

Handbook

Preliminary version for
country introduction



World Health
Organization

**GUIDELINES FOR AN INTEGRATED APPROACH TO THE NUTRITIONAL
CARE OF HIV-INFECTED CHILDREN (6 MONTHS–14 YEARS)**

**Guidelines for an Integrated Approach to the
Nutritional care of HIV-infected children
(6 months-14 years)**

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WHO Library Cataloguing-in-Publication Data

Guidelines for an integrated approach to the nutritional care of HIV-infected children
(6 months-14 years).

3 pts : Handbook -- Guide for local adaptation -- Chart booklet
Edition " Preliminary version for country introduction"

1.HIV infections - therapy. 2.Acquired immunodeficiency syndrome - therapy. 3.Child
nutrition disorders - therapy. 4.Nutrition therapy. 5.Delivery of health care, Integrated
6.Community health services. 7.Practice guidelines. 8.Child. I.World Health Organization.

ISBN 978 92 4 159752 4

(NLM classification: WC 503.6)

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Printed by the WHO Document Production Services, Geneva, Switzerland

Table of Contents

Acknowledgement	v
Acronyms	vi
Introduction	1
Checklist for facility/staff readiness to provide integrated nutrition care	3
SECTION ONE – ASSESS, CLASSIFY AND DECIDE A NUTRITIONAL CARE PLAN	5
STEP 1. ASSESS AND CLASSIFY THE CHILD'S GROWTH	7
STEP 2. ASSESS THE CHILD'S NUTRITIONAL NEEDS	11
STEP 3. DECIDE A NUTRITION CARE PLAN	15
Set targets for energy and micronutrient intakes	16
Nutritional supplements to provide additional energy	17
Therapeutic feeding for children with severe malnutrition	17
When to change Nutritional Care plans	18
Entry and exit criteria for nutritional supplements	18
Entry and exit criteria for therapeutic feeding	18
Nutrition Care Plan A for the child who is growing well ± ART	20
Nutrition Care Plan B for the child with poor weight gain or increased nutritional needs	21
Nutrition Care Plan C for the severely malnourished HIV-infected child	22
SECTION TWO – IMPLEMENT THE NUTRITION CARE PLAN	23
STEP 4. WHAT DOES THE CHILD EAT AND DRINK?	25
Counselling Sheet on Appropriate Feeding	28
STEP 5. DISCUSS WHO GIVES THE CHILD HIS/HER FOOD AND HOW THE CHILD EATS	29
STEP 6. ASSESS IF THERE IS FOOD AND INCOME AT HOME	33
When to provide Family Food Support	35
When to stop Family Food Support	35
STEP 7. DISCUSS EXERCISE AND AVOIDING RISK FACTORS FOR MALNUTRITION	37
STEP 8. DECIDE IF TO REFER AND WHEN TO REVIEW	43

SECTION THREE – CHILDREN WITH SPECIAL NEEDS	45
STEP 9. THE HIV-INFECTED CHILD WITH SPECIAL NEEDS	47
A. Eating during and when recovering from an illness - see Suggestion sheet 1	47
B. Poor appetite (anorexia) - see Suggestion sheet 2	48
C. Sore mouth or throat - see Suggestion sheet 3	48
D. Change in taste - see Suggestion sheet 4	48
E. Children with diarrhoea - see Suggestion sheet 5	48
F. Nausea and/or vomiting - see Suggestion sheet 6	48
G. Anaemia	49
STEP 10. CHILDREN ON ANTIRETROVIRAL TREATMENT	51
What to do if a child on ART is gaining weight well	53
What to do if a child on ART is not gaining weight	53
What to do if the child has nausea and vomiting when taking antiretroviral drugs	54
Check for metabolic abnormalities	54
Lactic acidosis	54
Altered Glucose metabolism	55
Lipodystrophy	56
Routine monitoring of children on ART for metabolic disorders	57
References	59
Appendix I - Staging criteria for children infected with HIV	63
Appendix II - Composition of different Therapeutic Feeding options	65
Appendix III - Home - based foods to increase energy intake	67
Appendix IV - Suggestion sheets to improve food intake	69
<i>Suggestion sheet 1. How to add extra energy and protein to everyday foods</i>	69
<i>Suggestion sheet 2. What to try if the child does not feel like eating</i>	70
<i>Suggestion sheet 3. What to try if the child has a sore/dry mouth or throat</i>	71
<i>Suggestion sheet 4. What to try if the child has a change in taste</i>	72
<i>Suggestion sheet 5. What to try if the child has diarrhoea</i>	73
<i>Suggestion sheet 6. What to try if the child has nausea and/or vomiting</i>	74
Appendix V - Guiding Principles for Complementary Feeding of the Breastfed Child	75
1. Duration of Exclusive Breastfeeding and Age of Introduction of Complementary Foods	75
2. Maintenance of Breastfeeding	75
3. Responsive Feeding	75
4. Safe Preparation and Storage of Complementary Foods	75
5. Amount of Complementary Food Needed	75
6. Food Consistency	75
7. Meal Frequency and Energy Density	76
8. Nutrient Content of Complementary Foods	76
9. Use of Vitamin-Mineral Supplements or Fortified Products for Infant and Mother	76
10. Feeding During and After Illness	76

Appendix VI - Guiding principles for feeding non-breastfed children 6-24 months of age	77
1. Amount of Food Needed	77
2. Food Consistency	77
3. Meal Frequency and Energy Density	77
4. Nutrient Content of Food	77
5. Use of Vitamin-Mineral Supplements or Fortified Products	77
6. Fluid Needs	78
7. Safe Preparation and Storage of Complementary Foods	78
8. Responsive Feeding	78
9. Feeding During and after Illness	78
Appendix VII - Five Keys to Safer Food	79

Acknowledgement

The primary author of this document is Professor Nigel Rollins, at the time of writing he was in the Department of Paediatrics and Child Health, Nelson R Mandela School of Medicine, University of KwaZulu - Natal, Durban, South Africa. He declared no conflict of interest.

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WHO acknowledges the generous financial and technical contribution and support of the National Institutes of Health (NIH)/United States Department of Health and Human Services (USDHHS), without which this document would not have been possible.

Many people from numerous countries contributed their valuable time and expertise to the development and field-testing of these guidelines. However, some individuals deserve special recognition to the roles they played.

- Carmen Casanovas, Technical Officer, Department of Nutrition for Health and Development WHO, who reviewed and finalized the document.
- Mercedes de Onis, Medical Officer, Chantal Gegout and Adelheid Onyango, Technical Officers from the Department of Nutrition for Health and Development, Siobhan Crowley and Micheline Diepart, Medical Officers, from the HIV/AIDS Department, Bernadette Daelmans and Lulu Muhe, Medical Officers and André Briend, Scientist from the Department of Child and Adolescent Health WHO for their valuable scientific contribution.
- Ruth Nduati, Department of Paediatrics, University of Nairobi, Kenya who planned and assisted in the field-tests and reviewed the document. She declared no conflict of interest.
- Ferima Coulibaly-Zerbo, World Health Organization Nutrition Technical Officer for Southern Africa who contributed with her expertise to field-testing the document.
- Daniel Raiten, Health Scientist Administrator, *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD/NIH) who provided his technical expertise and support throughout the whole process and helped support and coordinate a review consultation to review the guidelines. He declared no conflict of interest.
- Special thanks go to all participants of the Washington DC WHO/NIH meeting which took place in May 2006 for their valuable input.
- Ann-Beth Moller, Technical Officer, Department of Nutrition for Health and Development WHO, who reviewed and edited the document and assisted in the clearance process.

It is expected to update the guideline by 2015.

