

1.4 Definitions of wasting, nutritional oedema, and acute malnutrition

The WHO definition of malnutrition refers to deficiencies, excesses, or imbalances in a person's intake of energy and/or nutrients. The term malnutrition addresses three broad groups of conditions:

- undernutrition, which includes wasting (low weight-for-height) and nutritional oedema, stunting (low height-for-age) and underweight (low weight-for-age)
- micronutrient-related malnutrition, which includes micronutrient deficiencies (a lack of important vitamins and minerals) or micronutrient excess, and
- overweight, obesity and diet-related noncommunicable diseases (such as heart disease, stroke, diabetes and some cancers).

The International Classification of Diseases version 11 (ICD-11) (14) includes two terms under the category of undernutrition: 1) wasting (5B51) and 2) acute malnutrition (5B52). Although these terms have sometimes been used interchangeably, the precise definition of each is slightly different. This section aims to clarify the use of the terms to avoid confusion.

Wasting in infants and children under 5 years of age is defined as having a weight-for-height or weight-for-length z-score more than 2 standard deviations (SD) below the median of the WHO child growth standards (WHZ or WLZ < -2). This definition is also used in [global statistics on child malnutrition](#) (5) and is the basis of the targets of the [Sustainable Development Goals \(SDGs\)](#) (2) and the global nutrition targets 2025 (3). A mid-upper-arm circumference (MUAC) less than 125 mm can be used as an alternative measure.

Wasting can be sub-classified as severe or moderate:

- Severe wasting:
 - WHZ or WLZ less than -3 SD, or
 - MUAC less than 115 mm in children 6–59 months of age.
- Moderate wasting:
 - WHZ or WLZ between -3 SD and less than -2 SD (≥ -3 SD to < -2 SD), or
 - MUAC between 115 mm and less than 125 mm (≥ 115 mm to < 125 mm) in children 6–59 months of age.

Acute malnutrition in children under 5 years of age is defined as having a weight-for-height or weight-for-length z-score more than 2 SD below the median of the WHO child growth standards (WHZ or WLZ < -2) or having nutritional oedema. Again, a MUAC less than 125 mm can be used as an alternative measure to define acute malnutrition alongside weight-for-height and nutritional oedema.

Nutritional oedema is bilateral pitting oedema which starts in the feet and can progress up to the legs and the rest of the body, including the face. It is pathognomic of severe acute malnutrition. Clinical assessments for undernutrition should include an assessment for nutritional oedema.

Acute malnutrition may be further sub-classified as follows.

- Severe acute malnutrition (SAM):
 - nutritional oedema and/or
 - WHZ or WLZ < -3 SD and/or
 - MUAC < 115 mm.
- Moderate acute malnutrition (MAM):
 - WHZ or WLZ \geq -3 SD to < -2 SD and/or
 - MUAC \geq 115 mm to < 125 mm and
 - no nutritional oedema.

Limitations of the terminology “acute malnutrition”

It should be noted that the word “acute” may not have the same meaning here as in other uses in medical contexts. “Acute” usually refers to an event or condition that begins and worsens quickly and as a corollary is not “chronic” which takes a long time to develop or worsen. However, the conditions which lead to acute malnutrition may well develop over a relatively protracted period. Furthermore, there may be a connotation that something “acute” can and must always be treated and resolved relatively quickly. Children with MAM might not always need urgent medical or nutritional treatment, but more social protection and health counselling and education services for caregivers.

Terminology for this guideline

The terms MAM and SAM are currently the most familiar and widely used amongst policy makers, programme managers and health workers in national health systems and within both national and international non-governmental organizations. For this reason, this grouped terminology will be used more frequently in the operational guidance and derivative tools of the guidelines, as these will be used by more front-line audiences. This guideline document will use the terms wasting and/or nutritional oedema (with the subgroups of severe wasting and/or nutritional oedema and moderate wasting).

