamin complex.

Instructions for use: Clean drinking water must be available to children during consumption of RUTF spread. The product should only be given to children who can express their thirst.

RUTF is contra-indicated for children who are allergic to cow's milk, proteins or peanuts, and asthmatic people (due to risk of allergy).

Recommendations for use: In the management of severe acute malnutrition in therapeutic feeding, it is recommended to use the product in Phase 2. In Phase 1, use a milk-based diet (F75).

Storage of Plumpy'nut: Plumpy'nut has a shelf life of 24 months (two years) from manufacturing date. Keep stored in a cool and dry place.

Packaging: Plumpy'nut is presented in sachets of 92g. Each carton (around 15.1kg) contains 150 sachets. One sachet = 92 g = 500 Kcal.

BP-100

BP-100 is a compressed (RUTF) food product for use in the rehabilitation and treatment phase of severely malnourished children and adults. It is developed for use in feeding centres or direct to families as a take home ration. It is especially useful in contaminated environment and in cases where no therapeutic feeding facilities can be established. The nutrition specification is very similar to the therapeutic WHO formula F-100. The major nutritional difference between F-100 and BP-100 is that BP-100 contains iron (10mg per 100g).

BP-100 can be eaten as a biscuit directly from the pack, or crumbled into clean water and eaten as porridge, especially for children between 6 and 24 months and age. To make porridge use 2dl of boiled drinking water per 'meal pack' consisting of two BP-100 tablets. The intake of BP-100 should not be mixed in the same meal with local food items as the latter may contain components inhibiting the absorption of vitamins and minerals.

Table 4.8: Nutritional composition of RUTF³

Moisture content	2.5 % maximum
Energy	520-550 kcal/100g
Proteins	10% - 12% total energy
Lipids	45%-60% total energy
Sodium	290mg/100g maximum
Potassium	290mg/100g maximum
Calcium	300-600mg/100g
Phosphorus	80 – 140 mg/100g
Magnesium	10- 14mg/100g
Iron	11-14mg/100g
Zinc	1.4-1.8mg/100g
Copper	20-40µg
Iodine	70-140µg/100g
Vitamin A	0.8-1.1mg/100g
Vitamin D	15-20 µg/100g
Vitamin E	20mg/100g minimum
Vitamin K	15-30 µg/100g
Vitamin B1	0.5mg/100g minimum
Vitamin B2	1.6mg/ 100g minimum
Vitamin C	50 mg/ 100g minimum
Vitamin B6	0.6mg/ 100g minimum
Vitamin B12	1.6 µg/100g minimum
Folic acid	200 µg/100g minimum
Niacin	5mg/100g minimum
Panhotenic acid	3mg/100g minimum
Biotin	60 µg/ 100g minimum
N-6 fatty acid	3% - 10% of total energy
N-3 fatty acid	0.3% - 2.5% of total energy

Local Production of RUTF

The ingredients required are the four basic ingredients of RUTF:

- Sugar
- Dried Skim Milk (DSM)
- Oil
- A vitamin and mineral supplement

In addition, up to 25% of the product's weight 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:

1. Taste and texture suitable for young children
2. No additional processing required, such as cooking before consumption
3. Resistant to contamination by micro-organisms and a long shelf-life without sophisticated packaging
4. Ingredients that are low cost and readily available in developing countries

Information on how to produce RUTF locally is available at:

[http://www.who.int/child-adolescent health/New_Publications/NUTRITION/CBSM/tbp_4.pdf](http://www.who.int/child-adolescent-health/New_Publications/NUTRITION/CBSM/tbp_4.pdf)

3. WHO/WPP/SCN and UNICEF Joint Statement on Community based Management of Severe Acute Malnutrition available at: http://www.unicef.org/nutrition/index_39468.html

Appendix 4.2: Admission card for out-patient therapeutic care

ADMISSION CARD: OUTPATIENT THERAPEUTIC CARE

Name					Caretaker				
	Physical address								
	Age (months)	Sex	M	F		Date of Admission			
General Food Distribution									
Receiving Family Food Support	Yes	No	Receiving Supplementary Food			Yes	No		
Admission Anthropometry									
Weight (kg)		Height (cm)		MUAC (cm)		Other			
Admission Criteria	Oedema	MUAC <11.5 cm	<-3 WHZ			Readmission (Relapse)	Yes	No	
Diarrhoea	Yes	No	Stools / Day			1-3	4-5	>5	
Vomiting	Yes	No				Passing Urine	Yes	No	
Cough	Yes	No				If oedema, how long swollen?			
Appetite	Good	Poor	None				Breastfeeding	Yes	No
Reported Problems									
Physical Examination									
Respiration Rate (# min)	<30	30 - 39	40 - 49	50 - 59	60+	Chest Indrawing	Yes	No	
Temperature (°C)						Conjunctivae/Palmar Coloration	Normal	Pale	
Eyes	Normal	Sunken	Discharge			Dehydration	None	Moderate	Severe
Ears	Normal	Discharge				Mouth	Normal	Sores	Candida
Lymph Nodes	None	Neck	Axilla	Groin			Disability	Yes	No
Skin Changes	None	Scabies	Peeling	Ulcers / Abscesses		Extremities	Normal	Cold	
Routine Admission Medication & Immunisation									
Admission: Drug	Date	Dosage (& type)			2nd visit:	Date	Dosage		
Antibiotic					Albendazole/ mebendazole				
Antimalarial (coartem)					Immunisation	Measles	Yes	No	
Vitamin A					Fully Immunised	Yes	No		
Other Treatment									
Type			Other Drugs		Date	Dosage			
ART	Yes	No							
TB therapy	Yes	No							
FBP / Food Support	Yes	No							
Cotrimoxazole prophylaxis	Yes	No							

FOLLOW UP: OUTPATIENT THERAPEUTIC CARE

Name	REG. No																
Week	ADM.	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Date																	
Anthropometry																	
Weight (kg)																	
Weight loss* (Y/N)			*		*												
Height (cm)																	
WHZ / WHM																	
MUAC (cm)																	
Oedema (+ ++ +++)																	
* if below admission weight arrange home visit or refer to inpatient care																	
Medical History																	
Diarrhoea (# days)																	
Vomiting (# days)																	
Fever (# days)																	
Cough (# days)																	
Physical Examination																	
RUTF Test Good / Poor / Refused																	
Temperature (°C)																	
Respiratory Rate (# / min)																	
Dehydrated (Y/N)																	
Anaemia (Y/N)																	
Superficial Infection (Y/N)																	
Action/Medication Required (Y/N) (write details below)																	
RUTF (# sachets/units)																	
OUTCOME **																	
Name of Examiner																	
** A= absent D= defaulter (3 consecutive absences) T= transfer to inpatient R = Refused inpatient care X= died C= Cured NR= nonrespondent																	
																Community Health Worker	

Appendix 4.3: Out-Patient Therapeutic Care Ration Card

OTP RATION CARD

Hospital / Health Facility REG.N°

Name			Age			Sex	M	F
Date	Weight (kg)	Height (cm)	WHZ	MUAC (cm)	Oedema	RUTF (# units)	CSB / Unimix	

OTP RATION CARD

Hospital / Health Facility REG.N°

Name			Age			Sex	M	F
Date	Weight (kg)	Height (cm)	WHZ	MUAC (cm)	Oedema	RUTF (# units)	CSB / Unimix	

Section Four

Appendix 4.4: Medical Examination Checklist for OTP

Table 9: Medical Examination Checklist (OTP -> Inpatient Care) for Severe Acute Malnutrition

Examination	Criteria for referral to inpatient care
Oedema	Grade ++ +++
	OR Increasing oedema
	OR Marasmus-Kwashiorkor
Special cases	Severely malnourished infants < 6 months or children ≥6 months and weight <3kg
Appetite	Anorexia/no appetite or unable to eat
	Has difficulty swallowing the RUTF
Vomiting	Persistent/intractable
Temperature (axillary)	Fever ≥ 39°C
	Hypothermia < 35°C
Respiratory Rate*	Cough and fast breathing i.e.
	≥ 50 respirations/minute from 2 to 12 months
	≥ 40 respirations/minute from 1 to 5 years
	≥ 30 respirations/minute for over 5 years
	OR Any chest in-drawing
Anemia	Very pale, severe palmar pallor
Hydration status	Severe dehydration based on recent history of fluid loss (watery diarrhea/vomiting) with associated weight loss
Alertness	Extremely weak and lethargic, unconscious
	Fitting/convulsions
Superficial Infections	Open skin lesions, extensive infection requiring intramuscular treatment

* ≥60 respirations/minute for <2 months; but all infants should be referred to inpatient care

Any condition requiring an infusion or nasogastric feeding requires inpatient care

Appendix 4.5: Key message OTP

(Uncomplicated Severe Acute Malnutrition)

- RUTF (eg Plumpynut) is a food and medicine for very thin children only. It should not be shared.
- Sick children often do not like to eat. Give small regular meals of RUTF and encourage the child to eat often (if possible 8 meals/ day).
- RUTF is the only food sick/thin children need to recover during their time in OTP.
- For young children, continue to put the child to the breast regularly.
- Always offer the child plenty of clean water to drink while he or she is eating RUTF.
- Use soap for children's hands and face before feeding if possible.
- Keep food clean and covered.
- Sick children get cold quickly. Always keep the child covered and warm.
- When a child has diarrhoea, never stop feeding. Give extra food and extra fluids.
- Play, sing and talk with your child as this helps their recovery.

Notes:

Ready to Use Therapeutic Food (RUTF) e.g. Plumpynut is not for infants less than 6 months old: malnourished infants need to be referred to inpatient care for therapeutic/specialised milk.

The carer should be asked to repeat back to check that the messages have been correctly understood.

These key messages can be supplemented with more details and more messages if time allows.

Where a ration of supplementary food is given to avoid sharing of the RUTF, the message should be made clear that it is for the other children in the family not the severely malnourished child.

As the child nears the end of their treatment in OTP, other foods (supplementary food, local food) can start to be given in addition to the RUTF.

Appendix 4.6: Example of OTP Checklist for Field Support Visits

Name of health facility.....Date.....

Key areas	Assessment	Comments / observations
1. SCREENING Are anthropometric measurements taken and recorded correctly? Is testing and grading of oedema done correctly? Is Weight for Height Z scores calculated accurately?	Yes/No	
2. ADMISSION PROCEDURE Are children admitted according to criteria? Is history taken correctly? Is physical examination of child done correctly? Is appetite test done at every visit? Is rapid examination checklist assessment form used to identify referrals? Is ID number assigned to each child? Is every child assigned a community health worker?	Yes/ No	
3. MEDICAL MANAGEMENT Are the routine drugs (Amoxicillin, Vitamin A, deworming) given according to protocol? Is immunization status checked? Are slow responders checked for possible underlying causes? (eg tuberculosis, HIV, KalaAzar)	Yes/No	
4. NUTRITIONAL MANAGEMENT Is RUTF ration given according to child's body weight?	Yes/No	
5. DOCUMENTATION Is information / data correctly documented on: <ol style="list-style-type: none"> i. admission card ii. OTP ration card iii. OTP Register iv. OTP reporting forms v. report forms 	Yes/No	
6. HEALTH EDUCATION Is general information on OTP procedures given to caretaker on admission? <ol style="list-style-type: none"> i. Reason for admission ii. Principles of treatment iii. RUTF messages iv. Frequency of return visits v. Reasons for weekly return visits 	Yes/No	

Key areas	Assessment	Comments / observations
7. DISCHARGE PROCEDURES Are children discharged according to OTP criteria?	Yes/No	
8. MONITORING Is child's progress monitored on every visit? (appetite, anthropometric measurements, illnesses reported by caretaker, attendance) Is programme effectiveness monitored (i.e. admissions, exits, number in programme, weight gain, length of stay in programme) against Sphere standards?	Yes/No	
10. REPORTING Are report accurately compiled? Is the reporting channel followed?		
12. STORES MANAGEMENT Are stock cards maintained and updated? Are stocks of RUTF available and adequate? Is the storeroom clean and tidy?	Yes/No	
13. COMMUNITY MOBILISATION Is community mobilization conducted? How many community mobilization sessions are conducted each month? Is feedback on the programme given to community? Are absentees and defaulters followed up? Is feedback given to health facilities on cases followed up?	Yes /No	

Feedback given to health centre team.....Yes /No

Agreed action points:

1.
2.
3.
4.
5.

Mentoring team:

Name.....Organisation.....Date.....Sign.....

Name.....Organisation.....Date.....Sign.....

Name.....Organisation.....Date.....Sign.....

Section Five: Management Of Moderate Acute Malnutrition

Overview

This section covers the principles, design elements and implementation strategies to manage moderate acute malnutrition at the health facility. In Kenya, management of moderate acute malnutrition strategies are linked to national health programmes and are incorporated into Mother and Child Health programmes (MCH) which form part of the primary health-care infrastructure.

The main aim of managing moderately malnourished people is to meet the additional nutritional needs of the malnourished individuals of a vulnerable group, or prevent deterioration of nutritional status of those at-risk (e.g. infants, children, pregnant and lactating mothers; including guidance to adolescents and adults). This is basically done with supplementary feeding, nutrition counselling, and treatment of common ailments at the health facility (or centres designed to manage individuals that are moderately malnourished or at risk). Managing moderate malnutrition includes encouraging pregnant and lactating mothers to attend antenatal clinics and mothers to practice regular growth monitoring of children under five years.

In some communities, children between three and six years old are enrolled in Early Childhood Development (ECD) centres. According to the National Early Childhood Standard Guidelines, ECD centres should establish feeding programmes that provide nutritious snacks and lunch to alleviate short term hunger, and hence improve the capacity of the children.

In areas where HIV and AIDS prevalence is high, nutritional support and care is essential for people living with HIV and AIDS.

In areas where malnutrition rates are low, adults and children who present with moderate acute malnutrition can be treated at the health facility or at a community centre run by Community Health Workers (CHWs). In these centres, health workers measure children and adults, make nutritional diagnosis, offer counselling and provide necessary nutritional and medical treatment for malnourished individuals. Activities for managing moderate acute malnutrition can be undertaken at the MCH clinic.

Selection Criteria

When a malnourished individual attends a health facility, it is important that the health worker makes the right diagnosis and gives appropriate treatment. Initial assessment of an individual in a health facility includes taking the anthropometric measurements, the patient's history and a medical examination of the health and feeding practices of the individual. Based on that information, the health worker can determine if the patient is moderately, severely malnourished, or at-risk. See Table 5.1 for cut-off points.

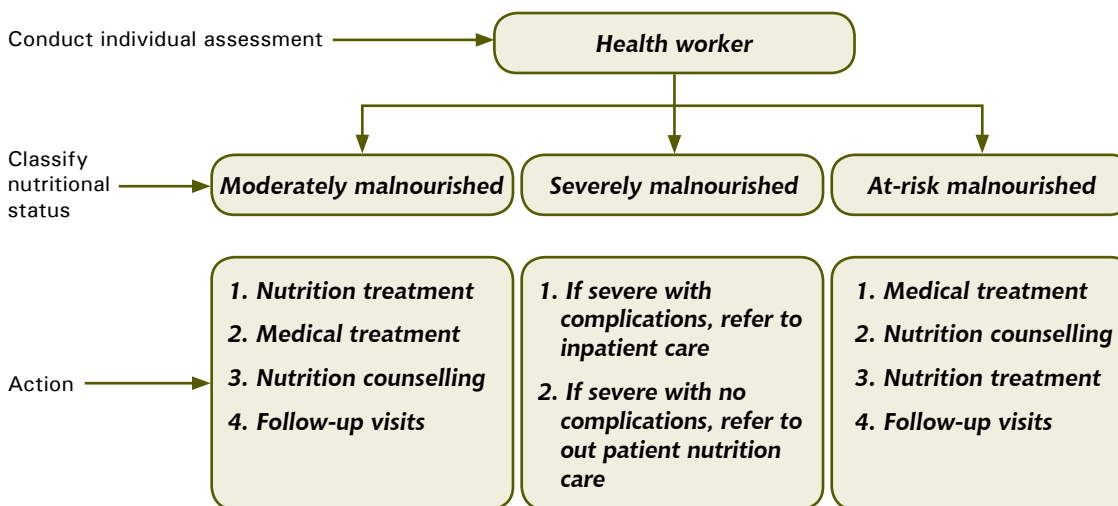
Note: Refer to Section 2, 3 and 4 for detailed information on the management of severe acute malnutrition.

Table 5.1: Nutritional status classification – use of cut off points¹

Indicator	Well nourished	At-risk malnutrition	Moderate malnutrition
Oedema	No	No	No
Weight-for-height (6 months to 18 years)	(+2 to -1SD)	(<-1 to -2SD)	(<-2 to >-3SD)
Height-for-age (6 months to 18 years)	(+2 to -1SD)	(<-1 to -2SD)	(<-2 to >-3SD)
Weight-for-age (6 to 59 months)			(<-2 to >-3SD)
<i>Weight-for-age (<6 months old)²</i>			
MUAC for children (6-59 months)	≥13.5cm	12.5-13.4cm	11.5-12.4cm
MUAC for PLW	>23cm	21-23cm	<21cm
MUAC for adults (PLWHA)	>23.3cm		<23.3cm
BMI for adults	≥18.5	17-18.4	16-16.9
BMI for adults (PLWHA)			<18.5

In addition to the cut-off points in Table 5.1, children presenting with chronic diseases (e.g. lung disease), HIV and AIDS, tuberculosis, Kala Azar, measles, persistent diarrhea and vomiting are at risk of becoming malnourished. In addition, health workers should also check the children's growth curve, a decline or a static curve indicates that the nutritional status of the child is not improving. These categories should as well be considered for supplementary feeding, especially in food insecure areas, in order to intervene early and prevent further deteriorations. The flow chart below summarizes the processes for a health worker to determine the status of the individual and the required actions.

Figure 5.1: Summary to determine the nutritional status of a patient and the required actions



1. Adapted from WFP. Food and Nutrition handbook, Rome 2001
 2. For moderately malnourished children <6 months old, admit mother in programme

Decision Matrix

This decision matrix can come in handy as a guide to enable a health worker makes the correct decisions.

Step 1: Take anthropometric measurements

- Check weight, height and age.
- Calculate weight-for-height or weight-for-age for children less than five years. (Refer to Section 1, Appendix 1.4)
- Calculate BMI for adults where applicable.
- **Or**, take MUAC measurement of children older than six months pregnant mothers and adults.
- Record measurements on patient card. If a child is enrolled in a growth monitoring programme, record measurement in the Child Welfare Card (CWC).
- Use cut-off points in Table 5.1 to determine the level of moderate malnutrition (at-risk or moderate).

Step 2: Conduct a causal assessment

Check the patient's record in the CWC. For children, discuss with the parent/caregiver the child's growth by showing them the child's growth curve. Inquire from parent/caregiver the reasons for deterioration of nutritional status.

Health status

- Ask about the patient's general health and any history of illness: use check Section, Appendix 1.1.
- For children, check child's immunization status and Vitamin A supplementation.
- For pregnant and lactating mothers, check for iron deficiency anemia and other micronutrient deficiencies, such as iodine.

Food consumption and care practices

- For children younger than 24 months, ask parent/caregiver if the child is breastfeeding.
- Ask caregiver what food the child eats, and how many times a day.
- Ask who feeds the child most often, and how the child is fed.
- For adult patients, ask what food they eat and frequency of consumption.

Step 3: Determine treatment

- If the patient is **moderately malnourished or at-risk**, refer for nutrition treatment, medical treatment and nutrition counselling.
- If there is **inadequate food at household level**: refer the patient to a food-based programme. If there is no food-based programme in or near to the health facility, provide nutritional counselling and/or refer the patient to social groups for food or cash assistance.
- If the patient is sick, **requires immunization, or suffers from micronutrient deficiencies**, refer to the relevant health services.
- If the problem is **feeding practice**, give the caregiver information on recommended feeding practices for the child's age, and discuss how they can adjust their feeding practices by using available resources. (Refer to Section nine for details on relevant counselling topics).