Acronyms

AIDS	Acquired Immunodeficiency Syndrome
ART	Antiretroviral treatment
ARV	Antiretroviral
BMI	Body Mass Index
CBO	Community-based organization
HIV	Human Immunodeficiency Virus
IMAAI	Integrated Management of Adult and Adolescent Illness
IMCI	Integrated Management of Childhood Illness
LIP	Lymphocytic interstitial pneumonitis
MUAC	Mid-upper arm circumference
NGO	Non-governmental organization
NICHD	National Institute of Child Health and Human Development
NIH	National Institutes of Health
NNRTI	Non-nucleoside reverse transcriptase inhibitor
NRTI	Nucleoside reverse transcriptase inhibitor
OI	Opportunistic Infection
PHC	Primary health care
PI	Protease inhibitor
PMTCT	Prevention of Mother-to-Child Transmission
RDA	Recommended daily allowance
RUTF	Ready to Use Therapeutic Food
SAM	Severe Acute Malnutrition
TB	Tuberculosis
USDHHS	United States Department of Health and Human Services
WFA	Weight-for-age
WFH	Weight-for-height
WHO	World Health Organization

Introduction

The Guidelines provide a framework for integrating nutrition support into the routine care of HIV-infected children. Although the severe nutritional consequences of HIV infection in adults and children has been recognised for many years, gaps remain in the evidence-base for defining effective interventions to prevent and treat HIV-associated malnutrition in resource-constrained settings. As a result, the development and implementation of guidelines on how best to offer nutritional care to HIV-infected children has lagged. The delivery of such care has also been compromised by service providers' overburden and need for training, recurring staff losses and weakened health care systems in HIV-affected settings. Finally, vertical implementation of HIV programmes, such as PMTCT and ART, have resulted in missed opportunities to gain synergy with other existing services.

In 2004 WHO commissioned a technical review of the nutritional requirements of adults and children infected with HIV as an evidence-base for the development of nutritional care guidelines. These were presented at the WHO technical consultation on Nutrition and HIV/AIDS held in Durban, April 2005, where participants called for urgent action to '*Develop practical nutrition assessment tools and guidelines for home, community, health facility-based and emergency programmes.*' Specific aspects of this recommendation were to '*Develop standard and specific guidelines for nutritional care of individuals ...*' and to '*Review and update existing guidelines to include nutrition/HIV considerations (e.g., integrated management of adolescent and adult illness, ARV treatment, nutrition in emergencies)*'.

HIV-infected children deserve special attention because of their additional needs to ensure growth and development and their dependency on adults for adequate care including nutrition care and support for treatment. This is of particular importance in light with the recommendation to start treatment as soon as possible in infected children and the fact that nutrition plays an important role in support to antiretroviral treatment. It was therefore proposed to first develop guidelines for children and thereafter consider a similar approach for other specific groups.

In May 2006, WHO and NIH held a technical consultation in Washington, DC to review the guidelines and the technical and scientific base used in development of the guidelines. Participants included scientists and experienced practitioners. Feedback was made following careful assessment and using a feedback form.

The guidelines were field-tested twice in South Africa (2006) in Durban at the Prince Mshiyeni Memorial Hospital and in Johannesburg at the Harriet Chezi Pediatric ARV clinic in Soweto. The information was presented in a full document (The Handbook) and the charts were used and field-tested in a separate one (The Chart Booklet). The two field-tests focused on testing the use, understanding, flow and organization of the information given. Several health workers from different backgrounds, i.e. nutritionists, dieticians, paediatricians, clinicians, chief nurses and community workers, participated in the field-test. The guidelines proved to be very useful, easy to follow, and certainly filled a gap in nutrition assessment, classification and management as far as nutrition is concerned. Some useful suggestions from the group were incorporated into the second version.

The revised version of the guidelines were again field-tested twice in Nairobi, Kenya (2007) and Dr Ruth Nduati an expert in the area assisted WHO in planning and conducting the field-test. This was followed by a third field-test in Malawi by Dr Mark Manary. Feedback was considered and a revised version of the guidelines was prepared.

Two meetings were held in Geneva (24 May 2007 and 10-12 July 2007) to review and discuss the revised guidelines with experts in various areas: growth reference study, emergencies, HIV/AIDS and nutrition, paediatric care, child health. Feedback was considered and agreement reached on all scientific information and recommendations.

The content of these guidelines acknowledges that wasting and undernutrition in HIV-infected children may reflect a series of failures within the health system, the home and community and not just a biological process related to virus and host interactions. In trying to protect the nutritional well-being or reverse the undernutrition experienced by infected children, issues of food insecurity, food quantity and quality as well as absorption and digestion of nutrients are considered. Interventions are proposed that are practical and feasible in resource poor settings and offer a prospect of clinical improvement.

The guidelines do not cover the feeding of infant 0 to 6 months old, because the specialised care in this age group is addressed in other WHO guidelines and documents.¹

Guidelines Outline

Aim: To provide simple guidelines for integrating nutrition into the routine care of children with a confirmed diagnosis of HIV infection at primary health care. These guidelines were developed making sure that they:

- are simple and clear to use;
- provide concrete advice that can be easily implemented in programme settings;
- are based on the best available evidence from research on HIV-infected individuals but also use the wealth of other non-HIV nutritional research and evidence where appropriate;
- refer to and link with other standard guidelines and courses such as the management of children with severe malnutrition, the integrated management of childhood illness (IMCI), the integrated management of adolescent and adult illness (IMAI);
- are organised in such a way that can be easily updated with new data and recommendations as they become available;
- have each section built on earlier sections yet result in meaningful sections when read alone.

Local adaptations

Sections of these guidelines will need to be adapted at country level to reflect local dietary practices, national policies and protocols for food and nutrition assistance, and protocols for the management of severe malnutrition. This is discussed further in the **Guide for local adaptation**.

What is included in the guidelines?

There are three components to these guidelines:

- a. The **Handbook** (this document) that outlines the key message and rationale related to each of the *10 Steps* for an Integrated Approach to the Nutritional care of HIV-infected children. These Steps describe the actions that are suggested for health workers at primary health care facilities. Appendices within these Guidelines provide additional information on issues relevant to the care of HIV-infected children, including guidance on HIV staging, non-nutritional care, and WHO Guiding Principles for feeding breastfed and non-breastfed children after 6 months.
- b. A set of colour-coded algorithms - **Chart booklet** - that leads a practitioner through the process of assessing, classifying, and managing each HIV-infected child and his/her caregivers. These steps are similar to the IMCI chart booklet. The Nutrition and HIV chart booklet can be used as a resource during assessments. It is a rapid reminder of

¹ The guidelines and documents are available in the following sites:

http://www.who.int/nutrition/topics/feeding_difficulty/en/index.html

http://www.who.int/child_adolescent_health/topics/prevention_care/child/nutrition/hivif/en/index.html

questions to be asked, measurements to be collected, and guidance on how these pieces of information should be used to assess, classify and manage children.

- c. An outline of **Tasks for local adaptation**. A brief summary of what countries and sites need to consider and content that should be reviewed to reflect local circumstances, resources, foods and culture.

The new WHO growth standards and definitions for severe malnutrition

The new WHO growth standards are the basis for growth assessment and the case definitions of growth failure or severe malnutrition. Severe malnutrition is described in terms of z-score (standard) deviations away from the median expected weight-for-height (WFH) rather than as a percentage (e.g. 70%) of the expected WFH as formerly applied in malnutrition management programmes. With the adoption of the WHO standards, new tools (tables, charts) have been made available for field use of the z-score. Countries may still be using growth charts based in former references and approaches for defining severe malnutrition. The **Guide for local adaptation** provides orientation on how to proceed if that is the case.

Guidelines vs. Training

Although the guidelines are intended to be comprehensive and self-explanatory, training is required so that practitioners are familiar with the layout and content and understand how these guidelines can be used routinely. Accompanying training materials with illustrations and case studies will be developed for this purpose.

Checklist for facility/staff readiness to provide integrated nutrition care

Equipment needed

- Weighing scales
- Length/height boards
- MUAC tapes
- Demonstration kitchen at clinic or other local facility

Procedures disseminated

- Protocols for nutritional management and support
- Protocols for nutritional care and support for children
- Entry and exit criteria for food or other nutritional support
- Protocols for outpatient management of severe malnutrition
- Referral criteria and where to refer to (see below)

Supplies needed

- Micronutrients as per national policy
- Routine food support supplies
- Therapeutic food support supplies (RUTF)

Familiarity with local referral and support resources

- Social welfare grants and eligibility requirements
- Livelihood support programs
- Water and sanitation improvement services
- Infant feeding support groups
- HIV support groups
- Community garden and other food production initiatives

- Food for work, food for education, and other supplementary feeding programmes
- Other community-based services that provide nutrition advice and/or support (e.g. faith-based organizations or women's groups with trained volunteers).

