



National Guidelines for the Management of **Severely Malnourished Children** in Bangladesh



On admission



After 3 days

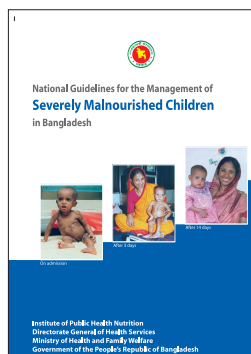


After 14 days

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

May 2008

Cover Photo Courtesy:
Nutrition Rehabilitation Unit, ICDDR,B



National Guidelines for the Management of **Severely Malnourished Children** in Bangladesh

May 2008

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Adviser
Ministry of Health and Family Welfare and
Ministry of Food & Disaster Management
Government of the People's Republic of Bangladesh

Foreword



Malnutrition is one of the most common causes of morbidity and mortality of children in Bangladesh. Despite steady progress in related indicators, severe malnutrition among under-five children remains a challenge. Surveys revealed that about 1-3 % under-five children are suffering from acute severe malnutrition in Bangladesh, who are facing recurrent illness including life threatening infections.

These children must receive effective treatment at health facilities that help achieve MDG-4 pertaining to the reduction of child mortality & morbidity. A 'National Guidelines for the Management of Severely Malnourished Children in Bangladesh' would provide uniform approach to manage the cases at the health facilities.

I congratulate the Institute of Public Health Nutrition for taking this important initiative to adopt the national guidelines. I acknowledge the valuable contributions by experts and health professionals from public and private sectors, development partners and research institutes. I hope that all stakeholders will come forward to utilize this guideline.

Shawkat

Dr. A M M Shawkat Ali



Message




One of the most important goals of the Health, Nutrition and Population Sector Programme is to improve the nutritional status of children as malnutrition remains one of the most common causes of morbidity and mortality among children in Bangladesh.

Severe malnutrition in children under 5 years of age is the end result of chronic nutritional deprivation. Successful management of severely malnourished children can remarkably reduce the under-five mortality contributing to achievement of MDG Goal 4.

The 'National Guidelines for the Management of Severely Malnourished Children in Bangladesh' will provide practical guidance for the treatment of severely malnourished children in hospitals and health centres. Now it is the time to promote capacity development through training and mentoring.

I would like to acknowledge the support and co-operation of all partners and stakeholders who contributed to the development of this important guideline. IPHN has been instrumental in developing the Guideline and have ensured that the development process has been both participatory and consultative. I hope that all stakeholders will extend their support in implementing management in line with this guideline that is now in place.

 12.5.2008

A K M Zafar Ullah Khan
Secretary
Ministry of Health and Family Welfare



Message

Directorate General of Health Services



Bangladesh has a huge burden of severe acute malnutrition (SAM) in under five children, who falls prey easily to illness and death. Thousands of severely malnourished children are either unidentified or not properly managed in facilities and communities. Health services in Bangladesh should adequately be empowered with capacity to identify and manage severe acute malnutrition cases. A WHO guideline is available that offers a structured approach to manage SAM. However there is scope to adapt it as per local context.

The National Guidelines for the Management of Severely Malnourished Children are intended for doctors, senior nurses and other senior health professionals responsible for the therapeutic care of severely malnourished children in health facilities. The guidelines are based on the global guidelines of the World Health Organization, which have been adapted, where necessary, to the context of Bangladesh. They provide a structured approach to the facility-based inpatient care of severe acute malnutrition in 10 essential steps: treatment of associated conditions; how to address failure to respond to treatment; guidelines for discharge before recovery is complete; and the emergency treatment of shock and severe anaemia. They seek to promote the best available therapy so as to reduce the risk of death, and to facilitate full recovery.

Upazila and district level health facilities cannot alone manage the large caseload of severely malnourished children in Bangladesh. At the same time, it is recognized that when complications are absent, severe acute malnutrition can be effectively managed at the community level. Models for a dual system of community-based and facility-based care for severely malnourished children are currently being developed in Bangladesh (i.e. IMCI), which will allow health facilities to focus attention on the specialized care of severely malnourished children with complications. Until this system is in place, all children with severe acute malnutrition should be treated in a health facility.

The National Guidelines are a key step towards improving the management of severe acute malnutrition. Immediate steps should now be taken to incorporate them into the curricula of all medical colleges and nursing institutes in the country, and to ensure that health facilities throughout the country have trained medical staff and necessary resources to implement the guidelines in their entirety. To this end, I call upon all stakeholders and partners in Bangladesh to lend their support.

for 4.05.18

Professor Md. Abul Faiz
Director General of Health Services
Ministry of Health and Family Welfare

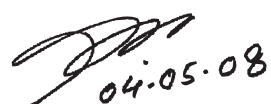
Message



The National Guidelines for the Management of Severely Malnourished Children in Bangladesh are the outcome of the 'National Workshop on the Management of Severe Malnutrition' held in Dhaka on 20 September 2006. The workshop was organized by the Directorate General of Health Services (DGHS), Ministry of Health and Family Welfare (MOHFW), Government of Bangladesh, and supported by the Centre for Medical Education (CME), UNICEF and Concern Worldwide, Bangladesh.

The national workshop brought together key experts from institutions throughout Bangladesh to share their experiences in managing severe acute malnutrition at the facility level. Participants included senior health officials from the government, and distinguished professors and consultants from the medical colleges and hospitals, senior health professionals from other medical institutes, UN agencies, ICDDR,B, Development Partners, and NGOs. During the workshop, consensus was reached on appropriate modifications of the 1999 WHO guidelines on the management of severe malnutrition that have been shown to work in the context of Bangladesh. A Technical Working Group took the recommendations from the workshop to develop the National Guidelines, presented herewith.

I would like to thank all participants of the National Workshop and particularly all members of the Contributors and Technical Working Group and Reviewers for their technical input to the National Guidelines. The financial and technical support of the Centre for Medical Education, UNICEF and Concern Worldwide Bangladesh is gratefully appreciated.



04.05.08

Prof Dr Khondhaker Md. Shefayetullah.
Director, Medical Education and HMPD, DGHS

Acknowledgement



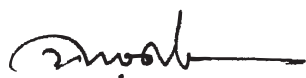
Malnutrition contributes to more than fifty percent of deaths in under-five children. Many children become severely malnourished even when prevention programmes are in place, and severe malnutrition is a life threatening condition requiring urgent treatment. Proper management can save thousands of lives in Bangladesh. Feasible and sustainable methods of management of severe malnutrition have been evidenced following WHO guidelines even in district and rural hospitals. In Bangladesh, we are yet to extend the standard treatment services for severe malnutrition up to rural hospitals where most of the severe cases get in; and even not the districts and most of the central level hospitals.

Following the national workshop for the Management of Severely Malnourished Children in Bangladesh held in Dhaka on 20 September 2006 by the key experts from institutions throughout Bangladesh to share their experiences in managing severe acute malnutrition at the facility level; through work of expert working group, consultations and review by eminent clinicians, this national guideline would be an excellent outcome.

This uniform national guideline would be used in all hospitals and facilities in Bangladesh for the management of severely malnourished children, which will save thousands of lives. The guideline is intended to promote the best available therapy so as to reduce the risk of death, shorten the length of time spent in hospital, and facilitate rehabilitation and full recovery.

It is now time to roll out the guideline to be used up to upazila level facilities. Initiatives would be taken to train and mentor professionals and facilities to develop capacity in management of severely malnourished children. IPHN is committed to carry forward the task along with other stakeholders.

I would like to thank all members of the Contributors and Technical Working Group for their technical input to the National Guidelines, institutions/agencies including UNICEF, WHO, ICDDR, & CONCERN, and reviewers of the guideline that included leading paediatricians of the country.

A handwritten signature in black ink, appearing to read 'Fatima Parveen Chowdhury'.

Professor Dr Fatima Parveen Chowdhury
Director, Institute of Public Health Nutrition

Contributors and Technical Working Group for Drafting the National Guidelines

Institute of Public Health Nutrition

Professor Dr. Fatima Parveen Chowdhury,
Director

Dhaka Medical College and Hospital

Professor Md Abid Hossain Mollah,
Head, Department of Paediatrics

Centre for Medical Education, DGHS

Dr. Md. Humayun Kabir Talukder,
Associate Professor

ICDDR'B

Dr. Tahmeed Ahmed, Scientist & Head Nutrition Programme
Dr. Md. Iqbal Hossain, Associate Scientist & Coordinator MCHS
Dr. Kazi M Jamil, Senior Medical Officer
Dr. M Munirul Islam, Assistant Scientist
Dr. AM Shamsir Ahmed, Project Research Manager, Nutrition Programme

Concern Worldwide, Bangladesh

Dr. Nina S Dodd, Programme Development Officer
Dr. Golam Mothabbir Miah, Advisor-Nutrition Programme

Plan International

Dr. T M Alamgir Azad, Project Manager, Integrated Nutrition Project

UNICEF

Dr. Md. Mohsin Ali, Nutrition Specialist
Dr. Harriet Torlesse, Nutrition Manager

WHO Bangladesh

Dr. Md. Abdul Halim, Consultant

Reviewers of the National Guideline

Professor Md. Salim Shakur,

Professor, Paediatric Nutrition and Gastroenterology and
Director, Dhaka Shishu Hospital

Professor Dr. Abdul Hannan,

Executive Director, Institute of Child and Mother Health (ICMH),
Matuail, Dhaka

Professor CA Kawser,

Department of Paediatrics, BSMMU, Dhaka

Professor MAK Azad Chowdhury,

Head of Neonatology, Dhaka Shishu Hospital

Professor Syeda Afroza,

Joint Director, ICMH, Matuail, Dhaka

Professor Ainun Afroze,

Department of Child Nutrition and Gastroenterology, BSMMU, Dhaka

Professor Soofia Khatoon,

Head, Department of Paediatrics, ICMH, Matuail, Dhaka

Dr. Nazneen Akhtar Banu,

Associate Professor of Paediatrics, SSMC and Mitford Hospital, Dhaka

Dr. Khursid Talukder,

Consultant Paediatrician, Centre for Women and Child Health,
Savar, Dhaka

Dr. AMM Anisul Awwal,

Deputy Director, IPHN

Dr. SM Rafiqul Islam,

Consultant, WHO, Bangladesh

Dr. Zeba Mahmud,

National Programme Manager,
Micronutrient Initiative, Bangladesh

Dr. Shamim Ahmed,

National Programme Officer, Micronutrient Initiative, Bangladesh

Dr. Ashraf Hossain Sarkar, Junior Clinician, IPHN

Dr. Ismat Ara, Junior Clinician, IPHN

Dr. Munir Ahmed, Save the Children-UK

Abbreviations

CMV	Combined mineral vitamin mix
GRS	Growth Reference Standard
ICDDR,B	International Centre for Diarrhoeal Disease Research, Bangladesh
IM	Intramuscular
IMCI	Integrated Management of Childhood Illnesses
IPHN	Institute of Public Health Nutrition
IV	Intravenous
MUAC	Mid-upper arm circumference
NG	Naso-gastric
ORS	Oral rehydration salts
ReSoMal	Rehydration Solution for Malnutrition
RUTF	Ready to use therapeutic food
SAM	Severe Acute Malnutrition
SD	Standard deviation
UNICEF	United Nations Children's Fund
WHO	World Health Organization
WHM	Weight-for-height median
WHZ	Weight-for-height z-score

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1

Introduction

1.1 Severe malnutrition in Bangladesh

Severe malnutrition is an important cause of death in children. In Bangladesh 1.2 % [1] of the ~17 [2] million under-five children, approximately 200,000 are believed to be severely wasted . But according to new WHO- Growth Reference Standard 2006, the proportion of children with severe wasting is 2.9 % thus the total number being 500,000 (BBS-UNICEF, 2007) [3]. The death rate among children hospitalized for SAM was as high as 15 percent (Islam et al., 2006) [4]. Once properly treated, severely malnourished children would grow up to lead a normal life. Severe malnutrition in children can be successfully treated by using WHO guidelines that have been shown to be feasible and sustainable even in small district hospitals with limited resources. Where the WHO guidelines have been implemented as recommended, substantial reductions in case fatality rates have been achieved. WHO guidelines are a structured approach to care and involve 10 steps in two phases and take into account the profound physiological changes that exist in severe malnutrition.