Admission and Discharge Criteria

When a patient is identified as moderately malnourished, the health worker takes the necessary steps to enroll him/her in a programme where he/she can receive nutrition support and care. It is important that the health worker understands the discharge criteria while admitting the patient. This will help the health worker determine the possible length of stay of the patient in the programme. Table 5.3 gives a summary of admission and discharge criteria.

Table 5.2: Indicators for Admission and Discharge

Admission criteria	Discharge criteria
Moderately malnourished <ul style="list-style-type: none"> • Children with a weight-for-height <-2 to $>-3SD$ and/or MUAC between 11.5cm and 12.4cm. • Pregnant and lactating mothers with a MUAC that is <21 cm • PLWHA with a MUAC that is < 23.3cm • Other adults with a MUAC of < 18.5cm • Other adults BMI < 18.5 	Moderately malnourished <ul style="list-style-type: none"> • Children maintain a weight-for-height $>-2SD$ - and/or MUAC ≥ 12.5cm for a period of two consecutive weighs/measurements • Pregnant and lactating mothers attain a MUAC that is above 23cm • PLWHA attain above 23.3cm • Other adults attain a MUAC of above 18.5cm • Other adults BMI above 18.5
At risk group	At risk group
<ul style="list-style-type: none"> • Chronically ill children (TB, HIV and AIDS, Malaria, persistent diarrhoea, vomiting, Kala Azar measles) • Children with the growth chart showing a decline in growth. 	<ul style="list-style-type: none"> • Child has recovered from illness • Child's growth curve is steadily increasing

Steps for Managing Moderate Acute Malnutrition

Registration

1. Register the patient in the registration book. If possible, have a separate register for children under five years, pregnant women, lactating women, and adults.
2. Provide the patient with a clinic or ration card. Health workers can modify the Supplementary Feeding Ration card in Appendix 5.4 accordingly.
3. Explain how treatment will be organized, and the reasons for admission to a nutrition programme.

Nutrition support

Provide food rations

Every community relies on a staple food or has a particular food familiar to the beneficiaries. Local food habits, tastes and preferences are taken into account when determining food rations and designing the food basket. A typical food basket will comprise of a cereal, pulses, oil and sometimes sugar. The ideal dry ration for supplementary food provides 1000 to 1200 Kcal; 35g to 45g of protein; and fat supplies 30% of required energy. The recommended amounts of each commodity as for the premix are shown in Table 5.3.

Table 5.3: Food commodities and ration size per patient for 14 days

Food items	Quantities per child <5 years old (kg)
CSB/UNIMIX	3.5
Vegetable oil	0.35
Total	4.5

Food Items	Quantities per adult (kg)
Maize	3.2
Pulses	0.56
Vegetable oil	0.18
Iodized salt	0.07
Total	4.55

For a take-home dry ration, prepare a premix by mixing the appropriate ingredients together in a big basin. Avoid distributing separate ingredients for take home rations. They may be used for other purposes, such as being sold in a market or shared with other household

members. During distributions, blended food can be mixed with oil and other dry ingredients such as sugars into a premix. See Appendix 5.3 to determine the proportions of premix. The oil in a premix will become rancid if the premix is made more than two weeks before eating; therefore it is important that ration distributions are either weekly or bi-weekly. After allocating the correct amounts of rations to the patient, explain when the next feed will be given.

- For those taking home dry ration based on blended foods such as CSB, conduct a cooking demonstration for new patients and caregivers. Explain how to make and serve the porridge see Appendix 5.2 for instructions.
- Remind patients and caregivers that **the ration is only for the patient**. Explain to them how long the ration should last (usually for one to two weeks, depending on the quantity).
- **Follow-up visit.** Carefully explain to the patient or caregiver what is expected for the next visit. Weight or MUAC measurement will be taken and recorded in the register and in the ration or clinic card at each visit. Height measurements will be taken monthly. Explain that this measurement will be taken in order to check nutritional progress.

Routine Medication

Supplementary Feeding always covers medical protocols such as provision of anti-helminths; vitamin A, iron and folic acid supplementation; and immunizations. Table 5.4 and 5.5 summarize routine medical treatment for children, people with HIV and AIDS, adolescents, and adults. Details regarding specific treatments can be obtained from the IMCI guidelines.

Table 5.4: Summary of routine medical treatment for children under five

Name of Product	When	Age	Prescription	Dose
Vitamin A*	At admission	<6 months	50,000IU	Single dose on admission
		6 months to <1 year	100 000IU	
		>1 year of age	200000IU	
Abendazole	At admission	<1 year	Do not give	
		1 year and above	400mgs	1 tab on admission
Mebendazole**	At admission	<1 year	Do not give	
		1 year and above	500mg	Single dose on admission
Iron /folate***	At admission	6 to 24 months (low birth weight and infants)	12.5mg iron/50µg folic acid	Daily dose from 6 to 12 months of age
		2 to 5 years	20-30mg	Daily dose
		6 to 11 years	30-60mg	Daily dose
		Adolescents and adults	60mg	Daily dose
Measles vaccination	At admission	>9 months	-	Once

* Do not repeat the dosage of Vitamin A if the child has already received a supplement of Vitamin A during the previous 30 days (e.g. during a national campaign or following recovery from SAM).

** Dose can be given again after 3 months if signs of re-infection appear.

*** Give one dose of 6mg/kg of iron daily for 14 days.

Table 5.5: Summary of routine medical treatment for pregnant and lactating mothers

Name of Product	When	Physiological status	Prescription	Dose
Vitamin A	Within first 4 weeks after delivery	Post partum	200000IU	Single dose on admission
Mebendazole	Second trimester	Pregnant	500mg	Single dose
Iron/ Folic acid	On admission	During pregnancy and lactation	60mg iron/400µg folic acid	Daily dose

Albendazole is not recommended after 2nd trimester of pregnancy

Nutrition counselling

- The patient or caregiver must receive adequate information about the cause of their malnutrition, and how to avoid a relapse. Annex 9.1 outlines key topics, messages and action points to assist a patient or caregiver improve his/her condition.
- Some patients may require both nutrition counselling and food rations. Ensure that they receive both.
- After counselling, ask caregiver or adult patient to explain what they will do at home. This is to make sure they understand the new practices.
- Inform the community worker about the counselling messages for follow-up purposes.

Follow-up

1. Make an appointment with the caregiver or patient for follow-up. Encourage caregivers or patients to come to the next nutrition counselling and food ration allocation sessions.
2. Explain the expected progress from the child and likewise the adult patient e.g. increased weight gain, good appetite.
3. Explain to the patient or caregiver that a CHW is likely to visit his/her home for follow-up. Introduce the CWH if she/he is present.
4. Ask the adult patient or caregiver to refer friends, acquaintances, family, etc. with similar problems to the health facility.

Data Collection and Reporting

Ration cards can be used at the health facility level to record information related to nutritional status, nutrition and medical treatment and type of nutrition education issued to all patients admitted to the programme. The cards keep a record of attendance, type and amount of rations, and treatment and nutrition counselling received.

- The card's information is similar to the health facility register.
- Counsel caregivers to ensure that the cards are kept in good condition.
- The cards are presented at each health facility visit and shown to the CHW when visiting a patient's home.

Health workers keep a monthly attendance report as well to record new admissions, attendance, discharge, deaths, default and transfers. (Annex 5.5 and 5.6 are samples of a monthly reporting formats and balance stock sheets). Monitoring data and other information can be slotted into the existing Child Health and Nutrition Information System (CHANIS) programme. Records are also kept for supplies of food and drugs, storage and staffing position. The monthly reports and stock balances are shared at coordination forums such as district health sector group meetings, District Steering Groups (DSGs), and with the relevant provincial and national departments.

3. Where the exact number of weeks cannot be determined, patient must be referred to the MCH for prescription

Requirements for Managing Moderate Malnutrition

Regardless of the number of malnourished patients that will attend the MCH clinic, a solid plan is essential to establish an intervention programme for the effective allocation of resources, and to assure good performance of any intervention.

Collect Information

In planning a programme, the district nutritionists need detailed information about all the health facilities in the district. The required information includes: the population by catchment health facility (disaggregated by age and sex); staffing positions; storage space, available modes of transportation and road conditions; supply chain for immunization and documentation of all intervention processes. This detailed information can be adapted from that used in an emergency context (Section 7) though on a smaller scale of operation.

Procure Equipment and Documentation

First, the district nutritionist ensures that the necessary equipment is available and in good condition. The anthropometric equipment required includes:

- height boards;
- weighing scales (25kg Salter scale and adult weighing scale);
- MUAC tapes, both child and adult;
- clinic cards, ration cards, and register books.

The health workers must keep a register of the patients enrolled in the programme. This is useful for tracking the number and type of patients and for monitoring supplies. The nutritionist ensures that nutrition education and training materials; counselling cards; monthly report sheets; and request forms are available for the programme.

Allocate Staff

An adequate number of qualified staff is essential to run the programme. If staff is limited, existing health staff may have to multi-task to ensure that the work is done. For example, a CHW can assist the nutritionist in taking measurements, distributing dry rations, and with counselling.

The essential staff required to run the programme include:

- 1 nutritionist to manage the programme, give nutrition counselling, provide technical assistance and organize refresher courses as protocols and guidelines are revised;
- 1 nurse to assess patients for common ailments and give health-related counselling;
- 1 store keeper to manage supplies and make returns or compile stock reports
- 1 cook (only for wet feeding programme);
- 1 Community Health Worker (CHW) to assist nutritionist and conduct follow-up.
- All staff must be trained to conduct their tasks with the utmost professionalism.

Calculate Expected Patient Load

Estimating the number of expected patients helps the health workers plan resources accordingly, and aids with supply distribution equitably among centres. The district nutrition officer can estimate the expected number of moderately acute malnourished patients by using the nutritional data recorded at each health facility to calculate average patient loads expected per health facility. It is therefore important that each health facility maintains good records for malnourished patients.

Calculate Quantity of Required Supplies

An accurate estimate of supplies is essential to avoid supply shortages or over-supply that result in wastage. See Appendix 7.4 for detailed information and steps to calculate the required quantity of supplies.

Supply Handling and Health Centre Management

Proper handling of supplies is of utmost importance as damage leads to waste. The health centre forwards requests to the national office and receives supplies from headquarters. This supply chain is similar to that described in Section 7 page 157.

Distribution of Food and Drugs

There are commercial food items such as fortified blended food such as CSB, sugar, and oil that can be distributed to moderately malnourished patients. Ration amounts and food commodities for this type of distribution are shown in Table 5.3. In the absence of these food commodities, nutritionists can use locally available food and prepare them in the most appropriate way to provide the recommended daily allowances. The nutrient content of each food or meal can be calculated to ensure that the required energy, proteins and fats are met.

Monitoring and Evaluation

Monitoring and Evaluation activities assess the appropriateness, efficiency, effectiveness and impact of a nutrition support programme. For instance a supplementary feeding programme is monitored continuously so that health facility managers and staff can detect and immediately act on day-to-day problems at any level of programme implementation. An evaluation is a one-off exercise that may be conducted on a regular basis and/or when the project period is extended. Evaluations measure outcomes and impacts. Generally, a nutritional assessment can be conducted in the district or division to determine the impact of the nutrition programme on the health and nutrition of the population. An evaluation gathers, organizes and presents information to use to improve future interventions as well as offer information to determine what other types of interventions are required to contribute towards reduction of malnutrition on the affected community.

Data collection and reporting

All nutrition programmes should keep a record of basic information for each patient admitted (see Supplementary Feeding ration cards and report forms in Annex 5.4 and 5.5). The records include a patient's registration number, name, age, sex, height, weight, date of admission and date of discharge. Children enrolled for supplementary feeding programme can wear a plastic bracelet, a metal tag, or a strap of cloth marked with a permanent pen with their name and registration number. as identification.

Appendix 5.1: Energy and Protein Values of Commonly Used Foods in Kenya

	common foods	energy kcal per 100g	protein g per 100 g	possible consumption per meal (g)	Nutrient output per meal	
					energy (kcal)	protein(g)
cereals	whole maize meal	370	9	50	185	5
	maize grain	370	9	50	185	5
	rice	359	8	75	270	6
	wheat flour	340	11	50	170	6
	wheat flour whole grain	334	17	50	167	9
	millet	335	9	60	202	6
	sorgum	306	8	60	183	5
	roots and tubers	cassava	375	2	75	281
arrow roots		125	2	75	94	2
sweet potatoes		131	6	75	98	98
irish/english potatoes		81	2	60	49	1
bananas raw (matoke)		109	1	60	65	1
others		cane sugar	375	.	20	75
	cooking fat	900	.	20	180	.
animal source foods	fish fillet	244	72	50	122	36
	meat beef	180	20	75	135	15
	chicken	163	25	75	122	19
	egg	154	12	100	154	12
	cow whole milk	73	3	200ml	150	6
plant source foods	green grams	352	24	50	176	12
	lentis	350	24	50	175	12
	beans	347	18	50	173	9
	cow peas	297	23	50	151	12
	soya	429	30	50	215	15
	pigeon peas	399	23	50	199	11
fruits	avocado	128	1	100	128	1
	banana ripe	94	1	50	47	1
	oranges	89	1	40	36	.
	passion	87	1	40	35	.
	mangoes	60	1	60	36	.
	pawpaw	32	0.4	40	12	0.2
nuts and seeds	ground nuts	554	10	50	277	5
	coconuts	544	6	50	314	17
	cashew nuts	569	21	50	265	11
	simsim	544	20	50	272	10
	vegetables	spinach	32	3	200	64
cabbage		24	2	150	36	3
kales(sukuma wiki)		52	4	150	73	6
cow peas leaves		43	6	100	43	6
amaranth(terere)		45	5	100	45	5
pumpkin leaves		36	5	100	36	5

Appendix 5.2: Local Recipes⁴

Blended foods

Corn Soya Blend porridge

- 1 cup CSB
- 3 cups water

Method

Use one cup of CSB/premix and three cups of water, cook the mixture until it has boiled for 5 to 10 minutes (not more).

Soya-sweet potato

Ingredients

- ¾ cup fine Soya grits or mash
- 1 ¾ cup diced sweet potatoes
- 1 ½ taste spoon sugar
- Pinch of salt

Method

1. Blanch the grits by dropping in boiling water and simmer for 10 minutes;
2. Drain off water, rinse in hot water, add cold water plus de-hull by rubbing between the hands;
3. Add 1 cup of water to the grits, add peeled plus diced sweet potatoes and cook for 15 minutes;
4. Grind the mixture or blend it to fine peeled slurry;
5. Re-heat the slurry to boiling point cool plus serve warm.

Variation: Replace sweet potatoes with pumpkin, green bananas, Irish potatoes, arrow roots.

Soya wimbi (millet) porridge

Ingredients

- 5 cups of water
- ½ cup of maize meal
- ¼ cup wimbi flour
- ¼ cup raw Soya flour
- 3 table spoon sugar
- Juice from 2 lemons (optional)

Method

1. Bring 3 cups of water to the boil;
2. Blend maize meal plus wimbi flour into a paste with the remaining 2 cups of water;
3. While stirring, add the paste to the boiling water, continue to stir until the mixture starts to thicken;
4. While stirring, sprinkle raw soya flour;
5. Reduce heat plus cook for about 25 minutes; and
6. Add sugar and stir to dissolve;
7. Add lemon juice and remove from fire;
8. Cool and serve.

Variations: Replace wimbi flour with sorghum or bulrush millet.

Note: Omit lemon juice if the porridge is cooked for a child.

4. Recipes from Ministry of Agriculture, department of home extension : Kenya Soya cook book and Nutrition manual for Kenya

Bean porridge

Ingredients

- 1 cup of beans
- 1 cup maize meal
- 1\2 teaspoon of margarine

Method

1. Soak beans and remove skin;
2. Fry the beans until dry and pound into flour;
3. Mix the beans flour with the maize meal and cook into a porridge;
4. Add margarine and serve;

How to calculate energy and nutrients in a meal

The following steps can assist the nutritionist calculate the nutrients in the meal that contains several ingredients:

Step 1: Weigh all raw ingredients

Step 2: Calculate the different nutrients in each ingredient

Step 3: Add up quantities of calories, proteins plus other nutrients in all the ingredients to determine whether the quantities provide the recommended kcals per person in a day.

Case study: Saidia Nutrition Centre, Kinoti location

Saidia health centre runs a wet feeding programme targeting 50 moderately malnourished < 5 years old children. The centre provides two porridge meals a day. Fatuma, the district nutritionist knows that the required kcals for wet feeding is 500-700kcals and 15g-25g of protein per day, and the fat should provide 30% of the total energy. However, she needs to verify that the meal provides the recommended kcals per person per day. The ingredients of the porridge meal per person are;

Ingredients

- 40gms groundnuts
- 70gms of maize flour
- 10gms sugar
- 1\2 an orange
- 1\2 liter of water

Method

- Roast groundnuts to remove the skin, pound until fine then sieve.
- Boil water in a saucepan.
- Make a smooth paste of maize flour, sugar plus cold boiled water.
- Place the mixture in the saucepan back on the fire and continue to stir until mixture is smooth and cooked.
- Add the sifted groundnut flour while stirring to avoid formation of lumps.
- Remove from the fire and when cool add the fruit juice from half the orange.
- Cool to a desirable temperature.
- Serve the child.

From the nutrient content table (Appendix 5.1), select the food item and check how much energy, protein and fat content is available per item. Note that the nutrient content is per 100gm

The following is calculated per 100g

- 100g maize flour has 368kcal energy , 9.4g protein and 1.0g fat
- 100g groundnut has 567kcal, 25.8g protein, 45g of fat,
- 100g Sugar has 400 kcal
- Protein contain 4.0kcal /g
- Fat contain 9.0kcal/g

The following formulas can be used to calculate the energy and nutrients available in any meal:

Formula 1: Energy (kcal) = Amount of Commodity (g) x Amount of energy in Commodity (kcal) /100g

Formula 2: Protein (g) = Amount of Commodity (g) x Amount of Protein in Commodity (g)/100g

Formula 3: Fat (g) = Amount of Commodity (g) x Amount of fat in Commodity (g)/100g

Formula 4: Total energy in fat (%) = Total amount of fat in all commodities (g) x Amount of Energy in fat (kcal/g) / Total amount of energy from all food items (kcal) x 100

Appendix 5.3: Proportions of Premix

Premix preparation for 1, 5, 10 and 20 persons – children < 5 years old

Food Item	Quantities for X Persons (kg)			
	1	5	10	20
CSB	3.9	19.3	39	77
Vegetable Oil	0.3	6.0	11.9	23.9
Sugar	0.3	1.8	3.6	7.2
Total	4.5	27.0	54.0	108.0

Measuring rations for caregivers or P/L women

Food Item	Quantities for X Persons (kg)			
	1	5	10	20
Maize Meal	3.50	17.5	35.0	70.0
Beans	1.05	5.25	10.5	21.0
Total	4.55	22.75	45.5	91.0

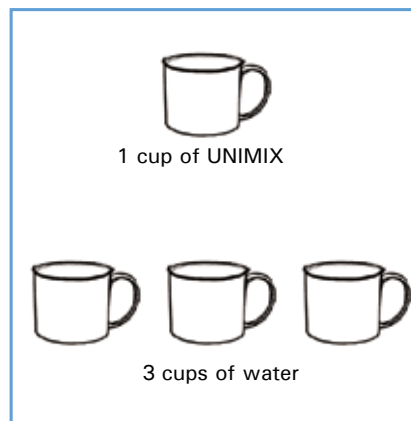
Rations for Supplementary Feeding

Commodity	Ration 1 (g)	Ration 2 (g)	Ration 3 (g)
On- site supplementary feeding			
Blended food fortified	100	-	-
Cereal (e.g. maize flour)	-	125	60
DSM	-	-	45
Pulses	-	30	-
Oil	30	20	30
Sugar	20	-	15
Salt	-	5	-
Energy (Kcal)	725	700	700
Protein (% of energy)	10	11	12.5
Take home supplementary feeding			
Blended food fortified	200	140	250
DSM	-	50	-
Pulses	20	50	25
Sugar	15	30	20
Energy (Kcal)	1000	1250	1250
Protein (% of energy)	14	14.5	14.5

WHO 2000, The management of nutrition in major emergencies

Appendix 5.4: Preparation of Porridge with Fortified Flour

UNIMIX (or CSB) is a special food for children 6 months to 5 years and others with special nutritional needs such as pregnant women and breast-feeding mothers. UNIMIX is a supplementary food that is meant to be eaten in addition to the normal family food to improve the diet of children and other vulnerable groups. To increase the energy density and taste, oil, seasonal fruits and vegetables and or any local nuts can be added. UNIMIX is pre-cooked but is not an instant product. It should be cooked for 5-10 minutes, but not longer. Before starting to cook, please ensure that the water which is used is safe before mixing into porridge and wash your hands thoroughly before preparing the porridge.