Values used in these guidelines

All values and figures used in these guidelines will be continuously revised and updated, according to the most recent scientific evidence and research results. If there is any critical change to be made, this will be immediately reflected on the web version of the guidelines, indicating date of the change.

**SECTION ONE - ASSESS, CLASSIFY AND
DECIDE A NUTRITIONAL CARE PLAN**

STEP 1. ASSESS AND CLASSIFY THE CHILD'S GROWTH

Key message 1

Regular and careful assessment of a child's growth helps monitor HIV disease progression, can identify complications early, and so offer the opportunity to intervene.

HIV infection can impair the nutritional status of infected children from early in life. Growth faltering and reduction in length and height often occurs even before opportunistic infections or other symptoms in almost all infected children. In these children, growth is a good reflection of a child's 'lean body tissue' - the total amount of muscle and non-fat tissue in the body. Another good indicator of a child's general nutritional status is their mid-upper arm circumference (MUAC). When children with HIV infection become malnourished they lose more muscle than malnourished children without HIV infection. Malnourished children can also lose fat reserves, irrespectively of their HIV-status. Children with severe growth failure and loss of muscle (lean body tissue) are at an increased risk of death. Antiretroviral treatment (ART), when clinically indicated, improves weight, growth and development of infected children and improves their life expectancy. WHO guidelines recommend treating all HIV infants.

Measuring weight is routine in most facilities and is helpful for monitoring progress. Scales should be calibrated and checked regularly and children should be routinely weighed with minimal clothing and without shoes or caps so that all measurements are standard and comparable between visits. Even though some primary health care facilities, and even outpatient departments in local hospitals, find it difficult to routinely measure length or height, it is recommended to use this measurement, since in combination with weight, it provides the most accurate way of assessing a child's nutritional status i.e. weight-for-height and body mass index. Measuring the mid-upper arm circumference is also a helpful way of screening children for malnutrition and helps to identify children at high risk of mortality. It can easily be performed at any level by trained health providers. However, MUAC does not respond rapidly when malnourished children are treated, and so it is less helpful as a way of measuring recovery or improvement of nutritional status and to evaluate nutrition interventions over a short period of time.

Children who are well and healthy should gain weight and length/height. Child health cards record the weight of children over time. Children who are growing normally follow a growth curve parallel to one of the standard growth curves. Weight loss or failure to gain weight can be identified by observing the child's weight over time. When weight "falters" or the growth curve "flattens" and is no longer parallel to the chart line this indicates the need for clinical assessment, management and nutritional intervention and possibly ART.

In children 6-60 months, severe malnutrition is marked by the presence of any of the following:

- weight-for-height is below -3 z-score* of the WHO growth standards, **or**
- there are signs of severe visible wasting, **or**
- oedema of both feet is present, **or**
- MUAC is less than 115 mm in children up to 60 months of age.

In children 5-14 years there is less experience of screening for severe malnutrition; the WHO 2007 reference for school-aged children and adolescents should be used for this age group. The following may be used for screening and diagnosis:

- BMI for age is below -3 z-score* of the WHO 2007 reference value, **or**
- there are signs of severe visible wasting, **or**

* See page 9 and Guide for local adaptation.

- oedema of both feet is present,
- MUAC – the most appropriate cut-off values still need to be determined for this age group. The following values still require formal validation but may be helpful for screening:
 - in children 5-9 years of age, a MUAC less than 129 mm (-3 z-score according to growth standards for 5 years old boys);
 - in children 10-14 years of age, a MUAC less than 160 mm (IMAAI guidelines).

Children with severe malnutrition must be identified and managed correctly, including giving therapeutic feeding. A full clinical examination is required including assessment for ART if they are not already on treatment; if the child is already on ART it is important to assess if there is a problem with adherence or poor response to treatment or new opportunistic infection (OI). This may require admission to hospital if the child has a poor appetite, or if the cause of weight loss needs further investigation. Therapeutic feeding of children in health facilities should be managed by trained staff (doctors, nurses, nutritionists and feeding assistants) with experience in nutritional stabilisation and rehabilitation; children can be managed at home if they have a good appetite (conduct a test meal at the clinic), and there is good supervision at home and therapeutic feeds can be provided and supported. Children with no appetite should receive inpatient care.

If weight-for-height and MUAC cannot be measured and a child is found to have a *very low weight* i.e. weight-for-age is below -3 z-score of the WHO standards value and no visible signs of severe malnutrition, then he/she should be assessed carefully for other problems, considering admission for investigation if the cause of *very low weight* has not been explained/diagnosed, the child should also be admitted if clinical signs of severe malnutrition have been found.

Identifying the child at risk of undernutrition

It is better to identify infants and children who are at risk of undernutrition, or who have poor growth, before they become severely malnourished. Therefore if:

- a mother reports that her child is failing to gain weight, **or**
- the child has had a poor appetite recently, **or**
- the child is not gaining weight and his/her growth curve is flattening, **or**
- the child is losing weight and the growth curve is dropping downwards, **or**
- there are changes in caregiver or home circumstances.

Then the child should be examined for visible signs of malnutrition i.e. very little subcutaneous fat and muscle (particularly obvious on the upper arm and the thighs and buttocks sagging skin) with or without bipedal oedema. If signs of severe visible wasting are not present the child can be given nutritional support at home with early follow-up (5-7 days), and assessed for ART and/or other medical problems.

Growth assessments at HIV treatment sites/referral facilities

Regular assessment and documentation of height should be performed every 3-6 months. This should be done by staff specifically trained in length/height measurement and with equipment that is regularly calibrated to ensure accuracy. Height is valuable as a measure of linear growth.

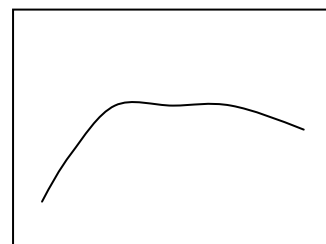
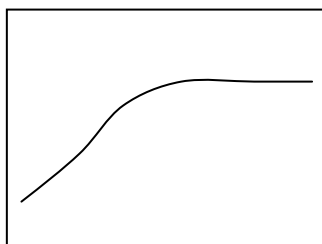
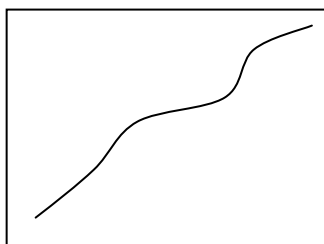
Step 1. Assess and classify child's weight and growth

ASK	LOOK and FEEL	SIGNS	CLASSIFY AS
<p>Ask mother/caregiver (or check the medical records)</p> <p>1. Has the child lost weight during the past month?</p>	<p>1. Look for signs of severe visible wasting</p> <ul style="list-style-type: none"> • Loss of muscle bulk • Sagging skin/buttocks <p>2. Check for presence of oedema of both feet (or sacrum)</p> <p>3. Check the weight and height</p> <ul style="list-style-type: none"> • Is the weight-for-height less than -3 z-score? • Is the child very low weight (weight-for-age less than -3 z-score)? • Is the child underweight (less than -2 z-score)? <p>4. Check the MUAC</p> <p><i>Infants 6-12 months</i></p> <ul style="list-style-type: none"> • Is MUAC less than 115 mm? <p><i>Children 13-60 months</i></p> <ul style="list-style-type: none"> • Is MUAC less than 115 mm? <p><i>Children 5-9 years</i></p> <ul style="list-style-type: none"> • Is MUAC less than 129 mm? <p><i>Children 10-14 years</i></p> <ul style="list-style-type: none"> • Is MUAC less than 160 mm? <p>5. Look at the shape of the growth curve</p> <ul style="list-style-type: none"> • Has the child lost weight since the last visit? (<i>confirm current weight by repeating measurement</i>) • Is the child's growth curve flattening? • Is the child gaining weight? 	<p>Signs of severe visible wasting, or</p> <p>Oedema present in both feet, or</p> <p>Weight-for-height less than -3 z-score, or</p> <p>MUAC less than:</p> <ul style="list-style-type: none"> • 115 mm in infants <i>6-12 months</i> • 115 mm in children <i>13-60 months</i> • 129 mm in children <i>5-9 years</i> • 160 mm in children <i>10-14 years</i> <p>Reported weight loss, or</p> <p>Very low weight (weight-for-age less than -3 z-score), or</p> <p>Underweight (weight-for-age less than -2 z-score), or</p> <p>Confirmed weight loss (>5%) since the last visit,</p> <p>or</p> <p>Growth curve flattening</p> <p>Child is gaining weight</p>	<p>SEVERE MALNUTRITION</p> <p>POOR WEIGHT GAIN</p> <p>GROWING APPROPRIATELY</p>

Ask all questions and complete all assessments with each child

Assess growth in all children

Examples of growing well, curve flattening (crossing growth lines) and losing weight (using weight-for-age charts)



STEP 2. ASSESS THE CHILD'S NUTRITIONAL NEEDS

Key message 2

The nutritional needs of HIV infected children for growth, development and immunological function depend on the stage of disease and history of recent complications such as persistent diarrhoea or opportunistic infections.

