Islamic Republic of Afghanistan

Ministry of Public Health
General Directorate of Preventive Medicine
Public Nutrition Department

Integrated Guidelines for the Management of Acute Malnutrition
FOR
PUBLIC PRIVATE PARTNERSHIP AT PRIMARY HEALTH CARE LEVEL

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FOREWORD
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<tr>
<td>AWG</td>
<td>Average Weight Gain</td>
</tr>
<tr>
<td>BHC</td>
<td>Basic Health Centre</td>
</tr>
<tr>
<td>CHC</td>
<td>Comprehensive Health Centre</td>
</tr>
<tr>
<td>CHS</td>
<td>Community Health Supervisor</td>
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<tr>
<td>CHW</td>
<td>Community Health Worker</td>
</tr>
<tr>
<td>C-IMCI</td>
<td>Community – Integrated Management of Childhood Illness</td>
</tr>
<tr>
<td>CMV</td>
<td>Combined Mineral Vitamin Mix</td>
</tr>
<tr>
<td>Diluted F100</td>
<td>Diluted Formula 100 therapeutic milk</td>
</tr>
<tr>
<td>DH</td>
<td>District Hospital</td>
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<tr>
<td>ER</td>
<td>Emergency Room</td>
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<td>FAO</td>
<td>Food and Agriculture Organisation</td>
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<td>F 75</td>
<td>Formula 75 therapeutic milk</td>
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<td>F 100</td>
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<tr>
<td>Hb</td>
<td>Haemoglobin</td>
</tr>
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<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
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<td>IMAM</td>
<td>Integrated Management of Acute Malnutrition</td>
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<td>IMCI</td>
<td>Integrated Management of Childhood Illness</td>
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<tr>
<td>IYCF</td>
<td>Infant and Young Child Feeding</td>
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<tr>
<td>LO-ORS</td>
<td>Low Osmolarity Oral Rehydration Solution</td>
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<tr>
<td>LOS</td>
<td>Length Of Stay</td>
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<tr>
<td>MAM</td>
<td>Moderate Acute Malnutrition</td>
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<td>MCH</td>
<td>Mother and Child Health</td>
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<td>MoPH</td>
<td>Ministry of Public Health</td>
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<tr>
<td>MUAC</td>
<td>Mid-Upper Arm Circumference</td>
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<tr>
<td>NCHS</td>
<td>National Centre for Health Statistics</td>
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<tr>
<td>NG</td>
<td>Nasogastric</td>
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<td>Outpatient Department</td>
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<tr>
<td>ORS</td>
<td>Oral Rehydration Solution</td>
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<tr>
<td>PCV</td>
<td>Packed Cell Volume</td>
</tr>
<tr>
<td>PH</td>
<td>Provincial Hospital</td>
</tr>
<tr>
<td>PLW</td>
<td>Pregnant or Lactating Woman</td>
</tr>
<tr>
<td>ReSoMal</td>
<td>Rehydration Solution for Malnutrition</td>
</tr>
<tr>
<td>RUSF</td>
<td>Ready to Use Supplementary Food</td>
</tr>
<tr>
<td>RUTF</td>
<td>Ready to Use Therapeutic Food</td>
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<td>Severe Acute Malnutrition</td>
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<td>SFP</td>
<td>Supplementary Feeding Programme</td>
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<td>United Nations Children’s Fund</td>
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<td>Weight for Age</td>
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<td>WFH/L</td>
<td>Weight for Height / Length</td>
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<tr>
<td>WHO</td>
<td>World Health Organisation</td>
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INTRODUCTION

PURPOSE OF GUIDELINES
The National Guideline for Integrated Management of Acute Malnutrition was developed as a tool to assist health workers in the assessment and appropriate management with services and/or counselling for the treatment both Moderate Acute Malnutrition (MAM) and Severe Acute Malnutrition (SAM). Strict implementation of the guidelines with a strong emphasis on the community outreach services can significantly contribute towards reducing the under-five mortality rate due to acute malnutrition.

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

The guidelines will also help responders involved in nutrition rehabilitation during emergencies to standardize treatment protocols established by the MoPH. Local adaptations may be made in service implementation depending on available resources; these should be done with the collaboration and consent of MoPH.

HOW TO USE THE GUIDELINES
Implementation of the National Integrated Guidelines for Management of Acute Malnutrition should consider the following:

- Services to provide care of the child or pregnant / lactating woman with acute malnutrition should be decentralised as far as possible to achieve maximum case coverage
- Efforts must emphasise the regular and effective screening of children in the community and in the health facilities
- Acute malnutrition, for children with no IMCI danger signs should be managed in the community wherever trained staff and facilities are available
- Efforts to manage acute malnutrition must go hand in hand with efforts to curb the underlying causes of malnutrition in the target area
- Services should be provided in such a way as to ensure effective linkages between treatment services and implement a smooth chain of service provision between community, outpatient and inpatient care
- Consult with MoPH Technical Officers for additional support where required

ORGANISATION OF SERVICES FOR THE TREATMENT OF ACUTE MALNUTRITION
The assessment and management of malnutrition is part of the holistic care offered through the Basic Package of Health Services (BPHS) in Afghanistan. Previously these treatments were available only as part of emergency programming but are now integrated into the BPHS so that holistic care can be offered through the standard health facilities.
The management of acute malnutrition can now be made available through simple treatment protocols at all levels of health services. This is not a stand-alone service and should be linked with other treatments / services available at the health facility and in the community.

The identification of acute malnutrition starts in the community with the active finding of cases through activities which are integrated into the usual activities of the Community Health Worker (CHW) and Community Health Supervisors (CHS). Once identified, cases of acute malnutrition can be referred to the local health facility for further assessment and management.

At the health facility an assessment of the child or Pregnant or Lactating Woman (PLW) will decide what treatment is appropriate. Cases of acute malnutrition which are not associated with any other serious medical illness (complications) may be treated as outpatients through the local health facility.

Cases where there is acute malnutrition associated with a complication require referral to an inpatient unit for more intensive treatment. After a period of stabilisation, the individual with acute malnutrition may be referred back to the local health facility for continuing treatment as an outpatient until cure. From community to Hospital, the management of acute malnutrition operates as a single service and requires strong linkages between the community and local health facility and the local health facility and the hospital.

**CONTENT OF THE GUIDELINES**

The guidelines are divided into the following sections. Each section is colour coded for easy reference:

- Introduction
- Section 1: Overview of Malnutrition
- Section 2: Assessment & Triage of Acute Malnutrition
- Section 3: Community Outreach
- Section 4: Outpatient Management of Acute Malnutrition for Children 6-59 months
- Section 5: Outpatient Management of Acute Malnutrition for Pregnant and Lactating Women
- Section 6: Inpatient Management of Severe Acute Malnutrition for Children 6-59 months
- Section 7: Inpatient Management of children aged less than 6 months and inpatient management of children older than 6 months weighing less than 3 kg
SECTION 1: OVERVIEW OF MALNUTRITION

This section contains the following sub-sections:

- Definition of Malnutrition
- Causes of Malnutrition
- Pathophysiology of Malnutrition
- Classification of Malnutrition
- Prevention and Treatment of Malnutrition
- Micronutrient Deficiencies
- Infant and Young Child Feeding

DEFINITION OF MALNUTRITION

Malnutrition is a term which comprises all forms of ‘bad’ nutrition which includes both ‘undernutrition’ and ‘overnutrition’. In the context of these guidelines, the term malnutrition relates exclusively to undernutrition; in particular, the guidelines focus on the treatment of one type of undernutrition called ‘Acute Malnutrition’.

Undernutrition may be defined as a lack of the minimum amount of proteins, carbohydrates, lipids, vitamins, minerals, and other nutrients essential for health and proper growth. Undernutrition may result from an inadequate food intake or a disease process resulting in an imbalance of or malabsorption of nutrients or increased nutrient requirements / losses.