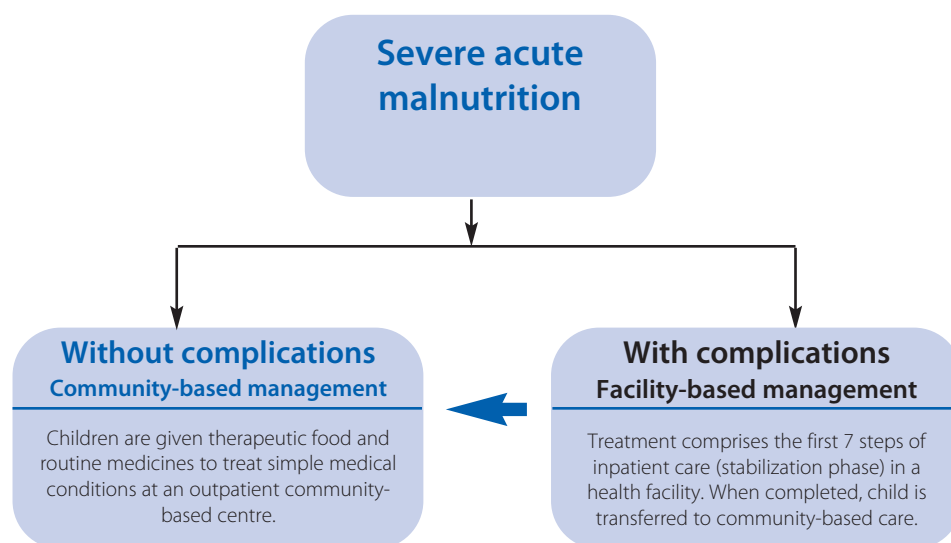
1.2 Management of severe acute malnutrition: combining facility-based and community-based care

In Bangladesh, severe acute malnutrition in children has traditionally been managed at the facility level through inpatient therapeutic care. A small proportion of cases receive this treatment because active case finding in the community is rare or absent, many families cannot afford the economic and opportunity costs associated with facility-based inpatient care, and health facilities cannot reasonably handle such a high case load.

Facility-based inpatient care is essential when severe acute malnutrition has progressed to a stage where children have medical complications that are life-threatening. If severe acute malnutrition is identified in the early

stages when complications are absent, the technical aspects of treatment are very simple. There is universal consensus that severe acute malnutrition without complications does not require inpatient treatment and can be effectively managed at the community level. Therefore, to maximize coverage and access to therapeutic care for severely malnourished children, an approach that combines the following components is most appropriate:

- ❑ **Active case seeking in the community for severe acute malnutrition** through rapid screening methods such as mid-upper arm circumference (MUAC).
- ❑ **Management at the facility level** for severely malnourished children with complications.
- ❑ **Management at the community level** for severely malnourished children without complications and children who have been discharged from facility-based inpatient care.



The advantages of a combined facility-based and community-based approach are many:

- ❑ Active case-finding in the community identifies severely malnourished children early in the progression of the condition, before medical complications occur. If cases can be identified at an early stage, only 10-15 % of severely malnourished children will require facility-based inpatient treatment.
- ❑ Rational use of facility-based inpatient care allows health facilities to focus resources on the specialized care of severely malnourished children with complications.

- ❑ Access to community-based care for children without complications benefits children by reducing exposure to hospital-acquired infections and benefits families by reducing the time that caregivers spend away from home and other siblings, and by reducing opportunity costs.
- ❑ Maximum coverage and access is possible making services accessible to the highest possible proportion of severely malnourished children. By improving access to treatment, it also ensures that children continue treatment until they have recovered and thus reduces default cases.
A model for community-based management of severe acute malnutrition without complications, including locally produced ready-to-use therapeutic foods*, is currently under development in Bangladesh. Until community-based care is in place, all children with severe acute malnutrition should be treated through facility-based care in a health facility.

1.3 About the National Guidelines

The National Guidelines for the Management of Severely Malnourished Children in Bangladesh are intended for doctors, senior nurses and other senior health professionals responsible for inpatient therapeutic care of severely malnourished children in health facilities. They are based on the global guidelines of the World Health Organization (WHO), which have been adapted, where necessary, to the context of Bangladesh.

The guidelines are designed for circumstances where community-based management of severe acute malnutrition is not available and therefore include the complete protocol for management of severe acute malnutrition, including:

- ◆ Assessment of SAM and admission criteria
- ◆ General principles for management (the '10 Steps')
- ◆ Treatment of associated conditions
- ◆ How to address failure to respond to treatment
- ◆ Guidelines for discharge before recovery is complete
- ◆ Emergency treatment of shock and severe anaemia.

*A local ready-to-use therapeutic food can be based on the 'pushti' packet, which is currently used for demonstrative feeding of severely underweight and growth faltering children covered by the government's National Nutrition Programme.

2

Assessment of severe acute malnutrition and admission criteria

2.1 Assessment of severe acute malnutrition

Severe acute malnutrition is identified by the presence of severe wasting and/or bi-pedal oedema.

A child aged 6-59 months is classified as severely malnourished if s/he has one or more of the following:

- ◆ Mid-upper arm circumference <110 mm
- ◆ Weight-for-height median (WHM) $<70\%$
- ◆ Weight-for-height z-score (WHZ) <-3 SD
- ◆ Bipedal oedema (kwashiorkor, marasmic kwashiorkor 'oedematous malnutrition')

Bangladesh has adopted the new World Health Organization (WHO) Growth Reference Standards (GRS), which should be used for determining the WHM and WHZ. Annex 1 provides the WHO GRS weight-for-height reference tables.

There are uncertainties regarding the classification of children aged <6 months as severely malnourished [5]. Until better information becomes available, a child aged <6 months should be classified as severely malnourished if s/he has one or more of the following:

- ◆ Visible wasting
- ◆ WHM $<70\%$ or <-3 SD
- ◆ Bipedal oedema

Oedema in all children is graded using the classification below:

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

2.2 Admission to facility-based (inpatient) or community-based (outpatient) care

In areas where only facility-based inpatient care is available, all children with one or more of the above criteria should be admitted to inpatient care.

In areas where both facility-based and community-based cares are available:

- ◆ Severe acute malnutrition without medical complications should be treated through community-based care
- ◆ Severe acute malnutrition with medical complications should be admitted to facility-based inpatient therapeutic care until medical complications are controlled.

Presence of any of the following conditions requires facility-based inpatient treatment:

Sign	Criteria for inpatient treatment
Oedema	Grade +++ Marasmic-kwashiorkor: a child with severe wasting (MUAC<110 mm or WHM<70% or WHZ<-3) AND oedema
Appetite/anorexia	Poor appetite or unable to eat
Vomiting	Persistent vomiting (≥ 3 per hour)
Temperature	Fever ($>39^{\circ}\text{C}$ or 102.2°F axillary) or hypothermia ($<35^{\circ}\text{C}$ or 95°F axillary)
Respiratory rate	Rapid breathing according to IMCI guidelines for age: ≥ 60 /min for children <2 months ≥ 50 /min for children 2-12 months ≥ 40 /min for children 12-59 months
Anaemia	Severely pale (severe palmer pallor) with or without difficult breathing
Infection	Extensive infection requiring parenteral treatment
Alertness	Very weak, apathetic, unconscious, fitting/convulsions
Hydration status and dehydrating diarrhoea	Dehydration based primarily on a recent history of diarrhoea, vomiting, fever or sweating, not passing urine for last 12 hours and on recent appearance of clinical signs of dehydration as reported by the caregiver
Other criteria	Infants <6 months with severe acute malnutrition Caregiver requests inpatient care Physician's impression

3

General principles of management

There are ten essential steps for management:

- Step 1: Treat/prevent hypoglycaemia
- Step 2: Treat/prevent hypothermia
- Step 3: Treat/prevent dehydration
- Step 4: Correct electrolyte imbalance
- Step 5: Treat/prevent infection
- Step 6: Correct micronutrient deficiencies
- Step 7: Start feeding cautiously including breast feeding

- Step 8: Achieve catch-up growth
- Step 9: Provide sensory stimulation and emotional support
- Step 10: Prepare for discharge and follow-up after recovery

In areas where community-based care is established, facility-based inpatient care for severely malnourished children with complications includes the first seven steps only. These steps should take four to seven days to complete and then the child is referred to community-based care to continue management of severe acute malnutrition.

The ten steps are accomplished in two phases, as shown by the typical time-frame for the management of a child with severe acute malnutrition in Table 1:

- ◆ **Stabilisation phase** when life-threatening problems are identified and treated, specific deficiencies are corrected, metabolic abnormalities are reversed and feeding is begun.
- ◆ **Rehabilitation phase** when intensive feeding is started to recover lost weight; emotional and physical stimulation is increased; breastfeeding is re-initiated and/or encouraged; the mother or caregiver is trained to continue care at home, and preparations are made for discharge of the child.

Table 1: Time-frame for the management of a child with severe acute malnutrition

Step	PHASE		
	STABILISATION	REHABILITATION	
	Days-1-2	Days-3-7	Weeks 2-6
1. Hypoglycaemia	→		
2. Hypothermia	→		
3. Dehydration	→		
4. Electrolytes	→	→	→
5. Infection	→	→	→
6. Micronutrients		no iron	with iron
7. Cautious feeding	→	→	→
8. Catch-up growth		→	→
9. Sensory stimulation		→	→
10. Prepare for follow-up		→	→

Step 1. Treat/prevent hypoglycaemia**a) Diagnosis**

Hypoglycaemia and hypothermia usually occur together and are signs of infection. Hypoglycaemia may also occur if the malnourished child has not been fed for 4-6 hours. Consider for hypoglycaemia whenever hypothermia is found (axillary $<35.0^{\circ}\text{C}$ or 95°F ; rectal $<35.5^{\circ}\text{C}$ or 95.9°F), or there is lethargy, limpness, convulsion and loss of consciousness.

- ◆ Assume all severely malnourished children as hypoglycaemic and treat accordingly.
- ◆ If blood glucose can be measured immediately and quickly (e.g. with dextrostix), take finger/heel prick blood and check blood sugar level. Hypoglycaemia is considered if blood sugar level is <3 mmol/L or 54 mg/dL.

b) Treatment:**If the child is conscious give:**

- ◆ 50 ml bolus of 10% glucose or sucrose solution (5 g or 1 rounded teaspoon of sugar in 50 ml or 3.5 tablespoons water), orally or by nasogastric (NG) tube.
- ◆ Then feed starter diet F-75 (as in Step 7) every 30 minutes for two hours (giving one fourth volume of the total recommended two hours' feed)
- ◆ Keep the child warm
- ◆ Antibiotics (as in Step 5)
- ◆ Two-hourly feeds, day and night (as in Step 7).