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Nutrition value of 100g of CSB /UNIMIX

Energy-380 Kcal Fat -6g Carbohydrates-60g Vitamin A - 1700 I.U, Riboflavin - 0.5mg, Pantothenic acid --3mg
 Phosphorous - 600mg, Sodium - 300mg, Protein-18g, Vitamin D - 200, Niacin - 8mg Folicin - 0.2mg Magnesium-
 100mg Potassium -700mg Vitamin E -8 I.U Vitamin B6 - 0.7mg Ascorbic acid - 40mg Iron - 18mg Iodine
 - 50mcg Thiamin -0.7mg Vitamin B12- 4mcg Calcium - 800mg Zinc - 3mg

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Appendix 5.5: Supplementary Feeding Ration Card

Card No:		SUPPLEMENTARY FEEDING CARD FOR CHILDREN < 5 yrs						
District Card No:		Health Facility:						
General Information								
Child Name:					Village/address:			
New Admission Yes /No					Mother/Caregiver's Name:			
Re- Admission Yes/ No								
Age (months):					Sex: Male / Female			
Medication/Supplementation								
Albendazole					Vitamin A			
Measles Vaccination					Iron tablets			
Other drugs								
Follow-up								
Distribution	Ration	Date	Weight (kg)	Height (cm)	W/H	Target W/H	MUAC (cm)	Iron/Folic
Admission								
2								
3								
4								
5								
6								
7								
Discharge								
Cured/T		ransferred			No Response			
Defaulted		Dead						

This card can be modified for Pregnant and lactating women

Appendix 5.6: Monthly Report Format for Management of Moderate Acute Malnutrition

MONTHLY REPORT FORMAT - MANAGEMENT OF MODERATE ACUTE MALNUTRITION

PROVINCE	IMPLEMENTING PARTNERS		
DISTRICT	MONTH	YEAR	
HEALTH FACILITY	NAME & POSITION OF REPORTING OFFICER		
	Signature	Date	
	ESTIMATED TARGET malnourished <5's (based on latest survey data and admission criteria)		
	CSB/UNIMIX consumption (kg)		
	Oil consumption (L)		

	New Cases (B)		Old Cases (C)		TOTAL ADMISSION (D) (B+C=D)	Discharges (E)				Transfer (F)	TOTAL EXITS (G) (E+F=G)	Total end of the month (H) (A+D-G=H)	
	According to admission criteria (W/H, MUAC, BMI) (B1)	Other (at risk) (B2)	From Outpatient or Inpatient Care, or Returned Defaulters	From Outpatient or Inpatient Care, or Returned Defaulters		CURED (E1)	DEATH (E2)	DEFAULTER (E3)	NON-RECOVERED (E4)				To Inpatient or Outpatient Care
<5years													
PLM													
Adult/Adol													
TOTAL													
					For < 5yrs	%	%	%	%	%	%	%	
					For PLM	%	%	%	%	%	%	%	
					For Adult/Adol	%	%	%	%	%	%	%	
					TARGET (Sphere Standards)	>75%	<3%	<15%	<15%				

E1: Cured = reaches discharge criteria

E3: Defaulter = absent for 3 consecutive visits

E4: Non recovered = does not reach the discharge criteria after 4 months in OTP

Appendix 5.7: Feeding Programme Stock Card

STOCK CARD

Province: _____ District: _____ Health facility: _____
 Reporting Month: _____ Year: _____ Period starting from Date: _____ to _____

Beneficiaries	Numbers		Food Items (CSB/UNIMIX (kg) Oil (kg) RUTF (Boxes) F-75 (Boxes) F-100 (Boxes) Others	Opening stock	Receipts	Distribute	Losse	Closing stock
	Total	Males						
children<5yrs Severe Inpatient								
children<5yrs Severe Outpatient								
children<5years Moderate								
P/L mothers moderate mal								
Adolescents severe mal								
Adolescents moderate mal								
Adults severe mal								
Adults moderate mal								
Total								

Note:
 1. closing stocks quantity of food items left after distributing and losses (Closing Stock= (Opening stocks +Receipts) -(dist ributed + Losses)
 2. the specification of male/female (does not apply for p/L women)
 3. the quantities are mainly measured in kg (a part from oil that is measured in Liter)

Name _____
 Signature _____
 Date _____

Section Six: Management of Malnutrition for Children in the Context of HIV and AIDS

Overview

According to the 2007 Kenya AIDS Indicator Survey (KAIS), Kenya has seen an increase in the overall prevalence of HIV from 6.7 per cent in 2003 to 7.8 per cent in 2007 -translating to 60,000 to 100,000 new infections a year. In accord with the 2005-2010 Kenyan National HIV and AIDS Strategic Plan, the Government of Kenya has identified good nutrition as a key component of the national response to the HIV and AIDS epidemic. This is keeping with global recognition that good nutrition is essential for the promotion of health and quality of life of all people, particularly people living with HIV and AIDS (PLHIV).

By the end of 2007 in Kenya, there were an estimated 234 facilities offering paediatric ART treatment (NASCO, 2008). While PMTCT services have expanded rapidly, the prevalence among pregnant women is approximately 9.6%, resulting in an estimated 90,000 children at risk of Mother-to-Child (MTCT) transmission of HIV and an estimated 34,000 to 45,000 new HIV infections every year. Tragically the majority of these children die within two years without being diagnosed. While 60,000 children are estimated to be in need of ART only 20,000 are known to be receiving treatment, reversing the previous gains in child survival in the country over the past two decades.

HIV-infected children's energy needs increase by 20-30%; children experiencing weight loss increase their energy needs by 50-100%. A number of studies have shown that growth faltering by age 3-4 months was observed while progressive stunting appeared to be more typical than wasting. Disturbances in growth are detectable well before the onset of opportunistic infections or other manifestations. In children with HIV and AIDS, growth failure is noted from several international studies and wasting being more prominent in children who are HIV positive after one year of age. Height growth or lean body mass is affected in children and is significantly linked to survival.

Patients with HIV & AIDS

This section details some of the broad principles for in-patient and out-patient nutritional management of children with HIV and AIDS. This section provides a comprehensive approach and will be cross referenced with other sections. Objectives, critical interventions as well as key nutritional requirements are detailed below. The general management for severe acute malnutrition needs to follow the protocols and principles of care highlighted in Section

Two: 'Inpatient Management and Treatment of Severe Acute Malnutrition' and Section Four: 'Out-patient therapeutic Care for Severe Acute Malnutrition' as well as other sections that pertain to care of children less than six months of age (Section Three: Management of Acute Malnutrition in Infants Less than Six Months).

Objectives and Guidelines for Providing Nutritional Care for PLHIV (from GoK, MOH, 2007, National Guidelines for Nutrition and HIV and AIDS)

Providing nutritional care and support for adults and children with HIV and AIDS serves to:

- Improve the quality of life through improved nutritional status, promote food-based strategies, reduce food and water-borne infections, enhance resistance to opportunistic infections and enhance better management of HIV related illnesses.
- Increase adherence to ARV treatment through nutritional management of side-effect(s) from medicines.
- Increase participation in programmes through food incentives that promote adherence to evidenced based care.
- Address micronutrient deficiencies that may prevent HIV disease progression and delay adverse pregnancy outcomes.
- Improve the nutritional assessment and care in all levels of service provision (e.g. PMTCT, ART, VCT and TB care).
- Increase the capacity of government and key NGO/CBO partners to provide nutritional care as part of PMTCT and home based care.
- Promote choice and action on optimal infant feeding practices. This would include minimizing mixed feeding and increasing exclusive breastfeeding where there are no alternatives that are acceptable, feasible affordable, sustainable and safe (AFASS).
- Establish and strengthen monitoring and evaluation systems that would guide further planning for optimal care of those living with and affected by HIV and AIDS.

The role of nutritional assessment is fundamental to effectively planning for the nutritional needs of PLHIV and assists in:

- Confirming an adequate nutrient intake, improve eating habits, and help build and maintain stores of essential nutrients.
- Confirming correct weight status, and maintain a healthy weight by preventing overall weight loss particularly of muscle mass (lean body mass, LBM) or development of obesity.
- Confirming absence of illnesses that aggravate nutritional wasting, and assist the patient in assessing treatment for illnesses that reduce food intake.
- Adjusting meals and meal plans for other chronic illnesses associated with HIV.
- Facilitating the provision of therapeutic nutritional care and support during advanced stages of HIV and AIDS.

Summary of Critical Nutrition Practices for PLHIV

- Have periodic nutritional status assessments, especially the weight, at least every second month for symptomatic clients and every third month for asymptomatic clients.
- Increase energy needs for the disease stage through consumption of balanced diet. Severely malnourished patients (BMI < 16) should be supported with therapeutic and supplementary foods, where this is available.
- Patients with no AIDS symptoms require 10% more energy (one snack) per day than the recommended daily allowance for HIV-negative individuals of the same age, sex,

physical activity level and physiological state. Patients with AIDS symptoms require 20-30% more energy (2-3 snacks) per day than the recommended daily allowance for HIV-negative individuals. Children with weight decline or faltering need 50-100% more energy than HIV-negative children of same age, sex. The additional energy can be achieved by consuming sufficient amounts of balanced food, including one or more snacks in between the meals in the course of the day,

- Maintain high levels of sanitation, food hygiene, and food/water safety at all times. If living in hookworm endemic areas one should be de-wormed bi-annually with an appropriate broad-spectrum anti-helminthic drug, like Albendazole or Mebendazole.
- Practice positive living behaviours, including practicing safer sex, avoiding or moderating use of alcohol, cigarettes and non-prescription drugs, moderating consumption of junk foods, and management of depression and stress.
- Carry out physical activity or exercises to strengthen or build muscles, increase appetite and health.
- Drink plenty of clean safe water (8 glasses in a day). All water used to swallow medicines and to prepare juices should be clean and safe (e.g. filtered and boiled).
- Seek prompt treatment for all opportunistic infections and other diseases, and dietary manage symptoms especially those that may interfere with food intake, absorption and utilization.
- Those on medicine, including ARVs, should manage the drug-food interactions and side-effects by following the drug-food schedule, use dietary approaches to manage side-effect symptoms. If taking traditional remedies (herbs, medicines) or other nutritional supplements, the clinician should be informed.
- Children (below 6 months) born to HIV + mothers whose mothers/caregivers have opted for exclusive replacement feeding, should be supplemented with 50,000 IU of Vitamin A and if not on commercial infant formula, put on multivitamins every day.

Clinical Guidelines for an Integrated Approach to the Nutritional Care of HIV-Infected Children (6 months to 14 years)

WHO (2007) clinical guidelines for nutritional management of children with HIV and AIDS (age 6 months to 14 years) are detailed in job aids for health care providers. The following is an excerpt from these draft guidelines.

The nutritional needs of HIV-infected children vary according to their age, stage of disease, the presence of acute and/or chronic infections and the treatments they receive. Nutritional needs are best met through balanced and varied diets. When these are not available, or demands are high, then additional support may be needed.

The energy and protein needs of HIV-infected children depend on their age, and growth patterns and the long-term effects of HIV disease such as acute/chronic infection or other complications (see table below). Improving the diet alone, though, may not result in normal growth, weight recovery or improvement in clinical status. Children who are not growing well may require additional medical interventions such as TB therapy or antiretroviral treatment (ART); these children should be referred to a health facility that is capable of skilled assessment if they are not already under follow-up. Children starting and remaining on ART also need additional energy and protein to build up their muscles, grow again and to be active and playful as the infection comes under control.

Table 6.1: Energy needs of HIV-infected children (kcal/day)

Daily energy needs of HIV uninfected children*	HIV infected and asymptomatic 10% additional energy	HIV infected and poor weight gain or other symptoms	20% additional energy	Severely malnourished and HIV infected 50-100% additional energy**
6-11 mths	690	760	830	150-220 kcal/kg/day
12-23 mths	900	990	1080	150-220 kcal/kg/day
24-59 mths	1260	1390	1510	150-220 kcal/kg/day
6-9 yrs	1650	1815	1980	75-100 kcal/kg/day
10-14 yrs	2020	2220	2420	60-90 kcal/kg/day

* Based on average of total energy requirements for light and moderate habitual physical activity levels for girls and boys by age group. Joint FAO/WHO/UNU Expert Consultation, October 2001. <ftp://ftp.fao.org/docrep/fao/007/y5686e/y5686e00.pdf>

** Management of Severe Malnutrition: a manual for physicians and other senior health workers. WHO. 1999.

Most HIV-infected children do not need any more protein than uninfected children, but they should rather have a balanced diet where protein contributes about 10-15% of energy intake. HIV-infected children frequently have low levels of vitamins and other micronutrients. They may not be receiving enough from their diet or their bodies are using up more to fight the HIV infection itself or opportunistic infections. Vitamin A supplements, as in children without HIV infection, reduce diarrhoeal morbidity and mortality especially in young children. Zinc supplements also help HIV-infected children to recover from diarrhoeal illnesses which is consistent with national IMCI guidelines for management of diarrhoeal illness in children 5 years and under.

Micronutrient intakes at recommended levels need to be assured in HIV-infected children through varied diets, fortified foods, and micronutrient supplements when adequate intakes cannot be guaranteed through local foods. At present, all WHO recommendations for micronutrient supplementation in the general population (e.g. vitamin A, zinc and iron) are the same as for HIV-infected children.

In summary, adequate and appropriate nutrition from the early stages of HIV infections and also in the advanced stages is necessary to optimise health outcomes; however nutrition support alone, macro- and/or micronutrients, are not an alternative to comprehensive HIV treatment including antiretroviral drugs.

National indicators for monitoring of programme implementation and impact have been detailed in other national guidelines and training documents on Nutrition and HIV and AIDS.

National reference documents include:

GoK - Ministry of Health: Kenyan National Guidelines on Nutrition and HIV and AIDS, January 2007

GoK - Ministry of Health: Kenyan National Training Curriculum on Nutrition and HIV and AIDS, January 2007

GoK - Ministry of Health: Kenya Nutrition and HIV and AIDS Strategy (Draft) February 2007.

The following pages provide reference to portions of a broader job aid that provides a stepwise approach to providing nutritional care to children infected with HIV from 6 months to 14 years of age. The following table highlights assessment and classification which remains similar to that of a child who is not infected with the exceptions of clinical wasting for a child with severe malnutrition (Care Plan C); weight loss or chronic health conditions identifying a child that is in need of supplementary food support (Care Plan B) or increased nutritional needs of a child that demonstrates normal growth (Care Plan A). The following plans of care are based on the macronutrient and also the micronutrient needs of children based on assessment and classification.

Table 6.2: Assess, clarify and decide a nutritional case plan

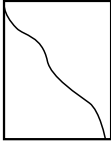
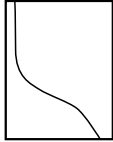

ASK	LOOK and FEEL	SIGNS	CLASSIFY AS	TREAT
<p>Ask mother/caregiver (or check the medical records)</p> <ol style="list-style-type: none"> Has the child lost weight during the past month? Does the child have: <ul style="list-style-type: none"> chronic lung disease, including LIP, bronchiectasis TB Persistent diarrhoea 	<ol style="list-style-type: none"> Look for signs of severe visible wasting <ul style="list-style-type: none"> Loss of muscle bulk Sagging skin/ buttocks Feel for oedema of both feet Check the weight and height <ul style="list-style-type: none"> Is the weight-for-height < 70% expected median? Is the child very low weight (less than 60% exp wt for age)? Is the child underweight (less than 3rd centile)? curve <ul style="list-style-type: none"> Has the child lost weight since the last visit? (<i>Confirm current weight by repeating measurement</i>) Is the child's growth curve flattening? Is the child gaining weight? Check the MUAC <p><i>Infants 6mo-12mo</i></p> <ul style="list-style-type: none"> Is MUAC less than 110mm? Is MUAC less than 115mm? <p><i>Children 1yr-5yrs</i></p> <ul style="list-style-type: none"> Is MUAC less than 110mm? Is MUAC less than 135mm? <p><i>Children 6yrs-9yrs</i></p> <ul style="list-style-type: none"> Is MUAC less than 135mm? Is MUAC less than 155mm? <p><i>Children 10yrs-14yrs</i></p> <ul style="list-style-type: none"> Is MUAC less than 160mm? Is MUAC less than 185mm? 	<p>Signs of severe visible wasting, or Oedema present in both feet, or Weight-for-height < 70% expected median, or MUAC less than:</p> <ul style="list-style-type: none"> 110mm in infants 6mo-12mo 110mm in infants 1yr-5yrs 136mm in infants 6yrs-9yrs 160mm in infants 10yrs-14yrs <p>Reported weight loss, or Very low weight (less than 60% exp wt for age), or Underweight (less than 3rd centile), or Confirmed weight loss (>5%) since the last visit, or Growth curve flattening, or MUAC less than:</p> <ul style="list-style-type: none"> 115mm in infants 6mo-12mo 135mm in infants 1yr-5yrs 155mm in infants 6yrs-9yrs 10yrs <p>Child is gaining weight</p>	<p>SEVERE MALNUTRITION</p>	<p>NUTRITION CARE PLAN C</p>
<p>Ask all questions and complete all assessments with each child</p>	<p>Gaining weight</p> 	<p>Assess growth in all children</p>	<p>POOR WEIGHT GAIN</p>	<p>NUTRITION CARE PLAN B</p>
<p>Growth curve flattening</p> 			<p>GROWING APPROPRIATELY</p>	<p>NUTRITION CARE PLAN A</p>
<p>Losing weight</p> 		<p>Chronic lung disease, or TB, or Persistent diarrhoea</p>	<p>CONDITION WITH INCREASED NUTRITIONAL NEEDS</p>	<p>NUTRITION CARE PLAN B</p>

Table 6.3: Nutrition Care Plan A (WHO - Nutritional care of HIV-infected children, 2006)

<p>1. Ask about general condition and if child is on any treatment including ART and TB medicine? Also check re. immunizations (Step 7) Is the child at school? If child is on ART then also complete Step 10</p> <p>2. Check mother's health (+ need for ART) and care of other children</p> <p>3. Nutrition counselling Encourage mother/caregiver that the child is growing well. Explain growth chart and how to follow progress Ask, have there been any major changes in the child's circumstances from the last visit that might put the care of the child at risk, including access to food? Advise mother/caregiver why additional food (energy) is needed in children (and adults) with HIV infection (approx 10%) Counsel on continued breastfeeding if mother is well (Check national guidelines and age of the child) Counsel on complementary feeding and replacement feeding (frequency of meals, amount & type of food per meal, responsive feeding – see Appendices VI and VII). Reinforce and encourage good practices. Counsel on feeding a variety of foods such as milk/ maas, fruit, vegetables, wholegrains, cereals & meat/ chicken or fish based on local diets i.e. food sources that are high in vitamin A, iron, calcium, etc. and other locally produced foods Review safe food preparation, food and water storage methods and hygiene issues (keep hands, utensils and food prep area clean; separate raw and cooked foods; cook food thoroughly; keep food at safe temperature; use safe water and food) Check if there are other sources of good foods such as through garden projects or other community resources</p> <p>4. Meet age-specific needs and additional 10% food (energy) based on actual weight</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2" style="text-align: center;">Examples of ways to increase energy intake by 10% using food GIVE IN ADDITION TO THE MEALS AND SNACKS APPROPRIATE FOR THE CHILD'S AGE</th> </tr> <tr> <td style="padding: 5px;">6 months - 11 months [100kcal]</td> <td style="padding: 5px;"> <ul style="list-style-type: none"> • Local adaptation E.g. 2 tsp marg/ oil & 1 tsp sugar to porridge add other examples of switches </td> </tr> <tr> <td style="padding: 5px;">12 months - 23 months [100kcal]</td> <td style="padding: 5px;"> <ul style="list-style-type: none"> • Local adaptation E.g. 2 tsp marg/ oil & 1 tsp sugar to porridge add other examples of switches </td> </tr> <tr> <td style="padding: 5px;">2 years - 5 years [150kcal]</td> <td style="padding: 5px;"> <ul style="list-style-type: none"> • Local adaptation E.g. 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Refer to national guidelines.</p> <p>6. Vitamin A supplements every 6 months <6 months 50,000IU 6-12 months 100,000IU >12 months, 200,000IU Do not give if child has received dose within the past month e.g. from hospital</p> <p>7. De-worm every 6 months (Step 7) Albendazole (oral) 400mg single dose every 6 months after first year of life</p> <p>8. Cotrimoxazole prophylaxis (Step 7) Provide from 6 weeks of age 5mg/kg/day</p> <p>9. Ensure mother/caregiver understands care plan and ask if she/he has any questions</p> <p>10. Review in 2-3 months (Tell caregiver to return earlier if problems arise)</p>	Examples of ways to increase energy intake by 10% using food GIVE IN ADDITION TO THE MEALS AND SNACKS APPROPRIATE FOR THE CHILD'S AGE		6 months - 11 months [100kcal]	<ul style="list-style-type: none"> • Local adaptation E.g. 2 tsp marg/ oil & 1 tsp sugar to porridge add other examples of switches 	12 months - 23 months [100kcal]	<ul style="list-style-type: none"> • Local adaptation E.g. 2 tsp marg/ oil & 1 tsp sugar to porridge add other examples of switches 	2 years - 5 years [150kcal]	<ul style="list-style-type: none"> • Local adaptation E.g. Extra cup of full cream milk/ fermented milk add other examples of switches 	6 years - 9 years [150kcal]	<ul style="list-style-type: none"> • Local adaptation E.g. Extra cup of full cream milk/ fermented milk add other examples of switches 	10 years - 14 years [250kcal]	<ul style="list-style-type: none"> • Local adaptation E.g. 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10 years - 14 years [250kcal]	<ul style="list-style-type: none"> • Local adaptation E.g. Extra cup of fruit yoghurt or cheese sandwich add other examples of switches 											

Table 6.4: Nutrition Care Plan B (WHO - Nutritional care of HIV-infected children, 2006)

1. Clinically stage the child (Appendix I). Assess for ART, clinical and immunological response to ART including adherence and refer if indicated. If child is on ART then also complete Step 10.