Although research has not been conducted to demonstrate that early nutritional support delays the progression to AIDS, early advice and active support is recommended to ensure adequate energy, protein and micronutrient intakes at all stages of HIV infection, prevent growth failure and loss of weight. Malnutrition itself results in decreased immune function and greater susceptibility to infections, accelerating disease progression.

All children and adults need adequate and appropriate food to maintain normal immune and other body functions, HIV-infected children, like any other children, need energy, protein, vitamins and minerals to grow, play and develop normally. These needs change with time and additional energy may be required to fight infections and recover lost weight. When children first become infected with HIV and have only mild symptoms, they need a small amount of extra energy - about 10% more. Children with acute infections such as pneumonia and those with chronic infections such as TB or other complications of HIV e.g. chronic lung disease, lymphocytic interstitial pneumonitis (LIP), persistent diarrhoea or an HIV-related malignancy, have greater nutritional requirements; this increased need may be due to the loss of nutrients e.g. diarrhoea, or the need to fuel the body's inflammatory response. Energy requirements increase by 20-30% during such infections and recovery. As in asymptomatic children, protein should contribute about 10-15% of the energy intake and there is no need for additional protein other than what is present in a balanced diet. Children with advanced disease are commonly severely malnourished with very poor muscle bulk, minimal fat reserves and low levels of all vitamins, minerals and other trace elements and need up to 50-100% extra energy to recover and regain weight. This is best achieved through therapeutic feeding. Severe malnutrition usually indicates that the child needs ART.

It is important to note that, as with other diseases, when HIV-infected children suffer episodes of diarrhoea, fever, oral thrush or other infections, their appetites decline while their nutrition needs increase. The result of this imbalance is that they lose weight and stop growing. It is, therefore, important for children to maintain their food intake as much as possible during times of acute infection and to increase food in the recovery period. Diets during, and following, illnesses should be varied to include adequate energy, protein, and micronutrients in order to protect and repair the body and thereby recover nutritionally.

Criteria for paediatric clinical stage of HIV infection have been developed (Appendix I). All infants under 12 months of age with confirmed HIV infection should be started on antiretroviral therapy, irrespective of clinical or immunologic stage. Other children should be started on ART when they have either clinical signs of advanced disease, or when their CD4 cell count or CD4% of total fall below age-specific thresholds.

Children with advanced disease need ART in order to improve their immune response (CD4 cell count) and reduce their viral load. After starting ART, children with advanced HIV disease need additional energy, protein and micronutrients in the months that follow to recover weight and especially muscle. Once the child is stable on ART and is clinically well and recovered nutritionally, then the nutritional requirements become similar to those of children who are asymptomatic or with mild disease (see page 16).

'Nutritional needs' are therefore assessed by classifying a child's growth and whether he/she has signs of severe malnutrition or poor growth (see Step 1); and by deciding if the child has an HIV-related condition that chronically increases his/her nutritional requirements.

Nutritional needs do not always relate to HIV staging or whether the child is on ART

Step 2. Assess the child’s nutritional needs

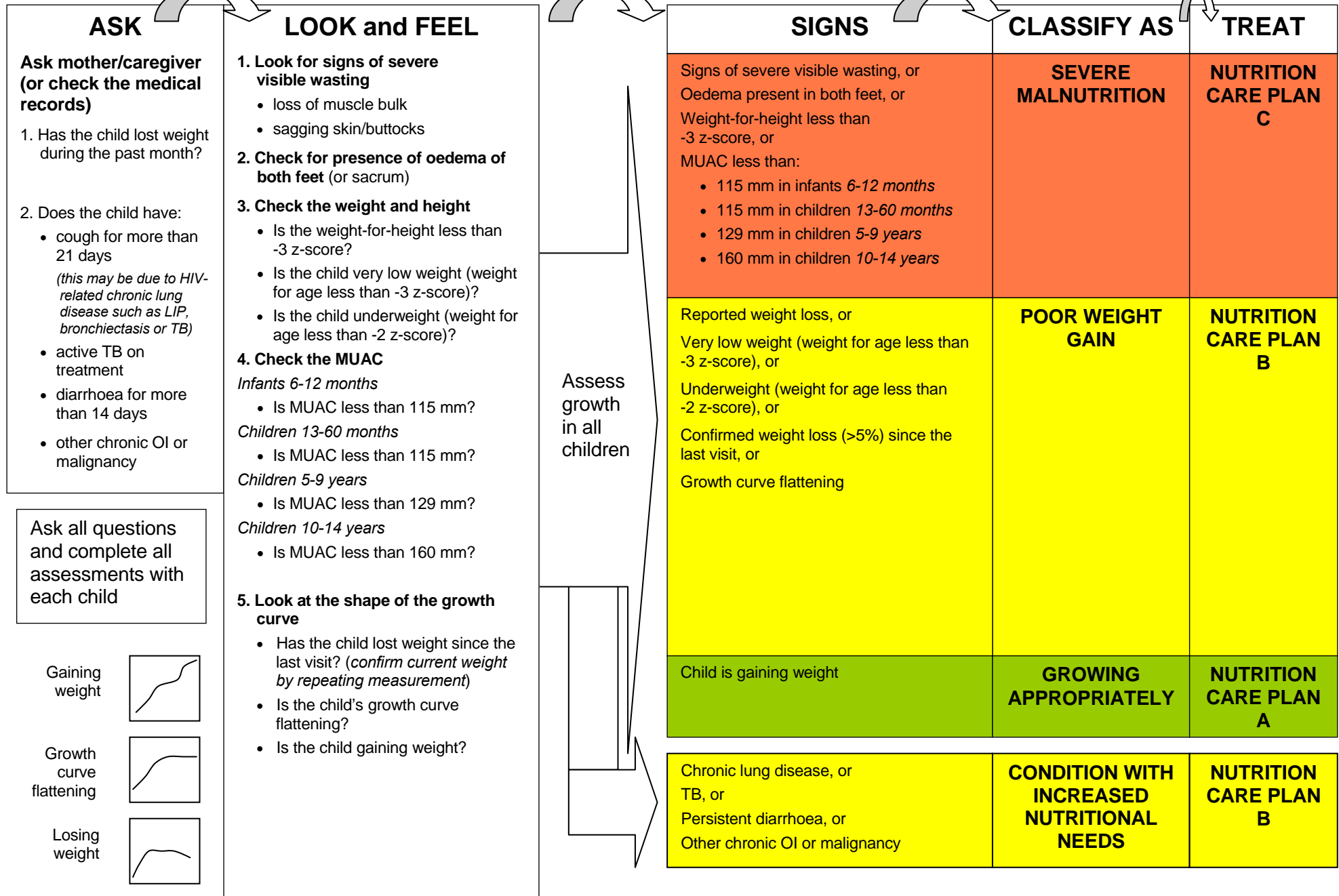
ASK	LOOK and FEEL	SIGNS	CLASSIFY AS
<p>Ask mother/caregiver (or check the medical records)</p> <p>Does the child have:</p> <ul style="list-style-type: none"> cough for more than 21 days? <i>(this may be due to HIV-related chronic lung disease such as LIP or bronchiectasis or TB)</i> active TB i.e. on treatment diarrhoea for more than 14 days other chronic OI or malignancy 	<p>At clinical sites decide if any of the following are present: (check medical notes)</p> <ul style="list-style-type: none"> chronic lung disease, including LIP, bronchiectasis, TB active TB persistent diarrhoea 	<p>Chronic lung disease, or TB, or persistent diarrhoea, or other chronic OI or malignancy</p>	<p>CONDITION WITH INCREASED NUTRITIONAL NEEDS</p>



Note. Chronic lung disease is different from cough or difficult breathing that has started recently.