If the child is unconscious or convulsing give:

- ◆ 10% glucose (5 ml/kg) IV followed by 50 ml of 10% glucose or sucrose by NG tube. Then give starter F-75 as above
- ◆ If convulsion persists after completion of IV glucose, give per rectal diazepam (0.5mg/kg body weight)
- ◆ Keep the child warm
- ◆ Antibiotics (as in Step 5)
- ◆ Two-hourly feeds, day and night (as in Step 7).

c) Monitor:

- ◆ Blood glucose: repeat dextrostix after two hours. Once treated, most children stabilise within 30 min. If blood glucose falls to <3 mmol/L give a further 50 ml bolus of 10% glucose or sucrose solution, and continue feeding every 30 minutes for two hours (giving one fourth volume of the total recommended two hours' feed)
- ◆ Axillary temperature: if this falls to $<36.0^{\circ}\text{C}$ or 96.8°F , repeat dextrostix
- ◆ If level of consciousness remains static; the treatment of hypoglycaemia should be repeated
- ◆ If condition does not improve consider other causes and/or refer to a higher facility if possible.

d) Prevention:

Frequent feeding is important in preventing both hypoglycaemia and hypothermia.

- ◆ Feed two-hourly
- ◆ Ensure feeds throughout the day and night.

Step 2. Treat/prevent hypothermia

a) Diagnosis:

If the axillary temperature is $<36.0^{\circ}\text{C}$ or 96.8°F .

b) Treatment:

- ◆ Re-warm the child: either clothe the child (including head), cover with a warmed blanket and increase the ambient temperature with available but safe heat source(s), or put the child on the mother's bare chest (skin to skin) and cover them
- ◆ Feed as in step 7

c) Monitor:

- ◆ Ensure that the child is covered at all times, especially at night
- ◆ Feel for warmth
- ◆ Temperature: during re-warming take axillary temperature two hourly until it rises to $>37.0^{\circ}\text{C}$ or 98.6°F
- ◆ Blood glucose level: check for hypoglycaemia whenever hypothermia is found

Annex 10 provides an example of a chart for recording temperature, pulse and respiratory rates.

d) Prevention:

- ◆ Keep child covered and away from cold air.
- ◆ Avoid regular bathing, keep child dry, change wet nappies, clothes and bedding
- ◆ Avoid exposure (e.g. bathing, prolonged medical examinations)
- ◆ Let child sleep with mother/caregiver at night for warmth
- ◆ Feed two-hourly, start straightaway (see Step 7)
- ◆ Always give feeds throughout the day and night during the stabilisation phase, especially for the first 24-48 hours.

Step 3. Treat/prevent dehydration

a) Diagnosis

It is difficult to estimate dehydration status in a severely malnourished child using clinical signs alone, because the clinical signs of dehydration may already present in severely malnourished children (e.g. slow skin pinch, sunken eyes, dry mouth) or are also signs of septic shock (e.g. cold hands and feet and diminished urine flow). Dehydration may be over estimated in a marasmic/wasted child and underestimated in a kwashiorkor/oedematous child. Therefore, assume that children with watery diarrhoea may have dehydration.

b) Treatment:

The standard oral rehydration salts (ORS) solution (90 mmol sodium/L) and the newly modified WHO-ORS (75 mmol sodium/L) contains too much sodium and too little potassium for severely malnourished children. Instead give special **Rehydration Solution for Malnutrition (ReSoMal)** (For recipe see Annex 2).

Give all children with watery diarrhoea:

- ◆ Every 30 min for first two hours, ReSoMal 5 ml/kg orally or by naso-gastric tube, then
- ◆ Alternate hours for 4-10 hours, ReSoMal 5-10 ml/kg/h (the exact amount to be given should be determined by how much the child wants, and stool loss and vomiting). F-75 is given in alternate hours during this period until the child is rehydrated.
- ◆ After rehydration, continue feeding F-75 (see step 7)

If diarrhoea is severe then new WHO-ORS (75 mmol sodium/L) may be used because the loss of sodium in the stool is high and symptomatic hyponatraemia can occur with ReSoMal [6].

Low blood volume can coexist with oedema. Do not use the IV route for rehydration except in cases of shock and then do so with care, infusing slowly to avoid flooding the circulation and overloading the heart (see Section 7)

c) Monitor:

Monitor progress of rehydration:

- ◆ Observe half-hourly for 2 hours, then hourly for the next 4-10 hours:
 - Pulse rate
 - Respiratory rate
 - Urine frequency
 - Stool/vomit frequency

During treatment, rapid respiration and pulse rates should slow down and the child should begin to pass urine. Return of tears, moist mouth, eyes and fontanelle appearing less sunken, improved skin turgor, and urination are also signs that rehydration is proceeding. However, many severely malnourished children will not show these changes even when fully rehydrated.

Continuing rapid breathing and rapid pulse during rehydration may suggest coexisting infection as well as overhydration.

Fluids should be stopped immediately if there are any signs of overhydration, especially signs of heart failure. If the following signs occur, stop fluids immediately and reassess after one hour:

- ◆ Increasing pulse rate (increase of 25 beats/min or more)
- ◆ Increasing respiratory rate (increase of 5 breaths/min or more)
- ◆ Puffy eyelids or increasing oedema

Stop ReSoMal as soon as the child has 3 or more of the following signs of improved hydration status:

- ◆ Child no longer thirsty
- ◆ Passing urine
- ◆ Slowing of respiratory and pulse rates from previous high rates
- ◆ Skin pinch less slow
- ◆ Tears

d) Prevention:

To prevent dehydration when a child has continuing watery diarrhoea:

- ◆ Keep feeding with starter F-75 (as in Step 7)
- ◆ Replace approximate volume of stool losses with ReSoMal (after each watery stool give 5-10ml/kg). Note that it is common for malnourished children to pass many small unformed stools: these should not be confused with profuse watery stools and do not require fluid replacement.
- ◆ If child is breastfed, encourage to continue breastfeeding with increased frequency.

Step 4. Correct electrolyte imbalance

All severely malnourished children have excess body sodium even though plasma sodium may be low. Giving high sodium loads in food and fluids is dangerous. Deficiencies of potassium and magnesium are also present and may take at least two weeks to correct. Oedema is partly due to these imbalances.

Treatment

Until stabilization, give:

- ◆ Extra potassium* 3-4 mmol/kg/d
- ◆ Extra magnesium* 0.4-0.6 mmol/kg/d
- ◆ When rehydrating, give low sodium rehydration fluid (e.g. ReSoMal)
- ◆ Prepare food without salt
- ◆ Do NOT treat oedema with a diuretic

*The extra potassium and magnesium can be prepared in a liquid form and added directly to feeds during preparation. Annex 2 provides a recipe for a combined electrolyte - mineral solution. Adding 20 ml of this solution to 1 litre of feed will supply the extra potassium and magnesium required. The solution can also be added to make ReSoMal.

Step 5. Treat/prevent infection

a) Diagnosis

In severe acute malnutrition the usual signs of infection, such as fever, are often absent, and infections are often hidden. Therefore routinely treat all severely malnourished children on admission with broad-spectrum antibiotics.

b) Treatment

Give routinely on admission:

- ◆ Broad-spectrum antibiotic(s)

Choice of broad-spectrum antibiotics: (see Annex 3 for antibiotic dosage):

(i) If the child appears to have **no complications** give

- ◆ Amoxicillin oral 15 mg/kg 8-hourly for 5 days or
- ◆ Cotrimoxazole oral; Trimethoprim 5mg/kg and Sulphamethoxazole 25mg/kg 12-hourly for 5 days.

(ii) If the child is **severely ill** (apathetic, lethargic or looking sick) or **has complications** (shock; hypoglycaemia; hypothermia; dermatosis with raw or broken skin; respiratory tract or urinary tract infection; lethargic/sickly appearance) give:

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

If the child **fails to improve clinically by 48 hours or deteriorates after 24 hours**, or if the child presents with septic shock or meningitis, antibiotics with a broader spectrum may be needed (e.g. ceftriaxone 50-100 mg/kg/d IV/IM once daily along with or without gentamicin).

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

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

If clinical condition does not improve after 5 days of antibiotic treatment, reassess the child. If partial improvement complete a full 10- day course.

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

Ensure that vitamin and mineral supplements have been correctly given.

If child is HIV-exposed or infected, continue to receive cotrimoxazole prophylaxis (5 mg/kg/day); if *Pneumocystis carinii* pneumonia (PCP) is suspected, they should be treated with the appropriate dose of cotrimoxazole. The new name for *P. carinii* is *P. jiroveci*.

Step 6. Correct micronutrient deficiencies

All severely malnourished children have vitamin and mineral deficiencies. As giving iron in acute phase can make infections worse, although anaemia is common, do **NOT** give iron initially but wait until the infection is controlled, child has a good appetite and starts gaining weight (usually by the second week),

Treatment

Give:

- ◆ Vitamin A orally on Day 1 unless there is definite evidence that a dose has been given in the last month (for age >12 months, give 200,000 IU; for age 6-12 months, give 100,000 IU; for age 0-5 months, give 50,000 IU)

Give daily for at least 2 weeks:

- ◆ Multivitamin supplement (without iron)
- ◆ Folic acid 1 mg/d (give 5 mg on Day 1)
- ◆ Zinc 2 mg/kg/d
- ◆ Copper 0.3 mg/kg/d (if available)
- ◆ Elemental iron 3 mg/kg/d but only when gaining weight (start in rehabilitation phase when gaining weight)

Annex 2 provides a recipe for a combined electrolyte-mineral solution. Adding 20 ml of this solution to 1 litre of feed or ReSoMal will supply the zinc and copper needed, as well as electrolytes (potassium and magnesium). If a combined electrolyte-mineral solution is available, only vitamin A, multivitamin supplement, folic acid and iron need to be given separately.

A combined mineral vitamin mix (CMV) for severe acute malnutrition is available commercially. This CMV can replace the electrolyte-mineral solution and multivitamin and folic acid supplements mentioned in steps 4 and 6, but still give the large single dose of vitamin A and folic acid on Day 1, and iron daily after weight gain has started.

Give the following vitamins and minerals as below:

	CMV available	Combined electrolyte/mineral solution available	Neither combined electrolyte - mineral solution nor CMV available
Vitamin A on day 1	✓	✓	✓
Daily for at least 2 wk:			
Multivitamin		✓	✓
Folic acid 1 mg/d (give 5 mg on Day 1)	✓	✓	✓
Zinc 2 mg/kg/d			✓
Copper 0.3 mg/kg/d			✓
Elemental iron 3 mg/kg/d when gaining weight	✓	✓	✓

Step 7. Start feeding cautiously

In the **stabilisation phase** a cautious approach is required because of the child's fragile physiological state and reduced capacity to handle large feeds. Feeding should be started as soon as possible after admission and should be designed to provide just sufficient energy and protein to maintain basic physiological processes. The guidelines in this section apply to children aged 6-59 months. For infants aged <6 months see Annex 9.

The essential features of feeding during the stabilisation phase are:

- ◆ Small, frequent feeds of low osmolarity and low lactose
- ◆ Oral or nasogastric (NG) feeds (never parenteral preparations)
- ◆ Energy intake of ~100 kcal/kg/d
- ◆ Protein intake of 1-1.5 g protein/kg/d
- ◆ Total fluid intake through feeds should not be more than 130 ml/kg/d (100 ml/kg/d if the child has severe (+++) oedema, which means oedema of the legs, hands and face)
- ◆ If the child is breastfed, encourage to continue breastfeeding but give the prescribed amounts of starter formula (F-75) to make sure the child's needs are met.

The suggested starter formula and feeding schedules (see below) are designed to meet these targets. Milk-based formulas such as starter formula F-75 containing 75 kcal/100 ml and 0.9 g protein/100 ml are satisfactory for most children (see Annex 4 for recipes). Feed from a cup. Very weak children may be fed by spoon, dropper or syringe. A recommended schedule in which volume is gradually increased, and feeding frequency gradually decreased is:

Days	Frequency	Vol/kg/feed	Vol/kg/d
1-2	2-hourly	11 ml	130 ml
3-5	3-hourly	16 ml	130 ml
6+	4-hourly	22 ml	130 ml

For children with a good appetite and no oedema, this schedule can be completed in 2-3 days (e.g. 24 hours at each level). Annex 5 shows the volume/feed already calculated according to body weight. Annex 6 gives the feed volumes for children with severe oedema. Use the Day 1 weight to calculate how much to give, even if the child loses or gains weight in this phase.

