

# WHO guideline on the prevention and management of wasting and nutritional oedema (acute malnutrition) in infants and children under 5 years



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# Abbreviations

<b>CHW</b>	community health worker
<b>CI</b>	confidence interval
<b>EtD</b>	Evidence-to-Decision
<b>FBF</b>	fortified blended food
<b>GDG</b>	Guideline Development Group
<b>GRADE</b>	Grading of Recommendations Assessment, Development and Evaluation
<b>Hb</b>	haemoglobin
<b>IMCI</b>	Integrated Management of Childhood Illness
<b>IU</b>	international units
<b>LNS</b>	lipid-based nutrient supplement
<b>MAM</b>	moderate acute malnutrition
<b>MNP</b>	multiple micronutrient powder
<b>MUAC</b>	mid-upper arm circumference
<b>OR</b>	odds ratio
<b>ORS</b>	oral rehydration solution
<b>PICO</b>	population, intervention, comparison, outcomes
<b>PROSPERO</b>	International Prospective Register of Systematic Reviews
<b>QUIPS</b>	Quality In Prognosis Studies
<b>ReSoMal</b>	Rehydration Solution for Malnourished children
<b>RoB 2</b>	Version 2 of the Cochrane risk-of-bias tool for randomized trials
<b>ROBINS-I</b>	Risk Of Bias In Non-randomized Studies - of Interventions
<b>RR</b>	relative risk or risk ratio
<b>RUSF</b>	ready-to-use supplementary food
<b>RUTF</b>	ready-to-use therapeutic food
<b>SAM</b>	severe acute malnutrition
<b>SD</b>	standard deviations
<b>SFF</b>	specially formulated food
<b>SQ-LNS</b>	small-quantity lipid-based nutrient supplement
<b>UN</b>	United Nations
<b>UNHCR</b>	UN Refugee Agency
<b>UNICEF</b>	United Nations Children's Fund
<b>WAZ</b>	weight-for-age z-score
<b>WHO</b>	World Health Organization
<b>WHZ</b>	weight-for-height z-score
<b>WLZ</b>	weight-for-length z-score



# Glossary

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<b>Admission</b>	refers to a child being registered and entering inpatient care as a patient. This is distinguished from the term “enrolment”, which is used for outpatient care.
<b>Anthropometric recovery</b>	refers to weight-for-height (WHZ)/weight-for-length (WLZ) z-score equal to or greater than -2 standard deviations (SD) of the WHO child growth standards median (WHZ or WLZ $\geq$ -2) and/or a mid-upper arm circumference (MUAC) equal to or greater than 125 mm in children 6–59 months (depending on whether the child was admitted on WHZ/WLZ or MUAC or both) observed for at least 2 consecutive outpatient care visits. Before any decisions can be made regarding exit from nutritional treatment these anthropometric measurements need to be accompanied by an assessment of nutritional oedema: a child must also be free of nutritional oedema for at least two consecutive visits to meet exit criteria. <i>Note that anthropometric recovery is different from exit criteria for severe wasting and nutritional oedema (see recommendation B5).</i>
<b>Blanket approach</b>	is an approach to supplementation in which all children or households within a certain population or geographic region are given this intervention, in contrary to targeting of certain children or households.
<b>Child</b>	is defined as a person less than 19 years old.
<b><u>Community health worker (CHW)</u></b>	is a type of health associate professional who provide health education, referral and follow up, case management, and basic preventive health care and home visiting services to specific communities. Community health workers provide support and assistance to individuals and families in navigating the health and social services system. Occupations included in this category normally require formal or informal training and supervision recognized by the health and social services authorities. Providers of routine personal care services and traditional medicine practitioners are not included.
<b>Discharge</b>	refers to a child finishing their inpatient care and leaving to go back home. This is distinguished from the term “exit” which is used for outpatient care.
<b>Enrolment</b>	refers to a child being registered into outpatient care where nutritional supplementation or treatment is provided on a regular basis (see <a href="#">outpatient care</a> ). This is different to the term “admission” which is used for inpatient care.
<b>Exit</b>	refers to a child finishing their nutritional treatment or supplementation and no longer attending outpatient care. This is distinguished from the term “discharge” which is used for inpatient care.
<b>Food insecurity</b>	means the lack of regular access to adequate nutrient-dense foods for healthy growth and development, which could be from food being unavailable and/or from insufficient resources to obtain food (as defined by the Food and Agriculture Organization of the United Nations).
<b>Fortified blended foods (FBFs)</b>	are combinations of partially precooked and milled cereals, soya, beans, pulses fortified with micronutrients. Improved FBFs refer to products with added sugar, oil, and/or milk over and above what was in the original specifications for these products. Examples of FBFs include Super Cereal (with added sugar but without milk) and Super Cereal plus (with added milk and sugar).

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<b>Health associate professionals</b>	perform technical and practical tasks to support diagnosis and treatment of illness, disease, injuries and impairments, and to support implementation of health care, treatment and referral plans usually established by medical, nursing and other health professionals. Appropriate formal qualifications are often an essential requirement for entry to these occupations; in some cases relevant work experience and prolonged on-the-job training may substitute for the formal education. Health associate professionals include community health workers, nursing associate professionals, midwifery associate professionals, etc.
<b>Health professionals</b>	include doctors, nurses, midwives, physiotherapists, dentists, paramedical practitioners, etc. They study, advise on or provide preventive, curative, rehabilitative and promotional health services based on an extensive body of theoretical and factual knowledge in diagnosis and treatment of disease and other health problems. They may conduct research on human disorders and illnesses and ways of treating them, and supervise other workers. The knowledge and skills required are usually obtained as the result of study at a higher educational institution in a health-related field for a period of 3–6 years leading to the award of a first degree or higher qualification.
<b>Health workers</b>	are divided up into five main categories: health professionals, health associate professionals, personal care workers in health services, health management and support personnel, and other health service providers not elsewhere classified. Health workers make up the health workforce and are people engaged to deliver health care to individuals and populations as part of the health system.
<b>Infant</b>	is a child less than 12 months of age.
<b>Inpatient care</b>	refers to medical care, nutritional supplementation or treatment, and feeding support (for both breastfed and non-breastfed infants) which is delivered in a health facility involving the child staying for one or more nights in the health facility itself.
<b>Mother/caregiver</b>	is a term used predominantly in relation to infants less than 6 months of age to highlight the importance of providing services for the mother/caregiver-infant pair together with a holistic approach encompassing all their physical and mental health and nutrition needs and recognizing the interdependence of this unit, especially in the early months of an infant's life.
<b>Neonate</b>	is a child less than 28 days of age.
<b>Non-specially formulated foods</b>	are defined as foods that have not been specifically designed, manufactured, distributed and used for special medical purposes or for special dietary uses, as specified by <a href="#">Codex Alimentarius</a> . They are predominantly foods that are available in the market and/or household and are typically consumed by the child and their family.
<b>Nutrient-dense foods</b>	are those high in nutrients relative to their energy content; they have a relatively high content of vitamins, minerals, essential amino acids and healthy fats. Examples of nutrient-dense foods include animal-source foods, beans, nuts and many fruits and vegetables.
<b>Nutritional supplementation (for moderate wasting)</b>	is the term used to describe the regular outpatient services, whereby infants and children with moderate wasting receive medical care and nutritional supplementation to achieve clinical and anthropometric recovery, as well as referring them to ongoing appropriate preventative and supportive services if needed and possible.

<b>Nutritional treatment (for severe wasting and/or nutritional oedema)</b>	is used to describe the regular outpatient services, and potentially inpatient services (if needed), whereby infants and children with severe wasting and/or nutritional oedema receive therapeutic milk or ready-to-use therapeutic food (RUTF) to help achieve anthropometric recovery and the resolution of nutritional oedema. Nutritional treatment should always be delivered alongside medical care and referral to appropriate preventive and supportive services as needed.
<b>Outpatient care</b>	refers to medical care, nutritional supplementation or treatment (for children 6–59 months) and feeding support (for both breastfed and non-breastfed infants) which is delivered in a health facility and which does not require an overnight stay, but involves regular appointments (often referred to as visits) with a health worker until the child reaches clinical and anthropometric recovery. This health worker could be a health professional such as a doctor or nurse, or a health associate professional such as a community health worker.
<b>Psychosocial stimulation</b>	can be defined as the sensory information received from interactions with people and environmental variability that engages a young child’s attention and provides information; examples include talking, smiling, pointing, enabling, and demonstrating, with or without objects. This also includes responsive feeding as a part of responsive caregiving.
<b>Ready-to-use supplementary food (RUSF)</b>	is a fortified lipid-based paste/spread used for the supplementation of children with moderate wasting. It should not be used for the nutritional treatment of severe wasting and/or nutritional oedema.
<b>Ready-to-use therapeutic food (RUTF)</b>	is a food for special medical purposes and includes pastes/spreads and compressed biscuits/bars used for the nutritional treatment of children with severe wasting and/or nutritional oedema (as defined by <a href="#">Codex Alimentarius</a> ).
<b>Referral</b>	refers predominantly to a child being referred to inpatient care from outpatient care. A malnourished child might however also get referred to other services such as HIV or TB (tuberculosis) for follow-up.
<b>Specially formulated foods (SFFs)</b>	are defined as foods that have been specifically designed, manufactured, distributed, and used for either: special medical purposes or for special dietary uses, as defined by <a href="#">Codex Alimentarius</a> .
<b>Targeted approach</b>	is an approach to supplementation in which a specific subset of children or households within a certain population or geographic region are prioritized for this intervention, in contrary to a blanket approach, where the intervention is given to all children or households.
<b>Transfer (from inpatient to outpatient care)</b>	describes the patient movement when a child is discharged from inpatient care to finish their nutritional treatment in outpatient care. They usually go home from the hospital and then attend an outpatient centre/clinic for nutritional treatment at a later date and then regularly until clinical and anthropometric recovery.

# Executive summary

## Introduction

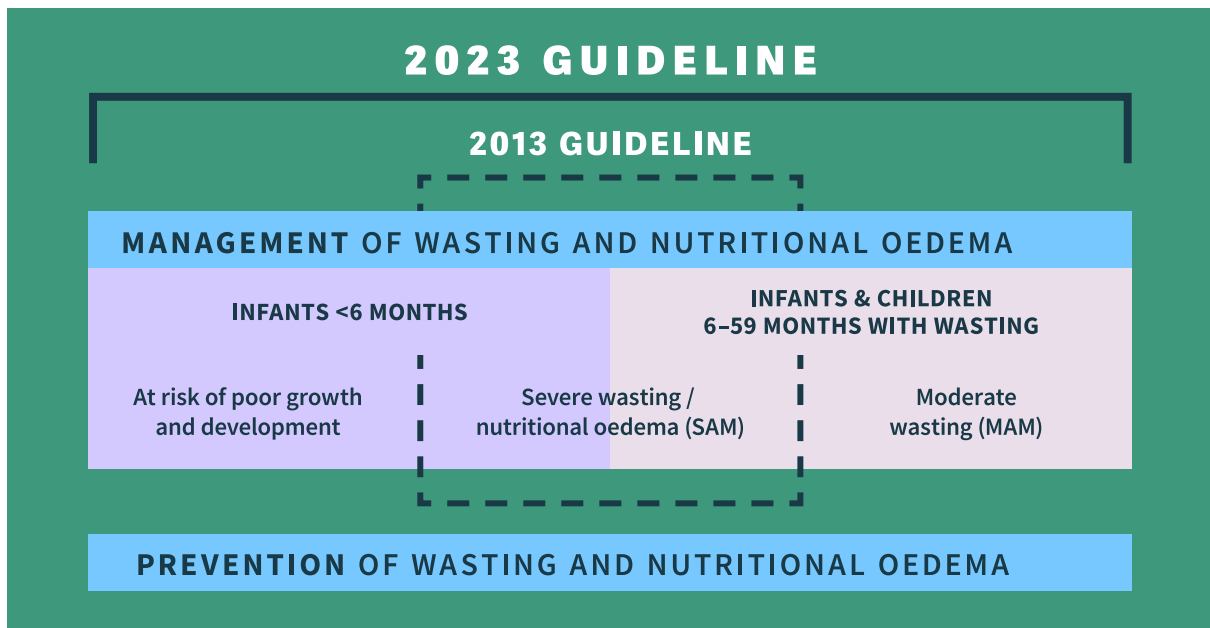
Over 45.4 million infants and children under 5 years of age experience wasting each year. The risk of wasting and nutritional oedema in infants and children, particularly in high-risk contexts where health and socioeconomic indicators are at their poorest, is heightened by ongoing crises including climate change, the COVID-19 pandemic, and conflict. There have therefore been major challenges along the road to achieving global targets for wasting and nutritional oedema including Sustainable Development Goal 2 to reach “Zero Hunger” by 2030.

In 2019, the United Nations (UN) Secretary-General released the Global Action Plan for Child Wasting in order to establish a common focus for governments, UN agencies and civil society organizations and guide individual and collective action to accelerate progress towards targets for wasting. One of the key commitments of World Health Organization (WHO) to this action plan was to update the normative guidance on the prevention and management of wasting and/or nutritional oedema, also known as acute malnutrition.

## Scope

This new 2023 WHO guideline includes recommendations and good practice statements informed by the best available evidence for the prevention and management of wasting and nutritional oedema. It includes four areas of focus, including infants less than 6 months of age at risk of poor growth and development, moderate wasting in infants and children 6–59 months of age, severe wasting and nutritional oedema in infants and children 6–59 months of age, and prevention of wasting and nutritional oedema from a child health perspective.

**Fig. 1.** Scope of the 2023 WHO guideline on wasting and nutritional oedema compared to the 2013 guideline



## **Guideline development process and methods**

The recommendations and good practice statements in this guideline were developed in accordance with the [WHO handbook for guideline development, second edition \(1\)](#) and following Grading of Recommendations, Assessment, Development and Evaluations (GRADE) methods for determining the certainty of evidence and for formulating recommendations based on this evidence.

The WHO Department of Nutrition and Food Safety oversaw the guideline development process with a designated WHO Steering Group for this guideline and guideline methodologists. A Guideline Development Group (GDG) was established comprising 27 external experts with a range of expertise and perspectives to determine the priority guideline questions, review the evidence, and formulate recommendations and good practice statements.

A prioritization approach was followed to determine the topics of interest for the guideline and the guideline questions and outcomes based on GDG input and scoring. There were 16 guideline questions that were prioritized and drafted into the relevant PICO format, including effectiveness questions as well as prognostic and diagnostic questions.

Systematic reviews were commissioned for each of the guideline questions, including effectiveness systematic reviews, diagnostic test accuracy reviews, and prognostic factor reviews. Qualitative evidence syntheses were completed focused on equity, acceptability, and feasibility of interventions and on values and preferences linked to outcomes. Systematic reviews of economic evidence were also completed to understand resource use and cost-effectiveness of interventions.

The evidence from these reviews was used to inform GRADE Evidence to Decision criteria that the GDG reviewed and made judgements on to develop recommendations and good practice statements. The GDG used these judgements to determine the direction and strength of recommendations in addition to the certainty of evidence.

## **New and updated recommendations and good practice statements**

This new 2023 guideline includes 21 recommendations (14 new and 7 updated) and 12 good practice statements. Note that all recommendations and good practice statements include important Remarks to aid with interpretation, which are detailed in the guideline, along with summaries of judgements made by the GDG and justifications.

## A. Management of infants less than 6 months of age at risk of poor growth and development

### Admission, referral, transfer, and exit criteria for infants at risk of poor growth and development

Good practice statement	New in 2023
<p>A1. Mothers/caregivers and their infants less than 6 months of age at risk of poor growth and development should receive regular care and monitoring by health professionals. The immediate goal is the early detection of any acute medical or psychological problems and preventing infants from becoming severely underweight or severely wasted. The longer-term goal of this regular care and monitoring is to enable these infants to grow and develop in a healthy way that can lead to them achieving their full potential, whilst simultaneously supporting their mothers/caregivers with their own health and wellbeing. This approach recognizes the importance of acknowledging and caring for the mother/caregiver and infant as an inter-dependent pair for both to survive and thrive.</p>	
Conditional recommendation, Low certainty evidence	Updated in 2023
<p>A2. a) Infants less than 6 months of age at risk of poor growth and development who have any of the following characteristics should be referred and admitted for inpatient care:</p> <ol style="list-style-type: none"><li>one or more Integrated Management of Childhood Illness (IMCI) danger signs</li><li>acute medical problems or conditions under severe classification as per IMCI</li><li>oedema (nutritional)</li><li>recent weight loss.</li></ol> <p>Infants less than 6 months of age at risk of poor growth and development who do not meet any of the criteria from part a should have an in-depth assessment to consider if they need inpatient admission or outpatient management based on clinical judgement if they have any of the following characteristics:</p> <ol style="list-style-type: none"><li>medical problems that do not need immediate inpatient care, but do need further examination and investigation (for example, HIV-related complications);</li><li>medical problems needing mid or long-term follow-up care and with a significant association with nutritional status (for example, congenital heart disease, HIV, tuberculosis, cerebral palsy or other physical disabilities);</li><li>specific anthropometric criteria from the list of criteria used to identify infants at risk of poor growth and development: WAZ &lt; -2 SD, WLZ &lt; -3 SD, MUAC &lt; 110 mm for infants between 6 weeks and less than 6 months of age, failure to gain weight based on two consecutive measurements;</li><li>ineffective breastfeeding (for example, attachment, positioning, suckling reflex) or perceived breastmilk insufficiency</li><li>feeding concerns for non-breastfed infants (for example, inappropriate and unsafe use of breastmilk substitutes for replacement feeding, milk refusal);</li><li>any maternal-related or social issue needing more detailed assessment or intensive support (for example, disability, depression of the caregiver, absent mother, adolescent mother or other adverse social circumstances).</li></ol> <p>c) Infants less than 6 months of age at risk of poor growth and development who have all of the following characteristics should be enrolled and managed as outpatients:</p> <ol style="list-style-type: none"><li>no danger signs or any of the criteria from part a needing inpatient admission</li><li>no criteria needing in-depth assessment (see part b) or when criteria from part b are present but an in-depth assessment has been completed and determined that no inpatient admission is needed (for example, feeding problems that can be managed in outpatient care, diarrhoea with no dehydration, respiratory infections with no signs of respiratory distress, malaria with no signs of severity).</li></ol>	

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

- A3. Infants less than 6 months of age at risk of poor growth and development who are admitted for inpatient care can be transferred to outpatient care when:
- i. there have been no danger signs for at least 48 hours prior to transfer time; and
  - ii. all acute medical problems are resolved; and
  - iii. nutritional oedema is resolving; and
  - iv. the infant has good appetite; and
  - v. documented weight gain for at least 2–3 days is satisfactory on either exclusive breastfeeding or replacement feeding; and
  - vi. all attempts have been made to refer the infants 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; and
  - vii. the infant has been checked for immunizations and other routine interventions delivered or plans made for follow-up; and
  - viii. the mothers/caregivers are linked with needed follow-up care and support (for example, for any health, mental health or social issues identified during assessment).

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

- A4. a) Infants less than 6 months of age at risk of poor growth and development can have a reduced frequency of outpatient visits when they:
- i. are breastfeeding effectively or feeding well with replacement feeds, and
  - ii. have sustained weight gain for at least 2 consecutive weekly visits.
- b) Infants less than 6 months of age at risk of poor growth and development should be assessed (including assessment of their anthropometry) once they reach 6 months of age to determine if they need ongoing follow-up or referral to services for infants 6 months of age and older (including for nutritional treatment/supplementation) as appropriate according to their clinical and nutritional status.

**Management of breastfeeding/lactation difficulties in mothers/caregivers of infants at risk of poor growth and development****Good practice statement****New in 2023**

- A5. For infants less than 6 months of age at risk of poor growth and development, health workers should conduct comprehensive assessments of the mother/caregiver-infant pair and follow best practices for the management of breastfeeding/lactation challenges and underlying factors contributing to these challenges.

**Supplemental milk for infants at risk of poor growth and development****Good practice statement****New in 2023**

- A6. Decisions about whether an infant less than 6 months of age at risk of poor growth and development needs a supplementary milk in addition to breastfeeding must be based on a comprehensive assessment of the medical and nutritional/feeding needs of the infant, as well as the physical and mental health of the mother/caregiver. This applies to infants who are enrolled in outpatient care or admitted into inpatient care.

- A7. Infants who are less than 6 months of age with severe wasting and/or nutritional oedema who are admitted for inpatient care:
- should be breastfed where possible and the mothers or female caregivers should be supported to breastfeed the infants. If an infant is not breastfed, support should be given to the mother or female caregiver to re-lactate. If this is not possible, wet nursing should be encouraged;
  - should also be provided a supplementary feed:
    - supplementary suckling approaches should, where feasible, be prioritized;
    - for infants with severe wasting but no oedema, expressed breast milk should be given, and, where this is not possible, commercial (generic) infant formula or F-75 or diluted F-100 may be given, either alone or as the supplementary feed together with breast milk;
    - for infants with oedema, commercial (generic) infant formula or F-75 should be given as a supplement to breast milk.
  - should *not* be given full-strength F-100 if they are clinically unstable and/or have diarrhoea or dehydration and/or nutritional oedema (due to the renal solute load of this therapeutic milk and risk of hypernatraemic dehydration);
  - should, if there is no realistic prospect of being breastfed, be given appropriate and adequate replacement feeds such as commercial (generic) infant formula, with relevant support to enable safe preparation and use, including at home when transferred from inpatient care.
- In addition:
- assessment of the physical and mental health status of mothers or caregivers should be promoted and relevant treatment or support provided.

### Interventions for mothers/caregivers of infants at risk of poor growth and development

- A8. Among mothers/caregivers of infants less than 6 months of age at risk of poor growth and development, comprehensive assessment and support are recommended to ensure maternal/caregiver physical and mental health and well-being. These actions are also important to optimize growth and development in infants at risk of poor growth and development.



## 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:
- they do not have any danger signs for at least 24–48 hours prior to transfer time; and
  - the medical problems that prompted their admission have resolved to the extent there is no longer requirement for inpatient care; and
  - they do not have ongoing weight loss (among children admitted with wasting only, who did not have nutritional oedema at any time); and
  - their nutritional oedema is no longer grade +++ and is resolving; and
  - they have a good appetite; and
  - 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 of 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 of 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.

## C. Post-exit interventions after recovery from wasting and/or nutritional oedema

<b>Good practice statement</b>	<b>New in 2023</b>
C1. Mothers/caregivers of infants and children treated for wasting and/or nutritional oedema should be provided with interventions after their children exit from nutritional treatment/supplementation. These could include counselling and education (on infant and young child feeding practices, recognition of common childhood illnesses and appropriate health-seeking behaviours); support to provide responsive care; and safe water, sanitation and hygiene intervention to improve overall child health and prevent relapse to wasting and/or nutritional oedema.	
<b>Conditional recommendation, Low certainty evidence</b>	<b>New in 2023</b>
C2. In infants and children at risk of poor growth and development or with wasting and/or nutritional oedema, psychosocial stimulation should continue to be provided by mothers/caregivers after transfer from inpatient care and exit from outpatient care, with psychosocial stimulation interventions as part of routine care to improve child development and anthropometric outcomes.	
<b>Conditional recommendation, Moderate certainty evidence</b>	<b>New in 2023</b>
C3. In infants and children with severe wasting and/or nutritional oedema, cash transfers in addition to routine care may be provided to decrease relapse and improve overall child health during outpatient care and after exit from treatment, depending on contextual factors such as cost.	
<b>Conditional recommendation, Moderate certainty evidence</b>	<b>New in 2023</b>
C4. In infants and children with severe wasting and/or nutritional oedema who are HIV negative, daily oral co-trimoxazole prophylaxis should not be provided after transfer from inpatient care and/or exit from outpatient care as part of routine care.	

## D. Prevention of wasting and nutritional oedema

### Good practice statement

New in 2023

D1. In contexts where wasting and nutritional oedema occur, preventive interventions should ideally be implemented through a multisectoral and multisystem approach (i.e. food, health, safe water, sanitation and hygiene, and social protection systems). These interventions should include access to healthy diets and nutrition and medical services as appropriate, counselling (breastfeeding, health and nutrition related, especially helping families use locally available nutrient-dense foods for a healthy diet), should address maternal and family needs, and should involve psychosocial elements of care to ensure healthy growth and development.

### Good practice statement

New in 2023

D2. Infant and young child feeding counselling must be provided as part of routine care especially in contexts where wasting and nutritional oedema occur. In order for this counselling to have the most benefit for the prevention of wasting and nutritional oedema and for other child health and nutrition outcomes, personnel carrying out the counselling should have comprehensive training and be supervised regularly, with dedicated resources and time within health system strategic planning for this intervention.

### Conditional recommendation, Low certainty evidence

New in 2023

- D3. a) In areas of or during periods of high food insecurity, in addition to infant and young child feeding counselling, specially formulated foods (SFFs), including medium-quantity lipid-based nutrient supplements (MQ-LNS) or small-quantity lipid-based nutrient supplements (SQ-LNS), may be considered for the prevention of wasting and nutritional oedema for a limited duration for all infants and children 6–23 months of age, while continuing to enable access to adequate home diets for the whole family.
- b) In areas of or during periods of high food insecurity, children living in the most vulnerable households should be prioritized for SFF interventions through a targeted approach. However, when targeting is not possible, these SFFs may need to be given to all households through a blanket approach for infants and children 6–23 months of age, while continuing to enable access to adequate home diets for the whole family and providing infant and young child feeding counselling.

### Strong recommendation, Moderate certainty evidence

New in 2023

D4. In contexts where wasting and nutritional oedema occur, multiple micronutrient powders (MNPs) should not be given to infants and children 6–23 months of age for the specific purpose of preventing wasting and nutritional oedema.

In addition, 18 standing recommendations and 2 best practice statements were carried over from 2013, 2017 and 2021 (see [Section 5](#). Standing WHO recommendations and best practice statements on wasting and nutritional oedema).





# 1. Introduction



# 1. Introduction

In 2015, United Nations (UN) Member States adopted the [Sustainable Development Goals](#) (SDGs), which include a target to end all forms of malnutrition by 2030 (Target 2.2), including by achieving internationally agreed targets on wasting in infants and children under 5 years of age by 2025 (indicator 2.2.2) (2). This aligns with Global Nutrition Targets 2025 (3) and targets set by the 65th World Health Assembly (4) to reduce the prevalence of wasting in infants and children to below 5% by 2025 and below 3% by 2030.

However, there has been little progress globally in reducing the prevalence of wasting since these major commitments were made. The [2023 Joint Child Malnutrition Estimates](#) (5) by the United Nations Children's Fund (UNICEF), WHO and the World Bank highlighted the huge burden of wasting and the fact that it is not declining. Relatively small improvements have been made in other nutrition targets such as stunting reduction, but progress in wasting has not followed the same trajectory.

According to the [Joint Child Malnutrition Estimates](#) (5), 45 million infants and children under 5 experienced wasting in 2022; an estimated 13.7 million infants and children under 5 had severe wasting and the remainder had moderate wasting. However, UN agencies have stated that these are likely underestimations. There are also many more infants and children with nutritional oedema who are not captured in these estimates.

There are serious consequences of wasting and nutritional oedema, including immediate susceptibility to disease and mortality. Surviving infants and children commonly experience poor motor and cognitive development, along with reduced economic productivity and elevated risk of non-communicable disease in adulthood.

The Principals of the UN agencies who are involved in preventing and treating wasting and nutritional oedema in infants and children – the Food and Agriculture Organization of the United Nations, the UN Refugee Agency, UNICEF, World Food Programme and WHO – released a joint statement (6) for urgent action to address wasting and nutritional oedema in 2019 and subsequently a framework for the [Global Action Plan on Child Wasting](#) (7). At the start of 2023, the Principals launched a [Call To Action](#) (8) to protect infants and children at risk of and experiencing wasting and nutritional oedema in 15 countries suffering from the most extreme effects of the ongoing food and nutrition crisis.

As part of the Global Action Plan on Child Wasting, WHO committed to updating normative guidance for the prevention and management of wasting and nutritional oedema in infants and children. WHO also pledged to support the review and update of national guidelines and to oversee future research and policy efforts related to wasting and nutritional oedema under the UN Decade of Action on Nutrition (2016–2025) (9).

The [WHO Guideline: updates on the management of severe acute malnutrition in infants and children, 2013](#) (10) was released a decade ago in 2013 and included recommendations for infants and children with severe wasting and/or nutritional oedema. This new 2023 guideline builds on these past recommendations and aims to further enhance care of infants and children with severe wasting and nutritional oedema as these conditions contribute greatly to mortality and other negative outcomes.

The 2023 guideline has also been expanded in scope to address some of the biggest nutritional challenges today, including providing support and interventions to mothers/caregivers, and infants less than 6 months old who are at risk of poor growth and development, even if they do not yet have wasting or nutritional oedema; managing moderate wasting in infants and children through dietary and clinical approaches; and mechanisms and programmes to prevent wasting across contexts. It also provides guidance on psychosocial elements of care for infants at risk of poor growth and development and infants and children with wasting and/or nutritional oedema, as well as their mothers/caregivers.

WHO applied rigorous and high-quality methods for evidence synthesis and guideline development, which have advanced since the previous guideline, to inform the development of recommendations and good practice statements. However, one of the most important conclusions of the guideline development process is that much more evidence needs to be generated to inform how best to prevent and manage wasting and nutritional oedema. This guideline will therefore be responsive and data-driven, with further updates as evidence is available. A Technical Advisory Group will be involved to determine when new recommendations can be made; this process is described further in [section 6.4 Updating recommendations](#).

The release of this new guideline is a milestone in the fight against wasting and nutritional oedema. Yet there is much more to be done from here to promote survival, growth and development in infants and children globally who are at highest risk.

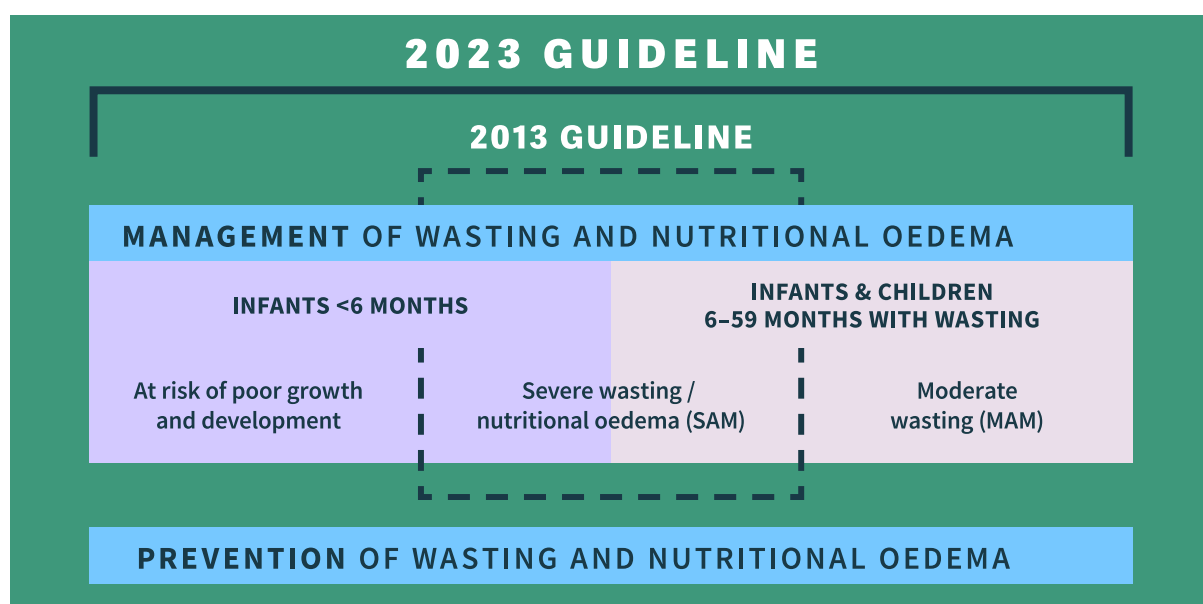
## 1.1 Purpose

This new 2023 WHO guideline provides global evidence-informed recommendations and good practice statements on the prevention and management of wasting and nutritional oedema in infants and children. It aims to help WHO Member States and their partners to make evidence-informed decisions on the appropriate actions that should be taken in their efforts to prevent and manage wasting and nutritional oedema in infants and children. The recommendations and good practice statements are intended to inform, revise, or update the development of national or organizational guidelines, protocols, tools, and manuals.

## 1.2 Scope

This 2023 guideline builds on the recommendations in the [WHO Guideline: updates on the management of severe acute malnutrition in infants and children, 2013 \(10\)](#) for severe wasting and/or nutritional oedema from a child health perspective. The 2013 guideline update covered eight broad topics on the identification and treatment of severe wasting and/or nutritional oedema in infants and children 6–59 months and included a limited number of recommendations for infants less than 6 months of age with severe wasting and/or nutritional oedema. The new guideline also has new recommendations and good practice statements for three new areas of focus, including infants less than 6 months of age at risk of poor growth and development (within which infants with wasting and/or nutritional oedema are a subset); moderate wasting in infants and children 6–59 months of age and prevention of wasting and nutritional oedema, depicted in Fig. 1.

**Fig. 1.** Scope of the 2023 WHO guideline on wasting and nutritional oedema compared to the 2013 guideline



### 1.2.1 Infants less than 6 months of age at risk of poor growth and development

The 2013 WHO guideline update included a limited number of recommendations for infants less than 6 months of age with severe wasting and/or nutritional oedema. Building on this, a key aim of the 2023 guideline process was to produce guidance on the identification and appropriate interventions for infants less than 6 months old who are not growing well, before they meet criteria for wasting and/or nutritional oedema.

A number of current WHO guidelines have nutritional/feeding recommendations and good practice statements for infants up to 6 weeks of age, including the [WHO recommendations on maternal and newborn care for a positive postnatal experience \(11\)](#) and the [WHO recommendations for care of the preterm or low-birth-weight infant \(12\)](#). In addition, the [Integrated Management of Childhood Illness \(IMCI\): Management of the sick young infant aged up to 2 months: Chart booklet \(13\)](#) also contains some guidance on feeding for infants up to 2 months of age. However, there is a well-recognized gap in guidance between approximately 2 months of age to 6 months of age for infants at risk of poor growth and development more broadly, which includes but is not limited to severe wasting or nutritional oedema. Furthermore, most national nutrition guidelines and recommendations start when infants are at least 6 months of age.

The Guideline Development Group (GDG) for the WHO guideline on prevention and management of wasting and nutritional oedema (acute malnutrition) was convened in September 2022 to determine an appropriate categorization of this broad population and potential identifiers of these infants, to whom recommendations and good practice statements in this guideline should apply. The GDG agreed to call this population “infants at risk of poor growth and development.” The GDG proposed that, for the purpose of this guideline, infants at risk of poor growth and development should include infants less than 6 months of age in any of the following categories with any of the following criteria:

#### Infants with poor growth based on sequential measures

- No weight gain or weight loss from one measurement to the next; or
- Downward crossing of weight-for-age centile lines<sup>1</sup>; or
- Insufficient weight gain (velocity standards<sup>2</sup> or grams/per specific time period<sup>3</sup>).

#### Infants with poor anthropometry based on a single measure (if sequential measures not available)

- Weight-for-age z-score (WAZ) below -2 standard deviations (SD) of the WHO child growth standards median; or
- Weight-for-length z-score (WLZ) below -2 standard deviations (SD) of the WHO child growth standards median; or
- Nutritional oedema; or
- Mid-upper arm circumference (MUAC) less than 110 mm for infants between 6 weeks to less than 6 months of age.

#### Infants with known risk factors for poor growth and development

- Neurodevelopmental concerns; or
- Infant feeding concerns; or
- Maternal risk (physical or mental health problem(s) affecting caring practices); or
- History of hospitalization.

1  $\geq 1$  growth centile space if birth weight < 9th centile;  $\geq 2$  centile spaces if birth weight 9th–91st centile;  $\geq 3$  centile spaces if birth weight > 91st centile.

2 Less than 2 standard deviations (SD) below the median on the WHO growth velocity standards from one measurement to the next.

3 Approximately less than 500 g/month, or if weekly measurements: birth to 3 months, approximately less than 150–200g/week and 3 to 6 months approximately less than 100–150 g/week.

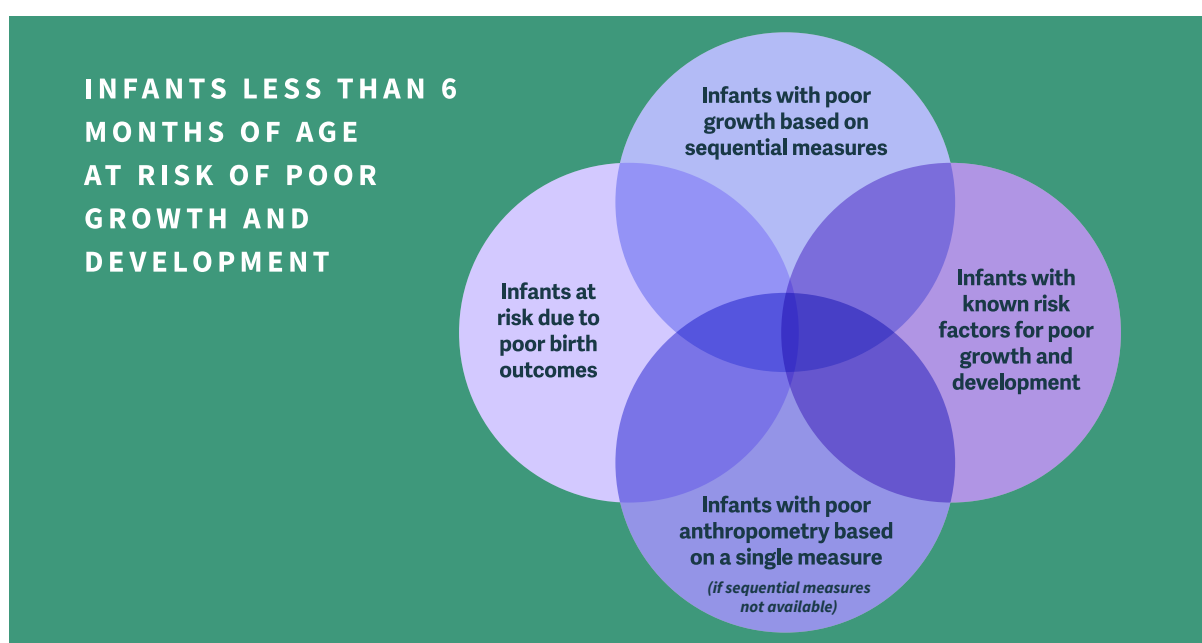
## Infants at risk due to poor birth outcomes

- Preterm birth<sup>1</sup>; or
- Low birth weight<sup>2</sup>; or
- Small for gestational age<sup>3</sup>.

Note: Sequential measures are preferable to single measures, but other than this there is no hierarchy of these criteria; an infant can have any of these and be categorized as being at risk of poor growth and development.

Fig. 2 summarizes the above categories and associated criteria as well as the potential for overlap. The GDG acknowledged that the presence of multiple factors simultaneously could confer higher risk.

**Fig. 2. Identification criteria for the four main categories of infants at-risk of poor growth and development.**



### A note on neonates

During the meeting, the GDG also acknowledged that the management of neonates less than 28 days old requires different clinical approaches and protocols than those required for older infants. As such, the GDG agreed that any recommendations or good practice statements related to breastfeeding should have the target population of infants 0–6 months at risk of poor growth and development but, those related to any nutritional supplementation should be restricted to infants 1–6 months of age (and end-users directed to the appropriate WHO guidance covering neonates). However, the systematic review of the literature for guideline questions related to these infants did cover infants 0–6 months, in order to ensure that all relevant evidence could be presented and its applicability to infants 1–6 months then be judged. Unfortunately, very little eligible and relevant evidence was found for guideline questions on nutritional supplementation in infants less than 6 months of age, so the new guidance here focused on good practice statements on breastfeeding, and updating existing recommendations on nutritional supplementation (only covering infants 0–6 months with severe wasting and/or nutritional oedema).

1 Defined as babies born alive before 37 weeks of pregnancy are completed

2 Defined as weight at birth of < 2500 grams (5.5 pounds).

3 Defined as infants below the 10th centile of a birthweight-for-gestational-age based on a gender-specific reference population.

### **1.2.2 Moderate wasting in infants and children 6–59 months of age**

*WHZ or WLZ  $\geq -3$  and  $< -2$  SD (or MUAC  $\geq 115$  mm to  $< 125$  mm as an alternative measure).*

Up to now, there have been no WHO guidelines focusing specifically on the management of moderate wasting, including clinical and nutritional management. While certain treatment approaches for severe wasting and/or nutritional oedema may be applicable for children with moderate wasting, the GDG agreed that it is possible that differentiated management approaches are needed because of different physiological thresholds and characteristics in children with moderate wasting.

### **1.2.3 Severe wasting and nutritional oedema in infants and children 6–59 months of age**

*WHZ or WLZ  $< -3$  SD (or MUAC  $< 115$  mm as an alternative measure) and/or nutritional oedema.*

The new recommendations build on the existing 2013 WHO guideline. Many of the key care gaps following the 2013 guideline related to clinical management for severe wasting and/or nutritional oedema which are still relevant today, and mortality remains high particularly in inpatient settings and following exit from treatment. Guideline questions were therefore prioritized to try and address these gaps in guidance. A parallel guideline process for fluid management in critically ill children is ongoing, which will also include children with wasting and/or nutritional oedema.

### **1.2.4 Prevention of wasting and nutritional oedema**

Prevention is a new area for WHO guideline development around wasting and nutritional oedema in infants and children. It includes prevention of wasting and nutritional oedema incidence and prevalence, and also includes prevention of progression from moderate to severe wasting and/or nutritional oedema, known as secondary prevention. Importantly, the appropriateness and effectiveness of prevention approaches may differ greatly by setting, context, and other factors.

## 1.3 Target audience

This document is intended for a wide audience, including policymakers, expert advisers, and technical and programme staff involved in the assessment, management, monitoring and evaluation of wasting and nutritional oedema in infants and children. Therefore, the end users for this guideline are any of the following that develop or implement evidence-based policies, regulations, and best practices to address wasting and nutritional oedema in infants and children:

- national and local policymakers
- implementers and managers of national and local programmes
- non-governmental and other organizations and professional societies, and
- health workers (including health professionals and health associate professionals in both the public and private sectors; see [glossary](#)).

Operational guidance in the form of clinical manuals, training materials, and other tools will accompany this guideline and will provide more detail for different audiences (policymakers, programme managers and health workers) on how to implement these recommendations and good practice statements.

## 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 below -2 standard deviations (SD) of the WHO child growth standards median (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 below -3 SD, or
  - MUAC less than 115 mm in children 6–59 months of age.
- Moderate wasting:
  - WHZ or WLZ between -3 SD and below -2 SD ( $\geq -3$  SD to  $< -2$  SD), or
  - MUAC between 115 mm and less than 125 mm ( $\geq 115$  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).



## 1.5 Guiding principles

There was agreement amongst the Guideline Development Group (GDG) during the scoping meetings and GDG meetings to make judgements and decisions based on the evidence that the following guiding principles should be the foundation of all the recommendations and good practice statements within this guideline:

**Child health approach** – Putting the child’s health, growth, and development at the forefront. It is vital to consider that children are part of a family and household and that the impacts on their family must also be taken into consideration. This guideline advocates for services to meet the child’s need wherever they present in the health system with appropriate, cohesive, and timely care given throughout the care pathway, to prevent children being siloed in programmes.

**Caring for the mother/caregiver-infant pair** – Mothers/caregivers and infants are interdependent. Evidence-informed care that meets the needs of both the mothers/caregivers and their infants is vital and recognizes that the health and wellbeing of one is intimately linked to the other’s. We must see their value as individuals and collectively.

**Multisectoral action with the health system at the centre** – Health systems take many different forms in different countries and contexts. These can range from health posts to primary health centres to hospitals – the set-up, choice of location, human resources capacity, and differing functions can all vary significantly. The health system needs to be central to where children and their families access services for the prevention and management of wasting and/or nutritional oedema. The importance of effective referral and utilizing community platforms is also key to the success of this health system-focused approach. However, as reflected in the Global Action Plan on Child Wasting, the prevention and management of wasting and/or nutritional oedema must involve other systems besides the health system, such as the food, water and sanitation, and social protection systems for true and sustainable impact.

The lens of the health system at the centre also relates to a key goal of WHO, that of universal health coverage. Universal health coverage means that all individuals and communities receive the health services they need without suffering financial hardship. It includes the full spectrum of essential health services, from health promotion to prevention, treatment, ongoing recovery and palliative care across the life course.

**Nutritious home foods as a priority** – Emphasizing the importance of access to diverse, locally available and nutrient-dense foods that constitute a healthy diet as integral to the prevention of wasting and nutritional oedema, management of moderate wasting, and recovery from severe wasting and/or nutritional oedema. Access to these nutrient-dense foods at home needs to be strengthened in many contexts and safeguarded in others to ensure health along with environmental sustainability. Where it is not possible to access nutrient dense foods at home, specially formulated foods (SFFs) (explained further in the [glossary](#)) may be needed for infants and children with moderate wasting but must be used appropriately and not seen as a long-term solution.

**Gender equity** – Globally, malnourished children predominantly have women as their primary caregivers. Alongside the mother/caregiver-infant pair approach for infants less than 6 months of age and including older children and other female caregivers, the promotion of gender equality is therefore central to prevention and management of wasting and/or nutritional oedema as laid out in this guideline. This means recognizing and taking into account power structures, gender norms, gender violence, access to and ownership of resources, and experiences with health and nutrition services.

**Local adaptation is key** – Implementation of the recommendations in this guideline should be informed by the local context, including the prevalence and incidence of wasting and/or nutritional oedema as well as other childhood illnesses, the values and preferences of families and health workers, equity, acceptability, and feasibility of interventions, availability of resources, the organization and capacity of the health system and anticipated cost-effectiveness. Special consideration should be given to how to implement these recommendations in humanitarian crises and the importance of reviewing any adaptations made as crises evolve and/or stabilize.

## 2. Guideline development process and methods



## 2. Guideline development process and methods

The guideline on the prevention and management of wasting and nutritional oedema (acute malnutrition) in infants and children under 5 years of age was prepared in accordance with WHO standards and methods for guideline development, as detailed in the [WHO handbook for guideline development, second edition \(1\)](#). Across the questions covered in this guideline, all efforts were made to adhere to best practice standards for evidence-informed guideline development. This was achieved through the use of rigorous systematic reviews of all relevant evidence and the use of Grading of Recommendations, Assessment, Development and Evaluations (GRADE), which provides an explicit approach to: i) assessing the certainty of the evidence across studies and outcomes, and ii) translating evidence to recommendations. Multiple steps were taken during the process to minimize bias, optimize usability and incorporate transparency in all judgements and decision making. Key elements related to equity, human rights, gender, and other social determinants of health were considered and integrated into processes and methods. The WHO Department of Nutrition and Food Safety led the development of the guideline. This section gives an overview of the standards, methods and processes applied across the questions in this guideline.