CAUSES OF MALNUTRITION

Malnutrition is a disease which is caused by the interaction of many factors. The UNICEF conceptual framework for malnutrition [Figure 1 below] provides a way to understand how these causes are related to each other. The causes are divided into immediate causes, underlying causes and basic causes. The way in which these factors interact with each other is different for each country, for communities within each country and even for individuals within each community.

Immediate Causes:

Inadequate food intake and disease are inextricably linked. Food intake refers to both the quantity and quality of food required to provide adequate amounts of nutrients for health and growth. A poor intake of food may adversely affect the individual by disturbing biochemical processes which causes a decrease in organ function. This affects every organ in the body. The reduced function of body systems may lead to the onset or worsening of other disease conditions.

The presence of infection may directly increase the nutritional requirements of the body because fever elevates body temperature and the rate of utilisation of nutrients increases. Vomiting and diarrhoea may adversely affect the absorption and utilisation of nutrient intake because the food does not pass through the gut in the usual way which may lead to an inadequate nutrient availability to the body. These immediate causes affect the individual. The treatment of the immediate causes of malnutrition requires attention to both adequate dietary intake according to age and the treatment of any other medical problems.

Underlying Causes:

The immediate causes of malnutrition may be affected by other factors. An adequate food intake for the individual will not be possible if the food available in the household will not provide the diet needed to avoid malnutrition. The lack of the appropriate foods in the house is called ‘household food insecurity’. An inadequate dietary intake may also result from inadequate child or maternal care. For example a child aged less than 6 months may not be provided with exclusive breastfeeding, or the recommended complementary feeding practices for older infants are not used [see annexes 3 to 7]. Disease may also be caused through inadequate child care, for example the child may not have been vaccinated against

2 Disease: a disordered or abnormal condition of an organ or other part of an organism resulting from the effect of genetic or developmental errors, infection, nutritional deficiency, toxicity, or unfavourable environmental factors; illness; sickness.
preventable diseases or there may be inadequate hygiene practices in the home. It may be that there are no adequate or accessible services available for the vaccination of children or the provision of proper hygiene. An inadequate public health environment also contributes to the likelihood of infection or other diseases ultimately leading to malnutrition. The underlying causes are usually those seen at the household or community level.

**Basic Causes:**

The underlying causes described above may be related to other factors which are beyond the control of individuals and often communities. These factors, which may include the international economy, national economy or national health and education infrastructure, contribute to a situation where it is difficult to provide the education or the services required to prevent disease or provide the education on eating a healthy diet.

**FIGURE 1 UNICEF CONCEPTUAL FRAMEWORK FOR MALNUTRITION**

**PATHOPHYSIOLOGY OF MALNUTRITION**

Malnutrition is a process which occurs over time. As the availability of nutrients to the body is reduced the body undergoes adaptation. Traditionally this has been referred to as Protein Energy Malnutrition, however this term is misleading. This lack of adequate nutrients is related not only to proteins but also to other nutrients including those micronutrients which are also essential for growth; in fact the absence of micronutrients alone can produce signs and symptoms of malnutrition. In children malnutrition affects growth in various ways; the child may grow more slowly in height (stunting) they may become thin (wasting) or they may be found to be less than the normal weight for their age (underweight). When recovering from malnutrition, both macronutrients AND micronutrients must be present in the diet in the proper proportions to allow recovery and catch up normal growth which has been lost.

All nutrients are essential to the body, but some have different uses. Some nutrients are required for normal systemic function but are not essential for growth while some nutrients must be present in the right amounts in order for growth to occur. Nutrients may be divided into two types according to their FUNCTION in the body, those which are essential for growth and those which are not. The classification is based on the response to a deficiency of the nutrients.

**Type 1 Nutrients:** These nutrients, when deficient produce specific clinical signs which are diagnostic for the deficiency. Administration of the deficient nutrient reverses the clinical signs. These nutrients are **NOT** essential for growth.
**Type 2 Nutrients**: These nutrients must be present in the diet in the right proportions for proper growth to occur and include both macronutrients and micronutrients. A deficiency in one nutrient produces a deficiency in all. The signs and symptoms of a deficiency in these nutrients are indistinguishable from each other.

Examples of type 1 and type 2 nutrients and the differences in response to deficiency are given in annex 1. A mild deficiency of a type 2 nutrient slows linear growth in children. If the deficiency continues over a period of time, the child appears significantly shorter than other children of the same age and sex. This process is called ‘stunting’ and is sometimes referred to as a form of ‘chronic malnutrition’ because it occurs over months or years. Importantly this process is most noticeable during the first 2 years of life when the child is growing most rapidly and has the greatest need for nutrients. After the age of 2 years the stunting becomes irreversible so there is a great emphasis put on ensuring he best nutrition for the child in this period.

When there is a mild deficiency causing stunting, there may be no other clinical signs of the deficiency; the shape of the body is normal. When the deficiency of type 2 nutrients is greater, linear growth stops altogether but the child never grows shorter. When there are even greater deficiencies, the body stats to get thinner (wasting). The classification and measurement of malnutrition falls into 2 broad categories ‘chronic’ and ‘acute’ malnutrition.

1. **Chronic Malnutrition**
   a. Stunting measured by height for age
   b. Underweight measured by weight for age

2. **Acute Malnutrition**
   a. Wasting measured using mid upper arm circumference or weight for height
   b. Oedema measure by the presence and extent of bilateral pitting oedema

Although these categories appear separate, there is some overlap and the different forms of malnutrition can all occur together in the same individual. The category of underweight is measured by comparing the weight of the child with the normal (median) weight of normally nourished child of the same age. A child may be underweight for their age because they have stunting, because they have wasting or some combination of stunting AND wasting.

Using weight for age and height for age are useful measurements to assess the growth of the child. Wasting and oedema are associated with an increased risk of mortality. Identifying children with wasting and oedema and giving the appropriate treatment is therefore a priority.

**The Pathophysiology of Acute Malnutrition**

The process of wasting occurs as a ‘reductive adaptation’ to nutrient shortage. Physiological and behavioural changes occur which reduce the need for nutrients and reduce energy expenditure. During this adaptation organs and physiological systems reduce or lose their ‘redundant capacity’ and the individual is no longer able to adapt to changes in the external or internal environment as was previously possible. Maintaining this excess functional capacity is very costly in terms of the nutrition required so that the reduction of the organ function saves on the amount of nutrients and energy needed to sustain it. All of the systems in the body are affected by these changes.

As reductive adaptation continues, the individual becomes more prone to infections and less able to respond to that infection. Organ functions continue to deteriorate; the liver loses its capacity to metabolise and detoxify protein. Further ingestion of protein could be potentially fatal and the individual loses their appetite as a self defence mechanism, preferably digesting their own body tissues for the metabolites needed for survival.

The loss of appetite is a crucial point in the process where, without specialised interventions (such as therapeutic milk) the process is irreversible and death results quickly. By this point the normal physiology is highly deranged with fluids and electrolytes present in abnormal levels in the different body compartments.

In the initial stages of treatment of severe wasting, this pathophysiology must be reversed carefully, during a stabilisation phase using low protein milk (excess protein can be fatal to the child) and low energy (excessive energy can induce refeeding syndrome leading to death). As cellular processes recover, fluid and electrolytes move between compartments (e.g. from intercellular to intravascular spaces). If heart and kidney function has not also recovered to an adequate extent, fluid overload may occur and heart failure and death may occur quickly.
More importantly, during the recovery process, the replacement of a single deficient type 2 nutrient at the normal daily requirement does not reverse the wasting and allow rapid catch up growth. During the rapid catch up growth following wasting, all of the required nutrients must be present in higher than normal quantities.