B. Management of infants and children 6–59 months with wasting and/or nutritional oedema

Admission, referral, transfer, and exit criteria for infants and children with severe wasting and/or nutritional oedema

Good practice statement

New in 2023

B1. Infants and children must be triaged as soon as they enter a health facility or have contact with a health worker in order to ensure that those with emergency or danger signs receive immediate life-saving care and that all others receive appropriate care as per their clinical status and classification. Identification of nutritional status is a vital aspect of this initial assessment in order to ensure that children with severe wasting and/or nutritional oedema receive prompt and appropriate interventions.

Conditional recommendation, Low certainty evidence

Updated in 2023

- B2. a) Infants and children 6–59 months old with severe wasting and/or nutritional oedema who have any of the following characteristics should be referred and admitted for inpatient care:
- one or more Integrated Management of Childhood Illness (IMCI) danger signs
 - acute medical problems
 - severe nutritional oedema (+++)
 - poor appetite (failed the appetite test).
- b) Infants and children 6–59 months old with severe wasting and/or nutritional oedema who do not meet any of the criteria from part a but who do have any of the following characteristics are likely to benefit from an in-depth assessment to inform the decision on possible referral to inpatient care:
- medical problems that do not need immediate inpatient care, but do need further examination and investigation (for example, bloody diarrhoea, hypoglycaemia, HIV-related complications);
 - medical problems needing mid or long-term follow-up care and with a significant association with nutritional status (for example, congenital heart disease, cerebral palsy or other disability, HIV, tuberculosis);
 - failure to gain weight or improve clinically in outpatient care;
 - previous episode(s) of severe wasting and/or nutritional oedema.
- c) Infants and children 6–59 months old with severe wasting and/or nutritional oedema who have all of the following characteristics should be enrolled and managed as outpatients:
- good appetite (passed the appetite test); and
 - no danger signs or any of the acute medical problems from part a ii; and
 - no criteria needing in-depth assessment (see part b) or criteria from part b present but an in-depth assessment has been completed and no inpatient admission needed (for example, diarrhoea with no dehydration, respiratory infections with no signs of respiratory distress, malaria with no signs of severity).

- B3. a) Infants and children 6–59 months with severe wasting and/or nutritional oedema who are admitted to inpatient care can be transferred to outpatient care when:
- i. they do not have any danger signs for at least 24–48 hours prior to transfer time; and
 - ii. the medical problems that prompted their admission have resolved to the extent there is no longer requirement for inpatient care; and
 - iii. they do not have ongoing weight loss (among children admitted with wasting only, who did not have nutritional oedema at any time); and
 - iv. their nutritional oedema is no longer grade +++ and is resolving; and
 - v. they have a good appetite; and
 - vi. all attempts have been made to refer children with medical problems needing mid or long-term follow-up care and with a significant association with nutritional status to appropriate care/support services and/or the limits of inpatient care have been reached.
- b) The decision to transfer children from inpatient to outpatient care should not be made on the basis of anthropometric criteria such as a specific weight-for-height/length or mid-upper arm circumference. Instead, the criteria listed above should be used.
- c) Upon deciding to transfer children from inpatient to outpatient care, caregivers must be linked to appropriate outpatient care with nutrition services.
- d) Additional social and family factors should be identified and addressed before transfer to outpatient care in order to ensure that the household has the capacity for care provision.

- B4. Continuity of care between inpatient and outpatient services that deliver medical and nutritional treatment is vital for the safe and effective follow-up of infants and children with severe wasting and/or nutritional oedema.
- Timely, efficient, and holistic discharge planning is key to ensuring that children are discharged from inpatient care at the appropriate time and with definitive guidance given to caregivers for follow-up care, both in terms of their ongoing nutritional treatment, but also for accessing ongoing medical and psychosocial support services.
- A key aspect of discharge planning should involve assessing the child's home environment in terms of environmental health aspects including: water, sanitation and hygiene; food security; economic stability; and the mental and physical health of caregivers. This assessment can be done by asking the caregiver or via home visits. In relation to this assessment, discharge planning should thus start soon after admission to inpatient care to allow for adequate time to identify and/or contact the outpatient services which will continue the medical and nutritional treatment as well as other relevant support services that will be needed.