### 2.1 Contributors to the guideline development process

#### WHO Steering Group

The WHO Steering Group provided input into the development of the guideline. It included representatives from relevant departments in WHO with an interest and expertise in the prevention and management of wasting and nutritional oedema in infants and children. The WHO Steering Group and guideline methodologists met regularly to plan and implement the development of the guideline.

#### Guideline Development Group (GDG)

The GDG for the WHO guideline on prevention and management of wasting and nutritional oedema (acute malnutrition) included 27 external experts with a range of technical skills, diverse perspectives, wide geographic representation, and gender balance. They are content experts, methodologists, and representatives of potential stakeholders and beneficiaries. The list of members of the GDG was established based on suggestions from all WHO departments with an interest in nutrition guidance, from WHO expert advisory panels, and from previous GDG membership.

The main functions of the GDG were determining the scope of the guideline and guideline questions (including the target population, intervention, comparator, and outcomes of interest), reviewing the evidence, and formulating evidence-informed recommendations.

#### Systematic Review Teams

Calls for authors for systematic reviews were published once the WHO Steering Group had drafted the guideline questions. The systematic review teams synthesized evidence and assessed the certainty of the body of evidence to inform recommendations and good practice statements. Review teams were required to have content and methods expertise, including experience in applying GRADE for systematic reviews and presenting results in GRADE Evidence Profiles.

#### Observers

Observers were identified by the WHO Steering Group to provide valuable insights to the GDG on issues relevant to the topic. Their role was to observe, although the GDG chairs were allowed to ask them for an opinion or information. They did not participate in the formulation of recommendations or good practice statements or in decisions on the wording, direction, or strength.

## Guideline Methodologists

There were two guideline methodologists with expertise in guidelines development, GRADE and translation of evidence into recommendations. Additional methods expertise for prognostic systematic review and guideline development were provided by a third methodologist for relevant prognostic questions. Methodologists provided orientation and overview of evidence-informed guideline development processes using the GRADE approach.

## Consultants with Additional Technical Expertise

One expert was appointed to provide technical and process functions for the guideline, including clear documentation of guideline processes and meetings, comments from the GDG and drafting of the guideline. This same expert was also involved in planning and development stages, attending GDG meetings, and working closely with the WHO Steering Group, supporting systematic review authors, and methodologists. Other consultants were involved in content support with questions focused on infants less than 6 months, data analysis for the prognostic questions, and data analysis for the prevention questions.

## External Review Group

The External Review Group for this guideline comprises eight people who have interest and expertise in the prevention and management of wasting and/or nutritional oedema in infants and children. They were identified by the WHO Steering Group as people who can provide valuable insights during the guideline development process. The Group includes technical experts, end-users, programme managers, advocacy groups and individuals who manage the children affected by the condition addressed in the guideline, among other stakeholders. The External Review Group was constituted so that it would provide diverse perspectives and is balanced in terms of geography and gender.

The External Review Group was asked to comment on (peer review) the final guideline to identify any errors or missing data and to comment on clarity and issues relating to implementation, dissemination, ethics, regulations, or monitoring, but not to change the recommendations formulated by the GDG. The members of the External Review Group were required to submit declarations of interests before the peer review process.

## 2.2 Guideline Development Group meetings

GDG meetings were convened virtually and in an in-person/hybrid format. Due to the extensive scope of the guideline, the responsibility of chairing was shared by several members of the GDG, who chaired different questions prioritized for the guideline. GDG meetings were also attended by members of the WHO Steering Group, the methodologists, systematic reviewers (for the key question under discussion), observers, and WHO staff. Working rules for each contributor type were outlined by the chair at the start of each meeting, covering aspects such as vocal rights, voting, and evidence to decision and recommendation formulating processes. The timeline of guideline development meetings is outlined in [section 2.7 Timeline of guideline development activities](#).

## 2.3 Declarations and management of interests

Prospective members of the GDG were asked to fill in and sign the standard WHO declaration of interests and confidentiality undertaking forms and to provide updated curriculum vitae. GDG members were engaged in their individual capacity and not as institutional representatives.

All participants of the GDG meetings – including each member of the GDG, systematic review teams and methodologists – were asked to sign a confidentiality undertaking relating to the guideline development process and outcomes.

In addition to the confidentiality undertaking forms, all systematic review teams and methodologists were also asked to fill in and sign the standard WHO declaration-of-interests.

The members of the external review group were asked to fill in and sign the standard WHO declaration-of-interests and confidentiality undertaking forms before the peer review process began.

Potential conflicts of interest were managed by the WHO Steering Group, in compliance with the [WHO Guidelines for declaration of interests for WHO experts \(15\)](#) and in collaboration with the Department of Compliance and Risk Management and Ethics.

Declaration of interest statements and the curriculum vitae for all GDG members were reviewed by the responsible technical officers, with input from the WHO Steering Group and the Director of the Department of Nutrition and Food Safety. Information was gathered from the internet or media to identify any public statements made or positions held by GDG members and experts on prevention and management of wasting and nutritional oedema in infants and children. Where the information was considered incomplete or unclear, potential GDG members were contacted for further clarification. These were assessed for intellectual bias that may affect or be perceived to affect impartiality. Any concerns or potential issues were discussed with the WHO Office of Compliance, Risk Management and Ethics.

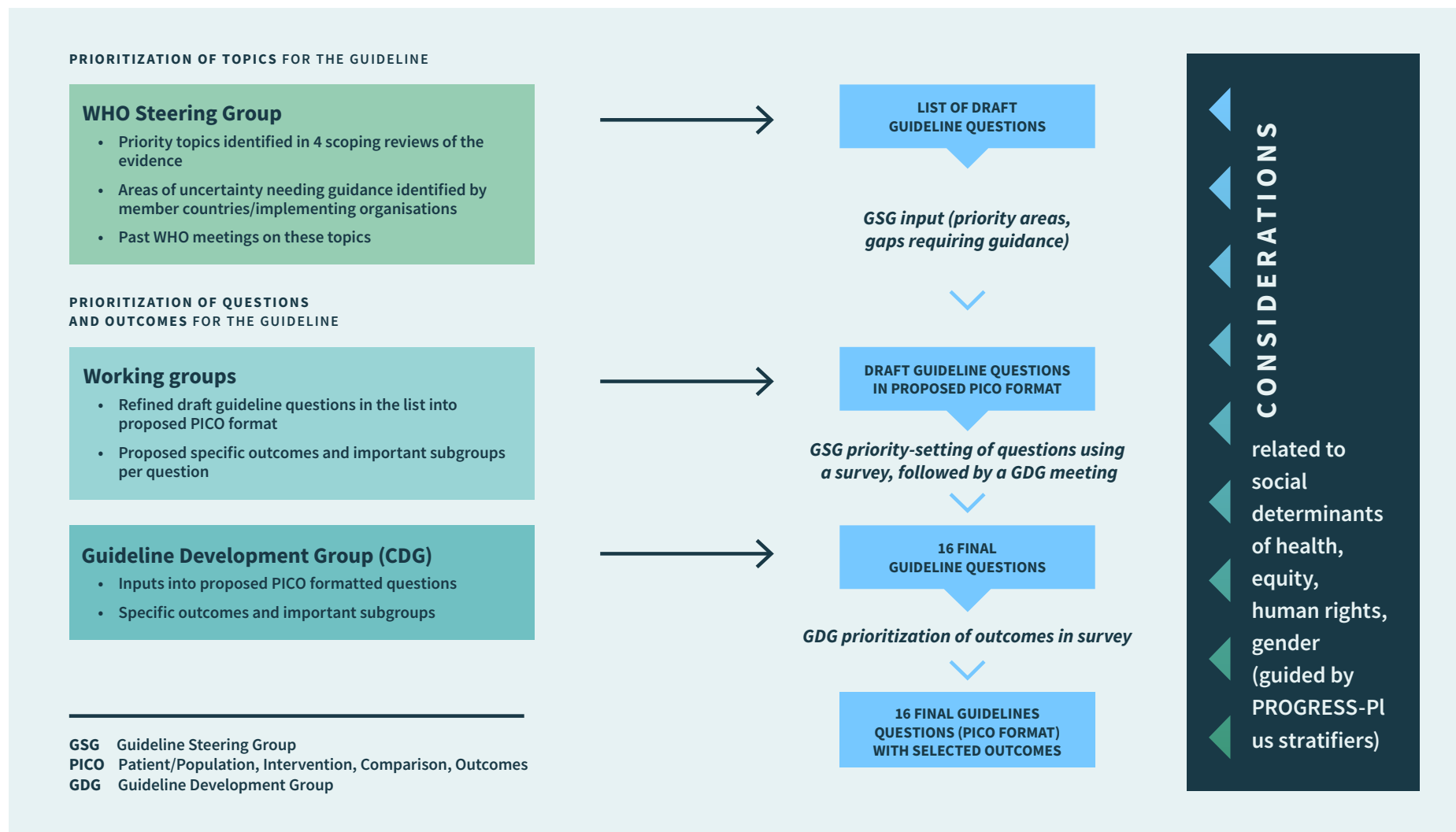
Possible conflicts of interest were managed on a case-by-case basis. An interest that had been declared could be assessed as insignificant or minimal if it was unlikely to affect or reasonably be perceived to affect the judgements of potential GDG members. If a declared interest was deemed to be potentially significant, conditional participation, partial exclusion, or total exclusion were considered in compliance with the WHO Guidelines for declaration of interests for WHO experts.

Names and brief biographies of the GDG members were published on the WHO website for public notice and comment for a minimum of two weeks. All GDG members verbally declared interests at the beginning of each meeting. The declarations of interest for each guideline question can be found in [Annex 2](#).

## 2.4 Formulating questions and selecting outcomes

Fig. 3 outlines the approach to the prioritization of topics, questions and outcomes for the guideline. The GDG was supported by the WHO Steering Group members, methodologists, and consultants with relevant inputs at the various steps in the approach, to ensure transparency and alignment with WHO standards and methods for guideline development. Throughout the approach, considerations related to social determinants of health, equity, human rights, and gender were discussed and considered, guided by [PROGRESS-Plus stratifiers \(16\)](#) including when guideline questions were refined into the PICO format, such as in the identification of important subgroups and considerations of differences in vulnerability, access, benefits, and consequences, when considering interventions and care.

**Fig. 3.** An outline of the approach to prioritization of topics, questions, and outcomes for the guideline



## Prioritization of topics

Four scoping reviews were commissioned, covering the areas of interest in the guideline's scope:

1. infants less than 6 months at risk of poor growth and development
2. infants and children 6–59 months with moderate wasting
3. infants and children 6–59 months with severe wasting and/or nutritional oedema, and
4. prevention of wasting and nutritional oedema.

Scoping review teams presented the findings at a GDG meeting, identifying priority topics from the evidence within each area. The WHO Steering Group presented a list of draft guideline questions informed by the scoping review findings, areas of uncertainty requiring guidance identified by Member States or implementing organizations, and past WHO meetings on these topics. The GDG had the opportunity to discuss these questions and give initial input on priority areas and gaps requiring guidance.

## Prioritization of questions and outcomes

Due to the broad scope of this guideline, working groups were formed for each of the four areas of interest of the guideline, which the WHO Steering Group invited GDG members and a small number of authors of the scoping reviews. The objectives of the working groups were to further refine the draft guideline questions from the GDG scoping meeting into proposed PICO formats, which included proposing specific outcomes and subgroups to be examined within these questions.

Following the working group meetings, GDG members prioritized the final guideline questions. In an online survey, GDG members were asked to rate each question on the list for importance using a Likert scale from one to nine, considering the following criteria (17): uncertainty or controversy about best practice, availability or absence of guidance, and impact on health outcomes, with an opportunity to add comments.

A GDG meeting was held to present the results of the priority-setting survey and discuss and resolve comments raised by GDG members in the survey. After agreeing on the most important guideline questions for the guideline, the PICO formats of these 16 guideline questions, including proposed specific outcomes and subgroups, were shared with GDG members for their input.

GDG members then prioritized the outcomes for each of the final guideline questions by rating the outcomes according to importance using a Likert scale from one to nine in an online survey, considering that numeric scores corresponded to categories of outcomes including not important, important, and critical. All outcomes proposed for the key guideline questions were important or critical outcomes. The broad grouping of anthropometric outcomes was prioritized for most questions in the guideline; in these cases, the systematic reviews included all specific outcomes within this grouping reported by the included studies.

The 16 final guideline questions included broadly focused and narrowly focused questions. Some of the broadly focused questions were split into several separate sub-questions in PICO format to find all the relevant evidence to inform the guideline questions and their potential recommendations. Types of questions included intervention effectiveness (management and prevention), prognostic and diagnostic questions. The 16 guideline questions prioritized for this guideline can be found in [Section 3](#). The guideline questions and outcomes can be found in [Web Annex A](#).



## 2.5 Evidence for the guideline

Informed by the evidence required for the GRADE (Grading of Recommendations, Assessment, Development and Evaluation) Evidence to Decision (EtD) criteria and the various types of questions prioritized for the guideline, systematic reviews were completed for the guideline questions and sub-questions, for use by the GDG when considering recommendations.

This included quantitative systematic reviews of intervention effectiveness, diagnostic test accuracy and prognostic factors for each of the guideline questions or sub-questions. Systematic reviews of economic evidence were done to gather evidence on resource use and cost-effectiveness of interventions, grouped into relevant intervention categories detailing specific interventions. Qualitative evidence syntheses were completed addressing stakeholder perspectives on equity, acceptability, and feasibility of relevant interventions for the defined intervention categories. A qualitative evidence synthesis was also completed to gather evidence on the values and preferences that people affected by the interventions assign to the intervention health outcomes in the guideline – focusing on critical outcomes organized into outcome categories. In consultation with the GDG, trustworthy and eligible preprint data were considered for certain questions and sub-questions.

## 2.6 Evidence retrieval, synthesis, and assessment

Protocols were drafted for all systematic reviews. Authors were encouraged to register their titles prospectively on the [International Prospective Register of Systematic Reviews \(PROSPERO\)](#) (18). Protocols were reviewed by the guideline methodologists, consultants, and the WHO Steering Group to support the use of best practice methods for systematic reviews, including comprehensive systematic searches, clear eligibility criteria, assessing the risk of bias of all included studies, assessing the certainty of evidence using GRADE, and presenting systematic review results according to best practice reporting guidelines. The applicable GRADE approach was followed according to the systematic review type for intervention effectiveness, diagnostic tests and prognostic factors. The methodologists and consultant supported the finalization of all GRADE assessments to promote rigour and internal consistency across questions. Evidence Profiles were populated in [GRADEpro](#) (19) or [MAGICapp](#). Reports for all systematic reviews, including GRADE Evidence Profiles, were provided to GDG members prior to GDG meetings. Review authors were encouraged to publish their systematic reviews. Where interventions were identified in the effectiveness reviews for the broadly focused questions, the teams completing the qualitative evidence synthesis (for equity, acceptability, and feasibility) and systematic reviews of economic evidence were informed of these interventions identified in the effectiveness reviews for the broadly focused questions to allow them to undertake additional literature searches if necessary and to align the qualitative and economic evidence with the comparisons of interest.

There were some questions for which additional information on energy requirements was used in addition to systematic review evidence. Energy requirements for infants and children with wasting and/or nutritional oedema were established through calculations using resting energy requirement data and other factors relating to energy needs.

The systematic review references can be found in [Web Annex B](#) and the GRADE Evidence Profiles can be found in [Web Annex C](#).

### Developing recommendations for intervention and diagnostic questions

Formal recommendations for the intervention and diagnostic questions in the guideline were developed in accordance with [WHO standards and methods for guideline development](#) (1). GRADE Evidence to Decision (EtD) frameworks were used to present evidence from the various quantitative systematic reviews and qualitative evidence syntheses for decision-making and judgements by the GDG (aided by [GRADEpro](#) software) for each question. Criteria considered by the GDG for intervention and diagnostic questions included balance of benefits and harms, values and preferences, certainty, resources, equity, acceptability, and feasibility.

## Developing recommendations for prognostic questions

### *Evidence to decisions*

As there is currently no formal EtD framework specifically for using prognostic evidence to develop recommendations, we adapted the existing EtD framework in order to structure the GDG discussions for the two prognostic guideline questions. We used this prognostic approach to update the 2013 WHO recommendations in terms of criteria that best inform admission, referral, transfer, and exit criteria in infants less than 6 months of age at risk of poor growth and development and in infants and children 6–59 months with severe wasting and/or nutritional oedema.

The following stepwise approach was implemented to facilitate the use of prognostic evidence by the GDG to develop recommendations along the care pathway.

#### **1. Systematic reviews of prognostic factor evidence**

Evidence from the commissioned prognostic factor systematic reviews was used to inform decisions about admission, referral, transfer and exit criteria. Best practice methods for prognostic factor systematic reviews were utilized, including risk of bias assessment with the Quality In Prognosis Studies (QUIPS) tool, and certainty in the prognostic value of each identified factor was assessed using the GRADE guidance ([20](#), [21](#)).

The reliance on prognostic factor evidence was necessary due to lack of direct evidence comparing one set of admission criteria to another. The ideal form of evidence would be a decision model analysis, combining randomized controlled trial data on interventions with prespecified admission criteria (i.e. administering inpatient interventions only to children who meet a specific set of criteria, as compared to administering inpatient interventions to all children or those who meet a different set of inpatient criteria, while tabulating the number of prioritized outcomes in each arm). This evidence, however, does not exist. The GDG therefore used prognostic factor evidence as an indirect surrogate measure, due to uncertainty around whether prioritization of children with worse prognosis, as identified by such factors, will lead to net benefit.

#### **2. Decision points, outcomes, and mapping of evidence**

Using a conceptual care pathway for the specific infants and children of interest, key decision points requiring criteria were identified, as follows: i) admission to inpatient care; ii) transfer to outpatient care from inpatient care; iii) exit from outpatient care. From the list of outcomes prioritized for these two guideline questions, the most relevant outcomes were mapped to each key decision point in the conceptual care pathway. The prognostic factor evidence in the systematic reviews for the most relevant outcomes was synthesized for each decision point in the care pathway.

#### **3. Factor filtering process**

Although primary studies to identify prognostic factors are typically abundant, findings are often inconsistent, and quality, measurement and reporting are variable. In order to be able to present the GDG with trustworthy prognostic factors to consider for decision making, a filtration strategy was used. Factors were only considered for which we had moderate to high certainty in their prognostic value. For these prognostic factors, absolute risk differences were calculated to evaluate their clinical importance. When sensible, and with the aim of ensuring the factors used were trustworthy and meaningful, further filtering was done by applying absolute risk thresholds determined by the GDG as being important. Where applied, the GDG considered absolute risk differences associated with prognostic factors as a surrogate of expected net benefit or harm. This benefit was considered in conjunction with the expected harms of admission to inpatient care, premature transfer to outpatient, or exit from outpatient care.

#### 4. Recommendations using prognostic evidence

The GDG developed recommendations separately for each decision point – informed by the filtered prognostic factor evidence for the relevant mapped outcomes, the standing 2013 WHO recommendations (10) and evidence from the qualitative evidence synthesis for equity, acceptability, and feasibility and the systematic review of economic evidence. Discussions addressed all EtD criteria except for balance of benefit versus harms. The certainty in the evidence was considered as the lowest of all prognostic factors (moderate certainty), with discussions by the GDG allowing further rating down due to indirectness (lack of direct evidence to suggest the use of these prognostic factors will lead to net benefit for the prioritized outcomes).

##### *Decision-making for recommendations*

Using the EtD criteria, the guideline methodologists facilitated decision-making and judgements, where needed, by the GDG to develop clear and actionable recommendations. Decisions were made by consensus, aided where needed during virtual meetings by polling. Judgements, additional considerations, research priorities, implementation considerations and points about monitoring and evaluation discussed by the GDG were documented.

The GDG used their judgements for the EtD criteria to determine the direction and strength of recommendations, including certainty of evidence. The four levels of the GRADE certainty of evidence are interpreted as detailed in Table 1. The certainty of evidence is stated for the recommendations.

**Table 1. Description of the interpretation of the GRADE four levels of certainty of evidence**

Certainty	Interpretation
High	We are very confident that the true effect lies close to that of the estimate of the effect.
Moderate	We are moderately confident in the effect estimate; the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
Low	Our confidence in the effect estimate is limited; the true effect may be substantially different from the estimate of the effect.
Very low	We have very little confidence in the effect estimate; the true effect is likely to be substantially different from the estimate of the effect.

A recommendation for an intervention indicates that it should be implemented; a recommendation against an intervention indicates that it should not be implemented. The strength of a recommendation – described as either “strong” or “conditional” – reflects the degree of confidence that the GDG has in the desirable effects of the recommendation outweigh the undesirable consequences (or the reverse in the case of the GDG recommending against an intervention – where the undesirable consequences outweighing the desirable consequences). Table 2 outlines the considerations for the EtD criteria in relation to the strength of a recommendation.

**Table 2. GRADE EtD criteria and considerations that link to the strength of recommendations**

Criteria	Considerations
<b>Benefits and harms</b>	When a new recommendation is developed, desirable effects (benefits) need to be weighed against undesirable effects (risks/harms), considering any previous recommendation or another alternative. The larger the gap or gradient in favour of the desirable effects over the undesirable effects, the more likely that a strong recommendation will be made.
<b>Certainty of the evidence about the effects</b>	The higher the certainty of the scientific evidence base, the more likely that a strong recommendation will be made.
<b>Values and preferences</b>	If there is no important uncertainty or variability in how much people value the main outcomes, it is likely that a strong recommendation will be made. Uncertainty or variability around these values that could likely lead to different decisions, is more likely to lead to a conditional recommendation.
<b>Economic implications</b>	Lower costs (monetary, infrastructure, equipment or human resources) or greater cost-effectiveness are more likely to support a strong recommendation.
<b>Equity and human rights</b>	If an intervention will reduce inequities, improve equity or contribute to the realization of human rights, the greater the likelihood of a strong recommendation.
<b>Feasibility</b>	The greater the feasibility of an intervention to all stakeholders, the greater the likelihood of a strong recommendation.
<b>Acceptability</b>	If a recommendation is widely supported by health workers and programme managers and there is widespread acceptance for implementation within the health service, the likelihood of a strong recommendation is greater.

Source: Schünemann H, Brozek J, Guyatt G, Oxman A (editors). GRADE handbook: handbook for grading the quality of evidence and the strength of recommendations using the GRADE approach. Grading of Recommendations Assessment, Development and Evaluation (GRADE) Working Group; 2013

The meanings of strong or conditional recommendations (for or against the intervention) are (22):

### **Strong recommendation**

Strong recommendations are those recommendations for which the WHO guideline development group is confident that the desirable consequences of implementing the recommendation outweigh the undesirable consequences. Strong recommendations can be adopted as practice or policy in most situations.

### **Conditional recommendation**

The WHO guideline development group is less certain that the desirable consequences of implementing the recommendation outweigh the undesirable consequences or when the anticipated net benefits are very small. Therefore, discussion may be required before a conditional recommendation can be adopted as practice or policy.

The strength and certainty of evidence are stated for the recommendations.

The GDG collectively drafted and finalized recommendations with relevant justifications and remarks to help with their interpretation, with close support and input from the consultant and guideline methodologists.

### Developing good practice statements

The GDG also established good practice statements for this guideline, which are actionable messages relevant to the guideline questions. The justification for each good practice statement was carefully considered by the GDG with an emphasis that they are clearly needed. Good practice statements were developed, guided by the following GRADE criteria (23, 24):

- Message is really necessary with regard to actual healthcare practice
- Have large net positive consequence (relevant outcomes and downstream consequences) (GRADE EtD domains)
- Collecting and summarizing the evidence is a poor use of time and resources
- Include a well-documented, clear rationale connecting indirect evidence
- Are clear and actionable statements.

The GDG collectively drafted and finalized good practice statements with relevant justifications and remarks to help with their interpretation, with close support and input from the consultant and guideline methodologists.

## 2.7 Timeline of guideline development activities

- GDG meeting for prioritization of topics  
*8–11 December 2020 (virtual)*
- Working group meetings for prioritization of questions and outcomes  
*2–5 February 2021 (virtual)*
- Rating of questions by GDG  
*25 February–4 March 2021 (online survey)*
- GDG meeting for prioritization of questions  
*10 March 2021 (virtual)*
- Working group meeting (prevention group only) for prioritization of questions and outcomes  
*26 March 2021 (virtual)*
- Rating of outcomes by GDG  
*14–23 April 2021 (online survey)*
- Call for authors for quantitative systematic reviews  
*1 May 2021 (call released), 31 May 2021 (deadline)*
- GDG meeting for prioritization of questions (cost-effectiveness and qualitative systematic reviews)  
*22 June 2021 (virtual)*
- Call for authors for cost-effectiveness and qualitative systematic reviews  
*1 July 2021 (call released), 27 July 2021 (initial deadline), 20 August 2021 (extended deadline)*
- Working group meeting (prevention group only) for evidence retrieval, synthesis, and assessment  
*16 December 2021 (virtual)*
- GDG meetings for developing recommendations and good practice statements  
*9 February 2022–26 July 2023 (32 three-hour virtual GDG meetings and eight days of in-person/hybrid meetings).*



### 3. Guideline questions



### 3. Guideline questions

The outcomes to the guideline questions can be found in [Web Annex A](#) and the systematic review references can be found in [Web Annex B](#).

#### A. Management of infants less than 6 months of age at risk of poor growth and development

##### **Admission, referral, transfer, and exit criteria for infants at risk of poor growth and development**

- A. In infants less than 6 months at risk of poor growth and development, what are the criteria that best inform the decision to initiate treatment in an outpatient/community setting?
- B. In infants less than 6 months at risk of poor growth and development, what are the criteria that best inform the decision for referral to treatment in an inpatient setting?
- C. In infants less than 6 months at risk of poor growth and development admitted for inpatient treatment, what are the criteria that best inform the decision for transfer to outpatient/community treatment?
- D. In infants less than 6 months at risk of poor growth and development receiving outpatient/community treatment, what are the criteria that best inform the decision for exit from outpatient/community treatment?

##### **Management of breastfeeding/lactation difficulties in mothers/caregivers of infants at risk of poor growth and development**

In mothers/caregivers of infants less than 6 months at risk of poor growth and development who are experiencing difficulties with breastmilk intake, which interventions to manage difficulties with breastfeeding/lactation can improve breastfeeding practices and increase breastmilk intake?

##### **Supplemental milk for infants at risk of poor growth and development**

- A. In infants less than 6 months at risk of poor growth and development, which criteria best determine if and when an infant should be given a supplemental milk (in addition to breastmilk if the infant is breastfed)?
- B. In infants less than 6 months at risk of poor growth and development meeting the above criteria, what is the most effective supplemental milk (donor human milk, human milk from wet nurse, commercial infant formula, F-75, F-100, or diluted F-100) and for how long should these be given?

##### **Antibiotics for infants at risk of poor growth and development**

In infants less than 6 months at risk of poor growth and development, should an antibiotic be routinely given (as per the 2013 guidelines for severe wasting and oedema)?

##### **Interventions for mothers/caregivers of infants at risk of poor growth and development**

In mothers/caregivers of infants less than 6 months at risk of poor growth and development, do maternal nutritional supplementation and/or counselling and/or maternal-directed mental health interventions improve infant outcomes?



## **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**

- A. In infants and children 6–59 months, what are the criteria that best inform the decision to initiate treatment in an outpatient/community setting for wasting and/or nutritional oedema?
- B. In infants and children 6–59 months with wasting and/or nutritional oedema, what are the criteria that best inform the decision for referral to treatment in an inpatient setting for wasting and/or nutritional oedema?
- C. In infants and children 6–59 months admitted for inpatient treatment of wasting and/or nutritional oedema, what are the criteria that best inform the decision for transfer to outpatient/community treatment?
- D. In infants and children 6–59 months receiving outpatient/community treatment for wasting and/or nutritional oedema, what are the criteria that best inform the decision for exit from outpatient/community treatment?

### **Identification of dehydration in infants and children with wasting and/or nutritional oedema**

In infants and children with moderate or severe wasting or oedema, how can dehydration be identified?

### **Rehydration fluids for infants and children with wasting and/or nutritional oedema and dehydration but who are not shocked**

In infants and children with moderate or severe wasting or oedema and dehydration but who are not shocked, what is the effectiveness of standard WHO low-osmolarity ORS compared with ReSoMal during inpatient care?

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

In infants and children with severe wasting or oedema who are not tolerating F-75 or F-100, what is the effectiveness of hydrolyzed or lactose-free formulas during inpatient care?

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

In infants and children 6–59 months with severe wasting and/or nutritional oedema, what is the optimal quantity and duration of RUTF?

### **Dietary management of infants and children with moderate wasting**

In infants and children 6–59 months with moderate wasting across settings and contexts, which children require specially formulated foods (SFFs); also what is the effectiveness of SFFs versus non-specially formulated food interventions versus other approaches?

In infants and children 6–59 months with moderate wasting, what is the appropriate dietary treatment in terms of optimal type, quantity, and duration?

### **Identification and management of wasting and nutritional oedema by community health workers**

In infants and children with wasting without co-morbidities, what is the effectiveness of the identification and management of wasting by community health workers (in community settings)?

## **C. Post-exit interventions after recovery from wasting and/or nutritional oedema**

- A. Which infants and children at risk of poor growth and development or with moderate or severe wasting or oedema require post-exit interventions?
- B. In infants and children at risk of poor growth and development or with moderate or severe wasting or oedema meeting the above criteria, which post-exit interventions are effective?

## **D. Prevention of wasting and nutritional oedema**

In communities with infants and children up to five years old at risk of wasting and nutritional oedema, what community characteristics increase or mitigate risk of wasting and nutritional oedema for individual children?

In communities with infants and children up to five years at risk of wasting and nutritional oedema, what is the effectiveness of interventions for prevention of wasting and nutritional oedema?

In communities with infants and children up to five years at risk of wasting and nutritional oedema, what is the effectiveness of population-based interventions compared to targeted interventions for primary and secondary prevention of wasting and nutritional oedema?

## 4. New and updated recommendations and good practice statements



## 4. New and updated recommendations and good practice statements

This section of the guideline – new and updated recommendations and good practice statements – is divided into four sub-sections:

- A. Management of infants less than 6 months of age at risk of poor growth and development
- B. Management of infants and children 6–59 months with wasting and/or nutritional oedema
- C. Post-exit interventions after recovery from wasting and/or nutritional oedema
- D. Prevention of wasting and nutritional oedema

### A. Management of infants less than 6 months of age at risk of poor growth and development

#### Admission, referral, transfer, and exit criteria for infants at risk of poor growth and development

Good practice statement	New in 2023
<p>A1. Mothers/caregivers and their infants less than 6 months of age at risk of poor growth and development should receive regular care and monitoring by health professionals. The immediate goal is the early detection of any acute medical or psychological problems and preventing infants from becoming severely underweight or severely wasted. The longer-term goal of this regular care and monitoring is to enable these infants to grow and develop in a healthy way that can lead to them achieving their full potential, whilst simultaneously supporting their mothers/caregivers with their own health and wellbeing. This approach recognizes the importance of acknowledging and caring for the mother/caregiver and infant as an inter-dependent pair for both to survive and thrive.</p>	

#### Remarks

- The definition of infants at risk of poor growth and development for the purpose of this guideline is described in the [scope section 1.2](#).
- Regular care and monitoring can involve the following activities (according to local capacity): comprehensive medical assessments (plus providing medical interventions when necessary), growth monitoring and promotion, breastfeeding assessment and support, replacement feeding assessment and support for non-breastfed infants, physical and mental health assessment of the mother/caregiver (or referral to appropriate services if this is not possible at the initial point of care), health education, counselling on more general infant and young child feeding practices, etc.
- This care and monitoring should be coordinated and delivered by a health professional (such as a doctor, nurse, midwife) capable of identifying and acting on any clinical deterioration of the mother/caregiver or the infant; however, certain aspects of care may be referred to health associate professionals who are based in the community such as community health workers, peer breastfeeding counsellors, etc. (depending on their competencies and availability), in order to improve acceptability and uptake of services with an ongoing focus on patient safety.

- The effectiveness, feasibility, and acceptability of this approach depends on policymakers, programme managers, and health workers all having a strong focus on continuity of care (particularly referral between inpatient and outpatient services) and actively communicating between different levels and locations within the health system. This includes forming strong links with antenatal and postnatal care services, sexual and reproductive health services (such as family planning), and other preventative and curative services where women and children have contact with health workers (for example, for vaccination, growth monitoring, psychological care, etc.). This also includes forming strong links with community platforms, especially for the early identification of these mother/caregiver-infant pairs and for improving access to care by providing welcoming and supportive services that are as close as possible to the families themselves.
- This regular monitoring and care should also be grounded in a family-centred and context-adapted approach to maximize the sustainability and acceptability of these interventions.

### **Rationale**

The GDG felt that this good practice statement was necessary to reinforce the importance of creating or revitalizing policies and interventions to prevent infants at risk of poor growth and development becoming underweight or wasted (with or without nutritional oedema) and to optimize healthy growth and development. In addition to this, the GDG emphasized the importance of supporting mothers/caregivers and taking a family-centred approach. They agreed that regular care and monitoring is crucial for these infants and their mothers/caregivers to achieve these goals.

- A2. a) Infants less than 6 months of age at risk of poor growth and development who have any of the following characteristics should be referred and admitted for inpatient care:
- i. one or more Integrated Management of Childhood Illness (IMCI) danger signs
  - ii. acute medical problems or conditions under severe classification as per IMCI
  - iii. oedema (nutritional)
  - iv. recent weight loss.
- b) Infants less than 6 months of age at risk of poor growth and development who do not meet any of the criteria from part a should have an in-depth assessment to consider if they need inpatient admission or outpatient management based on clinical judgement if they have any of the following characteristics:
- i. medical problems that do not need immediate inpatient care, but do need further examination and investigation (for example, HIV-related complications);
  - ii. medical problems needing mid or long-term follow-up care and with a significant association with nutritional status (for example, congenital heart disease, HIV, tuberculosis, cerebral palsy or other physical disabilities);
  - iii. specific anthropometric criteria from the list of criteria used to identify infants at risk of poor growth and development: WAZ < -2 SD, WLZ < -3 SD, MUAC < 110 mm for infants between 6 weeks and less than 6 months of age, failure to gain weight based on two consecutive measurements;
  - iv. ineffective breastfeeding (for example, attachment, positioning, suckling reflex) or perceived breastmilk insufficiency
  - v. feeding concerns for non-breastfed infants (for example, inappropriate and unsafe use of breastmilk substitutes for replacement feeding, milk refusal);
  - vi. any maternal-related or social issue needing more detailed assessment or intensive support (for example, disability, depression of the caregiver, absent mother, adolescent mother or other adverse social circumstances).
- c) Infants less than 6 months of age at risk of poor growth and development who have all of the following characteristics should be enrolled and managed as outpatients:
- i. no danger signs or any of the criteria from part a needing inpatient admission
  - ii. no criteria needing in-depth assessment (see part b) or when criteria from part b are present but an in-depth assessment has been completed and determined that no inpatient admission is needed (for example, feeding problems that can be managed in outpatient care, diarrhoea with no dehydration, respiratory infections with no signs of respiratory distress, malaria with no signs of severity).

## Remarks

- Maternal/caregiver autonomy, capacity and consent must be prioritized in the context of decision-making as outlined in this recommendation.
- The effectiveness and safety of care delivered using the admission/enrolment criteria above depends on policymakers, programme managers, and health workers all having a strong focus on continuity of care (in particularly referral between inpatient and outpatient services) and on active communication between different levels and locations within the health system.
- Health workers tasked with making these treatment decisions must have the training and expertise to recognize and act on the signs and symptoms described in this recommendation and detailed below.
- [IMCI \(25\)](#) danger signs include: not able to drink or breastfeed; vomits everything; had convulsions recently; lethargic or unconscious; convulsing now.

- Acute medical problems (as per IMCI classification) which need referral to inpatient care include:
  - signs of possible serious bacterial infection in infants less than 2 months of age
  - shock
  - oxygen saturation < 90%
  - pneumonia (with chest indrawing; and/or fast breathing; and if possible to measure, oxygen saturation < 94%)
  - dehydration (including some or severe dehydration)
  - severe persistent diarrhoea (diarrhoea for 14 days or more plus dehydration)
  - very severe febrile illness – in a malaria zone or with a positive rapid diagnostic test (RDT), this is treated as severe malaria
  - very severe febrile illness – where there is no risk of malaria or with a negative RDT, this is treated as bacterial disease, such as meningitis, etc.
  - severe complicated measles
  - mastoiditis
  - severe anaemia (severe palmar pallor or as per age-associated haemoglobin levels)
  - severe side effects from antiretroviral therapy (for HIV) – skin rash, difficulty breathing and severe abdominal pain, yellow eyes, fever, vomiting
  - open or infected skin lesions associated with nutritional oedema
  - other stand-alone ‘priority clinical signs’ not classified as danger signs: hypothermia (< 35°C axillary or 35.5°C rectal) or high fever ( $\geq 38.5^\circ\text{C}$  axillary or  $39^\circ\text{C}$  rectal)
- Recent weight loss can be established either through two or more documented weight measurements or reported by the mother/caregiver.
- An in-depth assessment in this context refers to a health worker carrying out a comprehensive medical, feeding, and psychosocial assessment of an infant less than 6 months of age at risk of poor growth and development and their mother/caregiver. The primary aim of this in-depth assessment is to decide if it is possible, safe, and appropriate to manage the child as an outpatient or refer them for inpatient care. The secondary function of this assessment is to initiate the appropriate care and/or referral, wherever this is subsequently to be delivered. This kind of assessment is likely to take longer than that carried out as part of initial community screening (and may be beyond the capacities of health workers at this level) or in an admission unit/emergency department/outpatient department of a health facility. Who carries out this assessment and where it is carried out will need to be decided depending on local context, according to set-up and capacity, but personnel, location, and other resources will need to be designated to this activity.
- HIV-related complications which should trigger an in-depth assessment include (as per IMCI):
  - not on antiretroviral therapy – any suspicion of opportunistic infections
  - on antiretroviral therapy but still experiencing: not gaining weight for 3 months, loss of milestones, poor adherence, stage worse than before, CD4% lower than before (in children less than 5 years old) LDL higher than 3.5 mmol/L, triglycerides higher than 5.6 mmol/L
  - to monitor start of antiretroviral therapy if child also has tuberculosis and/or is < 3kg.
- Medical problems needing mid or long-term follow-up care and with a significant association with nutritional status necessitating in-depth assessment could be a medical problem that has just been diagnosed where a decision needs to be made about whether they would benefit from initial inpatient care (for a period of intensive observation, initiating treatment, investigations not available in an outpatient setting, etc.) before commencing ongoing outpatient follow-up. Alternatively, it could be that a child with a known medical problem needing ongoing follow-up has an exacerbation or deterioration that does not involve any of the danger signs or signs and symptoms of the acute medical problems listed, but that still might need an in-depth assessment to decide whether referral to inpatient care is appropriate. Part of this in-depth assessment should involve evaluating how the mother/caregiver is coping and able to support the psychosocial impact of this medical problem on the infant themselves and the family.

- Feeding assessments should include the following domains: infant and mother/caregiver health status (including assessing for disabilities), maternal responsiveness to infant cues, for breastfeeding specifically: positioning, latching, sucking, and swallowing (noting that these aspects will vary with the age of the infant).
- WHO guidance on how to carry out comprehensive feeding assessments and best practices for the management of breastfeeding/lactation challenges should be used. WHO guidance can be found in the following resources:
  - [WHO/UNICEF Infant and young child feeding counselling: an integrated course: participant's manual, 2nd ed \(26\)](#).
  - [IMCI Management of the sick young infant aged up to 2 months: Chart booklet \(13\)](#).
  - [WHO Training Course on Child Growth Assessment \(27\)](#).
  - [WHO Guideline: counselling of women to improve breastfeeding practices \(28\)](#).
  - [WHO recommendations on maternal and new-born care for a positive postnatal experience \(11\)](#).
- Although MUAC can be used as one of the criteria for admission into inpatient care, in-depth assessment or enrolment into outpatient care for infants less than 6 months at risk of poor growth and development, it should not be used to monitor anthropometric and clinical progression. Weight gain and assessment of clinical status should be used to monitor progression.

## Rationale

This recommendation is a major update to recommendation 8.1 from the [WHO Guideline: updates on the management of severe acute malnutrition in infants and children, 2013 \(10\)](#). The GDG felt that this should be a conditional recommendation because of the uncertainties with regards to the available evidence and the need to consider different contexts including health systems in diverse settings. They agreed that the certainty should be low due to uncertainty about inpatient care based on certain criteria resulting in actual benefit.

In terms of the updates from the 2013 recommendation, the GDG agreed to expand the population from infants with severe wasting and/or oedema (severe acute malnutrition) to the broader group of infants at risk of poor growth and development, which is a new area of focus for this 2023 guideline with a prevention emphasis. The GDG also added an additional decision along the care pathway for infants at risk of poor growth and development to have an in-depth assessment to decide whether an infant needs admission to inpatient care or can be managed as an outpatient, rather than directly admitted for inpatient care which was the approach in the previous recommendation. Furthermore, considering evidence from a prognostic systematic review, existing criteria for infants (from IMCI) and guidance for infants and children 6–59 months with severe wasting and/or nutritional oedema, and collective judgement based on expert experience, the GDG reviewed and updated the criteria for inpatient care and agreed on criteria for infants requiring in-depth assessment as well as criteria for outpatient management.

The prognostic systematic review was commissioned with the objective of identifying factors associated with risk based on outcomes including mortality in a broad population of infants that may inform the need for referral or admission to inpatient care. These prognostic factors could be used to reinforce/support existing criteria and to identify additional criteria that are associated with increased risk, that could trigger a decision for referral to inpatient care.

The GDG examined all prognostic factors identified in the systematic review that had moderate or high certainty according to GRADE for prognostic studies (20). The only outcome with prognostic factor evidence for infants at risk of poor growth and development was mortality (inpatient and outpatient/community). The filtered prognostic factors can be found in [Web Annex D](#).

The GDG acknowledged and discussed the limitations of this evidence, including the lack of randomized controlled trials that evaluated whether admission for inpatient care based on prognostic factors



versus no admission would result in better outcomes for these infants. They also highlighted that there were few eligible studies and a limited number of prognostic factors with moderate or high certainty evidence and risk differences that would lead to different decisions along the care pathway. It was because of this uncertainty that the GDG felt the need for there to be another step in the care pathway for infants to have an in-depth assessment rather than be directly admitted for inpatient care.

Throughout the process for updating recommendations about decisions along the care pathway, the GDG also considered evidence from a qualitative evidence synthesis on equity, acceptability, and feasibility related to decisions for admission, transfer, and exit from care as well as resource use and cost-effectiveness information from an economic evidence synthesis. These systematic reviews had limited evidence and the GDG did not make explicit judgements across all EtD criteria for these recommendations.

## Systematic reviews

This recommendation was informed by the following systematic reviews:

Uthman O, Folasire Y, Fagbamigbe F, Anjorin S. Growth faltering and failure in infants younger than six months: a systematic review and meta-analysis. PROSPERO 2021 CRD42021288254 (29).

Annan RA, Aduku LNE, Agyapong NAF: Qualitative Systematic Review assessing the Values and Preferences parents/caregivers of children affected by wasting assign to defined health outcomes. PROSPERO 2021 CRD42021282013 (30).

Mdege DN, Masuku SD, Musakwa N, Chisala M, Tingum EN, Boachie MK et al. Costs and cost-effectiveness of treatment setting for children with wasting, oedema and growth failure/faltering: A systematic review. PLOS Glob Public Health. 2023 Nov 8; 3(11):e0002551. doi: 10.1371/journal.pgph.0002551 (31).

Twalibu A, Sulley AM, Chibwana A, Selemani A, Hanjahanja-Phiri T, Potani I et al. Equity, acceptability, and feasibility of decisions on where to treat wasting in children 0-59 months: A qualitative systematic review and meta-aggregation. PROSPERO 2022 CRD42022298843 (32).

## Evidence to decision

### Benefits and harms

The filtered prognostic factors from the systematic review with moderate or high certainty were predominantly anthropometric criteria, which made it challenging to apply to the recommendation itself. The GDG considered the criteria in the 2013 WHO recommendation, IMCI guidance, and recommendations for infants and children 6–59 months with severe wasting and/or nutritional oedema to make judgements about which infants at risk of poor growth and development may need to be admitted for inpatient care, undergo an in-depth assessment, and/or be managed as outpatients.

The GDG considered that there may be potential benefits of admitting infants at risk of poor growth and development who meet specific admission criteria but strongly felt that an in-depth assessment is important for some infants who may successfully be managed in outpatient settings after careful consideration. Other infants at risk of poor growth and development may be directly enrolled and managed as outpatients. The GDG noted that inpatient care has potential harms, including risk of hospital-acquired infections and social or family challenges.

### Certainty of the Evidence

The GDG examined prognostic factors from the systematic review that had moderate or high certainty only. However, the prognostic factor evidence had many limitations, including the fact that the factors were predominantly anthropometric criteria which were not used directly to inform the criteria in this recommendation. The GDG therefore used existing criteria such as IMCI criteria and guidance for infants and children 6–59 months with severe wasting and/or nutritional oedema.

The recommendation on admission for inpatient care, in-depth assessment, and/or management as outpatients for infants and children 6–59 months with severe wasting and/or nutritional oedema (recommendation B2) is of low certainty; the GDG agreed that the recommendation for infants at risk of poor growth and development should have the same certainty.

Furthermore, the GDG extensively discussed that there was uncertainty about whether inpatient care results in benefit for infants meeting specific criteria in terms of improvements in important outcomes. The GDG also considered the certainty of the evidence to be low because of this indirectness.

### **Values and preferences**

The GDG agreed that there is probably no important uncertainty or variability in how much people value the main outcomes including mortality. A qualitative evidence synthesis of values and preferences showed that caregivers from one context to the next are likely to place very similar value on whether their children survive or not.

### **Resources**

An economic evidence synthesis identified a limited amount of indirect evidence about resource use and cost-effectiveness related to settings across the care pathway, including community, outpatient, and inpatient settings. The GDG agreed that resource use and cost-effectiveness is context-specific and expected to vary considerably.

### **Equity**

A qualitative evidence synthesis identified two studies that indicated that caregivers may have challenges accessing care and that inpatient care may be expensive for caregivers (33, 34), which could negatively impact health equity. However, the GDG agreed that this qualitative evidence was very limited.

Evidence from the prognostic systematic review was used to identify infants who are at higher risk based on individual child factors, social factors, and contextual factors with the aim of increasing health equity for these infants. This approach could help reduce disparities in health outcomes, as at-risk infants might benefit more from inpatient care, although the GDG again highlighted the caveat that it is unknown whether inpatient care based on certain criteria will improve outcomes for all infants.