If, after allowing for any vomiting, intake does not reach 80 kcal/kg/d (105 ml F-75/kg) despite frequent feeds, coaxing and re-offering, give the remaining feed by NG tube (see Appendices 6 and 7 (Column 6) for intake volumes below which NG feeding should be given). Do not exceed 100 kcal/kg/d in this phase.

Criteria for increasing volume and decreasing frequency of F-75 feeds:

- ◆ If vomiting, frequent loose stool (≥ 5 per day), or poor appetite, continue 2-hourly feeds.
- ◆ If little or no vomiting, less frequent loose stool (< 5 per day), and finishing most feeds, changes to 3-hourly feeds.
- ◆ After a day on 3-hourly feeds - if no vomiting, less diarrhoea and finishing most feeds, change to 4-hourly feeds.

Monitor and note:

- ◆ Amounts offered and left over
- ◆ Frequency of vomiting
- ◆ Frequency of watery stool
- ◆ Daily body weight

During the stabilisation phase, diarrhoea should gradually diminish and oedematous children should lose weight. If diarrhoea continues despite cautious refeeding, or worsens substantially, see section 4.4 (continuing diarrhoea).

Step 8: Achieve catch-up growth

In the **rehabilitation phase** a vigorous approach to feeding is required to achieve very high intakes and rapid weight gain of >10 g gain/kg/d. Readiness to enter the rehabilitation phase is signalled by a return of appetite, usually about one week after admission, and a loss of most/all of the oedema. A gradual transition is recommended to avoid the risk of heart failure which can occur if children suddenly consume huge amounts. The guidelines in this section apply to children aged 6-59 months. For infants aged <6 months see Annex 9.

The recommended milk-based F-100 contains 100 kcal and 2.9 g protein/100 ml (see Annex 5 for recipes). Khichuri, halwa, modified porridges or modified family foods can be used provided they have comparable energy, protein and micronutrient concentrations. Recipes for khichuri and halwa are provided in Annex 8. There should be gradual replacement of F-100 with kichuri/halwa containing the equivalent amount of kilocalories.

The motivation of caregivers is crucial to success. Sufficient time must be spent with the child to enable him or her to finish each feed. The child must be encouraged to eat actively while sitting comfortably on the mother or caregiver's lap. Children must never be left to eat alone.

To change from starter to catch-up formula:

- ◆ Replace starter formula F-75 with the same amount of catch-up formula F-100 every 4 hours for 48 hours then,
- ◆ Increase each successive feed by 10 ml until some feed remains uneaten. The point when some remains unconsumed after most feeds is likely to occur when intakes reach about 30 ml/kg/feed (200 ml/kg/d).

Monitor for signs of heart failure during the transition phase:

- ◆ Respiratory rate
- ◆ Pulse rate

If respirations increase by 5 or more breaths/min and pulse by 25 or more beats/min for two successive 4-hourly readings, reduce the volume per feed: give 4-hourly F-100 at 16 ml/kg/feed for 24 hours (100 ml/kg/d); then 19 ml/kg/feed for 24 hours (115 ml/kg/d); then 22 ml/kg/feed for 48 hours (130/kg/d); then increase each feed by 10 ml as above.

After the transition phase give:

- ◆ Frequent feeds (at least 4-hourly) of unlimited amounts of catch-up formula F-100
- ◆ This will lead to energy and protein intakes of 150-220 kcal/kg/d and 4-6 g protein/kg/d, respectively.
- ◆ If the child is breastfed, encourage continued breastfeeding. Note, however, that breast milk alone does not have sufficient energy and protein to support rapid catch-up growth of severely malnourished children.

See Annex 7 for range of volumes for free feeding with F-100.

Monitor progress after the transition by assessing the rate of weight gain:

- ◆ Weigh child each morning before feeding. Plot weight on a graph paper (Annex 11 provides example).

If weight gain is:

- ◆ Poor (<5 g/kg/d), child requires full reassessment
- ◆ Moderate (5-10 g/kg/d); check whether intake targets are being met, or if infection has been overlooked
- ◆ Good (>10 g/kg/d), continue to praise staff and mothers)

Note: during the first few days of rehabilitation, children with oedema may not gain weight, despite an adequate intake because oedema fluid is being lost. Thus progress in these children is seen as decreased oedema rather than rapid weight gain. If the child is neither gaining weight nor showing decreased oedema, or there is increasing oedema, the child is failing to respond then reassess the child, look for any pitfall in the management and take appropriate measures.

Formula for calculating weight gain:

$$\text{Weight gain in g/kg/day} = \frac{(W2 - W1) \times 1000}{(W1 \times \text{number of days from } W1 \text{ to } W2)}$$

where: W1 = initial or lowest weight in kg;
 W2 = weight in kg on the day of calculation

Step 9. Provide sensory stimulation and emotional support

Severe malnutrition affects mental and behavioural development, which can be reversed by appropriate treatment including sensory stimulation and emotional support.

Provide:

- ◆ Tender loving care (smiling, laughing, patting, touching, etc.)
- ◆ A cheerful, stimulating environment
- ◆ Structured play therapy 15-30 min/d. The play sessions should make use of toys made of locally available discarded materials (see Annex 12)
- ◆ Physical activity as soon as the child is well enough
- ◆ Parental/caregiver involvement when possible (e.g. comforting, feeding, bathing, play) so that the special care is continued at home

Step 10. Prepare for discharge and follow-up after recovery

A child who has achieved 80% weight-for-length (equivalent to -2 SD) can be considered to have recovered sufficiently to be discharged from hospital, but follow-up is essential. During rehabilitation, the parents must be taught (e.g. preparation of halwa & khichuri as in annex 8) how to prevent malnutrition from recurring, and prior to discharge a plan should be made with the parents for follow-up. Where applicable and possible, the caregivers or other guardians of the child should be included in these discussions.

Criteria for discharge:

In areas where there is no community-based outpatient care, discharge may be given if the following criteria are present:

Criteria for discharge from inpatient care in areas where there is no community-based outpatient care

- | | |
|-------|---|
| Child | <ul style="list-style-type: none"> ● WHM $\geq 80\%$ or WHZ $\geq -2SD$ ● Oedema has resolved ● Gaining weight at a normal or increased rate ● Child eating an adequate amount of nutritious food that the mother can prepare at home ● All infections and other medical complications have been treated ● Child is provided with micronutrients ● Immunization is updated |
|-------|---|

Mother/

caregiver

- Knows how to prepare appropriate foods and to feed the child (annex 8)
- Knows how to make appropriate toys and to play with the child
- Knows how to give home treatment for diarrhoea, fever and acute respiratory infections, and how to recognise the signs that s/he must seek medical assistance
- Follow-up plan is completed

Teaching parents to care for the child and prevent malnutrition recurring:

Ensure that the parent understands the causes of malnutrition and how to prevent its recurrence:

- ◆ Correct breastfeeding and feeding practices (frequent feeding with energy and nutrient dense foods)
- ◆ How to treat, or seek treatment for, diarrhoea and other infections
- ◆ When to take the child for immunizations
- ◆ Ensure that the child receives a vitamin A supplement (children aged 9-59 months) and antihelminthic drug (children aged 24-59 months) every 6 months
- ◆ How to give structured play therapy to child.

Follow-up:

- ◆ Before discharge, make a plan with the parent for a follow-up visit at 1 week after discharge. Regular check-ups should also be made at 1 week, 2 week, 1 month, 3 month and every 3 months thereafter until WHM>90% or WHZ >-1 SD, at which point the child is discharged. If any problem is found, visits should be more frequent until it is resolved.
- ◆ At each follow-up visit, the child should be examined, weighed, measured and the results recorded. The mother should be asked about the child's recent health, feeding practices and play activities. Training of the mother should focus on areas that need to be strengthened, especially feeding practices, and mental and physical stimulation of the child.

See Annex 13 for an example of a Discharge Card

4

Treatment of associated conditions

4.1 Vitamin A deficiency

Children with vitamin A deficiency are likely to be photophobic and have closed eyes. It is important to examine the eyes very gently to prevent damage and rupture. All children should have their eyes examined carefully and gently.

If the child shows **any eye signs** of deficiency, give orally:

- ◆ Vitamin A on days 1, 2 and 14:

Children 0-5 months:	50,000 IU
Children 6-11 months:	100,000 IU
Children ≥ 12 months:	200,000 IU
- ◆ If first dose has been given in the referring centre, treat on days 1 and 14 only

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

- ◆ Instil chloramphenicol or tetracycline eye drops (1%) 2-3 hourly as required for 7-10 days in the affected eye
- ◆ Instil atropine eye drops (1%), 1 drop three times daily for 3-5 days
- ◆ Cover with eye pads soaked in saline solution and bandage

4.2 Dermatosis

Signs:

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

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

In addition weeping skin lesions are commonly seen in and around the buttocks of children with kwashiorkor:

- ◆ Keep the perineum dry.
- ◆ Apply a gauze soaked in 1% potassium permanganate solution over affected areas and keep for 10 minutes twice daily.
- ◆ Candidiasis should be treated with anti-fungal cream (eg. clotrimazole) twice daily for 2 weeks. Oral candidiasis should be treated with oral nystatin (100,000 IU four times daily).

4.3 Helminthiasis

Treatment of helminth infections should be delayed until the rehabilitation phase of treatment. Give a single dose of any one of the following antihelminthics:

- ◆ 200 mg albendazole for children aged 12-23 months, 400 mg albendazole for children aged ≥ 24 months
- or
- ◆ 100 mg mebendazole twice daily for 3 days for children ≥ 24 months (not recommended below 24 months)
- or
- ◆ 10 mg/kg pyrantel pamoate (any age).

4.4 Continuing diarrhoea and dysentery

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

Mucosal damage and **giardiasis** are common causes of continuing diarrhoea. Where possible examine the stools by microscopy. Treat giardiasis with metronidazole (7.5 mg/kg 8-hourly for 7 days).

If stool contains visible blood, treat the child with an oral antimicrobial that is effective against most local strains of *Shigella* (ciprofloxacin 10 mg/kg/12 hourly for 3 days or pivmecillinum 15 mg/kg/6 hourly for 5 days).

Lactose intolerance Only rarely is diarrhoea due to lactose intolerance. Treat only if continuing diarrhoea is preventing general improvement. Starter F-75 is a low-lactose feed. In exceptional cases:

- ◆ Substitute animal milk with yoghurt or a lactose-free infant formula (eg rice suji, see appendix 14)
- ◆ Reintroduce milk feeds gradually in the rehabilitation phase

Osmotic diarrhoea may be suspected if diarrhoea worsens substantially in young children with diarrhoea who are given F-75 prepared with milk powder, which has slightly higher osmolarity. In these cases:

- ◆ Use isotonic F-75 or low osmolar cereal-based F-75 (see Annex 4), then
- ◆ Introduce F-100 gradually.

4.5 Tuberculosis

If tuberculosis (TB) is strongly suspected (contacts with adult TB patient, poor growth despite good intake, unremitting chronic cough (> 2 weeks), chest infection not responding to conventional antibiotics):

- ◆ Perform Mantoux test (false negatives are frequent in severe malnutrition)
- ◆ Chest X-ray if possible

If test is positive or there is a strong suspicion of TB, treat according to National TB Control Guidelines of Bangladesh.

4.6 Other infections and conditions

Treat other associated conditions and infections according to national guidelines.

5

Failure to respond to treatment

Failure to respond is indicated by high mortality and low weight gain during the rehabilitation phase.