Conditional recommendation, Very low certainty evidence**Updated in 2023**

- B5. a) Infants and children 6–59 months with severe wasting and/or nutritional oedema should only exit from nutritional treatment when all of the following conditions are met:
- their weight-for-height/length z-score is equal to or greater than 2 SD below the WHO child growth standards median (WHZ or WLZ \geq -2 SD) and their mid-upper arm circumference (MUAC) is equal to or greater than 125 mm observed for at least 2 consecutive visits/measurements; and
 - they have had no nutritional oedema for at least 2 consecutive visits/measurements.
- b) Percentage weight gain and absolute weight gain should not be used as exit criteria.
- c) Children with medical problems needing mid or long-term follow-up care and with a significant association with nutritional status (for example, HIV, tuberculosis, congenital heart disease, cerebral palsy) and/or additional social factors (for example, household food insecurity, vulnerable household) have also been referred to appropriate care/support services care and the limit of care has been reached for outpatient care for severe wasting and/or nutritional oedema.

Identification of dehydration in infants and children with wasting and/or nutritional oedema**Good practice statement****New in 2023**

- B6. Accurate classification of hydration status in children with wasting and/or nutritional oedema who have diarrhoea or other fluid losses is vital in order to provide and monitor appropriate treatment and must be frequently reassessed. It is also essential as part of management to prevent clinical deterioration, specifically into circulatory impairment or shock, which have a high risk of death.

The success of using the clinical history and clinical signs to assess hydration status – including both dehydration and fluid overload – in children with wasting and/or nutritional oedema is dependent on comprehensive training and supervision of health workers carrying out these vital tasks, which needs dedicated resources and time within health system strategic planning.

Rehydration fluids for infants and children with wasting and/or nutritional oedema and dehydration but who are not shocked**Conditional recommendation, Very low certainty evidence****New in 2023**

- B7. In infants and children 6–59 months of age with severe wasting and/or nutritional oedema who are dehydrated but not in shock, the preferred rehydration fluid is Rehydration Solution for Malnourished children (ReSoMal). If not available, low-osmolarity Oral Rehydration Solution (ORS) can be used.

Conditional recommendation, Very low certainty evidence**New in 2023**

- B8. In infants and children 6–59 months with moderate wasting who are dehydrated but not in shock, low-osmolarity Oral Rehydration Solution (ORS) should be administered in accordance with existing WHO recommendations for all children apart from those with severe wasting and/or nutritional oedema.

Hydrolyzed formulas for infants and children with severe wasting and/or nutritional oedema who are not tolerating F-75 or F-100

Conditional recommendation, Very low certainty evidence

New in 2023

B9. In infants and children 6–59 months of age with severe wasting and/or nutritional oedema who are not tolerating F-75 or F-100 milks, there is insufficient evidence to recommend switching to hydrolyzed formulas.

Ready-to-use therapeutic food for treatment of severe wasting and/or nutritional oedema

Conditional recommendation, Low certainty evidence

New in 2023

B10. In infants and children 6–59 months of age with severe wasting and/or nutritional oedema who are enrolled in outpatient care, ready-to-use therapeutic food (RUTF) should be given in a quantity that will provide:

- 150–185 kcal/kg/day until anthropometric recovery and resolution of nutritional oedema; or
- 150–185 kcal/kg/day until the child is no longer severely wasted and does not have nutritional oedema, then the quantity can be reduced to provide 100–130 kcal/kg/day, until anthropometric recovery.

Dietary management of infants and children with moderate wasting

Good practice statement

New in 2023

B11. Infants and children aged 6–59 months of age with moderate wasting (defined as a weight-for-height between 2 and 3 z-scores below the WHO child growth standards median and/or a mid-upper arm circumference 115 mm or more and less than 125 mm, without oedema) should have access to a nutrient-dense diet to fully meet their extra needs for recovery of weight and height and for improved survival, health, and development.

Good practice statement

New in 2023

B12. All infants and children 6–59 months of age with moderate wasting should be assessed comprehensively and treated wherever possible for medical and psychosocial problems leading to or exacerbating this episode of wasting.