2. Check mother's health (+ need for ART) and care of other children

3. Nutrition counselling

- What does the child eat and drink? (Step 4)
- Who gives the child their food and how does the child eat? (Step 5)
- Is there food at home? (Step 6)
- Advise mother/caregiver why additional food (energy) is needed in children (and adults) with HIV + complications (25-30%)
- Review safe food preparation, food and water storage methods and hygiene issues (Step 7)
- Ask, have there been any major changes in the child's circumstances from the last visit that might put the care of the child at risk, including access to food? (Step 6)

4. Meet age-specific needs and additional 25 - 30% food (energy) based on actual wt

These needs may be met either through a food-based approach or through specific nutritional supplements – either form of support should be provided by the service/programme	
<u>Food-based approach</u> GIVE IN ADDITION TO MEALS AND SNACKS	<u>Nutritional supplement</u> GIVE IN ADDITION TO MEALS AND SNACKS
6 months- 11 months [230 -275 kcal] • 2 tsp marg/ oil to porridge/ food & 1 tsp sugar to porridge/ food - aim to add to 3 foods per day OR • *1 extra cup of full cream yoghurt or milk	6 months- 1year [230 - 275kcal] • equivalent local adaptation / recommendation (examples in Appendix III)
12 months - 23 months [425 - 500kcal] • 2 tsp marg/ oil to porridge/ food & 1 tsp sugar to porridge/ food - aim to add to 3 foods per day • *1 extra cup of enriched full cream milk OR • 1 Cheese/ peanut butter/ egg sandwich [2 slices]	1 year – 6 Years [425 - 500kcal] • or equivalent local adaptation / recommendation (examples in Appendix III)
2 years – 5 years [425 - 500kcal]	
6 years – 9 years [550 - 650kcal]	
10 years - 14years [550 - 650kcal] • 2 tsp marg/ oil to porridge/ food & 1 tsp sugar to porridge/ food - aim to add to 5 foods per day • 1 Extra cup of full cream milk/ OR • 3 Cheese/ peanut butter/ egg sandwich [6 slices]	7 - 14years [550 - 650kcal] • or equivalent local adaptation / recommendation (examples in Appendix III)

*To enrich milk add 4 tablespoons (60g) full cream milk powder to 500ml milk/fermented milk [605kcal & 30.7g protein]

See Appendix III for examples of nutritional support to provide additional 20-30% energy for different ages

5. Ensure adequate micronutrient intake

If the child's diet is not balanced then give a daily micronutrient supplement that provides 1 RDA of a wide range of vitamins and other micronutrients. Refer to national guidelines.

If recent diarrhoeal illness, give Zinc supplement (20mg daily for 2 weeks)

6. Vitamin A supplements every 6 months

<6 months	50,000IU	6-12 months	100,000IU	>12 months,	200,000IU
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Do not give if child has received dose within the past month e.g. from hospital

7. De-worm every 6 months (Step 7)
Albendazole (oral) 400mg single dose every 6 months after first year of life

8. Cotrimoxazole prophylaxis (Step 7)
Provide from 6 weeks of age 5mg/kg/day

9. Ensure mother/caregiver understands care plan and ask if she/he has any questions

10. Review 1st visit 1-2wks. If responding, then every 1-2 months depending on response

Table 6.5: Nutrition Care Plan C (WHO - Nutritional care of HIV-infected children, 2006)

<p>1. Assess if the child needs to be admitted Assess if there are signs of a concurrent opportunistic infection or dehydration, Assess if there have been any major changes in the child's circumstances? (Step 6) Assess if the child wants to eat – Conduct a test feed. (Step 4) If the child will not eat then admit and manage as per WHO Management of Severe Malnutrition. If the child eats well then plan home management according to table below. Prescribe feeds.</p> <p>2. Clinically stage the child (Appendix I). Assess for ART, clinical and immunological response to ART including adherence and refer if indicated. All severely malnourished children or those with recent severe weight loss should be assessed for possible ART and to exclude opportunistic infections such as TB</p> <p>3. Check mother's health (+ need for ART) and care of other children</p> <p>4. Meet age-specific needs and additional 50-100% food (energy) based on actual wt</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td colspan="2">Therapeutic feeding</td> </tr> <tr> <td colspan="2">Provide 150-220kcal/kg/day (do not rely on home foods being available)</td> </tr> <tr> <td colspan="2">6 months - 11 months [150-220kcal/kg/day = ~900 - 1300kcal]</td> </tr> <tr> <td colspan="2"> <ul style="list-style-type: none"> • Local adaptation </td> </tr> <tr> <td colspan="2">12 months - 23 months [150-220kcal/kg/day = ~900 - 1300kcal]</td> </tr> <tr> <td colspan="2"> <ul style="list-style-type: none"> • F100 – give volumes CHECK VOLUMES ETC or • RUTF [40g/kg/day] </td> </tr> <tr> <td colspan="2">2 years - 5 years [150-220kcal/kg/day = ~1,700 – 2,300kcal]</td> </tr> <tr> <td colspan="2"> <ul style="list-style-type: none"> • F100 – give volumes CHECK VOLUMES ETC or • RUTF [40g/kg/day] </td> </tr> <tr> <td colspan="2">6 years - 9 years [150-220kcal/kg/day = ~900 - 1300kcal]</td> </tr> <tr> <td colspan="2"> <ul style="list-style-type: none"> • F100 or • RUTF [40g/kg/day] </td> </tr> <tr> <td colspan="2">10 years – 14 years [150-220kcal/kg/day = ~2200 – 3,300kcal]</td> </tr> <tr> <td colspan="2"> <ul style="list-style-type: none"> • F100 or • RUTF [40g/kg/day] </td> </tr> </table> <p><i>See Appendix IV for composition of different Therapeutic feeding interventions.</i></p> <p>5. Ensure adequate micronutrient intake A child receiving F100 or RUTF will receive all the micronutrients that they require through the feeds A child that receives therapeutic feeding based on local foods is unlikely to receive all micronutrients in the required amounts and may therefore need a separate, additional vitamin-mineral supplement that meets defined standards. In addition, many commercial vitamin-mineral supplements do not contain adequate amounts of zinc and separate supplements of zinc may also be needed. If recent diarrhoeal illness, give Zinc supplement (20mg daily for 2-4 weeks)</p> <p>6. Vitamin A supplements every 6 months <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;"><6 months</td> <td style="text-align: center;">50,000IU</td> <td style="text-align: center;">6-12 months</td> <td style="text-align: center;">100,000IU</td> <td style="text-align: center;">>12 months,</td> <td style="text-align: center;">200,000IU</td> </tr> </table> Do not give if child has received dose within the past month e.g. from hospital</p> <p>7. De-worm every 6 months (Step 7) Albendazole (oral) 400mg single dose every 6 months after first year of life</p> <p>8. Cotrimoxazole prophylaxis (Step 7) Provide from 6 weeks of age 5mg/kg/day</p> <p>9. Ensure mother/caregiver understands care plan and ask if she/he has any questions</p> <p>10. If managed at home, then review in 1 week to ensure weight gain of at least 5gm/kg/d. If gaining weight then review every 1-2 weeks until recovery and change to plan A. If not gaining weight then consider admission.</p>	Therapeutic feeding		Provide 150-220kcal/kg/day (do not rely on home foods being available)		6 months - 11 months [150-220kcal/kg/day = ~900 - 1300kcal]		<ul style="list-style-type: none"> • Local adaptation 		12 months - 23 months [150-220kcal/kg/day = ~900 - 1300kcal]		<ul style="list-style-type: none"> • F100 – give volumes CHECK VOLUMES ETC or • RUTF [40g/kg/day] 		2 years - 5 years [150-220kcal/kg/day = ~1,700 – 2,300kcal]		<ul style="list-style-type: none"> • F100 – give volumes CHECK VOLUMES ETC or • RUTF [40g/kg/day] 		6 years - 9 years [150-220kcal/kg/day = ~900 - 1300kcal]		<ul style="list-style-type: none"> • F100 or • RUTF [40g/kg/day] 		10 years – 14 years [150-220kcal/kg/day = ~2200 – 3,300kcal]		<ul style="list-style-type: none"> • F100 or • RUTF [40g/kg/day] 		<6 months	50,000IU	6-12 months	100,000IU	>12 months,	200,000IU
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Deciding If and When to Refer a Child with HIV and AIDS

The following table identifies general recommendations for follow-up of a child with HIV and AIDS. Judgment should always be exercised depending on the social situation and mechanisms of support for each child.

Table 6.6: Recommendations for follow-up of a child with HIV and AIDS

Condition	Review interval	Comment
The child who is well and growing appropriately	2-3 months	Unless needing to attend to receive routine cotrimoxazole/ micronutrient or other support/treatment
The child on antiretroviral treatment (ART)	Three monthly	If gaining weight and no other problems
	2-4 weekly	If failing to gain weight
The child who has chronic increased nutritional needs but investigated and no other active problems	2-3 months	Tell caregiver to return earlier if problems arise.
Child starting on Nutrition Care Plan B	First visit 1-2wks Then 1-2 months	Tell caregiver to return earlier if problems arise
The child who is unwell and/or showing signs of growth faltering or has had recent diarrhoeal illness	2-4 weeks	May require more frequent visits depending on clinical status and support offered or being provided
When the child is malnourished +/- other signs of disease progression e.g. history of recent severe weight loss or recent diarrhoea illness	Weekly	Only if fulfils criteria for management at home and no other investigations immediately required that require hospitalization
When a child is severely malnourished or has very low weight and no explanation/ diagnosis has been identified	Admit for investigation	

The HIV-infected Child with Special Needs

Management of acute malnutrition can be met through supplementary or therapeutic foods detailed in sections two, three, four and five in these guidelines. Ensuring nutritional care is integrated with clinical and medical management of HIV and AIDS, opportunistic infections, chemo-prophylaxis and management of side effects of ART and other medicines will ensure optimal growth and prevention of weight loss in PLHIV. Key areas of intervention include nutritional support when recovering from a period of illness, poor appetite (anorexia), sore mouth/throat, change in taste, diarrhoeal illness and nausea and/or vomiting. Within the job aids for health workers, WHO has detailed interventions on:

- How to add extra energy and protein to everyday foods
- What to try if the child does not feel like eating
- What to try if the child has a sore/dry mouth or throat
- What to try if the child has a change in taste
- What to try if the child has diarrhoea
- What to try if the child has nausea and/or vomiting

A. Eating during and when recovering from an illness – see Suggestion sheet 1¹

It is often difficult to encourage children to eat during a febrile illness or when otherwise unwell e.g. difficulty breathing. During these acute illnesses, HIV-infected children are likely to lose weight. If this weight is not recovered in the weeks after the illness, then the child's

1. Suggestion sheets can be found in the Kenya Guidelines for Integrated Approach to the Nutritional Care of HIV-infected Children (6 months - 14 years), chart booklet for healthcare providers, 2008.

growth curve is likely to drop to a lower level in the long term. Hence it is important to optimize intake during illnesses if possible (in hospital this may require inserting a nasogastric tube) and targeting the recovery period to recover lost weight by ensuring the best care and nutritional intake. In the recovery period it is important to:

- increase the energy and protein using everyday foods,
- ensure that food is available day and night so that if the child is hungry then he/she has something appropriate to eat, and
- encourage the child in simple and loving ways.

Some of the ways to encourage a child to eat include the following:

- Make the child comfortable.
- Be patient and feed slowly.
- Feed small amounts frequently. Children may tire easily while eating, making it difficult to eat sufficient food at a sitting. Offering feeds frequently may be needed to increase food intake.
- Give foods that the child likes.
- Give a variety of foods and extra fluids.
- If the child is thirsty give fluids that have some energy e.g. milk, rather than juices or fizzy drinks that have very little energy value.
- Pay attention to the child and make feeding a happy time.

Sick children need extra drinks and food during illness, for example if they have fever or diarrhoea. A sick child may prefer breastfeeding to eating other foods. Do not withhold food from a sick child unless there is a medical reason.

B. Poor appetite (Anorexia) – see Suggestion sheet 2

Children and adults with HIV infection frequently experience loss of appetite. This may be due to sores in the mouth or because HIV infection itself can cause a loss of appetite.

C. Sore mouth or throat – see Suggestion sheet 3

A sore mouth or throat can make it difficult to eat. Thrush, herpes, infections and other conditions may cause a sore mouth or throat. Some conditions may respond to treatment; refer to a doctor if not sure whether there is such an infection. Mouth hygiene such as rinsing the mouth with clean water before and after meals and cleaning the teeth, is important and can help the child to feel better.

D. Change in taste – see Suggestion sheet 4

A child may find that they have a taste in their mouth or their food tastes different because of side-effects of medication or infections; this may be just temporary. Children may also be more aware of the texture or feel of foods in their mouth. They may even develop cravings for certain foods.

E. Children with diarrhoea – see Suggestion sheet 5

When a child passes a loose or watery stool three or more times a day, he/she has diarrhoea. It can be a side effect of medicines or a symptom of disease. Diarrhoea is often caused by contamination of water or food from poor hygiene and sanitation.

Most diarrhoea will cease after a few days. A child should be seen at the clinic if the diarrhoea lasts for more than three days or if there is a fever or blood in the stool. An infant or young child who is not able to drink or breastfeed or is drinking poorly, becomes sicker and weak, has blood in the stool or develops a fever should be seen by a health worker immediately. A child should be referred to hospital if the diarrhoea lasts more than 14 days and there is loss of weight.

Zinc supplements – any child with diarrhoea (acute, persistent or dysentery) should receive zinc as followed:

< 6 months: 10mg daily for 2 weeks

> 6 months: 20 mg daily for 2 weeks

Vitamin A supplements - children with diarrhoea should also receive an extra dose of vitamin A if they have not received their routine supplement in the previous month. This dose helps protect against serious later relapses of diarrhoea.

F. Nausea and/or vomiting – see Suggestion sheet 6

Nausea can be caused by infection, stress, certain foods, hunger, lack of water, unpleasant smells or a side-effect of some medications or treatments. Nausea may also reduce the appetite.

G. Anaemia

Anaemia is common in HIV-infected children and may be due to chronic opportunistic infections or direct effects on the bone marrow. Even in areas with high prevalence of worm infestation and iron deficiency, anaemia in HIV-infected children cannot be assumed to be due to iron deficiency.

Children with palmar or severe palmar pallor should be referred for investigation. Iron supplements should only be started if iron deficiency is confirmed.

Children on Antiretroviral Treatment

The following provides an overview of planning for assessment and follow-up for a child on anti-retroviral treatment.

If the child is on ART, then ask:

1. Has there been any change in eating patterns or appetite since the last visit?
2. Has the child vomited? If yes, has there been any fast breathing/fever? – see below
3. Since the last visit has the child been taking any other medicines from a doctor/pharmacy/ programmes, or from other sources including traditional medicines?
4. Have you noticed any change in body shape or appearance of the child?

What to do if a child on ART is gaining weight well

Most children will gain weight once started on ART. Remember to:

- Encourage the mother/father or caregiver that the child's health is improving
- Check the health of the mother/father and assess if any of them needs ART
- Check if doses of ART need to be increased with increasing weight
- Review ART adherence and remind mother/father or caregiver of signs of OIs

What to do if a child on ART is not gaining weight

If a child on ART is not gaining weight the healthcare worker should be thinking of:

- Failure to take ART correctly – either non-adherence or vomiting. (Severe wasting with other symptoms such as abdominal pain, vomiting or fast breathing may be a sign of lactic acidosis)
- Early side effects of ART e.g. nausea
- Development of the immune reconstitution syndrome (only to be expected in first 3 months of starting ART)
- Presence of an opportunistic infection e.g. TB
- Late ART related side effects e.g. lactic acidosis or lipodystrophy
- Inadequate food intake
- Other nutritional problem e.g. inadequate food supply or preparation or caregiving
- Possible early sign of treatment failure if the child has been on ART for more than 6 months

If persisting very low weight or visible severe wasting or oedema of both feet then refer urgently.

Depending on available resources the healthcare worker should:

- i. Assess ART adherence.
- ii. If possible, repeat the CD4 to check whether there is immunological deterioration
- iii. Investigate and treat for any opportunistic infection or underlying disease – TB is especially important.
- iv. Assess dietary intake and food security. Make appropriate referral to dietician, welfare or social worker if necessary.
- v. If these resources are not available then refer to an ART referral site for investigation and management. If resources are available then review every 2-4 weeks and monitor growth until cause of poor weight gain is identified and managed.
- vi. If the child continues to lose weight then refer urgently to an ART referral site.

Note: Children who are referred for weight loss should be followed up after discharge from the referral centre, and growth monitoring done on a regular basis (at least monthly, although it may be necessary to bring the child back more frequently or admit for observation in hospital).