5.1 High mortality

Case fatality rates (CFR) are categorized as follows:

Unacceptable	>20%
Poor	11-20%
Moderate	5-10%
Good	<5%

If mortality is >5%, determine whether the majority of deaths occur:

- ◆ Within 24 hours: consider untreated or delayed treatment of hypoglycaemia, hypothermia, septicaemia, severe anaemia or incorrect rehydration fluid or volume or overuse of IV fluids.
- ◆ Within 72 hours: check whether the volume of feed is too high or the wrong formulation is used; check whether potassium and correct antibiotics were given.
- ◆ At night: consider hypothermia from insufficient covers, no night feeds.
- ◆ When changing to catch-up F-100: consider too rapid a transition
- ◆ After 7 days: consider hospital-acquired sepsis.

5.2 Low weight gain during the rehabilitation phase

Low weight gain is categorized as follows:

Poor:	<5 g/kg/d
Moderate:	5-10 g/kg/d
Good:	>10 g/kg/d

If weight gain is <5 g/kg/d determine:

- ◆ Whether this is for all cases (needs major management overhaul of the Nutrition Unit).
- ◆ Whether this is for specific cases (reassess child as for a new admission, including screening for infections including TB, urinary tract infection, and ear infection).

Possible causes of poor weight gain are:

a) Inadequate feeding

Check:

- ◆ Night feeds are given
- ◆ Target energy and protein intakes are achieved: Is calculation of child's food requirement correct? Is actual intake (offered minus leftovers) correctly recorded? Is the quantity of feed recalculated as the child gains weight? Is the child vomiting or ruminating?
- ◆ Feeding technique: is the child fed frequently and offered unlimited amounts?
- ◆ Quality of care: are staff motivated/gentle/loving?
- ◆ All aspects of feed preparation: weighing scales, measurement of ingredients, mixing, taste, hygienic preparation and storage, and adequate stirring for proper mixing of the ingredients.
- ◆ If giving family foods, they are suitably modified to provide >100 kcal/100g (if not, re-modify).

b) Specific nutrient deficiencies

Check:

- ◆ Adequacy of multivitamin composition and shelf-life

- ◆ Preparation of electrolyte/mineral solution and whether this is correctly prescribed and administered. If in goitrous region, ensure that potassium iodide (KI) is added to the electrolyte/mineral solution (12 mg/2500 ml) or give all children Lugol's iodine (5-10 drops/day for 14 days)
- ◆ If modified family foods are substantially replacing F-100, electrolyte/mineral solution is added to the family food (20 ml/day).

c) Untreated infection

If feeding is adequate and there is no malabsorption, some hidden infection should be suspected. Urinary tract infections, otitis media, TB and giardiasis are easily overlooked. Other infections include dengue, hepatitis B, malaria and HIV infection. Investigate for infection as follows:

- ◆ Re-examine carefully (temperature, pulse rate and respiration rate every 3 hours)
- ◆ Repeat urinalysis for white blood cells
- ◆ Examine stools for intestinal infections and signs of blood.
- ◆ If possible, take chest X-ray
- ◆ Test blood for dengue, hepatitis B and malaria

Alter the antibiotic schedule (Step 5) only if a specific infection is identified.

d) HIV/AIDS

In children with HIV/AIDS, good recovery from malnutrition is possible though it may take longer and treatment failures may be common. Gut enteropathy tends to be worse in HIV-infected children. An important cause of enteropathy is *Cryptosporidium parvum* infection. Lactose intolerance occurs in severe HIV-related chronic diarrhoea: children with monosaccharide and disaccharide intolerance may benefit from lactose-free preparations.

e) Psychological problems

Check for abnormal behaviour such as stereotyped movements (rocking), rumination (self-stimulation through regurgitation) and attention seeking.

Ensure extra care, love and attention.

6

Discharge before complete recovery (if required)

A child may be considered to have recovered and be ready for discharge when she/he reaches 80% weight-for-length. For some children, earlier discharge may be considered if effective alternative supervision is available. Domiciliary care or home-based treatment should be considered only if the following criteria are met.

The child:

- ◆ Is aged >12 months
- ◆ Has lost oedema
- ◆ Has completed antibiotic treatment
- ◆ Has good appetite and good weight gain
- ◆ Has taken potassium, magnesium, mineral and vitamin supplement for 2 weeks (or continuing supplementation at home is possible)

The mother/caregiver

- ◆ Is not employed outside the home
- ◆ Is specifically trained to give appropriate feeding (type, amount and frequency)
- ◆ Has the financial resources to feed the child
- ◆ Lives within easy reach of the hospital for urgent readmission if the child becomes ill
- ◆ Can be visited weekly
- ◆ Is trained to give structured play therapy
- ◆ Is motivated to follow the advice given

Local health workers

- ◆ Are trained to support home care
- ◆ Are specifically trained to examine the child clinically at home, to decide when to refer him/her back to hospital, to weigh the child, and give appropriate advice
- ◆ Are motivated

When children are being rehabilitated at home, it is essential to give frequent meals with a high energy and protein content. These meals should provide at least 150 kcal/kg/d and adequate protein intake (at least 4 g/kg/d). This means feeding the child at least 5 times per day with foods that contain approximately 100 kcal and 2-3 g protein per 100 g. A practical approach would be using simple modifications of the usual home foods (e.g. preparing Khichuri with home foods). Vitamins, iron and electrolyte-mineral supplements can be continued at home.

The caregiver should be shown how to:

- ◆ Give appropriate meals at least 5 times daily
- ◆ Give high energy snacks between meals (e.g. milk, banana, bread)
- ◆ Assist and encourage the child to complete each meal
- ◆ Give micronutrient supplements
- ◆ Breastfeed as often as the child wants

7

Emergency treatment of shock and very severe anaemia

7.1 Shock in severely malnourished children

Severe dehydration and septic shock are difficult to differentiate on clinical signs alone. Signs of septic shock may include:

- ◆ Signs of dehydration, but without a history of watery diarrhoea
- ◆ Hypothermia or hypoglycaemia
- ◆ Children with dehydration will respond to IV fluids, while those with septic shock and no dehydration may not respond.

Diagnosis of shock is based on the following criteria:

- ◆ Lethargic or unconscious and
- ◆ has cold hands
plus either
- ◆ Slow capillary refill (longer than 3 sec) *
- or
- ◆ Weak or fast pulse (160/min or more for children 2-12 months of age, 140/min or more for children 1-5 years)

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

The amount of fluid given is determined by the child's response. Overhydration must be avoided.

To start treatment:

- ◆ Give oxygen
- ◆ Give sterile 10% glucose (5 ml/kg) by IV
- ◆ Give IV fluid at 15 ml/kg over 1 hour. Use Ringer's lactate with 5% dextrose; or half-normal saline with 5% dextrose, or cholera saline, or any other fluid except dextrose in aqua.
- ◆ Measure and record pulse and respiration rates every 30 minutes
- ◆ Give antibiotics (see Step 5).
- ◆ Keep the child warm.

If the shock is due to severe diarrhoea use cholera saline (15 ml/kg/hr for first 2 hours).

If there are signs of improvement (pulse and respiration rates fall):

- ◆ Repeat IV 15 ml/kg over 1 hour; then
- ◆ Switch to oral or NG rehydration with ReSoMal, 10 ml/kg/h in alternate hours with starter F-75 for up to 10 hours, then
- ◆ Continue feeding with starter F-75

If the child fails to improve (pulse and respiration rates remains high)

after the first hour of treatment with an infusion (15 ml/kg over 1 hour), assume that the child has septic shock. In this case:

- ◆ Give maintenance IV fluids (3 ml/kg/h) while waiting for blood,
- ◆ When blood is available transfuse fresh whole blood at 10 ml/kg slowly over 3 hours; then

If there are signs of over-hydration or cardiac failure during treatment (breathing increases by 5 breaths or more/min and pulse increases by 25 or more beats/min) stop the infusion to prevent the child's condition worsening.

7.2 Very severe anaemia in malnourished children

A blood transfusion is required if:

- ◆ Haemoglobin is less than 5 g/dL or packed cell value is less than 15%, or
- ◆ If there is breathlessness and haemoglobin is between 5 and 7 g/dL.

Give

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

It is particularly important that the volume of 10 ml/kg is not exceeded in severely malnourished children. If the severely anaemic child has signs of cardiac failure, transfuse packed cells (5-7 ml/kg) rather than whole blood.

Monitor for signs of transfusion reactions. Stop the transfusion if any of the following signs develop during the transfusion for very severe anaemia:

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

Also monitor the respiratory rate and pulse rate every 15 minutes. If either of them rises, transfuse more slowly.

In all cases of anaemia (mild, moderate, and severe anaemia), oral iron (elemental iron 3 mg/kg/day) should be given for three months to replenish iron stores. **BUT this should not be started** until the child has begun to gain weight.

A n n e x e s


Weight-for-Height Reference Tables


Bangladesh has adopted the new World Health Organization (WHO) Growth Reference Standards (GRS), which should be used for determining the weight for length (<2 years) or weight for height (2-5 years).


Recumbent length is measured for children below 2 years (<87 cm), and standing height is measured for children aged ≥ 2 years (≥ 87 cm). Length is on average 0.7 cm greater than standing height; a correction may be made by subtracting 0.7 cm from all lengths above 84.9 cm if standing height cannot be measured.


The tables below provide, for girls and boys separately, the z-scores for weight for length (children <2 years) and weight for height (children 2-5 years).


Simplified field tables

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


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
75.0	7.1	7.7	8.4	9.1	10.0	11.0	12.2
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


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
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
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


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	
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
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							


Simplified field tables

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
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)							 World Health Organization
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


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
75.0	7.5	8.1	8.8	9.5	10.3	11.3	12.3
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


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
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
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


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
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
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							

Simplified field tables


Weight-for-length 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-length 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


Weight-for-length GIRLS 2 to 5 years (z-scores)							 World Health Organization
cm	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
95.0	10.8	11.7	12.7	13.9	15.2	16.7	18.5
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


Weight-for-length GIRLS 2 to 5 years (z-scores)							 World Health Organization
cm	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
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
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 Staudards							

Simplified field tables

Weight-for-length BOYS 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	5.9	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-length BOYS 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	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

Weight-for-length BOYS 2 to 5 years (z-scores)						 World Health Organization	
cm	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
95.0	11.1	12.0	13.0	14.1	15.3	16.6	18.1
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

Weight-for-length BOYS 2 to 5 years (z-scores)							 World Health Organization
cm	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
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
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							

Recipes for ReSoMal and electrolyte-mineral Solution

ReSoMal oral rehydration solution

ReSoMal contains approximately 45 mmol Na, 40 mmol K and 3 mmol Mg/litre. The recipe [7] using the new ORS formulation* is given below:

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

* In each liter the new ORS contains 2.6g sodium chloride, 2.9g trisodium citrate dihydrate, 1.5g potassium chloride and 13.5g glucose.

Note: if you have ORS with 3.5g sodium chloride (previous WHO-ORS), add 2 litres of water, 50 g sugar and 40 ml electrolyte-mineral solution with one 1000ml ORS packet.

Electrolyte-mineral solution

Weigh the following ingredients and make up to 2500 ml. Add 20 ml of electrolyte-mineral solution to 1000 ml of milk feed.

	Quantity (g)	Molar content of 20 ml
Potassium Chloride: KCl	224	24 millimol
Tripotassium Citrate: $C_6H_5K_3O_7 \cdot H_2O$	81	2 millimol
Magnesium Chloride: $MgCl_2 \cdot 6H_2O$	76	3 millimol
Zinc Acetate: $Zn(CH_3COO)_2 \cdot 2H_2O$	8.2	300 micromol
Copper Sulphate: $CuSO_4 \cdot 5H_2O$	1.4	45 micromol
Water: make up to	2500 ml	

Note: add selenium if available (sodium selenate 0.028 g, $\text{NaSeO}_4 \cdot 10\text{H}_2\text{O}$) and iodine (potassium iodide 0.012 g, KI) per 2500 ml.