The consequences of acute malnutrition affect every organ and system, giving rise to the typical signs and symptoms seen. Annex 2 gives an overview of the effects of acute malnutrition on each organ system.

The point at which breakdown of physiological coping mechanisms occurs differs for each child. As systems become disrupted IMCI danger signs and other complications start to occur.

The presence of bilateral pitting oedema is always a sign of severe acute malnutrition. In children, other conditions such as nephritic syndrome also give rise to oedema however the two conditions can usually be distinguished through examination and the taking of a careful history. In the case of nutritional oedema, the swelling is first expressed in the feet and lower limbs whilst in nephritic syndrome; the oedema is usually present in the facial features first.

The aetiology of nutritional oedema is quite different from nephritic syndrome although the consequences of oedematous malnutrition also result in high mortality. Recent studies suggest a genetic predisposition to oedema rather than wasting. The formation of oedema results from a protein losing enteropathy however it is not due primarily to a low protein diet; low protein diets are used to reverse this form of malnutrition as with wasting.

It appears from studies that the development of oedema results in a preservation of lean tissue to some extent and may even be protective in terms of the development and progression of certain diseases. In any case the treatment of this condition is the same as for children with wasting. Cases of severe oedema marked by swelling which is generalised and includes the facial features is associated with high mortality.

Occasionally, oedema occurs which is combined with severe wasting. When both forms of SAM are present the risk of mortality is high and treatment is given in the inpatient setting. This combination of severe wasting and oedematous malnutrition is called ‘Marasmic-Kwashiorkor’

If the acute malnutrition is detected before complications have occurred, cases of moderate or severe wasting and cases of mild and moderate oedema can be successfully treated in the outpatient setting. It is only cases with complications or very severe forms of acute malnutrition which need treatment in an inpatient unit.

CLASSIFICATION OF ACUTE MALNUTRITION

A new classification of malnutrition was devised [see figure 2 below] so as to differentiate cases which can be managed in the community and which need referral to inpatient care. The primary classification is whether the individual has any medical complications since this is the main factor deciding on inpatient or outpatient care. The classification of severe and moderate cases of acute malnutrition is defined by anthropometric measurements or by the presence and grade of oedema. It is the classification by anthropometry which decides the most appropriate treatment as an inpatient or as an outpatient. These are described further in section 2, [The Assessment and Triage of Acute Malnutrition]

FIGURE 2  CLASSIFICATION OF ACUTE MALNUTRITION (COLLINS & YATES 2003)

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4 Collins and Yates, 2003: The need to update the classification of Acute Malnutrition: The Lancet, 362, (93979), 2003:249
**Prevention and Treatment of Malnutrition**

Malnutrition is best prevented rather than cured. While many of the basic causes of malnutrition are beyond the control of individuals and communities, it is possible to mitigate some of these causal factors through the provision of quality services, counselling and education.

- Immunisation
- Promotion of hygiene & sanitation
- Nutrition counselling (especially important for children aged less than 2 years)
- Behavioural change to encourage timely seeking of preventative / curative services
- Promotion of understanding and recognition of malnutrition in the community
- Promotion of the right quantity and quality of the child’s diet

The prevention and identification of malnutrition is not solely a health issue, it involves a role for other sectors. At the level of the health facility, the proper assessment and referral of children for services at every contact opportunity plays a vital role in its prevention or timely treatment of malnutrition.

The prevention and treatment of malnutrition is not a stand-alone service, it is part of the holistic care of the child which is offered through the BPHS and Extended Package of Health Services (EPHS). New research and developments in the approach to identification and treatment of malnutrition have enabled the development of simple protocols which can be implemented at community level and allow the child to have access to services provided locally and the child to be treated at home.

Disease and poor food intake are the immediate causes of malnutrition as illustrated above (see figure 1). The prevention of malnutrition in part may be achieved through proper dietary intake. This is especially important for children in the first 2 years of life and the correct feeding according to the child’s age is essential. The **quality** of food intake is as important as the **quantity**. Micronutrients play a vital role in proper growth and development and should be part of the counselling given to mothers. A varied diet rich in micronutrients should be advised for the pregnant or breastfeeding mother and for the child over the age of 6 months.

**Micronutrient deficiencies**

Another important form of malnutrition is micronutrient deficiencies. The most common forms of micronutrient deficiencies are:

- Iron / folate causes anaemia
- Vitamin A causes night blindness & xerophthalmia, Bitot spots
- Iodine causes goitre & cretinism
- Vitamin C causes scurvy
- Niacin (B3) causes pellagra

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➤ Thiamin (B1) causes beriberi

The requirements for micronutrients for children and women of various ages are indicated in table 3 below. The Afghanistan National Guidelines of Micronutrients (prevention, control and treatment), 2010, gives specific advice for each of the major micronutrients. The provision of micronutrients in the diet may be enhanced by advising mothers to buy foods which are fortified or through the provision of micronutrient supplements as part of routine health services. During pregnancy and after delivery, the mother should be advised regarding proper micronutrient intake as part of ante-natal and post-partum services.

| TABLE 1 | MICRONUTRIENT REQUIREMENTS FOR CHILDREN AND WOMEN |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|               | Vitamin A (mcg/d) | Vitamin C (mg/d) | Folate (mcg/d) | Iodine (mcg/d) | Iron (mg/d) | Zinc (mg/d) | Vitamin D (mcg/d) |
| Infants:       |                 |                  |                |                |            |            |                 |
| 0-6 m          | 400             | 40               | 65             | 110            | 0.27       | 2           | 5               |
| 7-12 m         | 500             | 50               | 80             | 130            | 11         | 3           | 5               |
| Children:      |                 |                  |                |                |            |            |                 |
| 1-3 yrs.       | 300             | 15               | 150            | 90             | 7          | 3           | 5               |
| 4-8 yrs.       | 400             | 25               | 200            | 90             | 10         | 5           | 5               |
| Females:       |                 |                  |                |                |            |            |                 |
| 9-13 yrs.      | 600             | 45               | 300            | 120            | 8          | 8           | 5               |
| 14-18 yrs.     | 700             | 65               | 400            | 150            | 15         | 9           | 5               |
| 19-30 yrs.     | 700             | 75               | 400            | 150            | 18         | 8           | 5               |
| 31-50 yrs.     | 700             | 75               | 400            | 150            | 18         | 8           | 5               |
| 51-70 yrs.     | 700             | 75               | 400            | 150            | 8          | 8           | 10              |
| >70 yrs.       | 700             | 75               | 400            | 150            | 8          | 8           | 15              |
| Pregnancy:     |                 |                  |                |                |            |            |                 |
| ≤18 yrs.       | 750             | 80               | 600            | 220            | 27         | 13          | 5               |
| 19-30 yrs.     | 770             | 85               | 600            | 220            | 27         | 11          | 5               |
| 31-50 yrs.     | 770             | 85               | 600            | 220            | 27         | 11          | 5               |
| Lactation:     |                 |                  |                |                |            |            |                 |
| ≤18 yrs.       | 1200            | 115              | 500            | 290            | 10         | 14          | 5               |
| 19-30 yrs.     | 1300            | 120              | 500            | 290            | 9          | 12          | 5               |
| 31-50 yrs.     | 1300            | 120              | 500            | 290            | 9          | 12          | 5               |


When a woman becomes acutely malnourished during pregnancy this affects the birth weight of the child; low birth weight children are at higher risk of mortality. Supplementary food rations supplied to an acutely malnourished pregnant or lactating woman aim to reduce this risk and are detailed further in section 5 of these guidelines.

The utilisation of micronutrients is increased during disease so that clinicians should be mindful that the normal diet of the child may not provide enough micronutrients to prevent the child from becoming malnourished. When there is illness or diarrhoea, the clinician should advise the carer not to stop feeding and to increase the food intake of the child.