What to do if the child has nausea and vomiting when taking antiretroviral drugs

- 1) All children who present with nausea and vomiting should be assessed using IMCI guidelines to assess and classify severity of the vomiting and to look for any danger signs. The presence of danger signs should also alert to possible lactic acidosis. (See below)
- 2) If the child vomits doses for more than 2 days or complains of increased fatigue or difficulty breathing then refer urgently; missed doses may make their ART stop working so well.
- 3) Check if there has been a recent change in treatment.
- 4) If the child does not need urgent referral or other care e.g. rehydration, then manage as if the nausea and vomiting are related to their antiretroviral drug therapy:
 - If the child vomits their ART within 30 minutes of the dose, the dose should be repeated.
 - Nausea and vomiting may be related to the taste of the medicines. The following suggestions may be helpful to control these symptoms:
 - i. Take ART drugs separately from other medications such as cotrimoxazole or TB treatment
 - ii. Do not mix all the ART syrups together.
 - iii. If dissolving capsules (e.g. Stavudine) reduce the amount of fluid used to dissolve.
 - iv. If the child complains of the taste, then instruct mother or caregiver to place the syringe near the back of mouth to give the medicine (to avoid the child tasting the medicine)
 - v. Advise mother or caregiver to keep syrups in fridge to make more palatable (ritonavir cannot be refrigerated)
 - vi. Reassure the mother or caregiver that nausea and vomiting are common side effects of ART especially in the first few weeks. The symptoms usually settle, but if she is concerned or the child does not respond within two days she should return to the clinic.
 - vii. Advise on use of fluids, ORS and prevention of dehydration

Routine monitoring of children on ART for metabolic disorders

Children on ART require regular monitoring of the viral and immune response as well as for possible metabolic and other adverse effects.

Table 6.7: Laboratory parameters for monitoring infants and children at baseline, before and during ART

Diagnosis and monitoring laboratory tests	Baseline (at entry into care)	At initiation of first-line or second-line ARV regimen	Every six months	As required or symptom-directed
HIV diagnostic testing: virological and Ab testing	√	-	-	-
Haemoglobin ^a	√	√	-	√
WBC and differential ^b	√	√	-	√
%CD4 + or absolute CD4 cell count ^c	√	√	√	√
Pregnancy testing in adolescent girls ^d	-	-	-	√
Full chemistry (including, but not restricted to, ALT, ^e liver enzymes, renal function, glucose, lipids, amylase, lipase and serum electrolytes) ^f	-	-	-	√
HIV viral load measurement ^g	-	-	-	√

a Haemoglobin monitoring at weeks 4, 8 and 12 after initiation of ART is recommended by some experts if AZT is used.

b Monitoring at weeks 4, 8 and 12 after initiation of ART is optional.

c Children not yet eligible for ART should be monitored with CD4 every six months. For infants and children who develop new or recurrent WHO stage 2 or 3 events or whose CD4 approach threshold values the frequency of CD4 measurement can be increased. %CD4+ is preferred in children <5 years of age.

d Pregnancy testing may be needed for adolescent girls prior to initiating a regimen containing EFV.

e The predictive value of pre-emptive liver enzyme monitoring is considered very low by some experts. WHO recommends liver enzyme monitoring in a symptom-directed approach. However, regular monitoring during the first three months of treatment and symptom-directed measurement of liver enzymes thereafter has been considered by some experts for children on nevirapine-based regimens, or for adolescent girls with CD4 values over 250 cells/mm³ and for infants and children coinfecting with hepatitis B or hepatitis C virus or other hepatic disease.

f Regular monitoring (every six months) of full chemistry, particularly lipid levels, liver enzymes and renal function, should be considered for infants and children on second-line drugs.

g At present, viral load measurement is not recommended for decision-making on the initiation or regular monitoring of ART in resource-limited settings. Tests for assessment of HIV RNA viral load can also be used to diagnose HIV infection, and to assess discordant clinical and CD4 findings in children suspected of failing ART.

Appendix 6.1: HIV and infant feeding

New evidence and programmatic experience : report of a technical consultation held on behalf of the Inter-agency Task Team (IATT) on Prevention of HIV Infections in Pregnant Women, Mothers and their Infants, Geneva, Switzerland, 25-27 October 2006 (WHO, UNICEF, UNAIDS, UNFPA)

Updated Recommendations on HIV and Infant Feeding

Based on the new evidence and experience, the group agreed on the following recommendations for policy-makers and programme managers. These are intended to supplement, clarify and update existing United Nations guidance and do not replace it. An update of the relevant United Nations guidance incorporating these additional recommendations is available.

- The most appropriate infant feeding option for an HIV-infected mother should continue to depend on her individual circumstances, including her health status and the local situation, but should take greater consideration of the health services available and the counselling and support she is likely to receive.
- Exclusive breastfeeding is recommended for HIV-infected women for the first six months of life unless replacement feeding is acceptable, feasible, affordable, sustainable and safe for them and their infants before that time.
- When replacement feeding is acceptable, feasible, affordable, sustainable and safe, avoidance of all breastfeeding by HIV-infected women is recommended.
- At six months, if replacement feeding is still not acceptable, feasible, affordable, sustainable and safe, continuation of breastfeeding with additional complementary foods is recommended, while the mother and baby continue to be regularly assessed. All breastfeeding should stop once a nutritionally adequate and safe diet without breast milk can be provided.
- Whatever the feeding decision, health services should follow up all HIV exposed infants, and continue to offer infant feeding counselling and support, particularly at key points when feeding decisions may be reconsidered, such as the time of early infant diagnosis and at six months of age.
- Breastfeeding mothers of infants and young children who are known to be HIV-infected should be strongly encouraged to continue breastfeeding.
- Governments and other stakeholders should revitalize breastfeeding protection, promotion and support in the general population. They should also actively support HIV-infected mothers who choose to exclusively
- breastfeed, and take measures to make replacement feeding safer for HIV infected women who choose that option.
- National programmes should provide all HIV-exposed infants and their mothers with a full package of child survival and reproductive health interventions² with effective linkages to HIV prevention, treatment and care services. In addition, health services should make special efforts to support primary prevention for women who test negative in antenatal and delivery settings, with particular attention to the breastfeeding period.
- Governments should ensure that the package of interventions referenced above, as well as the conditions described in current guidance, are available before any distribution of free commercial infant formula is considered.
- Governments and donors should greatly increase their commitment and resources for implementation of the Global Strategy for Infant and Young Child Feeding and the United Nations HIV and Infant Feeding Framework for Priority Action in order to effectively prevent postnatal HIV infections, improve HIV-free survival and achieve relevant UNGASS goals.

2 UPDATED RECOMMENDATIONS ON HIV AND INFANT FEEDING

For the full package of interventions, see: WHO. Antiretroviral drugs for treating pregnant women and preventing HIV infection in infants in resource-limited settings. Geneva, 2006; WHO. The World Health Report: Make every mother and child count. Geneva, 2005.

Appendix 6.2: Micronutrient Requirements for Children

Table 6.8: Micronutrient requirements for children 0 - 6 years

Target micronutrient	0-3 months	4-6 months	7-9 months	10-12 months	1-3 years	4-6 years
Vitamin A ($\mu\text{g RE}$)	375	375	400	400	400	450
Vitamin B1 (mg)	0.2	0.2	0.3	0.3	0.5	0.6
Vitamin B2 (mg)	0.3	0.3	0.4	0.4	0.5	0.6
Vitamin B3 (mg)	2	2	4	4	6	8
Vitamin B6 (mg)	0.1	0.1	0.3	0.3	0.5	0.6
Vitamin B12 (μg)	0.4	0.4	0.5	0.5	0.9	1.2
Vitamin C (mg)	25	25	30	30	30	30
Vitamin D (μg)	5	5	5	5	5	5
Vitamin E (mg)	2.7	2.7	2.7	2.7	5	5
Folic acid (mg)	80	80	80	80	160	200
Vitamin K (μg)	5	5	10	10	15	20
Calcium (mg)	300	300	400	400	500	600
Iodine (μg)	15	15	135	135	75	110
Iron (mg)	a	a	a	10	6	6
Zinc b (mg)	2.8	2.8	4.1	4.1	4.1	5.1
Magnesium (mg)	26	26	53	53	60	7.3
Selenium (μg)	6	6	10	10	17	21

Source: Food and Agricultural Organization of the United Nations and World Health Organization: Human vitamin and mineral requirements. Report of a joint FAO/WHO consultation. Bangkok, Thailand 1998.

NB: Bioavailability is the degree to which a nutrient is absorbed or becomes available at the site of physiological activity after intake.

a Neonatal iron stores are sufficient to meet the iron requirement for the first six months in full term infants. Premature infants and low birth weight infants require additional iron. Based on 15% bioavailability. b Based on high dietary bioavailability

Appendix 6.3: Nutritional Composition of Fortified Supplementary Blended Foods

Table 6.9: Nutritional composition of fortified supplementary blended food

Name of Product		Insta Health Builder - Advantage	Insta Health Builder – First Food	UNIMIX (CSB) 10 % Sugar
Nutrient	Unit	Per 100g	Per 100 g	Per 100g
Energy	Kcal	440	435	400
Protein	%	16	12	14
Fat	%	12	11	6
Carbohydrate	%	60	64	
Fibre	%	4	4	12 %
Vitamin A	IU	1050	920	2300
Vitamin B1	mg	0.29	0.25	0.28
Vitamin B2	mg	0.44	0.38	0.82
Niacin (B3)	mg	3.17	2.75	5.0
Vitamin B5	mg	1.60	1.39	
Vitamin B6	mg	0.17	0.15	0.165
Vitamin B12	mcg	0.52	0.52	1.3
Folate	mcg	136	108	0.2 mg
Vitamin C	mg	28.0	24	60
Vitamin D	IU	90.0	80	200
Vitamin E	mg	3.60	3.15	7.5 iu
Vitamin K	mcg	11.9	7.25	
Ca-d-pantothenate	mg			0.28
Iodine	mcg	20.1	18.2	
Copper	mg	0.32	0.28	0.7
Iron	mg	6.50	5.18	8.0
Zinc	mg	5.50	4.80	12
Phosphorus	mg	322	240	
Magnesium	mg	146	112	
Calcium	mg	155	128	260
Manganese	mg	0.84	0.67	
Potassium	mg	561	400	
Selenium	mcg	6.45	4.45	
Sodium	mg	200	160	650
Chloride	mg	180	155	

Appendix 6.4: WHO Clinical Staging of HIV and AIDS for Children (2006)

Table 6.10: WHO clinical staging of HIV and AIDS for children with confirmed HIV infection

Clinical Stage 1
Asymptomatic
Persistent generalized lymphadenopathy
Clinical Stage 2
Unexplained persistent hepatosplenomegaly
Papular pruritic eruptions
Extensive wart virus infection
Extensive molluscum contagiosum
Fungal nail infections
Recurrent oral ulcerations
Unexplained persistent parotid enlargement
Lineal gingival erythema
Herpes zoster
Recurrent or chronic upper respiratory tract infections (otitis media, otorrhoea, sinusitis or tonsillitis)
Clinical Stage 3
Unexplained a moderate malnutrition not adequately responding to standard therapy
Unexplained ^a persistent diarrhoea (14 days or more)
Unexplained persistent fever (above 37.5°C intermittent or constant, for longer than one month)
Persistent oral candidiasis (after first 6-8 weeks of life)
Oral hairy leukoplakia
Acute necrotizing ulcerative gingivitis or periodontitis
Lymph node tuberculosis
Pulmonary tuberculosis
Severe recurrent bacterial pneumonia
Symptomatic lymphoid interstitial pneumonitis
Chronic HIV-associated lung disease including bronchiectasis
Unexplained anaemia (<8.g/dl), neutropaenia (<0.5 x 10 ⁹ per liter) and/or chronic thrombocytopenia (<50 x 10 ⁹ per liter)
Clinical Stage 4^b
Unexplained severe wasting, stunting or severe malnutrition not responding to standard therapy
Pneumocystis pneumonia
Recurrent severe bacterial infections (such as empyema, pyomyositis, bone or joint infection or meningitis but excluding pneumonia)
Chronic herpes simplex infection (orolabial or cutaneous of more than one month's duration or visceral at any site)
Extrapulmonary tuberculosis
Kaposi sarcoma
Oesophageal candidiasis (or candidiasis of trachea, bronchi or lungs)
Central nervous system toxoplasmosis (after one month of life)
HIV encephalopathy

Cytomegalovirus infection: retinitis or cytomegalovirus infection affecting another organ, with onset at age older than one month
Extrapulmonary cryptococcosis (including meningitis)
Disseminated endemic mycosis (extrapulmonary histoplasmosis, coccidiomycosis)
Chronic cryptosporidiosis
Chronic isosporiasis
Disseminated non-tuberculous mycobacterial infection
Cerebral or B-cell non-Hodgkin lymphoma
Progressive multifocal leukoencephalopathy
Symptomatic HIV-associated nephropathy or HIV-associated cardiomyopathy

a - Unexplained refers to where the condition is not explained by other causes.

b - Some additional specific conditions can also be included in regional classifications (such as reactivation of American trypanosomiasis [meningoencephalitis and/or myocarditis] in the WHO Region of the Americas, penicilliosis in Asia and HIV-associated rectovaginal fistula in Africa).

Section Seven:

Emergency Nutrition Response

Overview

An important component of any response to a humanitarian crisis in Kenya are the health and nutrition activities geared toward a resident population, an internally displaced population, and/or a refugee population. In Kenya, the humanitarian health and nutrition actors include the Government of Kenya (GoK), the ministries of the Office of the President; the Ministry of Health; the Ministry of Agriculture and Livestock; and the Ministry of Education. UN agencies (WHO, WFP, UNICEF, UNHCR, OCHA) work with the Red Cross, Non-Governmental Organizations (NGOs), Community Based Organizations (CBOs), religious groups and co-operations. (See Appendix 7.1 for the roles of stakeholders).

Often NGOs play a major role in nutrition response during emergency situations. Even so, all emergency nutrition response activities are conducted under the umbrella of the Health and Nutrition Sector Working Group chaired by the MoH. Under the health and nutrition sector working group, the Nutrition Technical Forum (NTF) coordinates all the nutrition activities. The MoH works through its health and nutrition programmes implemented in all of Kenya's districts. All implementing partners and support agencies are required to channel their plans and/or implementing strategies to the MoH for guidance and approval. The Arid Lands Resource Management programme (ALRMP) under the Office of the President coordinates all emergency preparedness and response activities to ensure that gaps are identified and response is timely.

Steps for Emergency Response

Coordination

Coordination of all the emergency activities is the key to success of any response. All emergency nutrition response and preparedness must be linked to the NTF and the Health and Nutrition Sector Working Group, which is the technical arm of the Kenya Food Security Sector Working Group (KFSSG) in health and nutrition matters (see "Coordination Structure" Appendix 7.1). The mandate of the Health and Nutrition Sector Working Group is to coordinate local and international assistance to Kenya to assure that the health and nutritional needs of vulnerable populations in emergencies are addressed in a timely and appropriate manner. In particular, the NTF assesses, identifies and priorities nutritional issues of relevance to Kenya in order to provide a planned and coordinated strategy to address these issues. This forum was established to improve the efficiency of nutrition interventions in emergency as well as non-emergency settings.

The Health and Nutrition Sector Working Group and NTF address:

- **Preparedness** by promoting readiness and the ability to cope and respond to emergencies at all levels.
- **Prevention** of emergency situations to the extent possible.
- **Mitigation** by minimizing the effects of the emergency.
- **Response and relief** by meeting the needs of people affected by the emergency situation in a coordinated, efficient and timely manner.

How does it work?

The Working Group is chaired by the MOH and co-chaired by UNICEF Country Office.

- At national level, the groups meet regularly in a forum to exchange information, discuss subjects such as updates on emergency interventions, health and nutrition needs, and identification of gaps that may require support.
- At the district level, the Sector Working Group is the technical arm of the District Steering Group (DSG) that reports to the KFSSG. The District Medical Officer (DMO) chairs the meeting while the District Nutrition Officer (DNO) co-chairs. These meetings are held once a month. The Sector Working Group discusses specific health and nutrition issues at the district level, including food ration distributions, integrated nutritional assessments, response strategies, and pockets of interventions.

Detailed information regarding the Sector Working Group can be downloaded from website www.kenyafoodsecurity.org

Identifying main nutrition and health problems

For any emergency, an initial assessment is conducted to understand the situation and to be able to analyze the extent of threat to life, dignity, health, and livelihoods. All the assessments should be coordinated through the Health and Nutrition sector group. To gather nutrition information, standardized assessment reports are disseminated to relevant stakeholders. The assessment will determine the nature of the response required, and whether an external response is necessary.

For the assessment to yield robust results, the following factors must be considered:

- Use a detailed, comprehensive and context-specific checklist and/or a questionnaire. The tools are available in the Health and Nutrition sector working group.
- Conduct the assessment as soon as feasible after the disaster occurs; write up and disseminate the report quickly.
- An assessment team must be multi-disciplinary, comprised of relevant technical specialists. Each individual of the team must have clear terms of reference.
- The community must be actively involved in the assessment process including developing tools, training, and data collection. Their local knowledge of the area is important.
- Clear objectives must be set so that process of collecting information is clear and well understood by the user.
- Sources of information should be varied for validity and reliability; therefore both secondary and primary data must be reviewed.

If possible, conduct a multi-sectoral assessment to understand the different factors affecting malnutrition: the immediate, underlying and basic causes of malnutrition. This will ensure a holistic approach to the treatment of acute malnutrition.

- Where existing nutrition interventions are in place, it is best to conduct a rapid programme review.
- Data collected must be presented in a logical manner and disaggregate by age, gender, occupation, livelihood and vulnerability. This will help to plan an appropriate response and effective actions to address malnutrition.

Setting up response programmes and targeting

Planning a programme

An emergency response programme is required when the relevant authorities are unable or unwilling to respond to the identified needs of the population; or when the assessment and analysis proves that the population's general nutritional needs are unmet.

Emergency programmes should have the following characteristics:

- Programmes are designed to support and strengthen existing systems (e.g. Health infrastructures, coordination mechanisms)
- Programmes are designed to protect lives of people and to promote livelihood.
- Programmes are most effective when they are well coordinated, with a good flow of information between stakeholders (making gaps known).
- Programmes must maximize positive impact and do no harm (i.e. competition for scarce resources/increased resources, misuse or misappropriation of supplies).
- Programmes ensure that humanitarian services are provided equitably and impartially.

It is important that the implementing partner works with local authorities, in particular the MoH and the district administrators. The implementing partner must be familiar with programme requirements.

Community participation in the initial assessment and the programme plan and design will lead to the emergency response programme's success. Establish a committee of community/beneficiary representatives to secure the community's full participation. In districts where a Village Health Committee (VHC) exists, the committee can be used as a venue to the community. If there is no formal committee, meet with a contact representative of the community (a village elder or chief). The committee or contact person can meet and discuss with the responsible officers food distribution and other issues (immunization schedules, programme adjustments/changes, official visits).

The targeting criteria outlined below must be based on thorough, astute analysis of the community's vulnerability. Critical needs will arise when a targeting system fails to reach all of the vulnerable people. The criteria must be known to the VHC, contact person, affected population and implementing partners.

Selecting programme sites

Whenever existing infrastructures have reached their maximum capacity or do not ensure adequate coverage, additional programme sites would be considered to provide adequate services and ensure good coverage. The affected area or emergency area in a district must be mapped in consultation with the district health and nutrition coordination group. The affected area can be defined by administrative boundaries such as district lines or a division, or by livelihood zones such as agro-pastoralists, pastoralists and fisher folks. A programme site can then be identified. The size of the programme will depend on the capacity of implementing partner and resources available. The site must easily be accessible to the vulnerable population. Once the area is identified, nutrition service delivery sites are established. The following is taken into consideration while selecting a feeding centre:

- A feeding centre is ideally located within walking distance of the target population, especially for small children, pregnant and lactating mothers. It is also ideally close to a health facility.
- In a large displacement camp a number of small centres is best. Small centres are easier to manage and more pleasant for children, mothers and other malnourished patients. The centres should also provide a good working environment for staff.
- For wet feeding intervention, the feeding site is located in a clean and secure environment, near adequate safe drinking water.
- The feeding centre or distribution site must have an organized layout; be fenced and protected; have formal entry and exits, marked well; have adequate space to prevent over-crowding; and provide a shelter (temporary or permanent) that is safe.