Preparation: Dissolve the ingredients in cooled boiled water. Store the solution in sterilised bottles in the fridge to retard deterioration. Discard if it turns cloudy. Make fresh each month.

If the preparation of this electrolyte-mineral solution is not possible and if premixed sachets (see Step 4) are not available, give K, Mg and Zn separately:

Potassium:

- ◆ Make a 10% stock solution of potassium chloride (100 g KCl in 1 litre of water):
 - For oral rehydration solution, use 40 ml of stock KCl solution instead of 33 ml electrolyte-mineral solution
 - For milk feeds, add 22.5 ml of stock KCl solution instead of 20 ml of the electrolyte-mineral solution
- ◆ If KCl is not available, give syrup K (4 mmol/kg/day)

Magnesium:

- ◆ Give 50% magnesium sulphate intramuscularly once (0.3 ml/kg up to a maximum of 2 ml)

Zinc:

- ◆ Make a 1.5% solution of zinc acetate (15 g zinc acetate in 1 litre of water). Give the 1.5% zinc acetate solution orally, 1 ml/kg/day

Antibiotics reference table

Summary: Antibiotics for Severely Malnourished Children

If:	Give:	
No complications	Amoxicillin oral 15 mg/kg 8-hourly for 5 days	
Complications (shock, hypoglycaemia, hypothermia, dermatosis with raw skin/fissures, respiratory or urinary tract infections, or lethargic/sickly appearance)	Gentamicin IM/IV 7.5 days mg/kg once daily for 7	
	Ampicillin IM/IV 50 mg/kg 6-hourly for 2 days	Amoxycillin oral 15 mg/kg 8-hourly for 5 days
If a specific infection requires an additional antibiotic.	Specific antibiotics as required	

Doses for specific formulations and bodyweight ranges

Antibiotic	Route/dose/ frequency/ duration	Formulation	Dose according to child's weight		
			3.0-5.9 kg	6.0-7.9 kg	8.0-9.9 kg
Amoxicillin	Oral: 15 mg/kg every 8 hours for 5 days	Tablet: 250 mg	1/4 tablet	1/2 tablet	1/2 tablet
		Syrup: 125 mg/5 ml	2.5 ml	5 ml	5 ml
		Syrup: 250 mg/5 ml	1.5 ml	2 ml	2.5 ml
Cotrimoxazole (SMX + TMP)	Oral: 25 mg SMX + 5 mg TMP/kg every 12 hours for 5 days	Tablet, 100g SMX + 20 mg TMP	1 tablet	1 1/2 tablet	2 tablets
		Syrup: 200 mg SMX + 40 mg TMP per 5 ml	2.5 ml	4 ml	5 ml
Metronidazole	Oral: 7.5 mg/kg every 8 hours for 7 days	Suspension: 200 mg/ 5 ml	1 ml	1.25 ml	1.5 ml
Benzylpenicillin	IV or IM: 50,000 units/kg every 6 hours for 5 days	IV: Vial of 600 mg mixed with 9.6 ml sterile water to give 1,000,000 units/10 ml	2 ml	3.5 ml	4.5 ml
		IM: Vial of 600 mg mixed with 1.6 ml sterile water to give 1,000,000 units/2 ml	0.4 ml	0.7 ml	0.9 ml

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

Doses for iron syrup for a common formulation

Route/dose/ frequency	Formulation	3.0-5.9 kg	6.0-9.9 kg	10.0-14.9 kg
Oral: 3 mg/kg/daily	Iron syrup: ferrous fumerate 100 mg/5 ml (20 mg elemental iron per ml)	0.5 ml	0.75 ml	1 ml

Recipes for starter (F-75) and catch-up (F-100) formulas

There are two main groups of F-75 recipes: those which contain cereal flour and require cooking facilities, and those that do not contain cereal flour and do not require cooking. The F-75 recipes containing cereal flour should be used where possible, particularly for children with osmotic diarrhoea, because they have lower osmolality (approximately 330 mOsmol/L) than those without cereal flour (415 mOsmol/L). Commercial isotonic versions of F-75 (280 mOsmol/l), which contain maltodextrins instead of cereal flour and some of the sugar and which include all the necessary micronutrients, are also available for children with isotonic diarrhoea. F-100 does not contain cereal flour and requires no cooking.

Formula that needs to be stored more than 2 hours should preferably be kept in a refrigerator. It can be stored at room temperature for a maximum of 6 hours.

F-75 recipes if cereal flour and cooking facilities are available

Type of milk	Ingredients	Amount for F-75
Dried skimmed milk	Dried skimmed milk	25 g
	Sugar	70 g
	Cereal flour*	35 g
	Vegetable oil	30 g (or 35 ml)
	Electrolyte Mineral mix	20 ml
	Water: make up to	1000 ml
Dried whole milk	Dried whole milk	35 g
	Sugar	70 g
	Cereal flour*	35 g
	Vegetable oil	20 g (or 20 ml)
	Electrolyte Mineral mix	20 ml
	Water: make up to	1000 ml

Full-cream cow's milk (fresh or long life)	Full-cream cow's milk (fresh or long life)	300 ml
	Sugar	70 g
	Cereal flour*	35 g
	Vegetable oil	20 g (or 20 ml)
	Electrolyte Mineral mix	20 ml
	Water: make up to	1000 ml

*Cereal flour may be rice, wheat, maize, or whatever cereal is locally available.

Preparation:

If using an electric blender

- ◆ Put about 200 ml of boiled, cooled water into a blender. If you are using liquid milk instead of milk powder, omit this step.
- ◆ Add the flour, milk or milk powder, sugar, oil and electrolyte/mineral solution. Blend.
- ◆ Add cooled, boiled water to the 1000 ml mark and blend at high speed.
- ◆ Transfer the mixture to a cooking pot and boil gently for 4 minutes, stirring continuously.
- ◆ Some water will evaporate during cooking, so transfer the mixture back to the blender after cooking, and add enough boiled water to make 1000 ml. Blend again.

If using a hand whisk:

- ◆ Mix the flour, milk, or milk powder, sugar, oil and electrolyte/mineral mix in a 1-litre measuring jug.
- ◆ Slowly add cooled, boiled water up to 1000 ml.
- ◆ Transfer the mixture to a cooking pot and whisk the mixture vigorously.
- ◆ Boil gently for 4 minutes, stirring continuously.
- ◆ Some water will evaporate during cooking, so transfer the mixture back to the measuring jug after cooking, and add enough boiled water to make 1000 ml. Whisk again.

F-75 recipes if cereal flour and/or cooking facilities are unavailable and F-100 recipes

Type of milk	Ingredients	Amount for F-75	Amount for F-100
Dried skimmed milk	Dried skimmed milk	25 g	80 g
	Sugar	100 g	50 g
	Vegetable oil	30 g (or 35 ml)	60 g (or 70 ml)
	Electrolyte/mineral mix	20 ml	20 ml
	Water: make up to	1000 ml	1000 ml
Dried whole milk	Dried whole milk	35 g	110 g
	Sugar	100 g	50 g
	Vegetable oil	20 g (or 20 ml)	30 g (or 35 ml)
	Electrolyte/mineral mix	20 ml	20 ml
	Water: make up to	1000 ml	1000 ml
Full-cream cow's milk (fresh or long life)	Full-cream cow's milk (fresh or long life)	300 ml	880 ml
	Sugar	100 g	75 g
	Vegetable oil	20 g (or 20 ml)	20 g (or 20 ml)
	Electrolyte/mineral mix	20 ml	20 ml
	Water: make up to	1000 ml	1000 ml

Preparation:

If using an electric blender

- ◆ Put about 200 ml of boiled, cooled water into a blender. If you are using liquid milk instead of milk powder, omit this step
- ◆ Add the milk or milk powder, sugar, oil and electrolyte/mineral mix.
- ◆ Add cooled, boiled water to the 1000 ml mark and blend at high speed.

If using a hand whisk:

- ◆ Mix the milk powder and sugar in a 1-litre measuring jug, and then add the oil and stir well to make a paste. If you use liquid milk, mix the sugar and oil, then add the milk.
- ◆ Add the electrolyte/mineral mix, and slowly add boiled, cooled water up to 1000 ml, stirring all the time.
- ◆ Whisk vigorously.

F-75 feed volumes for children without severe oedema

**F-75 feed volumes for children without severe oedema are given below.
For children with severe (+++) oedema, see Annex 6.**

Weight of Child (kg)	Volume of F-75 per feed (ml) ^a			Daily total (130 ml/kg)	80% of daily total ^a (minimum)
	Every 2 hours ^b (12 feeds)	Every 3 hours ^c (8 feeds)	Every 4 hours (6 feeds)		
2.0	20	30	45	260	210
2.2	25	35	50	286	230
2.4	25	40	55	312	250
2.6	30	45	55	338	265
2.8	30	45	60	364	290
3.0	35	50	65	390	310
3.2	35	55	70	416	335
3.4	35	55	75	442	355
3.6	40	60	80	468	375
3.8	40	60	85	494	395
4.0	45	65	90	520	415
4.2	45	70	90	546	435
4.4	50	70	95	572	460
4.6	50	75	100	598	480
4.8	55	80	105	624	500
5.0	55	80	110	650	520
5.2	55	85	115	676	540
5.4	60	90	120	702	560
5.6	60	90	125	728	580
5.8	65	95	130	754	605
6.0	65	100	130	780	625
6.2	70	100	135	806	645
6.4	70	105	140	832	665
6.6	75	110	145	858	685
6.8	75	110	150	884	705
7.0	75	115	155	910	730
7.2	80	120	160	936	750
7.4	80	120	160	962	770
7.6	85	125	165	988	790
7.8	85	130	170	1014	810

Continued

F-75 feed volumes for children without severe oedema are given below. For children with severe (+++) oedema, see Annex 6.

Weight of Child (kg)	Volume of F-75 per feed (ml) ^a			Daily total (130 ml/kg)	80% of daily total ^a (minimum)
	Every 2 hours ^b (12 feeds)	Every 3 hours ^c (8 feeds)	Every 4 hours (6 feeds)		
8.0	90	130	175	1040	830
8.2	90	135	180	1066	855
8.4	90	140	185	1092	875
8.6	95	140	190	1118	895
8.8	95	145	195	1144	915
9.0	100	145	200	1170	935
9.2	100	150	200	1196	960
9.4	105	155	205	1222	980
9.6	105	155	210	1248	1000
9.8	110	160	215	1274	1020
10.0	110	160	220	1300	1040

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

^b Feed 2-hourly for first two days. Then, when little or no vomiting, modest diarrhoea (<5 watery stools per day), and finishing most feeds, change to 3-hourly feeds.

^c After 2 to 5 days on 3-hourly feeds: If no vomiting, less diarrhoea, and finishing most feeds, change to 4-hourly feeds.

Note:

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

F-75 feed volumes for children with severe oedema

F-75 feed volumes for children with severe (+++) oedema are given below.
For children without severe oedema, see Annex 5.