### **Acceptability**

One study identified in the qualitative evidence synthesis indicated that caregivers have perceptions of benefits of inpatient treatment of infants with wasting (33). The GDG acknowledged the limited available qualitative evidence but felt that the acceptability of admission for inpatient care based on specific criteria may vary across settings and by different situations which supports the need for a conditional recommendation.

### **Feasibility**

Studies in the qualitative evidence synthesis suggested that quality of inpatient care is not always consistent, discharge from inpatient care may happen too early in some situations, and quality of outpatient care may be inadequate (33–36).

The GDG agreed that the feasibility of adopting criteria for inpatient care is highly dependent on resources, infrastructure, and capacities of health systems. Factors that may influence feasibility include the availability of hospital beds with trained staff, as well as the prevalence of infants at risk of poor growth and development meeting these criteria within certain settings. Context-specific strategies should be developed to address the unique challenges and optimize the feasibility of implementing the recommendation in various settings.

## Research needs

Future studies should:

- establish whether inpatient care of infants less than 6 months of age at risk of poor growth and development improves outcomes compared to outpatient care based on a set of criteria or different factors
- determine the most appropriate methods and tools for assessing breastfeeding, including whether an infant is being exclusively breastfed, having difficulties breastfeeding, etc.
  - this should include methods and tools that health workers can use to assess and manage simple breastfeeding problems
- identify approaches to effectively re-establish breastfeeding for mothers of infants who have stopped breastfeeding
- determine the cadres, training needs, and tools that can most effectively support breastfeeding
- establish the efficacy/effectiveness of interventions targeting social, psychological, and economic challenges faced by mothers/caregivers
- consider how infants who fail to respond to initial supported breastfeeding and clinical treatment should be managed
- include biological studies that aim to understand resilience, functional recovery, immune function, and cognitive development of infants less than 6 months of age at risk of poor growth and development
- include clinical and social science studies to understand factors affecting resilience and cognitive development of infants less than 6 months of age at risk of poor growth and development
- determine optimal enrolment and monitoring/transfer criteria, with a specific focus on which anthropometric indicators and cut-offs best identify high-risk infants across different settings
- consider which packages of care are most effective at improving outcomes in infants at risk of poor growth and development and preventing wasting and nutritional oedema
- understand mother/caregiver, community, and health worker perspectives on different models of care
- consider how best to link with related services (for example, Integrated Management of Newborn and Childhood Illness; immunizations; growth monitoring; mental health; disability treatment services)
- establish the short- and long-term impact of services focusing on infants at risk of poor growth and development (for example, prevention of later wasting/morbidity, better development)
- incorporate systems research approaches such as system dynamics and scenario- or agent-based modelling to understand the complex adaptive nature of the health system within which interventions are delivered.

- A3. Infants less than 6 months of age at risk of poor growth and development who are admitted for inpatient care can be transferred to outpatient care when:
- i. there have been no danger signs for at least 48 hours prior to transfer time; and
  - ii. all acute medical problems are resolved; and
  - iii. nutritional oedema is resolving; and
  - iv. the infant has good appetite; and
  - v. documented weight gain for at least 2–3 days is satisfactory on either exclusive breastfeeding or replacement feeding; and
  - vi. all attempts have been made to refer the infants 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; and
  - vii. the infant has been checked for immunizations and other routine interventions delivered or plans made for follow-up; and
  - viii. the mothers/caregivers are linked with needed follow-up care and support (for example, for any health, mental health or social issues identified during assessment).

### Remarks

- The effectiveness and safety of care delivered using the admission/enrolment criteria above depends on policymakers, programme managers and health workers all having a strong focus on continuity of care (in particular, referral between inpatient and outpatient services) and actively communicating between different levels and locations within the health system.
- Health workers in charge of making these treatment decisions must have the training and expertise to recognize and act on the signs and symptoms described in this recommendation and detailed below.
- [IMCI \(25\)](#) danger signs include: not able to drink or breastfeed; vomits everything; had convulsions recently; lethargic or unconscious; convulsing now.
- Acute medical problems (as per IMCI classification) which need referral to inpatient care include:
  - signs of possible serious bacterial infection in infants less than 2 months of age
  - shock
  - hypoglycaemia (measured) persistent after initial emergency corrective treatment
  - oxygen saturation < 90%
  - pneumonia (with chest indrawing; and/or fast breathing; and if possible to measure, oxygen saturation < 94%)
  - dehydration (including some or severe dehydration)
  - severe persistent diarrhoea (diarrhoea for 14 days or more plus dehydration)
  - very severe febrile illness – in a malaria zone or with a positive rapid diagnostic test (RDT), this is treated as severe malaria
  - very severe febrile illness – where there is no risk of malaria or with a negative RDT, this is treated as bacterial disease, such as meningitis, etc.
  - severe complicated measles
  - mastoiditis
  - severe anaemia (severe palmar pallor or as per age-associated haemoglobin levels)
  - severe side effects from antiretroviral therapy (for HIV) – skin rash, difficulty breathing and severe abdominal pain, yellow eyes, fever, vomiting
  - open or infected skin lesions associated with nutritional oedema
  - other stand-alone “priority clinical signs” not classified as danger signs: hypothermia (< 35°C axillary or 35.5°C rectal) or high fever (≥ 38.5°C axillary or 39°C rectal).

- Assessing that the infant has a good appetite should be done using a systematic method for either breastfeeding assessment or assessment of appropriate replacement feeding practices.
- Medical problems needing mid or long-term follow-up care and with a significant association with nutritional status could include congenital heart disease, HIV, tuberculosis, cerebral palsy or other physical disabilities.
- The limits of care for inpatient services is usually reached when inpatient care adds no further benefit for an individual child (and their family). More specifically, it refers to the situation when staff have appropriately utilized all the resources and drugs available to them in this particular inpatient centre and a child remains wasted and/or with nutritional oedema with no signs of improvement.

## Rationale

This recommendation is an update to recommendation 8.5 from the [WHO Guideline: updates on the management of severe acute malnutrition in infants and children, 2013 \(10\)](#). The GDG discussed extensively that there could be serious harms of transferring infants at risk of poor growth and development from inpatient to outpatient care too early, before they meet specific criteria as outlined in the recommendation. The GDG therefore felt that this must remain a strong recommendation and that the evidence is of moderate certainty based on indirect evidence in infants and children 6–59 months with severe wasting and/or nutritional oedema.

As with the prior recommendation, the GDG agreed to expand the population from infants with severe wasting and/or oedema (severe acute malnutrition) to the broader group of infants at risk of poor growth and development, which is a new area of focus for this 2023 guideline with a prevention emphasis.

With regards to the specific criteria in the recommendation, the GDG mainly used existing criteria from the 2013 WHO recommendation and the criteria from the recommendation on transfer of infants and children 6–59 months with severe wasting and/or nutritional oedema from inpatient to outpatient care (recommendation B3), with consideration of their collective expert experience.

The GDG also examined all prognostic factors identified in the prognostic systematic review that had moderate or high certainty according to GRADE for prognostic studies (20). The only outcome with prognostic factor evidence for infants at risk of poor growth and development was mortality (inpatient and outpatient/community) and none of the evidence could be directly used to inform this recommendation due to the limited outcomes and prognostic factors across the care pathway. The filtered prognostic factors can be found in [Web Annex D](#).

The certainty of the evidence for the recommendation on transfer for infants and children 6–59 months with severe wasting and/or nutritional oedema is moderate, and the GDG agreed that this recommendation on infants at risk of poor growth and development should align, with moderate certainty evidence as well.

Throughout the process for updating recommendations about decisions along the care pathway, the GDG also considered evidence from a qualitative evidence synthesis on equity, acceptability, and feasibility related to decisions for admission, transfer, and exit from care as well as resource use and cost-effectiveness information from an economic evidence synthesis. These systematic reviews had limited evidence and the GDG did not make explicit judgements across all EtD criteria for these recommendations.

## Systematic reviews

This recommendation was informed by the following systematic reviews:

Uthman O, Folasire Y, Fagbamigbe F, Anjorin S. Growth faltering and failure in infants younger than six months: a systematic review and meta-analysis. PROSPERO 2021 CRD42021288254 (29).

Annan RA, Aduku LNE, Agyapong NAF: Qualitative Systematic Review assessing the Values and Preferences parents/caregivers of children affected by wasting assign to defined health outcomes. PROSPERO 2021 CRD42021282013 (30).

Mdege DN, Masuku SD, Musakwa N, Chisala M, Tingum EN, Boachie MK et al. Costs and cost-effectiveness of treatment setting for children with wasting, oedema and growth failure/faltering: A systematic review. PLOS Glob Public Health. 2023 Nov 8; 3(11):e0002551. doi: 10.1371/journal.pgph.0002551 (31).

Twalibu A, Sulley AM, Chibwana A, Chisala M, Shokraneh F. Equity, acceptability, and feasibility of decisions on where to treat wasting in children 0-59 months: A qualitative systematic review and meta-aggregation. PROSPERO 2022 CRD42022298843 (32).

## Evidence to decision

### Benefits and harms

The GDG discussed the need for infants at risk of poor growth and development to be transferred upon meeting specific criteria informed by the prior recommendation on admission to inpatient care and expert experience, as well as the recommendation for infants and children 6–59 months with severe wasting and/or nutritional oedema (recommendation B3). There were no prognostic factors from the systematic review focused on infants at risk of poor growth and development that could inform this recommendation directly due to the lack of evidence across outcomes and the emphasis on anthropometric factors in published studies included in the review.

In the absence of direct evidence, the GDG agreed that the harms of transferring infants at risk of poor growth and development from inpatient to outpatient care prematurely could be serious. They GDG felt strongly about the recommendation for infants to meet specific criteria before being transferred.

### Certainty of the Evidence

As described above, the prognostic factor systematic review had limited evidence to directly inform the criteria for infants at risk of poor growth and development to be transferred from inpatient to outpatient care. The GDG again collectively acknowledged the chance of harms from transferring infants before they met the criteria in the recommendation based on expert experience. The GDG was highly certain of this but agreed that the certainty of the recommendation should be downgraded to moderate due to indirectness based on a lack of empirical evidence.

### Values and preferences

The GDG agreed that there is probably no important uncertainty or variability in how much people value the main outcomes including mortality. A qualitative evidence synthesis of values and preferences showed that caregivers from one context to the next are likely to place very similar value on whether their children survive or not.

### Resources

An economic evidence synthesis identified a limited amount of indirect evidence about resource use and cost-effectiveness related to settings across the care pathway, including community, outpatient, and inpatient settings. The GDG agreed that resource use and cost-effectiveness is context-specific and expected to vary considerably.

## Equity

A qualitative evidence synthesis identified one study that highlighted that inpatient care may be expensive for caregivers (34), which could negatively impact health equity. However, the GDG agreed that this qualitative evidence was very limited, particularly with regards to transfer from inpatient to outpatient care. The GDG also recognized that access to high-quality outpatient care and follow-up support services may differ across contexts but this did not directly influence their decisions on the recommendation.

## Acceptability

There were no directly relevant studies in the qualitative evidence synthesis about the acceptability of transfer from inpatient to outpatient care based on specific criteria.

## Feasibility

Studies in the qualitative evidence synthesis suggested that quality of inpatient care is not always consistent, discharge from inpatient care may happen too early in some situations, and quality of outpatient care may be inadequate (33–36). This reiterates the concern that the GDG had about transfer of infants from inpatient to outpatient care potentially happening too early.

## Research needs

Future studies should:

- establish whether inpatient care of infants less than 6 months of age at risk of poor growth and development improves outcomes compared to outpatient care based on a set of criteria or different factors
- determine the most appropriate methods and tools for assessing breastfeeding, including whether an infant is being exclusively breastfed, having difficulties breastfeeding, etc.
  - this should include methods and tools that health workers can use to assess and manage simple breastfeeding problems
- identify approaches to effectively re-establish breastfeeding for mothers of infants who have stopped breastfeeding
- determine the cadres, training needs, and tools that can most effectively support breastfeeding
- establish the efficacy/effectiveness of interventions targeting social, psychological, and economic challenges faced by mothers/caregivers
- consider how infants who fail to respond to initial supported breastfeeding and clinical treatment should be managed
- include biological studies that aim to understand resilience, functional recovery, immune function, and cognitive development of infants less than 6 months of age at risk of poor growth and development
- include clinical and social science studies to understand factors affecting resilience and cognitive development of infants less than 6 months of age at risk of poor growth and development
- determine optimal enrolment and monitoring/transfer criteria, with a specific focus on which anthropometric indicators and cut-offs best identify high-risk infants across different settings
- consider which packages of care are most effective at improving outcomes in infants at risk of poor growth and development and preventing wasting and nutritional oedema.
- understand mother/caregiver, community, and health worker perspectives on different models of care

- consider how best to link with related services (for example, Integrated Management of Newborn and Childhood Illness; immunizations; growth monitoring; mental health; disability treatment services)
- establish the short- and long-term impact of services focusing on infants at risk of poor growth and development (for example, prevention of later wasting/morbidity, better development)
- incorporate systems research approaches such as system dynamics and scenario- or agent-based modelling to understand the complex adaptive nature of the health system within which interventions are delivered.

### Conditional recommendation, Very low certainty evidence

Updated in 2023

- A4. a) Infants less than 6 months of age at risk of poor growth and development can have a reduced frequency of outpatient visits when they:
- are breastfeeding effectively or feeding well with replacement feeds, and
  - have sustained weight gain for at least 2 consecutive weekly visits.
- b) Infants less than 6 months of age at risk of poor growth and development should be assessed (including assessment of their anthropometry) once they reach 6 months of age to determine if they need ongoing follow-up or referral to services for infants 6 months of age and older (including for nutritional treatment/supplementation) as appropriate according to their clinical and nutritional status.

### Remarks

- Infants less than 6 months of age at risk of poor growth and development are still considered vulnerable even after the acute problem that necessitated their admission into care has been resolved. Therefore, regular follow up at reduced frequency is recommended until they reach 6 months of age. Programme managers and health workers should determine the frequency of follow up for these infants depending on their contexts.
- An infant at 6 months of age or older who meets anthropometric and clinical criteria of moderate wasting or severe wasting and/or nutritional oedema should be referred to the appropriate services for medical management (if needed), health and nutrition education and counselling, nutritional supplementation (if appropriate) or nutritional treatment.
- Other ongoing follow-up or referral for this group of infants could be: routine vaccination services, regular infant and young child feeding services, breastfeeding support, specialized medical services for congenital diseases or disabilities, outpatient management of HIV or tuberculosis, psychological support for the mother/caregiver, social protection services, etc.

### Rationale

This recommendation is an update to recommendation 8.6 from the [WHO Guideline: updates on the management of severe acute malnutrition in infants and children, 2013 \(10\)](#). The GDG felt that this should be a conditional recommendation, with different decisions on whether and how to apply this recommendation based on resources and across settings. The GDG agreed the certainty of evidence should still be very low due to there being no direct evidence to inform this recommendation except for expert experience.

As with the previous recommendations, the GDG agreed to expand the population from infants with severe wasting and/or oedema (severe acute malnutrition) to the broader group of infants at risk of poor growth and development, which is a new area of focus for this 2023 guideline with a prevention



emphasis. They included part b of this recommendation with this lens to ensure that there is continuity of care across age groups.

The GDG aimed to use evidence from a prognostic systematic review for this guideline question, yet none of the evidence could be directly used to inform this recommendation due to the limited outcomes and prognostic factors across the care pathway. The filtered prognostic factors can be found in [Web Annex D](#).

The GDG felt that there was a need to still update the previous 2013 WHO recommendation with consideration of this broader population group. They further emphasized the importance of breastfeeding effectively or feeding well with replacement feeds as a criterion. They also updated the second criterion to be sustained weight gain for at least 2 consecutive weekly visits, which is more focused than the criteria in the 2013 WHO recommendation of having adequate weight gain. The GDG removed the criterion around weight-for-length z-scores because of the expanded population of infants at risk of poor growth and development for which this may not apply.

The GDG also felt that because of the uncertainty that infants at risk of poor growth and development should be assessed again once they reach the age of 6 months. This allows for additional follow-up and referral to appropriate services for infants and children 6–59 months of age.

### **Systematic reviews**

This recommendation was informed by the following systematic reviews:

Uthman O, Folasire Y, Fagbamigbe F, Anjorin S. Growth faltering and failure in infants younger than six months: a systematic review and meta-analysis. PROSPERO 2021 CRD42021288254 ([29](#)).

Annan RA, Aduku LNE, Agyapong NAF. Qualitative Systematic Review assessing the Values and Preferences parents/caregivers of children affected by wasting assign to defined health outcomes. PROSPERO 2021 CRD42021282013 ([30](#)).

Mdege DN, Masuku SD, Musakwa N, Chisala M, Tingum EN, Boachie MK et al. Costs and cost-effectiveness of treatment setting for children with wasting, oedema and growth failure/faltering: A systematic review. PLOS Glob Public Health. 2023 Nov 8; 3(11):e0002551. doi: 10.1371/journal.pgph.0002551 ([31](#)).

Twalibu A, Sulley AM, Chibwana A, Selemani A, Hanjahanja-Phiri T, Potani I et al. Equity, acceptability, and feasibility of decisions on where to treat wasting in children 0-59 months: A qualitative systematic review and meta-aggregation. PROSPERO 2022 CRD42022298843 ([32](#)).

### **Evidence to decision**

#### **Benefits and harms**

There was no direct evidence to inform the recommendation on when infants at risk of poor growth and development can safely exit from all care or when the frequency of outpatient visits can be reduced. The GDG agreed to broaden the recommendation to infants at risk of poor growth and development, and therefore, with the aim of improving outcomes during and following outpatient care and based on collective expert experience, made updates to the past recommendation to ensure that it applied to these infants. They considered the importance of continuity of care as infants increase in age to above 6 months, with follow-up and referral to services based on clinical and nutritional status.

#### **Certainty of the Evidence**

The GDG acknowledged that the systematic review did not identify any direct evidence to inform the recommendation. The updated recommendation is based on collective expert experience, which is considered the lowest level of evidence. Therefore, the GDG agreed that the recommendation should still have very low certainty.

## Values and preferences

The GDG agreed that there is probably no important uncertainty or variability in how much people value the main outcomes including mortality. A qualitative evidence synthesis of values and preferences showed that caregivers from one context to the next are likely to place very similar value on whether their children survive or not.

## Resources

There was no direct evidence from an economic evidence synthesis about outpatient visits or exit from all care. The GDG agreed that resource use and cost-effectiveness is context-specific and expected to vary considerably.

## Equity

There were no directly relevant studies for this recommendation from the qualitative evidence synthesis for this recommendation. The GDG recognized that access to high-quality outpatient care and follow-up support services may vary between different populations and settings which could impact equity. They emphasized the importance of adapting this recommendation to support the individual needs and circumstances of each infant and to suit different contexts based on health systems and resources in place.

## Acceptability

There were no directly relevant studies in the qualitative evidence synthesis about the acceptability of different frequency of outpatient visits for infants at risk of poor growth and development nor follow-up or referral to services once infants reach 6 months of age.

## Feasibility

There were no directly relevant studies in the qualitative evidence synthesis about the feasibility of this recommendation in terms of outpatient visits and follow-up or referral to services once infants reach 6 months of age. As outlined above, the GDG recognized that the feasibility may vary across settings.

## Research needs

Future studies should:

- establish whether inpatient care of infants less than 6 months of age at risk of poor growth and development improves outcomes compared to outpatient care based on a set of criteria or different factors
- determine the most appropriate methods and tools for assessing breastfeeding, including whether an infant is being exclusively breastfed, having difficulties breastfeeding, etc.
  - this should include methods and tools that health workers can use to assess and manage simple breastfeeding problems
- identify approaches to effectively re-establish breastfeeding for mothers of infants who have stopped breastfeeding
- determine the cadres, training needs, and tools that can most effectively support breastfeeding
- establish the efficacy/effectiveness of interventions targeting social, psychological, and economic challenges faced by mothers/caregivers
- consider how infants who fail to respond to initial supported breastfeeding and clinical treatment should be managed
- include biological studies that aim to understand resilience, functional recovery, immune function, and cognitive development of infants less than 6 months of age at risk of poor growth and development

- include clinical and social science studies to understand factors affecting resilience and cognitive development of infants less than 6 months of age at risk of poor growth and development
- determine optimal enrolment and monitoring/transfer criteria, with a specific focus on which anthropometric indicators and cut-offs best identify high-risk infants across different settings
- consider which packages of care are most effective at improving outcomes in infants at risk of poor growth and development and preventing wasting and nutritional oedema
- understand mother/caregiver, community, and health worker perspectives on different models of care
- consider how best to link with related services (for example, Integrated Management of Newborn and Childhood Illness; immunizations; growth monitoring; mental health; disability treatment services)
- establish the short- and long-term impact of services focusing on infants at risk of poor growth and development (for example, prevention of later wasting/morbidity, better development)
- incorporate systems research approaches such as system dynamics and scenario- or agent-based modelling to understand the complex adaptive nature of the health system within which interventions are delivered.

## Management of breastfeeding/lactation difficulties in mothers/caregivers of infants at risk of poor growth and development

### Good practice statement

New in 2023

- A5. For infants less than 6 months of age at risk of poor growth and development, health workers should conduct comprehensive assessments of the mother/caregiver-infant pair and follow best practices for the management of breastfeeding/lactation challenges and underlying factors contributing to these challenges.

### Remarks

- The definition of infants at risk of poor growth and development for the purpose of this guideline is described in the [scope section 1.2](#).
- The recommended comprehensive assessment should be conducted on first contact with the mother/caregiver-infant pair and repeated at each additional contact, especially if feeding problems have been identified.
- Feeding assessments should include the following domains: infant and mother/caregiver health status (including assessing for disabilities), maternal responsiveness to infant cues, positioning, latching, sucking, and swallowing.
- WHO guidance on how to carry out comprehensive feeding assessments and best practices for the management of breastfeeding/lactation challenges should be used. WHO guidance can be found in the following resources:
  - [WHO/UNICEF Infant and young child feeding counselling: an integrated course: participant's manual, 2nd ed \(26\)](#).
  - [IMCI Management of the sick young infant aged up to 2 months: Chart booklet \(13\)](#).
  - [WHO Training Course on Child Growth Assessment \(27\)](#).
  - [WHO Guideline: counselling of women to improve breastfeeding practices \(28\)](#).
  - [WHO recommendations on maternal and newborn care for a positive postnatal experience \(11\)](#).
  - [UNICEF-WHO Global Breastfeeding Collective \(37\)](#).
- Not all people who breastfeed identify as female and this good practice statement applies regardless of gender identity.

### Rationale

One of the many causes of an infant less than 6 months becoming at risk of poor growth and development is problems with breastfeeding. The GDG agreed that this good practice statement was necessary to emphasize the importance of a comprehensive assessment from the first contact between a health worker and these infants and their mothers/caregivers (once any danger signs or acute medical problems have been identified and acted on) with best practices for the management of breastfeeding/lactation challenges followed. This assessment must take a holistic approach, viewing the mother/caregiver and the infant as an interdependent unit who both need specific care and attention. The GDG also felt that efforts must also be made to address underlying factors contributing to challenges with breastfeeding/lactation. Furthermore, the GDG recommended that these actions should be carried out at each subsequent contact with these mother/caregiver-infant pairs.

## Questions or interventions for which the GDG did not make a recommendation

**Guideline question:** In mothers/caregivers of infants less than 6 months of age at risk of poor growth and development who are experiencing difficulties with breastmilk intake, which interventions to manage difficulties with breastfeeding/lactation can improve breastfeeding practices and increase breastmilk intake?

The systematic reviews for this broadly focused guideline question did not identify relevant interventions and the GDG was unable to make a recommendation. The evidence from the effectiveness systematic review was predominantly on interventions for preterm and/or low birth weight infants during the neonatal period.

### Systematic reviews

This decision on this guideline question was informed by the following systematic reviews:

Mohandas S, Rana R, Sirwani B, Kirubakaran R, Puthussery S. Effectiveness of Interventions to Manage Difficulties with Breastfeeding for Mothers of Infants under Six Months with Growth Faltering: A Systematic Review Update. *Nutrients*. 2023 Feb 16; 15(4):988. doi: 10.3390/nu15040988 (38).

O'Toole B, Shaw N, Muthukumar M et al. What is the resource use, cost, and cost-effectiveness of interventions to manage difficulties with breastfeeding/lactation to improve breastfeeding practices and increase breastmilk intake in mothers of infants aged 1 to 6 months with growth failing/faltering who are experiencing difficulties with breastmilk intake? (unpublished) (39).

Puthussery S, Tseng P-C, Wayles L, Eshett E, Abdy D, Boyle S. Equity, acceptability and feasibility of interventions to manage difficulties with breastfeeding for infants under six months with growth faltering: a qualitative evidence synthesis. PROSPERO 2022 CRD42022341282 (40).

### Research needs

Future studies should:

- include infants with disabilities
- include adolescent mothers and mothers with obesity in future research to determine whether they need additional support
- identify drivers of early cessation of breastfeeding to determine which infants/mother pairs are at risk and what could be done to prevent such outcomes
- assess the drivers and impacts of the use of prelacteal feeds on breastfeeding and other infant outcomes
- identify how to determine whether breastmilk production is below an infant's needs at different ages up to 6 months of age and which indicators should be used for this assessment
- identify and compare intervention packages to support existing health staff, such as using peer counsellors for the assessment and management of breastfeeding/lactation difficulties
- collect qualitative data on acceptability and existing practices around wet nursing, supplementary suckling technique, re-establishment of breastfeeding, etc.
- identify reliable criteria for defining optimal growth in infants with intra-uterine growth retardation
- identify the optimal tool to assess (breast)feeding difficulties.

## Supplemental milk for infants at risk of poor growth and development

### Good practice statement

### New in 2023

A6. Decisions about whether an infant less than 6 months of age at risk of poor growth and development needs a supplementary milk in addition to breastfeeding must be based on a comprehensive assessment of the medical and nutritional/feeding needs of the infant, as well as the physical and mental health of the mother/caregiver. This applies to infants who are enrolled in outpatient care or admitted into inpatient care.

### Remarks

- The definition of infants at risk of poor growth and development for the purpose of this guideline is described in the [scope section 1.2](#).
- Initial management of any infant less than 6 months of age at risk of poor growth and development presenting to any health facility or who has contact with a health worker should focus on triage and stabilization of any emergency signs or symptoms. Following this initial management, the next step should be diagnosing and treating (wherever possible) medical conditions which could be the cause of the infant being at risk of poor growth and development.
- Once underlying medical conditions have been ruled out, stabilized, and treated (wherever possible), focus must be on identifying and addressing feeding problems causing or contributing to poor growth and development.
- Feeding assessments should include the following domains: infant health status (including assessing for disabilities), mother/caregiver physical and mental health status, maternal responsiveness to infant cues, positioning, latching, sucking, and swallowing.
- WHO guidance on how to carry out comprehensive feeding assessments and best practices for the management of breastfeeding/lactation challenges should be used. WHO guidance can be found in the following resources:
  - [WHO/UNICEF Infant and young child feeding counselling: an integrated course: participant's manual, 2nd ed \(26\)](#).
  - [IMCI Management of the sick young infant aged up to 2 months: Chart booklet \(13\)](#).
  - [WHO Training Course on Child Growth Assessment \(27\)](#).
  - [WHO Guideline: counselling of women to improve breastfeeding practices \(28\)](#).
  - [WHO recommendations on maternal and newborn care for a positive postnatal experience \(11\)](#).
- WHO guidance on how to do comprehensive assessments of physical and mental health of mothers/caregivers should be used. WHO guidance can be found in the following resources:
  - [WHO recommendations on maternal and newborn care for a positive postnatal experience \(11\)](#).
  - [WHO guide for integration of perinatal mental health in maternal and child health services \(41\)](#).
  - [WHO-IMAI district clinician manual: hospital care adolescents and adults \(42\)](#).
- Not all people who breastfeed identify as female and this good practice statement applies regardless of gender identity.

### Rationale

The GDG agreed that this good practice statement about supplemental milk for infants less than 6 months of age at risk of poor growth and development is necessary. This is needed to ensure that decisions about giving a supplemental milk in addition to breastfeeding are made carefully, based on a comprehensive assessment of the infant, their needs, and those of their mother/caregiver. This was regarded as particularly important in light of the risk of giving supplemental milk inappropriately and undermining the life-saving health and nutritional value of breastfeeding.

- A7. Infants who are less than 6 months of age with severe wasting and/or nutritional oedema who are admitted for inpatient care:
- a) should be breastfed where possible and the mothers or female caregivers should be supported to breastfeed the infants. If an infant is not breastfed, support should be given to the mother or female caregiver to re-lactate. If this is not possible, wet nursing should be encouraged;
  - b) should also be provided a supplementary feed:
    - supplementary suckling approaches should, where feasible, be prioritized;
    - for infants with severe wasting but no oedema, expressed breast milk should be given, and, where this is not possible, commercial (generic) infant formula or F-75 or diluted F-100 may be given, either alone or as the supplementary feed together with breast milk;
    - for infants with oedema, commercial (generic) infant formula or F-75 should be given as a supplement to breast milk.
  - c) should not be given full-strength F-100 if they are clinically unstable and/or have diarrhoea or dehydration and/or nutritional oedema (due to the renal solute load of this therapeutic milk and risk of hypernatraemic dehydration);
  - d) should, if there is no realistic prospect of being breastfed, be given appropriate and adequate replacement feeds such as commercial (generic) infant formula, with relevant support to enable safe preparation and use, including at home when transferred from inpatient care.  
In addition:
  - e) assessment of the physical and mental health status of mothers or caregivers should be promoted and relevant treatment or support provided.

## Remarks

- This recommendation contains an update to part c of recommendation 8.4 from the [WHO Guideline: updates on the management of severe acute malnutrition in infants and children, 2013 \(10\)](#).
  - Parts a, b, d, and e stand from the 2013 recommendation as no evidence was identified from a systematic search of the literature to inform or change these components of the recommendation.
- Full-strength F-100 refers to F-100 therapeutic milk prepared following the manufacturer's instructions. Diluted F-100 refers to F-100 which is prepared using an extra 30% of water (for example, if full-strength F-100 is prepared with 1000 mL of water, diluted F-100 would be prepared with 1300 mL of water).
- WHO and Codex Alimentarius guidance on safe and hygienic preparation of powdered formulae should also be followed including:
  - [WHO Safe preparation, storage and handling of powdered infant formula: guidelines \(43\)](#).
  - [Code of Hygienic Practice for Powdered Formulae for Infants and Young Children \(44\)](#).
- Clinically unstable refers to severe abnormal and fluctuating clinical signs and symptoms on examination of one or all the major systems: cardiovascular, respiratory, neurological, and gastrointestinal. Infants who are clinically unstable require frequent monitoring and intervention by skilled health workers to prevent deterioration and death.
- There was no evidence around the use of full-strength F-100 for infants who have not yet been stabilized or who have diarrhoea or dehydration.

- Concerns remain regarding giving full-strength F-100 even to clinically stable infants less than 6 months with severe wasting due to the high renal solute load and risk of hypernatraemic dehydration and the high protein and osmolarity of this milk in infants with potential for poor renal concentrating ability.
- No studies looked at other infants at risk of poor growth and development beyond those with severe wasting and/or nutritional oedema.
- Not all people who breastfeed identify as female and this recommendation applies regardless of gender identity.

## Rationale

The [WHO Guideline: updates on the management of severe acute malnutrition in infants and children, 2013 \(10\)](#) included a recommendation with options for types of supplemental milks to give to infants less than 6 months of age with severe wasting and/or nutritional oedema, including commercial infant formula, F-75, or diluted F-100, either alone or supplementary to breastmilk (recommendation 8.4).

The GDG decided that the standing guidance from the 2013 guideline should hold for infants less than 6 months of age with severe wasting and/or nutritional oedema but agreed to make an update specifically on the use of full-strength F-100 as a type of supplemental milk in part c of the recommendation.

Considering the evidence from an effectiveness systematic review, the GDG agreed that the desirable anticipated effects of giving full-strength F-100 to infants less than 6 months of age with severe wasting, admitted for inpatient care and who are clinically stable, without diarrhoea, and free of nutritional oedema, likely outweigh the undesirable anticipated effects. However, the GDG noted the limitations of the evidence, and the potential safety concerns around giving full-strength F-100 even to clinically stable infants less than 6 months and emphasized that this should only be given to infants meeting the criteria stated in the Recommendation and Remarks.

Results of the two eligible trials identified in an effectiveness systematic review for this question indicated that diluted F-100 compared to infant formula may have little to no effect on anthropometric outcomes, mortality, morbidity, and renal solute load, with the evidence being very uncertain for most of these outcomes (45, 46). Similar results were shown with full-strength F-100 compared to infant formula for these outcomes. There were no data for clinical deterioration, relapse, readmission, and non-response which were prioritized by the GDG.

Although not initially pre-specified, effects on renal solute load were also considered by the GDG due to safety concerns and an explicit statement about this in the 2013 recommendation in relation to F-100 within part c. This outcome was measured in one of the trials (45).

The available evidence did not support the use of one type of supplemental milk over another nor a hierarchy of types of supplemental milks. There was also no evidence identified in the effectiveness review to inform other components of the 2013 recommendation, and therefore the GDG agreed that parts a, b, d, and e of the recommendation should stand.

Systematic searches did not identify directly relevant evidence on equity, acceptability and feasibility implications, nor economic data on resources and cost-effectiveness, and the GDG did not make judgements across all the EtD criteria for this update to part c of the 2013 recommendation.



## Systematic reviews

This recommendation was informed by the following systematic reviews:

Tomori C, Pérez-Escamilla R, O'Connor D, Ververs M, Orta-Aleman D, Budhathoki C. Determining Optimal Supplementation for Growth Faltering in Infants under 6 Months: Systematic Review and Meta-Analysis. PROSPERO 2022 CRD42022350150 (47).

Annan RA, Aduku LNE, Agyapong NAF. Qualitative Systematic Review assessing the Values and Preferences parents/caregivers of children affected by wasting assign to defined health outcomes. PROSPERO 2021 CRD42021282013 (30).

Crathorne L, Muthukumar M, O'Toole B, Robinson S, Shaw N. What is the resource use, cost, and cost-effectiveness of supplemental milk (donor human milk, human milk from wet nurse, commercial infant formula, F-75, F-100, or diluted F-100) in infants aged 1 to 6 months with growth failing/faltering who are breast fed? (unpublished) (48).

Potani I, Hanjahanja-Phiri T, Selemani A, Mpinda I, Mamani-Mategula E, Chibwana A et al. The acceptability, feasibility, and equitability of inpatient, outpatient, post discharge and maternal-directed interventions in the prevention and treatment of wasting and/or oedema: A meta-aggregation. PROSPERO 2021 CRD42021286230 (49).

## Research needs

Future studies should:

- determine the need for and the effectiveness of supplemental milk and breastmilk fortifiers predominantly in inpatient settings for infants at risk of poor growth and development as well as those with severe wasting and/or nutritional oedema
- examine different formulas including F-75, diluted F-100, full-strength F-100, and infant formulas (potentially consider pre-term formulas if appropriate) as well as donor human milk in inpatient settings
- include infants with diarrhoea or dehydration and who are clinically stable enough to receive enteral feeds but still not fully medically stabilized
- have sufficient sample sizes for safety outcomes – proof of principle and pilot trials alone are not sufficiently informative for future policy update
- be powered for subgroup analysis of infants with different types of anthropometric deficits (wasting alone, underweight alone, wasting and underweight) and with and without nutritional oedema
- evaluate pathophysiology of severe wasting and/or oedema, including cardiorespiratory, renal, and liver function before, during, after treatment with therapeutic milks
- incorporate re-establishment of breastfeeding into intervention approaches within trials
- have longer-term follow-up beyond the inpatient period, including during outpatient care and exit from outpatient care and should include development and morbidity/health outcomes as well as mortality
- study non-milk formulas in infants less than 6 months old also who have already stopped exclusive breastfeeding.

## Questions or interventions for which the GDG did not make a recommendation

### Guideline question:

- A) In infants less than 6 months of age at risk of poor growth and development, which criteria best determine if and when an infant should be given a supplemental milk (in addition to breastmilk if the infant is breastfed)?
- B) In infants less than 6 months of age at risk of poor growth and development meeting the above criteria, what is the most effective supplemental milk (donor human milk, human milk from wet nurse, commercial infant formula, F-75, F-100, or diluted F-100) and for how long should these be given?

The effectiveness systematic review for this broadly focused guideline question identified evidence on full-strength F-100, diluted F-100 and commercial (generic) infant formula in infants with severe wasting and/or nutritional oedema which was used to update recommendation A7. One objective had been to establish a hierarchy of supplemental milks, but the review did not find evidence to support such a hierarchy. In addition, the effectiveness systematic review did not find any eligible studies on other types of supplemental milks in this population. Furthermore, no studies looked at other infants at risk of poor growth and development beyond those with severe wasting and/or nutritional oedema.

The effectiveness systematic review also did not provide evidence on the criteria to determine if and when an infant should be given a supplemental milk and therefore the GDG was unable to make a recommendation on this.

### Systematic reviews

The decision on this guideline question was informed by the following systematic reviews:

Tomori C, Pérez-Escamilla R, O'Connor D, Ververs M, Orta-Aleman D, Budhathoki C. Determining Optimal Supplementation for Growth Faltering in Infants under 6 Months: Systematic Review and Meta-Analysis. PROSPERO 2022 CRD42022350150 (47).

Crathorne L, Muthukumar M, O'Toole B, Robinson S, Shaw N. What is the resource use, cost, and cost-effectiveness of supplemental milk (donor human milk, human milk from wet nurse, commercial infant formula, F-75, F-100, or diluted F-100) in infants aged 1 to 6 months with growth failing/faltering who are breast fed? (unpublished) (48).

Potani I, Hanjahanja-Phiri T, Selemani A, Mpinda I, Mamani-Mategula E, Chibwana A et al. The acceptability, feasibility, and equitability of inpatient, outpatient, post discharge and maternal-directed interventions in the prevention and treatment of wasting and/or oedema: A meta-aggregation. PROSPERO 2021 CRD42021286230 (49).

### Research needs

Future studies should:

- determine the need for and the effectiveness of supplemental milk and breastmilk fortifiers for infants at risk of poor growth and development as well as those with severe wasting and/or nutritional oedema
- examine different formulas including F-75, diluted F-100, full-strength F-100, and infant formulas (potentially consider pre-term formulas if appropriate) as well as donor human milk
- include infants with diarrhoea or dehydration and who are clinically stable enough to receive enteral feeds but still not fully medically stabilized
- have sufficient sample sizes for safety outcomes – proof of principle and pilot trials alone are not sufficiently informative for future policy update

- be powered for subgroup analysis of infants with different types of anthropometric deficits (wasting alone, underweight alone, wasting and underweight) and with and without nutritional oedema
- evaluate pathophysiology of severe wasting and/or oedema, including cardiorespiratory, renal, and liver function before, during, after treatment with therapeutic milks
- incorporate re-establishment of breastfeeding into intervention approaches within trials
- have longer-term follow-up beyond the inpatient period, including during outpatient care and exit from outpatient care and should include development and morbidity/health outcomes as well as mortality
- study non-milk formulas in infants less than 6 months old also who have already stopped exclusive breastfeeding.

## Antibiotics for infants at risk of poor growth and development

### Questions or interventions for which the GDG did not make a recommendation

**Guideline question:** In infants less than 6 months of age at risk of poor growth and development, should an antibiotic be routinely given (as per the 2013 guidelines for severe wasting and oedema)? The systematic reviews did not identify appropriate evidence for this intervention and the GDG was unable to make a recommendation. Specifically, the effectiveness systematic review did not find any eligible studies.

### Systematic reviews

The decision on this guideline question was informed by the following systematic reviews:

Imdad A, Chen FF, François M, Sana M, Tanner-Smith E, Smith A et al. Routine antibiotics for infants less than 6 months of age with growth failure/faltering: a systematic review. *BMJ open* 13(5):e071393. doi: 10.1136/bmjopen-2022-071393 (50).

Shaw N, O'Toole B, Crathorne L, Muthukumar M, Robinson S. What is the resource use, cost, and cost-effectiveness associated with the use of antibiotics in infants aged 1 to 6 months with growth failing/faltering? (unpublished) (51).

Potani I, Hanjahanja-Phiri T, Selemani A, Mpinda I, Mamani-Mategula E, Chibwana A et al. The acceptability, feasibility, and equitability of inpatient, outpatient, post discharge and maternal-directed interventions in the prevention and treatment of wasting and/or oedema: A meta-aggregation. PROSPERO 2021 CRD42021286230 (49).

### Research needs

Future studies should:

- evaluate amoxicillin and another antibiotic (i.e. two experimental arms)
- assess outcomes including mortality, growth, antimicrobial resistance, etc., with trials powered for mortality
- target infants based on risk factors/in populations such as elevated CRP, moderate wasting, etc. and/or complete subgroup analysis of effects
- include infants with opportunistic infections (for example, salmonella, norovirus, etc.)
- be conducted in settings beyond sub-Saharan Africa, including South and Southeast Asia.

## Interventions for mothers/caregivers of infants at risk of poor growth and development.

### Good practice statement

New in 2023

A8. Among mothers/caregivers of infants less than 6 months of age at risk of poor growth and development, comprehensive assessment and support are recommended to ensure maternal/caregiver physical and mental health and well-being. These actions are also important to optimize growth and development in infants at risk of poor growth and development.

### Remarks

- The definition of infants at risk of poor growth and development for the purpose of this guideline is described in the [scope section 1.2](#).
- WHO guidance on the assessment of maternal/caregiver physical and mental health and well-being should be used as well as the consideration of context-specific tools. WHO guidance can be found in the following resources:
  - [WHO recommendations on maternal and newborn care for a positive postnatal experience \(11\)](#).
  - [WHO guide for integration of perinatal mental health in maternal and child health services \(41\)](#).
  - [WHO-IMAI district clinician manual: hospital care adolescents and adults \(42\)](#).
- Effective referral links should be established to deliver appropriate medical, nutritional, and mental health support and care to mothers/caregivers.
- Social protection programmes targeted to women caregivers should be used to address household poverty and food insecurity, to empower women and increase gender equity, to improve intra-household allocation of resources, and to prevent domestic violence.

### Rationale

The GDG decided that this good practice statement emphasizing assessment and support for maternal/caregiver physical and mental health and well-being is necessary considering their importance and that this is not done enough in practice.

### Questions or interventions for which the GDG did not make a recommendation

**Guideline question:** In mothers/caregivers of infants less than 6 months of age at risk of poor growth and development, do maternal nutritional supplementation and/or counselling and/or maternal-directed mental health interventions improve infant outcomes?

The systematic reviews for this broadly focused question did not identify relevant interventions and the GDG was unable to make a recommendation. The evidence from the effectiveness systematic review was predominantly on interventions for mothers/caregivers of preterm and/or low birth weight infants during the neonatal period.

### Systematic reviews

The decision on this guideline question was informed by the following systematic reviews:

Rana R, Kirubakaran R, Puthussery S, Lelijveld N, Kerac M, Sirwani B, Choudhury P. Effectiveness of postnatal maternal or caregiver interventions on outcomes among infants under six months with growth faltering. PROSPERO 2021 CRD42021276022 (52).

Robinson S, Muthukumar M, O’Toole B, Shaw N, Crathorne L. What is the resource use, cost, and cost-effectiveness of interventions given to mothers or caregivers of infants aged < 6 months with failure/faltering? (unpublished) (53).

Potani I, Hanjahanja-Phiri T, Selemani A, Mpinda I, Mamani-Mategula E, Chibwana A et al. The acceptability, feasibility, and equitability of inpatient, outpatient, post discharge and maternal-directed interventions in the prevention and treatment of wasting and/or oedema: A meta-aggregation. PROSPERO 2021 CRD42021286230 (49).

## Research needs

Future studies should:

- assess the feasibility of implementation and effectiveness of interventions aimed at detecting and addressing maternal mental health, especially among mothers /caregivers of infants at risk of poor growth and development
- understand priority medical and nutritional support and interventions for mothers/caregivers
- evaluate the role of intervention types such as:
  - improved maternal protein-energy supplementation and/or micronutrient supplementation
  - multisectoral vs focused intervention approaches
  - women’s empowerment
  - m-health technologies
  - conditional cash transfers
  - water, sanitation and hygiene interventions
  - agricultural interventions.

## 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
<p>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.</p>	

#### Remarks

- The process of triage (conducting a preliminary assessment of patients in order to determine the urgency of their need for treatment and the nature of treatment required) must be carried out wherever there is first contact between a child (and their mother/caregiver) and a health worker (this could be a health professional such as a doctor or nurse, or a health associate professional such as a community health care worker). Triage may be conducted in a health facility or in the community and the system of triage may vary according to national protocols, but the principle and importance of triage remains constant.
- Adequate training, regular supervision and frequent refresher trainings must be in place to enable health workers to safely and efficiently triage and appropriately stabilize, refer and/or treat children with severe wasting and/or nutritional oedema according to the severity of their clinical condition.

#### Rationale

The GDG formulated this good practice statement to strongly emphasize the need for triaging infants and children at the time of presentation to a health facility, including prompt identification of infants and children with emergency or danger signs and delivery of life-saving care. The GDG also felt it was important to emphasize that nutritional assessment must be done to ensure that infants and children with severe wasting and/or nutritional oedema receive timely and appropriate treatment, including clinical and nutritional care.

- 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:
- i. one or more Integrated Management of Childhood Illness (IMCI) danger signs
  - ii. acute medical problems
  - iii. severe nutritional oedema (+++)
  - iv. 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:
- i. medical problems that do not need immediate inpatient care, but do need further examination and investigation (for example, bloody diarrhoea, hypoglycaemia, HIV-related complications);
  - ii. 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);
  - iii. failure to gain weight or improve clinically in outpatient care;
  - iv. 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:
- i. good appetite (passed the appetite test); and
  - ii. no danger signs or any of the acute medical problems from part a ii; and
  - iii. 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).