Strong recommendation, Moderate certainty evidence**New in 2023**

B13. Prioritizing specially formulated food (SFF) interventions with counselling, compared to counselling alone, should be considered for infants and children 6–59 months of age with moderate wasting with any of the following factors.

Individual child factors:

- mid-upper arm circumference (MUAC) 115–119 mm
- weight-for-age z-score (WAZ) < -3 SD
- age < 24 months
- failing to recover from moderate wasting after receiving other interventions (for example, counselling alone)
- having relapsed to moderate wasting
- history of severe wasting
- co-morbidity (medical problems needing mid or long-term follow-up care and with a significant association with nutritional status such as HIV and tuberculosis or a physical or mental disability)

Social factors:

- severe personal circumstances, such as mother died or poor maternal health and well-being.

Strong recommendation, Moderate certainty evidence**New in 2023**

B14. In high-risk contexts (where there is a recent or ongoing humanitarian crisis), all infants and children 6–59 months of age with moderate wasting should be considered for specially formulated foods (SFFs) along with counselling and the provision of home foods for them and their families.

Conditional recommendation, Low certainty evidence**New in 2023**

B15. In infants and children 6–59 months of age with moderate wasting who need supplementation with specially formulated foods (SFFs), lipid-based nutrient supplements (LNS) are the preferred type. When these are not available, fortified blended foods (FBFs) with added sugar, oil, and/or milk (improved FBFs) are preferred compared to FBFs with no added sugar, oil, and/or milk.

Conditional recommendation, Very low certainty evidence**New in 2023**

B16. Infants and children 6–59 months of age with moderate wasting who require specially formulated foods (SFFs) should be given SFFs to provide 40–60% of the total daily energy requirements needed to achieve anthropometric recovery. Total daily energy requirements needed to achieve anthropometric recovery are estimated to be around 100–130 kcal/kg/day.

Identification and management of wasting and nutritional oedema by community health workers**Conditional recommendation, Very low certainty evidence****New in 2023**

B17. Assessment, classification and management or referral of infants and children 6–59 months of age with wasting and/or nutritional oedema can be carried out by community health workers as long as they receive adequate training, and regular supervision of their work is built into service delivery.

5. Standing WHO recommendations and best practice statements on wasting and nutritional oedema

The standing recommendations and good practice statements described in this section have been carried over from previous guidelines as they are still relevant to be implemented today.¹

Strong recommendation, Low certainty evidence

Standing from 2013

Recommendation 1.6

Children with severe wasting and/or nutritional oedema who are discharged from treatment programmes should be periodically monitored to avoid a relapse (10).

Conditional recommendation, Low certainty evidence

Standing from 2013

Recommendation 3.1

Children with uncomplicated severe wasting and/or nutritional oedema, not requiring to be admitted and who are managed as outpatients, should be given a course of oral antibiotic such as amoxicillin (10).

Strong recommendation, Low certainty evidence

Standing from 2013

Recommendation 3.2

Children who are undernourished but who do not have severe wasting and/or nutritional oedema should not routinely receive antibiotics unless they show signs of clinical infection (10).

Strong recommendation, Low certainty evidence

Standing from 2013

Recommendation 4.1

Children with severe wasting and/or nutritional oedema should receive the daily recommended nutrient intake of vitamin A throughout the treatment period. Children with severe wasting and/or nutritional oedema should be provided with about 5000 IU vitamin A daily, either as an integral part of therapeutic foods or as part of a multi-micronutrient formulation (10).

Strong recommendation, Low certainty evidence

Standing from 2013

Recommendation 4.2

Children with severe wasting and/or nutritional oedema do not require a high dose of vitamin A as a supplement if they are receiving F-75, F-100 or RUTF that complies with WHO specifications (and therefore already contains sufficient vitamin A), or vitamin A is part of other daily supplements (10).