**INFANT AND YOUNG CHILD FEEDING (IYCF)**

The vast majority of child malnutrition in Afghanistan occurs in children aged less than 2 years, the greatest proportion of these being in children aged less than 6 months. These children are most vulnerable due to the proportionally higher energy and nutrient requirements according to body weight than any other age group coupled with their vulnerability to disease.

The prevention of disease and malnutrition in this group starts with the early initiation of breastfeeding (within 1 hour of birth) and the giving of colostrum (baby’s first vaccination). On-going care should involve the giving of exclusive breastfeeding for the first 6 months of life and childhood vaccinations against preventable diseases. The continuation of breastfeeding to the age of 2 years and the proper introduction of age appropriate complementary foods after the age of

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6 months combine to give the child the best start in life, preventing disease and growth retardation (stunting). After the age of 2 years the child grows relatively more slowly and the effects of malnutrition and stunting become essentially irreversible.

The feeding of infants and young children may be subject to many cultural practices which are detrimental to the developing child. Proper counselling is an essential part of the provision of health services for this age group. Details of such counselling and recommended practices are detailed in the Afghanistan National Strategy for Infant and Young Child Feeding and UNICEF IYCF guidelines.

Counselling on Infant and Young Child Feeding (IYCF), forms part of an integrated strategy on the reduction of child mortality and morbidity. It is essential that strong linkages between IYCF, IMCI, vaccination and other maternal and child services are formed to maximise the impact of these approaches.

The basic elements of counselling for IYCF are described in annexes 3-7 at the end of this section.
# ANNEX 1  CLASSIFICATION OF NUTRIENTS ACCORDING TO THEIR EFFECT ON GROWTH

<table>
<thead>
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<th>Type 2 nutrients</th>
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<td>Copper</td>
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<td>Sodium</td>
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<td>Magnesium</td>
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<td>Selenium</td>
<td>Zinc</td>
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<td>Calcium</td>
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<td>Protein</td>
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<td>Thiamin</td>
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<td>Threonine</td>
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<td>Nicotinic Acid</td>
<td>Lysine</td>
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<td>Cobalamin</td>
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</tr>
<tr>
<td>Folate</td>
<td>Oxygen</td>
</tr>
<tr>
<td>Ascorbic Acid</td>
<td></td>
</tr>
<tr>
<td>Retinol</td>
<td></td>
</tr>
<tr>
<td>Tocopherol</td>
<td></td>
</tr>
<tr>
<td>Vitamin D</td>
<td></td>
</tr>
<tr>
<td>Vitamin K</td>
<td></td>
</tr>
</tbody>
</table>

Differences between type 1 and type 2 deficiency response

<table>
<thead>
<tr>
<th>Type 1 nutrients</th>
<th>Type 2 nutrients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth continues in early stages</td>
<td>Growth failure first response</td>
</tr>
<tr>
<td>Specific clinical signs develop</td>
<td>No specific clinical signs</td>
</tr>
<tr>
<td>Body stores nutrients</td>
<td>No body store of nutrients</td>
</tr>
<tr>
<td>Concentrated in particular tissues</td>
<td>Not concentrated in any particular tissue</td>
</tr>
<tr>
<td>Specific enzymes affected</td>
<td>General effect on metabolism</td>
</tr>
<tr>
<td>Not usually anorexic</td>
<td>Anorexia a common response</td>
</tr>
<tr>
<td>tissue concentration independent of other types of nutrients</td>
<td>Dependent upon all the other type 2 nutrients</td>
</tr>
<tr>
<td>Tissue concentration drops with deficiency</td>
<td>Tissue concentration maintained with deficiency</td>
</tr>
<tr>
<td>Tissue concentration maintained in different metabolic states</td>
<td>Tissue concentration may change depending on metabolic state</td>
</tr>
<tr>
<td>food sources very variable</td>
<td>Ratio in foods not very variable</td>
</tr>
<tr>
<td>Diagnosed by biochemical tests</td>
<td>Do not give specific biochemical abnormalities</td>
</tr>
<tr>
<td>Anthropometric abnormality appears late in the deficiency</td>
<td>Diagnosed by anthropometric abnormality</td>
</tr>
</tbody>
</table>
### Cardiovascular System
- Cardiac output and stroke volume are reduced
- Sudden increases in cardiovascular volume may result in heart failure
- Reduced blood pressure compromises tissue/organ perfusion

### Gastro-intestinal system
- Production of gastric acid is reduced compromising the first line of immunity
- Intestinal motility is decreased
- Production of digestive enzymes is reduced
- Pancreas is atrophied
- Intestinal mucosa/microvilli are atrophied allowing invasion of pathogens through the stomach wall leading to diarrhoea
- Absorption of nutrients is reduced when large amounts of food are eaten
- Normal gut flora is disturbed with an overgrowth of pathogenic bacteria

### Liver function
- Abnormal metabolites of amino acids are produced
- Detoxification of by-products of protein metabolism (ammonia) is compromised
- Reduced storage of glycogen
- Reduced gluconeogenesis (increasing the risk of hypoglycaemia)
- Heat production (normally 1/3rd of body requirements) is reduced
- Transferrin activity is reduced limiting capacity to absorb and reduce iron.

### Genitourinary system
- Renal perfusion and circulation time are reduced
- Glomerular filtration is reduced
- Sodium excretion is reduced
- Urinary phosphate output is low
- Ability to concentrate urine reduced

### Immune system
- Lymph glands, tonsils and thymus are atrophied
- Cell mediated T-cell immunity is severely reduced
- IgA levels in secretions are reduced
- Complement components are low
- Production of phagocytes is reduced and do not kill ingested bacteria efficiently
- Acute phase immune response is diminished
- Hypothalamic temperature regulation is impaired
- Production of phagocytes is reduced and do not kill ingested bacteria efficiently
- Acute phase immune response is diminished
- Tissue damage does not result in normal inflammation or white cell migration
- Hypothalamic temperature regulation is impaired

### Endocrine system
- Insulin production is reduced and glucose intolerance increased
- Insulin Growth Factor (IGF-1) production is reduced
- Growth hormone production is reduced
- Cortisol levels increased

### Circulatory system
- Plasma volume is usually normal
- Red cell volume is reduced

### Homeostasis
- Basal Metabolic Rate reduced by 30%
- Temperature regulation is impaired producing poikilothermy
- Reduced energy expenditure through reduced activity
- Sodium pump activity is reduced
- Cell membranes are more permeable than normal, which leads to an increased intracellular sodium
- Decreased intracellular potassium and magnesium

### Skin, Muscles and Exocrine Glands
- The skin and subcutaneous fat are atrophied, which leads to loose folds of skin.
- Normal signs of dehydration are unreliable; eyes may be sunken because of loss of subcutaneous fat in the orbit.
- Many glands, including the sweat, tear and salivary glands are atrophied; the child has dryness of the mouth, and eyes and sweat production is reduced.
- Respiratory muscles are easily fatigued; the child is lacking in energy.

### Psychological
- Child may be easily irritable
- Child may be lethargic
- Rumination may occur after feeding
- Child may experience developmental delays
During your pregnancy, eat one extrasmall meal or "snack" (extra food between meals) each day to provide energy and nutrition for you and your growing baby.

You need to eat the best foods available, including milk, fresh fruit and vegetables, meat, fish, eggs, grains, peas and beans.

Drink whenever you are thirsty.

Taking tea or coffee with meals can interfere with your body’s use of the foods. Limit the amount of coffee you drink during pregnancy.

During pregnancy and breastfeeding, special nutrients will help your baby grow well and be healthy.

Take iron and folic acid tablets to prevent anaemia during pregnancy and for at least 3 months after your baby’s birth.

Take vitamin A tablets immediately after delivery or within 6 weeks so that your baby receives the vitamin A in your breast milk to help prevent ill health.

Use iodised salt to help your baby’s brain and body develop well.