Nutrition Programme Beneficiary Selection Process for Children

The selection criterion for children has two phases:

1. **Initial screening** is conducted in the community. MUAC is measured for children between 6-59 months. Children with a MUAC measurement <13.5cm are referred to a health centre or feeding centre for further measurements of weight and height. Presence of oedema is an indicator of severe acute malnutrition and a child with oedema is referred to an existing in-patient or a out-patient therapeutic care programme, see details in Sections Two and Section four.
2. **Second screening** is conducted in the health centre or feeding centre by taking the weight and height measurement of children already screened by MUAC. The weight-for-height indicator is a more accurate estimate of body wasting, and is usually the preferred index for nutritional status in emergencies.

Implementing Emergency Nutrition Interventions

In an emergency setting, emergency nutrition interventions are programmes set-up to 1) manage acute malnutrition, 2) provide other critical nutrition services (i.e. growth monitoring, micronutrient supplementation, protection of infant and young child feeding practices) and, 3) provide food to a population that does not have access to food. In essence, the emergency nutrition intervention works to reduce high rates of acute malnutrition of large, vulnerable populations.

There are three types of nutritional interventions: general feeding programme, supplementary feeding programme, and therapeutic feeding programme. The supplementary feeding programme (SFP) is an ideal nutrition intervention for management of moderately acute malnourished patients whereas the therapeutic feeding programmes (TFP) is ideal for management of severely acute malnourished patients. Emergency nutrition interventions require substantial resources to set-up and monitor, and NGOs often support the MoH with implementation. An effective nutrition intervention is one that is comprehensive and provides a holistic approach in managing acute malnutrition. The intervention should identify a vulnerable population, distribute food, offer basic medical treatment, micronutrient supplementation and if possible nutrition education.

General Feeding Programme

This programme provides a food ration to households highly affected by food insecurity. Organization and coordination is the key to success of a food distribution operation. If the population is entirely depending on general food rations as a source of food, then the rations must provide at least 2100kcal per person per day. General food rations are usually provided as dry rations for people to cook in their homes. The local community's food habits, tastes and preferences must be taken into consideration when distributing general food rations. World Food Programme (WFP) has set standards for distributing general food to the affected population¹.

Supplementary Feeding Programme

The goal of a supplementary feeding programme (SFP) is to rehabilitate individuals affected by Moderate Acute Malnutrition or at risk of becoming malnourished by providing a supplementary food ration which is highly nutritious. There are two types of SFP: targeted and blanket.

Targeted Supplementary Feeding Programme

This programme is set up when:

- There are large numbers of mild and moderately acute malnourished individuals.
- A large number of children are likely to become mildly or moderately acute malnourished due to aggravating factors like serious food insecurity or high levels of disease.
- There are children discharged from an existing therapeutic feeding programme.
- A high prevalence of people with HIV and AIDS.
- A high prevalence of micronutrient deficiencies.
- There is short-term hunger among preschoolers.

1. WFP (2000) Food and Nutrition Handbook

Blanket Supplementary Feeding Programme

The main aim of a blanket SFP is to prevent widespread acute malnutrition and to reduce excess mortality among those at-risk by providing a food/micronutrient supplement for all members of the vulnerable group (e.g. children under five, people with HIV and AIDS, elderly and the chronically ill).

Blanket SFPs may be set up under one or a combination of the following circumstances:

- At the onset of an emergency when general food distribution systems are not adequately in place.
- Problems in delivering/distributing the general ration.
- When large numbers of mild and moderately acute malnourished individuals are likely to become severe due to aggravating factors.
- Anticipated increase in rates of acute malnutrition due to seasonally induced epidemics.
- In case of micronutrient deficiency outbreaks, to provide micronutrient-rich food to the target population.

Supplementary Feeding Programme: On-site Feeding and Take-home Feeding

There are two ways to distribute food commodities during emergencies: on-site feeding (or wet ration) and take-home (or dry ration). The ideal dry ration supplementary food provides 1000 to 1200Kcal; 35g to 45g of protein; and fat supplies 30% of required energy. On-site feeding supplementary food provides 500 to 700Kcal per beneficiary per day; includes 15g to 25g of protein; and fat supplies 30% of required energy.

Table 7.1 Take-home (or dry ration) versus on-site feeding (or wet ration)

Take-home or dry ration	On-site feeding or wet ration
<p>This is the preferred option: a regular (weekly or bi-weekly) distribution of food in dry form that is prepared at home. Generally, the take-home or dry ration option should be considered first as it requires fewer resources and less hardship on the patients. There is no evidence that on-site SFPs are more effective.</p> <p>Other advantages of dry ration are:</p> <ul style="list-style-type: none"> • Serves more patients. • There is less risk of cross-infection as malnourished and sick children do not sit in close proximity while feeding. • It takes less time to establish (on-site feeding programmes require setting-up and equipping centres). • Is less time consuming for mothers who attend every week or fortnight instead of daily. As a result, the take-home option leads to better coverage and lower default rates. • Keeps the feeding responsibility in the family. • Dispersed populations do not have to travel long distances to attend daily. • The dry-ration option prevents displacement in famine situations. 	<p>A daily distribution of cooked food/meals at a health facility or feeding centre is one method of supplementary feeding. It is only considered for extreme situations as it is time consuming and also undermines the family's ability to take responsibility. It may also create population movements into centres, which is not recommended. When it is conducted, the number of meals provided varies, but usually two to three meals are provided each day.</p> <p>An on-site feeding may be justified when:</p> <ul style="list-style-type: none"> • Food supply in the household is extremely limited, increasing the risk that a moderately malnourished patient's take-home ration is distributed to all family members (some sharing is to be expected). • Firewood, water, and cooking utensils are in serious short supply making it almost impossible to prepare meals in the household. • The security situation is extremely serious and beneficiaries are at-risk of being looted when returning home carrying weekly supplies of food.

Therapeutic Feeding Programme

The therapeutic feeding programme deals with the management of severe acute malnourished patients. In these guidelines, the management of severely acute malnourished patients has two components, in-patient and outpatient therapeutic care. Detailed information is provided in Section Two, three and four.

Requirements for Emergency Nutrition Intervention

Personnel

Several different staff positions are required to implement an emergency nutrition programme, including managers and technical staff (doctors, nurses, nutritionists and health assistants). The local aid worker must have the relevant technical qualifications, be fluent with the local language and culture of the beneficiaries, and be familiar with the area's geography. Some of the staff must be trained prior to commencing an emergency nutrition intervention and have experience with the different roles, responsibilities and procedures.

The following staff are needed on site:

- Overall programme manager.
- A supervisor may be required to oversee an implementation site.
- Community field workers: to conduct food distributions to affected population. Personnel hired to support food distribution, cooking and other support tasks are recruited from among the beneficiaries on a clearly defined cash- or food-for-work basis.
- Registry clerks and assistants (number hired will depend on the size of the operation).
- Store-keepers and food supervisors trained in food safety.
- Guards for guarding food stocks (security may be provided by the government).
- Community health workers (CHWs).
- Community volunteers.
- Village Health Committee members.

Supervision and Management

Quality, experienced supervision ensures effective programme implementation:

- Managers are accountable for decisions, ensuring adequate security and compliance to the codes of conduct.
- Each member of the staff must have a written job description with clear reporting lines and a periodic performance assessment.
- Staff must be provided with necessary training, resources, and logistical support in order to fulfill their responsibilities.
- Staff must clearly understand the programme objectives and activities required and receive subsequent feedback on their performance.
- Staff must be oriented on health and safety issues.

Office Space

An emergency nutrition response team requires an office with basic equipment: office furniture (table and chairs); stationary; where possible a computer, photocopying machine and paper; registry books; relevant documentation (national guidelines, population sizes, a map of the area or camp with the livelihood zones, sectors and facilities); a chart or a blackboard indicating the number of inhabitants in each sector; a clear and complete list of all personnel, equipment, transport; and stock record book. The office should have a sheltered porch for waiting visitors, and is always be locked after working hours. Security personnel can be provided to safe guard the equipment and emergency supplies.

Supply Chain Management

Ration planning

Rations for general food distribution are planned according to the standard initial planning requirements for energy, protein, fat and micronutrients for each individual or for the affected community. The materials required for planning rations include spreadsheets and instructions for calculating the nutritional content of a ration compared to the average bodily requirement. The nutrition manger may also require a spreadsheet for calculating the tonnage of different commodities required for the feeding centre. (See Appendix 7.4).

When determining the amounts of rations, make adjustments to suit the local situation. For example, if the standard requirement is 2100kcal/person/day and an assessment shows that the local population acquires 40% of kcal from local or personal resources, the ration should be allocated to provide 2100kcal - 850kcal = 1250kcal/person/day.

Similar calculation are considered for protein and fat. The total amount of food required is based on the ratio combination. In this case, the ration combination in Table 7.2 is best suited for the programme beneficiaries.

Note: Food rations should be acceptable by the population and cost effective.

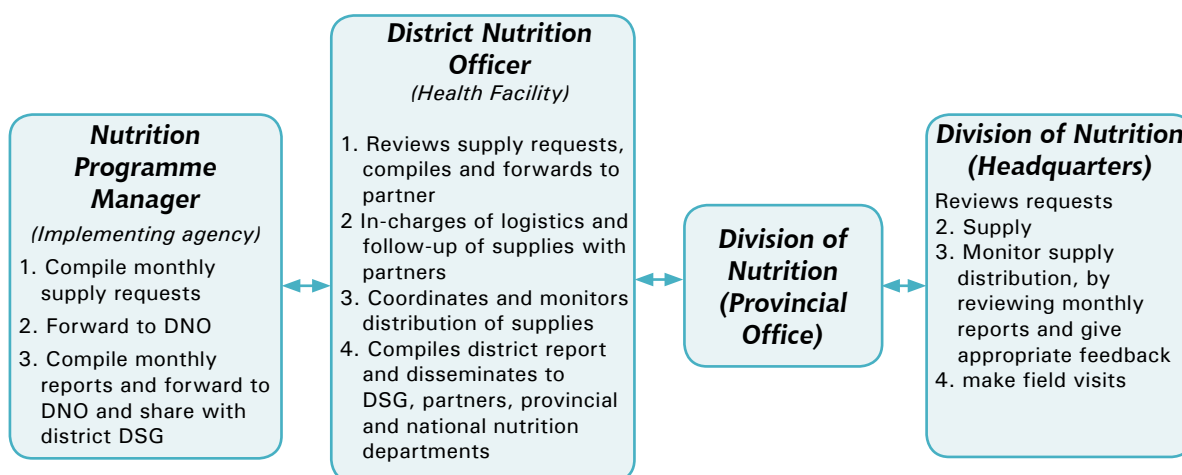
Table 7.2: Nutritive value of food commodities

Commodity	Nutrition value			Amount (g)
	Energy (kcal)	protein (g)	fat (g)	
Blended food (CSB)	950	22.5	15	250
Oil	220	-	25	25
Sugar	80	-	-	20
Energy (Kcal)				1250
Protein (% of energy)				14.5

Sourcing and Procurement

In any emergency response, an assessment must be conducted to determine the local food supply, its availability and reliability. It also must include the implications that an emergency programme will have on local production and market systems before sourcing from outside. The programme manager must try to tap into an existing supply system. This will save on time and resources. Emergency supplies for selective feeding interventions are channeled through MOH and health facilities. See Appendix 7.4 for guidelines to calculate supplies for feeding centres. The figure below outlines the MOH supply system.

Figure 7.1: Flow chart outlining Kenya MoH supply system



Transportation²

Problems with transportation of foodstuff, which is bulky, is often the cause of bottle-necks and delays in relief operations. Considerations include the following:

- Transporting the full dry ration (36,000 kg) for one week for 10,000 people requires 12 three-tonne trucks.
- A jeep or a minibus can carry about 500kg of food, plus a small team of personnel for food distribution and surveillance; 500kg represents the daily general ration for 1,000 people (200 families) or the supplementary ration for 5,500 children.
- Transportation is also needed for supervisory personnel on a full-time basis.
- In bad weather conditions, at least one out of every ten vehicles will be immobilized at any given time for maintenance or repair.
- Delays due to bad weather, poor roads, and vehicle breakdown are common.

Storage³

Bulky cereals (grain or flour) occupy the most space yet have a short shelf life. Careful storage and handling can minimize waste. The following rules should be followed:

- The store should have a good roof and be dry, well ventilated, and as cool as possible. Using modern buildings, where possible with concrete floor and walls, as warehouses minimizes the problem of rodents, insects, etc.
- Products are kept at least 40cm away from the walls and 10cm off the floor. Bags must lie on pallets, boards, heavy branches, bricks, or a layer of clean dry polyethylene bags or tarpaulins – not directly on the floor.
- Damaged bags must be kept apart from the undamaged (possibly in a separate area); a reserve of good empty bags should be kept so that goods from damaged bags can be repacked.
- Bags should be stacked two by two (i.e. two bags in one direction, then two more on top at 90° to the first two) to allow ventilation. They will also be stable and easier to count.
- Stacks should be no higher than two meters (2m). This makes handling easier and reduces the risk of stacks falling.
- Each product is stored separately and has its own stock card.
- Access to the warehouse is limited to a few authorized individuals. The store must have a lock that the storekeeper keeps and is responsible for.
- The balance on the stock cards should be checked periodically by counting the actual number of items in the store.
- Stocks should be rotated on the basis of first-in, first-out. New deliveries are not to be stacked on top or in front of old stock. Old stocks should be issued before new supplies.
- Labourers are trained and supervised. This will reduce damage from careless handling.

Calculating storage space

There must be space allocated for ventilation and aisles for access: about 80% of a warehouse floor space is for storage. In bags, 1 tonne (2205lbs or 1000kg) of cereals or processed food occupies approximately two cubic meters (2m³). Thus one tonne of grain stacked two meters high occupies 1 m² of floor space.

Example: For 30 000 people using 400g of grain/person/day for 60 days:

$$30\ 000 \times 400 \times 60 = 720\ 000\ 000\text{g} = 720\ \text{tonnes}$$

- The volume of this grain is 1440 m³.
- Stacked two meters high requires a surface of area of 720m² + 20% access and ventilation = 864m².
- A building 43 m x 20 m would provide 860 m².
- A building 50 m x 18 m would provide 900 m².

2. WHO 2000. The Management of Nutrition in Major Emergencies

3. WHO 2000, The Management of Nutrition in Major Emergencies

Monitoring and Evaluation

In order to determine the actual performance of the nutrition relief programme, it is recommended that a nutritional assessment is conducted at the end of the programme period to determine the extent that nutritional problem has been reduced. A nutritional assessment is generally the best way to determine the impact of the relief programme. However, care should be taken while interpreting the results of nutritional assessment as programme performance can be influenced by many other factors. The following set of indicators are collected and used as a guide to determine the effectiveness of the programme:

- **Recovery rate:** the number of children successfully discharged in the previous month as a proportion of the number of children registered at the beginning of that month.
- **Attendance rate:** the number of children who attend the programme as a proportion of the number of children enrolled in programme.
- **Default rate:** the proportion of children who drop out of the SFP each month (i.e. did not attend for two consecutive sessions).
- **Mortality rate:** the number of children who died after admission to the SFP.
- **Coverage rate:** the number of children enrolled in the SFP as a proportion of the estimated number of the target group.
- **Mean length of stay:** the mean amount of time it takes a child to attain the discharge weight.

See Appendix 7.5 for indicators of a successful nutrition programme.

Linking Nutrition Programmes with Other Interventions

Emergency nutrition interventions are more effective when a population is entirely dependent on outside intervention for all basic needs and relief programmes are already in place. The most effective and efficient care first ensures that potable water and general food needs are met while rapidly establishing disease control measures such as measles vaccination and adequate sanitation. Providing shelter and essential non-food items (water containers, blankets and possible fuel sources for cooking) is the next priority. To ensure a smooth operation and correct priorities, the various implementing agencies must coordinate their work.

The emergency nutrition programme must be connected with the existing community health services from the onset of the emergency. This will facilitate referral from the feeding centre to the health services whenever a malnourished patient has medical complications. Also, it may be more efficient to manage beneficiaries through the existing health structure if the vulnerable population is small enough. For instance, in the absence of a relief nutrition intervention, individual attention should always be given to malnourished children through other community health services. See Section eight for detailed information on out-patient nutrition care strategy.

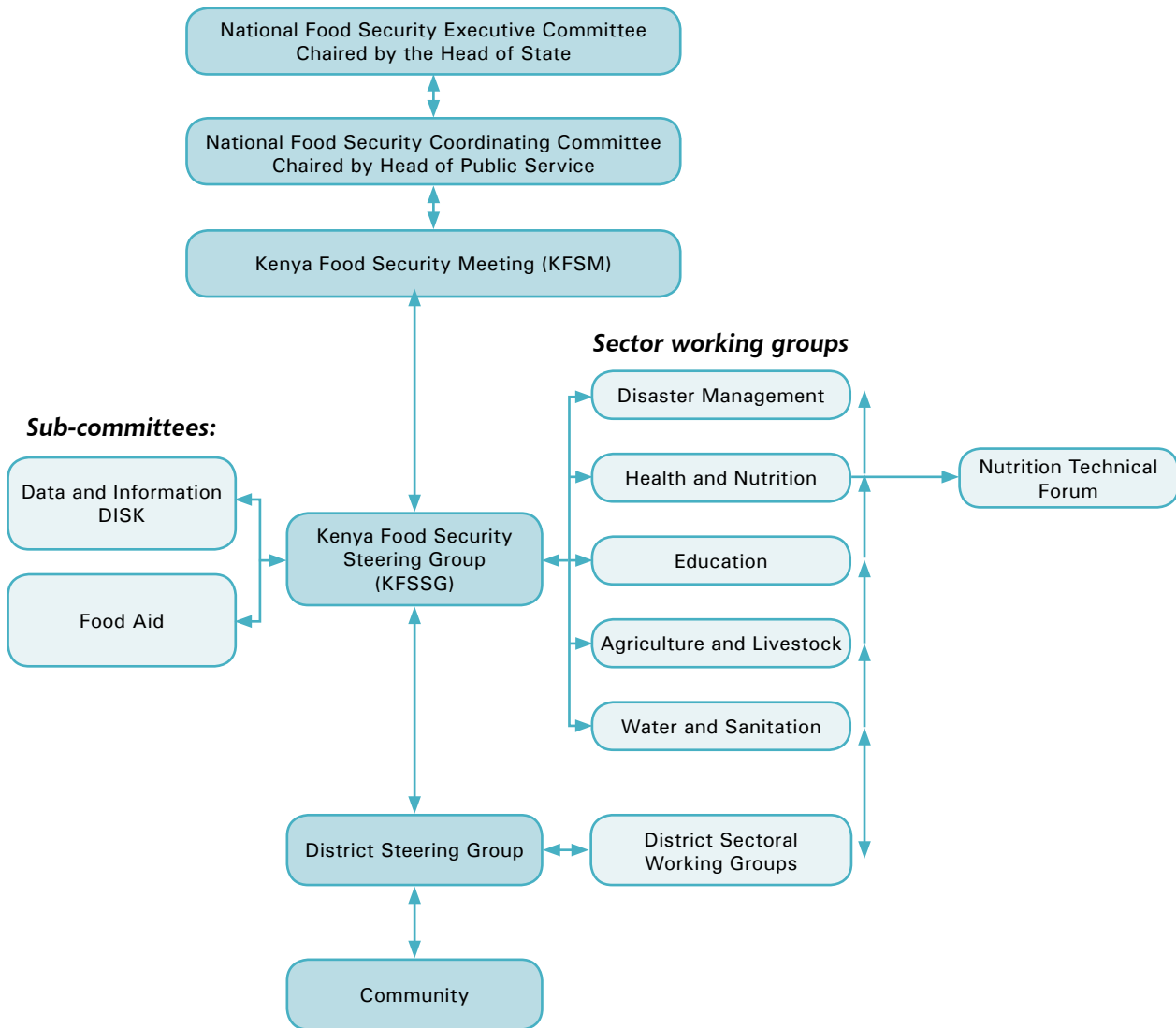
Appendix 7.1: Stakeholders' Roles in Emergency Response

Table 7.3: Stakeholders' roles in emergency response

Agency	Role
Ministry of Health	<ul style="list-style-type: none"> • Technical support to implementing partner such as NGOs and CBOs • Technical support in conducting nutritional and health assessments. To ensure that critical health and nutrition needs are addressed • Technical support in nutrition and health education • Provide staff, materials/equipment, food and drugs • Monitor and evaluate emergency nutrition programmes • Provide information for decision making and policy formulation • Advocate for interventions in affected areas • Coordinate health and nutrition interventions
ALRMP	<ul style="list-style-type: none"> • Coordinate emergency preparedness and response activities in arid and semi arid areas • Identify key response areas • Avail information for decision making
UN-agencies	Support GOK coordination and response to emergencies through <ol style="list-style-type: none"> 1. Technical and financial support to government departments and implementing partners for emergency preparedness and response
NGOs/CBOs	Support GOK in responding to emergencies through; <ol style="list-style-type: none"> 2. Provision of technical and logistical support to existing infrastructures 3. Set-up and implementing emergency interventions programmes 4. Conduct health and nutrition assessment and share information 5. Support coordination structures, at national and sub-national levels
Other Government Departments	Provide other humanitarian services such as: <ul style="list-style-type: none"> • Provide water and sanitation • Shelter and clothing • Education for school children

Appendix 7.2: Coordination Structure

Figure 7.2: Coordination Structure



Appendix 7.3: Determining Number of Beneficiaries

Determining number of beneficiaries for admission in a targeted SFP

Based on the findings of a nutritional assessment, the population of a targeted SFP can be estimated as follows:

Population of vulnerable group x moderate acute malnutrition rates = total number of malnourished group

Example: In order to determine the number of moderately malnourished children 6-59 months who can be admitted in a targeted SFP programme in district X, the targeted population can be estimated as:

- Total population of district X = 200,000
- Population aged 6-59 months (20% of total population) = 40,000
- Prevalence of moderate acute malnutrition (z-scores) = 10%

Estimated number of moderately malnourished children is $40,000 \times 10\% = 4,000$

If the programme plans to attain 80% coverage, then the estimated number of beneficiaries to be registered in the programme will be; $4,000 \times 80\% = 3,200$

Determining number of beneficiaries for admission in a blanket SFP

- All children younger than five years old are used as a cut-off point. Population size of children under five years can be estimated as 20% of the total population in the target area.
- All pregnant women from the time of confirmed pregnancy, and lactating mothers until maximum six months after delivery. Population size can be estimated as 6% of total population in the target area.
- All adults showing signs of acute malnutrition.
- All the elderly and the chronically sick.