Weight with+++ oedema kg	Volume of F-75 per feed (ml) ^a			Daily total (130 ml/kg)	80% of daily total ^a (minimum)
	Every 2 hours ^b (12 feeds)	Every 3 hours ^c (8 feeds)	Every 4 hours (6 feeds)		
3.0	25	40	50	300	240
3.2	25	40	55	320	255
3.4	30	45	60	340	270
3.6	30	45	60	360	290
3.8	30	50	65	380	305
4.0	35	50	65	400	320
4.2	35	55	70	420	335
4.4	35	55	75	440	350
4.6	40	60	75	460	370
4.8	40	60	80	480	385
5.0	40	65	85	500	400
5.2	45	65	85	520	415
5.4	45	70	90	540	430
5.6	45	70	95	560	450
5.8	50	75	95	580	465
6.0	50	75	100	600	480
6.2	50	80	105	620	495
6.4	55	80	105	640	510
6.6	55	85	110	660	530
6.8	55	85	115	680	545
7.0	60	90	115	700	560
7.2	60	90	120	720	575
7.4	60	95	125	740	590

Continued

Weight with+++ oedema kg	Volume of F-75 per feed (ml) ^a			Daily total (130 ml/kg)	80% of daily total ^a (minimum)
	Every 2 hours ^b (12 feeds)	Every 3 hours ^c (8 feeds)	Every 4 hours (6 feeds)		
7.6	65	95	125	760	610
7.8	65	100	130	780	625
8.0	65	100	135	800	640
8.2	70	105	135	820	655
8.4	70	105	140	840	670
8.6	70	110	145	860	690
8.8	75	110	145	880	705
9.0	75	115	150	900	720
9.2	75	115	155	920	735
9.4	80	120	155	940	750
9.6	80	120	160	960	770
9.8	80	125	165	980	785
10.0	85	125	165	1000	800
10.2	85	130	170	1020	815
10.4	85	130	175	1040	830
10.6	90	135	175	1060	850
10.8	90	135	180	1080	865
11.0	90	140	185	1100	880
11.2	95	140	185	1120	895
11.4	95	145	190	1140	910
11.6	95	145	195	1160	925
11.8	100	150	195	1180	940
12.0	100	150	200	1200	960

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

^b Feed 2-hourly for at least first two days.. Then, when little or no vomiting, modest diarrhoea (<5 watery stools per day), and finishing most feeds, change to 3-hourly feeds.

^c After 2 to 5 days on 3-hourly feeds: If no vomiting, less diarrhoea, and finishing most feeds, change to 4-hourly feeds.

Range of volumes for free feeding with F-100

Weight of Child kg	Range of volumes per 4 hourly of F-100 (6 feeds daily)		Range of daily volumes of F-100	
	Minimum (ml)	Maximum (ml)	Minimum (150 ml/kg/day)	Maximum (220 ml/kg day)
2.0	50	75	300	440
2.2	55	80	330	484
2.4	60	90	360	528
2.6	65	95	390	572
2.8	70	105	420	616
3.0	75	110	450	660
3.2	80	115	480	704
3.4	85	125	510	748
3.6	90	130	540	792
3.8	95	140	570	836
4.0	100	145	600	880
4.2	105	155	630	924
4.4	110	160	660	968
4.6	115	170	690	1012
4.8	120	175	720	1056
5.0	125	185	750	1100
5.2	130	190	780	1144
5.4	135	200	810	1188
5.6	140	205	840	1232
5.8	145	215	870	1276
6.0	150	220	900	1320
6.2	155	230	930	1364
6.4	160	235	960	1408

Continued

Weight of Child kg	Range of volumes per 4 hourly of F-100 (6 feeds daily)		Range of daily volumes of F-100	
	Minimum (ml)	Maximum (ml)	Minimum (150 ml/kg/day)	Maximum (220 ml/kg day)
6.6	165	240	990	1452
6.8	170	250	1020	1496
7.0	175	255	1050	1540
7.2	180	265	1080	1588
7.4	185	270	1110	1628
7.6	190	280	1140	1672
7.8	195	285	1170	1716
8.0	200	295	1200	1760
8.2	205	300	1230	1804
8.4	210	310	1260	1848
8.6	215	315	1290	1892
8.8	220	325	1320	1936
9.0	225	330	1350	1980
9.2	230	335	1380	2024
9.4	235	345	1410	2068
9.6	240	350	1440	2112
9.8	245	360	1470	2156
10.0	250	365	1500	2200

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

Local alternatives to F-100

Culturally acceptable alternatives to F-100 that contain low-cost, culturally appropriate, nutritious, and locally available ingredients include halwa and khichuri. These foods can easily be prepared at home, and so their use in an inpatient therapeutic care centre serves the double purpose of rehabilitating the child and teaching the mother how to prepare and feed them to her child when the child returns home. They can also be fed to other siblings, thereby preventing them from becoming malnourished.

The recipes developed by ICCDR,B [8] are given below.

Halwa

Ingredient	Amount for 1 kg halwa
Wheat flour (atta)	200 g
Lentils (mashur dal)	100 g
Oil (soya)	100 ml
Molasses (brown sugar or gur)	125 g
Water (to make a thick paste)	600 ml
Total energy/kg	2,404 kcal
Total protein/kg	50.5 g

Soak the lentils in water for 30 minutes and then mash. Roast the wheat flour on a hot pan for a few minutes, and then mix with the mashed lentils, oil and water. Melt the molasses and add to the mixture to make a thick paste. Halwa takes about 15 minute to cook and can be kept at room temperature for 6-8 hours.

Khichuri

Ingredient	Amount for 1 kg khichuri
Rice	120 g
Lentils (mashur dal)	60 g
Oil (soya)	70 ml
Potato	100 g
Pumpkin	100 g
Leafy vegetable (shak)	80 g
Onion (2 medium size)	50 g
Spices (ginger, garlic, turmeric and coriander powder)	50 g
Water	1000 ml
Total energy/kg	1,442 kcal
Total protein/kg	29.6 g

Put the rice, lentils, oil, onion, spices and water in a pot and boil. Cut the potatoes and pumpkin into pieces and add to the pot after 20 minutes. Five minutes before the rice is cooked, add the cleaned and chopped leafy vegetable. The pot should be kept covered throughout cooking. Khichuri takes about 50 minutes to cook and can be kept at room temperature for 6-8 hours.

Management of severe acute malnutrition in infants aged <6 months

Feeding severely acutely malnourished young infants is labour intensive and requires different skills to those needed for older children. The table below summarizes the management of young severely malnourished infants from initial admission to discharge.

Outline for the management for severely malnourished infants <6 months	
Initial assessment and treatment	Management is the same as for older children: weigh and measure infant, diagnose and treat complications such as hypothermia, hypoglycaemia, dehydration, infection and septic shock.
Give the infant initial re-feeding	Feed the infant with appropriate milk feeds for initial recovery and metabolic stabilization (see below).
Feed and care for the mother	If the mother is available, feed and care for her physically and psychologically, to help restore her health, her ability to produce milk, and her ability to respond to her baby.
Keep mother and infant together	Keep mother and infant together, to help the mother care for and respond to the baby, and to give skin-to-skin contact (Kangaroo care) to warm the baby. Beds or mats are better for this than cots.
Continue and improve or re-establish breastfeeding	Unless the infant has to be artificially fed, breastfeeding is an integral part of management. Continue and improve or start to re-establish breastfeeding as soon as possible from the beginning of treatment, if necessary using the supplementary suckling technique (SST). A mother may need to express breast milk, if the infant is too weak to suckle. Show her how to do this. Give supplementary milk feeds using a breastfeeding supplementer if needed, as long as necessary, until exclusive breastfeeding is re-established.

Outline for the management for severely malnourished infants <6 months

Feed the infant for catch-up growth	As the infant starts to recover, feed him/her to achieve rapid catch-up growth, (nutrition rehabilitation). Give supplementary milk feeds using a breastfeeding supplementer if needed, as long as necessary, until exclusive breastfeeding is re-established.
Discharge when gaining weight on breastfeeding alone or on a safe alternative	Discharge the infant from inpatient facility when gaining weight for 5 days on breastfeeding alone (regardless of original body weight) or when the infant has changed completely to adequate artificial feeding with formula; and has had weight-for-length 80-85% of the median WHO standards reference values for 3

The selection of feeds for severely malnourished infants <6 months of age is an area of continued research and debate. Pending the development of new guidelines for this age group, the following is recommended.

- ◆ In the **stabilisation phase** give F-75 prepared without cereals. Where possible, breastfeeding or expressed breast milk is an alternative to F-75. If the production of breast milk is insufficient initially, combine expressed breast milk and appropriate therapeutic milk initially.
- ◆ In the **rehabilitation phase** the child should return to exclusive breastfeeding, if adequate milk production has been re-established and if infant feeds often enough day and night. If breastfeeding is not possible, the child can be give diluted F-100 (F-100 diluted by one-third extra water). Prior to discharge, non-breastfed infants should be changed to a breast-milk substitute suitable for preparation at home.

Monitoring records

Monitor respiratory rate, pulse rate and temperature 2-4 hourly until after transition to F-100 and patient is stable. Then monitoring may be less frequent (e.g., twice daily).

Danger Signs: Watch for increasing pulse and respirations, fast or difficult breathing, sudden increase or decrease in temperature, rectal temperature below 35.5° C, and other changes in condition.

MONITORING RECORD

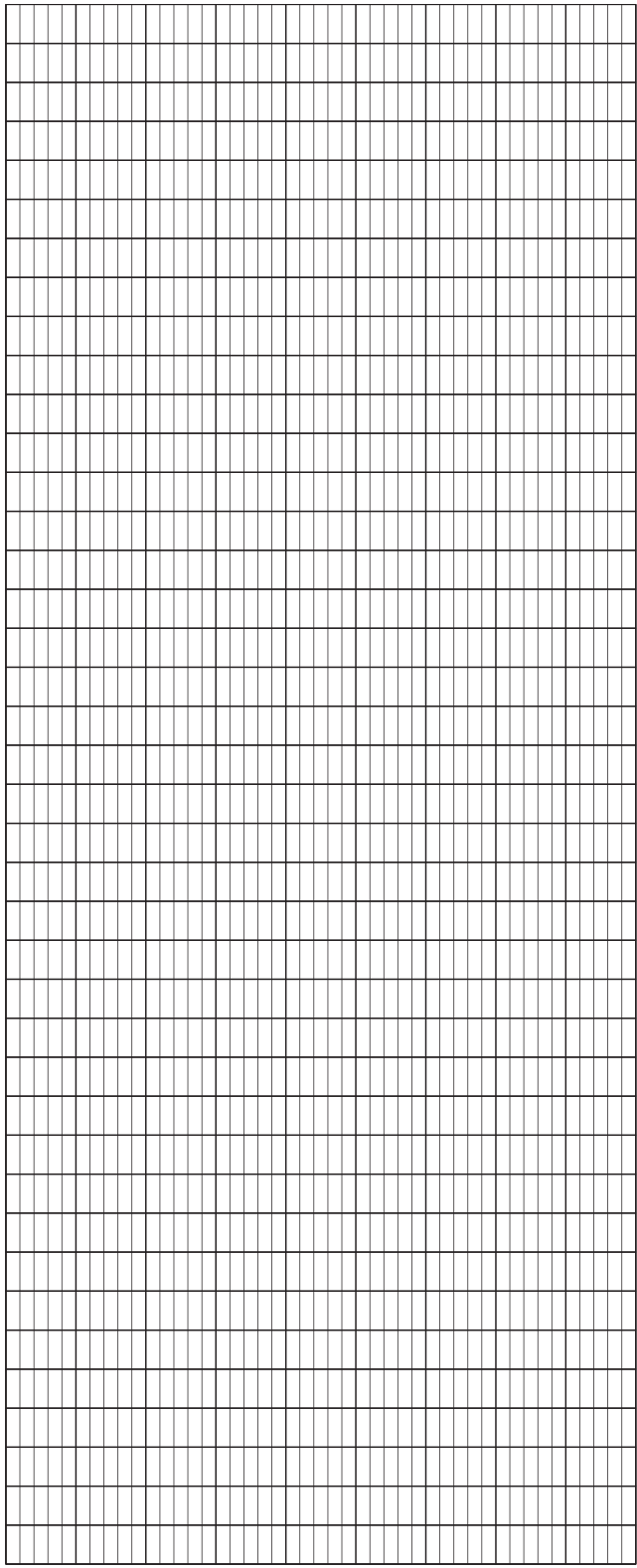
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[illegible]

Pulse rate

[illegible]