¹ Those dating from 2013 are carried over from the WHO Guideline: updates on the management of severe acute malnutrition in infants and children, 2013 (10), those dating from 2017 are carried over from WHO Guideline: Assessing and managing children at primary health-care facilities to prevent overweight and obesity in the context of the double burden of malnutrition 2017 (189), and the one dating from 2021 is carried over from WHO guideline on the dairy protein content in ready-to-use therapeutic foods for treatment of uncomplicated severe acute malnutrition (190).

4.3 Strong recommendation, Low certainty evidence

Standing from 2013

Recommendation 4.3

Children with severe wasting and/or nutritional oedema should be given a high dose of vitamin A (50 000 IU, 100 000 IU or 200 000 IU, depending on age) on admission, only if they are given therapeutic foods that are not fortified as recommended in WHO specifications and vitamin A is not part of other daily supplements (10).

Strong recommendation, Very low certainty evidence

Standing from 2013

Recommendation 5.1

Children with severe wasting and/or nutritional oedema who present with either acute or persistent diarrhoea, can be given RUTF in the same way as children without diarrhoea, whether they are being managed as inpatients or outpatients (10).

Strong recommendation, Very low certainty evidence

Standing from 2013

Recommendation 5.2

In inpatient settings, where RUTF is provided as the therapeutic food in the rehabilitation phase (following F-75 in the stabilization phase)

Once children are stabilized, have appetite and reduced oedema and are therefore ready to move into the rehabilitation phase, they should transition from F-75 to RUTF over 2–3 days, as tolerated. The recommended energy intake during this period is 100–135 kcal/kg/day. The optimal approach for achieving this is not known and may depend on the number and skills of staff available to supervise feeding and monitor the children during rehabilitation.

Two options for transitioning children from F-75 to ready-to-use therapeutic food are suggested:

- a) start feeding by giving RUTF as prescribed for the transition phase. Let the child drink water freely. If the child does not take the prescribed amount of RUTF, then top up the feed with F-75. Increase the amount of RUTF over 2–3 days until the child takes the full requirement of RUTF, or
- b) give the child the prescribed amount of RUTF for the transition phase. Let the child drink water freely. If the child does not take at least half the prescribed amount of RUTF in the first 12 h, then stop giving the RUTF and give F-75 again. Retry the same approach after another 1–2 days until the child takes the appropriate amount of RUTF to meet energy needs (10).

Strong recommendation, Very low certainty evidence

Standing from 2013

Recommendation 5.3

In inpatient settings where F-100 is provided as the therapeutic food in the rehabilitation phase Children who have been admitted with complicated severe wasting and/or nutritional oedema and are achieving rapid weight gain on F-100 should be changed to RUTF and observed to ensure that they accept the diet before being transferred to an outpatient programme (10).

Strong recommendation, Low certainty evidence**Standing from 2013****Recommendation 6.3**

ReSoMal (or locally prepared ReSoMal using standard WHO low-osmolarity oral rehydration solution) should not be given if children are suspected of having cholera or have profuse watery diarrhoea. Such children should be given standard WHO low-osmolarity oral rehydration solution that is normally made, i.e. not further diluted (10).

Strong recommendation, Very low certainty evidence**Standing from 2013****Recommendation 7.1**

Children with severe wasting and/or nutritional oedema who are HIV infected and who qualify for lifelong antiretroviral therapy should be started on antiretroviral drug treatment as soon as possible after stabilization of metabolic complications and sepsis. This would be indicated by return of appetite and resolution of severe oedema. HIV-infected children with severe wasting and/or nutritional oedema should be given the same antiretroviral drug treatment regimens, in the same doses, as children with HIV who do not have severe wasting and/or nutritional oedema. HIV infected children with severe wasting and/or nutritional oedema who are started on antiretroviral drug treatment should be monitored closely (inpatient and outpatient) in the first 6–8 weeks following initiation of antiretroviral therapy, to identify early metabolic complications and opportunistic infections (10).

Strong recommendation, Very low certainty evidence**Standing from 2013****Recommendation 7.2**

Children with severe wasting and/or nutritional oedema who are HIV infected should be managed with the same therapeutic feeding approaches as children with severe wasting and/or nutritional oedema who are not HIV infected (10).