The population figures can be obtained from the district statistic office, district medical officer and district arid lands resource management project offices.

Appendix 7.4: Supply Procurement

How to calculate food and drugs for procurement

While calculating the actual amount of food and drugs required, it should be noted that:

1. Additional estimates need to be made for carers and added in the total request.
2. The list should not be used as a reference document for drugs.
3. Each month, the number of children should be adjusted accordingly.
4. The total amount of food required is calculated as follows:
Quantity per person per day x No. of beneficiaries to be covered x expected duration in days = Total supplies
5. Care should be taken that the total supplies are presented in metric tones.
6. The tables below give examples of therapeutic and supplementary feeding calculation.

These spread sheets work best in an excel programme, but in the absence of a computer software, a calculator will be handy. The final request sheet should be a summary of each food item.

Table 7.4: Supplementary feeding estimates: commodity requirement

Food Commodity	kcal/100g	Quantity (g)/ person/ day	Number of Children Covered	Expected Duration of Stay (days)	Total kcal /person/ day	Total Quantity Procured (MT)
Unimix	400	230	500	60	920	6.9
Oil	900	28	500	60	252	0.8
Sugar	400	28	500	60	112	0.8

Table 7.5: In-patient centres: formula requirement

Commodity	Kg/litre Formula	Number of Children Admitted in Programme	Days/Child on Formula	Sub-total Quantity Required (MT)
F75	0.205	100	5	0.13
F100	0.228	100	25.00	1.14

Table 7.6: In-patient centres: starter formula - high energy milk (using DSM, oil and sugar)

Commodity	Kg/litre formula	Number of Children Admitted in Programme	Days/child on Starter Formula	Sub-total Quantity Required (kg)
DSM	0.025	200	5	25.00
Sugar	0.100	200	5	100.00
Oil	0.027	200	5	27.00
CMV	0.003	200	5	3.30

Table 7.7: In-patient centre: catch up formula - High energy milk

Commodity	Kg/litre formula	Number of Children Admitted in Programme	Days/child on Catch-up Formula	Sub-total Quantity Required (kg)
DSM	0.080	200	25	800.00
Sugar	0.050	200	25	500.00
Oil	0.060	200	25	600.00
CMV	0.003	200	25	33.00

Table 7.8: In-patient centre: semi-solid feeds

Commodity	Kg/litre formula	Number of Children Admitted in Programme	Days/Child on Solid Meal	Sub-total Quantity Required (kg)
Sugar	0.020	200	20	0.08
Oil	0.030	200	20	0.12
UNIMIX	0.100	200	20	0.40

Table 7.9: RTUF requirements, estimated for a 10kg child

Commodity	Quantity per day	One Month
Plumpy'nut Per 10kg child	3 sachets (1 sachet = 92g)	90 sachets carton = 150 sachets
BP - 100 per 10kg child	7 bars	210 bars. 1 carton = 216 bars

Table 7.10: Estimates for common drugs used in supplementary feeding centres

Please note that this list of drugs is not exhaustive and may vary depending on the nature of complication.

Drug	Unit Size	Units pd pc (10kg child)	Days of Treatment	Estimated Proportion of Children	No. of Children Treated	Total Units Procured
ORS	sachet per 1000ml	1.00	3	0.30	500	450
Mebendazole	100mg tab	2.00	3	1.00	500	3000
Vitamin A	200,000 IU	1.00	1	0.80	500	400
Vitamin A	100,000 IU	1.00	1	0.20	500	100
Benzyl benzoate	25% 1 litre bottle	0.01	2	0.50	500	5
Tetracycline eye ointment	1% 5g tube	0.20	5	0.30	500	150
Paracetamol	100mg tab	8	2	0.25	500	2000
Measles vaccine	plus equipment	1.00	1.00	1.00	500	500

* malaria treatments should be according to national protocols

** syrups require a source of clean bottles for dispensing to out patients

MOH STOCK POSITION: WAREHOUSE

Table 7.11: Stock balance sheets (sample)

MOH		STOCK POSITION: WAREHOUSE								
Reporting period:										
OPENING STOCK			IN			OUT				
Description	Unit	Bal.	Quantity received	Date of receipt	WR location	Quantity released	Release order #	Date out	Destination	Bal.

Stock balance sheet (sample)

District:		Name of health facility or implementing partner:						
Reporting Month:		Total Number of beneficiaries :						
Type of Selective Feeding Programme	Commodity Type	Opening Stock	Receipts	Distributed	Losses	Closing Stock (Kg)	Closing Stock (in MT)	

Appendix 7.5: Performance Indicators for Nutrition Interventions

Table 7.12: Performance indicators for nutrition interventions

Key indicator	Target levels
Coverage rate	>50% in rural, >70% in urban and >90% in camp situation
Distribution of SFP centres	More than 90% of target population is within <1 days return walk (including time for treatment) of distribution centre for dry ration and not more than 1 hour for wet feeding
Mortality rate	<3% of individuals in programme have died
Recovery rate	>75% of those admitted have recovered and successfully been discharged from programme
Defaulter rate	< 15 defaulted in the programme
Mean weight gain	5 and 10gm per kg of their body weight per day.

Section Eight: Community Mobilization

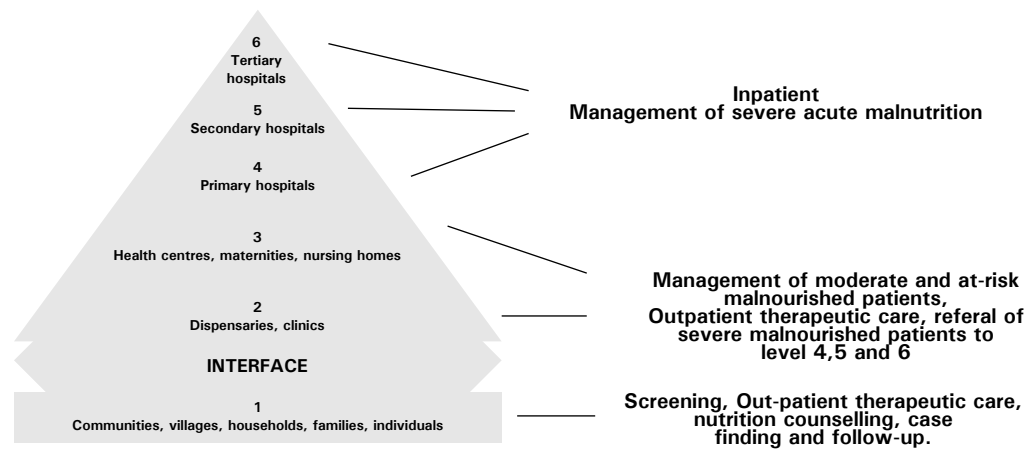
Overview

Community Nutrition Care refers to the nutritional support and care for out-patient severely malnourished patients, moderately malnourished patients and those at-risk. Nutrition support is managed by the patient's household members, community members and Community Health Workers (CHWs). Household members are in general actively involved in preventive and promotive health care. They also often manage the clinical care of the critically and chronically ill. It is therefore essential to work with households, to give household members a chance to influence how care is delivered and to regain the people's confidence in a given health system. To ensure nutrition care at community level, it is important to focus on enhancing household capacity and to have discussions that enable household members make informed decisions both for health and for nutritional needs.

MOH is at the forefront of the effort to ensure that the community is actively involved in preventive and promotive health care, clearly stipulated in the National Health Sector Strategic Plan (NHSSP II) 2005-2010. The NHSSP II has the mandate to scale up community-based interventions and link with the referral systems. One objective of NHSSP II is to involve communities in addressing downward spiral of determining health status. Since NHSSP II applies a broader approach in service delivery, the Kenya Essential Package of Health (KEPH) was initiated to represent the integration of all health programmes into a single package that focuses its intervention towards improving health at different phases of human cycle such as age groups and levels of care (see Figure 8.1)¹. Essential packages that specifically target the communities are referred to as Community-Based Kenya Essential Package for Health (CB-KEPH)

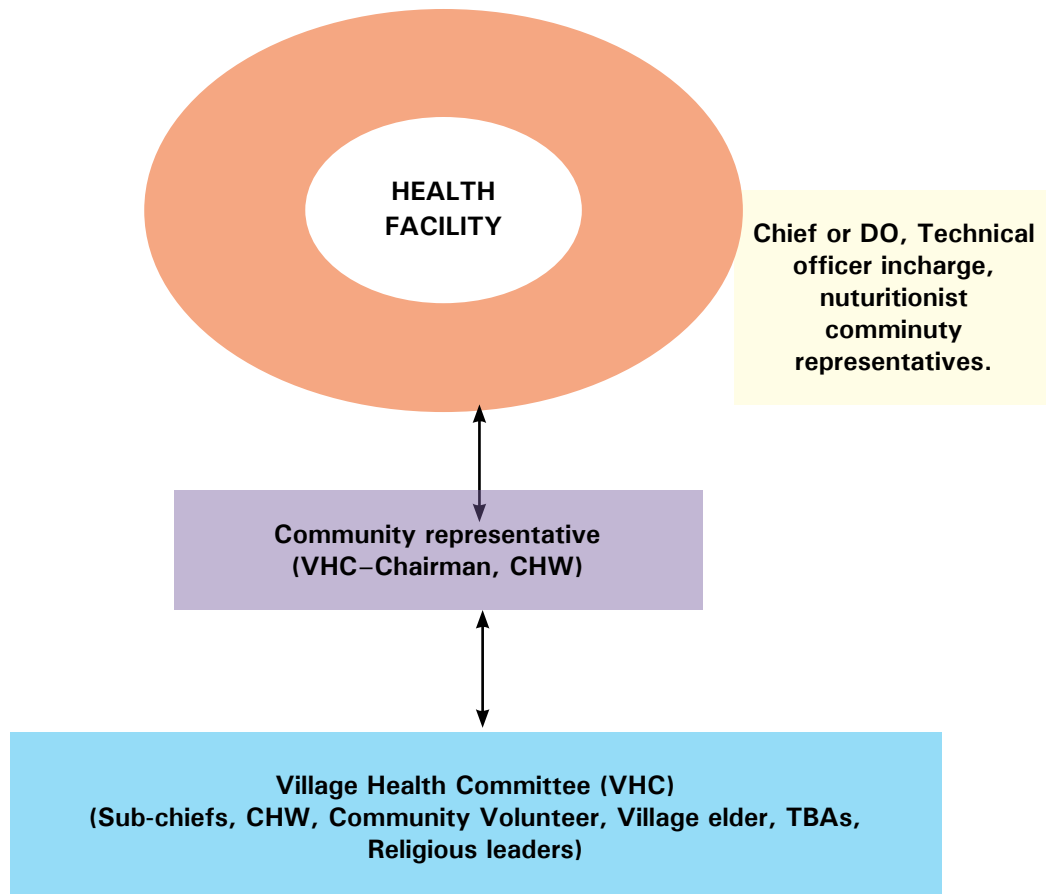
1. National Health Sector Strategic Plan (NHSSP II) 2005-2010 policy paper

Figure 8.1: Levels of care in the Kenya Essential Package of Health (KEPH)



The foundation of service delivery is the community level (Figure 8.1, level one). The community defines its own priorities, and services are provided based on the priorities which creates ownership and commitment. A Village Health Committee (VHC) is a community structure essential to the process. Households and individuals participate in the VHC and contribute to their own health and that of their village. Figure 8.2 shows the community representation at the health facility and how they link. Community representatives relay health- and nutrition-related issues affecting the community to the health facility management committee. Information from the health facility is then channelled back to the community.

Figure 8.2: Community representation and linkage at the health facility



Community Mobilization

“Community mobilization”² is a term used to cover a range of activities that, in this case, help nutrition programme implementers (i.e. nutritionists, managers and health workers) build a relationship with the community and foster people in the community to use the nutrition programme. In turn, community mobilization helps health workers better understand the affected communities they’re working in. It is central to the success of the management of malnutrition.

In essence, the goals of community mobilization are to:

- Provide a link for the community and the existing health facilities
- Create awareness on the treatment of malnutrition
- Provide early detection for and treatment of malnourished individuals
- Promote community participation

There are two phases and five essential steps in conducting community mobilization. See Figure 8.3 for an overview of the community mobilization process. The planning phase involves the assessment of community capacity to determine gaps and levels of participation. The implementation phase is the actual community participation; the implementation of the nutritional support and care programme; and sensitizing the community members on the importance of nutrition.

Figure 8.3: Processes of community mobilization



Step 1: Assess community capacity

To assess the community’s capacity, first identify the community representatives and community groups and organizations that will help to: inform communities about nutrition and malnutrition; identify and screen malnourished individuals; and conduct treatment and case follow-up.

Establish the formal and informal channels of communication in the area. The **informal** (e.g. market places, women gathering at water points, ceremonies such as weddings, funerals, etc.) and **formal** (e.g. posters, megaphones, community meetings such as the local chief’s **baraza**) are good venues for health workers to share information and to open up dialogue with the community members.

Table 8.1: Key community representatives

Groups	Key representatives
Administrative Leaders	Councillors, chiefs, sub-chiefs and village elders
Community workers from the MoH and other government departments	Village health volunteers, Community Health Workers (CHW), community vaccinators, agricultural extension workers and social workers
Religious leaders	Priests, pastors, sheikhs/Imam and traditionalists
Traditional health practitioners	Traditional Birth Attendants (TBAs), traditional healers/herbalists
Community groups and organisations	Women groups, relief committees, youth groups, adult literacy schools (<i>Subaru</i>) and school teachers/children

2. Valid International 2006, Community-based Therapeutic Care (CTC), A Field Manual. Oxford, UK

Step 2: Community sensitization

Community sensitization is a way to reach out to people in the community and teach the causes, signs and symptoms of malnutrition, and teach how to seek treatment opportunities. Community sensitization is summarized in three steps:

1. Plan messages that are simple and explicit in local terms on the following:

- What is malnutrition? What are the signs of malnutrition?
- Available treatment services and methods used for treatment.
- Access points for the treatment services.
- Those who benefit from the treatment of malnutrition.

2. Make a sensitization plan

Decide who to inform, and how to best get the information out. Always share and discuss the information messages with a few community figures first to make sure the messages are culturally appropriate and inoffensive.

3. Disseminate the messages

- Sensitize the community representatives, groups and organizations through the most effective communication channels identified.
- Use pictures of malnourished children to strengthen the messages. Pictures for Marasmic and Kwashiorkor will assist communicating the messages better.

Step 3: Case finding

CHWs and community volunteers will screen and identify malnourished individuals based on MUAC measurement and the presence of nutritional oedema. Screening takes two different forms:

Mass screening

CHWs at the health facility or in the village screen vulnerable groups in the population (i.e. children under five years, pregnant and lactating mothers, the chronically ill and the elderly). Often, the sick and vulnerable may not attend the mass event and remain in the house. It is important to find out during the screening if people know of thin or sick individuals in their locality (use pictures or posters and local terms to ensure understanding).

Active Case Finding

CHWs screen at the households and the health facility, actively seeking out sick and malnourished individuals. Consultation with community groups (see Table 7.1) will help identify the vulnerable households and narrow and expedite the search.

Table 8.2: Referral criteria for malnourished persons and the relevant actions

MUAC	CATEGORY	ACTION
<11.5cm for children <18cm for adults	Severe malnutrition	Refer urgently to health facility for immediate assistance.
11.5 to <12.4cm for children 18 to 21cm for adults <21cms for P/L women	Moderate malnutrition	Refer to health facility where services for management at risk and moderate malnutrition are available.

Step 4: Follow-up

CHWs conduct home visits on a regular basis. Home visits focus on households where children or adults:

- Are not recovering
- Have deteriorating medical conditions
- Are not responding to the treatment, should be admitted for inpatient care
- Are not presenting for follow-up visits at the health facility
- Need constant monitoring of new practices taught during nutrition counselling sessions

It's sometimes easier during a home visit to gently inquire the reasons why a patient has defaulted or is showing poor response. It's also an opportunity to encourage a patient to return to treatment or to provide support to the caregivers to ensure recovery.

Home visits are done with a standard checklist (see Appendix 8.1) which will ensure that key areas of follow-up are covered.

Step 5: On-going sensitization

Community sensitization is an on-going process. Community members, by attending meetings, can regularly voice their views and suggest alternative courses for action. The Community Own Resource Persons (CORPS) and other community workers maintain regular contact with the community to identify problems and work together to provide timely solutions. A regular means of maintaining contact with the community should be established as soon as the programme becomes operational. During design stage, information collected on appropriate channels, individuals and forums in which to conduct this dialogue can be useful to the process.

Appendix 8.1: Home Visit Checklist

The following are issues to focus on during a home visit.

Feeding

- Is the Premix/RUTF eaten only by the sick child?
- Is food other than Premix/RUTF given to the sick child? If yes, what food?
- Is Premix/RUTF finished before other food is given?
- How is the child given the Premix/RUTF? (eg. mixed with other food, with water)
- How much Premix/RUTF does the child eat each day?
- How many times per day is the sick child given food/RUTF to eat?
- Does anyone encourage/help the sick child to eat?
- What does the parent/caregiver do if the sick child does not want to eat?
- Observe child eating one meal of Premix/RUTF.

Caring

- Does the parent/caregiver feel that their child is improving? If not, why not?
- Have they visited the traditional healer to help this child?
- Who cares for the sick child during the day?
- Is the sick child clean?
- Is anyone in the household sick or has anyone recently died? How does this affect the caring of the child?
- Any other household circumstances that affect the caring of the child?