## Remarks

- The effectiveness and safety of care delivered using the admission/enrolment criteria above depends on policymakers, programme managers, and health workers all having a strong focus on continuity of care (in particular referral between inpatient and outpatient services) and actively communicating between different levels and locations within the health system.
- Health workers in charge of making these treatment decisions must have the training and expertise to recognize and act on the signs and symptoms described in this recommendation and detailed below.
- [IMCI \(25\)](#) danger signs include: not able to drink or breastfeed; vomits everything; had convulsions recently; lethargic or unconscious; convulsing now.
- Acute medical problems (as per IMCI classification) which need referral to inpatient care include:
  - shock
  - hypoglycaemia (measured) persistent after initial emergency corrective treatment
  - oxygen saturation < 90%
  - pneumonia (with chest indrawing; and/or fast breathing; and, if possible to measure, oxygen saturation < 94%)
  - dehydration (including some or severe dehydration)
  - severe persistent diarrhoea (diarrhoea for 14 days or more plus dehydration)

- very severe febrile illness – in a malaria zone or with a positive rapid diagnostic test (RDT), this is treated as severe malaria
  - very severe febrile illness – where there is no risk of malaria or with a negative RDT, this is treated as bacterial disease, for example, meningitis, etc.
  - severe complicated measles
  - mastoiditis
  - severe anaemia (severe palmar pallor or Hb < 4g/dL or Hb 4–6g/dL with signs of decompensation)
  - severe side effects from antiretroviral therapy (for HIV) – skin rash, difficulty breathing and severe abdominal pain, yellow eyes, fever, vomiting
  - open or infected skin lesions associated with nutritional oedema
  - other stand-alone “priority clinical signs” not classified as danger signs: hypothermia (< 35°C axillary or 35.5°C rectal) or high fever (≥ 38.5°C axillary or 39°C rectal).
- An in-depth assessment in this context refers to a health worker carrying out a comprehensive medical, nutritional/feeding (including breastfeeding) and psychosocial assessment of a child with severe wasting and/or nutritional oedema and their caregiver/family. The primary aim of this in-depth assessment is to decide if it is possible, safe, and appropriate to manage the child as an outpatient or refer them for inpatient care. The secondary function of this assessment is to initiate the appropriate care and/or referral, wherever this is subsequently to be delivered. This kind of assessment is likely to take longer than that carried out as part of initial community screening (and may be beyond the capacities of health workers at this level) or in an admission unit/emergency department/outpatient department of a health facility. Who carries out this assessment and where it is carried out will need to be decided on as per local context according to set-up and capacity, but personnel, location, and other resources will need to be designated for this activity.
  - Medical problems needing mid or long-term follow-up care and with a significant association with nutritional status needing in-depth assessment could be either a medical problem which has just been diagnosed where a decision needs to be made about whether they would benefit from initial inpatient care (for example, for a period of intensive observation, initiating treatment, investigations not available in an outpatient setting, etc.) before commencing ongoing outpatient follow-up. Or it could be that a child with a known medical problem needing ongoing follow-up has an exacerbation or deterioration (secondary or not to the severe wasting and/or nutritional oedema itself) that does not involve any of the danger signs or signs and symptoms of the acute medical problems listed, but still might need an in-depth assessment to decide if referral to inpatient care is appropriate. Part of this in-depth assessment should involve evaluating how the caregiver(s) are coping and able to support the psychosocial impact of this medical problem on the child themselves and the family.
  - HIV-related complications needing an in-depth assessment include (as per IMCI):
    - not on antiretroviral therapy – any suspicion of opportunistic infections
    - on antiretroviral therapy but still experiencing: insufficient weight gain for 3 months, loss of developmental milestones, poor adherence, stage worse than before, CD4% lower than before (in children less than 5 years of age), LDL higher than 3.5 mmol/L, or triglycerides higher than 5.6 mmol/L
    - to monitor start of antiretroviral therapy if child also has tuberculosis and/or is < 3 kg.
  - Failure to gain weight in outpatient care might have different definitions in different contexts and will need local decision-making and adaptation. Examples of how this could be calculated include: no weight gain for two consecutive weekly visits, weight gain less than an average of 5 g/kg/day (or 35 g/kg per week) observed over a period of 2–3 weeks, etc.
  - Children with medical problems which are judged as not possible to manage in outpatient care (for example, eye signs of vitamin A deficiency) may also need referral to inpatient care.



## Rationale

This recommendation is an update to recommendation 1.3 from the [WHO Guideline: updates on the management of severe acute malnutrition in infants and children, 2013 \(10\)](#) and also incorporates recommendation 2.1 rather than having this as a separate recommendation. The GDG felt that this should be a conditional recommendation because of the uncertainties with regards to the available evidence and the need to consider different contexts including health systems in diverse settings. They agreed that the certainty should be low due to uncertainty about whether admission to inpatient care based on these criteria results in actual net benefit.

The GDG added an additional decision along the care pathway for infants and children 6–59 months with severe wasting and/or nutritional oedema to have an in-depth assessment to decide whether a child needs admission to inpatient care or can be managed as an outpatient. Furthermore, considering evidence from a prognostic systematic review, existing guidance on infants and children 6–59 months with severe wasting and/or nutritional oedema, and collective judgement based on expert experience, the GDG reviewed and updated the criteria for inpatient care and agreed on criteria for in-depth assessment as well as criteria for outpatient management.

The prognostic systematic review was commissioned with the objective of identifying factors associated with risk based on outcomes in infants and children 6–59 months with severe wasting and/or nutritional oedema that may inform the need for referral or admission to inpatient care. These prognostic factors could be used to reinforce/support existing criteria and to identify additional criteria that are associated with increased risk that could trigger a decision for referral to inpatient care.

The GDG completed an online survey (before the GDG meetings for this recommendation) to determine minimally important absolute risk thresholds for each important outcome in infants and children 6–59 months with severe wasting and/or nutritional oedema, defined as the smallest change in the outcome regarded by the majority of health workers as meaningful. If a prognostic factor had an absolute risk difference above one of these thresholds, then this could mean using this factor as a criterion for initiating inpatient care. The outcomes that the GDG considered to inform decisions for this recommendation were:

- inpatient mortality in infants and children with severe wasting and/or nutritional oedema currently in inpatient care (*minimally important absolute risk threshold: 1%; clinical prognostic factors only*)
- recovery in infants and children with severe wasting and/or nutritional oedema following initial inpatient care (*minimally important absolute risk threshold: 5%; clinical prognostic factors only*)
- outpatient mortality in infants and children with severe wasting and/or nutritional oedema treated in outpatient care (*minimally important absolute risk threshold: 1%*)
- anthropometric recovery in infants and children with severe wasting and/or nutritional oedema treated in outpatient care (*minimally important absolute risk threshold: 5%*)
- non-response in infants and children with severe wasting and/or nutritional oedema treated in outpatient care (*minimally important absolute risk threshold: 5%*).

The GDG examined all prognostic factors identified in the systematic review for meeting the above thresholds for the above outcomes that had moderate or high certainty according to GRADE for prognostic studies (20). These filtered prognostic factors for this guideline question informing admission, referral, transfer, and exit recommendations can be found in [Web Annex E](#).

The GDG acknowledged and discussed the limitations of this evidence, including the lack of randomized controlled trials that evaluated whether admission for inpatient care based on prognostic factors versus no admission would result in better outcomes for these children. The GDG also highlighted that there were limited prognostic factors with moderate or high certainty evidence and risk differences that would lead to different decisions along the care pathway. Because of this uncertainty, the GDG felt the need for there to be another step in the care pathway for infants to have an in-depth assessment rather than be directly admitted for inpatient care.

Throughout the process for updating recommendations about decisions along the care pathway, the GDG also considered evidence from a qualitative evidence synthesis on equity, acceptability, and feasibility related to decisions for admission, transfer, and exit from care as well as resource use and cost-effectiveness information from an economic evidence synthesis. These systematic reviews had limited evidence and the GDG did not make explicit judgements across all EtD criteria for these recommendations.

## Systematic reviews

This recommendation was informed by the following systematic reviews:

Uthman O, Folasire Y, Fagbamigbe AF, Anjorin S. Moderate or Severe wasting/Oedema in infants and children aged six months and older: a systematic review and meta-analysis. PROSPERO 2021 CRD42021288271 (54).

Annan RA, Aduku LNE, Agyapong NAF. Qualitative Systematic Review assessing the Values and Preferences parents/caregivers of children affected by wasting assign to defined health outcomes. PROSPERO 2021 CRD42021282013 (30).

Mdege DN, Masuku SD, Musakwa N, Chisala M, Tingum EN, Boachie MK et al. Costs and cost-effectiveness of treatment setting for children with wasting, oedema and growth failure/faltering: A systematic review. PLOS Glob Public Health. 2023 Nov 8; 3(11):e0002551. doi: 10.1371/journal.pgph.0002551 (31).

Twalibu A, Sulley AM, Chibwana A, Selemani A, Hanjahanja-Phiri T, Potani I et al. Equity, acceptability, and feasibility of decisions on where to treat wasting in children 0-59 months: A qualitative systematic review and meta-aggregation. PROSPERO 2022 CRD42022298843 (32).

## Evidence to decision

### Benefits and harms

Before the GDG meetings on admission, referral, transfer, and exit criteria, the GDG was sent an online survey to determine minimally important absolute risk thresholds for each outcome. This meant that if a certain prognostic factor was associated with risk that met the threshold, then the factor could be considered for this recommendation. Specifically, the GDG judged that the minimum absolute risk difference perceived to be important by majority of health workers is 1% for inpatient mortality, 5% for recovery amongst children admitted to inpatient care, 1% for outpatient mortality, 5% for anthropometric recovery amongst children in outpatient care, and 5% for non-response.

The GDG was of the view that there may be potential benefits of admitting infants and children with severe wasting and/or nutritional oedema who meet specific admission criteria but strongly felt that an in-depth assessment is important for some infants and children who may after careful consideration successfully be managed in outpatient settings. Other infants and children 6–59 months old with severe wasting and/or nutritional oedema may be directly enrolled and managed as outpatients. The GDG noted that inpatient care has potential harms, including risk of hospital-acquired infections, social or family challenges and opportunity costs. They did however, work within the overall assumption that primary care should refer cases that they cannot manage to secondary or tertiary care as the default, even taking into account the potential risks of inpatient care as mentioned previously. The GDG also considered the certainty of the evidence to be low because of this indirectness.

### Certainty of the Evidence

The GDG examined only those prognostic factors from the systematic review that had moderate or high certainty. However, the GDG acknowledged that there were also criteria from the 2013 WHO recommendation and IMCI guidance beyond those identified in the prognostic systematic review.

Furthermore, the GDG extensively discussed that there was uncertainty about whether inpatient care results in benefit for infants and children meeting specific criteria in terms of improvements in important outcomes. There was no direct evidence about this; due to this indirectness the GDG agreed that the certainty of the evidence should remain as low.

### **Values and preferences**

The GDG agreed that there is probably no important uncertainty or variability in how much people value the main outcomes including growth and recovery, failure to respond or worsening condition after intervention, and mortality. A qualitative evidence synthesis of values and preferences showed that caregivers from one context to the next are likely to place very similar value on whether their children are growing well, recover from illness or not, whether they improve or not after an intervention, and whether they survive or not.

### **Resources**

An economic evidence synthesis identified a limited amount of indirect evidence about resource use and cost-effectiveness related to settings across the care pathway including community, outpatient, and inpatient settings. The GDG agreed that resource use and cost-effectiveness is context-specific and expected to vary considerably.

### **Research evidence**

An economic evidence synthesis identified a limited amount of indirect evidence about resource use and cost-effectiveness related to settings across the care pathway including community, outpatient, and inpatient settings. The GDG agreed that resource use and cost-effectiveness is context-specific and expected to vary considerably.

### **Equity**

A qualitative evidence synthesis identified two studies that indicated that caregivers may have challenges accessing care and that inpatient care may be expensive for caregivers (33, 34), which could negatively impact health equity. However, the GDG agreed that this qualitative evidence was very limited.

Evidence from the prognostic systematic review was used to identify infants and children with severe wasting and/or nutritional oedema who are at higher risk based on individual child factors, social factors, and contextual factors with the aim of increasing health equity for these children. This approach could help reduce disparities in health outcomes, as at-risk infants and children with severe wasting and/or nutritional oedema might benefit more from inpatient care, although the GDG again highlighted the caveat that it is unknown whether inpatient care based on certain criteria will improve outcomes for all children.

### **Acceptability**

One study identified in the qualitative evidence synthesis indicated that caregivers have perceptions of benefits of inpatient care of infants and children with wasting and/or nutritional oedema (33). The GDG acknowledged the limited available qualitative evidence but felt that the acceptability of admission for inpatient care based on specific criteria may vary across settings and by different situations which supports the need for a conditional recommendation.

### **Feasibility**

Studies in the qualitative evidence synthesis suggested that quality of inpatient care is not always consistent, discharge from inpatient care may happen too early in some situations, and quality of outpatient care may be inadequate (33–36).

The GDG agreed that the feasibility of adopting criteria for inpatient care is highly dependent on resources, infrastructure, and capacities of individual health systems. Factors that may influence feasibility include the availability of hospital beds with trained staff, as well as the prevalence of infants and children 6–59 months with severe wasting and/or nutritional oedema meeting these criteria within certain settings. Context-specific strategies should be developed to address the unique challenges and optimize the feasibility of implementing the recommendation in various settings.

### **Research needs**

Future studies should:

- evaluate additional social factors that may be associated with the risk of poor outcomes in children with severe wasting and/or nutritional oedema (such as fathers' mental health, stigma, lack of social support, domestic violence, low socioeconomic status, and food insecurity)
- establish whether inpatient care of children with severe wasting and/or nutritional oedema improves outcomes compared to outpatient care based on a set of criteria or different factors
- determine the most appropriate methods for assessing and supporting breastfeeding, including relactation where needed and possible for infants and children over 6 months and up to 2 years
- include biological studies that aim to understand resilience, functional recovery, immune function, and cognitive development of infants and children who have experienced wasting and/or nutritional oedema
- include clinical and social science studies to understand factors affecting resilience and cognitive development of infants and children who have experienced wasting and/or nutritional oedema
- assess social interventions targeting access (such as travel vouchers, queue avoidance, etc.), maternal agency (cash transfers, for example), and maternal health and psychosocial support and mental health
- evaluate risk-targeted follow-up strategies of infants and children with wasting and/or nutritional oedema
- identify early markers of likelihood of non-recovery from wasting and/or nutritional oedema
- aim to understand pathways underlying mortality in infants and children with wasting and/or nutritional oedema after transition to outpatient care.

- 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.

## Remarks

- The effectiveness and safety of care delivered using the admission/enrolment criteria above depends on policymakers, programme managers and health workers all having a strong focus on continuity of care (in particular referral between inpatient and outpatient services) and actively communicating between different levels and locations within the health system.
- [IMCI \(25\)](#) danger signs include: not able to drink or breastfeed; vomits everything; had convulsions recently; lethargic or unconscious; convulsing now.
- Acute medical problems (as per IMCI classification) which need referral to inpatient care include:
  - shock
  - hypoglycaemia (measured) persistent after initial emergency corrective treatment
  - oxygen saturation < 90%
  - pneumonia (with chest indrawing; and/or fast breathing; and if possible to measure, oxygen saturation < 94%)
  - dehydration (including some or severe dehydration)
  - severe persistent diarrhoea (diarrhoea for 14 days or more plus dehydration)
  - very severe febrile illness – in a malaria zone or with a positive rapid diagnostic test, this is treated as severe malaria
  - very severe febrile illness – where there is no risk of malaria or with a negative rapid diagnostic test, this is treated as bacterial disease, such as meningitis, etc.
  - severe complicated measles
  - mastoiditis
  - severe anaemia (severe palmar pallor or Hb < 4g/dL or Hb 4–6g/dL with signs of decompensation)
  - severe side effects from ART (for HIV) – skin rash, difficulty breathing and severe abdominal pain, yellow eyes, fever, vomiting
  - open or infected skin lesions associated with nutritional oedema

- other stand-alone ‘priority clinical signs’ not classified as danger signs: hypothermia (< 35°C axillary or 35.5°C rectal) or high fever (≥ 38.5°C axillary or 39°C rectal).
- Appropriate care/support services for children with medical problems needing mid- or long-term follow-up care and with a significant association with nutritional status could include outpatient HIV or tuberculosis treatment, physiotherapy/speech and language therapy for feeding difficulties associated with cerebral palsy or other disabilities, psychological support groups for children and their caregivers, etc.
- The limits of care for inpatient services is usually reached when inpatient care adds no further benefit for an individual child (and their family). More specifically, it refers to the situation when staff have appropriately utilized all the resources and drugs available to them in this particular inpatient centre and a child remains wasted and/or with nutritional oedema with no signs of improvement.
- A good appetite should be assessed using a systematic method to see if a child is able to successfully consume the ready-to-use therapeutic food (RUTF) that they will be supplied with in outpatient care to complete their treatment (until anthropometric recovery and the resolution of nutritional oedema).
- If a child is still being breastfed, counselling and support should be given before transfer, and referral made to ongoing breastfeeding support if needed and possible, along with health education on the importance of appropriate complementary foods; especially if the child is 6–23 months. This health education and counselling is also vital for non-breastfed children.
- If possible, the following interventions should be delivered before transfer out of inpatient care: age-appropriate vaccinations, deworming medication, vitamin A supplementation (only if not using RUTF meeting WHO and Codex Alimentarius specifications (55) in outpatient management). If it is not possible to deliver these interventions before transfer, then referral plans should be made to ensure the child receives them as an outpatient.

## Rationale

This recommendation is an update to recommendation 1.4 from the [WHO Guideline: updates on the management of severe acute malnutrition in infants and children, 2013 \(10\)](#). The GDG discussed extensively the potential for serious harms from transferring infants and children with severe wasting and/or nutritional oedema from inpatient to outpatient care too early, before they meet specific criteria as outlined in the recommendation. The GDG therefore felt that this must remain a strong recommendation and that the evidence is of moderate certainty, supported by the prognostic factor evidence.

A prognostic systematic review was commissioned with the objective of identifying factors associated with risk based on outcomes in infants and children with severe wasting and/or nutritional oedema that may inform transfer from inpatient to outpatient care. These prognostic factors could be used to reinforce/support existing criteria and to identify additional criteria that could trigger a decision for transfer.

The GDG completed an online survey (before the GDG meetings for this recommendation) to determine minimally important absolute risk thresholds for each important outcome in infants and children 6–59 months with severe wasting and/or nutritional oedema, defined as the smallest change in the outcome regarded by the majority of health workers as meaningful. If a prognostic factor had an absolute risk difference above one of these thresholds, then this could mean using this factor as a criterion for transferring from inpatient to outpatient care. The outcomes that the GDG considered to inform decisions for this recommendation were:

- inpatient mortality in infants and children with severe wasting and/or nutritional oedema currently in inpatient care (*minimally important absolute risk threshold: 1%*)
- recovery in infants and children with severe wasting and/or nutritional oedema following initial inpatient care (*minimally important absolute risk threshold: 5%*)
- post-hospital discharge mortality in infants and children with severe wasting and/or nutritional oedema following initial inpatient care (*minimally important absolute risk threshold: 3%*).

The GDG examined all prognostic factors identified in the systematic review to determine which met the above thresholds for the outcomes that had moderate or high certainty according to GRADE for prognostic studies (20). These filtered prognostic factors for this guideline question informing admission, referral, transfer, and exit recommendations can be found in [Web Annex E](#).

Based on the available evidence, the GDG considered individual child factors as well as social factors that would be important to consider when transferring children from inpatient to outpatient care.

The GDG acknowledged and discussed the limitations of this evidence, including the lack of randomized controlled trials that evaluated whether transfer from inpatient to outpatient care based on prognostic factors would result in better outcomes for these children.

Throughout the process for updating recommendations about decisions along the care pathway, the GDG also considered evidence from a qualitative evidence synthesis on equity, acceptability, and feasibility related to decisions for admission, transfer, and exit from care as well as resource use and cost-effectiveness information from an economic evidence synthesis. These systematic reviews had limited evidence and the GDG did not make explicit judgements across all EtD criteria for these recommendations.

## Systematic reviews

This recommendation was informed by the following systematic reviews:

Uthman O, Folasire Y, Fagbamigbe AF, Anjorin S. Moderate or Severe wasting/Oedema in infants and children aged six months and older: a systematic review and meta-analysis. PROSPERO 2021 CRD42021288271 (54).

Annan RA, Aduku LNE, Agyapong NAF. Qualitative Systematic Review assessing the Values and Preferences parents/caregivers of children affected by wasting assign to defined health outcomes. PROSPERO 2021 CRD42021282013 (30).

Mdege DN, Masuku SD, Musakwa N, Chisala M, Tingum EN, Boachie MK et al. Costs and cost-effectiveness of treatment setting for children with wasting, oedema and growth failure/faltering: A systematic review. PLOS Glob Public Health. 2023 Nov 8; 3(11):e0002551. doi: 10.1371/journal.pgph.0002551 (31).

Twalibu A, Sulley AM, Chibwana A, Selemani A, Hanjahanja-Phiri T, Potani I et al. Equity, acceptability, and feasibility of decisions on where to treat wasting in children 0-59 months: A qualitative systematic review and meta-aggregation. PROSPERO 2022 CRD42022298843 (32).

## Evidence to decision

### Benefits and harms

The GDG discussed the need for infants and children with severe wasting and/or nutritional oedema to be transferred upon meeting specific criteria informed by the prior recommendation on admission to inpatient care, additional prognostic factor evidence, and expert experience.

As described for the previous recommendation, GDG was surveyed to determine minimally important absolute risk thresholds for each outcome, meaning that if a certain prognostic factor was associated with

risk that met the threshold, then the factor could be considered for this recommendation. Specifically, the GDG judged that the minimum absolute risk difference perceived to be important by majority of health workers is 1% for inpatient mortality, 5% for recovery amongst children admitted to inpatient care, and 3% for post-hospital discharge mortality.

The GDG agreed that the harms of transferring infants with severe wasting and/or nutritional oedema from inpatient to outpatient care prematurely could be serious. They GDG felt strongly about the recommendation for these children to meet specific criteria before being transferred. They also agreed that caregivers must be linked to appropriate outpatient care and additional social and family factors be considered and addressed, supported by the prognostic factor evidence.

### **Certainty of the Evidence**

The GDG examined prognostic factors from the systematic review only if they had moderate or high certainty. The overall certainty in the evidence is upgraded from the 2013 WHO recommendation due to the additional prognostic evidence and the additional indirect evidence and expert experience which informed the GDG's recommendations. However, the GDG acknowledged that there were also criteria from the 2013 WHO recommendation and IMCI guidance beyond those identified in the prognostic systematic review.

### **Values and preferences**

The GDG agreed that there is probably no important uncertainty or variability in how much people value the main outcomes, including growth and recovery, failure to respond or worsening condition after intervention, and mortality. A qualitative evidence synthesis of values and preferences showed that caregivers from one context to the next are likely to place very similar value on whether their children are growing well, recover from illness or not, whether they improve or not after an intervention, and whether they survive or not.

### **Resources**

An economic evidence synthesis identified a limited amount of indirect evidence about resource use and cost-effectiveness related to settings across the care pathway including community, outpatient, and inpatient settings. The GDG agreed that resource use and cost-effectiveness is context-specific and expected to vary considerably.

### **Equity**

A qualitative evidence synthesis identified one study that highlighted that inpatient care may be expensive for caregivers (34), which could negatively impact health equity. However, the GDG agreed that this qualitative evidence was very limited, particularly with regards to transfer from inpatient to outpatient care. The GDG also recognized that access to high-quality outpatient care and follow-up support services may differ across contexts but this did not directly influence the GDG's decision on the recommendation.

### **Acceptability**

There were no directly relevant studies in the qualitative evidence synthesis about the acceptability of transfer from inpatient to outpatient care based on specific criteria.

### **Feasibility**

Studies in the qualitative evidence synthesis suggested that quality of inpatient care is not always consistent, discharge from inpatient care may happen too early in some situations, and quality of outpatient care may be inadequate (33–36). This reiterates the GDG's concern about transfer of infants from inpatient to outpatient care potentially happening too early.



## Research needs

Future studies should:

- evaluate additional social factors that may be associated with the risk of poor outcomes in children with severe wasting and/or nutritional oedema (such as fathers' mental health, stigma, lack of social support, domestic violence, low socioeconomic status and food insecurity)
- establish whether inpatient care of children with severe wasting and/or nutritional oedema improves outcomes compared to outpatient care based on a set of criteria or different factors
- determine the most appropriate methods for assessing and supporting breastfeeding, including relactation where needed and possible for infants and children over 6 months and up to 2 years
- include biological studies that aim to understand resilience, functional recovery, immune function and cognitive development of infants and children who have experienced wasting and/or nutritional oedema
- include clinical and social science studies to understand factors affecting resilience and cognitive development of infants and children who have experienced wasting and/or nutritional oedema
- assess social interventions targeting access (such as travel vouchers, queue avoidance), maternal agency (cash transfers, for example), and maternal health and psychosocial support and mental health
- evaluate risk-targeted follow-up strategies of infants and children with wasting and/or nutritional oedema
- identify early markers of likelihood of non-recovery from wasting and/or nutritional oedema
- aim to understand pathways underlying mortality in infants and children with wasting and/or nutritional oedema after transition to outpatient care.

### Good practice statement

### New in 2023

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.

## Remarks

- The effectiveness and safety of care delivered using the admission/enrolment criteria above depends on policymakers, programme managers and health workers all having a strong focus on continuity of care (in particular referral between inpatient and outpatient services) and actively communicating between different levels and locations within the health system.

- Ongoing medical and psychosocial support services could include those for children with medical problems needing mid- or long-term follow-up care and with a significant association with nutritional status, such as outpatient HIV or tuberculosis treatment, physiotherapy/speech and language therapy for feeding difficulties associated with cerebral palsy or other disabilities, psychological support groups for children and their caregivers, etc. For children who are still breastfed, referral could also be made for ongoing breastfeeding counselling and support if needed and possible, along with health education on the importance of appropriate complementary foods; especially if the child is 6–23 months. These health education and counselling services are also vital for non-breastfed children.

## Rationale

The GDG agreed that a good practice statement was needed to reinforce the importance of continuity of care of infants and children with severe wasting and/or nutritional oedema between inpatient and outpatient services. One action that the GDG felt should be taken to support this is discharge planning, with guidance, support and services provided to mothers/caregivers throughout follow-up care. The GDG also felt that effective discharge planning requires assessment of the home environment of the child to be able to link families to support services as appropriate. Furthermore, an emphasis was put on the importance of starting this discharge planning early in a child's admission. This is because many of the preparatory assessments and the process of setting up follow-up care can take considerable time and so should not be rushed just before discharge as this increases the chances of these efforts not being completed or being ineffective.

### 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 of 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.

## Remarks

- It is acknowledged that there may be individual cases of patients admitted on both WLZ/WHZ and MUAC admission/enrolment criteria who after lengthy treatment may normalize on one criterion but not another. For example, their WHZ may be equal to or greater than -2 SD of the WHO child growth standards median (WHZ or WLZ  $\geq$  -2), but their MUAC remains stagnant and does not reach 125 mm or above, despite prolonged therapeutic feeding. These patients should be assessed by a health professional (preferably one who has been following their care throughout) and if it is decided that it would be safe and appropriate, they may exit from outpatient care. A follow-up visit within a month of exit should be arranged to assess if the child is still clinically well and hasn't deteriorated in terms of their nutritional and clinical status.

- Percentage weight gain and absolute weight gain are not recommended to be used for exit criteria as a child starting from a very low baseline weight will still be very small and still at high risk of mortality/morbidity even after seemingly good percentage or absolute weight gain.
- Appropriate care/support services for children with medical problems needing mid or long-term follow-up care and with a significant association with nutritional status could include outpatient HIV or tuberculosis treatment, physiotherapy/speech and language therapy for feeding difficulties associated with cerebral palsy or other disabilities, psychological support groups for children and their caregivers, etc. Supportive services for other social factors could include food assistance and other social safety net interventions for the household as a whole. The possibility to refer children to these services or care will vary from context to context, but policymakers, programme managers, and health workers should advocate for the provision of these services.
- The limit of care for outpatient services is usually reached when there is no longer a perceived benefit of ongoing outpatient care in this particular health facility for an individual child (and their family).
- Special attention should be paid to ensure that caregivers feel prepared for exit and that their own mental and physical health and capacity for care at home has been taken into consideration for the timing of exit decisions and any subsequent follow-up.
- All efforts should be made while children are in nutritional treatment to deliver age-appropriate vaccinations as well as clear referral plans made for when and where they can receive their next scheduled immunization after exit from nutritional treatment.

## Rationale

This recommendation is an update to recommendation 1.5 from the [WHO Guideline: updates on the management of severe acute malnutrition in infants and children, 2013 \(10\)](#). The GDG felt that this should be a conditional recommendation with different decisions on whether and how to apply this recommendation based on resources and across settings. The GDG agreed the certainty of evidence should still be very low due to limited direct evidence to inform this recommendation in addition to expert experience.

A prognostic systematic review was commissioned with the objective of identifying factors associated with risk based on outcomes in infants and children with severe wasting and/or nutritional oedema that may inform exit from outpatient care. These prognostic factors could be used to reinforce/support existing criteria and to identify additional criteria for exit.

The GDG completed an online survey (before the GDG meetings for this recommendation) to determine minimally important absolute risk thresholds for each important outcome in infants and children 6–59 months with severe wasting and/or nutritional oedema, defined as the smallest change in the outcome regarded by the majority of health workers as meaningful. If a prognostic factor had an absolute risk difference above one of these thresholds, then this could mean using this factor as a criterion for exit or delaying exit from outpatient care. The outcomes that the GDG considered to inform decisions for this recommendation were:

- relapse in infants and children with severe wasting and/or nutritional recovery (*minimally important absolute risk threshold: 7%*)
- sustained recovery in infants and children with severe wasting and/or nutritional recovery (*minimally important absolute risk threshold: 6%*).

The GDG examined all prognostic factors identified in the systematic review to determine which met the above thresholds for the outcomes that had moderate or high certainty according to GRADE for prognostic studies (20). These filtered prognostic factors for this guideline question informing admission, referral, transfer, and exit recommendations can be found in [Web Annex E](#).

Based on the available evidence, the GDG considered individual child factors as well as social and contextual factors that would be important to consider when deciding whether a child is ready for exit from outpatient care.

The GDG acknowledged and discussed the limitations of this evidence including the lack of randomized controlled trials that evaluated whether exit based on prognostic factors would result in better outcomes for these children.

Throughout the process for updating recommendations about decisions along the care pathway, the GDG also considered evidence from a qualitative evidence synthesis on equity, acceptability, and feasibility related to decisions for admission, transfer and exit from care as well as resource use and cost-effectiveness information from an economic evidence synthesis. These systematic reviews had limited evidence and the GDG did not make explicit judgements across all EtD criteria for these recommendations.

### **Systematic reviews**

Uthman O, Folasire Y, Fagbamigbe AF, Anjorin S. Moderate or Severe wasting/Oedema in infants and children aged six months and older: a systematic review and meta-analysis. PROSPERO 2021 CRD42021288271 (54).

Annan RA, Aduku LNE, Agyapong NAF. Qualitative Systematic Review assessing the Values and Preferences parents/caregivers of children affected by wasting assign to defined health outcomes. PROSPERO 2021 CRD42021282013 (30).

Mdege DN, Masuku SD, Musakwa N, Chisala M, Tingum EN, Boachie MK et al. Costs and cost-effectiveness of treatment setting for children with wasting, oedema and growth failure/faltering: A systematic review. PLOS Glob Public Health. 2023 Nov 8; 3(11):e0002551. doi: 10.1371/journal.pgph.0002551 (31).

Twalibu A, Sulley AM, Chibwana A, Selemani A, Hanjahanja-Phiri T, Potani I et al. Equity, acceptability, and feasibility of decisions on where to treat wasting in children 0-59 months: A qualitative systematic review and meta-aggregation. PROSPERO 2022 CRD42022298843 (32).

### **Evidence to decision**

#### **Benefits and harms**

As described for the previous recommendation, the GDG was surveyed to determine minimally important absolute risk thresholds for each outcome, meaning that if a certain prognostic factor was associated with risk that met the threshold, then the factor could be considered for this recommendation. Specifically, the GDG judged that the minimum absolute risk difference perceived to be important by majority of health workers is 7% for relapse and 6% for sustained recovery.

However, there was limited evidence from the prognostic factor systematic review to inform the recommendation on when infants and children 6–59 months with severe wasting and/or nutritional oedema can safely exit from all care. The GDG considered medical problems needing mid or long-term follow-up care and with a significant association with nutritional status as well as social factors which emerged from the prognostic evidence. Further to this, based on expert experience, the GDG made updates to the past recommendation that the GDG felt would ensure that infants and children with severe wasting and/or nutritional oedema exit all care once they have achieved anthropometric recovery and have no nutritional oedema for consecutive visits.

## **Certainty of the Evidence**

The GDG acknowledged that the systematic review had limited direct evidence to inform the recommendation. The GDG made some updates to the criteria in the recommendation based on expert experience, which is considered the lowest level of evidence. The GDG therefore downgraded the 2013 WHO recommendation from low to very low certainty evidence.

## **Values and preferences**

The GDG agreed that there is probably no important uncertainty or variability in how much people value the main outcomes, including growth and recovery and failure to respond or worsening condition after intervention. A qualitative evidence synthesis of values and preferences showed that caregivers from one context to the next are likely to place very similar value on whether their children are growing well, recover from illness or not and whether they improve or not after an intervention.

## **Resources**

There was no direct evidence from an economic evidence synthesis for this recommendation about exit from all care.

## **Equity**

There were no directly relevant studies for this recommendation from a qualitative evidence synthesis for this recommendation.

## **Acceptability**

There were no directly relevant studies for this recommendation from a qualitative evidence synthesis for this recommendation.

## **Feasibility**

There were no directly relevant studies for this recommendation from a qualitative evidence synthesis for this recommendation.

## **Research needs**

Future studies should:

- evaluate additional social factors that may be associated with the risk of poor outcomes in children with severe wasting and/or nutritional oedema (such as fathers' mental health, stigma, lack of social support, domestic violence, low socioeconomic status and food insecurity)
- establish whether inpatient care of children with severe wasting and/or nutritional oedema improves outcomes compared to outpatient care based on a set of criteria or different factors
- determine the most appropriate methods for assessing and supporting breastfeeding, including relactation where needed and possible for infants and children over 6 months and up to 2 years
- include biological studies that aim to understand resilience, functional recovery, immune function and cognitive development of infants and children who have experienced wasting and/or nutritional oedema
- include clinical and social science studies to understand factors affecting resilience and cognitive development of infants and children who have experienced wasting and/or nutritional oedema

- assess social interventions targeting access (such as travel vouchers, queue avoidance), maternal agency (cash transfers, for example), and maternal health and psychosocial support and mental health
- evaluate risk-targeted follow-up strategies of infants and children with wasting and/or nutritional oedema
- identify early markers of likelihood of non-recovery from wasting and/or nutritional oedema
- aim to understand pathways underlying mortality in infants and children with wasting and/or nutritional oedema after transition to outpatient care.

## 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.

### Remarks

- The accurate classification of hydration status must be grounded in a systematic approach to assessing the overall clinical status of a child and importantly assessing for any deterioration, using a structured system such as Emergency Triage Assessment and Treatment (ETAT) or other national emergency assessment and triage protocols.
- The classification of hydration status in children with wasting and/or nutritional oedema is challenging. This is because clinical features of wasting or nutritional oedema which are usually used to identify the level of dehydration (for example, sunken eyes, slow/very slow skin pinch) may be present in a malnourished child even without dehydration, leading to an over-diagnosis of dehydration. Conversely, clinical features such as nutritional oedema may mask signs used to diagnose dehydration (for example, sunken eyes, slow/very slow skin pinch) or lead to a false diagnosis of fluid overload and so lead to an overall under-diagnosis of dehydration.
- It can still be effective to use algorithms/scoring systems or other approaches based on the clinical history and signs, which were developed for the classification of dehydration in non-malnourished children, but the reliability of certain clinical signs should be assessed on an individual basis and then an overall judgement made each time. In order for health workers to become proficient in this kind of clinical practice, comprehensive training is needed as well as exposure to these types of cases on a regular basis, with close and constructive supervision by experienced clinicians.

- WHO guidance on using the clinical history and clinical signs to assess hydration status – including both dehydration and fluid overload – in children with wasting or nutritional oedema can be found in:
  - [IMCI Management of the sick young infant aged up to 2 months: Chart booklet \(13\)](#).
  - [Integrated Management of Childhood Illness: IMCI chart booklet \(25\)](#).
  - [WHO Guideline: updates on the management of severe acute malnutrition in infants and children \(10\)](#).
  - [WHO Updated Guidelines: Paediatric emergency triage, assessment and treatment: Care of critically ill children \(56\)](#).

## Rationale

The GDG decided that this good practice statement is needed to emphasize the importance of accurate classification of hydration status, along with providing appropriate treatment and monitoring of infants and children with wasting and/or nutritional oedema.

## Questions or interventions for which the GDG did not make a recommendation

**Guideline question:** In infants and children with moderate or severe wasting or oedema, how can dehydration be identified?

The diagnostic test accuracy systematic review provided very low certainty evidence that did not directly answer this guideline question and the GDG was unable to make a recommendation.

## Systematic reviews

This question was informed by the following systematic reviews:

Tsegaye AT, Pavlinac PB, Walson JL, Tickell KD. In infants and children with moderate or severe wasting or oedema, how can dehydration be identified? (unpublished) (57).

Shaw N, Muthukumar M, O'Toole B, Robinson S, Crathorne L. Fluid management strategies during inpatient care (unpublished) (58).

Potani I, Hanjahanja-Phiri T, Selemani A, Mpinda I, Mamani-Mategula E, Chibwana A et al. The acceptability, feasibility, and equitability of inpatient, outpatient, post discharge and maternal-directed interventions in the prevention and treatment of wasting and/or oedema: A meta-aggregation. PROSPERO 2021 CRD42021286230 (49).

## Research needs

Future studies should:

- determine how to assess and classify hydration status in children with wasting and/or nutritional oedema, with comparisons of moderate versus severe wasting and/or nutritional oedema and complicated (inpatient) versus uncomplicated (outpatient/community)
- compare different classification approaches using test-treat designs
- include important outcomes including mortality, recovery, health, development, etc. as opposed to rehydration which is a proxy for clinical recovery and survival
- examine resource utilization based on the duration that assessments take using different tools/ measures, including clinical assessment tools that take minimal time to conduct compared to current practice
- evaluate weight change as a continuous outcome which can be modelled rather than dehydrated/ rehydrated
- be multi-centre as incidence and severity of diarrhoea is different across settings.

## 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.

### Remarks

- Although ReSoMal is the preferred rehydration solution for children with severe wasting and/or nutritional oedema who are dehydrated but not in shock, it must only be administered in health facilities, with supervision and monitoring by a health worker; it should not be given to caregivers to administer at home. Low-osmolarity ORS can be given to caretakers to administer at home (or administered in a health facility if ReSoMal is not available).
- Caregivers of infants and children 6–59 months with severe wasting and/or nutritional oedema who are dehydrated but not in shock should be encouraged to continue breastfeeding in addition to any rehydration fluids given.
- If there is no ReSoMal or low-osmolarity ORS available, clean water should be given as the rehydration solution and breastfeeding encouraged as much as possible.
- Commercially prepared ReSoMal and low-osmolarity ORS are preferred to solutions prepared in the health facility or in the home. This is due to the lower risk of the component ingredients being inappropriately prepared and higher food safety standards for commercially prepared products.
- No evidence was identified in relation to infants less than 6 months of age.



**Table 3. Summary of judgements for recommendations B7 and B8**

<b>PROBLEM</b>	No	Probably no	Probably yes	<b>Yes</b>	Varies	Don't know
<b>DESIRABLE EFFECTS</b>	Trivial	Small	Moderate	Large	Varies	Don't know
<b>UNDESIRABLE EFFECTS</b>	Large	Moderate	Small	Trivial	Varies	Don't know
<b>CERTAINTY OF EVIDENCE</b>	<b>Very low</b>	Low	Moderate	High	No included studies	
<b>VALUES</b>	Important uncertainty or variability	Possibility important uncertainty or variability	<b>Probably no important uncertainty or variability</b>	No important uncertainty or variability		
<b>BALANCE OF EFFECTS</b>	Favours the comparison 	Probably favours the comparison 	Does not favour either the intervention or the comparison 	Probably favours the intervention 	Favours the intervention 	Varies Don't know
<b>RESOURCES REQUIRED</b>	Large costs 	Moderate costs 	Negligible costs and savings 	<b>Moderate savings</b> 	Large savings 	Varies Don't know
<b>CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES</b>	Very low	Low	Moderate	High	No included studies	
<b>COST EFFECTIVENESS</b>	Favours the comparison 	Probably favours the comparison 	Does not favour either the intervention or the comparison 	Probably favours the intervention 	Favours the intervention 	Varies No included studies
<b>EQUITY</b>	Reduced 	Probably reduced 	Probably no impact 	<b>Probably increased</b> 	Increased 	Varies Don't know
<b>ACCEPTABILITY</b>	No	Probably no	<b>Probably yes</b>	Yes	Varies	Don't know
<b>FEASIBILITY</b>	No	Probably no	<b>Probably yes</b>	Yes	Varies	Don't know

**Rationale**

Infants and children with wasting and/or nutritional oedema have a high risk of mortality and other poor outcomes during diarrhoeal episodes. The [WHO Guideline: updates on the management of severe acute malnutrition in infants and children, 2013 \(10\)](#) included a recommendation (recommendation 6.2) that infants and children with severe wasting and/or nutritional oedema who have some dehydration or severe dehydration (but without shock or suspected cholera) should receive Rehydration Solution for Malnourished children (ReSoMal). ReSoMal is a rehydration solution designed to rehydrate infants and children with wasting and/or nutritional oedema whilst minimizing the risk of fluid overload.

The GDG agreed that the standing guidance should remain with ReSoMal being recommended as the preferred rehydration solution if ReSoMal and low-osmolarity ORS are both available. One of the key reasons for this is that the only evidence of the effects of WHO low-osmolarity ORS compared to ReSoMal is from one small trial which added 20 mmol/L of potassium to WHO low-osmolarity ORS, which equates to the potassium amount in ReSoMal.

The GDG also agreed that this should be a conditional recommendation and that WHO low-osmolarity ORS can be used for infants and children with severe wasting and/or nutritional oedema plus dehydration if ReSoMal is unavailable.

The GDG felt that the certainty of evidence from the trial (59) was very low and that they did not know whether the balance of effects favours WHO low-osmolarity ORS or ReSoMal.

The GDG suggested that there could potentially be moderate savings from the use of WHO low-osmolarity ORS instead of ReSoMal, and that equity would probably be increased as low-osmolarity ORS is often much more readily available than ReSoMal and can be given at home, which is not the case for ReSoMal.

The GDG agreed that WHO low-osmolarity ORS would probably be acceptable and feasible to implement for children with wasting and/or nutritional oedema as it is widely used for non-malnourished children treated by the same health workers.

## Systematic reviews

This recommendation was informed by the following systematic reviews:

Tickell K, Tsegaye AT, Means A, Walson J, Pavlinac P. Effectiveness and safety of standard WHO low-osmolarity ORS compared with ReSoMal for managing acute diarrhea among children with moderate or severe wasting. PROSPERO 2021 CRD42021276133 (60).

Annan RA, Aduku LNE, Agyapong NAF. Qualitative Systematic Review assessing the Values and Preferences parents/caregivers of children affected by wasting assign to defined health outcomes. PROSPERO 2021 CRD42021282013 (30).

Shaw N, Muthukumar M, O'Toole B, Robinson S, Crathorne L. Fluid management strategies during inpatient care (unpublished) (58).

Potani I, Hanjahanja-Phiri T, Selemani A, Mpinda I, Mamani-Mategula E, Chibwana A et al. The acceptability, feasibility, and equitability of inpatient, outpatient, post discharge and maternal-directed interventions in the prevention and treatment of wasting and/or oedema: A meta-aggregation. PROSPERO 2021 CRD42021286230 (49).

## Evidence to decision

### Benefits and harms

One small randomized controlled trial that included infants and children with severe wasting and/or nutritional oedema and with diarrhoea was eligible for inclusion in the effectiveness systematic review. Infants and children were randomized to receive either WHO low-osmolarity oral rehydration solution (ORS) or Rehydration Solution for Malnourished children (ReSoMal). Importantly, an additional 20 mmol/L of potassium was added to WHO low-osmolarity ORS, totalling 40 mmol/L of potassium (equivalent to the potassium concentration in ReSoMal) (59).

The trial showed that WHO low-osmolarity ORS may reduce hyponatraemia in infants and children with severe wasting and/or nutritional oedema plus diarrhoea. The GDG noted that hyponatraemia was mild, rather than severe, in infants and children included in the trial, with no clinically symptomatic hyponatraemia cases. Estimates for the other outcomes reported on by the trial were very uncertain.

Several pre-specified outcomes of interest were not reported on, including duration of diarrhoea, morbidity or recovery from co-morbidity, duration of hospital stay or time to discharge, and weight change.

The GDG made the judgement of “don't know” for the anticipated desirable and undesirable effects, and “don't know” in terms of which rehydration fluid is favoured (balance of effects).

## **Certainty of the Evidence**

The GDG agreed that the overall certainty of the evidence of effects was very low. The certainty of evidence for all outcomes was very low, apart from hyponatraemia, for which the certainty of evidence was low.

There was also serious indirectness because the potassium content of WHO low-osmolarity ORS was increased in this trial by 20 mmol/L to reach a total potassium concentration of 40 mmol/L (equivalent to the potassium concentration in ReSoMal).

## **Values and preferences**

The GDG agreed that, based on the three studies identified in a qualitative evidence synthesis focusing on mortality and clinical outcomes, there is probably no uncertainty or variability around how much people value these outcomes. This means that caregivers from one context to the next are likely to place very similar value on whether their children recover from illness or not and whether they survive or not.

## **Resources**

In a systematic review of economic evidence no evidence was identified for this question. However, it is known that ReSoMal generally costs around three times more than WHO low-osmolarity ORS, and so the GDG made the judgement of “moderate savings” in terms of the resources required for using WHO low-osmolarity ORS compared to ReSoMal.

The GDG discussed that ReSoMal can also be prepared by combining one sachet of WHO low-osmolarity ORS with 2 liters of water, 50 grams of sugar, and mineral mix or combined minerals and added vitamins. However, the GDG also agreed that these mineral mixes are often not available in health facilities, and that the need to add micronutrients will increase costs.

The GDG noted that costs for added potassium are not shown in the study identified by the effectiveness systematic review.

Importantly, the GDG also considered that ReSoMal must be administered in health facilities with supervision and monitoring by a health worker, which may have resource implications compared to using WHO low-osmolarity ORS, which can be administered at home, as well as in health facilities.

## **Equity**

In a qualitative evidence synthesis there were no studies that provided direct evidence relevant to equity implications for this question.

The GDG considered it plausible that using WHO low-osmolarity ORS would result in a positive impact on health equity, since it does not need to be administered at a health facility by trained staff as is the case with ReSoMal. This means that children with severe wasting and/or nutritional oedema who have diarrhoea or other fluid losses (such as vomiting) but no dehydration, can be given WHO low-osmolarity at home, which is known to be a better rehydration solution than clean water alone, and which is the current guidance by default for this population group. This could effectively prevent them from becoming dehydrated (i.e. being diagnosed as having some or severe dehydration) and needing inpatient admission.