The classifications in Step1 and Step 2 together indicate how much energy a child requires to maintain normal activity and growth if asymptomatic or recover nutritionally if chronically unwell or with severe malnutrition. These needs can be met by implementing nutritional care plans that indicate the ideal nutritional intake and offer suggestions on how these intakes can be achieved.

Details of Nutrition Care Plans A, B and C are given in Step 3.



STEP 3. DECIDE A NUTRITION CARE PLAN

Key message 3

Nutritional needs are best met through balanced and varied diets in adequate quantities. When these are not available, or demands are high, then additional support may be needed.

As indicated in the previous step, the energy and protein needs of HIV-infected children depend on their age, and growth patterns and the long-term effects of HIV disease such as acute/chronic infection or other complications. Improving the diet alone, though, may not result in normal growth, weight recovery or improvement in clinical status. Children who are not growing well may require additional medical interventions such as TB therapy or antiretroviral treatment; these children should be referred to a health facility where skilled assessment is available, if they are not already under follow-up. Children starting and remaining on ART also need additional energy and protein to build up their muscles, grow again and to be active and playful as the infection comes under control. For this reason, counselling on foods and the ART interaction should be provided when ART treatment starts.

HIV-infected children frequently have low levels of vitamins and other micronutrients. They may not be receiving enough from their diet or their bodies are using up more to fight the HIV infection itself or opportunistic infections. Vitamin A supplements, as in children without HIV infection, reduce diarrhoeal morbidity and mortality especially in young children. Zinc supplements also help HIV-infected children to recover from diarrhoeal illnesses (see Step 9). Although some research studies have shown that some multiple micronutrient supplements may delay HIV disease progression, this evidence is insufficient at present to change current recommendations. Results of more research are needed.

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

In summary, adequate and appropriate nutrition from the early to advanced stages of HIV infections is necessary to optimise health outcomes; however nutrition care and support alone, are NOT an alternative to comprehensive HIV treatment including antiretroviral drugs.

SET TARGETS FOR ENERGY AND MICRONUTRIENT INTAKES**Children that are growing well and asymptomatic or with mild symptoms only; (this may include children on ART >6 months following recovery of weight).**

The energy needs of these children are increased by about 10% (based on actual weight rather than expected weight for age). The child still needs appropriate energy intake according to his/her age and weight. The additional energy helps to maintain normal growth, development, activity and body functions. The additional energy is best given through additional household foods, provided as part of a balanced, varied diet. If there is inadequate food for the child's entire household then *Family Food Support* may be required (see Step 6).

Children with conditions with increased energy needs e.g. chronic lung disease or chronic infections e.g. TB or persistent diarrhoea. Children may, or may not, be on ART.

Children with chronic illnesses may require an extra 20-30% energy each day (based on actual weight rather than expected weight for age). These children also need ART and should be referred to a treatment site for assessment and exclusion of TB. The additional 20-30% energy is best given through additional household foods, provided as part of a balanced, varied diet. If this is not possible, then specific **nutritional supplements** should be offered until the underlying causes of poor weight gain, or causes of additional energy needs e.g. chronic lung disease, TB or HIV-related malignancy are effectively managed (see page 18).

Children with severe malnutrition i.e. signs of visible wasting, bilateral oedema or severely impaired growth. Children may, or may not be, on ART.

These children need 50 to 100% extra energy each day (based on actual weight rather than expected weight for age) for a limited period until weight is recovered. These children should be treated with **therapeutic feeding** which should continue until nutritional recovery is achieved (average ~6-10 weeks). They should also be referred to an ART treatment site for assessment and exclusion of TB.

Severely malnourished infants with no medical complications can often be managed at home if they still have a good appetite. Children with a poor appetite, implying complications, should be referred for inpatient care. The nutritional management of HIV-infected severely malnourished children is largely the same as for children without HIV infection except that they should also be assessed for ART. Other opportunistic infections such as thrush, TB or cryptosporidiosis should also be excluded and treated (see page 11-12).

The presence or absence of appetite i.e. no medical complications determines if the child can be managed at home or needs admission to hospital**Total energy needs of HIV-infected children (kcal/day)**

	Daily energy needs of HIV uninfected children*	HIV infected and asymptomatic 10% additional energy	HIV infected and poor weight gain or other symptoms 20% additional energy	Severely malnourished and HIV infected (post-stabilisation) 50-100% additional energy**
6-11 mo	690	760	830	150-220 kcal/kg/day
12-23 mo	900	990	1080	150-220 kcal/kg/day
2-5 yrs	1260	1390	1510	150-220 kcal/kg/day
6-9 yrs	1650	1815	1980	75-100 kcal/kg/day
10-14 yrs	2020	2220	2420	60-90 kcal/kg/day

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

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

Nutritional supplements to provide additional energy

Children who have chronic increased nutritional requirements, but who are not severely malnourished, may require long-term nutrition support. Nutrition support should provide 20-30% additional energy, over and above the energy provided through the child's routine diet. Nutrition support may be provided in the form of food or other special products such as locally produced fortified porridges i.e. nutritional supplements. The supplement may be prescribed and dispensed through the referral site e.g. ARV treatment site or district hospital or through the primary health care facilities.

Therapeutic feeding for children with severe malnutrition

Therapeutic feeding meets the complete nutritional needs of a severely malnourished child through a specifically prepared and formulated diet.

Severely malnourished children with medical complications should be admitted to hospital for medical care including therapeutic feeding. During the stabilisation phase these children should be fed with a low protein therapeutic milk called F 75 and receive 100 kcal/kg/day. The feeds should be given in small amount and frequently (every 3 to 4 hours).

The child should also receive medical care to manage complications (e.g. severe dehydration, shock, severe anaemia, corneal ulceration).

After the stabilisation phase, these children should receive F 100 therapeutic diet or RUTF (Appendix II).

Severely malnourished children without medical complications may be managed at home. These children should receive 150-220 kcal/kg/day (6 months-5 years) or 60-75 kcal/kg/day (6-14 years) as well as vitamin A supplements, antibiotics and deworming treatment.

It should be provided to the caregiver in form of RUTF in adequate quantities until the child has recovered nutritionally (usually ~6-10 weeks).

Note F 100 milk and F 75 diet are not used for community-based management.

Therapeutic feeding may be offered through a number of approaches.

- Ready to Use Therapeutic Food (RUTF) is a therapeutic food prepared from peanut butter, dried skimmed milk, sugar, oil and a micronutrient mixture so as to have the same energy, protein and micronutrient composition as non diluted F 100, except for iron. It is prepared as a paste that can be stored safely in small plastic containers at room temperature for up to several weeks and given to child on a spoon. RUTFs are appropriate for children with severe malnutrition either when admitted to hospital or when managed at home.
- F 75 is a therapeutic diet. This is prepared from dried skimmed milk, sugar or preferably cereal flour, vegetable oil, mineral and vitamin mixes and water. It can be either ready-to-prepare or prepared with local products. It is used in the stabilisation phase for severely malnourished children with no appetite. F 75 should be used only for inpatient care (see Appendix II).
- F 100 is a therapeutic diet prepared from dried skimmed milk, sugar, vegetable oil, mineral and vitamin mix and water. It is used only for the in-patient feeding of severely malnourished children once they are stable and appetite has recovered (see Appendix II).
- During rehabilitation, other specialised foods such as amylase-enriched, high-energy porridges fortified with micronutrients may be used if they provide the same nutritional composition as F 100. These porridges may be combined with milk to increase their nutrient content.