Health

- What is the household's main source of water?
- Do they use soap in the household?
- Does the parent or caregiver and the sick child wash hands and face before feeding?
- Is Premix/RUTF, other food and water covered and free from flies?
- Does the parent or caregiver know what causes diarrhoea?
- What action does the parent or caregiver take when the sick child suffers from diarrhoea? (include any action involving foods, medicines, fluids)
- If any medicines have been prescribed, are they being given correctly?
- If there is a particular medical problem that has been identified by the out-patient care team, how is the child progressing? Is there a need for an extra clinic visit?
- Observation of diarrhoea or vomiting.

Food Security

- What is the most important source of food for the household?
- What is the most important source of income for the household?
- Is the family currently receiving General Ration? and for how many people?

Section Nine: Nutrition Information, Education and Communication

Overview

Information, education and communication about nutrition are the means to help people maximize their use of food and health resources and adapt to a changing environment. Section Nine is a framework for Community Health Workers (CHWs) to use to deliver nutrition-related information in a consistent way that will reduce cases of malnutrition.

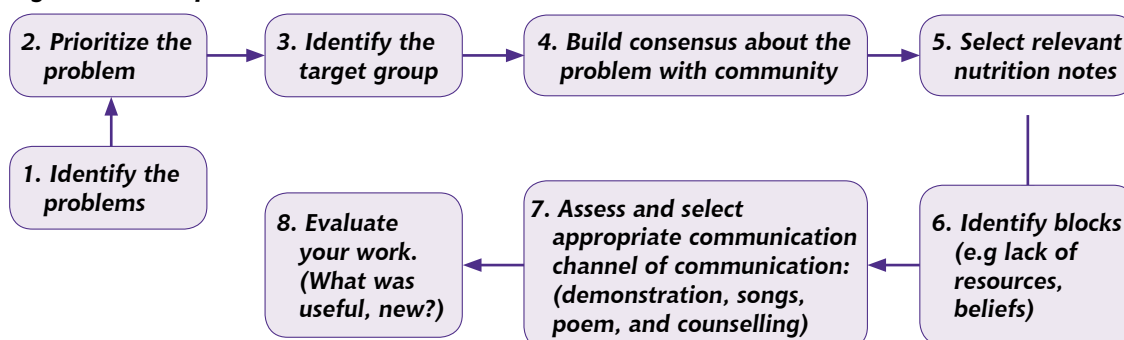
For success in this endeavor, the community must be involved and understand the causes of malnutrition in their situation so they are more open to change negative food-related behaviour.

Behaviour change depends on many factors. A successful nutrition education endeavour will:

- Consider the motivation of the people being reached.
- Recognize that people have strong and established beliefs about their food and will not assume that a community is a “blank slate” on which new ideas are written.
- Be based on a participatory assessment and analysis of the nutrition problem, and a carefully thought-out plan of action.
- Rely on observed behavioural practices, not on anecdotal evidence.
- Target a specific group and communicate a clear message.

Approach to Nutrition Education

Figure 9.1: Steps to conduct a nutrition education session



Health promotion and health education activities rely on a variety of well-designed and effective information, education and communication (IEC) materials. IEC materials, including training materials, are provided at clinics to community-based workers and supervisors. IEC materials are most useful to health workers when there is proper training and follow-up on how to use them. Every brochure, poster, videotape or other piece of IEC material is supported by research, to deal with a specific health concern, and to be well-received and persuasive among a specific audience.

Channels of Communication

There are two main methods to communicate nutritional messages: face-to-face and with mass media. In many successful approaches, a combination of methods is applied. Harnessing skills of different personnel and special training of local personnel may be necessary. The knowledge and skills of local personnel or influential community members involved in nutrition IEC will be a major factor in determining the method and success of the interventions

Face-to-face/Interpersonal Communication

Interpersonal communication, counselling and discussion about nutrition and health related issues is useful to reach individuals who have specific nutrition-related problems (e.g. parents with malnourished children) and also for reaching sub-groups. Such communication is enriched by the use of printed materials (wall charts, flip charts, brochures and posters) and practical demonstrations.

Mass Media Communication

Mass media communication can be successful for public information campaigns. It uses all types of media (for example radio and print) to address a single problem or behaviour, and to communicate a single message clearly and in a positive way. Messages can be relayed through popular media such as storytelling, participatory theatre, puppet theatre, song and dance. These forms combine entertainment with education.

Guidelines on Key Nutrition Information

Many packages and guidelines have been developed to assist in IEC. The following are recommended:

The “Essential Nutrition Actions Package” developed by the MoH and UNICEF covers the following:

1. Optimal breastfeeding;
2. Optimal complementary feeding;
3. Feeding sick and/or malnourished children;
4. Maternal nutrition;
5. Control of anaemia; and
6. Control of iodine deficiency.

Other packages cover subjects such as vitamin A supplementation, growth monitoring, immunization, hygiene and sanitation and de-worming.

For each of the above essential nutrition actions, there are either guidelines, policies or protocols that are used for nutrition counselling at different points of contact with individuals or groups.

Other resources on nutrition counselling and education are available at the Ministry of Health, Department of Child Health, Division of Nutrition;

- Integrated Management of Childhood Illness (IMCI) National Guidelines
- Health Worker Guidelines on Infant Young Child Feeding
- Policy on Infant Young Child Feeding
- Health worker guidelines on the code for marketing of breast milk substitutes

- Summary of Kenyan code for marketing of Breast Milk substitute
- FAQ on breastfeeding/Maternal nutrition
- Guidelines on implementation on Baby Friendly Hospital initiative (BFHI)
- Kenyan National Guidelines on Nutrition and HIV and AIDS
- Kenyan National Curriculum on Nutrition and HIV and AIDS
- Nutrition counselling cards for nutritional care for support for PLWHA
- MOH Community strategy to deliver KEPH at level one

See Appendix 9.1 for a summary of key messages and action points.

Nutrition Subjects and Message Content

Infant and Young Child Feeding

Information covers appropriate feeding practices for infants less than six months; adequate dietary intake during introduction of complementary feeding at six months; the prevention and care of infections; and reasons to be attentive to the care of a child.

Optimal Breastfeeding

The best and safest method to feed infants for the first six months of life is exclusive breastfeeding. Exclusive breastfeeding means giving an infant no other food or drink, not even water, apart from breast milk (including expressed breast milk), with the exception of drops or syrups consisting of vitamins, mineral supplements or medicines. During pregnancy expectant mothers are to be counselled on infant feeding options, irrespective of HIV status. There are national job aids, counselling cards and IEC tools to support counselling on infant feeding and HIV.

Message content

Step 1: Counsel all expectant mothers on:

- Information on benefits of breastfeeding
- Prevention and management of breastfeeding problems
- Appropriate complementary feeding
- Good maternal nutrition and self-care
- Child spacing
- Prompt treatment of infections
- Reduction of risk of HIV infections
- Information on counselling and HIV testing
- Reinforcing risk reduction to couples

Step 2: Provide counselling and encourage testing for mothers in areas where HIV prevalence is high:

- Reinforce reduction of the risk of HIV transmission (national counselling cards and IEC materials available for infant feeding and HIV).
- Reinforce risk reduction to couples

Optimal Complementary Feeding

After six months, breast milk and other forms of milk alone are not adequate to meet the infant's nutritional requirements. Complementary foods are introduced after six months with continued breastfeeding or replacement feeding until a nutritionally adequate diet can be sustained without breast milk. Abrupt cessation of breast feeding is discouraged to avoid undue traumatic effects on both the mother and the infant. Milk continues as an important component of the diet, providing up to half or more of the nutritional requirements for children between 6-12 months old, and up to one third of the requirements for children aged 12-24 months.

Message content

- When to start complementary feeding
- What food to give and when
- How to prepare complementary foods hygienically
- Food variation to ensure nutrition adequacy

Immunization and De-worming**Immunization**

Vaccines are available for certain major infectious childhood diseases including measles, poliomyelitis, tuberculosis, diphtheria, tetanus, whooping cough (pertussis), mumps and rubella. Education on immunization is essential to avoid outbreaks of these diseases that could be fatal or cause complications such as blindness, partial paralysis and stunting.

Message content

- Importance of immunization
- Barriers to immunization
- Overcoming barriers to immunization
- Access to immunization services (lobbying for improved access)
- Making immunization safe (i.e. check expiry date, use disposable needles, sterilize syringes, use of trained personnel)

De-worming

Intestinal parasitic infections are a major cause of anaemia among children, pregnant and lactating mothers. In communities where these parasites are endemic, education on treatment and prevention measures is useful.

Message content

- Types of helminthes
- Causes and consequences
- Symptoms and signs
- Care, prevention and treatment

Growth Monitoring and Promotion

Growth monitoring is to periodically measure the weight and height of a child to assure adequate growth. Growth monitoring is also useful for targeting resources, in that resources are allocated to improve health and nutritional status of identified malnourished patients; increase participation of patients; mobilize communities; and track progress in reducing malnutrition. Growth promotion is motivates caregivers, families, communities and health workers to practice behaviour that supports adequate growth (height and weight gain) in young children.

Message content**Growth monitoring**

- Monitoring weight beginning from birth
- Involvement of caretakers in monitoring
- Adequate weigh gain rather than nutritional status as an indicator of action
- Use of growth chart to record child's growth process
- Interpretation of information in a child's growth chart
- Analysis of the causes of inadequate growth leading to feasible options for action
- Guidelines on how to monitor growth.

Growth promotion

- Adequate pre-conception and prenatal nutrition for mothers
- Exclusive breastfeeding for the first six months
- Appropriate complementary feeding with continued breastfeeding for 24 months
- Adequate nutritional care during illness and severe malnutrition
- Adequate micronutrient intake

Protein and Energy Malnutrition (PEM)

Protein-Energy Malnutrition is a general terminology that refers to deficiencies of protein and energy in the body. Two types of PEM are kwashiorkor and marasmus. PEM is a major health problem that affects children between six months and five years. It is a cause, directly or indirectly, of death. Health workers and community members require information on management of PEM to be able to counsel caregivers adequately.

Message content

- Basic understanding of the forms of PEM
- Causes and consequences
- Symptoms and signs
- Care prevention and treatment
- Alternative supplementary food for the malnourished individuals

Hygiene and Sanitation

Poor hygiene and a unsanitary environment contribute to malnutrition. Information on hygiene and sanitation helps a community and health workers decide on the best and most appropriate interventions for their community health problems.

Message content

General health

- Factors that influence health with focus on environment, awareness of health issues, personal hygiene and health care
- Identifying health problems and establishing priorities through assessing community perceptions about health and
- Identifying causes of health problems and possible solutions

Food handling and storage

- Food safety during preparation and cooking
- Food storage
- Care for kitchen utensils and cooking surfaces
- Proper child feeding practices and care

Water

- Water sources
- Household water treatment
- Safe handling of water
- Monitoring of water quality
- Managing community water resources

Message content

- Disposal of waste
- Problems caused by poor drainage
- Methods of improving drainage
- Solid waste management and chemical safety
- Personal, domestic and community hygiene
- assessing hygiene practices

Micronutrient Deficiencies

Micronutrient deficiencies cause permanent or long-lasting disability, and often increase risk of morbidity and mortality.

- Basic understanding of the major nutrients: Vitamin A, Iron, Iodine, Zinc, Folic Acid and Vitamin C.
- Micronutrient deficiency disorders:
 - Types
 - Causes
 - Clinical manifestation
 - Care, prevention and treatment

Nutrition Counselling

Nutrition counselling is integral to the management of acute malnutrition. It is essential at discharge for acutely malnourished individuals who are managed at home by family members or those discharged from facility-based programmes. Caregivers must know the proper feeding practices at home to avoid patient relapse or deterioration in nutrition status. Alongside counselling, follow-ups by the health workers are conducted to ensure that the malnourished individuals are adequately cared for.

CHWs may not be able to follow-up each child, however, owing to limited staff capacity and distance. This, therefore, calls for thorough understanding by the family members on the need for proper care and nutritional support of malnourished or discharged individuals. Table 8.1 is a summary on proper feeding of malnourished individuals, focusing on children less than five years old and pregnant and lactating mothers.

Table 9.1: General guidance on counselling

Who does the nutrition counselling?	Nutritionists, nurses, clinicians, Community Health Workers (CHWs) and extension workers
When to do the nutrition counselling	During management, discharge, and follow-up of malnourished individuals
Who are the clients?	<ul style="list-style-type: none"> • Parent or caregiver of child • Community groups • Pregnant and lactating mothers • Adults who are malnourished or chronically ill
Materials and methods	<ul style="list-style-type: none"> • Depending on the topic, use national MoH guidelines such as the IMCI, guidelines on IYCF, Nutrition and HIV and AIDS • Draw examples from local events and materials • Use simple language that is easily understood • Use pictures and posters to explain symptoms

Monitoring and Evaluation of Nutrition Education Programmes

Monitoring a nutrition education programme is essential to determine its progress towards achieving the set objectives. Qualitative data can be collected continually to determine its appropriateness, effectiveness and the coverage of nutrition education programmes. At the onset of the programme the implementers should develop a monitoring and evaluation plan. The plan should be well understood by information collectors and be specific to the programme. Examples of monitoring indicators are:

- Number of trainings conducted
- Number of programme supervisors and managers trained
- Number of community groups/individuals trained
- Number of peer educators trained
- Number of active peer educators
- Number of “trainers of trainers” trained
- Number of BCC materials developed

It is also important that the monitoring and evaluation plan schedules the evaluation, and sets out the methodology, resources and the type of indicators. Often an evaluation will address two main question: Are the results those that were intended? And, are they of value?

The following indicators are considered.

- The impact of the programme in terms of behavioural change. For example, the increase in the number of mothers exclusively breastfeeding
- The efficient use of resources and management of programme
- Cost effectiveness of the programme
- Programme coverage (e.g. number of specific groups a message reaches of those targeted)

All information obtained is shared with all stakeholders to improve practices, scale-up interventions, revise guidelines and inform policy.

Appendix 9.1: Nutrition Messages

Topic	Key messages/ action points
Optimal breastfeeding	<ul style="list-style-type: none"> • Timely initiation of breastfeeding (within one hour of delivery) and giving of colostrum. • Importance of continuing to breastfeed for at least two years. • Importance of ensuring proper hygiene in food preparation and feeding. • Give appropriate information to mothers to support exclusive and continued breastfeeding. • Children 0-6 months should be exclusively breastfed: No feeds (including water) other than breast milk only • Breastfeeding should be on demand (as long as the infant wants). • Encourage breastfeeding during illness. If child is not able to breast feed, encourage expression of breast milk and feed by cup.
Optimal complementary feeding	<ul style="list-style-type: none"> • Encourage continued breastfeeding beyond 6 months together with appropriate complementary feeding. • Explain body building, energy giving, and protective foods. Body building foods responsible for building and repairing our body (e.g. Meat, beans, milk eggs). • Explain energy giving foods provide energy to our body to enable us to carry out daily activities like, working, thinking, running, playing etc (sorghum, maize, oil,). • Explain protective foods enable the body to protect against infection and fight diseases (e.g. Green vegetables, Mangoes, Carrots). • Encourage increased fluid intake, including breastfeeding, day and night for children with diarrhea or vomiting. • Discourage withholding of feeds during illness and instead encourage intake of small frequent enriched feeds daily or give an extra meal above child ' s usual daily feeds. • Encourage mothers to bring all their children below 5 years old to the nearest health facility for growth monitoring monthly as well as for vitamin A supplementation every 6 months. • Feeding of the sick and or malnourished children • If the child is still breastfeeding, encouraged mother to continue. • The child at this stage requires: 1. High energy intake (150 -200 kcal/kg body weight) 2. Sufficient protein 4-5g/kg body weight/day 3. Micronutrients especially potassium, iron, zinc and vitamins • The feeds must be easy to eat and digest. • To achieve high energy intakes: 1. feed the child frequently, at least six times a day 2. Add oil, honey, margarine, butter, sugar 3. Use fat rich foods like groundnuts, avocado, undiluted buffalo milk, sheep's milk. • To achieve high protein intakes: Use milk, or locally available stable mixed with legumes, meat or fish

Maternal nutrition	<ul style="list-style-type: none"> • Take the weight (in kg) of all pregnant women and record it on the maternal clinic card. • Counsel mothers on appropriate diet for pregnant women using locally available foods. • Encourage consumption of a balanced diet rich in vitamins and minerals. • Emphasize on use of iodised salt. • Encourage mother to ensure that all children aged five years and below and pregnant women sleep under insecticide treated mosquito nets, for preventing anemia because malaria is often a major underlying factor. • Counsel mothers on diet during lactation emphasizing importance of extra food while lactating using list of locally affordable foods.
Vitamin A supplementation	<p>Children</p> <ul style="list-style-type: none"> • All children aged 6 to 59 months need a vitamin A capsule every 6 months. • Vitamin A supplementation is safe for children and protects them from diseases such as diarrhea, acute respiratory infections and also reduces deaths. • Children should be fed as often as possible with vitamin A rich foods (mangoes, green leafy vegetables, wild red and orange fruits, egg York, liver, milk, etc.) • Children sick with measles, certain eye problems, severe diarrhoea or severe malnutrition should visit health centres because they may need additional Vitamin A according to the treatment schedule. <p>Mothers</p> <ul style="list-style-type: none"> • Give mothers a dose of 200,000 IU of vitamin A if baby is 8 weeks old or less. • Ensure that the capsule is swallowed on site. • Encourage the mother to consume a balanced diet using locally available foods and a variety of foods rich in vitamin A such as liver, eggs, oranges, yellow sweet potatoes, pumpkins, dark green leafy vegetables. • Record in register mother who have received high dose vitamin A supplementation. Also indicate in Child Card that mother has been supplemented with vitamin A.

Iron and folate	<p>Children</p> <ul style="list-style-type: none"> • Give one dose at 6 mg/kg of iron daily for 14 days. • Avoid iron in a child known to suffer from sickle cell anemia • Avoid folate until 2 weeks after child has completed the dose of sulfa based drugs <p>Mothers</p> <ul style="list-style-type: none"> • Give all pregnant women a standard dose of 200mg iron (Feso4) tablets three times a day + 5 mg folate once daily. • Promote use of anti-malarial interventions such as bednets for preventing anaemia because malaria is often a major underlying factor. • Provide advice on food items and medicines that should not be taken together with iron supplements since they may inhibit absorption such as milk, antacids, tea, coffee. • Treat anemia with treatment doses of iron for 3 months. • Refer severe cases of anaemia to the nearest higher level of care if they are in the last month of pregnancy, have signs of respiratory distress or cardiac abnormalities such as oedema. • Provide advice on a balanced diet and emphasize on consumption of iron rich foods such as liver, red meats, eggs, fish, whole-grain bread, legumes and iron fortified foods. • Promote consumption of vitamin C rich foods such as oranges, green vegetables, as they enhance the absorption of iron.
Hygiene and sanitation	<ul style="list-style-type: none"> • Store uncooked food in a safe dry place • Protect food from insects, rodents and other animals • Avoid contact between raw food stuffs and cooked food • Keep areas where children are fed or play free from human and animal faeces • Keep all food preparation premises clean • Wash hands before preparing food for feeding children • Wash cooking utensils Wash fruits and vegetables • Use clean water Cook food thoroughly • Avoid storing cooked food, instead, prepare food often If cooked food is saved, keep it as cool as possible If previously food is to be eaten reheat it thoroughly before eating • Wash the child ' s hands before feeding • Use open feeding cups • Feed actively, that is supervise the child and continue offering food until the child has enough
De-worming	<ul style="list-style-type: none"> • Give 500mg mebendazole or 400mg albendazole as a single dose in clinic if the child is 2 years of age or older and if the child has not had any in the previous 6 months
Growth monitoring	<ul style="list-style-type: none"> • Children aged 0-2 years need to be weighed every month. • Children 0-59 months need to be weighed often enough to determine if they are growing adequately. • When children come for weighing , also check for their immunization and vitamin A supplementation status • Children whose growths are faltering are at high risk and should be monitored closely by health facility staff.



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