Overall, the GDG felt that the judgement would be that it probably increased equity compared to WHO low-osmolarity ORS, with some GDG members opting for a judgement of “don’t know” here.

## **Acceptability**

The GDG made the judgement that standard WHO low-osmolarity ORS is probably more acceptable than ReSoMal to certain key stakeholders, such as health workers and health facility managers.

One qualitative study was identified relating to acceptability, which indicated that the routine use and preparation of ReSoMal at hospitals in South Africa and Ghana was considered to be demanding and

not worth this additional effort considering the low number of children with severe wasting who needed ReSoMal at any given time. Instead, staff provided ORS plus breastmilk, water, and other liquids (61).

The GDG also noted that ReSoMal has been in widespread use for many years, but that ORS is also well-known and valued by many health workers, and so a shift to using this product would likely be accepted.

### Feasibility

The GDG felt that the evidence suggested that WHO low-osmolarity ORS is probably more feasible to implement compared to ReSoMal in some settings.

A study at a hospital in Kenya found that most ward-based health workers said that pre-mixed ReSoMal sachets were usually available (62). A cross-sectional survey done in eight district hospitals in Rwanda found that ReSoMal was only available in a minority of hospitals for infants and children with severe wasting and/or nutritional oedema, yet most hospitals had ORS available (63). Furthermore, a study examining health facilities' preparedness in Zimbabwe showed that a majority of the provinces had no ReSoMal stocks at all (64).

There have been documented challenges related to preparing and even more related to administering ReSoMal, with it being difficult and demanding according to health workers, and with specific challenges around giving correct volumes and monitoring (61, 62).

### Research needs

Future studies should:

- compare ReSoMal to low-osmolarity ORS without added potassium
- explore whether adding sodium to F-75 can achieve optimal sodium content
- not be open-label (particularly for subjective outcomes like time to full rehydration)
- include infants and children with moderate wasting, severe wasting, and no wasting to determine whether treatment should be the same for all
- evaluate rehydration fluids for infants and children with moderate wasting with co-morbidities.

## 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.

### Remarks

- No evidence was found specifically on infants and children with moderate wasting, but the GDG considered it appropriate for the existing WHO recommendations for all children to also apply to this target group.
- No evidence was identified for infants less than 6 months of age.

**Table 3. Summary of judgements for recommendations B7 and B8**

<b>PROBLEM</b>	No	Probably no	Probably yes	<b>Yes</b>	Varies	Don't know
<b>DESIRABLE EFFECTS</b>	Trivial	Small	Moderate	Large	Varies	Don't know
<b>UNDESIRABLE EFFECTS</b>	Large	Moderate	Small	Trivial	Varies	Don't know
<b>CERTAINTY OF EVIDENCE</b>	<b>Very low</b>	Low	Moderate	High	No included studies	
<b>VALUES</b>	Important uncertainty or variability	Possibility important uncertainty or variability	<b>Probably no important uncertainty or variability</b>	No important uncertainty or variability		
<b>BALANCE OF EFFECTS</b>	Favours the comparison 	Probably favours the comparison 	Does not favour either the intervention or the comparison 	Probably favours the intervention 	Favours the intervention 	Varies Don't know
<b>RESOURCES REQUIRED</b>	Large costs 	Moderate costs 	Negligible costs and savings 	<b>Moderate savings</b> 	Large savings 	Varies Don't know
<b>CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES</b>	Very low	Low	Moderate	High	No included studies	
<b>COST EFFECTIVENESS</b>	Favours the comparison 	Probably favours the comparison 	Does not favour either the intervention or the comparison 	Probably favours the intervention 	Favours the intervention 	Varies No included studies
<b>EQUITY</b>	Reduced 	Probably reduced 	Probably no impact 	<b>Probably increased</b> 	Increased 	Varies Don't know
<b>ACCEPTABILITY</b>	No	Probably no	<b>Probably yes</b>	Yes	Varies	Don't know
<b>FEASIBILITY</b>	No	Probably no	<b>Probably yes</b>	Yes	Varies	Don't know

**Rationale**

Although there were no eligible trials in infants and children with moderate wasting, the GDG agreed that a recommendation in this population should be made. They agreed to use the evidence and their judgements across the EtD criteria for infants and children with severe wasting and/or nutritional oedema to inform this recommendation.

The GDG stated that they could not make a certainty of evidence judgement specifically for infants and children with moderate wasting, but agreed that their overall judgement of very low certainty evidence in infants and children with severe wasting and/or nutritional oedema was appropriate to this population, since it reflects the uncertainty. The GDG agreed that their judgments for the other EtD criteria in infants and children with severe wasting and/or nutritional oedema were applicable also to this population.

The GDG agreed a recommendation on the use of WHO low-osmolarity ORS for infants and children with moderate wasting was warranted, in alignment with existing recommendations for all children apart from those with severe wasting and/or nutritional oedema.

## Systematic reviews

This recommendation was informed by the following systematic reviews:

Tickell K, Tsegaye AT, Means A, Walson J, Pavlinac P. Effectiveness and safety of standard WHO low-osmolarity ORS compared with ReSoMal for managing acute diarrhea among children with moderate or severe wasting. PROSPERO 2021 CRD42021276133 (60).

Annan RA, Aduku LNE, Agyapong NAF. Qualitative Systematic Review assessing the Values and Preferences parents/caregivers of children affected by wasting assign to defined health outcomes. PROSPERO 2021 CRD42021282013 (30).

Shaw N, Muthukumar M, O'Toole B, Robinson S, Crathorne L. Fluid management strategies during inpatient care (unpublished) (58).

Potani I, Hanjahanja-Phiri T, Selemani A, Mpinda I, Mamani-Mategula E, Chibwana A et al. The acceptability, feasibility, and equitability of inpatient, outpatient, post discharge and maternal-directed interventions in the prevention and treatment of wasting and/or oedema: A meta-aggregation. PROSPERO 2021 CRD42021286230 (49).

## Evidence to decision

### Benefits and harms

One small randomized controlled trial including infants and children with severe wasting and/or nutritional oedema and with diarrhoea was eligible for inclusion in the effectiveness systematic review. Infants and children were randomized to receive either WHO low-osmolarity oral rehydration solution (ORS) or Rehydration Solution for Malnourished children (ReSoMal). Importantly, an additional 20 mmol/L of potassium was added to WHO low-osmolarity ORS, totalling 40 mmol/L of potassium (equivalent to the potassium concentration in ReSoMal) (59).

The trial showed that WHO low-osmolarity ORS may reduce hyponatraemia in infants and children with severe wasting and/or nutritional oedema plus diarrhoea. The GDG noted that hyponatraemia was mild, rather than severe, in infants and children included in the trial, with no clinically symptomatic hyponatraemia cases. Estimates for the other outcomes reported on by the trial were very uncertain.

Several pre-specified outcomes of interest were not reported on, including duration of diarrhoea, morbidity or recovery from co-morbidity, duration of hospital stay or time to discharge, and weight change.

The GDG made the judgement of “don't know” for the anticipated desirable and undesirable effects, and “don't know” in terms of which rehydration fluid is favoured (balance of effects).

### Certainty of the Evidence

The GDG agreed that the overall certainty of the evidence of effects was very low. The certainty of evidence for all outcomes was very low, apart from hyponatraemia, for which the certainty of evidence was low.

There was also serious indirectness because the potassium content of WHO low-osmolarity ORS was increased in this trial by 20 mmol/L to reach a total potassium concentration of 40 mmol/L (equivalent to the potassium concentration in ReSoMal).

### Resources

There was no evidence identified in a systematic review of economic evidence for this question. However, it is known that the cost of ReSoMal is generally around three times higher than the cost of WHO low-osmolarity ORS, and so the GDG made the judgement of “moderate savings” in terms of the resources required for using WHO low-osmolarity ORS compared to ReSoMal.

The GDG discussed that ReSoMal can also be prepared by combining one sachet of WHO low-osmolarity ORS with 2 litres of water, 50 grams of sugar, and mineral mix or combined minerals and added vitamins. However, they also agreed that these mineral mixes are often not available in health facilities, and that the need to add micronutrients will increase costs.

They noted that costs for added potassium are not shown in the study identified by the effectiveness systematic review.

Importantly, the GDG also considered that ReSoMal must be administered in health facilities with supervision and monitoring by a health worker, which may have resource implications compared to using WHO low-osmolarity ORS which can be administered at home, as well as in health facilities.

## Equity

In a qualitative evidence synthesis there were no studies that provided direct evidence relevant to equity implications for this question.

The GDG considered it plausible that using WHO low-osmolarity ORS would result a positive impact on health equity, since it does not need to be administered at a health facility by trained staff as is the case with ReSoMal. This means that children with severe wasting and/or nutritional oedema who have diarrhoea or other fluid losses (such as vomiting) but no dehydration can be given WHO low-osmolarity at home, which is known to be a better rehydration solution than clean water alone, and which is the current guidance by default for this population group. This could effectively prevent them from becoming dehydrated (i.e. being diagnosed as having some or severe dehydration) and needing inpatient admission.

Overall, the GDG felt that the judgement would be that it probably increased equity compared to WHO low-osmolarity ORS, with some GDG members opting for a judgement of “don’t know” here.

## Acceptability

The GDG made the judgement that standard WHO low-osmolarity ORS is probably more acceptable than ReSoMal to certain key stakeholders, such as health workers and health facility managers.

One qualitative study relating to acceptability was identified, which indicated that the routine use and preparation of ReSoMal at hospitals in South Africa and Ghana was considered to be demanding and not worth this additional effort considering the low number of children with severe wasting who needed ReSoMal at any given time. Instead, staff provided ORS plus breastmilk, water, and other liquids (61).

The GDG also noted that ReSoMal has been in widespread use for many years, but that ORS is also well-known and valued by many health workers and so a shift to using this product would likely be accepted.

## Feasibility

The GDG felt that the evidence suggested that WHO low-osmolarity ORS is probably more feasible to implement than ReSoMal in some settings.

A study at a hospital in Kenya found that most ward-based health workers said that pre-mixed ReSoMal sachets were usually available (62). A cross-sectional survey done in eight district hospitals in Rwanda found that ReSoMal was only available in a minority of hospitals for infants and children with severe wasting and/or nutritional oedema, yet most hospitals had ORS available (63). Furthermore, a study examining health facilities’ preparedness in Zimbabwe showed that a majority of the provinces had no ReSoMal stocks at all (64).

There have been documented challenges related to preparing and even more related to administering ReSoMal, with it being difficult and demanding according to health workers, and with specific challenges around giving correct volumes and monitoring ([61](#), [62](#)).

### Research needs

Future studies should:

- compare ReSoMal to low-osmolality ORS without added potassium
- explore whether adding sodium to F-75 can achieve optimal sodium content
- not be open-label (particularly for subjective outcomes like time to full rehydration)
- include infants and children with moderate wasting, severe wasting, and no wasting to determine whether treatment should be the same for all
- evaluate rehydration fluids for infants and children with moderate wasting with co-morbidities.

### 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.

### Remarks

- Intolerance of F-75 or F-100 milks can be defined as any of the following: intractable vomiting, osmotic diarrhoea, persistent abdominal distension, paralytic ileus, abdominal pain; all in the context where an acute abdomen has been ruled out.
- WHO and Codex Alimentarius guidance on safe and hygienic preparation of powdered formulae should be followed including:
  - [WHO Safe preparation, storage and handling of powdered infant formula: guidelines \(43\)](#).
  - [Code of Hygienic Practice for Powdered Formulae for Infants and Young Children \(44\)](#).
- Caregivers of infants and children receiving F-75 and F-100 should also be encouraged to continue breastfeeding their child unless there is a clinical indication for the child to receive these milks via nasogastric tube (NGT) only and that oral feeding is likely to be risky (for example, child with moderate or severe respiratory distress). As soon as oral fluids can be started again, breastmilk should be prioritized.
- The only evidence of the benefits of hydrolyzed or lactose-free infant formulas compared to standard therapeutic feeds is from one trial in infants and children 6–23 months old with diarrhoea, in which it is unclear whether the diarrhoea was related to intolerance of F-75 or F-100.
- For this question there was no evidence in infants less than 6 months of age.
- For this question there was no evidence on lactose-free or elemental infant formulas.
- This recommendation does not rule out the potential benefit of hydrolyzed formulas for individual patients where an experienced clinician assesses that they are not tolerating F-75 and F-100 (based on clinical indication) to help recover from this episode of illness/malnutrition when all other management options have been exhausted (for example, diluting the therapeutic milks, fractioning feeds, giving feeds slower).



**Table 4. Summary of judgements for recommendation B9**

<b>PROBLEM</b>	No	Probably no	Probably yes	Yes	Varies	Don't know
<b>DESIRABLE EFFECTS</b>	Trivial	Small	Moderate	Large	Varies	Don't know
<b>UNDESIRABLE EFFECTS</b>	Large	Moderate	Small	Trivial	Varies	Don't know
<b>CERTAINTY OF EVIDENCE</b>	Very low	Low	Moderate	High	No included studies	
<b>VALUES</b>	Important uncertainty or variability	Possibility important uncertainty or variability	Probably no important uncertainty or variability	No important uncertainty or variability		
<b>BALANCE OF EFFECTS</b>	Favours the comparison ◀◀	Probably favours the comparison ◀	Does not favour either the intervention or the comparison ○	Probably favours the intervention ▶	Favours the intervention ▶▶	Varies Don't know
<b>RESOURCES REQUIRED</b>	Large costs ◀◀	Moderate costs ◀	Negligible costs and savings ○	Moderate savings ▶	Large savings ▶▶	Varies Don't know
<b>CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES</b>	Very low	Low	Moderate	High	No included studies	
<b>COST</b>	Favours the comparison ◀◀	Probably favours the comparison ◀	Does not favour either the intervention or the comparison ○	Probably favours the intervention ▶	Favours the intervention ▶▶	Varies No included studies
<b>EQUITY</b>	Reduced ◀◀	Probably reduced ◀	Probably no impact ○	Probably increased ▶	Increased ▶▶	Varies Don't know
<b>ACCEPTABILITY</b>	No	Probably no	Probably yes	Yes	Varies	Don't know
<b>FEASIBILITY</b>	No	Probably no	Probably yes	Yes	Varies	Don't know

**Rationale**

Considering their judgements across the EtD criteria, the GDG agreed that a conditional “against” recommendation would be appropriate, meaning that switching to hydrolyzed formulas is not recommended 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.

The effectiveness systematic review identified one study examining a hydrolyzed formula compared to standard therapeutic feeds from one trial in infants and children with severe wasting and/or nutritional oedema who presented with persistent diarrhoea of greater than 14 days duration (65).

This research was not in children who were put on F-75 or F-100 and subsequently started showing signs of feeding intolerance. The GDG emphasized the point that diarrhoea alone is not confirmative of feeding intolerance.

The GDG concluded that due to the lack of direct evidence in the population of interest, the potential for significant feasibility, equity and cost implications, a WHO recommendation on switching to hydrolyzed formulas under these circumstances is not warranted. Furthermore, the prevalence of intolerance to F-75 and F-100 is not well-documented and feeding intolerance is poorly defined, which adds uncertainty around this question, as highlighted by the GDG.

Importantly, this recommendation does not rule out the potential benefit of providing hydrolyzed formulas in individual cases of children not tolerating F-75 and F-100, based on clinical indication, and when all other management options have been exhausted, such as diluting the therapeutic milks, fractioning feeds, giving feeds slower, etc.

### **Systematic reviews**

This recommendation was informed by the following systematic reviews:

Lombard M, Nienaber A, Conradie C, Dolman RC, Nel E, Milanzi E et al. Hydrolysed- and lactose-free feeds compared to standard F75 and F100 for the treatment of hospitalised infants and children (0-59 months of age) with severe wasting, oedema, and/or growth failure with feeding intolerance – protocol for a systematic review. PROSPERO 2021 CRD42021289220 (66).

Annan RA, Aduku LNE, Agyapong NAF. Qualitative Systematic Review assessing the Values and Preferences parents/caregivers of children affected by wasting assign to defined health outcomes. PROSPERO 2021 CRD42021282013 (30).

O'Toole B, Shaw N, Muthukumar M, Robinson S, Crathorne L. Hydrolyzed or lactose-free formulas during inpatient care (unpublished) (67).

Potani I, Hanjahanja-Phiri T, Selemani A, Mpinda I, Mamani-Mategula E, Chibwana A et al. The acceptability, feasibility, and equitability of inpatient, outpatient, post discharge and maternal-directed interventions in the prevention and treatment of wasting and/or oedema: A meta-aggregation. PROSPERO 2021 CRD42021286230 (49).

### **Evidence to decision**

#### **Benefits and harms**

The GDG agreed that there is high uncertainty about the effects of hydrolyzed formulas compared to standard therapeutic feeds on several outcomes including tolerating feeds, mortality, and weight change. The GDG made the judgement of “don't know” for desirable and undesirable anticipated effects, and whether the balance favours the intervention or the comparison.

Many prioritized outcomes were not reported on, such as clinical deterioration, duration and intensity of osmotic diarrhoea, duration of nil per os (NPO) and intravenous maintenance fluids used, duration of hospital stay or time to discharge.

The GDG also noted that there were insufficient data on intake and therefore interpretation of the results was challenging.

#### **Certainty of the Evidence**

The GDG agreed that the overall certainty was very low, since the certainty of the evidence was very low for all three prioritized outcomes that were reported on. The study had a high risk of bias due to issues such as unblinded study personnel. There was very serious indirectness because the infants and children in the study presented with persistent diarrhoea at the time of enrolment, not after they were given a therapeutic feed, and the comparator was a liquid feed that was not standard F-100.

## Values and preferences

The GDG agreed, based on three studies identified in a qualitative evidence synthesis, that there is probably no uncertainty or variability around how much the main outcomes, including mortality, illness, and other clinical outcomes, are valued. This means that caregivers from one context to the next are likely to place very similar value on whether their children are growing well, recover from illness, and whether they survive or not.

## Resources

The systematic review of economic evidence for this question found no published economic or scientific studies examining the required resources. However, the GDG made the judgement that there are potentially large financial costs of hydrolyzed formulas compared to therapeutic milks. They also noted that there is likely to be high variability in the cost of hydrolyzed feeds across settings.

An additional consideration raised by the GDG is that caregivers often have to pay for these products out-of-pocket. Therapeutic milks like F-100 may be freely supplied for infants and children but hydrolyzed or lactose-free formulas might not be.

## Equity

There were no studies identified in the qualitative evidence synthesis related to the use of hydrolyzed or lactose-free feeds. However, due to the high cost of hydrolyzed and lactose-free feeds there may be inequitable access to these products. The GDG made the judgement that equity would probably be reduced if this intervention was widely implemented.

## Acceptability

As there were no studies identified in the qualitative evidence synthesis related to the use of hydrolyzed or lactose-free feeds, the GDG considered there was uncertainty due to the absence of evidence and so made the judgement that the acceptability of this intervention was unknown (“don’t know”).

## Feasibility

There were no studies identified in the qualitative evidence synthesis related to the use of hydrolyzed or lactose-free feeds. However, because of the high costs and potential difficulties in accessing these feeds in many settings, the GDG made the judgement that the intervention is probably unfeasible to implement.

## Research needs

Future studies should:

- develop standardized criteria of feeding intolerance
- explore the prevalence of feeding intolerance to therapeutic milks and lactose intolerance
- be conducted across diverse regions and in different populations of infants and children with severe wasting and/or nutritional oedema, including settings with many patients having severe diarrhoea compared to with less severe diarrhoea
- examine mortality at least 90 days as endpoint
- include proper cost-effectiveness evaluations
- consider the use of somatic hydrolysis on existing F-75 formulas to create a hydrolyzed F-75 and determine its costs
- evaluate donor human milk in addition to hydrolyzed and lactose-free feeds.

## 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.

### Remarks

- Anthropometric recovery in infants and children 6–59 months is defined as weight-for-height (WHZ) -or -length (WLZ) z-score equal to or greater than -2 standard deviations (SD) of the WHO child growth standards median (WHZ or WLZ  $\geq$  -2 SD) and/or MUAC equal to or greater than 125 mm (depending on whether the child was admitted on WHZ/WLZ or MUAC or both), and no nutritional oedema for at least two consecutive outpatient visits.
- Ready-to-use therapeutic food (RUTF) is a food for special medical purposes (55) and includes pastes/spreads and compressed biscuits/bars like BP-100.
- Details on this quantity and range are available in [Web Annex F](#).
- 150–185 kcal/kg/day should be provided as a starting quantity for a target weight gain of 5–10 g/kg/day.
- The decision as to whether to reduce the quantity of RUTF given to children when they are no longer severely wasted and do not have nutritional oedema must be made by programme managers, taking into account a number of important factors. These factors include the capacity of the health workers who deliver the nutritional treatment to safely and efficiently follow a reducing-quantity protocol along with close monitoring of the patient’s clinical condition. Another factor may be the food security context in which the child and their family live (for example, if there is widespread food insecurity then reducing the quantity may not be appropriate, especially if it is known that food insecurity could lead to a higher risk of sharing of the RUTF at home with other family members).
- If decision-makers consider that more harm than good could potentially come from reducing the quantity of RUTF in their contexts, they should stick to the starting quantities until anthropometric recovery.
- The quantity of RUTF given to a patient is just one aspect of holistic care across the care pathway for children with severe wasting and/or nutritional oedema. Proportionate attention must also be given to the medical and psychosocial elements of care, including counselling on preventative health actions, and in particular the importance of breastfeeding and other safe infant and child feeding practices.
- No eligible studies in inpatient settings were found.

**Table 5. Summary of judgements for recommendation B10**

<b>PROBLEM</b>	No	Probably no	Probably yes	<b>Yes</b>	Varies	Don't know
<b>DESIRABLE EFFECTS</b>	<b>Trivial</b>	Small	Moderate	Large	Varies	Don't know
<b>UNDESIRABLE EFFECTS</b>	Large	Moderate	Small	<b>Trivial</b>	Varies	Don't know
<b>CERTAINTY OF EVIDENCE</b>	Very low	<b>Low</b>	Moderate	High	No included studies	
<b>VALUES</b>	Important uncertainty or variability	Possibility important uncertainty or variability	<b>Probably no important uncertainty or variability</b>	No important uncertainty or variability		
<b>BALANCE OF EFFECTS</b>	Favour the comparison 	Probably favour the comparison 	<b>Does not favour either the intervention or the comparison</b> 	Probably favour the intervention 	Favour the intervention 	Varies Don't know
<b>RESOURCES REQUIRED</b>	Large costs 	Moderate costs 	Negligible costs and savings 	<b>Moderate savings</b> 	Large savings 	Varies Don't know
<b>CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES</b>	Very low	Low	<b>Moderate</b>	High	No included studies	
<b>COST</b>	Favour the comparison 	Probably favour the comparison 	Does not favour either the intervention or the comparison 	Probably favour the intervention 	Favour the intervention 	Varies No included studies
<b>EQUITY</b>	Reduced 	Probably reduced 	Probably no impact 	Probably increased 	Increased 	Varies Don't know
<b>ACCEPTABILITY</b>	No	Probably no	<b>Probably yes</b>	Yes	Varies	Don't know
<b>FEASIBILITY</b>	No	Probably no	<b>Probably yes</b>	Yes	Varies	Don't know

**Rationale**

Considering their judgements across the EtD criteria, members of the GDG agreed that a conditional “either/or” recommendation would be appropriate. This means that in infants and children 6–59 months of age with severe wasting and/or nutritional oedema who are enrolled in outpatient care, RUTF should be given at a quantity that will provide 150–185 kcal/kg/day until anthropometric recovery and resolution of nutritional oedema, or at a quantity that will provide 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.

The GDG emphasized the conditionality of the recommendation and made clear that programmers must take into account several key factors when making the decision on whether to reduce the quantity of RUTF which are reflected in the Remarks.

There were three eligible trials (68–70) identified in a systematic review of effectiveness evidence which had heterogeneous intervention approaches and implementation around reducing the quantity

of RUTF given. Note that information and data from a pre-print for the study done in the Democratic Republic of the Congo were considered by the GDG; the full paper was published following the development of this recommendation (68, 71).

The GDG felt that the effectiveness evidence did not favour either a reduced quantity of RUTF following approaches in the three trials or a standard quantity (not reduced) of RUTF. The GDG did note that there is potential for moderate savings in terms of the resources required if infants and children are given a reduced quantity once they no longer have severe wasting or nutritional oedema. The GDG agreed that this would probably be acceptable and feasible to implement.

In considering the effectiveness systematic review evidence, the GDG discussed key points related to the previously recommended standard quantity of RUTF of 150–220 kcal/kg/day until anthropometric recovery and resolution of nutritional oedema for infants and children with severe wasting and/or nutritional oedema.

Points made included that this quantity assumed a consistently high rate of weight gain, which does not necessarily happen in practice in these infants and children. Instead, the rate of weight gain often declines over the course of treatment with RUTF, as energy requirements decrease over time. There are also questions as to the appropriate rate of weight gain in these children, and that there also other outcomes of interest in infants and children with severe wasting and/or nutritional oedema.

The range of 150–220 kcal/kg/day was initially derived from F-100 therapeutic milk intake in the inpatient rehabilitation phase of treatment for children with severe wasting and/or nutritional oedema. The evidence was from a small number of infants and children in one setting. Consuming up to 220 kcal/kg/day may be possible as a liquid diet in an inpatient setting, but to consume this amount of energy as RUTF pastes or biscuits in communities is challenging for many infants and children. Furthermore, these calculations were based on trying to achieve fast weight gain as high as 20 g/kg/day, and infants in the comparator groups in the available trials did not receive quantities at the upper range of 220 kcal/kg/day. Based on these discussions, key points raised about the previous approach to estimating the standard quantity range and the availability of recent directly relevant data, the GDG agreed that it was necessary to revisit this previously recommended standard quantity range of RUTF of 150–220 kcal/kg/day for infants and children with severe wasting and/or nutritional oedema.

An alternative EtD approach was agreed upon by the GDG to address this identified need using best available evidence in a transparent, consultative process. This included using estimations of energy requirements informed by empirical evidence on resting energy expenditure in infants and children with severe wasting and/or oedema, as well as considerations of practical and contextual factors. Details about the quantity and range in the recommendation are available in [Web Annex F](#).

In summary, and as was done for moderate wasting, resting energy expenditure data (determined using the gold standard method of indirect calorimetry) in infants and children with severe wasting and/or nutritional oedema provided by the Childhood Acute Illness and Nutrition (CHAIN) Network (72) were used to estimate the energy requirements of these infants and children.

The estimated energy requirements were calculated using the following formula: (resting energy expenditure × (activity factor + disease factor – 1) × growth factor)/energy absorption coefficient.

Using a weighted average based on the proportion of children with oedema compared to severe wasting from the CHAIN data, the resting energy expenditure was about 75 kcal/kg/day.

An activity factor of 1.2 was selected, which is lower than that of a normally active child. A disease factor of 1.3 was selected based on judgement to account for severe wasting and/or nutritional oedema. A growth factor of 1.02 for all infants and children above one year of age was chosen. An energy absorption coefficient of 0.9 was used. The estimated energy requirements based on this equation and variables was 136 kcal/kg/day.

For a target weight gain of 5–10 g/kg/day, an additional 25–50 kcal/kg/day would likely be needed based on the [2012 WHO Technical note: supplementary foods for the management of moderate acute malnutrition in infants and children 6–59 months of age \(73\)](#).

With this amount added, the estimated energy requirements are 158–183 kcal/kg/day. The GDG agreed on a range of 150–185 kcal/kg/day to be met by RUTF for infants and children with severe wasting and/or nutritional oedema as a starting quantity, and continued until anthropometric recovery and resolution of nutritional oedema in the case that a reduced dose is not given, which would be based on program-level decisions, and in line with the conditions and points made in the Remarks for this recommendation.

This range was chosen by the GDG considering that the resting energy expenditure is higher for infants and children who have required inpatient treatment, which was the study population for the CHAIN study, compared to outpatients with severe wasting and/or nutritional oedema. The lower end of the range also accounts for infants and children with nutritional oedema having a lower resting energy expenditure. This overall range overlaps with the amounts of RUTF given in the trials but does not go as low (i.e. one of the trials had a range that went down to 50 kcal/kg/day).

Considering the certainty of the evidence from the effectiveness systematic review and the additional information reviewed, the GDG agreed on a low certainty for this recommendation.

One limitation of the eligible effectiveness studies is that all were carried out in African settings, yet the metabolic calculations include data from Bangladesh as well as Malawi.

No eligible studies of different quantities of RUTF in inpatient settings were found, so the GDG agreed that this recommendation applies only to those enrolled in outpatient care. There were also no studies found that compared different durations of RUTF and therefore the GDG agreed that RUTF should be given until anthropometric recovery and resolution of nutritional oedema.

## Systematic reviews

This recommendation was informed by the following systematic reviews:

Likoswe BH, Chimera-Khombe B, Patson N, Selemani A, Potani I, Phuka J et al. A Systematic Review on the Optimal Dose and Duration of RUTF for 6–59-Month-Old Children with Severe Wasting or Oedema. *Nutrients* 2023 15(7): 1750. doi: 10.3390/nu15071750 (74).

Annan RA, Aduku LNE, Agyapong NAF. Qualitative Systematic Review assessing the Values and Preferences parents/caregivers of children affected by wasting assign to defined health outcomes. *PROSPERO* 2021 CRD42021282013 (30).

Crathorne L, Robinson S, O’Toole B, Muthukumar M, Shaw N. What is the resource use, cost, and cost-effectiveness of RUTF for the treatment of severe wasting and/or oedema in infants and children? (unpublished) (75).

Potani I, Hanjahanja-Phiri T, Selemani A, Mpinda I, Mamani-Mategula E, Chibwana A et al. The acceptability, feasibility, and equitability of inpatient, outpatient, post discharge and maternal-directed interventions in the prevention and treatment of wasting and/or oedema: A meta-aggregation. *PROSPERO* 2021 CRD42021286230 (49).

## Evidence to decision

### Benefits and harms

The GDG made the judgement that there were trivial desirable and undesirable effects of a reduced quantity of RUTF compared to a standard quantity meaning that the balance of effects does not favour either.

The first eligible study was a randomized controlled trial that examined the effectiveness of a reduced weight-based quantity as MUAC increased over the course of treatment of severe wasting and/or nutritional oedema in the intervention arm. Specifically, the RUTF quantity was decreased to 125–190 kcal/kg/day when MUAC was 115–119 mm and further reduced to 50–166 kcal/kg/day when MUAC was 120–125 mm. The initial published trial included infants and children with moderate wasting, as well as severe wasting and/or nutritional oedema (76), but additional data from a sample that recruited a higher number of infants and children with severe wasting and/or nutritional oedema, were used for the meta-analysis (68).

The second study was a randomized controlled trial in Burkina Faso that evaluated a reduced quantity of RUTF from week two of treatment of severe wasting and/or nutritional oedema until discharge as the intervention, with a specific number of sachets given per week as opposed to a weight-based quantity (69).

The third study was a cluster-randomized controlled trial in Sierra Leone which included infants and children with severe wasting and/or nutritional oedema, as well as those with moderate wasting whose data were not considered by the GDG for this recommendation. Infants and children with severe wasting and/or nutritional oedema in the intervention arm were first given a quantity of RUTF of 175 kcal/kg/day with additional interventions including nutrition and hygiene counselling. Once their MUAC was at least 115 mm, these infants and children were given a reduced quantity of 75 kcal/kg/day (70). The GDG noted that there were different inclusion criteria and personnel across the intervention and comparison arms; sensitivity analysis was done with the exclusion of this trial and showed similar results for critical and important outcomes.

The GDG discussed that there was no evidence of increased mortality from a reduced quantity of RUTF but emphasized the wide confidence intervals around the point estimate, and that the trials were underpowered for mortality as an outcome.

The GDG had particular concerns about the possible undesirable effects of a reduced quantity of RUTF on linear growth shown by the systematic review. Additional data were requested from one of the trials that did not publish height-related outcomes including height, HAZ, and WAZ (70) and considered by the GDG. They noted that these data were limited as they were measured at the time of discharge for one of the trials and within three months for another trial (70, 69); these timepoints are too short to gauge impacts on linear growth.

Sustained recovery was a pre-specified outcome that was not examined in the trials.

### **Certainty of the Evidence**

The GDG agreed that the certainty of the evidence of effects is low. Specifically, the certainty was moderate for five outcomes and low for six outcomes. There was a high risk of bias for two of the trials and some concerns for the third trial, which were reasons for downgrading the evidence. There was also serious inconsistency and serious imprecision for many outcomes.

### **Values and preferences**

The GDG made the judgement that there is probably no important uncertainty or variability around outcomes relating to growth and recovery, failure to respond or worsening condition after intervention, and mortality. Essentially, caregivers are likely to place very similar value on whether their children are growing well, whether they improve or not after an intervention, and whether they survive or not, regardless of context. This was based on evidence from four studies identified in a qualitative evidence synthesis.



## Resources

The GDG made the judgement that there are moderate savings in terms of the resources required for a reduced quantity of RUTF, with moderate certainty evidence. There were no eligible studies that examined cost-effectiveness of a reduced quantity of RUTF.

There was one economic evaluation identified in a systematic review of economic evidence, which was linked to one of the three eligible trials (69, 77). It compared costs of a reduced quantity of RUTF to a standard quantity.

The total cost in US dollars per child treated was \$76.2 in the reduced quantity arm compared to \$91.6 in the standard quantity of RUTF arm, meaning a cost saving of \$15.4 per child treated. Similar results were observed when considering overall treatment cost from the institutional perspective, which was \$60.3 for the reduced quantity arm and \$75.8 for the standard quantity arm, leading to a cost saving of \$15.7 per child treated. The principal source of savings was lower RUTF costs, which offset the marginal additional costs incurred for additional follow-up consultations in the reduced quantity arm.

The costs (US dollars) of RUTF in the trial in the Democratic Republic of the Congo were \$6510 for the reduced quantity arm compared to \$12 012 in the standard quantity arm. At this time (2021), each box of RUTF cost \$42 in this setting (68). The trial in Sierra Leone reported costs (US dollars) of \$36 per child in the reduced quantity arm and \$68 per child in the standard quantity arm (70).

One additional consideration raised by the GDG was that there may be investment required to adapt protocols and train staff to implement a reduced quantity, which may also have a cost.

## Equity

There was no information directly comparing a reduced quantity of RUTF to a standard quantity with regards to equity in a qualitative evidence synthesis for this question; only indirect information was found from a qualitative evidence synthesis for this question.

The GDG discussed that equity would be increased if a reduced quantity allowed for greater coverage (via the mechanism of treating more children with the same amount of funding). However, it is unknown whether this would actually be the case, especially as access to these nutrition services and hence coverage is dependent on many different factors in addition to the amount of RUTF available to each child. Coverage is also linked to a reliable supply chain for RUTF (and other essential medicines and commodities), yet supply chain issues could equally affect equity irrespective of the quantity of RUTF actually given to each child.

The GDG also raised the point that caregivers who travel a long distance to obtain RUTF for their infants and children may default if they feel that the quantity they are getting is insufficient when they see the quantity reduced or in comparison to previous admissions, although this has not been confirmed with evidence. Another consideration is that a lower quantity of RUTF may increase duration of treatment, which could negatively impact equity as caregivers will have to come for more outpatient appointments with the associated opportunity costs; this effect has not been established in any studies on the topic.

Due to the gaps in evidence outlined above and the possibility of multiple directions of effect, the GDG made the judgement that the impacts of a reduced quantity of RUTF compared to a standard quantity on equity were unknown.

## Acceptability

There was no direct qualitative information identified on the acceptability of a reduced quantity of RUTF compared to a standard amount.

As described above, the GDG discussed the potential for a reduced quantity to increase treatment duration, although this was not directly shown in the effectiveness evidence. The GDG also discussed

that a lower quantity may mean families chose to not share it, so all the RUTF goes to the child enrolled in nutritional care (especially in households who had children previously enrolled in care and so are familiar with the “standard” quantities they had received before), which could theoretically make it less acceptable to the caregivers as it reduces a source of food for other family members.

The GDG, however, made the judgement that a reduced quantity of RUTF is probably acceptable to key stakeholders.

### Feasibility

Again, a qualitative evidence synthesis for this question found a lack of directly relevant evidence that was related to feasibility of a reduced quantity of RUTF, but the GDG agreed that it is probably feasible to implement this approach.

### Research needs

Future studies should:

- understand the physiology and energy/nutrient requirements of infants and children with severe wasting and/or oedema, including when children improve from severe to moderate wasting
- establish the long-term cardiometabolic effects of these quantities along with the rates of weight gain from different quantities of RUTF
- compare different protocol options with reducing quantities to each other and to standard quantities
- evaluate outcomes including relapse, linear growth, risk of hospitalization, weight and MUAC gain, and neurodevelopment
- determine cost and cost-effectiveness of different quantities of RUTF
- include breastfeeding data in the analysis.

### 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 of 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.	

### Remarks

- Nutrient-dense foods are those high in nutrients relative to their energy content; they have a relatively high content of vitamins, minerals, essential amino acids and healthy fats. Examples of nutrient-dense foods include animal source foods, beans, nuts and many fruits and vegetables.
- Nutrient-dense foods enable children to consume and maximize the absorption of nutrients in order to fulfil their requirements for energy and all essential nutrients. Animal-source foods are more likely to meet the amino acid and other nutrient needs of recovering children. Plant-source foods, in particular legumes or a combination of cereals and legumes, also have high-quality proteins, although they also contain some anti-nutrients such as phytates, tannins or inhibitors of digestive enzymes, which may limit the absorption of some micronutrients, particularly minerals.

- Adequate locally available diets include foods available in the market and/or household typically consumed by the child that are adequate in terms of nutrients.
- Anthropometric recovery in infants and children 6–59 months is defined as weight-for-height (WHZ) or -length (WLZ) z-score equal to or greater than -2 standard deviations (SD) of the WHO child growth standards median (WHZ or WLZ  $\geq$  -2 SD) and/or MUAC equal to or greater than 125 mm (depending on whether the child was admitted on WHZ/WLZ or MUAC or both), and no nutritional oedema for at least two consecutive outpatient visits.
- For guidance on the quantity and proportion of the daily energy needs that can be covered by supplementary food, see recommendation B16.
- Psychosocial stimulation can be defined as the sensory information received from interactions with people and environmental variability that engages a young child’s attention and provides information; examples include talking, smiling, pointing, enabling, and demonstrating, with or without objects. This also includes responsive feeding as a part of responsive caregiving.
- This good practice statement is consistent with the following WHO guidance:
  - [WHO Technical note: supplementary foods for the management of moderate acute malnutrition in infants and children 6–59 months of age \(73\)](#).
  - [WHO Essential Nutrition Actions: Improving Maternal, Newborn, Infant and Young Child Health and Nutrition \(78\)](#).

## Rationale

The GDG agreed that this good practice statement is necessary to emphasize the importance of locally available diets and other interventions for infants and children with moderate wasting, preceding the recommendations specifically on dietary management for this population. This aligns with other available WHO guidance for infants and children with moderate wasting including the [WHO Technical note: supplementary foods for the management of moderate acute malnutrition in infants and children 6–59 months of age \(73\)](#) and the [WHO Essential Nutrition Actions: Improving Maternal, Newborn, Infant and Young Child Health and Nutrition \(78\)](#).

### 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.

## Remarks

- This good practice statement is intended to emphasize that although dietary management is necessary, it is usually not sufficient without treatment of the medical and psychosocial conditions leading to or exacerbating this episode of moderate wasting.
- Any treatment initiated should follow the [IMCI principles \(79\)](#) or other relevant WHO treatment guidance.
- This comprehensive assessment and treatment could include interventions such as vaccination and assessment and follow-up for 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 or other disabilities).
- Other important interventions include counselling (health and nutrition related, especially helping families use locally available foods for preventing relapse) and psychosocial care (such as play therapy).

## Rationale

The GDG strongly agreed that there was a specific need to include a good practice statement emphasizing the necessity of comprehensive assessment and treatment of medical and psychosocial conditions in moderately wasted children. The GDG also noted that these actions do not routinely happen in practice and this good practice statement can provide an advocacy tool for the implementation of this holistic child-health approach for infants and children with moderate 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.

## Remarks

- Specially formulated foods (SFFs) are foods specifically designed, manufactured, distributed, and used for special medical purposes ([CXS 180-1991](#)) (80) or for special dietary uses ([CXS 146-1985](#)) (81), as defined by [Codex Alimentarius](#) (44).
- The above factors have been associated with increased risk of adverse outcomes in infants and children with moderate wasting (reduced anthropometric recovery, deterioration to severe wasting and/or oedema, non-response, mortality, and/or reduced sustained recovery).
- These factors can be used for prioritization decisions in all contexts, including high-risk contexts where further prioritization is needed/appropriate (see recommendation B14 about consideration of SFFs to all children in high-risk contexts where there is a recent or ongoing humanitarian crisis).
- If a child has any of these characteristics before enrolment, or develops them at any point during their enrolment in outpatient nutritional care, they should be prioritized for support to address the immediate and underlying cause as well as consideration for SFFs.
- The decisions on which factors to use are context-specific, therefore programme managers should make judgements based on the factors that are applicable in their contexts (taking into account feasibility, acceptability and equity).

**Table 6. Summary of judgements for recommendations B13 and B14**

<b>PROBLEM</b>	No	Probably no	Probably yes	<b>Yes</b>	Varies	Don't know
<b>DESIRABLE EFFECTS</b>	Trivial	Small	<b>Moderate</b>	Large	Varies	Don't know
<b>UNDESIRABLE EFFECTS</b>	Large	Moderate	Small	Trivial	Varies	Don't know
<b>CERTAINTY OF EVIDENCE</b>	Very low	Low	<b>Moderate</b>	High	No included studies	
<b>VALUES</b>	Important uncertainty or variability	Possibility important uncertainty or variability	<b>Probably no important uncertainty or variability</b>	No important uncertainty or variability		
<b>BALANCE OF EFFECTS</b>	Favours the comparison 	Probably favours the comparison 	Does not favour either the intervention or the comparison 	<b>Probably favours the intervention</b> 	Favours the intervention 	Varies Don't know
<b>RESOURCES REQUIRED</b>	Large costs 	<b>Moderate costs</b> 	Negligible costs and savings 	Moderate savings 	Large savings 	Varies Don't know
<b>CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES</b>	Very low	<b>Low</b>	Moderate	High	No included studies	
<b>COST</b>	Favours the comparison 	Probably favours the comparison 	Does not favour either the intervention or the comparison 	Probably favours the intervention 	Favours the intervention 	Varies No included studies
<b>EQUITY</b>	Reduced 	Probably reduced 	Probably no impact 	<b>Probably increased</b> 	Increased 	Varies Don't know
<b>ACCEPTABILITY</b>	No	Probably no	<b>Probably yes</b>	Yes	Varies	Don't know
<b>FEASIBILITY</b>	No	Probably no	<b>Probably yes</b>	Yes	Varies	Don't know

**Rationale**

Considering the GDG’s judgements across the EtD criteria, the GDG agreed that a strong “for” recommendation would be appropriate, meaning that prioritizing specially formulated food interventions with counselling, compared to counselling alone, should be considered for infants and children 6–59 months of age with moderate wasting who have any of the individual child and social factors stated in this recommendation.

Results from the four studies in the effectiveness systematic review that compared SFFs to nutritional counselling showed that there are moderately desirable effects of SFFs in terms of increasing anthropometric recovery, reducing deterioration to severe wasting and non-response, and improving most anthropometric outcomes (82–85). The GDG agreed that SFFs are probably favoured over counselling alone, with moderate costs in terms of the resources required for this intervention. The GDG concluded that SFFs probably increase equity and acceptability from the perspective of infants and children with moderate wasting and their caregivers.

No eligible studies for children with moderate wasting in inpatient settings were found examining SFFs compared to nutritional counselling or other interventions of interest for this question.

Within the effectiveness systematic review for this question there were too few studies and data did not allow for subgroup meta-analysis to identify differential responses to SFFs and inform which subgroup(s) of infants and children with moderate wasting have a potentially greater need for SFFs (effect modification of relative risks).

Instead, another approach was to examine differences in baseline risk that translate to meaningful absolute risk differences, and can thus inform which risk factors identify those infants and children who are at greatest risk of poor outcomes and could potentially have a greater net benefit (effect modification of absolute risk differences). Data in infants and children with moderate wasting from a prognostic factor systematic review was used for this purpose.

An equity lens was applied for this approach in order to prioritize greater attention and resources to more vulnerable infants and children, reflecting a concern for health equity in alignment with GRADE guidance (86). The GDG determined that this guideline question was sensitive to health equity based on questions (87) around whether certain children might be disadvantaged in relation to the problem and/or intervention of interest, whether there are different baseline conditions across groups or settings that affect the impact of the intervention and/or importance of the problem for children who are disadvantaged, and whether there are important considerations for people implementing the intervention to ensure that inequities are reduced if possible.

The GDG moved through a process of filtering all prognostic factors identified in the systematic review in infants and children with moderate wasting linked to the outcomes prioritized for this question, including anthropometric recovery, deterioration to severe wasting and/or oedema, non-response, mortality, and sustained recovery. Prognostic factors with moderate or high certainty based on GRADE for prognostic studies (20) for at least one of the prioritized outcomes for this question were considered. A threshold for an absolute risk difference of approximately 10% or more for at least one outcome was applied to prioritize prognostic factors for which the impact is likely to be meaningful. The filtered prognostic factors can be found in [Web Annex G](#).

It should be noted that dietary management with SFFs was provided to infants and children with moderate wasting in most of the studies that were included in the prognostic systematic review (88–92, 95–98). There was only one study in which the infants and children with moderate wasting did not receive nutritional supplementation (93). The GDG discussed this at length, with the key point being that there could be different prognostic factors in infants and children with moderate wasting who were given SFFs versus those not given this intervention (i.e. uncertainty in the applicability of the identified prognostic factors due to serious indirectness).

Because of this limitation, one of the papers identified in the effectiveness review was considered by the GDG as it examined factors in infants and children with moderate wasting in the control arm of the study who did not receive SFFs (99). This study was not initially eligible for the prognostic factor systematic review because of having a composite outcome (deteriorated or died), but the GDG made the judgement that it should be examined due to the limited evidence in infants and children who did not receive SFFs.

With this caveat in mind, the GDG discussed all prognostic factors that remained from the filtering process and integrated them into the recommendations for infants and children with moderate wasting. Several of the prognostic factors identified overlapped between the nine studies that provided dietary management with SFFs and the one study in which children did not receive SFFs. This overlap increased the GDG's certainty in the prognostic value reported across all identified studies. The GDG decided to organize them by individual child factors, social factors, and contextual factors.

This specific recommendation applied all the individual child factors and social factors within the Remarks, as identified by the GDG using the prognostic factor systematic review.