Note. Nutritional supplements and therapeutic feeding are different from Family Food Support which may be required when a family is found to have insufficient food available. In these situations, even if the child is not malnourished, support such as food packages is recommended (see Step 6). Children may or may not be malnourished.

When to change Nutritional Care plans

Children who respond appropriately to specific interventions e.g. TB treatment, starting ART or therapeutic feeding should re-gain weight. Over time their nutritional needs decrease as underlying infections are treated and there is immunological improvement. Doctors, nurses and dieticians at Referral/Treatment sites need to identify when these changes occur (and investigate appropriately if they do not occur) and decrease the target additional energy i.e. change their care plan.

When children begin recovering from severe malnutrition they regain their appetite and want to eat large amounts of food. Parents/caregivers need to recognise this and provide food/nutritional support to meet this increased appetite. This may require food or other forms of support from health services.

Entry and exit criteria for nutritional supplements

Entry criteria for nutritional supplements (rather than only increased household foods)

If a child requires nutritional care plan B then consider nutritional supplements if:

- Appropriate and adequate food access cannot be guaranteed, **or**
- There is not enough confidence about the ability of the caregiver to prepare and give the appropriate and adequate food-based diet.

Nutritional supplements should be 'prescribed' as a treatment specifically for that child.

Exit criteria for nutritional supplements

A child no longer needs nutrition care plan B if weight-for-age or weight-for-height/length is >-1 z-score and he/she is gaining weight for at least two visits over about 30 days. Any condition with increased energy needs should also have been adequately treated and the condition resolved e.g. TB or persistent diarrhoea. Before stopping nutritional supplements assess financial status and access to food. *Family Food Support* may be needed.

Entry and exit criteria for therapeutic feeding

Entry criteria for therapeutic feeding (Programme on Management of Severe Malnutrition)

Any severely malnourished child should receive therapeutic feeding. If the child has a medical complication or no appetite, the child should be admitted to a health facility. If the child has a good appetite and the caregiving environment is stable and adequate (see Step 5), then this may be offered at home and follow nutritional care plan C.

Exit criteria for therapeutic feeding

'Nutritional recovery' may have different endpoints depending on circumstances. Ideally, both weight and height would be measured and weight-for-height determined. Severely malnourished children usually need therapeutic feeds for about 6-10 weeks. Before stopping therapeutic feeds assess financial status and access to food.

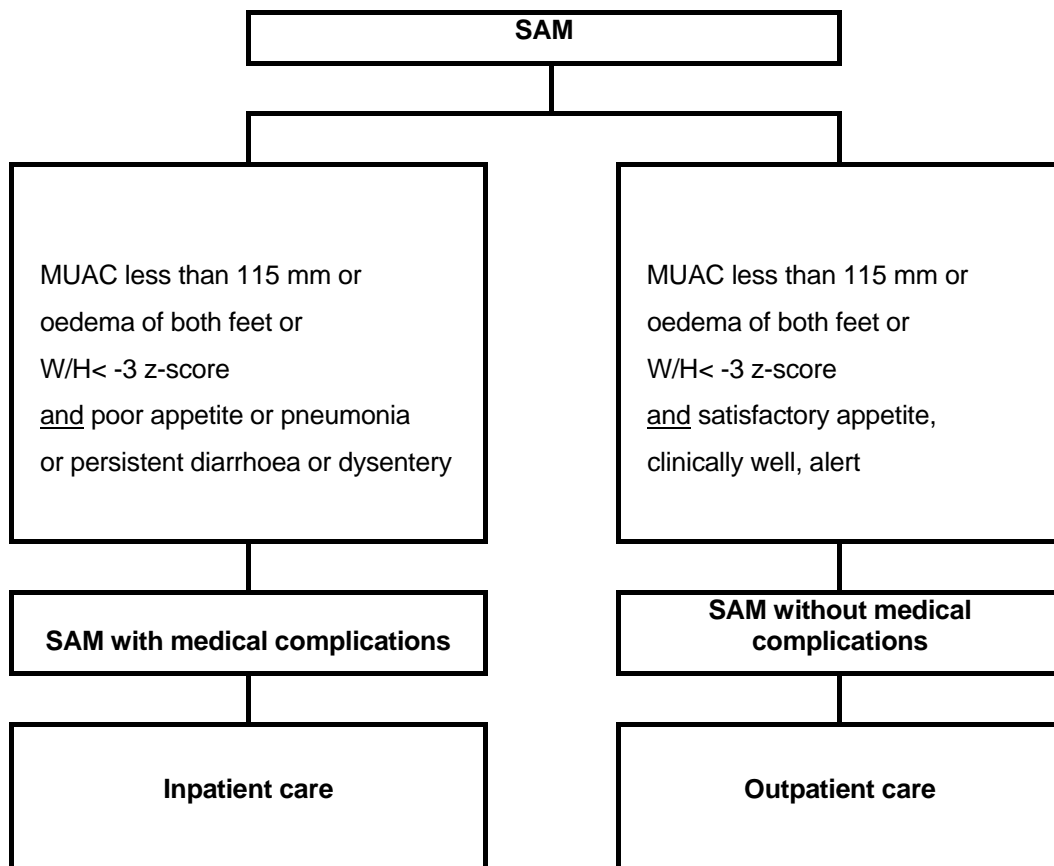
- a. Recovery of severely malnourished children without HIV infection is indicated by loss of oedema, recovery of appetite and achieving at least -1 z-score for weight-for-height or 15% weight gain after the loss of oedema. Severely malnourished HIV-infected children who achieve these should be changed from nutritional care plan C to either plan B or A depending on whether they have a condition with chronic increased nutritional requirements.
- b. In the child who suffered acute/recent weight loss, then nutritional recovery is indicated by the child achieving the same weight-for-age or weight-for-height (at least -1 z-score for WFH) as before the clinical deterioration.
- c. If height has not been measured then nutritional recovery is suggested if the child has lost all oedema, is eating well and gaining at least 5-15 g/kg per day in hospital; if managed in the community, weight gain of 5 g/kg/day should be expected. Therapeutic feeding may be stopped if:

- he/she achieves -1 z-score for WFH, **or**
- he/she regains more than 15% after stabilization.

Note.

- Children starting on ART, especially if severely immuno-compromised, can experience difficulties in the first few months related to immune reconstitution. Nutrition care plans should be followed unless the child's nutritional status deteriorates. If this happens the child should be re-assessed.*
- Children classified as severely malnourished on the basis of low MUAC should be evaluated for recovery on the basis of anthropometric measures other than MUAC. MUAC may lag behind in recovery and may suggest non-response to interventions if considered in isolation.*
- Children starting on ART may regain weight very rapidly. Regular assessment of ART doses is needed to ensure under-dosing does not happen.*
- The graphic below helps to differentiate complicated and uncomplicated severe acute malnutrition (SAM).*

Differentiating complicated and uncomplicated SAM (in children up to 5 years).



Nutrition Care Plan A for the child who is growing well ± ART

1st Action. Ask about general condition and if child is on any treatment including ART and TB medicine?

- Also check immunizations (Step 7).
- Is the child at school?
- If child is on ART then also complete Step 10. Check if ART dose needs to be adjusted up.

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

3rd Action . Nutrition counselling

- Encourage mother/caregiver indicating that the child is growing well. Explain growth chart and how to follow progress.
- Ask, have there been any major changes in the child's circumstances from the last visit that might put the care of the child at risk, including access to food?
- Advise mother/caregiver why additional food (energy) is needed in children (and adults) with HIV infection (approx 10%).
- Counsel on continued breastfeeding if mother is well (check national guidelines related to breastfeeding policy and age of the child).
- Counsel on complementary feeding and replacement feeding (frequency of meals, amount and type of food per meal, responsive feeding – see Appendices VI and VII). Reinforce and encourage good practices.
- Counsel on feeding a variety of foods such as milk, fruit, vegetables, whole grains, cereals and meat/chicken or fish based on local diets i.e. food sources that are high in vitamin A, iron, calcium, etc. and other locally produced foods.
- Review safe food preparation, food and water storage methods and hygiene issues (keep hands, utensils and food preparation area clean; separate raw and cooked foods; cook food thoroughly; keep food at safe temperature; use safe water and food).
- Check if there are other sources of good foods such as garden projects or other community resources.