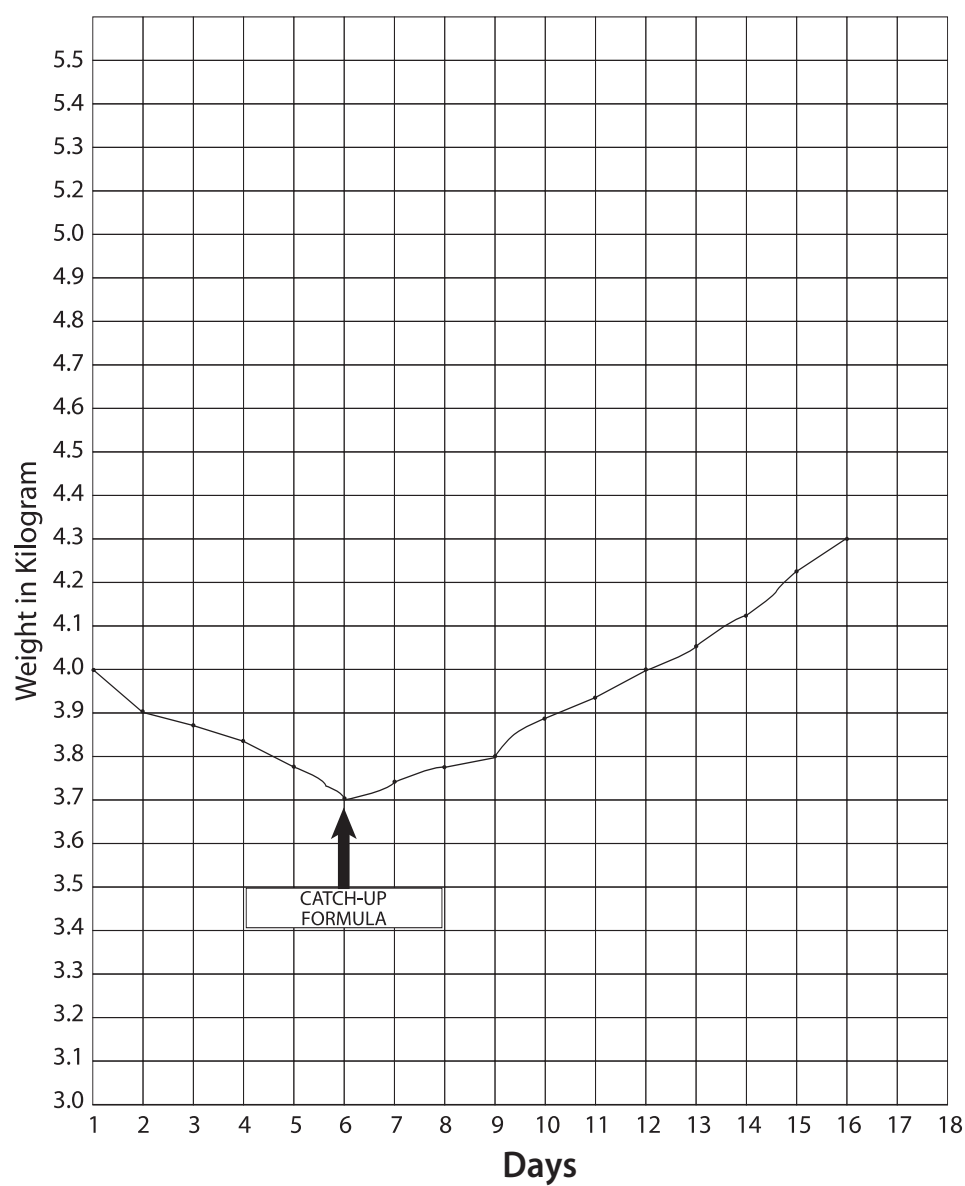
Temperature



Date/time

Weight record chart

Name: Saiful aged 14 months, male, 4 kg and 65 cm on admission, oedema ++



Structured play activities

Severely malnourished children have delayed mental and behavioural development which, if not treated, can become the most serious long-term result of malnutrition. Play therapy is intended to develop language and motor skills aided by simple toys. It should take place in a loving, relaxed and stimulating environment and can continue after discharge.

The aim should be to play with each child, individually, for 15-30 minutes each day, in addition to informal group play. Each play session should include language and motor activities, and activities with toys.

Language activities

At each play session:

- ◆ Teach local songs and games using the fingers and toes
- ◆ Encourage the child to laugh
- ◆ Describe what (s)he is doing, and repeat what (s)he says
- ◆ Teach action words with activities e.g. 'bang bang' as (s)he beats a drum, 'bye bye' as (s)he waves etc.
- ◆ Teach words at every opportunity, examples are in italics in the text below

Motor activities

Encourage the child to perform the next motor milestone. For example:

- ◆ Bounce the child up and down and hold him/her under the arms so that the feet support the child's weight
- ◆ Prop the child up, roll toys out of reach, encourage the child to crawl after them

- ◆ Hold hand and help the child to walk
- ◆ When starting to walk alone, give a 'push-along' and later a 'pull-along' toy

Activities with toys

Simple toys can easily be made from readily available materials. These toys can be used for a variety of different motor activities:

'Ring on a string'

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

'Rattle and drum'

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

'In and Out' toy with blocks

- ◆ Let the child explore blocks and container. Put blocks into container and shake it, then teach child to take them out, one at a time, saying 'out' and 'give me'
- ◆ Teach the child to take out blocks by turning container upside down
- ◆ Teach the child to hold a block in each hand and bang them together
- ◆ Let the child put blocks in and out of container saying 'in' and 'out'

- ◆ Cover blocks with container saying 'where are they, they are under the cover'. Let the child find them. Then hide them under two and then three covers (e.g. pieces of cloth)
- ◆ Turn the container upside down and teach the child to put blocks on top of the container
- ◆ Teach the child to stack blocks: first stack two then gradually increase the number. Knock them down saying, 'up up' then 'down'. Make a game of it
- ◆ Line up blocks horizontally: first line up two then more; teach the child to push them along making train or car noises. Teach older children words such as stop and go, fast and slow and next to. After this teach to sort blocks by colour, first two then more, and teach high and low building. Make up games

Posting bottle

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

Stacking bottle tops

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

Books

- ◆ Sit the child on your lap. Teach the child to turn the pages of the book and to point to the pictures. Then teach the child to point to the pictures that you name. Talk about the pictures. Show the child pictures of simple familiar objects and of people and animals. Teach older children to name the pictures and to talk about them.

Doll

- ◆ Encourage the child to hold and cuddle the doll. Teach the word 'baby'. Sing songs whilst rocking the child
- ◆ Teach the child to identify his/her own body parts and those of the doll when you name them. Teach older children to name their own body parts
- ◆ Put the doll in a box as a bed and give sheets, teach the words 'bed and sleep' and describe the games you play

Ring on a string (from 6 months)

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



Drum (from 12 months)

Any tin with a tightly fitting lid.

Mirror (from 18 months)

A tin lid with no sharp edges.

In-and-cut toy (from 9 months)

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



Rattle (from 12 months)

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



Pasling bottle (from 12 months)

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



Blocks (from 9 months)

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

Stacking bottle tops (from 12 months)

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



Push along toy (from 12 months)

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



Nesting toys (from 9 months)

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



Pull-along toy (from 12 months)

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



Puzzle (from 18 months)

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



Doll (from 12 months)

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

Book (from 18 months)

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



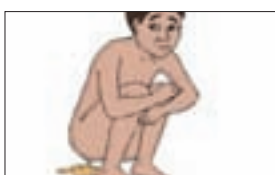
A model discharge card

Danger Signs - Bring Child for immediate Care if:

Not able to drink or breastfeed
Stops feeding



Diarrhoea more than 1 day or
blood in stool



Swelling in feet, hands legs or
arms



Fever (feels hot)



Convulsion (Fits)



Fast or difficult breathing



Come for Scheduled Follow-Up Visits

Next Planned Follow-UP:		Record of Visits			
Date	Place	Date	Ht/length	Weight	% wt-for ht

Vitamin A-Bring Child for a Dose Every Six Months

Next Dose Vitamin A:		Record of Doses Received:	
Date	Place	Date	Place

Immunizations Given

Tick or record date given:

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
BCG	DPT 1	DPT 2	DPT 3
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
OPV 0	OPV 2	OPV 2	OPV 3
			<input type="text"/>
			Measles

Next Immunization

Date	Dose(s) needed

DISCHARGE CARD

For Child Recovering from Severe Malnutrition
Hospital Name _____



Child's name: _____ M F Date of birth _____

Address: _____

	Date	Weight (Kg)	Ht/length (cm)	% weight-for-ht
Admission				
Discharge				



Instructions for Feeding at Home

What to feed? (Include recipe if needed) _____

How many and how often _____

Medications and Supplements

Give _____ drops _____ (multivitamin preparation) with food once daily.

Give 1 tablet folic acid once daily for _____ days

Give _____ Iron twice daily for 1 month.

Other: _____

Recommendations for Feeding During Sickness and Health

A good daily diet should be adequate in quantity and include an energy-rich food (for example, thick cereal with added oil), meat, fish, eggs, or pulses; and fruits and vegetables.

Up to 6 Months of Age



- Breastfeed as often as the child wants, day and night, at least 8 times in 24 hours.
- Breastfeed when the child shows signs of hunger beginning to fuss, sucking largers of moving the lips.
- Do not give other foods or fluids.
- Only in the child

Appears hungry after breastfeeding or is not gaining weight adequately, and non complementary foods (listed under 6 months up to 12 months). Give these food 1 or 2 times per day after breastfeeding.

6 Months up to 12 months



- Breastfeed as often as the child wants.
- Give adequate serving of

- 3 times per day if breastfed;
- 5 times per day if not breastfed;
- Add nutritious snacks



- Small chewable items to eat with fingers. Let the child try to food salt, but provide help

12 Months up to 2 years



- Breastfeed as often as the child wants.
- Give adequate serving of

of family foods 5 times per day



- Continue to actively help the child to eat

2 years and Older



- Give family foods at 3 meals each day. Also twice daily, give nutritious food between meals, such as:



- Offer a variety of foods. If a new food is refused, offer 'tastes' several times show that you like the food

Up to 4 months of age

Play: Provide ways for your child to see, hear, feel and move



Communicate: Look into your child's eyes and smile at him or her. When you are breastfeeding is a good link.

4 months up to 8 months

Play: Have large colourful things for your child to reach for and now things to see



Communicate: Talk to your child and get a conversation going with sounds or gestures

Play: Give your child things to stack up, and to put into containers and take out.



Communicate: Ask your child simple questions, respond your child's attempts to talk. Play games like 'bye'

Play: Help your child count, name, and compare things. Make simple toys for your child.



Communicate: Encourage your child to talk and answer your child's questions. Teach your child songs and games

These recommendations are consistent with current WHO infant feeding policy.

The decision when precisely to begin complementary feeding should be made in consultation with a health worker, based on the individual infant's specific growth and development needs.

Feeding Recommendations for a child who has PERSISTENT DIARRHOEA

- If still breastfeeding, give more frequent, longer breastfeeds, day and night
- If taking other milk: replace with increased breastfeeding OR replace with fermented milk products, such as yoghurt OR replace half the milk with nutrient rich semisolid food
- For other foods, follow feeding recommendations for the child's age.

Composition of Rice Suji: a lactose-free diet for persistent diarrhoea due to lactose intolerance

	Rice suji
Rice powder (g)	60
White of eggs (g)	100 (4 eggs)
Sugar (g)	35
Soya oil (g)	30
Magnesium chloride (g)	0.5
Potassium chloride (g)	1.0
Calcium lactate (g)	2.0
Cooked volume (L)	1.0
Energy (kcal/100 mL)	70
Protein (g/100 mL)	1.88
Protein energy ratio, %	8
Fat energy ratio, %	47



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Supported by: **unicef** 