The GDG noted that predictors of risk and how they interact are likely to be different across contexts and situations. The prognostic factor review included evidence only from African settings, which the GDG stated as a limitation. The GDG also highlighted that sources of information for decisions made about giving SFFs are likely to differ across settings.

In summary, the GDG formulated this recommendation to enable decision-makers to prioritize greater attention and resources to more vulnerable children to increase health equity.

## Systematic reviews

This recommendation was informed by the following systematic reviews:

Uthman O, Folasire Y, Fagbamigbe AF, Anjorin S. Moderate or Severe wasting/Oedema in infants and children aged six months and older: a systematic review and meta-analysis. PROSPERO 2021 CRD42021288271 (54).

Padhani ZA, Cichon B, Das JK, Salam RA, Stobaugh HC, Mughal M et al. Systematic Review of Management of Moderate Wasting in Children over 6 Months of Age. *Nutrients* 2023;15(17). doi: 10.3390/nu15173781 (100).

Annan RA, Aduku LNE, Agyapong NAF. Qualitative Systematic Review assessing the Values and Preferences parents/caregivers of children affected by wasting assign to defined health outcomes. PROSPERO 2021 CRD42021282013 (30).

Robinson S, O'Toole B, Muthukumar M, Crathorne L, Shaw N. What is the resource use, cost, and cost-effectiveness of SFFs compared with non-specially formulated food interventions or standard care in infants and children aged >6 months with moderate wasting? (unpublished) (101).

Potani I, Hanjahanja-Phiri T, Selemani A, Mpinda I, Mamani-Mategula E, Chibwana A et al. The acceptability, feasibility, and equitability of inpatient, outpatient, post discharge and maternal-directed interventions in the prevention and treatment of wasting and/or oedema: A meta-aggregation. PROSPERO 2021 CRD42021286230 (49).

## Evidence to decision

### Benefits and harms

The GDG came to a consensus that there are moderate desirable effects of SFFs compared to nutritional counselling alone. Although the existing evidence indicates no undesirable or trivial effects from SFFs, the GDG made the judgement that we do not know all the potential and existing undesirable effects.

Four trials were identified in the effectiveness systematic review that compared SFFs to nutritional counselling (82–85). One trial identified in the effectiveness review examined a multicomponent intervention including RUTF as the specially formulated food, amoxicillin, and counselling provided to infants and children at high risk (defined by the study protocol itself) only, compared to the standard of care (99). This study was not eligible for the specific comparison of SFFs versus counselling but was examined as part of the prognostic factor systematic review.

The GDG noted that sustained recovery was not measured in the eligible trials, yet local/home foods may sustain recovery more than SFFs do. There were also no long-term results for outcomes including readmission, morbidity, and mortality. The GDG acknowledged that although 12 weeks of follow-up is too short to expect effects on length/height, this does not necessarily mean that SFFs have no effect on length/height.

Another discussion point raised by the GDG was that there is inconclusive evidence on mortality, which means it is not possible to fully determine the direction of effect. The trials were not powered to detect differences in mortality between arms. Some studies in this population have reported low mortality even without provision of SFFs. The GDG also acknowledged that mortality can be difficult to assess in settings with moderate wasting that are unstable, making it challenging to design trials.

The GDG also discussed that the benefits of SFFs may differ according to baseline risk differences, even in infants and children with similar anthropometry. This was discussed extensively when the GDG was evaluating prognostic factor review evidence, during which they highlighted this limitation of the existing evidence.

### **Certainty of the Evidence**

The GDG made the judgement that the overall certainty of the evidence was moderate.

The certainty of the evidence ranged from low to moderate for the outcomes of interest evaluated in the four eligible studies for this comparison. Both of the critical outcomes (anthropometric recovery and deterioration to severe wasting) had moderate certainty evidence. There was unclear or high risk of bias for all trials and serious imprecision for several of the outcomes.

### **Values and preferences**

The GDG was of the view that there is probably no uncertainty or variability around how much people value the main outcomes, including growth and recovery, failure to respond or worsening condition after intervention, and mortality, based on six studies in a qualitative evidence synthesis of values and preferences. In other words, the value that caregivers place on whether their children are growing well, recover from illness or not, whether they improve or not after an intervention, and whether they survive or not is likely to be very similar from one context to the next. The GDG noted that sustained recovery is an important outcome to consider for which there was no evidence.

### **Resources**

In the systematic review of economic evidence for this question there were two studies identified that reported on overall costs for management of moderate wasting with SFFs including RUSF and RUTF in addition to medical interventions, yet the GDG raised several additional considerations beyond what was available from the evidence ([102](#), [103](#)).

The GDG discussed that the prevalence of moderate wasting and the case fatality rate are key in terms of resource considerations, which makes it difficult to make a judgement across contexts. There is variability in costs based on other factors such as local production versus importing SFFs.

The GDG noted that the quality and modality of counselling interventions can vary greatly, impacting costs. Personnel costs and costs for co-interventions can also be large cost drivers.

However, even with these factors that affect costs across settings, the GDG agreed that there will be further costs of SFFs in addition to counselling alone. The GDG judged that there are moderate costs of SFFs compared to counselling with moderate certainty. There were no direct studies on cost-effectiveness comparing SFFs to counselling and therefore no judgement could be made.

### **Equity**

A qualitative evidence synthesis identified no evidence directly related to the comparison of SFFs versus counselling alone.

The GDG noted that anecdotally there is often discussion about potential sharing of SFFs at the household level when discussing equity, and specifically the lack of clarity on whether this increases or decreases equity both for the children who are supposed to receive the SFFs and other household members.

Members of the GDG agreed that the more important issue was likely to be how access to health and nutritional interventions could be increased for households with infants and children with moderate wasting so as to prevent sharing of SFFs happening in the first place. Distance to health facility is often a key barrier to accessing such medical and nutritional services.



Evidence from a systematic review of prognostic factors was used to inform the prioritization of infants and children with moderate wasting to receive SFFs and as such increase health equity overall in a population, which is discussed in further detail in the rationale.

### Acceptability

Based on the evidence identified and the additional considerations brought up in discussions during meetings, the GDG judged that giving SFFs compared to counselling alone is probably acceptable.

The qualitative evidence synthesis for this question identified several studies with positive themes related to SFFs or dietary interventions more broadly (105–108). Two of these qualitative studies also stated that infants and children with moderate wasting usually accept the taste of SFFs and that they consume these products without any problems (106, 108).

The GDG noted the small number of studies were restricted to African settings. In certain contexts, SFFs may be less acceptable, especially for long durations, and SFFs are not necessarily widely used across all contexts. The GDG also highlighted the importance of clear and accurate messaging around SFFs for moderate wasting. Specifically for messaging, the GDG cautioned against medicalizing SFFs, which are meant to be supplementary in addition to local/home foods.

### Feasibility

There was a split judgement for this domain as to whether the feasibility of implementation is probable or variable.

Stock-outs of SFFs have been commonly reported in many existing programmes (64, 109). The GDG therefore emphasized that local sustainable solutions are needed for the provision of SFFs. The GDG also noted that imported SFFs may not be acceptable in some countries; therefore giving SFFs may not be feasible in these contexts unless locally produced products are available in sufficient quantities. Supply issues are often linked to prioritization and support to specific programmes, which impacts feasibility.

### Research needs

Future studies should:





















- determine nutrient requirements in infants and children with moderate wasting
- establish the optimal rate of weight gain in infants and children with moderate wasting
- understand the efficacy of using home foods in the management of moderate wasting
- evaluate the efficacy of different approaches to dietary management of moderate wasting, including the use of available home foods in different contexts, with longer follow-up durations
- evaluate the response to interventions in moderately wasted children who have identified prognostic factors
- examine different quantities of SFFs to establish a dose-response relationship
- determine the optimal micronutrient content of SFFs along with the development of product specifications
- understand the long-term effects of different types and durations of SFFs
- determine cost and cost-effectiveness of SFFs and other dietary interventions
- assess the feasibility of reaching all infants and children with moderate wasting who require SFFs
- understand the acceptability of dietary approaches from perspectives beyond caregivers.

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.

### Remarks

- Specially formulated foods (SFFs) are foods specifically designed, manufactured, distributed, and used for special medical purposes ([CXS 180-1991](#)) (80) or for special dietary uses ([CXS 146-1985](#)) (81), as defined by [Codex Alimentarius](#) (44).
- High-risk contexts include those where the majority of the population is affected by any of the following characteristics/circumstances:
  - high rates of food insecurity; and/or
  - poor water quality and sanitation (or poor water, sanitation and hygiene (WASH) indicators); and/or
  - low-income status / low socioeconomic status; and/or
  - high incidence/prevalence of wasting and/or nutritional oedema, which could be seasonal.
- High-risk contexts are associated with increased risk of adverse outcomes in infants and children with moderate wasting (reduced anthropometric recovery, deterioration to severe wasting and/or oedema, non-response, mortality, and/or reduced sustained recovery).
- All/some of the above and different factors may combine into a humanitarian crisis with or without a high proportion of displaced persons. This could be secondary to a natural disaster (climate-change related or not), disease outbreak or from socio-political causes (such as conflict, genocide, widespread discrimination/persecution of particular populations).
- Characteristics will apply differentially at national/provincial/community levels and also may vary temporarily and seasonally (as mentioned above).

**Table 6. Summary of judgements for recommendations B13 and B14**

<b>PROBLEM</b>	No	Probably no	Probably yes	<b>Yes</b>	Varies	Don't know	
<b>DESIRABLE EFFECTS</b>	Trivial	Small	<b>Moderate</b>	Large	Varies	Don't know	
<b>UNDESIRABLE EFFECTS</b>	Large	Moderate	Small	Trivial	Varies	Don't know	
<b>CERTAINTY OF EVIDENCE</b>	Very low	Low	<b>Moderate</b>	High	No included studies		
<b>VALUES</b>	Important uncertainty or variability	Possibility important uncertainty or variability	<b>Probably no important uncertainty or variability</b>	No important uncertainty or variability			
<b>BALANCE OF EFFECTS</b>	Favours the comparison	Probably favours the comparison	Does not favour either the intervention or the comparison	<b>Probably favours the intervention</b>	Favours the intervention	Varies	Don't know
							
<b>RESOURCES REQUIRED</b>	Large costs	<b>Moderate costs</b>	Negligible costs and savings	Moderate savings	Large savings	Varies	Don't know
							
<b>CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES</b>	Very low	<b>Low</b>	Moderate	High	No included studies		
<b>COST</b>	Favours the comparison	Probably favours the comparison	Does not favour either the intervention or the comparison	Probably favours the intervention	Favours the intervention	Varies	No included studies
							
<b>EQUITY</b>	Reduced	Probably reduced	Probably no impact	<b>Probably increased</b>	Increased	Varies	Don't know
							
<b>ACCEPTABILITY</b>	No	Probably no	<b>Probably yes</b>	Yes	Varies	Don't know	
<b>FEASIBILITY</b>	No	Probably no	<b>Probably yes</b>	Yes	<b>Varies</b>	Don't know	

**Rationale**

Considering the GDG’s judgements across the EtD criteria, the GDG agreed that a strong “for” recommendation would be appropriate, meaning that in high-risk contexts, all infants and children 6–59 months of age with moderate wasting should be considered for SFFs along with the provision of home foods for them and their families.

Results from the four studies in the effectiveness systematic review that compared SFFs to nutritional counselling showed that there are moderately desirable effects of SFFs in terms of increasing anthropometric recovery, reducing deterioration to severe wasting and non-response, and improving most anthropometric outcomes (82–85). The GDG agreed that SFFs are probably favoured over counselling alone, with moderate costs in terms of the resources required for this intervention. The GDG concluded that SFFs probably increase equity and acceptability from the perspective of infants and children with moderate wasting and their caregivers.

No eligible studies for children with moderate wasting in inpatient settings were found examining SFFs compared to nutritional counselling or other interventions of interest for this question.

Within the effectiveness systematic review for this question there were too few studies and data did not allow for subgroup meta-analysis to identify differential responses to SFFs and inform which subgroup(s) of infants and children with moderate wasting have a potentially greater need for SFFs (effect modification of relative risks).

Instead, another approach was to examine differences in baseline risk that translate to meaningful absolute risk differences and can therefore inform which risk factors identify those infants and children who are at greatest risk of poor outcomes and could potentially have a greater net benefit (effect modification of absolute risk differences). Data in infants and children with moderate wasting from a prognostic factor systematic review was used for this purpose.

An equity lens was applied for this approach in order to prioritize greater attention and resources to more vulnerable infants and children, reflecting a concern for health equity in alignment with GRADE guidance (86). The GDG determined that this guideline question was sensitive to health equity based on questions (87) around whether certain children might be disadvantaged in relation to the problem and/or intervention of interest, whether there are different baseline conditions across groups or settings that affect the impact of the intervention and/or importance of the problem for children who are disadvantaged, and whether there are important considerations for people implementing the intervention to ensure that inequities are reduced if possible.

The GDG moved through a process of filtering all prognostic factors identified in the systematic review in infants and children with moderate wasting linked to the outcomes prioritized for this question, including anthropometric recovery, deterioration to severe wasting and/or oedema, non-response, mortality, and sustained recovery. Prognostic factors with moderate or high certainty based on GRADE for prognostic studies (20) for at least one of the prioritized outcomes for this question were considered. A threshold for an absolute risk difference of approximately 10% or more for at least one outcome was applied to prioritize prognostic factors for which the impact is likely to be meaningful. The filtered prognostic factors can be found in Web Annex G.

It should be noted that dietary management with SFFs was provided to infants and children with moderate wasting in most of the studies that were included in the prognostic systematic review (88–92, 95–98). There was only one study in which the infants and children with moderate wasting did not receive nutritional supplementation (93). The GDG discussed this at length, with the key point being that there could be different prognostic factors in infants and children with moderate wasting who were given SFFs versus those not given this intervention (i.e. uncertainty in the applicability of the identified prognostic factors due to serious indirectness).

Because of this limitation, one of the papers identified in the effectiveness review was considered by the GDG as it examined factors in infants and children with moderate wasting in the control arm of the study who did not receive SFFs (99). This study was not initially eligible for the prognostic factor systematic review because of having a composite outcome (deteriorated or died), but the GDG made the judgement that it should be examined due to the limited evidence in infants and children who did not receive SFFs.

With this caveat in mind, the GDG discussed all prognostic factors that remained from the filtering process and integrated them into the recommendations for infants and children with moderate wasting. Several of the prognostic factors identified overlapped between the nine studies that provided dietary management with SFFs and the one study in which children did not receive SFFs. This overlap increased the GDG's certainty in the prognostic value reported across all identified studies. The GDG decided to organize them by individual child factors, social factors, and contextual factors.

This specific recommendation on high-risk contexts applied all the contextual prognostic factors within the Remarks, including food insecurity, poor water, sanitation and hygiene indicators, and low income

or socioeconomic status. Although not identified in the prognostic factor review, based on the expertise and experience, the GDG made the consensus decision to add high incidence/prevalence of wasting and/or nutritional oedema to the list of factors that identify high-risk contexts.

The GDG noted that predictors of risk and how they interact are likely to be different across contexts and situations. The prognostic factor review included evidence only from African settings, which the GDG stated as a limitation. The GDG also highlighted that sources of information for decisions made about giving SFFs are likely to differ across settings.

In summary, the GDG formulated this recommendation to enable decision-makers to prioritize greater attention and resources to more vulnerable children in high-risk contexts where there is a recent or ongoing humanitarian crisis to increase health equity.

## Systematic reviews

This recommendation was informed by the following systematic reviews:

Uthman O, Folasire Y, Fagbamigbe AF, Anjorin S. Moderate or Severe wasting/Oedema in infants and children aged six months and older: a systematic review and meta-analysis. PROSPERO 2021 CRD42021288271 (54).

Padhani ZA, Cichon B, Das JK, Salam RA, Stobaugh HC, Mughal M et al. Systematic Review of Management of Moderate Wasting in Children over 6 Months of Age. *Nutrients* 2023;15(17). doi: 10.3390/nu15173781 (100).

Annan RA, Aduku LNE, Agyapong NAF. Qualitative Systematic Review assessing the Values and Preferences parents/caregivers of children affected by wasting assign to defined health outcomes. PROSPERO 2021 CRD42021282013 (30).

Robinson S, O'Toole B, Muthukumar M, Crathorne L, Shaw N. What is the resource use, cost, and cost-effectiveness of SFFs compared with non-specially formulated food interventions or standard care in infants and children aged >6 months with moderate wasting? (unpublished) (101).

Potani I, Hanjahanja-Phiri T, Selemani A, Mpinda I, Mamani-Mategula E, Chibwana A et al. The acceptability, feasibility, and equitability of inpatient, outpatient, post discharge and maternal-directed interventions in the prevention and treatment of wasting and/or oedema: A meta-aggregation. PROSPERO 2021 CRD42021286230 (49).

## Evidence to decision

### Benefits and harms

The GDG came to a consensus that there are moderate desirable effects of SFFs compared to nutritional counselling alone. Although the existing evidence indicates no undesirable or trivial effects from SFFs, the GDG made the judgement that we do not know all the potential and existing undesirable effects.

Four trials were identified in the effectiveness systematic review that compared SFFs to nutritional counselling (82–85). One trial identified in the effectiveness review examined a multicomponent intervention including RUTF as the specially formulated food, amoxicillin, and counselling provided to infants and children at high risk (defined by the study protocol itself) only, compared to the standard of care (99). This study was not eligible for the specific comparison of SFFs versus counselling but was examined as part of the prognostic factor systematic review.

The GDG noted that sustained recovery was not measured in the eligible trials, yet local/home foods may sustain recovery more than SFFs do. There were also no long-term results for outcomes including readmission, morbidity, and mortality. The GDG acknowledged that although 12 weeks of follow-up is too short to expect effects on length/height, this does not necessarily mean that SFFs have no effect on length/height.

Another discussion point raised by the GDG was that there is inconclusive evidence on mortality, which means it is not possible to fully determine the direction of effect. The trials were not powered to detect differences in mortality between arms. Some studies in this population have reported low mortality even without provision of SFFs. The GDG also acknowledged that mortality can be difficult to assess in settings with moderate wasting that are unstable, making it challenging to design trials.

The GDG also discussed that the benefits of SFFs may differ according to baseline risk differences, even in infants and children with similar anthropometry. This was discussed extensively when the GDG was evaluating prognostic factor review evidence, during which they highlighted this limitation of the existing evidence.

### **Certainty of the Evidence**

The GDG made the judgement that the overall certainty of the evidence was moderate.

The certainty of the evidence ranged from low to moderate for the outcomes of interest evaluated in the four eligible studies for this comparison. Both of the critical outcomes (anthropometric recovery and deterioration to severe wasting) had moderate certainty evidence. There was unclear or high risk of bias for all trials and serious imprecision for several of the outcomes.

### **Values and preferences**

The GDG was of the view that there is probably no uncertainty or variability around how much people value the main outcomes, including growth and recovery, failure to respond or worsening condition after intervention, and mortality, based on six studies in a qualitative evidence synthesis of values and preferences. In other words, the value that caregivers place on whether their children are growing well, recover from illness or not, whether they improve or not after an intervention, and whether they survive or not is likely to be very similar from one context to the next. The GDG noted that sustained recovery is an important outcome to consider for which there was no evidence.

### **Resources**

In the systematic review of economic evidence for this question there were two studies identified that reported on overall costs for management of moderate wasting with SFFs including RUSF and RUTF in addition to medical interventions, yet the GDG raised several additional considerations beyond what was available from the evidence ([102](#), [103](#)).

The GDG discussed that the prevalence of moderate wasting and the case fatality rate are key in terms of resource considerations, which makes it difficult to make a judgement across contexts. There is variability in costs based on other factors such as local production versus importing SFFs.

The GDG noted that the quality and modality of counselling interventions can vary greatly, impacting costs. Personnel costs and costs for co-interventions can also be large cost drivers.

However, even with these factors that affect costs across settings, the GDG agreed that there will be further costs of SFFs in addition to counselling alone. The GDG judged that there are moderate costs of SFFs compared to counselling with moderate certainty. There were no direct studies on cost-effectiveness comparing SFFs to counselling and therefore no judgement could be made.

### **Equity**

A qualitative evidence synthesis identified no evidence directly related to the comparison of SFFs versus counselling alone.

The GDG noted that anecdotally there is often discussion about potential sharing of SFFs at the household level when discussing equity, and specifically the lack of clarity on whether this increases or decreases equity both for the children who are supposed to receive the SFFs and other household members.

Members of the GDG agreed that the more important issue was likely to be how access to health and nutritional interventions could be increased for households with infants and children with moderate wasting so as to prevent sharing of SFFs happening in the first place. Distance to health facility is often a key barrier to accessing such medical and nutritional services.

Evidence from a systematic review of prognostic factors was used to inform the prioritization of infants and children with moderate wasting to receive SFFs and as such increase health equity overall in a population, which is discussed in further detail in the rationale.

### **Acceptability**

Based on the evidence identified and the additional considerations brought up in discussions during meetings, the GDG judged that giving SFFs compared to counselling alone is probably acceptable.

The qualitative evidence synthesis for this question identified several studies with positive themes related to SFFs or dietary interventions more broadly ([105-108](#)). Two of these qualitative studies also stated that infants and children with moderate wasting usually accept the taste of SFFs and that they consume these products without any problems ([106](#), [108](#)).

The GDG noted the small number of studies were restricted to African settings. In certain contexts, SFFs may be less acceptable, especially for long durations, and SFFs are not necessarily widely used across all contexts. The GDG also highlighted the importance of clear and accurate messaging around SFFs for moderate wasting. Specifically for messaging, the GDG cautioned against medicalizing SFFs, which are meant to be supplementary in addition to local/home foods.

### **Feasibility**

There was a split judgement for this domain as to whether the feasibility of implementation is probable or variable.

Stock-outs of SFFs have been commonly reported in many existing programmes ([64](#), [109](#)). The GDG therefore emphasized that local sustainable solutions are needed for the provision of SFFs. The GDG also noted that imported SFFs may not be acceptable in some countries; therefore giving SFFs may not be feasible in these contexts unless locally produced products are available in sufficient quantities. Supply issues are often linked to prioritization and support to specific programmes, which impacts feasibility.

### **Research needs**

Future studies should:

- determine nutrient requirements in infants and children with moderate wasting
- establish the optimal rate of weight gain in infants and children with moderate wasting
- understand the efficacy of using home foods in the management of moderate wasting
- evaluate the efficacy of different approaches to dietary management of moderate wasting, including the use of available home foods in different contexts, with longer follow-up durations
- evaluate the response to interventions in moderately wasted children who have identified prognostic factors
- examine different quantities of SFFs to establish a dose-response relationship
- determine the optimal micronutrient content of SFFs along with the development of product specifications
- understand the long-term effects of different types and durations of SFFs

- determine cost and cost-effectiveness of SFFs and other dietary interventions
- assess the feasibility of reaching all infants and children with moderate wasting who require SFFs
- understand the acceptability of dietary approaches from perspectives beyond caregivers.

### 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.

### Remarks

- Lipid-based nutrient supplements (LNS) refer to formulations that adhere to the technical specifications for ready-to-use supplementary food (RUSF) or ready-to-use therapeutic food (RUTF). Products meeting WHO and the [Codex Alimentarius specifications of RUTFs \(55\)](#) can also be in biscuit-based form (for example, BP-100) and can be used in the same way as RUTF in LNS form.
- This recommendation covers the use of RUTF and RUSF for moderate wasting and does not suggest use of RUSF in children with severe wasting and/or nutritional oedema.
- This recommendation excludes small-quantity LNS (SQ-LNS).
- Improved fortified blended foods (FBFs) refer to products with added sugar, oil, and/or milk over and above what was in the original specifications for these products. Examples include Super Cereal (with added sugar but without milk) and Super Cereal plus (with added milk and sugar).
- No eligible studies were identified that compared specially formulated foods (SFFs) to home foods (i.e. foods accessed locally and frequently eaten in the home as part of the normal family diet).



**Table 7. Summary of judgements across multiple comparisons for recommendation B15**

	JUDGEMENTS				
	Local FBFs vs LNS	CSB vs LNS	Improved FBFs vs LNS	Improved FBFs vs Local FBFs	RUTF vs RUSF
<b>PROBLEM</b>	Yes				
<b>DESIRABLE EFFECTS</b>	None	None	Trivial	Trivial	Trivial
<b>UNDESIRABLE EFFECTS</b>	Moderate	Moderate	Small	Trivial	Trivial
<b>NET BALANCE</b>	Moderate net less desirable	Moderate net less desirable	Small net less desirable	Null net desirable	Null net desirable
<b>CERTAINTY OF EVIDENCE</b>	Low	Low	Low	Very Low	Low
	Overall certainty of evidence: Low				
<b>VALUES</b>	Probably no uncertainty				
<b>BALANCE OF EFFECTS EFFECTIVENESS</b>	Probably favours LNS	Probably favours LNS	May favour LNS	Either	Either
<b>RESOURCES REQUIRED</b>	Varies	Don't know	Varied	Don't know	Varied
<b>CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES</b>	Very Low to Moderate	No included studies	Moderate	No included studies	No included studies
<b>COST EFFECTIVENESS</b>	Probably favours LNS	No included studies	Varied	Probably favours improved FBFs	No included studies
<b>EQUITY</b>	Varied			Varied	Varied
<b>ACCEPTABILITY</b>	Probably yes for all types of SFFs				
<b>FEASIBILITY</b>	Probably yes for all types of SFFs				

### Rationale

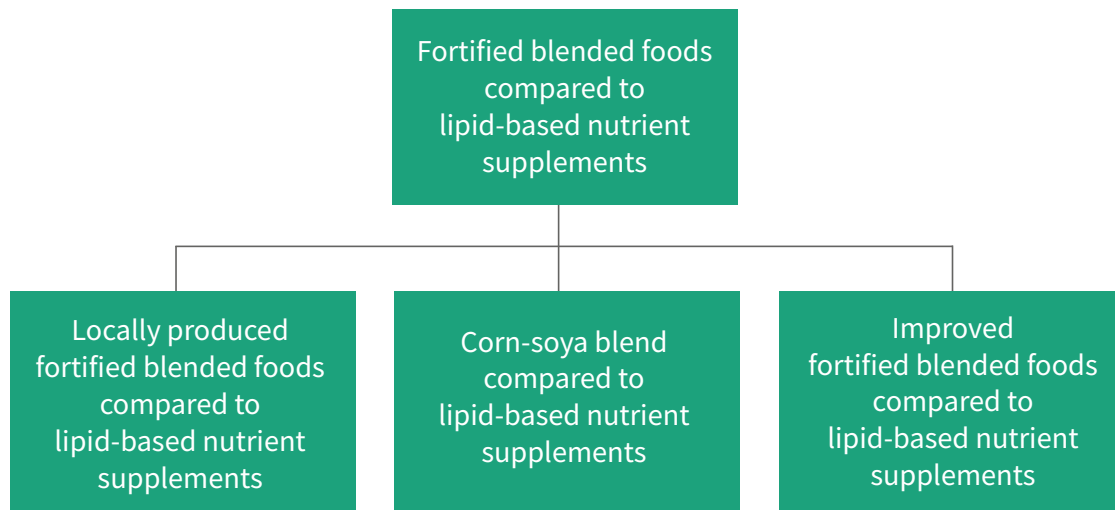
Considering their judgements across the EtD criteria, members of the GDG agreed that a conditional “for” recommendation would be appropriate, meaning that for infants and children 6–59 months of age with moderate wasting who need supplementation with SFFs, LNS are the preferred type. When these are not available, FBFs with added sugar, oil, and/or milk (improved FBFs) are preferred compared to FBFs with no added sugar, oil, and/or milk.

The effectiveness systematic review for this question identified 17 studies on different types of SFFs published across 22 papers, which were then categorized into five different comparisons. Comparisons were formulated with no clear assumed anticipated effects of one specially formulated food over another. In terms of the process, the evaluation of multiple pairwise comparisons by the GDG, informed

by relevant multi-comparison GRADE approach and resources (110), enabled an overall relative ranking of the possible interventions within a recommendation, if appropriate, for all possible comparisons. The effects of all comparisons of specially formulated food types identified in the effectiveness systematic review were examined.

As shown in Fig. 4, the first overarching categorization was FBFs compared to LNS. Within this, there were three comparisons: locally produced FBFs compared to LNS; corn-soya blend compared to LNS; and improved FBFs (products with added sugar, oil, and/or milk over and above what was in the original specifications for these products) compared to LNS.

**Fig. 4. Comparisons of fortified blended foods to lipid-based nutrient supplements**



The GDG determined that for infants and children with moderate wasting who may require SFFs, LNS is preferred over other SFFs. LNS was favoured over other specially formulated food types in terms of both effectiveness and cost-effectiveness. The evidence for the effectiveness of RUSF and RUTF suggests that both are equally effective, but the comparative cost-effectiveness is still unclear, which is a reason for the conditionality of the recommendation.

The GDG also had challenges in making judgements – particularly on resource requirements and criteria including equity, acceptability and feasibility – due to a lack of evidence. The GDG considered that the different types of products have varying impacts on equity, and that acceptability and feasibility may be equivalent but are context specific. For example, the GDG discussed that although an LNS may have been shown to be most effective overall, in some contexts better outcomes might be achieved by providing an improved FBF that can be made into a meal that more closely resembles food usually served at home, as this may be more acceptable to a child (and potentially their family), and thus consumed more readily than LNS.

The GDG concluded that in cases where LNS is unavailable, improved FBFs are preferred over other FBFs.

One important consideration that the GDG kept in mind when evaluating these comparisons is that across the different studies, locally produced FBFs varied greatly in terms of ingredients, nutrient composition, and energy. This is another reason for the conditionality of the recommendation.

Another point that the GDG raised linked to the conditionality of the recommendation was that a majority of studies, including effectiveness, systematic reviews of economic evidence, and qualitative studies, were conducted only in African settings.

The GDG noted that no studies that were identified comparing SFFs to non-specially formulated foods/home foods, which is a major gap in the evidence. There were also no eligible studies conducted in inpatient settings in this population.

## Systematic reviews

This recommendation was informed by the following systematic reviews:

Cichon B, Das JK, Salam RA, Padhani ZA, Stobaugh HC, Mughal M et al. Effectiveness of Dietary Management for Moderate Wasting among Children > 6 Months of Age-A Systematic Review and Meta-Analysis Exploring Different Types, Quantities, and Durations. *Nutrients* 2023 15(5): doi: 10.3390/nu15051076 ([111](#)).

Annan RA, Aduku LNE, Agyapong NAF. Qualitative Systematic Review assessing the Values and Preferences parents/caregivers of children affected by wasting assign to defined health outcomes. *PROSPERO* 2021 CRD42021282013 ([30](#)).

Robinson S, O'Toole B, Muthukumar M, Crathorne L, Shaw N. What is the resource use, cost, and cost-effectiveness of SFFs compared with non-specially formulated food interventions or standard care in infants and children aged >6 months with moderate wasting? (unpublished) ([101](#)).

Potani I, Hanjahanja-Phiri T, Selemani A, Mpinda I, Mamani-Mategula E, Chibwana A et al. The acceptability, feasibility, and equitability of inpatient, outpatient, post discharge and maternal-directed interventions in the prevention and treatment of wasting and/or oedema: A meta-aggregation. *PROSPERO* 2021 CRD42021286230 ([49](#)).

## Evidence to decision

### Benefits and harms

Multiple pairwise comparisons were evaluated, with the GDG going through five GRADE EtD frameworks for all possible comparisons of specially formulated food types identified in the effectiveness systematic review, which were then considered by the GDG simultaneously in a multiple judgements grid that summarized their judgements for the EtD criteria across the five comparisons to support the development of a single recommendation. An additional judgement on the net balance of effects for each comparison was added to quantify the relationship between desirable and undesirable effects for each intervention, considering both the magnitude and direction of the effect. This additional criterion facilitated the relative rankings of interventions by the GDG. A common comparator was selected a priori to facilitate net balance judgements and relative rankings. Where possible and for efficiency, the GDG made one judgement for certain EtD criteria across the comparisons.

The first comparison examined for this recommendation was locally produced FBFs compared to LNS based on one cluster-randomized controlled trial in Mali ([112](#)). The evidence indicated no desirable effects and moderate undesirable effects of locally produced FBFs compared to LNS which the GDG agreed meant that locally produced FBFs have moderately less desirable net effects compared to LNS. Results indicated lower efficacy of locally produced FBFs in terms of anthropometric recovery, anthropometric outcomes, time to recovery, and non-response. Pre-specified outcomes not measured were deterioration to severe wasting, relapse, and sustained recovery.

The second comparison of corn-soya blend compared to LNS showed similar results based on three trials in Ethiopia, Malawi, and Niger, respectively, with no desirable effects and moderate undesirable effects of corn-soya blend compared to LNS ([113-115](#)). The GDG made the judgement that there were moderately less desirable net effects of corn-soya blend versus LNS. Corn-soya blend probably has undesirable effects on several anthropometric outcomes and may have undesirable effects on anthropometric recovery. Sustained recovery was a pre-specified outcome of interest that was not reported on in the trials.

The third comparison was improved FBFs (products with added sugar, oil, and/or milk over and above what was in the original specifications for these products) versus LNS. There were six eligible studies for this comparison conducted in Mali, Burkina Faso, Sierra Leone, Malawi, and Cameroon (82, 112, 116–119). The evidence showed trivial desirable effects and small undesirable effects of improved FBFs compared to LNS, meaning small less desirable net effects. There was probably little to no difference in terms of the effects for anthropometric recovery, sustained recovery, deterioration to severe wasting, non-response, and relapse, and potentially undesirable effects for some anthropometric outcomes.

In summary, the judgements indicated that the balance of effects probably favours LNS over both locally produced FBFs and over corn-soya blend and may favour LNS over improved FBFs.

With regards to different types of FBFs, there were trivial desirable effects and trivial undesirable effects of improved FBFs compared to locally produced FBFs based on four studies in Mali, Uganda, and Ethiopia, translating to a null net balance (112, 120–122). Sustained recovery, non-response, and relapse were pre-specified outcomes that were not measured. However, the net balance of effects for the above comparisons of locally produced FBFs versus LNS and improved FBFs versus LNS indicated that improved FBFs are favoured over locally produced FBFs.

The last comparison of RUTF compared to RUSF as types of LNS, which was evaluated in a cluster-randomized controlled trial in Kenya and South Sudan (123). The evidence indicated trivial desirable effects and trivial undesirable effects, meaning a null net balance. The GDG noted the different directions of point estimates, but with almost all confidence intervals crossing the null and with trivial balance of effects. In summary, RUTF and RUSF would be considered equal in terms of benefits and harms. There were several pre-specified outcomes that were not measured including deterioration to severe wasting, sustained recovery, time to recovery, and non-response.

### **Certainty of the Evidence**

The GDG agreed that the overall certainty of evidence across all of the comparisons was low.

The certainty was low for all five pairwise comparisons examined by the GDG, apart from improved FBFs compared to locally produced FBFs which the GDG agreed had very low certainty.

There was unclear risk of bias for the eligible trial in the comparison of locally produced FBFs compared to LNS, and therefore the evidence was downgraded. There was imprecision for several of the outcomes resulting in low certainty.

Two of the three studies included in the comparison of corn-soya blend to LNS had a high risk of bias. There was imprecision for several of the outcomes and inconsistency for several of the outcomes.

Most studies in the comparison of improved FBFs to LNS had unclear or high risk of bias. There was imprecision for several of the outcomes and inconsistency for several of the outcomes which meant that the overall certainty of effects is low for this comparison.

The certainty of the evidence for the comparison of improved FBFs to locally produced FBFs was deemed by the GDG to be very low. Although many individual outcomes had low certainty, the overall mix of directionality led to the agreement that very low is more appropriate. A majority of studies in this comparison had unclear or high risk of bias and there was imprecision and inconsistency for several of the outcomes.

The last comparison of RUTF to RUSF included one study which had some concerns for risk of bias, and data were from a sub-sample of the larger study population. There was serious imprecision for many of the outcomes. The GDG felt that the certainty across outcomes was low.

## Values and preferences

The GDG made one judgement for values and preferences across all comparisons for this recommendation. They agreed there is probably no important uncertainty or variability, meaning that caregivers from one context to the next are likely to place very similar value on whether their children are growing well, recover from illness or not, and whether they improve or not after an intervention. This was based on two studies identified in a qualitative evidence synthesis relating to growth and recovery and three studies linked to failure to respond or worsening condition after intervention. The GDG noted that there is a difference in perceptions of recovery from severe wasting compared to moderate wasting, and multiple studies from the qualitative evidence synthesis were focused on severe wasting which is indirect evidence.

## Resources

The GDG agreed that resources required for locally produced FBFs compared to LNS vary with very low to moderate certainty. Cost-effectiveness probably favours LNS over locally produced FBFs. The GDG also suggested that resources required vary for improved FBFs compared to LNS, ranging from negligible to moderate savings with moderate certainty. The GDG discussed that the cost-effectiveness probably favours LNS, or alternatively there may be equivalence of the two types of foods.

The judgement for corn soy blend compared to LNS was “don’t know” as there were no included studies. This was also the case for improved FBFs compared to locally produced FBFs with no studies on resources required specifically, but the GDG felt that cost-effectiveness probably favours improved FBFs over locally produced FBFs.

The GDG concluded that resources required for RUTF compared to RUSF vary, ranging from moderate costs to negligible costs, but with no included studies for this comparison.

A cost-effectiveness study in Mali showed that on a direct cost basis, RUSF appeared more expensive than other products including improved FBFs and locally produced FBFs. This same study estimated cost per death averted and found that using RUSF to treat moderate wasting is more expensive and more effective than no treatment, resulting in a cost per death averted of \$9241. This study also estimated cost per disability-adjusted life year averted and found that using RUSF to treat moderate wasting is more expensive and more effective than no treatment, resulting in a cost per disability-adjusted life year averted of \$347. Compared to RUSF, improved and locally produced FBFs were found to be less effective and more costly. RUSF is therefore considered to be a cost-effective treatment option as it dominated these treatments ([102](#)).

On a cost per enrolled child basis (USD per child), one study in Sierra Leone found an improved FBF to be associated with the lowest cost. RUSF is a more expensive option when considered from a program and caregiver perspective. In this same study, costs per sustained recovery (USD per child) range from \$214 to \$226 for improved FBFs, with overlapping uncertainty ranges (program and caregiver perspective). Costs per sustained recovery (USD per child) range from \$179 with an improved FBF to \$196 with RUSF, with overlapping uncertainty ranges (program perspective) ([117](#)).

The GDG raised an additional consideration that resources required will depend on prevalence of moderate wasting, case fatality rates, and availability of health services in different settings. They also noted that corn soy blend is known to be shared with family members while LNS may be less likely to be shared, which could in turn impact effectiveness and therefore cost-effectiveness. Duration of treatment is another variable at the child level that is likely to influence resources.

## Equity

The judgements for all the comparisons were that the impacts on equity vary, with too little context-specific information available to determine the true equity impacts of these different types of supplementary foods for a global recommendation.

Studies identified in a qualitative evidence synthesis done in Uganda, Burkina Faso, and Niger indicated that infants and children with moderate wasting receiving corn soya blend or FBFs may not get the full prescribed quantity due to challenges in preparation ([106](#), [107](#), [121](#)). It was reported that RUSF is comparatively easier to use than corn soya blend in a study in Burkina Faso ([106](#)).

The GDG noted that opportunity costs in terms of caregiver time are important to consider with respect to equity. FBFs can take more time for caregivers to prepare which have implications for food and water acquisition and transportation to the household. On the other hand, they discussed that the principle of FBFs being shared more easily could make them more equitable.

## Acceptability

The GDG made one judgement across all comparisons and products and agreed that all types of SFFs are probably acceptable to key stakeholders.

There was some evidence identified in the qualitative evidence synthesis for this question with themes around caregivers perceiving SFFs to be highly acceptable and most infants and children with severe wasting accepting the taste of different SFFs ([105–108](#)).

The GDG noted several additional considerations in the discussion of acceptability such as some caregivers being more open to locally produced products rather than imported products, yet that there are benefits of having products like LNS that do not require additional preparation and resources. They highlighted that locally generated evidence on acceptability is needed and may be used to decide which types of SFFs to use in certain settings.

## Feasibility

The GDG made one judgement for feasibility across comparisons and types of SFFs, suggesting that all are probably feasible to implement.

The GDG also noted that the feasibility of the management of moderate wasting with SFFs, regardless the product, depends largely on the availability and acceptability of the product and service, and funding for both the product and the service.

From the perspective of caregivers, LNS is likely to be more feasible than other types of SFFs. However, stockouts particularly of RUSF and RUTF in nutritional treatment programmes in Somalia and Zimbabwe have been documented ([64](#), [109](#)).

The GDG highlighted that there are limited data on local availability of raw materials and local manufacturers of FBFs, nor the ability to produce these products at scale.

## Research needs

Future studies should:

- determine nutrient requirements in infants and children with moderate wasting
- establish the optimal rate of weight gain in infants and children with moderate wasting
- understand the efficacy of using home foods in the management of moderate wasting
- evaluate the efficacy of different approaches to dietary management of moderate wasting, including the use of available home foods in different contexts, with longer follow-up durations

- evaluate the response to interventions in moderately wasted children who have identified prognostic factors
- examine different quantities of SFFs to establish a dose-response relationship
- determine the optimal micronutrient content of SFFs along with the development of product specifications
- understand the long-term effects of different types and durations of SFFs
- determine cost and cost-effectiveness of SFFs and other dietary interventions
- assess the feasibility of reaching all infants and children with moderate wasting who require SFFs
- understand the acceptability of dietary approaches from perspectives beyond caregivers.

### 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.

### Remarks

- Not all children with moderate wasting need specially formulated foods (SFFs) (see good practice statement B11 and good practice statement B12). If SFFs are needed, they should be given as per this recommendation; it is important that families should also have access to a nutrient-dense diet at home to cover the full total daily energy and nutrient needs of the child with moderate wasting.
- Details on this quantity and range are available in [Web Annex H](#).
- Anthropometric recovery in infants and children 6–59 months is defined as weight-for-height -or -length z-score equal to or greater than -2 standard deviations (SD) of the WHO child growth standards median (WHZ or WLZ  $\geq$  -2 SD) and/or MUAC equal to or greater than 125 mm (depending on whether the child was admitted on WHZ/WLZ or MUAC or both), and no nutritional oedema for at least two consecutive outpatient visits.
- There are wide physiological differences in children who meet the anthropometric and clinical criteria of moderate wasting and differences in terms of what the children will be getting from breastmilk and home foods, which makes it challenging to decide a single amount (dose) of supplementary foods. Therefore, a range has been proposed in this recommendation.
- The recommended range allows for context-specific decisions to be made by programme managers, which may vary in different circumstances (for example, during food crises).
- The range was also derived taking into account children who are still breastfeeding. Total daily energy requirements are estimated to be provided from the normal diet, including breast milk. However, due to the complicated nature of trying to assess the contribution of breast milk from breastfeeding to the daily diet, as well as the nutritious and life-saving properties of breast milk, providing children with breast milk should be prioritized and given alongside any SFFs.

## Rationale

One of the planned approaches to answering this question was to undertake a subgroup meta-analysis using evidence identified in the effectiveness systematic review for this question, according to different quantities and durations within the trials. However, unfortunately there were too few studies that aligned in terms of their comparisons of SFFs and outcomes.

Meta-regression was then carried out with studies that provided a specific daily quantity of any type of specially formulated food and with studies that had a fixed duration, respectively. The meta-regression results showed poor precision and it was not possible to detect relationships between quantity and duration with outcomes including anthropometric recovery. The trials were not designed to examine dose-response which was also a limiting factor.

Consequently, an alternative evidence-to-decision approach was agreed upon by the GDG in order to facilitate a recommendation on this important question using best available evidence in a transparent, consultative process. This included using estimations of energy requirements informed by empirical evidence on resting energy expenditure in moderately wasted infants and children, as well as considerations of practical and contextual factors, and the evidence from the effectiveness systematic review (energy provided by the SFFs in the trials). Details about the quantity and range in the recommendation are available in [Web Annex H](#).

In summary, the resting energy expenditure data (determined using the gold standard method of indirect calorimetry) in infants and children with moderate wasting provided by the Childhood Acute Illness and Nutrition (CHAIN) Network (72) were used to estimate the energy requirements of these infants and children. The estimated energy requirements were calculated using the following formula:

$$\frac{(\text{resting energy expenditure} \times (\text{activity factor} + \text{disease factor} - 1) \times \text{growth factor})}{\text{energy absorption coefficient}}$$

Indirect calorimetry data at hospital discharge, 14 days post-hospital discharge, and 45 days post-hospital discharge were used in this calculation. Specifically, the resting energy expenditure across these timepoints was approximately 70 kcal/kg/day in infants and children with moderate wasting.

An activity factor of 1.2 was used in this equation, which is slightly below that of a normally active child. A disease factor of 1.1 was selected by GDG members to account for moderate wasting. A growth factor for infants and children aged one year and above of 1.02 was used. An energy absorption coefficient of 0.9 was chosen, representing malabsorption of 90%. The estimated energy requirements based on this equation and variables was 103 kcal/kg/day.

There are additional requirements to recover lean tissue and enable normal growth with consideration of nutrient requirements. The [2012 WHO Technical note: supplementary foods for the management of moderate acute malnutrition in infants and children 6–59 months of age \(73\)](#) recommended an increase in intake of 25 kcal/kg/day to support a weight gain of 5 g/kg/day based on average tissue composition. With this amount added, the estimated energy requirements for infants and children with moderate wasting to support weight gain are approximately 130 kcal/kg/day.

The GDG agreed to use a range for the estimated energy requirements with 100 kcal/kg/day at the lower end of the range and 130 kcal/kg/day as calculated at the upper end. The 100 kcal/kg/day is based on energy requirements of non-wasted infants and children of 80 kcal/kg/day, plus 25 kcal/kg/day required for lean tissue recovery and growth.

The final estimated energy requirement range agreed upon by the GDG was therefore 100–130 kcal/kg/day. This would include energy from the usual diet, including breastmilk for infants, plus supplementary foods. This range can also cover additional energy requirements from any co-morbidities that the children may have along side the moderate wasting, which was calculated using different stress factors and judgements of appropriate averages.



With regards to the provision of supplementary foods, the GDG felt that it would be most appropriate to set a range in order to allow for setting-specific decisions, which may change over time. They also noted that the clinical presentation and causes of moderate wasting can be extremely varied, as can the contexts in which these children live, which affects availability and access to appropriate and adequate, locally available diets. Another discussion point was about the potential for wastage and sharing. However, the GDG agreed that the evidence on the true extent of this is highly limited.

A 40–70% range of supplementary foods contributing to the daily energy requirements was initially proposed, which aligns with what was provided in the trials in the effectiveness systematic review. The GDG discussed this extensively and concluded that 70% at the top end of the range may be too high for younger infants and children and/or by those experiencing illness in addition to moderate wasting. The GDG therefore made the decision collectively to narrow the range to 40–60%.