4th Action. Meet age-specific needs and additional 10% energy based on actual weight

Examples of ways to increase energy intake by 10% using food GIVE IN ADDITION TO THE MEALS AND SNACKS APPROPRIATE FOR THE CHILD'S AGE

6-11 months [additional 60-75 kcal = Total ~760 kcal/day]

- LOCAL ADAPTATION – Give examples and quantities of local foods that can be used to increase energy density of other foods e.g. 2 tsp margarine/oil and 1-2 tsp sugar to porridge or that can be given in addition to normal diet.

12-23 months [additional 80-95 kcal = Total ~990 kcal/day]

- LOCAL ADAPTATION – Give examples and quantities of local foods that can be used to increase energy density of other foods e.g. margarine/oil and sugar to porridge or that can be given in addition to normal diet.

2-5 years [additional 100-140 kcal = Total ~1390 kcal/day]

- LOCAL ADAPTATION – Give examples and quantities of local foods that can be used to increase energy density of other foods or that can be given in addition to normal diet e.g. extra cup of full cream milk/fermented milk.

6-9 years [additional 130-190 kcal = Total ~1815 kcal/day]

- LOCAL ADAPTATION – Give examples and quantities of local foods that can be used to increase energy density of other foods or that can be given in addition to normal diet e.g. extra cup of full cream milk/fermented milk.

10-14 years [additional 170-230 kcal = Total ~2200 kcal/day]

- LOCAL ADAPTATION – Give examples and quantities of local foods that can be used to increase energy density of other foods or that can be given in addition to normal diet e.g. extra cup of fruit yoghurt or cheese/peanut butter sandwich.

5th Action. Ensure adequate micronutrient intake

- If the child's diet is not balanced and does not contain a variety of animal sourced foods, fruits and vegetables then give a daily micronutrient supplement that provides 1 Recommended Daily Allowance of a wide range of vitamins and other micronutrients. Refer to national guidelines.

6th Action. Vitamin A supplements every 6 months

- 6-12 months 100 000 IU 1-5 years 200 000 IU

Do not give if child has received dose within the past month e.g. from hospital

7th Action. De-worm every 6 months (Step 7)

- Albendazole (oral) 400 mg single dose every 6 months after first year of life.

8th Action. Cotrimoxazole prophylaxis (Step 7)

- Provide from 6 weeks of age 5 mg/kg/day. See step 7 for guidance on when to stop.

9th Action. Ensure mother/caregiver understands care plan and ask if she/he has any questions

10th Action. Review in 2-3 months (tell caregiver to return earlier if problems arise).

For children >5 yrs, vitamin A should be provided through regular daily micronutrient supplements

Nutrition Care Plan B for the child with poor weight gain or increased nutritional needs

1st Action. Clinically stage the child (Appendix I) and assess for ART. Check for treatable conditions. If on ART, assess clinical and immunological response (complete Step 10). Refer if indicated.

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

3rd Action. Nutrition counselling

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

4th Action. Meet age-specific needs and additional 20-30% food (energy) based on actual weight

These needs may be achieved either through a food-based approach or through specific nutritional supplements – either form of support should be provided by the service/programme

Food-based approach or Nutritional Supplement*

GIVE IN ADDITION TO MEALS AND SNACKS

6-11 months [additional 120-150 kcal per day]

- **LOCAL ADAPTATION:** Give examples of quantities and frequency of local foods that can be used to increase energy density of other foods e.g. 2 tsp margarine/oil and 1-2 tsp sugar to porridge. Aim to add 3 times daily

12-23 months [additional 160-190 kcal per day]

- **LOCAL ADAPTATION:** Give examples of quantities and frequency of local foods that can be used to increase energy density of other foods e.g. extra cup of full cream milk or cheese/peanut butter sandwich (1 slice)

2-5 years [additional 200-280 kcal per day]

- **LOCAL ADAPTATION:** Give examples of quantities and frequency of local foods that can be used to increase energy density of other foods e.g. extra cup of enriched milk or cheese/peanut butter sandwich (4 slices)

6-9 years [additional 260-380 kcal per day]

- **LOCAL ADAPTATION:** Give examples of quantities and frequency of local foods that can be used to increase energy density of other foods e.g. extra cup of enriched milk or cheese/peanut butter sandwich (6 slices)

10-14 years [additional 340-400 kcal per day]

- **LOCAL ADAPTATION:** Give examples of quantities and frequency of local foods that can be used to increase energy density of other foods e.g. cheese/peanut butter/egg sandwiches (6 slices)

See Appendix III for examples of foods that can provide additional 20-30% energy.

5th Action. Ensure adequate micronutrient intake

- If the child's diet is not balanced then give a daily micronutrient supplement that provides 1 RDA of a wide range of vitamins and other micronutrients (refer to national guidelines).
- Check if any prescribed nutritional supplement provides micronutrient intake. Additional supplements may not be needed.
- If recent diarrhoeal illness, give zinc supplement (20 mg daily for 2 weeks).

6th Action. Vitamin A supplements every 6 months

- 6-12 months 100 000 IU >12 months 200 000 IU

Do not give if child has received dose within the past month e.g. from hospital

7th Action. De-worm every 6 months (Step 7)

- Albendazole (oral) 400 mg single dose every 6 months after first year of life.

8th Action. Cotrimoxazole prophylaxis (Step 7)

- Provide from 6 weeks of age 5 mg/kg/day. See step 7 for guidance on when to stop.

9th Action. Ensure mother/caregiver understands care plan and ask if she/he has any questions

**10th Action. Review, 1st visit in 1-2 weeks. If responding, then review every 1-2 months depending on response
Change to Nutrition Care Plan A when nutritional recovery achieved (page 16).**

For children >5 yrs, vitamin A should be provided through regular daily micronutrient supplements

* The term nutritional supplement is used to refer to fortified processed foods

Nutrition Care Plan C for the severely malnourished HIV-infected child

1st Action. Assess if the child needs to be admitted ***CHECK FOR GENERAL DANGER SIGNS***

- Assess if there are signs of a concurrent opportunistic infection. If yes, then Admit and Treat accordingly.
- Assess if the child wants to eat. **Conduct a test feed (Step 4, page 25)**. If the child does not eat (suggestive of underlying complications) then refer to specialised care for management as per WHO Management of Children with Severe Malnutrition.
- If the child eats well then plan home (community-based) management according to table below. Prescribe feeds.
- Assess if there have been any major changes in the child's circumstances. (Step 6)

2nd Action. Clinically stage the child (Appendix I) and assess for ART. Check for treatable conditions. If on ART, assess clinical and immunological response (complete Step 10). Refer if indicated.

- All severely malnourished children or those with recent severe weight loss should be assessed for possible ART and to exclude opportunistic infections such as TB.

3rd Action. Check mother's health (+ need for ART) and care of other children

4th Action. Home management. Give Therapeutic feeds to provide 50-100% additional energy

Give Therapeutic feeding (average ~6-10 weeks)

Adjust amounts according to age and weight (do not rely on home foods being available)

6-11 months [150-220 kcal/kg/day based on actual weight]

- Local adaptation** – WHO recommends providing RUTF as the *Therapeutic Feed* of choice to children that are severely malnourished in the recovery/growth catch-up phase of management. National recommendations should be followed to provide the target energy intake by age group.

12-23 months [150-220 kcal/kg/day based on actual weight]

- Local adaptation** – WHO recommends providing RUTF as the *Therapeutic Feed* of choice to children that are severely malnourished in the recovery/growth catch-up phase of management. National recommendations should be followed to provide the target energy intake by age group.

2-5 years [150-220 kcal/kg/day based on actual weight]

- Local adaptation** – WHO recommends providing RUTF as the *Therapeutic Feed* of choice to children that are severely malnourished in the recovery/growth catch-up phase of management. National recommendations should be followed to provide the target energy intake by age group.

6-9 years [75-100 kcal/kg/day based on actual weight]

- Local adaptation** – WHO recommends providing RUTF as the *Therapeutic Feed* of choice to children that are severely malnourished in the recovery/growth catch-up phase of management. National recommendations should be followed to provide the target energy intake by age group.