Attend antenatal care at least 4 times during pregnancy. These check-ups are important for you to learn about your health and how your baby is growing.

Take de-worming tablets to help prevent anaemia.

To prevent malaria, sleep under an insecticide-treated mosquito net and take anti-malarial tablets as prescribed.

Learn your HIV status, attend all clinic appointments and take your medicines as advised by your health provider.

Adolescent mothers: you need extra care, more food and more rest than an older mother. You need to nourish your own body which is still growing, as well as your growing baby’s.
Breastmilk provides all the food and water that your baby needs during the first 6 months.

Do not give anything else, not even water, during your baby's first 6 months.

Even during very hot weather, breast milk will satisfy your baby's thirst.

Giving your baby anything else will cause him/her to suckle less and will reduce the amount of breast milk that you produce.

Water, other liquids and food can make the baby sick.

You can give medicines if they are recommended by your health provider.

Exclusive breastfeeding means feeding your baby only breast milk for the first 6 months.

Breast milk provides all the food and water that your baby needs during the first 6 months of life.

Exclusive breastfeeding for the first 6 months protects your baby from many illnesses, such as diarrhoea and respiratory infections.

When you exclusively breastfeed your baby during the first 6 months and have no menses, you are protected from another pregnancy.

Mixed feeding means feeding your baby both breast milk and any other foods or liquids, including infant formula, animal milks, or water.
➢ Mixedfeeding before 6 months can damage your baby's stomach.

➢ Mixedfeeding increases the chance that your baby will suffer from illnesses such as diarrhoea and pneumonia, and from malnutrition.

➢ Giving your baby foods or any kind of liquids other than breastmilk including infant formula, animal milks or water before 6 months can damage your baby's stomach. This reduces the protection that exclusive breastfeeding gives and all of the benefits that your baby gets from breastmilk.

➢ Breastfeed your baby on demand, day and night.

➢ More suckling with good attachment makes more breast milk.

➢ Crying is a sign of hunger. Early signs that your baby wants to breastfeed include:
  o Restlessness
  o Opening mouth and turning head from side-to-side
  o Putting tongue in and out
  o Sucking on fingers and fists

➢ Let your baby finish one breast before offering the other. Switching back and forth from one breast to the other prevents the baby from getting the nutritious 'hindmilk'. The 'foremilk' has more water and satisfies the baby's thirst. The 'hindmilk' has more fat and satisfies your baby's hunger.

➢ If your baby is ill or sleepy, wake him or her to offer the breast often.

➢ Do NOT use bottles, teats or spouted cups. They are difficult to clean and can cause your baby to become sick.

**Feeding the sick baby aged less than 6 months**

➢ Breastfeed more frequently during illness, including diarrhoea, to help the baby fight sickness, reduce weight loss and recover more quickly.

➢ Breastfeeding also provides comfort to your sick baby. If your baby refuses to breastfeed, encourage your baby until he or she takes the breast again.

➢ Give only breast milk and medicines recommended by your doctor/healthcare provider.

➢ If the baby is too weak to suckle, express breast milk to give the baby. This will help you to keep up your milk supply and prevent breastfeeding difficulties.

➢ After each illness, increase the frequency of breastfeeding to help your baby regain health and weight.

➢ When you are sick, you can continue to breastfeed your baby. You may need extra food and support during this time.
 ✓ Continue breastfeeding your baby on demand both day and night. This will maintain his/her health and strength as breastmilk continues to be the most important part of your baby’s diet.

 ✓ Breastmilk supplies half (1/2) baby’s energy needs from 6 to 12 months.

 ✓ Breastfeed first before giving other foods.

 ✓ When giving complementary foods to your baby, think; Frequency, amount, thickness, variety, active /responsive feeding and hygiene.
   - Frequency: Feed your baby complementary foods 3 times per day.
   - Amount: Increase amount gradually to half (1/2) cup (250 ml cup; show amount in cup brought by the mother). Use a separate plate to make sure the young child eats all the food given.
   - Thickness: Give pureed/mashed family foods. By 8 months baby can begin eating finger foods.
   - Variety: Try to feed a variety of foods at each meal. For example:
     - Animal source foods (flesh meats, eggs and dairy products)
     - Staples (grains, roots and tubers)
     - Legumes and seeds
     - Vitamin A rich fruits and vegetables and other fruits and vegetables.

 Feeding the sick baby aged more than 6 months:

 ✓ Offer the baby simple foods breastfeed more frequently during illness, including diarrhoea, to help your baby fight sickness, reduce weight loss and recover more quickly.

 ✓ Your baby needs more food and liquids while he or she is sick.

 ✓ If your child's appetite is decreased, encourage him or her to eat small, frequent meals.

 ✓ Like porridge and avoid spicy or fatty foods. Even if the child has diarrhoea, it is better for him or her to keep eating.

 ✓ After your baby has recovered, actively encourage him or her to eat one or two additional meals of solid food a day during the following two weeks. This will help your child regain the weight he or she has lost.

 ✓ When you are sick, you can continue to breastfeed your baby. You may need extra food and support during this time. When you are sick, you will also need plenty of liquids.
ANNEX 6 COMPLEMENTARY FEEDING FROM 9 UP TO 12 MONTHS

➢ Continue breastfeeding your baby on demand both day and night. This will maintain his/her health and strength as breastmilk continues to be the most important part of your baby’s diet.

➢ Breastmilk supplies half (1/2) baby’s energy needs from 6 to 12 months.

➢ Breastfeed first before giving other foods.

➢ When giving complementary foods to your baby, think; Frequency, amount, thickness, variety, active /responsive feeding and hygiene:
  o Frequency: Feed your baby complementary foods 4 times per day.
  o Amount: Increase amount gradually to half (1/2) cup (250 ml cup; show amount in cup brought by the mother). Use a separate plate to make sure the young child eats all the food given.
  o Thickness: Give finely chopped family foods, finger foods, sliced foods.
  o Variety: Try to feed a variety of foods at each meal. For example;
    ▪ Animal source foods (flesh meats, eggs and dairy products)
    ▪ Staples (grains, roots and tubers)
    ▪ Legumes and seeds
    ▪ Vitamin A rich fruits and vegetables and other fruits and vegetables
ANNEX 7 COMPLEMENTARY FEEDING 12-24 MONTHS

➤ Continue breastfeeding your baby on demand both day and night. This will maintain his/her health and strength as breastmilk continues to be the most important part of your baby’s diet.

➤ Breastmilk continues to make up about one third (1/3) of the energy needs of the young child from 12 up to 24 months.

➤ To help your baby continue to grow strong and breastfeed, you should use a family planning method to prevent another pregnancy.

➤ When giving complementary foods to your baby, think; Frequency, Amount, Thickness, Variety, Active/Responsive Feeding and Hygiene
  - Frequency: Feed your young child complementary foods 5 times per day
  - Amount: Increase amount to three quarters (3/4) to one (1) cup (250 ml cup; show amount in cup brought by mother). Use a separate plate to make sure young child eats all the food given.
  - Thickness: Give foods cut into small pieces, finger foods, sliced food.
  - Variety: Try to feed a variety of foods at each meal. For example;
    - Animal source foods (flesh meats, eggs and dairy products)
    - Staples (grains, roots and tubers)
    - Legumes and seeds
    - Vitamin A rich fruits and vegetables and other fruits and vegetables.
SECTION 2: ASSESSMENT, DIAGNOSIS & TRIAGE OF ACUTE MALNUTRITION

This section contains the following sub-sections:

- Assessment of Acute Malnutrition in Children aged 6 to 59 months
- Assessment of Acute Malnutrition in Children aged less than 6 months
- Assessment of Acute Malnutrition in Pregnant or Lactating Women

The assessment of acute malnutrition requires an assessment of both anthropometric status and clinical signs and symptoms in order to triage and treat the cases appropriately. The assessment of acute malnutrition varies according to the age of the child which also differs from the assessment of pregnant and lactating women (PLW).