The GRADE certainty of the evidence for the recommendation agreed upon by the GDG on optimal type of SFFs for infants and children with moderate wasting was low, and this was used as the point of departure when the GDG considered the certainty of evidence for this recommendation on quantity and duration of SFFs. Consequently, the certainty of evidence judgement agreed upon by the GDG through consensus for this recommendation was very low. Reasons for this included the many assumptions that were necessary for the estimations of energy requirements.

The trials in the effectiveness systematic review generally did not include rationales or evidence on the duration of treatment used, apart from national protocols and other programmatic considerations. It was not possible to determine the optimal duration for SFFs from available evidence, and so the GDG agreed for this recommendation that the endpoint would be anthropometric recovery, which was prioritized as a critical outcome for this question.

## Research needs

Future studies should:

- determine nutrient requirements in infants and children with moderate wasting
- establish the optimal rate of weight gain in infants and children with moderate wasting
- understand the efficacy of using home foods in the management of moderate wasting
- evaluate the efficacy of different approaches to dietary management of moderate wasting, including the use of available home foods in different contexts, with longer follow-up durations
- evaluate the response to interventions in moderately wasted children who have identified prognostic factors
- examine different quantities of SFFs to establish a dose-response relationship
- determine the optimal micronutrient content of SFFs along with the development of product specifications
- understand the long-term effects of different types and durations of SFFs
- determine cost and cost-effectiveness of SFFs and other dietary interventions
- assess the feasibility of reaching all infants and children with moderate wasting who require SFFs
- understand the acceptability of dietary approaches from perspectives beyond caregivers.

## Questions or interventions for which the GDG did not make a recommendation

**Guideline question:** In infants and children 6–59 months of age with moderate wasting across settings and contexts, which children require specially formulated foods (SFFs); also what is the effectiveness of SFFs versus non-specially formulated food interventions versus other approaches?

The effectiveness systematic review for this broadly focused guideline question identified evidence on SFFs for moderate wasting which was used to inform recommendation B13 and recommendation B14. However, the effectiveness systematic review did not find any eligible studies on non-specially formulated food interventions or other approaches and therefore the GDG could not make recommendations on these other types of interventions.

### Systematic reviews

The decision on this guideline question was informed by the following systematic reviews:

Padhani ZA, Cichon B, Das JK, Salam RA, Stobaugh HC, Mughal M et al. Systematic Review of Management of Moderate Wasting in Children over 6 Months of Age. *Nutrients* 2023;15(17). doi: 10.3390/nu15173781 (100).

Annan RA, Aduku LNE, Agyapong NAF. Qualitative Systematic Review assessing the Values and Preferences parents/caregivers of children affected by wasting assign to defined health outcomes. PROSPERO 2021 CRD42021282013 (30).

Robinson S, O’Toole B, Muthukumar M, Crathorne L, Shaw N. What is the resource use, cost, and cost-effectiveness of SFFs compared with non-specially formulated food interventions or standard care in infants and children aged >6 months with moderate wasting? (unpublished) (101).

Potani I, Hanjahanja-Phiri T, Selemani A, Mpinda I, Mamani-Mategula E, Chibwana A et al. The acceptability, feasibility, and equitability of inpatient, outpatient, post discharge and maternal-directed interventions in the prevention and treatment of wasting and/or oedema: A meta-aggregation. PROSPERO 2021 CRD42021286230 (49).

### Research needs

Future studies should:

- determine nutrient requirements in infants and children with moderate wasting
- establish the optimal rate of weight gain in infants and children with moderate wasting
- understand the efficacy of using home foods in the management of moderate wasting
- evaluate the efficacy of different approaches to dietary management of moderate wasting, including the use of available home foods in different contexts, with longer follow-up durations
- evaluate the response to interventions in moderately wasted children who have identified prognostic factors
- examine different quantities of SFFs to establish a dose-response relationship
- determine the optimal micronutrient content of SFFs along with the development of product specifications
- understand the long-term effects of different types and durations of SFFs
- determine cost and cost-effectiveness of SFFs and other dietary interventions
- assess the feasibility of reaching all infants and children with moderate wasting who require SFFs
- understand the acceptability of dietary approaches from perspectives beyond caregivers.

## 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.

### Remarks

- [Community health workers \(CHWs\)](#) are defined in this context as health workers based in communities (i.e. conducting outreach beyond primary health care facilities or based at peripheral health posts that are not staffed by doctors or nurses), who are either paid or volunteer, who are not professionals, and who have fewer than two years training but at least some training.
- Assessment involves measuring the child's weight, length/height, mid-upper arm circumference, and detection of bilateral pitting oedema (nutritional oedema).
- Classification involves establishing whether the child has moderate wasting (defined as weight-for-height -or -length z-score between -2 and -3 standard deviations (SD) of the WHO child growth standards median (WHZ or WLZ  $\geq -3$  and  $< -2$  SD) and/or MUAC 115 mm or more and less than 125 mm), severe wasting (defined as weight-for-height or -length z-score below -3 SD of the WHO child growth standards median and/or MUAC below 115 mm), and/or nutritional oedema in infants and children aged 6–59 months.
- Management includes provision of RUTF or other appropriate dietary supplementation/management, micronutrients and medical management according to the current WHO recommendations, as well as regular monitoring and follow up during management. For children with severe wasting and/or nutritional oedema, an appetite test is required to decide whether the child should be managed as an outpatient or should be referred for inpatient care.
- Referral for inpatient care is required for all children who fail the appetite test or have any medical complications (that cannot be managed in an outpatient health facility).
- This recommendation applies to infants and children with wasting and/or nutritional oedema who do not require inpatient care. CHWs should be well trained to identify and appropriately refer children who require inpatient management. Each context should assess the CHW capacity and expertise to decide whether CHWs can refer directly to hospital or first to the primary healthcare level for a comprehensive assessment of the child's need for inpatient care.
- To ensure the patient safety of this high-risk group of children, appropriate structures should be established before implementing this recommendation. These include:
  - adequate training of the CHWs
  - regular supervision and monitoring of the quality of care delivered by CHWs by qualified health workers
  - adequate resources (for example, with MUAC tapes, weighing scales, length/height boards, therapeutic and supplementary foods, medicines)
  - a rigorous, reliable and well managed supply chain for all necessary medical, nutritional and administrative resources.
- CHWs who provide care for children with wasting and/or nutritional oedema should be appropriately remunerated.

- In the case that it is not possible to implement this this recommendation, trained CHWs should still identify and refer infants and children with wasting and/or nutritional oedema for full assessment at a health facility.

**Table 8. Summary of judgements for recommendation B17**

<b>PROBLEM</b>	No	Probably no	Probably yes	<b>Yes</b>	Varies	Don't know
<b>DESIRABLE EFFECTS</b>	Trivial	Small	Moderate	Large	Varies	Don't know
<b>UNDESIRABLE EFFECTS</b>	Large	Moderate	Small	Trivial	Varies	Don't know
<b>CERTAINTY OF EVIDENCE</b>	Very low	Low	Moderate	High	No included studies	
<b>VALUES</b>	Important uncertainty or variability	Possibility important uncertainty or variability	Probably no important uncertainty or variability	No important uncertainty or variability		
<b>BALANCE OF EFFECTS</b>	Favours the comparison 	Probably favours the comparison 	Does not favour either the intervention or the comparison 	Probably favours the intervention 	Favours the intervention 	Varies Don't know
<b>RESOURCES REQUIRED</b>	Large costs 	Moderate costs 	Negligible costs and savings 	Moderate savings 	Large savings 	Varies Don't know
<b>CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES</b>	Very low	Low	Moderate	High	No included studies	
<b>COST</b>	Favours the comparison 	Probably favours the comparison 	Does not favour either the intervention or the comparison 	Probably favours the intervention 	Favours the intervention 	Varies No included studies
<b>EQUITY</b>	Reduced 	Probably reduced 	Probably no impact 	Probably increased 	Increased 	Varies Don't know
<b>ACCEPTABILITY</b>	No	Probably no	Probably yes	Yes	Varies	Don't know
<b>FEASIBILITY</b>	No	Probably no	Probably yes	Yes	Varies	Don't know

## Rationale

The Global Action Plan on Child Wasting (7) aims to increase coverage of management services by 50% by 2025. One of the actions for this goal is to increase capacity of community health workers (CHWs).

The 2013 guideline (10) included a recommendation (recommendation 1.1) stating that trained CHWs can be involved in screening for wasting and/or nutritional oedema in the community. However, there was previously no recommendation for CHWs to manage wasting and/or nutritional oedema.

CHWs have been managing non-malnourished children with a number of childhood illnesses in the community for many years, through initiatives such as [Integrated Community Case Management \(iCCM\)](#) (136),

which was introduced to improve the uptake of services in areas where access to facility-based health services is poor. Under integrated Community Case Management, CHWs are trained to identify and treat diarrhoea, malaria, and pneumonia and to screen and refer children with severe wasting and/or nutritional oedema.

In light of these current objectives to improve coverage of wasting and/or nutritional oedema management services and existing mobilization of CHWs for other childhood diseases, this guideline question was prioritized by the GDG in order to examine the evidence for a more definitive recommendation on this topic for children with wasting and/or nutritional oedema.

Considering their judgements across the EtD criteria, the members of the GDG agreed that a conditional “for” recommendation would be appropriate, meaning that the 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, under specified conditions. These conditions include that the CHWs receiving adequate training, and that regular supervision of their work is built into service delivery.

The evidence from the effectiveness systematic review indicated few differences between the intervention and comparison arms in terms of the prioritized child outcomes, although the certainty was very low for most of these. There was extensive discussion of the public health impact of recommending identification and management of wasting and/or nutritional oedema by CHWs. The GDG agreed that identification and management of wasting and/or nutritional oedema by CHWs could be favoured when all issues are considered, including potential cost savings and increased coverage of the intervention, which could positively influence equity. The GDG noted that it is possible that outcomes would also be improved through earlier identification of wasting and/or nutritional oedema, which may be facilitated by CHWs (compared to waiting until a child presents at a health facility).

The GDG did highlight several key limitations of the evidence, that contributed to the consensus of overall very low certainty of evidence for the recommendation. It was not possible to disentangle identification and management components, with no trials specifically looking at identification of wasting and/or nutritional oedema alone. Much of the evidence came from one trial and some data were from observational studies.

There was no evidence in infants below 6 months of age and the GDG agreed that it would not be appropriate to extrapolate this recommendation to these infants without the necessary evidence.

The GDG agreed on a conditional recommendation because of contextual differences including acceptability and feasibility implications, such as the capacity of existing CHW systems/networks, prevalence of wasting and/or nutritional oedema in different settings, and resources available and directed to support and train CHWs. Furthermore, the GDG emphasized that an equity lens must be applied, with CHWs receiving appropriate remuneration for their work.

## **Systematic reviews**

The decision on this guideline question was informed by the following systematic reviews:

Papadopoulou E, Lim YC, Chin WY, Dwan K, Munabi-Babigumira S, Lewin S. Lay health workers in primary and community health care for maternal and child health: identification and treatment of wasting in children. *Cochrane Database of Systematic Reviews* 2023-08-30; doi: 10.1002/14651858.CD015311 (137).

Annan RA, Aduku LNE, Agyapong NAF. Qualitative Systematic Review assessing the Values and Preferences parents/caregivers of children affected by wasting assign to defined health outcomes. *PROSPERO* 2021 CRD42021282013 (30).

Huda T, Hoque ME, Chowdhury MAK, Jahan NKJ, Aitken T, Dibley MJ. Costs, cost-effectiveness and resource use in Identification and treatment of wasting by community health workers: a systematic review (unpublished) (138).

Potani I, Hanjahanja-Phiri T, Selemani A, Mpinda I, Mamani-Mategula E, Chibwana A et al. The acceptability, feasibility, and equitability of inpatient, outpatient, post discharge and maternal-directed interventions in the prevention and treatment of wasting and/or oedema: A meta-aggregation. PROSPERO 2021 CRD42021286230 (49).

## Evidence to decision

### Benefits and harms

The GDG agreed that the balance of effects is equal for identification and management of wasting and/or nutritional oedema by CHWs versus identification and management of wasting and/or nutritional oedema by health professionals. The GDG agreed that it is challenging with the existing evidence to suggest that one would be favoured over the other, acknowledging the very low certainty evidence.

The effectiveness review for this question identified six studies specific to this recommendation, with five in African settings (Malawi, Mali, Mauritania, Niger, United Republic of Tanzania) and one in the Eastern Mediterranean Region (Pakistan) (124–129). These studies evaluated management by CHWs (in community settings) of children with wasting and/or nutritional oedema, but without medical complications needing referral for inpatient care (intervention arm) vs management in an outpatient health facility (comparison). In all six of these studies, the intervention involved both the identification and management of wasting and/or nutritional oedema and the individual components were not analysed separately (i.e. identification of children with wasting and/or nutritional oedema alone and management of children with wasting and/or nutritional oedema alone).

The effectiveness evidence indicates potential desirable effects on anthropometric recovery and little to no difference in other outcomes from identification and management of wasting and/or nutritional oedema by CHWs. The GDG had a split vote for the desirable effects domain.

The evidence suggests potentially less desirable effects on non-response, improvement from severe wasting, and mortality from identification and management of wasting by CHWs. The GDG considered these to be small undesirable effects.

Pre-specified outcomes not measured in the included studies were sustained recovery and deterioration to severe wasting.

### Certainty of the Evidence

The GDG agreed that the overall certainty of the evidence is very low due to the many limitations of the evidence described in the benefits and harms section above.

The certainty of the randomized controlled trial evidence ranged from low to moderate (improvement from severe wasting, non-response, weight change, relapse, mortality), while the certainty of the observational evidence was very low (anthropometric recovery, non-response, MUAC change, weight change, mortality).

### Values and preferences

The GDG agreed that there is probably no important uncertainty or variability in how much people value the main outcomes, which included growth and recovery outcomes, failure to respond or worsening condition after intervention, and mortality. This means that the value that caregivers place on whether their children are growing well, recover from illness or not, whether they improve or not after an intervention, and whether they survive or not is likely to be very similar from one context to the next. This judgement was based on four studies identified in a qualitative evidence synthesis of values and preferences.

## Resources

The resource requirements varied across the three studies that were identified in the systematic review of economic evidence for this question ([128-131](#)).

Based on this information and additional considerations discussed, the GDG made the judgement that management by CHWs will lead to moderate savings in terms of the resource requirements. The GDG agreed that there was moderate certainty in the evidence of required resources.

The GDG also made the judgement that cost-effectiveness varies, much more than resource requirements do. The GDG agreed on the high importance of context, as well as of the prevalence of wasting and/or nutritional oedema within contexts.

## Equity

The GDG made the judgement that identification and management of wasting and/or nutritional oedema by CHWs probably increases equity for the child, as there is potential to reach more children with wasting and/or nutritional oedema including those that would otherwise be missed, those that cannot access care in health facilities or those who would receive care only when their wasting and/or nutritional oedema has deteriorated further.

There was some evidence identified in the qualitative evidence synthesis for this question ([132-134](#)). However, the GDG highlighted that this evidence was more focused on the perspectives of health workers, rather than those of the child/caregiver.

## Acceptability

The GDG agreed that overall, the identification and management of wasting and/or nutritional oedema by CHWs is probably acceptable.

The GDG made this judgement from the perspective of caregivers. Studies identified in the qualitative evidence synthesis conducted in India and Bangladesh indicated that CHWs are reliable and supportive to caregivers, yet community members may have high expectations of CHWs, with a risk of these not always being met ([94, 135](#)).

The GDG noted that acceptability to other key stakeholders (in addition to caregivers), such as health system decision-makers, will be dependent on many context-specific factors, and these would need to be considered when deciding on how acceptable it would be for CHWs to identify and manage children with wasting and/or nutritional oedema in a particular setting/context.

## Feasibility

The GDG made the judgement that identification and management of wasting and/or nutritional oedema by CHWs is probably feasible to implement, but that heavy investment in training is required for CHWs. This training and ongoing supervision would be necessary to ensure that CHWs can safely identify and refer children with danger signs or other urgent clinical signs and symptoms, consistently carry out accurate anthropometric assessments and ongoing clinical monitoring, and prescribe the correct supplementation/management of wasting and/or nutritional oedema.

Evidence from the qualitative evidence synthesis highlighted the importance of adequate training and supervision of CHWs for successful implementation of wasting and/or nutritional oedema identification and management in community settings ([94, 134, 135](#)). These findings contributed to the GDG specifying conditions in the recommendation, namely, adequate training, regular supervision, and sufficient resources, emphasizing that if these cannot be met, identification and management of children with wasting and/or nutritional oedema should not be done by CHWs.

## Research needs

Future studies should:

- examine the effectiveness of CHWs in management of wasting and/or nutritional oedema throughout the care pathway (i.e. identification, treatment and follow-up, and referral), with randomization done at different points in the pathway
- apply systems/complexity science methods which also identify unintended consequences
- report process/implementation outcomes to evaluate the delivery at these different points and link with the critical child outcomes
- examine cost-effectiveness and the impacts of this approach on coverage and other services.

## C. Post-exit interventions after recovery from wasting and/or nutritional oedema

Good practice statement	New in 2023
<p>C1. Mothers/caregivers of infants and children treated for wasting and/or nutritional oedema should be provided with interventions after their children exit from nutritional treatment/supplementation. These could include counselling and education (on infant and young child feeding practices, recognition of common childhood illnesses and appropriate health-seeking behaviours); support to provide responsive care; and safe water, sanitation and hygiene interventions to improve overall child health and prevent relapse to wasting and/or nutritional oedema.</p>	

### Remarks

- Children who have recovered from wasting and/or nutritional oedema should be followed up after exit from nutritional care.
- This good practice statement is consistent with the following WHO guidance:
  - [WHO Infant and young child feeding counselling: an integrated course: course handouts \(139\)](#).
  - [Integrated Management of Childhood Illness: IMCI chart booklet \(25\)](#).
  - [WHO Pocket Book of Hospital Care for Children: Guidelines for the management of common Childhood Illness, Second Edition \(140\)](#).
  - [Improving early child development: WHO guideline \(141\)](#).
  - [Improving nutrition outcomes with better water and hygiene: practical solutions for policies and programmes \(142\)](#).

### Rationale

The GDG agreed that this good practice statement is needed considering the exceptionally high risk of mortality, infection and relapse observed in infants and children following nutritional recovery, which warrants greater emphasis on interventions and monitoring post-exit. The GDG felt strongly that post-exit interventions are needed that address many aspects of child health, including health and nutrition counselling, responsive care, and water, sanitation and hygiene.























C2. In infants and children at risk of poor growth and development or with wasting and/or nutritional oedema, psychosocial stimulation should continue to be provided by mothers/ caregivers after transfer from inpatient care and exit from outpatient care, with psychosocial stimulation interventions as part of routine care to improve child development and anthropometric outcomes.

### Remarks

- Psychosocial stimulation can be defined as the sensory information received from interactions with people and environmental variability that engages a young child's attention and provides information; examples include talking, smiling, pointing, enabling, and demonstrating, with or without objects. This also includes responsive feeding as a part of responsive caregiving.
- Psychosocial stimulation can be most effective when delivered as part of an integrated package of post-exit interventions.
- The two studies included in the effectiveness systematic review enrolled children who had severe underweight (weight-for-age z-score < -3 SD) or severe wasting and nutritional oedema. In both studies, psychosocial stimulation was provided during inpatient care and continued after exit from outpatient nutritional care as part of a continuity of care approach.
- There were insufficient studies to complete subgroup analysis to determine which specific children would benefit more from psychosocial stimulation as a post-exit intervention.
- None of the studies included infants less than 6 months at risk of poor growth and development. The definition of infants at risk of poor growth and development for the purpose of this guideline is described in the [scope section 1.2](#).

**Table 9. Summary of judgements for recommendation C2**

<b>PROBLEM</b>	No	Probably no	Probably yes	<b>Yes</b>	Varies	Don't know
<b>DESIRABLE EFFECTS</b>	Trivial	Small	<b>Moderate</b>	Large	Varies	Don't know
<b>UNDESIRABLE EFFECTS</b>	Large	Moderate	Small	Trivial	Varies	Don't know
<b>CERTAINTY OF EVIDENCE</b>	Very low	<b>Low</b>	Moderate	High	No included studies	
<b>VALUES</b>	Important uncertainty or variability	Possibility important uncertainty or variability	<b>Probably no important uncertainty or variability</b>	No important uncertainty or variability		
<b>BALANCE OF EFFECTS</b>	Favours the comparison 	Probably favours the comparison 	Does not favour either the intervention or the comparison 	<b>Probably favours the intervention</b> 	Favours the intervention 	Varies Don't know
<b>RESOURCES REQUIRED</b>	Large costs 	Moderate costs 	Negligible costs and savings 	Moderate savings 	Large savings 	Varies Don't know
<b>CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES</b>	Very low	Low	Moderate	High	No included studies	
<b>COST</b>	Favours the comparison 	Probably favours the comparison 	Does not favour either the intervention or the comparison 	Probably favours the intervention 	Favours the intervention 	Varies No included studies
<b>EQUITY</b>	Reduced 	Probably reduced 	Probably no impact 	Probably increased 	Increased 	Varies Don't know
<b>ACCEPTABILITY</b>	No	Probably no	<b>Probably yes</b>	Yes	Varies	Don't know
<b>FEASIBILITY</b>	No	Probably no	Probably yes	Yes	Varies	Don't know

**Rationale**

Considering their judgements across the EtD criteria, members of the GDG agreed that a conditional “for” recommendation would be appropriate, meaning that in infants and children at risk of poor growth and development or with wasting and/or nutritional oedema, psychosocial stimulation should continue to be provided by caregivers after transfer from inpatient care and exit from outpatient care, with psychosocial stimulation interventions as part of routine care to improve child development and anthropometric outcomes.

Psychosocial stimulation is one of the interventions that was identified in the effectiveness review for this question focused on post-exit interventions. The GDG agreed that the intervention had moderate desirable effects on outcomes including anthropometry and child development, which are key in infants and children with wasting and/or nutritional oedema who have poor nutritional and developmental outcomes following treatment. The overall certainty of the evidence was low. The GDG felt that the intervention is probably acceptable to key stakeholders.

The GDG also discussed that psychosocial stimulation interventions may have stronger effects when delivered in conjunction with other post-exit interventions in these infants and children.

None of the studies included infants less than 6 months of age at risk of poor growth and development, yet the GDG agreed that psychosocial stimulation should be recommended for these infants even in the absence of evidence.

## Systematic reviews

This recommendation was informed by the following systematic reviews:

Bliznashka L, Rattigan SM, Sudfeld CR, Isanaka S. Analysis of Postdischarge Interventions for Children Treated for Moderate or Severe Wasting, Growth Faltering or Failure, or Edema: A Systematic Review. *JAMA network open* 6(5): e2315077- doi: 10.1001/jamanetworkopen.2023.15077 (143).

Annan RA, Aduku LNE, Agyapong NAF. Qualitative Systematic Review assessing the Values and Preferences parents/caregivers of children affected by wasting assign to defined health outcomes. PROSPERO 2021 CRD42021282013 (30).

Crathorne L. What is the resource use, cost, and cost-effectiveness of post discharge interventions for children aged > 6 months with moderate or severe wasting and/or oedema or infants aged 1 to 6 months with growth failing/faltering? (unpublished) (144).

Potani I, Hanjahanja-Phiri T, Selemani A, Mpinda I, Mamani-Mategula E, Chibwana A et al. The acceptability, feasibility, and equitability of inpatient, outpatient, post discharge and maternal-directed interventions in the prevention and treatment of wasting and/or oedema: A meta-aggregation. PROSPERO 2021 CRD42021286230 (49).

## Evidence to decision

### Benefits and harms

The evidence indicated that psychosocial stimulation may have desirable effects on anthropometric outcomes. The GDG also examined child development outcomes for this specific comparison since this intervention is aimed at improving developmental outcomes.

Two randomized controlled studies were eligible for this specific comparison, the first being a randomized controlled trial in Ethiopia in infants and children 6–60 months of age hospitalized with severe wasting and/or nutritional oedema. The intervention was play-based psychosocial stimulation during and after exit from inpatient care (145).

The second study was a randomized controlled trial in Bangladesh with infants and children 6-24 months of age hospitalized for being severely underweight, without acute infection(s) or severe wasting. The psychosocial stimulation intervention involved individual play sessions and parental education, at community clinics for a period of six months. Some study arms also received food supplementation given for three months. Arms that received psychosocial stimulation were pooled together for the purpose of this comparison (146).

There were several pre-specified outcomes that were not reported on, including mortality, sustained recovery, readmission, relapse and deterioration to severe wasting.

The GDG agreed that there were moderate desirable effects of the intervention, and they made the judgement of “don’t know” in terms of undesirable effects, which could not be determined from the limited evidence available. They made the judgement that the balance of effects probably favours psychosocial stimulation.

### Certainty of the Evidence

The GDG judged the overall certainty of the evidence to be low, with certainty for all outcomes being low. Reasons for this were serious risk of bias and imprecision for all outcomes that were reported on.

## Values and preferences

The GDG agreed there was probably no important uncertainty or variability around the outcomes of interest based on evidence from a qualitative evidence synthesis. These outcomes included growth and recovery, failure to respond or worsening condition after intervention, and mortality. This means that caregivers from one context to the next are likely to place very similar value on whether their children are growing well, recover from illness or not, whether they improve or not after an intervention, and whether they survive or not. The GDG noted the positive effects of this intervention on child development which is a valued outcome.

## Resources

A systematic review of economic studies did not identify any studies applicable to this question, the GDG agreed on the judgement of “don’t know” in terms of the resources required. The GDG discussed that this intervention is likely to increase costs – including to caregivers – but there was no evidence to quantify this. On the other hand, it may lead to savings if it improves outcomes.

## Equity

In the qualitative evidence synthesis, no relevant studies were identified related to psychosocial stimulation in this population, so the GDG opted for a “don’t know” judgement.

## Acceptability

There was one study identified in the qualitative evidence synthesis that included caregivers and infants and children with severe wasting and/or nutritional oedema that participated in a hospital-based psychosocial stimulation and counselling programme. Caregivers perceived the intervention as beneficial and suggested that they changed behaviour, including speaking and playing with their infants and children because of this intervention. The caregivers proposed other potential settings for this intervention in the communities and said they would benefit from a longer duration of the intervention beyond the inpatient period (147).

The GDG noted the lack of directly relevant studies of acceptability of psychosocial stimulation interventions in the post-exit period but agreed that the intervention is probably acceptable to key stakeholders.

## Feasibility

The qualitative evidence synthesis did not identify any studies on feasibility of psychosocial stimulation interventions for this population. The GDG noted that psychosocial stimulation is likely to be most effective when there is a dedicated person to lead these activities, which links to feasibility of delivery. However, with the lack of studies the GDG opted for a “don’t know” judgement about whether the intervention is feasible to implement.

## Research needs

Future studies should:





















- evaluate the effects of combining psychosocial stimulation with other interventions
- evaluate implementation considerations for psychosocial stimulation including intensity and frequency, as well as who can provide the intervention and in what contexts
- determine the cost and cost-effectiveness of the intervention including the costs for caregivers and trained staff.

C3. In infants and children with severe wasting and/or nutritional oedema, cash transfers in addition to routine care may be provided to decrease relapse and improve overall child health during outpatient care and after exit from treatment, depending on contextual factors such as cost.

**Remarks**

- Cash transfers can be most effective when delivered as part of an integrated package of post-exit interventions.
- The evidence for this recommendation was derived from one study that included infants and children 6–59 months treated for uncomplicated severe wasting or nutritional oedema only; there were no studies that included infants less than 6 months of age at risk of poor growth and development or infants and children with moderate wasting.
- The intervention started during outpatient care and continued after exit from nutritional care as part of a continuity of care approach.
- There were insufficient studies to complete subgroup analysis to determine which specific children would benefit more from cash transfers as a post-exit intervention.

**Table 10. Summary of judgements for recommendation C3**

<b>PROBLEM</b>	No	Probably no	Probably yes	<b>Yes</b>	Varies	Don't know
<b>DESIRABLE EFFECTS</b>	Trivial	Small	<b>Moderate</b>	Large	Varies	Don't know
<b>UNDESIRABLE EFFECTS</b>	Large	Moderate	Small	Trivial	Varies	Don't know
<b>CERTAINTY OF EVIDENCE</b>	Very low	Low	<b>Moderate</b>	High	No included studies	
<b>VALUES</b>	Important uncertainty or variability	Possibility important uncertainty or variability	<b>Probably no important uncertainty or variability</b>	No important uncertainty or variability		
<b>BALANCE OF EFFECTS</b>	Favours the comparison 	Probably favours the comparison 	Does not favour either the intervention or the comparison 	<b>Probably favours the intervention</b> 	Favours the intervention 	Varies Don't know
<b>RESOURCES REQUIRED</b>	Large costs 	<b>Moderate costs</b> 	Negligible costs and savings 	Moderate savings 	Large savings 	Varies Don't know
<b>CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES</b>	Very low	Low	Moderate	High	No included studies	
<b>COST</b>	Favours the comparison 	Probably favours the comparison 	Does not favour either the intervention or the comparison 	Probably favours the intervention 	Favours the intervention 	Varies No included studies
<b>EQUITY</b>	Reduced 	Probably reduced 	Probably no impact 	Probably increased 	Increased 	Varies Don't know
<b>ACCEPTABILITY</b>	No	Probably no	Probably yes	Yes	Varies	Don't know
<b>FEASIBILITY</b>	No	Probably no	Probably yes	Yes	Varies	Don't know

**Rationale**

Considering their judgements across the EtD criteria, the GDG agreed that a conditional “for” recommendation would be appropriate, meaning in infants and children with severe wasting and/ or nutritional oedema, cash transfers in addition to routine care may be provided to decrease relapse and improve overall child health during outpatient care and after exit from treatment depending on contextual factors such as cost.

One of the interventions identified in an effectiveness systematic review on post-exit interventions was unconditional cash transfers for caregivers of infants and children receiving outpatient care for severe wasting and/or nutritional oedema.

The GDG agreed that there were beneficial effects of cash transfers in terms of decreasing relapse and improving overall child health based on moderate certainty evidence. They deemed the costs of this intervention to be moderate based on resource data from the effectiveness trial.

However, the GDG strongly emphasized that decisions on delivery of this intervention are highly dependent on the context, including costs of implementing this programme and agreed that a conditional recommendation would be appropriate.

## Systematic reviews

This recommendation was informed by the following systematic reviews:

Bliznashka L, Rattigan SM, Sudfeld CR, Isanaka S. Analysis of Postdischarge Interventions for Children Treated for Moderate or Severe Wasting, Growth Faltering or Failure, or Edema: A Systematic Review. *JAMA network open* 6(5):e2315077. doi: 10.1001/jamanetworkopen.2023.15077 (143).

Annan RA, Aduku LNE, Agyapong NAF. Qualitative Systematic Review assessing the Values and Preferences parents/caregivers of children affected by wasting assign to defined health outcomes. *PROSPERO* 2021 CRD42021282013 (30).

Crathorne L. What is the resource use, cost, and cost-effectiveness of post discharge interventions for children aged > 6 months with moderate or severe wasting and/or oedema or infants aged 1 to 6 months with growth failing/faltering? (unpublished) (144).

Potani I, Hanjahanja-Phiri T, Selemani A, Mpinda I, Mamani-Mategula E, Chibwana A et al. The acceptability, feasibility, and equitability of inpatient, outpatient, post discharge and maternal-directed interventions in the prevention and treatment of wasting and/or oedema: A meta-aggregation. *PROSPERO* 2021 CRD42021286230 (49).

## Evidence to decision

### Benefits and harms

The evidence from the one eligible trial in the effectiveness systematic review indicated that unconditional cash transfers have desirable effects on most anthropometric outcomes and on relapse to moderate and severe wasting and/or nutritional oedema, but have little to no effect on height and HAZ.

The study was a cluster-randomized controlled trial including infants and children receiving outpatient care for severe wasting and/or nutritional oedema across 20 health centres in the Democratic Republic of the Congo. Caregivers in the intervention arm received an unconditional cash transfer of US\$40 each month during treatment and follow-up for a total of six months, adding up to US\$240. The amount was estimated to provide 70% of the monthly household income (148).

Mortality, sustained recovery, readmission, deterioration to severe wasting were pre-specified outcomes that were not reported on.

The GDG determined that these are moderately desirable anticipated effects, but that the judgement was “don’t know” in terms of undesirable effects: although there were no undesirable effects reported on in the trial, as described above, there were several outcomes for which no evidence was found.

The GDG agreed that the balance of effects probably favours unconditional cash transfers in addition to routine care.

### Certainty of the Evidence

The GDG agreed on an overall judgement of moderate certainty of evidence for this recommendation. The certainty of the evidence was initially graded as high for all prioritized outcomes in the systematic review, but on discussion, there was consensus in the GDG to downgrade the evidence to moderate certainty due to indirectness, since the generalizability of the effects of unconditional cash transfers across contexts is limited.

### Values and preferences

The GDG made the judgement that there was probably no important uncertainty or variability in terms of values and preferences related to the outcomes based on findings from a qualitative evidence synthesis. The outcome categories were growth and recovery, failure to respond or worsening condition after intervention, and mortality. This means that caregivers from one context to the next are likely to

place very similar value on whether their children are growing well, recover from illness or not, whether they improve or not after an intervention, and whether they survive or not.

## Resources

The GDG made the judgement that there are moderate costs of cash transfers in terms of the resource requirements and that the overall cost-effectiveness is unknown.

There were resource use and cost-effectiveness data linked to the study included in the effectiveness systematic review which showed incremental costs of US\$5700 per case of severe wasting averted and US\$1400 per case of moderate wasting averted (149).

Modelling results from this study showed that with an estimated cost of US\$300 per child for severe wasting treatment in this setting, adding cash transfers to treatment would result in a saving of over US\$18 000, or approximately 6% of the cost of the cash transfer intervention (149).

Making similar assumptions to those made in the above severe wasting estimates, if moderate wasting cases were to be treated in this context at an approximate cost of US\$40 per case, this would translate into a cost-saving of just under US\$17 000. The total potential cost-savings of preventing relapse with the addition of cash transfers is estimated to be US\$35 000 or about 11% of the cost of the cash transfer intervention (149).

The GDG noted several limitations of the cost-effectiveness evidence, including the methods applied and the specific context within a framework of the intervention being implemented by a well-resourced non-governmental organization rather than by a ministry of health alone. They felt that cash transfers did not actually appear to be highly cost-effective based on the evidence.

The GDG also highlighted several additional considerations, noting that there may be substantial indirect costs, such as those for supervision and monitoring of the intervention and that the cost of treatment may be variable across settings. The GDG also highlighted that many cash transfer programmes use electronic payment methods to save money, but this was not the case for the intervention in the eligible trial.

## Equity

Most GDG members agreed that cash transfers probably increase or do increase equity in this population.

There was some indirect evidence identified in the qualitative evidence synthesis for this question on unconditional cash transfers with respect to how these are used by caregivers of infants and children with wasting and/or nutritional oedema (150, 151). One of these studies in Burkina Faso said that cash transfers helped to mitigate against seasonal shocks, which increases equity (151).

The GDG further discussed that the impacts on equity depend on how the intervention is targeted and whether cash transfers are conditional or unconditional. There were concerns raised about how targeting infants and children with wasting could create perverse incentives. The GDG also discussed that unconditional cash transfers may be used for other purposes, but considered that, regardless of this, giving cash could have broader health benefits no matter how it is used.

The GDG further discussed that the impacts on equity depend on how the intervention is targeted and whether cash transfers are conditional or unconditional. There were concerns raised about how targeting to families with infants and children with wasting and/or nutritional oedema could create pervasive incentives. The GDG also discussed that unconditional cash transfers may be used for other purposes, but that regardless of this, giving cash no matter how it is used could have broader child health benefits.



## Acceptability

There were no studies identified in the qualitative evidence synthesis for this question that linked to acceptability of the intervention.

## Feasibility

There were no studies identified in the qualitative evidence synthesis for this question related to feasibility of the intervention.

## Research needs

Future studies should:

- focus on the cost-effectiveness of cash transfers (based on metrics such as disability-adjusted life years) to establish the impact of the intervention in different settings
- determine the impact of post-exit cash transfers combined with individual counselling
- evaluate prepaid vouchers versus cash transfers.

### Conditional recommendation, Moderate certainty evidence





















New in 2023

C4. In infants and children with severe wasting and/or nutritional oedema who are HIV negative, daily oral co-trimoxazole prophylaxis should not be provided after transfer from inpatient care and/or exit from outpatient care as part of routine care.

## Remarks

- Evidence for this recommendation comes from a study that was conducted in a specific population of hospitalized infants and children 2–59 months of age with severe wasting and/or nutritional oedema and without HIV. The intervention started during outpatient care and continued after exit as part of an experimental continuity of care approach.
- In the effectiveness systematic review on post-exit interventions there were insufficient studies to complete subgroup analysis to determine which specific infants and children will benefit from this intervention post-exit.
- Infants and children with HIV should be given daily oral cotrimoxazole regardless of their nutritional status, according to the [WHO Consolidated guidelines on HIV prevention, testing, treatment, service delivery and monitoring: recommendations for a public health approach \(152\)](#).

**Table 11. Summary of judgements for recommendation C4**

<b>PROBLEM</b>	No	Probably no	Probably yes	<b>Yes</b>	Varies	Don't know
<b>DESIRABLE EFFECTS</b>	Trivial	Small	Moderate	Large	Varies	Don't know
<b>UNDESIRABLE EFFECTS</b>	Large	Moderate	Small	<b>Trivial</b>	Varies	Don't know
<b>CERTAINTY OF EVIDENCE</b>	Very low	Low	<b>Moderate</b>	High	No included studies	
<b>VALUES</b>	Important uncertainty or variability	Possibility important uncertainty or variability	<b>Probably no important uncertainty or variability</b>	No important uncertainty or variability		
<b>BALANCE OF EFFECTS</b>	Favours the comparison 	Probably favours the comparison 	<b>Does not favour either the intervention or the comparison</b> 	Probably favours the intervention 	Favours the intervention 	Varies Don't know
<b>RESOURCES REQUIRED</b>	Large costs 	Moderate costs 	Negligible costs and savings 	Moderate savings 	Large savings 	Varies Don't know
<b>CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES</b>	Very low	Low	Moderate	High	No included studies	
<b>COST</b>	Favours the comparison 	Probably favours the comparison 	Does not favour either the intervention or the comparison 	Probably favours the intervention 	Favours the intervention 	Varies No included studies
<b>EQUITY</b>	Reduced 	Probably reduced 	Probably no impact 	Probably increased 	Increased 	Varies Don't know
<b>ACCEPTABILITY</b>	No	Probably no	Probably yes	Yes	Varies	Don't know
<b>FEASIBILITY</b>	No	Probably no	Probably yes	Yes	Varies	Don't know

**Rationale**

The GDG agreed that a recommendation on this specific antibiotic treatment (co-trimoxazole) was warranted because of a high-quality trial identified in the effectiveness systematic review that evaluated the impact of this intervention on mortality in infants and children with severe wasting and/or nutritional oedema (153).

Considering their judgements across the EtD criteria, the GDG agreed that a conditional “against” recommendation would be appropriate, meaning that in infants and children with severe wasting and/or nutritional oedema who are HIV negative, daily oral co-trimoxazole prophylaxis should not be provided after transfer from inpatient care and/or exit from outpatient care as part of routine care.

The GDG concluded that there was no evidence of benefits of daily oral co-trimoxazole prophylaxis compared to placebo for infants and children with severe wasting and/or nutritional oedema. The GDG also discussed concerns about increasing antibiotic resistance from this systematic use of antibiotics (versus their use on the basis of clinical indication) and possible costs of this intervention, which had not been shown to positively influence outcomes in these infants and children.

The [WHO Guideline: updates on the management of severe acute malnutrition in infants and children, 2013](#) (10) includes a recommendation that infants and children with severe wasting and/or nutritional oedema be given a course of oral antibiotic such as amoxicillin during outpatient care (recommendation 3.1), which stands as guidance for this population.

## Systematic reviews

This recommendation was informed by the following systematic reviews:

Bliznashka L, Rattigan SM, Sudfeld CR, Isanaka S. Analysis of Postdischarge Interventions for Children Treated for Moderate or Severe Wasting, Growth Faltering or Failure, or Edema: A Systematic Review. *JAMA network open* 6(5):e2315077. doi: 10.1001/jamanetworkopen.2023.15077 (143).

Annan RA, Aduku LNE, Agyapong NAF. Qualitative Systematic Review assessing the Values and Preferences parents/caregivers of children affected by wasting assign to defined health outcomes. *PROSPERO* 2021 CRD42021282013 (30).

Crathorne L. What is the resource use, cost, and cost-effectiveness of post discharge interventions for children aged > 6 months with moderate or severe wasting and/or oedema or infants aged 1 to 6 months with growth failing/faltering? (unpublished) (144).

Potani I, Hanjahanja-Phiri T, Selemani A, Mpinda I, Mamani-Mategula E, Chibwana A et al. The acceptability, feasibility, and equitability of inpatient, outpatient, post discharge and maternal-directed interventions in the prevention and treatment of wasting and/or oedema: A meta-aggregation. *PROSPERO* 2021 CRD42021286230 (49).

## Evidence to decision

### Benefits and harms

The evidence showed that daily oral co-trimoxazole prophylaxis compared to placebo has little to no effect on most anthropometric outcomes or recovery and probably has little to no effect on mortality, which was the primary outcome for this trial.

The eligible randomized controlled trial identified in the effective systematic review for this question was carried out in Kenya and included hospitalized infants and children 2–59 months with severe wasting and/or nutritional oedema who did not have HIV. The intervention of daily oral co-trimoxazole was given after their discharge from hospital and during their subsequent outpatient care and continued after exit from the nutrition programme. The children had also received antibiotics as inpatients, as per the national protocol for the inpatient management of children with severe wasting and/or nutritional oedema (153).

Relapse was a pre-specified outcome of interest that was not reported on in this study, although there were data on non-fatal admissions to hospital and episodes of illness, which were not different between study arms.

The GDG determined that the desirable anticipated effects of this intervention are trivial and agreed that the undesirable effects are also trivial. Overall, the GDG agreed that neither daily oral co-trimoxazole nor placebo were favoured over the other.

Along with the potential costs of the intervention, the GDG raised the key point that there are major public health concerns about increasing antibiotic resistance.

### Certainty of the Evidence

The certainty of the evidence was high for most outcomes but was moderate for mortality and HAZ due to serious imprecision. The GDG felt that the trial was of high quality but as there was only one study, the GDG agreed that a judgement of moderate certainty of evidence was most appropriate.

## Values and preferences

The GDG determined that there is probably no important uncertainty or variability in terms of values and preferences of the main outcomes, which were related to growth and recovery, failure to respond or worsening condition after intervention, and mortality, based on studies in a qualitative evidence synthesis. This means that the value caregivers place on whether their children are growing well, recover from illness or not, whether they improve or not after an intervention, and whether they survive or not, is likely to be very similar from one context to the next .

## Resources

A systematic review identified no economic studies for this question. The GDG felt that this intervention could be high cost for countries with a high prevalence of severe wasting and/or nutritional oedema. Overall, they agreed on a judgement of “don’t know” for the resources required.

## Equity

A qualitative evidence synthesis identified no studies related to this specific intervention.

## Acceptability

A qualitative evidence synthesis identified no studies related to this specific intervention.

## Feasibility

A qualitative evidence synthesis identified no studies related to this specific intervention. The GDG agreed that co-trimoxazole prophylaxis is commonly being provided to infants and children with HIV, meaning that the supply chains already exist and that the intervention could therefore be feasible to implement.

## Research needs

Future studies should:

- determine the efficacy of other antibiotics with different durations provided to infants and children as post-discharge interventions
- stratify analyses by subgroups (for example, moderate wasting, severe wasting, nutritional oedema)
- include additional outcomes such as antimicrobial resistance, long-term changes in body composition and microbiome, cost-effectiveness
- seek to understand perceptions of the intervention by caregivers
- study non-antibiotic pharmacologic and other medical interventions.

## Questions or interventions for which the GDG did not make a recommendation

**Guideline question:** In infants and children at risk of poor growth and development or with moderate or severe wasting or oedema meeting the above criteria, which post-exit interventions are effective?

**Intervention identified in the effectiveness systematic review:** An integrated package of care including medical care, food supplementation and malaria prevention and treatment

The GDG considered the evidence for this intervention identified in this broadly focused guideline question, made judgements across the EtD criteria and agreed not to make a recommendation for this intervention, mainly due to limited evidence, which was of very low certainty and lacked generalizability.

A summary of judgements per EtD domain for this intervention can be found in [Web Annex I](#).

### Systematic reviews

The decision on this guideline question was informed by the following systematic reviews:

Bliznashka L, Rattigan SM, Sudfeld CR, Isanaka S. Analysis of Postdischarge Interventions for Children Treated for Moderate or Severe Wasting, Growth Faltering or Failure, or Edema: A Systematic Review. *JAMA network open* 6(5):e2315077. doi: 10.1001/jamanetworkopen.2023.15077 ([143](#)).

Annan RA, Aduku LNE, Agyapong NAF. Qualitative Systematic Review assessing the Values and Preferences parents/caregivers of children affected by wasting assign to defined health outcomes. *PROSPERO* 2021 CRD42021282013 ([30](#)).

Crathorne L. What is the resource use, cost, and cost-effectiveness of post discharge interventions for children aged > 6 months with moderate or severe wasting and/or oedema or infants aged 1 to 6 months with growth failing/faltering? (unpublished) ([144](#)).

Potani I, Hanjahanja-Phiri T, Selemani A, Mpinda I, Mamani-Mategula E, Chibwana A et al. The acceptability, feasibility, and equitability of inpatient, outpatient, post discharge and maternal-directed interventions in the prevention and treatment of wasting and/or oedema: A meta-aggregation. *PROSPERO* 2021 CRD42021286230 ([49](#)).

### Research needs

Future research should:

- evaluate different integrated post-exit packages including medical or health promotion interventions across contexts.

## D. Prevention of wasting and nutritional oedema

### Good practice statement

New in 2023

D1. In contexts where wasting and nutritional oedema occur, preventive interventions should ideally be implemented through a multisectoral and multisystem approach (i.e. food, health, safe water, sanitation and hygiene, and social protection systems). These interventions should include access to healthy diets and nutrition and medical services as appropriate, counselling (breastfeeding, health and nutrition related, especially helping families use locally available nutrient-dense foods for a healthy diet), should address maternal and family needs, and should involve psychosocial elements of care to ensure healthy growth and development.