Strong recommendation, Very low certainty evidence**Standing from 2013****Recommendation 7.3**

HIV-infected children with severe wasting and/or nutritional oedema should receive a high dose of vitamin A on admission (50 000 IU to 200 000 IU depending on age) and zinc for management of diarrhoea, as indicated for other children with severe wasting and/or nutritional oedema, unless they are already receiving F-75, F-100 or RUTF, which contain adequate vitamin A and zinc if they are fortified following the WHO specifications (10).

Strong recommendation, Very low certainty evidence**Standing from 2013****Recommendation 7.4**

HIV-infected children with severe wasting and/or nutritional oedema in whom persistent diarrhoea does not resolve with standard management should be investigated to exclude carbohydrate intolerance and infective causes, which may require different management, such as modification of fluid and feed intake, or antibiotics (10).

Strong recommendation, Very low certainty evidence**Standing from 2013****Recommendation 8.2**

Infants who are less than 6 months of age with severe wasting and/or nutritional oedema should receive the same general medical care as infants with severe wasting and/or nutritional oedema who are 6 months of age or older:

- a) infants with severe wasting and/or nutritional oedema who are admitted for inpatient care should be given parenteral antibiotics to treat possible sepsis and appropriate treatment for other medical complications such as tuberculosis, HIV, surgical conditions or disability;
- b) infants with severe wasting and/or nutritional oedema who are not admitted should receive a course of broad-spectrum oral antibiotic, such as amoxicillin, in an appropriately weight-adjusted dose ([10](#)).

Strong recommendation, Very low certainty evidence**Standing from 2013****Recommendation 8.3**

Feeding approaches for infants who are less than 6 months of age with severe wasting and/or nutritional oedema should prioritize establishing, or re-establishing, effective exclusive breastfeeding by the mother or other caregiver ([10](#)).

Strong recommendation, Very low certainty evidence**Standing from 2013****Recommendation 8.7**

For infants who are less than 6 months of age with severe wasting and/or nutritional oedema and who do not require inpatient care, or whose caregivers decline admission for assessment and treatment:

- a) counselling and support for optimal infant and young child feeding should be provided, based on general recommendations for feeding infants and young children, including for low-birth-weight infants;
- b) weight gain of the infant should be monitored weekly to observe changes;
- c) if the infant does not gain weight, or loses weight while the mother or caregiver is receiving support for breastfeeding, then he or she should be referred to inpatient care;
- d) assessment of the physical and mental health status of mothers or caregivers should be promoted and relevant treatment or support provided ([10](#)).

Best practice statement**Standing from 2017****Best practice statement 1**

All infants and children aged less than 5 years presenting to primary health-care facilities should have both weight and length/height measured, in order to determine weight-for-length/height and to classify nutritional status according to WHO child growth standards ([189](#)).

Note: The measurement of mid-upper arm circumference both at health facilities and in the community can be used to identify children with moderate wasting or severe wasting and/or nutritional oedema. However, mid-upper arm circumference cannot be used to determine overweight or obesity, as there are no validated cut-off values as yet. The best practice statement therefore only makes reference to weight and length/height.

Best practice statement**Standing from 2017****Best practice statement 2**

Caregivers and families of infants and children aged less than 5 years presenting to primary health-care facilities should receive general nutrition counselling, including promotion and support for exclusive breastfeeding in the first 6 months and continued breastfeeding until 24 months or beyond ([189](#)).

Note: Against the background of best practice that caregivers of all infants and children aged less than 5 years should receive general nutrition counselling, no recommendation is made regarding providing nutrition counselling that is specific to children with stunting only.

Conditional recommendation, Moderate certainty evidence**Standing from 2021****Recommendation**

Standard ready-to-use therapeutic food (RUTF) (with at least 50% of protein coming from dairy products) is recommended for outpatient treatment of children with severe wasting and nutritional oedema. Use of RUTF formulations with less than 50% of protein from dairy products for outpatient treatment of children with severe wasting and nutritional oedema is encouraged within research and evaluation settings ([190](#)).