ASSESSMENT OF ACUTE MALNUTRITION IN CHILDREN AGED 6 TO 59 MONTHS

The measurement of anthropometric criteria is a proxy for the physiological changes happening in the body. They are not precise measures but they do have a relationship to the risk of mortality. Currently the measures used are;

- Mid-Upper Arm Circumference (MUAC)
- Weight for Height / Length (using WHO growth standards, 2006)
- Oedema (graded according to severity)

These different measures are not equal to each other; they identify different children. All of these anthropometric indicators are independent criteria for admission meaning that the child should be treated for acute malnutrition if ANY ONE OF THEM applies.

Because of the simplicity of measuring MUAC and oedema it can be used to detect acute malnutrition in the community and at health facilities. The assessment of MUAC and oedema are the first priority in the assessment of acute malnutrition. If acute malnutrition is identified using MUAC or oedema there is no need to also use weight for height to confirm the diagnosis.

Measuring weight for height is more time consuming and labour intensive than measuring MUAC and oedema and should be done at the health facility level only. This can also be a problem at busy clinics when caseloads are high therefore when caseloads and time allow the measurement of weight for height it should be used to screen children for acute malnutrition AFTER MUAC and oedema have been found to be normal but acute malnutrition is still suspected.

MID UPPER ARM CIRCUMFERENCE (MUAC)

The measurement of the mid upper arm provides a measure of both the fat and the lean muscle mass of the upper arm. During the progress of malnutrition as lean mass is lost the risk of death becomes greater.

Since 2005, MUAC has been recognised by WHO and other UN agencies as the best indicator for the risk of mortality in children between 6-59 months. While MUAC changes with age as the child grows, the risk of death as measured by MUAC is independent of age for the 6-59months age group.

Figure 3 below illustrates the increasing risk of mortality as the MUAC becomes less and the child becomes more acutely malnourished.

- MUAC 11.5 to 12.5cm  = 1.5 x increased risk (indicates Moderate Acute Malnutrition)
- MUAC less than 11.5cm  = 4- 20 x increased risk (indicates Severe Acute Malnutrition)

MUAC can be used for both admission and discharge from treatment for MAM / SAM. The technique for measuring MUAC is illustrated in annex 8.
Weight for height also identifies children at increased risk of mortality from acute malnutrition. This is particularly true of the new WHO growth standards (2006). The old National Centre for Health Statistics (NCHS) standards do not accurately reflect the risk of mortality and should not be used.

**FIGURE 4** RISK OF MORTALITY ACCORDING TO WEIGHT FOR HEIGHT (WHO, 2006)

> -2Z scores to -3Z scores indicates Moderate Acute Malnutrition
> -3Z scores indicates Severe Acute Malnutrition

The techniques for measuring weight, height and weight for height are illustrated in annexes 9, 10 and 11 respectively.

OEDEMA

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7 Myatt et al 2005: A review of methods to detect cases of severely malnourished children in the community for their admission into community based therapeutic care programs: WHO informal global consultation for the community-based management of severe malnutrition
Oedematous malnutrition is **ALWAYS** an indication of severe acute malnutrition. The oedema can be graded according to its severity and this has implications in terms of where the child should be treated.

Annex 12 illustrates the classification of oedema as noted below. The important features to notice are that nutritional oedema is always bilateral. Oedema of only one limb may be indicative of another disease process. Oedematous malnutrition always begins in the feet and as severity increases it becomes more widespread;

- **Grade 1+** oedema: Bilateral pitting oedema of the feet
- **Grade 2+** oedema: Bilateral oedema of the feet and lower limbs / hands
- **Grade 3+** oedema: Generalised oedema of feet, lower limbs, hands and periorbital

Grade 1+ and 2+ may be treated as an outpatient. Grade 3+ must always be treated as an inpatient due to the high risk of mortality.

**MARASMIC - KWASHIORKOR**

The terms wasting and oedema are preferable to the terms Marasmus and Kwashiorkor respectively. However all of these terms continue to be used. One form of acute malnutrition is called Marasmic-Kwashiorkor (MK). This is a combination of both forms of severe acute malnutrition and is associated with a very high mortality risk. Children with MK should **ALWAYS** be treated as inpatients irrespective of other clinical signs and symptoms.

**CHILDREN OLDER THAN 6 MONTHS WEIGHING LESS THAN 3 KG**

Children who are older than six months but weight less than 3 kg should be referred to an inpatient unit for treatment. Children in this category may be suffering developmental delay and the immaturity of their organs (e.g. kidney function) requires careful nutritional management in the inpatient unit using the same therapeutic milk used for children aged less than 6 months. **RUSF and RUTF are unsuitable for this group of children**

After measuring the child using MUAC, weight for height and the assessment of oedema the child can be classified regarding the degree of acute malnutrition.

**TABLE 2  CLASSIFICATION OF ACUTE MALNUTRITION IN CHILDREN 6-59 MONTHS BASED ON ANTHROPOMETRY**

<table>
<thead>
<tr>
<th>Age</th>
<th>Moderate Acute Malnutrition</th>
<th>Severe Acute Malnutrition</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 to 59 months</td>
<td>- MUAC: less than 12.5 to 11.5 cm or</td>
<td>- MUAC less than 11.5 cm or</td>
</tr>
<tr>
<td></td>
<td>- WFH/L less than -2Z to -3Z scores and</td>
<td>- WFH/L less than -32 scores or</td>
</tr>
<tr>
<td></td>
<td>- Oedema is absent</td>
<td>- Bilateral oedema is present</td>
</tr>
</tbody>
</table>

**CLINICAL SIGNS**

As acute malnutrition progresses, a process of reductive adaptation occurs [section 1]. When the adaptations begin to break down the child becomes progressively more vulnerable to complications. Ultimately the child may lose their appetite. These clinical signs are used together with the measurements of MUAC, oedema and weight for height to decide how it is most appropriate to treat the child (triage).

**CLINICAL COMPLICATIONS**

Complications which may develop during the progress of acute malnutrition are shown below in table 3. These complications include the IMCI danger signs among others. A child presenting with acute malnutrition with any of these complications must be triaged carefully.

- A child with SAM + complications must be treated in an inpatient unit providing therapeutic care for SAM
- A child with MAM + complications must be referred to the paediatric ward of the hospital

**TABLE 3  CLINICAL COMPLICATIONS OF ACUTE MALNUTRITION**
Clinical complication | Criteria
---|---
High fever | Greater than 39 C (102.2 F)
Hypothermia | Less than 35.5 C (96 F)
Persistent vomiting | Vomits all food and fluids
Severe dehydration | Clinical signs + recent history of fluid loss
Severe anaemia | Severe palmar pallor
Unconscious / convulsing | Reduced level of consciousness / lethargy / fitting
Difficult or fast breathing | 2 to 12 months Greater than 50 breaths / min  12 to 59 months Greater than 40 breaths / min
Skin lesions | Extensive skin ulceration requiring IV / IM antibiotics

APPETITE
The loss of appetite in a child with acute malnutrition may indicate a serious pathophysiology [section x]. In order to be treated as an outpatient, the child must be able to eat the Ready to Use Foods which are provided as part of the treatment.

- **RUSF** Ready to Use Supplementary Food Used to treat MAM in outpatient care
- **RUTF** Ready to Use Therapeutic Food Used to treat SAM in outpatient care

The appetite is assessed for a child identified as being acutely malnourished. This is called “the appetite test” and is done at the time of the initial diagnosis of acute malnutrition and at every follow up visit to the health facility until the child is discharged cured.