### Remarks

- This good practice statement is intended to emphasize that prevention of 'wasting and nutritional oedema requires a package of interventions to be implemented together, rather than focusing on single interventions. It is consistent with the [Global Action Plan on Child Wasting \(7\)](#) which emphasizes strengthening national health, food and social protection systems and addressing social determinants of health.
- Implementation of these interventions should ensure targeting of children living in households and communities that are most vulnerable. This targeting may be based on socioeconomic status, household food insecurity, or other risk factors as appropriate within the specific context.
- This good practice statement is consistent with the following WHO guidance:
  - [WHO Infant and young child feeding counselling: an integrated course: course handouts \(139\)](#).
  - [Improving early child development: WHO guideline \(141\)](#).
  - [Improving nutrition outcomes with better water and hygiene: practical solutions for policies and programmes \(142\)](#).
- Nutrient-dense foods are those high in nutrients relative to their energy content; they have a relatively high content of vitamins, minerals, essential amino acids and healthy fats. Examples of nutrient-dense foods include animal source foods, beans, nuts and many fruits and vegetables.

### Rationale

The GDG felt that this good practice statement, in alignment with the [Global Action Plan on Child Wasting \(7\)](#), is important considering the multifactorial causes of wasting and nutritional oedema. Preventing wasting and nutritional oedema therefore requires a set of interventions and approaches that address child health and nutrition, and support mothers/caregivers and families in households where wasting and nutritional oedema occur.

D2. Infant and young child feeding counselling must be provided as part of routine care especially in contexts where wasting and nutritional oedema occur. In order for this counselling to have the most benefit for the prevention of wasting and nutritional oedema and for other child health and nutrition outcomes, personnel carrying out the counselling should have comprehensive training and be supervised regularly, with dedicated resources and time within health system strategic planning for this intervention.

### Remarks

- Infant and young child feeding counselling is recommended for mothers/caregivers of all infants and young children.
- Infant and young child feeding counselling must include messaging and support for breastfeeding and complementary feeding and should emphasize the importance of responsive feeding.
- WHO guidance on infant and young child feeding can be found in the following resources:
  - [WHO/UNICEF Infant and young child feeding counselling: an integrated course: participant's manual, 2nd ed \(26\)](#).
  - [WHO Guideline: counselling of women to improve breastfeeding practices \(28\)](#).
  - [WHO recommendations on maternal and newborn care for a positive postnatal experience \(11\)](#).
  - [WHO/UNICEF Thematic Brief: Nurturing young children through responsive feeding \(154\)](#).
- Personnel who provide infant and young child feeding counselling should be appropriately remunerated.

### Rationale

The GDG agreed that a good practice statement promoting infant and young child feeding counselling is needed particularly in the context of prevention of wasting and nutritional oedema, with emphasis on comprehensive training and regular supervision. The GDG expressed that dedicated time and resources are required to operationalize this and to ensure effective delivery and implementation of this intervention.

- D3. a) In areas of or during periods of high food insecurity, in addition to infant and young child feeding counselling, specially formulated foods (SFFs), including medium-quantity lipid-based nutrient supplements (MQ-LNS) or small-quantity lipid-based nutrient supplements (SQ-LNS), may be considered for the prevention of wasting and nutritional oedema for a limited duration for all infants and children 6–23 months of age, while continuing to enable access to adequate home diets for the whole family.
- b) In areas of or during periods of high food insecurity, children living in the most vulnerable households should be prioritized for SFF interventions through a targeted approach. However, when targeting is not possible, these SFFs may need to be given to all households through a blanket approach for infants and children 6–23 months of age, while continuing to enable access to adequate home diets for the whole family and providing infant and young child feeding counselling.

### Remarks

- In contexts where wasting and nutritional oedema occur, implementation of these interventions should ideally be through a multisectoral and multisystem approach as described in good practice statement D1. Specially formulated foods (SFFs) may have a role to play alongside multisectoral and multisystem interventions mentioned above for the prevention of wasting and nutritional oedema in areas of or periods of high food insecurity.

### Food insecurity assessment

- Food insecurity can be assessed using agreed upon methods and tools appropriate for the context such as the [Integrated Food Security Phase Classification \(IPC\) Acute Food Insecurity classification](#) for example, with IPC 4 (emergency) or IPC 5 (catastrophe/famine) prompting the use of SFFs for the prevention of wasting or nutritional oedema while enabling access of households to adequate home diets for the whole family.

### Targeted versus blanket approaches

- A targeted approach to supplementation is one in which a specific subset of children or households within a certain population or geographic region are prioritized for this intervention. This contrasts with a blanket approach, where the intervention is given to all children or households. Targeting may be based on socioeconomic status, household food insecurity, or other risk factors as appropriate within the specific context.
- Blanket provision of SFFs to all infants and children for the prevention of wasting and nutritional oedema is unlikely to be feasible in most contexts, hence the need for prioritizing children living in the most vulnerable households as described in the above point about targeting.























## **Specially formulated foods**

- SFFs for the prevention of wasting and nutritional oedema can include medium-quantity lipid-based nutrient supplements (MQ-LNS), with an energy amount of 250 to < 500 kcal/day, or small quantity lipid-based nutrient supplements (SQ-LNS), with an energy amount of 100 to 120 kcal/day.
- If MQ-LNS and SQ-LNS are unavailable, large quantity lipid-based nutrient supplements (LQ-LNS) can be used for a limited period of time if available in sufficient quantity and provided their use will not disrupt management of wasting and nutritional oedema.





























## **Implementation considerations**

- In the trials identified in the effectiveness systematic review for this recommendation, SQ-LNS was predominantly given for a duration of 12–18 months; MQ-LNS for 6–12 months; and LQ-LNS for 3 months. However, the optimal quantity and duration of SFFs for prevention of wasting and nutritional oedema is unknown based on the available evidence and therefore those implementing these interventions should consider what is most appropriate, feasible and equitable within their contexts based on careful planning. Provision of SFFs for the prevention of wasting and nutritional oedema should be stopped when the food insecurity situation improves and/or when the most vulnerable households can meet energy and nutrient needs from locally available nutrient-dense foods.
- Potential undesirable and unintended consequences from providing SFFs for the prevention of wasting and nutritional oedema should be considered when planning implementation. Examples may include risk of displacing breastmilk and/or nutrient-dense home foods, diverting necessary resources from other important interventions, and giving the perception that these interventions replace products for the management of wasting and nutritional oedema.
- SFFs should be delivered with behaviour change communication and with messaging on infant and young child feeding including breastfeeding and complementary feeding. Importantly, SFFs should not displace breastfeeding and nutrient-dense home foods.
- Screening and referral for wasting and nutritional oedema should be done alongside delivery of preventive interventions as part of a continuum of care.





















**Table 12. Summary of judgements for recommendation D3: large-quantity lipid-based nutrient supplements (LQ-LNS) and medium-quantity lipid-based nutrient supplements (MQ-LNS)**

<b>PROBLEM</b>	No	Probably no	Probably yes	<b>Yes</b>	Varies	Don't know
<b>DESIRABLE EFFECTS</b>	Trivial	Small	<b>Moderate</b>	Large	Varies	Don't know
<b>UNDESIRABLE EFFECTS</b>	Large	Moderate	Small	Trivial	Varies	Don't know
<b>CERTAINTY OF EVIDENCE</b>	Very low	Low	<b>Moderate</b>	High	No included studies	
<b>VALUES</b>	Important uncertainty or variability	Possibility important uncertainty or variability	<b>Probably no important uncertainty or variability</b>	No important uncertainty or variability		
<b>BALANCE OF EFFECTS</b>	Favours the comparison 	Probably favours the comparison 	Does not favour either the intervention or the comparison 	<b>Probably favours the intervention</b> 	Favours the intervention 	Varies Don't know
<b>RESOURCES REQUIRED</b>	Large costs 	<b>Moderate costs</b> 	Negligible costs and savings 	Moderate savings 	Large savings 	Varies Don't know
<b>CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES</b>	Very low	<b>Low</b>	<b>Moderate</b>	High	No included studies	
<b>COST</b>	Favours the comparison 	Probably favours the comparison 	Does not favour either the intervention or the comparison 	Probably favours the intervention 	Favours the intervention 	Varies No included studies
<b>EQUITY</b>	Reduced 	Probably reduced 	Probably no impact 	Probably increased 	Increased 	Varies Don't know
<b>ACCEPTABILITY</b>	No	Probably no	<b>Probably yes</b>	Yes	Varies	Don't know
<b>FEASIBILITY</b>	No	Probably no	<b>Probably yes</b>	Yes	Varies	Don't know

**Table 13. Summary of judgements for recommendation D3: small-quantity lipid-based nutrient supplements (SQ-LNS)**

<b>PROBLEM</b>	No	Probably no	Probably yes	<b>Yes</b>	Varies	Don't know	
<b>DESIRABLE EFFECTS</b>	Trivial	Small	<b>Moderate</b>	Large	Varies	Don't know	
<b>UNDESIRABLE EFFECTS</b>	Large	Moderate	Small	Trivial	Varies	<b>Don't know</b>	
<b>CERTAINTY OF EVIDENCE</b>	Very low	Low	<b>Moderate</b>	High	No included studies		
<b>VALUES</b>	Important uncertainty or variability	Possibility important uncertainty or variability	<b>Probably no important uncertainty or variability</b>	No important uncertainty or variability			
<b>BALANCE OF EFFECTS</b>	Favours the comparison 	Probably favours the comparison 	Does not favour either the intervention or the comparison 	<b>Probably favours the intervention</b> 	Favours the intervention 	Varies 	Don't know 
<b>RESOURCES REQUIRED</b>	Large costs 	<b>Moderate costs</b> 	Negligible costs and savings 	Moderate savings 	Large savings 	Varies 	Don't know 
<b>CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES</b>	Very low	Low	<b>Moderate</b>	High	No included studies		
<b>COST</b>	Favours the comparison 	Probably favours the comparison 	Does not favour either the intervention or the comparison 	<b>Probably favours the intervention</b> 	Favours the intervention 	Varies 	No included studies 
<b>EQUITY</b>	Reduced 	Probably reduced 	Probably no impact 	Probably increased 	Increased 	Varies 	<b>Don't know</b> 
<b>ACCEPTABILITY</b>	No	Probably no	<b>Probably yes</b>	Yes	Varies	Don't know	
<b>FEASIBILITY</b>	No	Probably no	<b>Probably yes</b>	Yes	Varies	Don't know	

**Table 14. Summary of judgements in for recommendation D3: blanket versus targeted approaches**

<b>PROBLEM</b>	No	Probably no	Probably yes	<b>Yes</b>	Varies	Don't know	
<b>DESIRABLE EFFECTS</b>	Trivial	Small	<b>Moderate</b>	Large	Varies	Don't know	
<b>UNDESIRABLE EFFECTS</b>	Large	Moderate	Small	Trivial	Varies	Don't know	
<b>CERTAINTY OF EVIDENCE</b>	Very low	Low	<b>Moderate</b>	High	No included studies		
<b>VALUES</b>	Important uncertainty or variability	Possibility important uncertainty or variability	<b>Probably no important uncertainty or variability</b>	No important uncertainty or variability			
<b>BALANCE OF EFFECTS</b>	Favours the comparison	Probably favours the comparison	Does not favour either the intervention or the comparison	<b>Probably favours the intervention</b>	Favours the intervention	Varies	Don't know
							
<b>RESOURCES REQUIRED</b>	Large costs	Moderate costs	Negligible costs and savings	Moderate savings	Large savings	Varies	Don't know
							
<b>CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES</b>	Very low	Low	Moderate	High	No included studies		
<b>COST</b>	Favours the comparison	Probably favours the comparison	Does not favour either the intervention or the comparison	Probably favours the intervention	Favours the intervention	Varies	No included studies
							
<b>EQUITY</b>	Reduced	Probably reduced	Probably no impact	<b>Probably increased</b>	Increased	Varies	Don't know
							
<b>ACCEPTABILITY</b>	No	Probably no	<b>Probably yes</b>	Yes	Varies	Don't know	
<b>FEASIBILITY</b>	No	Probably no	Probably yes	Yes	Varies	Don't know	

## Rationale

The GDG came to consensus on a conditional recommendation around the potential use of SFFs including MQ-LNS or SQ-LNS for the prevention of wasting and nutritional oedema in contexts with high food insecurity through a targeted approach. The GDG agreed that the evidence also supports the use of LQ-LNS for a limited time period in cases where MQ-LNS and SQ-LNS are unavailable and there is enough of this product available to avoid causing disruptions to management of wasting and nutritional oedema.

The GDG felt that the evidence for this recommendation was of low certainty. They judged the certainty of effectiveness evidence for MQ-LNS and LQ-LNS and for SQ-LNS as moderate yet downgraded the overall certainty of the recommendation to low because of indirectness with regards to the statement about considering these interventions in areas of or during periods of high food insecurity. This was

based on evidence from a prognostic factor systematic review in infants and children with moderate wasting, used to inform recommendation B14, which indicated that food insecurity is associated with poor outcomes. There was also indirectness around the statement on prioritizing the most vulnerable households through a targeted approach, as there was no direct evidence around the effects of targeting SFFs for the prevention of wasting and nutritional oedema.

Results from the eight trials on MQ-LNS and LQ-LNS indicated small to moderate desirable effects in terms of reducing incidence and prevalence of wasting and moderate to large desirable effects in terms of reducing mortality (155–162). The GDG made the judgement “don’t know” for undesirable effects of MQ-LNS and LQ-LNS. Overall, the GDG felt that the balance of effects probably favours MQ-LNS and LQ-LNS. They agreed that there are likely to be moderate costs of these interventions at a minimum, in terms of resources required, and that these costs will vary across settings. There was insufficient evidence around cost-effectiveness for these interventions for the GDG to inform this judgement. The GDG noted that the impacts on equity are unknown, but that MQ-LNS and LQ-LNS are probably acceptable and feasible in many contexts.

The GDG also agreed that there were moderate desirable effects on reducing prevalence of wasting and mortality based on the eight trials on SQ-LNS for prevention of wasting (162–170). Again, the GDG felt that the undesirable effects of SQ-LNS were unknown, but the balance of effects probably favours SQ-LNS. The GDG agreed that there would be moderate costs of SQ-LNS, and that cost-effectiveness probably favours SQ-LNS. They felt the impacts of SQ-LNS on equity are unknown but that they are probably acceptable and feasible, as is the case with MQ-LNS and LQ-LNS.

The GDG noted that it was not possible to determine the optimal quantity and duration of these SFFs for prevention of wasting and nutritional oedema. They agreed that this is a conditional recommendation requiring those implementing these interventions to evaluate their contexts and decide what works best in terms of appropriateness and feasibility and mitigating undesirable consequences.

In addition to this evidence on effectiveness of different SFF interventions, the GDG examined evidence on blanket versus targeted approaches from one trial eligible for an effectiveness systematic review on this guideline question (171). The intervention in this trial included a food ration for pregnant and lactating women, a family ration, and a food ration for children including wheat soy blend. The intervention was given to all infants and children 6–23 months of age in the intervention arm through a blanket approach, or to underweight infants and children 6–60 months of age in the comparison arm through a targeted approach (171). There was moderate certainty evidence of the effects of blanket compared to targeted approaches including reducing prevalence of wasting, improving other anthropometric outcomes, and reducing prevalence of underweight in this trial.

However, the GDG noted the indirectness of this evidence on blanket versus targeted approaches to inform this recommendation. There was also limited information about resources and cost-effectiveness, as well as feasibility of blanket versus targeted approaches. The GDG acknowledged that providing SFFs for prevention of wasting and nutritional oedema to all infants and children may not be possible in all settings, meaning that prioritization would be important based on context-specific criteria.

## Systematic reviews

This recommendation was informed by the following systematic reviews:

Lassi Z, Rahim K, Das J, Salam R, Black R, Bhutta Z. Effectiveness of community prevention interventions (e.g. nutritional supplementation, social protection programs, cash transfers, etc.) for prevention of wasting in communities with infants and children up to five years at risk of wasting. PROSPERO 2021 CRD42021277429 (172).

Das J, Lassi Z, Feroz Z, Salam R, Black R, Bhutta Z. Effectiveness of population-based interventions compared to targeted interventions for primary and secondary prevention of wasting in communities with infants and children up to five years at risk of wasting. PROSPERO 2021 CRD42021277425 (173).

Annan RA, Aduku LNE, Agyapong NAF. Qualitative Systematic Review assessing the Values and Preferences parents/caregivers of children affected by wasting assign to defined health outcomes. PROSPERO 2021 CRD42021282013 (30).

Huda TM, Jahan NK, Hoque ME, Aitken T, Dibley MJ. Costs of community-based interventions for prevention of wasting in children: a systematic review and narrative synthesis (unpublished) (174).

Brand A, Visser ME, Kallon II, van Wyk S, Rohwer A. The acceptability, feasibility and equity implications of interventions for the prevention of wasting in infants and young children: a rapid qualitative evidence synthesis (QES) for a guideline. PROSPERO 2022 CRD42022351360 (175).

## Evidence to decision

### Benefits and harms

The GDG felt that the balance of effects probably favours MQ-LNS and LQ-LNS based on evidence from eight trials examining these interventions for prevention of wasting with moderate overall desirable effects (155–162). They made the same judgements for SQ-LNS, based on evidence from eight trials on the impacts of this intervention of prevention of wasting (162–170). The GDG therefore made a conditional recommendation that included multiple options for SFFs based on the evidence for these different interventions.

However, the GDG made the judgement “don’t know” for undesirable effects for MQ-LNS and LQ-LNS and for SQ-LNS and discussed that questions remain around the sustained effects and sustainability of these interventions; MQ-LNS were predominantly given for 6–12 months and SQ-LNS for 12–18 months in the trials. The GDG highlighted the potential for other undesirable impacts, with examples being displacing breastmilk and/or nutrient-dense home foods which may negatively impact child health and nutrition outcomes.

The GDG acknowledged that the optimal quantity and duration are still unknown based on the available evidence, which was another reason for the recommendation to be conditional.

### Certainty of the Evidence

The GDG came to consensus that overall certainty of the evidence for MQ-LNS and LQ-LNS and for SQ-LNS was moderate but downgraded the certainty for the recommendation itself to low due to indirectness in relation to some elements that the GDG included in the recommendation linked to its conditionality.

One reason for downgrading the certainty was the direction to consider giving these SFFs only in areas of or during periods of high food insecurity, which was based on evidence from a prognostic factor systematic review of food insecurity in infants and children with moderate wasting that informed recommendation B14. The other reason was the statement about prioritization of these SFFs to the most vulnerable households using a targeted approach.

### Values and preferences

There was no direct evidence in the qualitative evidence synthesis on values and preferences around incidence and prevalence of wasting and nutritional oedema. However, the GDG agreed that there is probably no important uncertainty or variability in terms of how much mothers/caregivers value this critical outcome based on their collective judgement.

## Resources

The GDG felt that there were at minimum moderate costs of these SFF interventions based on evidence from two studies identified in a systematic review of economic evidence (176–178). The GDG noted that costs will vary across settings and that resources required may be higher in certain situations such as high-risk contexts with humanitarian crises. The GDG again emphasized that the optimal quantity and duration of these interventions is unknown, and those implementing the intervention will need to decide and plan delivery of SFFs, which may be based on or have impacts on resources required. The GDG also highlighted the potential opportunity costs for mothers/caregivers and personnel costs for delivering these interventions.

There were no directly relevant studies identified that examined cost-effectiveness of MQ-LNS and lq-LNS with prevention of wasting as an outcome. There were unpublished data available on cost-effectiveness of SQ-LNS, linked to the trial evidence, which the GDG considered and agreed that the cost-effectiveness favours SQ-LNS as compared to no SFFs provided.

## Equity

The GDG made the judgement “don’t know” in terms of the impacts of these SFF interventions for prevention of wasting and nutritional oedema on equity. There was limited evidence for this judgement from a qualitative evidence synthesis and the GDG felt that provision of these SFFs could potentially either increase or decrease equity in different contexts. The GDG also noted the unknown impacts on equity of blanket versus targeted approaches, and targeting based on certain criteria. These were all reasons for the recommendation being made conditional.

## Acceptability

The GDG made the judgement that MQ-LNS and lq-LNS and for SQ-LNS are probably acceptable. There was one study identified in the qualitative evidence synthesis done in Niger on MQ-LNS and several studies on SQ-LNS from Haiti, Malawi, Zimbabwe and South Africa (179–183). These studies indicated that MQ-LNS and SQ-LNS are considered by mothers/caregivers to be good for child well-being, enjoyed by children and convenient to use.

The GDG noted there were no qualitative studies identified from certain regions, such as the WHO South-East Asian region. The GDG discussed that it may be possible to locally produce SFFs, which may be more acceptable in some contexts including some Asian settings.

## Feasibility

The GDG agreed that MQ-LNS and LQ-LNS and for SQ-LNS for prevention of wasting and nutritional oedema is probably feasible but concluded that providing these SFFs in all contexts for this purpose is likely to be unfeasible. Although there was some evidence from the qualitative evidence synthesis around the perspective of mothers/caregivers indicating the potential feasibility, the GDG noted the importance of that other perspectives including the perspectives of those implementing the intervention.

The GDG decided to specify that this intervention should be given to the most vulnerable households through a targeted approach because it may not be possible to provide it to all infants and children within a certain area. However, the GDG noted that targeting may not be possible — for example, if identifying these households is not feasible — which may mean there is a need for a blanket approach to supplementation to be implemented.

## Research needs

Future research should:

- establish optimal quantity, duration and timing of food-based interventions for prevention of wasting and nutritional oedema and their cost-effectiveness
- further understand the impacts of SFFs on body composition, neurodevelopment and long-term health outcomes
- increase understanding of potential adverse effects of SFFs, including displacing breastfeeding and home diets, encouraging consumption of processed foods and displacing healthy food production and preparation skills
- determine the most effective and cost-effective household and geographical targeting criteria to implement preventive SFFs
- determine the cost-effectiveness of food-based interventions for prevention of wasting and nutritional oedema, including logistics and implementation costs
- identify the most effective and cost-effective platforms or services to implement food-based interventions for prevention of wasting and nutritional oedema
- understand direct, indirect and opportunity costs to families of food-based interventions for prevention of wasting and nutritional oedema
- determine the potential impact of maternal interventions in the context of prevention of wasting and nutritional oedema.

**Strong recommendation, Moderate certainty evidence**

**New in 2023**





















D4. In contexts where wasting and nutritional oedema occur, multiple micronutrient powders (MNPs) should not be given to infants and children 6–23 months of age for the specific purpose of preventing wasting and nutritional oedema.

## Remarks

- Multiple micronutrient powders (MNPs) are recommended for infants and children in populations where anaemia is a public health problem as outlined in the [WHO guideline: use of multiple micronutrient powders for point-of-use fortification of foods consumed by infants and young children aged 6–23 months and children aged 2–12 years \(184\)](#).
- There is a lack of effectiveness of MNPs for preventing wasting and nutritional oedema. This intervention is designed mainly to address iron deficiency and iron deficiency anaemia rather than wasting.
- The absence of effects of MNPs on preventing wasting and nutritional oedema and the costs of MNPs mean that this intervention should not be used solely for the prevention of wasting and nutritional oedema, yet this does not preclude the use of MNPs in populations where anaemia is a public health problem.



**Table 15. Summary of judgements for recommendation D4**

<b>PROBLEM</b>	No	Probably no	Probably yes	<b>Yes</b>	Varies	Don't know
<b>DESIRABLE EFFECTS</b>	Trivial	Small	Moderate	Large	Varies	Don't know
<b>UNDESIRABLE EFFECTS</b>	Large	Moderate	Small	<b>Trivial</b>	Varies	Don't know
<b>CERTAINTY OF EVIDENCE</b>	Very low	Low	<b>Moderate</b>	High	No included studies	
<b>VALUES</b>	Important uncertainty or variability	Possibility important uncertainty or variability	<b>Probably no important uncertainty or variability</b>	No important uncertainty or variability		
<b>BALANCE OF EFFECTS</b>	Favours the comparison 	Probably favours the comparison 	<b>Does not favour either the intervention or the comparison</b> 	Probably favours the intervention 	Favours the intervention 	Varies Don't know
<b>RESOURCES REQUIRED</b>	Large costs 	<b>Moderate costs</b> 	Negligible costs and savings 	Moderate savings 	Large savings 	Varies Don't know
<b>CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES</b>	Very low	<b>Low</b>	Moderate	High	No included studies	
<b>COST</b>	Favours the comparison 	<b>Probably favours the comparison</b> 	Does not favour either the intervention or the comparison 	Probably favours the intervention 	Favours the intervention 	Varies <b>No included studies</b>
<b>EQUITY</b>	Reduced 	Probably reduced 	Probably no impact 	Probably increased 	Increased 	Varies Don't know
<b>ACCEPTABILITY</b>	No	Probably no	<b>Probably yes</b>	Yes	Varies	Don't know
<b>FEASIBILITY</b>	No	Probably no	<b>Probably yes</b>	Yes	Varies	Don't know

**Rationale**

The GDG agreed to make a strong recommendation against the use of multiple micronutrient powders (MNPs) for the specific purpose of preventing wasting and nutritional oedema based on moderate certainty evidence. The GDG acknowledged that MNPs were not designed for this specific purpose. However, MNPs are recommended for infants and children in populations where anaemia is considered a public health problem.

The GDG agreed there are no desirable effects of MNPs for prevention of wasting and nutritional oedema based on moderate certainty evidence across five trials that examined prevalence of wasting (155, 164, 185–187). The GDG judged the resources required for MNPs to be moderate costs and that this intervention is probably feasible and acceptable, but emphasized that there is unlikely to be cost-effectiveness if there is no clear benefit on the prevention of wasting and nutritional oedema.

## Systematic reviews

Lassi Z, Rahim K, Das J et al: Effectiveness of community prevention interventions (for example, nutritional supplementation, social protection programs, cash transfers, etc.) for prevention of wasting in communities with infants and children up to five years at risk of wasting. PROSPERO 2021 CRD42021277429 ([172](#)).

Annan RA, Aduku LNE, Agyapong NAF: Qualitative Systematic Review assessing the Values and Preferences parents/caregivers of children affected by wasting assign to defined health outcomes. PROSPERO 2021 CRD42021282013 ([30](#)).

Huda TM, Jahan NK, Hoque ME et al: Costs of community-based interventions for prevention of wasting in children: a systematic review and narrative synthesis (unpublished) ([174](#)).

Brand A, Visser ME, Kallon II et al: The acceptability, feasibility and equity implications of interventions for the prevention of wasting in infants and young children: a rapid qualitative evidence synthesis (QES) for a guideline. PROSPERO 2022 CRD42022351360 ([175](#)).

## Evidence to decision

### Benefits and harms

The GDG agreed that the balance of effects did not favour multiple micronutrient powders (MNPs) for the prevention of wasting and nutritional oedema over not providing MNPs. There were no effects – either desirable or undesirable – in terms of critical and important outcomes including incidence and prevalence of wasting, other anthropometric outcomes, morbidity outcomes, nor mortality across the five trials that evaluated the impacts of MNPs on the prevalence of wasting ([155](#), [164](#), [185](#), [186](#), [187](#)). The GDG emphasized that MNPs are not intended for prevention of wasting and nutritional oedema.

### Certainty of the Evidence

The certainty of evidence for most of the outcomes, including prevalence of wasting, was moderate with low or very low certainty evidence for morbidity outcomes. The GDG agreed that there is moderate certainty in the evidence around the critical outcome prevalence of wasting and therefore moderate certainty overall for this recommendation.

### Values and preferences

In the qualitative evidence synthesis there was no direct evidence on values and preferences around incidence and prevalence of wasting and nutritional oedema. However, the GDG agreed that there is probably no important uncertainty or variability in terms of how much mothers/caregivers value this critical outcome based on their collective judgement.

### Resources

The GDG judged that there are moderate costs of MNPs although there was limited direct information identified in a systematic review of economic evidence. There were no data available about cost-effectiveness of this intervention for prevention of wasting and nutritional oedema. However, the GDG felt strongly that, because there is evidence that this intervention is not effective to prevent wasting and nutritional oedema, it would not be cost-effective for this purpose.

### Equity

There was no evidence identified in a qualitative evidence synthesis on impacts of MNPs for prevention of wasting and nutritional oedema on equity and the GDG made the judgement “don’t know.”

## Acceptability

From evidence identified in a qualitative evidence synthesis on impacts of MNPs, one theme emerged on impacts of MNPs that indicated that caregivers mostly consider MNPs to benefit child well-being and to be convenient. The GDG made the judgement that MNPs are probably acceptable but again emphasized that MNPs do not have beneficial effects in terms of reducing prevalence of wasting, and it would potentially be harmful for there to be messaging about MNPs being used for prevention or management of wasting and nutritional oedema conveyed to mothers/caregivers.

## Feasibility

The GDG agreed it is probably feasible to implement this intervention, linked to the acceptability of MNPs from the perspective of mothers/caregivers, but would require clear messaging about the use of MNPs which are not intended for the prevention of wasting and nutritional oedema.

## Research needs

Future research should:

- aim to better understand links between micronutrient deficiencies, micronutrient interventions, and wasting and nutritional oedema.

## Questions or interventions for which the GDG did not make a recommendation

**Guideline question:** In communities with infants and children up to five years old at risk of wasting and nutritional oedema, what community characteristics increase or mitigate risk of wasting and nutritional oedema for individual children?

The review did not identify any appropriate evidence and did not inform recommendation D3.

## Review

The decision on this guideline question was informed by the following review:

Young H, Marshak A, Fitzpatrick M, Chung M, Li R, Ezaki A et al. The community characteristics that increase or mitigate risk of child wasting (unpublished) ([188](#)).

## Research needs

Future research should:

- identify community, household and child-level factors associated with likelihood of progressing to wasting or nutritional oedema.

## Questions or interventions for which the GDG did not make a recommendation

**Guideline question:** In communities with infants and children up to five years at risk of wasting and nutritional oedema, what is the effectiveness of interventions for prevention of wasting and nutritional oedema?

### Interventions identified in the effectiveness systematic review:

- Intensive infant and young child feeding counselling<sup>1</sup>
- FBFs for infants and children
- FBFs for mothers/caregivers and children
- SQ-LNS for mothers/caregivers and children
- Conditional cash transfers
- Unconditional cash transfers
- Food vouchers

The GDG considered the evidence for the above interventions identified in this broadly focused guideline question, made judgements across the EtD criteria and agreed not to make recommendations for these interventions for the prevention of wasting and nutritional oedema.

There was moderate certainty evidence for intensive infant and young child feeding counselling and the GDG agreed that neither the intervention nor the comparison (routine infant and young child feeding counselling) were favoured and that the impacts on equity and feasibility of delivering this intervention vary.

There was low certainty evidence for FBFs for infants and children, and the GDG concluded that the balance of effects for this intervention was not known. There were no cost-effectiveness data and the GDG agreed that the impacts on equity and feasibility of this intervention are unknown.

The GDG considered evidence around FBFs for mothers/caregivers and children and SQ-LNS for mothers/caregivers and children. They did not make a recommendation on these interventions for mothers/caregivers and children due to limited certainty in the evidence, no cost-effectiveness data, and unknown impacts on equity.

For conditional cash transfers, unconditional cash transfers and food vouchers, there was very low certainty evidence and the GDG concluded that the balance of effects was unknown. There was no information on cost-effectiveness for conditional cash transfers and food vouchers and the GDG agreed that cost-effectiveness varies for unconditional cash transfers. The GDG concluded that impacts on equity and feasibility of these interventions vary or are unknown.

A summary of judgements per EtD domain for the above interventions can be found in Web Annex J.

*Note:* the effectiveness systematic review for this question identified additional interventions that were beyond the scope of this guideline including maternal/caregiver interventions, alternative foods, and agricultural interventions.

<sup>1</sup> Defined as infant and young child feeding counselling that is more intensive in terms of duration, intensity, frequency, or mode than routine infant and young child feeding counselling.

## Systematic reviews

The decision on this guideline question was informed by the following systematic reviews:

Lassi Z, Rahim K, Das J, Salam R, Black R, Bhutta Z. Effectiveness of community prevention interventions (e.g. nutritional supplementation, social protection programs, cash transfers, etc.) for prevention of wasting in communities with infants and children up to five years at risk of wasting. PROSPERO 2021 CRD42021277429 ([172](#)).

Annan RA, Aduku LNE, Agyapong NAF. Qualitative Systematic Review assessing the Values and Preferences parents/caregivers of children affected by wasting assign to defined health outcomes. PROSPERO 2021 CRD42021282013 ([30](#)).

Huda TM, Jahan NK, Hoque ME, Aitken T, Dibley MJ. Costs of community-based interventions for prevention of wasting in children: a systematic review and narrative synthesis (unpublished) ([174](#)).

Brand A, Visser ME, Kallon II, van Wyk S, Rohwer A. The acceptability, feasibility and equity implications of interventions for the prevention of wasting in infants and young children: a rapid qualitative evidence synthesis (QES) for a guideline. PROSPERO 2022 CRD42022351360 ([175](#)).

## Research needs

Future research should:

- evaluate the impact of maternal, infant and young child feeding counselling/interventions on improved practices and on the prevention of wasting and nutritional oedema
- determine the optimal delivery of maternal, infant and young child feeding counselling/interventions and the types/models of counselling that are most effective
- examine the effectiveness of maternal, infant and young child feeding counselling/interventions in areas with different levels of wasting and food insecurity
- assess a package of interventions for the prevention of wasting that includes maternal, infant and young child feeding counselling
- closely examine undesirable effects of different interventions for prevention of wasting and nutritional oedema as well as sustained effects of these interventions
- evaluate costs and cost-effectiveness of preventive interventions compared to each other
- understand impacts of preventive interventions on equity in different contexts
- include implementation research across contexts with various resources.

## Questions or interventions for which the GDG did not make a recommendation

**Guideline question:** In communities with infants and children up to five years at risk of wasting and nutritional oedema, what is the effectiveness of population-based interventions compared to targeted interventions for primary and secondary prevention of wasting and nutritional oedema?

There was no specific recommendation for this question, but the evidence was considered for recommendation D3 with judgements made by the GDG across the EtD criteria.

### Systematic reviews

The decision on this guideline question was informed by the following systematic reviews:

Das J, Lassi Z, Feroz Z, Salam R, Black R, Bhutta Z. Effectiveness of population-based interventions compared to targeted interventions for primary and secondary prevention of wasting in communities with infants and children up to five years at risk of wasting. PROSPERO 2021 CRD42021277425 ([173](#)).

Annan RA, Aduku LNE, Agyapong NAF. Qualitative Systematic Review assessing the Values and Preferences parents/caregivers of children affected by wasting assign to defined health outcomes. PROSPERO 2021 CRD42021282013 ([30](#)).

Huda TM, Jahan NK, Hoque ME, Aitken T, Dibley MJ. Costs of community-based interventions for prevention of wasting in children: a systematic review and narrative synthesis (unpublished) ([174](#)).

Brand A, Visser ME, Kallon II, van Wyk S, Rohwer A. The acceptability, feasibility and equity implications of interventions for the prevention of wasting in infants and young children: a rapid qualitative evidence synthesis (QES) for a guideline. PROSPERO 2022 CRD42022351360 ([175](#)).

### Research needs

Future research should:

- further evaluate prevention versus management approaches for wasting and nutritional oedema
- understand the feasibility and sustainability of blanket compared to targeted approaches across settings.

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



## 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.<sup>1</sup>

### 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).

<sup>1</sup> 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](#)).

## 6. Dissemination, implementation and future updates



## 6. Dissemination, implementation and future updates

This section details the dissemination, implementation, monitoring and evaluation of the guideline and outlines the process for future updates to the recommendations.

### 6.1 Dissemination

The current guideline will be posted on the WHO website, including the WHO Nutrition website and the WHO e-Library of Evidence for Nutrition Actions (eLENA). In addition, it will be disseminated through a broad network of international partners, including WHO country and regional offices, ministries of health, WHO collaborating centres, universities, other United Nations agencies, and non-governmental organizations.

### 6.2 Implementation

As referred to across the Remarks, Rationale and Evidence to Decision sections of this guideline, many of these recommendations and even some good practice statements, will have very different implications for their operationalization depending on context. As such, detailed operational guidance will be developed in order to assist governments and implementing organizations to navigate what is needed from health workers and health systems to allow them to deliver the care and interventions outlined in this guideline.

The operational guidance will take the form of clinical manuals, training packages, decision-making tools and monitoring and evaluation guidance. Three main audience levels will be targeted: policymakers, programme managers, and health workers; and the relevant operational guidance developed for each level.

The newly formed Technical Advisory Group on Wasting and Nutritional Oedema (Acute Malnutrition), coordinated by UNICEF and WHO will be key to prioritizing, developing, and reviewing this guidance. The members of this group have been selected for their broad gender and geographical representation as well as bringing a wide range of experiences, backgrounds, and skills to advise WHO in this key output of this guideline development process. There are a number of government representatives in the TAG, but WHO will also seek to gather the identified needs of as many Member States as possible as well as involving them in the development and review of operational guidance. For further information see the [Technical Advisory Group home page](#).

### 6.3 Monitoring and evaluation of guideline implementation

The impact of this guideline and the associated operational guidance, manual, and training courses can be evaluated within countries (i.e. through monitoring and evaluation of the programmes implemented at national or regional scale) and across countries (i.e. adoption and adaptation of the guideline globally).

For evaluation at the global level, the WHO Department of Nutrition and Food Safety has a centralized platform for sharing information on nutrition actions in public health practice implemented around the world. By sharing programmatic details, specific country adaptations and lessons learnt, this platform will provide examples of how guidelines are being translated into nutrition actions.

## 6.4 Updating recommendations

WHO will oversee the monitoring of new evidence relevant to the scope of this guideline and, through the mechanism of the newly formed Technical Advisory Group on Wasting and Nutritional Oedema (Acute Malnutrition) coordinated by UNICEF and WHO (see the [Technical Advisory Group home page](#)), will decide on the time frame to trigger the process for updating or formulating new recommendations. The members of this TAG have been selected for their broad gender and geographical representation as well as the wide range of experiences, backgrounds, and skills they bring so that they can advise WHO in this key aspect of when to update the guideline.

Recommendations in this guideline that are conditional and those with low or very low certainty evidence may be prioritized for updates. If there is a decision to update or formulate new recommendations, the GDG will be reconvened. GRADE methods for guidelines will be followed when updating or formulating new recommendations.

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### Effectiveness systematic review: interventions for mothers/caregivers of infants at risk of poor growth and development

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## Diagnostic test accuracy review: identification of dehydration in infants and children with wasting and/or nutritional oedema

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## Effectiveness systematic review: rehydration fluids for infants and children with wasting and/or nutritional oedema and dehydration but who are not shocked

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## Effectiveness systematic review: hydrolyzed formulas for infants and children with severe wasting and/or nutritional oedema who are not tolerating F-75 or F-100

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## Effectiveness systematic review: ready-to-use therapeutic food for treatment of severe wasting and/or nutritional oedema

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## Effectiveness systematic reviews: dietary management of infants and children with moderate wasting

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## Effectiveness systematic reviews: dietary management of infants and children with moderate wasting

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## Effectiveness systematic review: identification and management of wasting and nutritional oedema by community health workers

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## Effectiveness systematic review: post-exit interventions after recovery from wasting and/or nutritional oedema

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## Prognostic systematic review: community characteristics that increase or mitigate risk of wasting and nutritional oedema

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## Effectiveness systematic review: interventions for prevention of wasting and nutritional oedema

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## Effectiveness systematic review: population-based interventions compared to targeted interventions for prevention of wasting and nutritional oedema

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## Qualitative evidence synthesis: values and preferences

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## Qualitative evidence syntheses: equity, acceptability and feasibility of management and post-exit interventions for infants at risk of poor growth and development, wasting and nutritional oedema

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## Qualitative evidence synthesis: equity, acceptability and feasibility of supplemental milk for infants at risk of poor growth and development

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## Qualitative evidence synthesis: equity, acceptability and feasibility of interventions for prevention of wasting and nutritional oedema

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## Systematic reviews of economic evidence: admission, referral, transfer, and exit criteria

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## Systematic reviews of economic evidence: management and post-exit interventions for infants at risk of poor growth and development, wasting and nutritional oedema

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## Systematic reviews of economic evidence: identification and management of wasting and nutritional oedema by community health workers and interventions for prevention of wasting and nutritional oedema

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## Annex 2: Declarations of interest for each guideline question

### A. Management of infants less than 6 months of age at risk of poor growth and development

Admission, referral, transfer, and exit criteria	Jay Berkley was an author on 4 of 8 papers in the prognostic systematic review for this guideline question. He was not allowed to participate in discussions or decisions or formal voting for this guideline question, yet clarifications were permissible at the discretion of the GDG Chairs.
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Management of breastfeeding/lactation difficulties in mothers/ caregivers of infants at risk of poor growth and development	None
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Supplemental milk for infants at risk of poor growth and development	Tahmeed Ahmed was an author on the only paper covering all comparisons in the effectiveness systematic review for this guideline question. He was not allowed to participate in discussions or decisions or formal voting for this question, yet clarifications were permissible at the discretion of the GDG Chairs.
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Antibiotics for infants at risk of poor growth and development	None
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Interventions for mothers/ caregivers of infants at risk of poor growth and development	Marko Kerac was an author on the effectiveness systematic review that was commissioned for this guideline question. He was not allowed to participate in discussions or decisions or formal voting for this question, yet clarifications about the systematic review were permissible at the discretion of the GDG Chairs.
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### B. Management of infants and children 6–59 months with wasting and/or nutritional oedema

Admission, referral, transfer, and exit criteria	Tahmeed Ahmed (4 papers), Beatrice Amadi (2 papers), Jay Berkley (4 papers), Marko Kerac (1 paper), Sunita Taneja (1 paper), and Indi Trehan (1 paper) were authors on studies in the prognostic systematic review for this guideline question, which included 62 papers. They were allowed to participate in discussions and in decisions regarding the recommendation and formal voting for this question.
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Identification of dehydration in infants and children with wasting and/or nutritional oedema	Praveen Kumar was an author of 1 of 5 studies in the diagnostic test accuracy systematic review for this question. He was allowed to participate in discussions and in decisions and formal voting for this guideline question.
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## B. Management of infants and children 6–59 months with wasting and/or nutritional oedema

Rehydration fluids for infants and children with wasting and/or nutritional oedema and dehydration but who are not shocked	Praveen Kumar was an author of the only study in the effectiveness systematic review for this guideline question. He was not allowed to participate in discussions or decisions or formal voting for this question, yet clarifications were permissible at the discretion of the GDG Chairs.
Hydrolyzed formulas for infants and children with severe wasting and/or nutritional oedema who are not tolerating F-75 or F-100	Beatrice Amadi was an author of the only study in the effectiveness systematic review for this question. She was not allowed to participate in discussions or decisions or formal voting for this guideline question, yet clarifications were permissible at the discretion of the GDG Chairs.
Ready-to-use therapeutic food for treatment of severe wasting and/or nutritional oedema	None
Identification and management of wasting and nutritional oedema by community health workers	None
Dietary management of infants and children with moderate wasting	<p>Lieven Huybrechts, Marko Kerac, Robert Bandsma and Tahmeed Ahmed were each authors of 1 study in the effectiveness systematic review for this guideline question which included 5 papers. They were allowed to participate in discussions and in decisions regarding the recommendation and formal voting for this guideline question.</p> <p>Indi Trehan was an author of 6 of 12 papers in the prognostic systematic review. He was allowed to participate in discussions but not in decisions regarding the recommendation or formal voting for the specific part of the recommendation linked to determining which infants and children should be considered for SFFs.</p> <p>Lieven Huybrechts, Marko Kerac, Robert Bandsma, Tahmeed Ahmed, Indi Trehan, and Per Ashorn were authors of studies in the systematic reviews for this question focused on types of SFFs. They were allowed to participate in discussions and in decisions regarding the recommendation and formal voting for this guideline question.</p>

## C. Post-exit interventions after recovery from wasting and/or nutritional oedema

Tahmeed Ahmed was an author of 1 of 2 studies on psychosocial stimulation in the effectiveness systematic review for this question and Robert Bandsma was an author of 1 study in the qualitative evidence synthesis on this intervention. They were allowed to participate in discussions and in decisions regarding the recommendation and formal voting for this guideline question.

Jay Berkley was an author on the only study on daily oral co-trimoxazole prophylaxis in the effectiveness systematic review for this guideline question. He was not allowed to participate in discussions or decisions or formal voting for this question, yet clarifications were permissible at the discretion of the GDG Chairs.

## D. Prevention of wasting and nutritional oedema interventions

Tahmeed Ahmed was an author of 1 of 5 studies in an effectiveness systematic review for this guideline question on FBFs for infants and children, 1 of 8 studies on LQ-LNS and MQ-LNS for infants and children and 1 of 9 studies on SQ-LNS for infants and children. Bindi Borg was an author of 1 of 5 studies on FBFs for infants and children, 1 of 8 studies on LQ-LNS and MQ-LNS for infants and children and 1 of 9 studies on SQ-LNS for infants and children. Lieven Huybregts was an author of 1 of 8 studies on LQ-LNS and MQ-LNS for infants and children and 2 of 9 studies on SQ-LNS for infants and children. They were allowed to participate in discussions and decisions regarding the recommendations and formal voting for these interventions.

Per Ashorn was an author of 1 of 5 studies on SQ-LNS for infants and children, 1 of 5 studies on FBFs for infants and children and 1 of 8 studies on LQ-LNS and MQ-LNS for infants and children. However, Per Ashorn was an author of 2 of 3 studies on SQ-LNS for mothers and children. He was allowed to participate in discussions and formal voting for the above comparisons aside from SQ-LNS for mothers and children, but was not allowed to participate in discussions or decisions regarding recommendations on SFFs.

Kathryn Dewey was an author of 4 of 9 studies on SQ-LNS for infants and children, 1 of 5 studies on MNPs, 1 of 5 studies on FBFs for infants and children, 1 of 8 studies on LQ-LNS and MQ-LNS for infants and children and 3 of 3 studies on SQ-LNS for mothers and children. She was not allowed to participate in discussions or decisions regarding recommendations nor formal voting for any of these interventions.

Marie Ruel was an author of 2 of 9 studies on SQ-LNS for infants and children. She was allowed to participate in discussions and decisions regarding the recommendation for infants and children and formal voting for specially formulated food interventions for infants and children. However, Marie Ruel was an author of the only study in the effectiveness systematic review on blanket versus targeted approaches. She was allowed to participate in discussions and formal voting for the above comparisons aside from blanket versus targeted approaches but was not allowed to participate in discussions or decisions regarding recommendations on SFFs.

Lieven Huybregts was also an author of 1 of 2 studies on unconditional cash transfers. He was not allowed to participate in discussions or decisions regarding unconditional cash transfers.

Helen Young was an author on the review on community characteristics that increase or mitigate risk of wasting and nutritional oedema that was commissioned for one of the prevention guideline questions. She was not allowed to participate in discussions or decisions or formal voting for this question

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**For further information, please contact:**

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