**NB:** RUSF and RUTF are not suitable for children aged less than 6 months.

THE APPETITE TEST
When testing appetite, the child should be given clean water to drink before and during the test and if required the carer and child may go to a quiet space where the child can eat the RUSF/RUTF with encouragement from the carer. The appetite test may take up to 30 mins and may be done while the clinician continues to see other patients.

In any case, a child considered to have a poor appetite as indicated by the categories in table 4 below MUST be transferred to hospital for further assessment.

The appetite test

1. Ask the carer to wash their hands with soap and water
2. Tear open the packet of RUSF / RUTF at the corner
3. Offer the child sips of clean water before beginning the appetite test
4. Children older than 2 years may hold the packet themselves if they are able to feed themselves and children younger than 2 years require assistance to feed themselves
5. The carer should offer a small amount of RUSF/RUTF from the corner of the packet or if the child needs assistance a small amount on a spoon or the carers finger
6. Immediately give the child more water to sip
7. Repeat the cycle of RUSF/RUTF followed by sips of water until the test is complete as indicated in Table 4
8. For children who are sick or unwilling, the appetite test may take up to 30 mins. The test may continue in a quiet corner for this time while the staff continue seeing other cases

<p>| TABLE 4 | CATEGORISATION OF THE APPETITE TEST |</p>
<table>
<thead>
<tr>
<th>Age / Weight</th>
<th>Good appetite</th>
<th>Poor appetite</th>
</tr>
</thead>
<tbody>
<tr>
<td>less than 5kg</td>
<td>Eats at least ¼ packet</td>
<td>Eats less than ¼ packet</td>
</tr>
<tr>
<td>More than 5kg</td>
<td>Eats at least 1/3 packet</td>
<td>Eats less than 1/3 packet</td>
</tr>
<tr>
<td>More than 6 months AND less than 3 kg</td>
<td>DO NOT USE RUSF/RUTF IN THIS GROUP – TRANSFER TO INPATIENT CARE</td>
<td></td>
</tr>
</tbody>
</table>

A child with a good appetite may be treated as an outpatient. If the child has a poor appetite:

- A child with MAM and a poor appetite should be examined for the underlying cause and prescribed appropriate medication. If required they may be transferred to another higher level health facility with additional diagnostic equipment and/or appropriate medical staffing.
- A child with SAM and poor appetite should be transferred to hospital for inpatient care for SAM and treated as a medical emergency.

It is rare (but possible) that a child with MAM may lose appetite because the physiological ability to adapt to reduced food intake or disease process is lost more quickly than the anthropometric severity would suggest. If no clear cause for the lack of appetite is diagnosed at lower level health facilities the child should be admitted to an inpatient unit for further assessment.

Following the assessment of the child using anthropometry, clinical signs and testing for appetite, the child can be triaged and treated appropriately according to the severity of the condition. Figure 5 below indicates the algorithm to decide on the correct treatment.

**FIGURE 5 ALGORITHM FOR DIAGNOSIS AND TRIAGE OF CHILDREN 6-59 MONTHS WITH ACUTE MALNUTRITION**

* If no facilities for the outpatient treatment of SAM exist refer all children with SAM to an inpatient unit*

**ASSESSMENT OF ACUTE MALNUTRITION IN CHILDREN AGED LESS THAN 6 MONTHS**

Infants aged less than 6 months are highly susceptible to acute malnutrition and should be screened routinely during any contact with the health facility and by CHWs in the community. The assessment of these infants is different from older children for MUAC and WFH/L;
MUAC cannot be used in children aged less than 6 months
WFH/L can only be used in children with a length greater than 45cm
Oedema is assessed in the same way as for older children

Infants aged less than 6 months may present to the health facility because they are sick or not the mother feels unable or unwilling to breastfeed and the child is not gaining weight. If the infant presents at any visit and has any IMCI danger sign they should be referred to hospital immediately for further assessment.

During the visit to the health facility the infant should be weighed and an assessment of breastfeeding made. If the infant is too weak to suckle effectively, the infant should be referred to inpatient care for SAM immediately. If the infant appears to be breastfeeding, a full assessment should be made of feeding practices and counselling on exclusive breastfeeding given [see annexes 3-7, Section 1]. A follow up counselling session should be arranged for the following week and the infant weighed again. If the child does not gain weight since the first visit, the child should be referred to the inpatient unit for SAM.

Except using WFH/L it is not possible in this age group to classify acute malnutrition as being moderate or severe. There is no appetite test since RUSF and RUTF are unsuitable for infants aged less than 6 months and are not used in this age group.

The goal of treatment in these cases is to intervene early in the progress of malnutrition if the child is not gaining weight as expected and to re-establish exclusive breastfeeding whenever possible. If breastfeeding is not possible the child will be treated with therapeutic milk until cure and the mother taught the safe preparation and use of formula milk at home.

### TABLE 5 CRITERIA FOR REFERRAL OF INFANTS AGED LESS THAN 6 MONTHS TO INPATIENT SAM TREATMENT

<table>
<thead>
<tr>
<th>Age</th>
<th>Moderate Acute Malnutrition</th>
<th>Severe Acute Malnutrition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 6 months</td>
<td>◆ MUAC: Do not use</td>
<td>◆ MUAC: Do not use</td>
</tr>
<tr>
<td></td>
<td>◆ WFH/L: Less than -2Z to -3Z scores* and</td>
<td>◆ WFH/L: Less than -3Z scores or</td>
</tr>
<tr>
<td></td>
<td>◆ Oedema is absent</td>
<td>◆ Bilateral pedal oedema</td>
</tr>
<tr>
<td></td>
<td>* Assess WFH/L if infant is more than 45cm</td>
<td>◆ Visible severe wasting</td>
</tr>
<tr>
<td></td>
<td>◆ Infant is too weak to suckle effectively</td>
<td>* Assess WFH/L if infant is more than 45cm</td>
</tr>
<tr>
<td></td>
<td>◆ Infant is not gaining weight despite breastfeeding counselling</td>
<td></td>
</tr>
<tr>
<td></td>
<td>◆ Visible severe wasting</td>
<td></td>
</tr>
</tbody>
</table>

**ASSESSMENT OF ACUTE MALNUTRITION IN PREGNANT AND LACTATING WOMEN**

The assessment of acute malnutrition for pregnant and lactating women (PLW) is done using MUAC only. Weight for height is not used as this is an unreliable indicator in these groups. The eligibility criteria for this group is indicated in table 6 below.

The aim of treatment for PLWs is to supplement the woman’s diet if she becomes acutely malnourished to prevent low birth weight of the infant on delivery and to provide nutrition during the first six months of the infant’s life while the woman is exclusively breastfeeding.

Unlike other treatments given to children, there are no discharge criteria based on anthropometry. The woman once eligible for support receives the rations until the infant reaches 6 months of age.
### TABLE 6 CRITERIA FOR ACUTE MALNUTRITION IN PREGNANT AND LACTATING WOMEN

<table>
<thead>
<tr>
<th>Category</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnant women</td>
<td></td>
</tr>
<tr>
<td>☐ From the 2nd Trimester</td>
<td>MUAC &lt; 23cm</td>
</tr>
<tr>
<td>Lactating Women</td>
<td></td>
</tr>
<tr>
<td>-----------------</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
- Breastfeeding infant aged less than 6 months
Ensure a MUAC tape with the correct cut-off points is used. Discard any others.

- RED MUAC 11.5cm Indicates SAM
- YELLOW MUAC 11.5 to 12.5cm Indicates MAM
- GREEN MUAC > 12.5cm Normal

- Remove the child’s clothing to expose the left arm
- Identify the mid-point of the left arm between the tip of the shoulder and tip of the elbow
- Mark the position of the mid-point with a marker pen or keep the finger over the location
- Wrap the MUAC tape around the mid-point of the left arm
- Ensure the tape lies comfortably against the skin with no gaps (too loose)
- Ensure the tape is not pinching the skin of the arm even slightly (too tight)
- Take the reading where the arrow on the tape indicates Figure 6 below

**FIGURE 6** PICTURE INDICATING CORRECT MEASUREMENT OF MUAC READING AT THE ARROW
ANNEX 9 MEASURING WEIGHT

Weight can be measured using a Salter-type hanging spring scale (as is commonly found in the field) or an electronic scale (e.g. SECA scale or UNISCALE) which enables a child to be measured in the mother/caregiver’s arms.

Hanging Spring (Salter) Scale

A 25 kg hanging spring scale accurate to 100g should be used. In the field setting, the scale is hooked to a tree, a tripod or a stick held by two people. In a clinic, it is attached to the ceiling or a stand. The important factors here are that when being weighed, the child should be hanging freely without touching other objects and that the scale should be able to be read at eye level.

The child should be weighed naked and ideally a separate room to allow privacy should be used. If clothing is worn it must be the absolute minimum (light underwear only). A misdiagnosis of weight can adversely affect the classification of malnutrition and subsequent treatment.

How to use the Salter Scale: (see figure 7 below)

1. Before weighing the child, take all his/her clothes off.
2. Zero the weighing scales (i.e., make sure the arrow is at zero (with the weighing pants attached)
3. Place the child in the weighing pants/hammock
4. Hang the child in the weighing pants from the scale ensuring the child is not touching any objects
5. Read the child’s weight. The arrow should be steady and the weight scale should be read at eye level
6. If the child is very agitated, the arrow may move considerably. Either wait until the child is calm or take an average weight which is between the two extremes
7. Record the weight in kg and to the nearest 100 g (e.g., 6.4 kg).

Considerations:
- Make sure the child is safely in the weighing pants or hammock with one arm in front and one arm behind the straps to help maintain balance, hanging upright
- In cold climates ensure the weighing area is heated and the child is undressed for the minimum time.

The scale should be checked daily against a known weight. To do this, set the scale to zero and weigh objects of known weight (e.g., 1, 2, 5 and 10kg). If the measure does not match the weight to within 100 grams, the scale must be recalibrated or the scale should be replaced.

How to use the SECA / UNISCALE: (see figure 8 below)

1. Turn on the scale. Cover the solar panel for 2 seconds. When ‘zero’ appears, the scale is ready.
2. The mother should remove her shoes. The weighing assistant should hold the infant / child
3. Ask the mother to stand in the middle of the scale, feet slightly apart, and remain still
4. Remind the mother to stay still on the scale until told the weighing is complete
5. With the mother remaining still on the scale and her weight displayed, zero the scale by covering the solar panel for 2 seconds. The scale should now read zero with the mother standing alone
6. Tell the mother to remain still and gently hand the naked infant / child to the mother
7. The baby’s weight appears on the display. Record the weight being careful to read the numbers correctly
8. If the child is aged 2 years or able to stand still the child may be weighed alone on the scale.
FIGURE 7  MEASURING WEIGHT WITH A HANGING SCALE

Mother's weight alone.

Zero the scale

Baby's weight appears on display.

FIGURE 8  USING A SECA SCALE TO MEASURE WEIGHT
ANNEX 10 MEASURING HEIGHT

To increase accuracy and precision, two people are always needed to measure length and height.

Children aged 2 years or able to stand correctly are measured standing up, while those under 2 or unable to stand correctly are measured lying down. If the age is difficult to assess, children at least 87 cm tall (using WHO 2006 growth standards) are measured standing, and those less than 87 cm are measured lying down.

If children age 2 or older or at least 87 cm tall are measured lying down, 0.7 cm is subtracted from the measurement.

For children aged 2 Years or able to stand or with a height of equal or greater than 87 cm

1. The child's shoes are removed.
2. The child is placed on the height board, standing upright in the middle of the board with arms at his/her sides.
3. The assistant firmly presses the child's ankles and knees against the board while the measurer holds the child's head straight.
4. The child's head, shoulders, buttocks and heels should be touching the board, and his/her feet should be close together.
5. The measurer positions the sliding board and takes the measurement to the nearest 0.1 cm.
6. The measurer announces the measurement, and the assistant repeats it for verification and records it on the anthropometric form or health card.

FIGURE 9 MEASURING HEIGHT
For Children aged less than 2 Years or unable to stand or less than 87 cm tall

1. The height board is placed flat/horizontal on the ground.
2. The child's shoes are removed.
3. The child is gently placed on his/her back on the middle of the board, facing straight up with arms at his/her sides and feet at right angles.
4. The assistant holds the sides of the child's head and positions it on the board.
5. While holding down the child's ankles or knees, the measurer moves the sliding board up against the bottom of the child's feet and takes the measurement to the nearest 0.1 cm.
6. The measurer announces the measurement, and the assistant repeats it for verification and records it on the anthropometric form or health card.

FIGURE 10 MEASURING LENGTH

**Boys' weight (kg)** | **Length (cm)** | **Girls' weight (kg)**
--- | --- | ---
-4 Z | -3 Z | -2 Z | -1 Z | Median | Median | -1 Z | -2 Z | -3 Z | -4 Z
1.7 | 1.9 | 2.0 | 2.2 | 2.4 | 45 | 2.5 | 2.3 | 2.1 | 1.9 | 1.7
1.8 | 2.0 | 2.2 | 2.4 | 2.6 | 46 | 2.6 | 2.4 | 2.2 | 2.0 | 1.9
2.0 | 2.1 | 2.3 | 2.5 | 2.8 | 47 | 2.8 | 2.6 | 2.4 | 2.2 | 2.0
2.1 | 2.3 | 2.5 | 2.7 | 2.9 | 48 | 3.0 | 2.7 | 2.5 | 2.3 | 2.1
2.2 | 2.4 | 2.6 | 2.9 | 3.1 | 49 | 3.2 | 2.9 | 2.6 | 2.4 | 2.2
2.4 | 2.6 | 2.8 | 3.0 | 3.3 | 50 | 3.4 | 3.1 | 2.8 | 2.6 | 2.4
2.5 | 2.7 | 3.0 | 3.2 | 3.5 | 51 | 3.6 | 3.3 | 3.0 | 2.8 | 2.5
2.7 | 2.9 | 3.2 | 3.5 | 3.8 | 52 | 3.8 | 3.5 | 3.2 | 2.9 | 2.7
2.9 | 3.1 | 3.4 | 3.7 | 4.0 | 53 | 4.0 | 3.7 | 3.4 | 3.1 | 2.8
3.1 | 3.3 | 3.6 | 3.9 | 4.3 | 54 | 4.3 | 3.9 | 3.6 | 3.3 | 3.0

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<th>Girls' weight (kg)</th>
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ANNEX 12 CLASSIFICATION OF NUTRITIONAL OEDEMA

To assess oedema: Firm pressure should be applied to both feet simultaneously for a period of 3 seconds (counting “one thousand ONE, one thousand TWO, one thousand THREE”). If oedema is found in the feet, this is repeated on the lower legs and hands. Assess periorbital oedema visually; do not put pressure around the eyes.

Look and feel for a pit in each foot. Oedema in the feet only is classified as **mild (+1) oedema**. If there is no oedema in the feet, STOP. Nutritional oedema always spreads from the feet upwards.

If oedema is present in the feet look for oedema in the lower legs. Use the same technique as for the feet checking both sides. Bilateral pitting oedema in the feet AND the lower legs is classified as **moderate (+2) oedema**.

If oedema is present in the feet and lower legs, check the hands. Use the same technique. If there is oedema in the feet, lower legs and hands this is also classified as **moderate (+2) oedema**.

If moderate oedema is diagnosed, check for oedema around the eyes (periorbital oedema). Do **not press on the eyes to look for pitting**. If there is oedema around the eyes this is classified as **severe (+3) oedema**. Children with +3 oedema are at high risk of mortality and are always treated in inpatient care.