10-14 years [60-90 kcal/kg/day based on actual weight]

- Local adaptation** – WHO recommends providing RUTF as the *Therapeutic Feed* of choice to children that are severely malnourished in the recovery/growth catch-up phase of management. National recommendations should be followed to provide the target energy intake by age group.

See Appendix II for composition of recommended therapeutic foods and micronutrient supplementation.

5th Action. Ensure adequate micronutrient intake

- A child receiving RUTF will receive all the micronutrients that they require through the feeds.
- A child that receives therapeutic feeding based on local foods should also receive an additional vitamin-mineral supplement that meets the standards for severely malnourished children.
- If recent diarrhoeal illness and child not receiving RUTF, give zinc supplement (20 mg daily for 2-4 weeks).

6th Action. Vitamin A supplements every 6 months

- 6-12 months 100 000 IU >12 months 200,000 IU

Do not give if child has received dose within the past month e.g. from hospital

7th Action. De-worm every 6 months (Step 7)

- Albendazole (oral) 400 mg single dose every 6 months after first year of life.

8th Action. Cotrimoxazole prophylaxis (Step 7)

- Provide from 6 weeks of age 5 mg/kg/day. See step 7 for guidance on when to stop.

9th Action. Ensure mother/caregiver understands care plan and ask if she/he has any questions

10th Action. If managed at home, then review in 1 week to ensure weight gain of at least 5 g/kg/d. (if managed in hospital then would expect weight gain of ~5-15 g/kg/d). If gaining weight then review every 1-2 weeks until recovery (children can usually only tolerate this energy intake for 6-10 weeks). If not gaining weight then consider admission. Review and change to plan A or plan B if child has condition with increased nutritional needs (see page 16).

SECTION TWO – IMPLEMENT THE NUTRITION CARE PLAN

STEP 4. WHAT DOES THE CHILD EAT AND DRINK?

Key message 4

Implementing a nutritional care plan starts with understanding what the child presently eats and drinks. The type of food given, and how it is prepared, can be as important as the amount and frequency of food eaten. In most situations a balanced diet, when the child eats a variety of foods, is better than specialised supplements.

HIV-infected children need additional energy from the time they become infected. This energy helps maintain normal growth and development as well as immune function. As the HIV infection progresses and the child suffers other infections the amount of additional energy needed increases.

During infections the body responds by producing an inflammatory response. If energy and protein are not available through the diet then the body will break down its own muscle and fat stores to provide the energy needed for the inflammatory response. Children with HIV infection often have low levels of micronutrients (vitamins and minerals). Micronutrients are needed in small amounts every day and, in general, are not stored in the body for a long time. They are critical for many of the body's functions e.g. immune responses, repair of damaged tissue. If micronutrient levels are low then these functions will be impaired. Micronutrient levels in the body are decreased after repeated infections or if there are not enough micronutrients in the diet; levels can also be low if the body does not absorb or cannot utilise them from the diet e.g. after diarrhoea. Some foods, particularly cereals, also contain substances such as phytates that block the absorption of micronutrients from the diet.

Energy is provided to the body by foods that contain carbohydrates, proteins and fats. Different foods contain different amounts of these.

- Staple (grains or cereals, such as rice, wheat, maize/corn or millet) or starchy foods (roots, tubers or fruits such as cassava or potato, plantain or breadfruit) provide energy mainly in the form of carbohydrate and provide only a little protein.
- Vegetables and fruits are generally rich in vitamins and other micronutrients.
- Peas, beans and lentils (sometimes called pulses or legumes), as well as nuts and seeds provide some protein and micronutrients that can help the body to build and repair itself. The protein from these sources is not as good as protein from animal sources. However, the proteins from a mixture of pulses or nuts + cereal have a better biological value than when eaten separately.
- Animal source foods (meat, birds and fish) and dairy products such as eggs, milk, yoghurt and cheese are valuable sources of high quality protein as well as several vitamins and micronutrients.

People and families living with HIV/AIDS often have limited financial resources to purchase high quality foods, such as meat, fish or milk. In these situations parents or caregivers or the child him/herself need to choose foods wisely to ensure that the best balance of foods is achieved. Poor diets are not always the result of poor income but also of poor choices made by caregivers in what they buy.

The way in which foods are prepared, cooked or combined can also change the amount of micronutrients available e.g. vegetables lose some of their nutrient content if soaked or boiled for a long time; iron in vegetables becomes more available to the body if taken at the same

time as vitamin C rich foods. Nutritional foods may be available in the community yet not often used e.g. goat milk. Local recipes should be explored to take advantage of all local foods with good nutritional value.

In many countries where HIV is highly prevalent there are individuals and companies that sell nutritional products or specialised foods that they claim have special benefit for adults and children living with HIV/AIDS. Most of these products have never been properly tested to prove whether they have a definite benefit. These products are often expensive. Other products are sold as high energy, high protein or high-dose micronutrient supplements especially suitable for people with HIV infection, suggesting that they will restore strength and boost immunity. Sometime it is even advised that antiretroviral treatment is stopped when taking these supplements. **ART should never be stopped unless** decided by the doctor e.g. if there are signs of viral resistance. Parents/caregivers should always inform the clinic about any alternative treatment that their children are taking and staff should always ask about such treatments.

STEP 4. WHAT DOES THE CHILD EAT AND DRINK

If a child is not growing well or there has been recent weight loss or growth faltering or the child is underweight, then check what the child eats and drinks.

Assess	Classify/Consider	Counsel
<p>1. Ask about milk intake</p> <p>a. Does the child drink milk?</p> <p>b. What types of milk do you usually give to him/her?</p> <p>c. How much, and how often do you give the milk?</p> <p>d. Do you ever breastfeed your child?</p> <p>2. Food intake (past 24 hours)</p> <p>Ask, from the time the child woke up yesterday until he/she went to sleep at night, what did he/she eat:</p> <p><i>for breakfast</i></p> <p><i>as a snack between breakfast and lunch</i></p> <p><i>for lunch</i></p> <p><i>as a snack between lunch and dinner</i></p> <p><i>for dinner</i></p> <p>a. Was the frequency of meals and snacks appropriate for the child's age?</p> <p>b. Was the quantity of the main meal appropriate for the child's age?</p> <p>c. Did the child eat meat, fish or eggs in the past week?</p>	<p>If <u>no</u> solid food eaten in last 4 meals, or <u>only</u> milk taken in the last 24 hours, then classify as Serious Poor Food Intake.</p>	<p>If Serious Poor Food Intake then refer urgently for admission or other immediate social/welfare support.</p>
	<p>If food intake is less than recommended then classify as Poor Food intake.</p> <p>Try to identify cause e.g. recent illness, change in social circumstances, and ask if this is because there is insufficient supply, reluctance to eat/drink or caregiver unsure of correct volumes.</p>	<p>If Poor Food intake then</p> <ul style="list-style-type: none"> ▪ Counsel on complementary/ appropriate feeds (page 28). ▪ Also consider Food support (see Step 6) if appropriate (check what other public sector support is available e.g. grants and other NGO/CBO support in the area). ▪ Assess and exclude other medical conditions.
	<p>If food intake adequate then classify as Food intake adequate.</p>	<p>If adequate and no changes in food intake then assess feeding practices (see below) and then who feeds the child and how the child eats (see Step 5).</p>

<u>Age-related milk and food intake standards</u>	<u>Appropriate</u>		<u>Insufficient</u>
	<u>Full Cream Milk (incl. fermented milks)</u>	<u>Food (cooked)*</u>	
6–11 months	If BF, then frequently/on demand If not BF, then 200-500 ml/day	½ cup x 4/day	Anything less than the recommended amounts
12–23 months	200-500 ml/day (1-2 cups)	¾ - 1 cup x 4/day	
24–59 months	500-750 ml/day (2-3 cups)	1 - 2 cups x 4/day	
5–9 years	500-750 ml/day (2-3 cups)	2 - 3 cups x 3/day	
10-14 years	500-750 ml/day (2-3 cups)	2 - 3 cups x 3/day	
	1 cup = 240 ml	1 cup = 240 ml	

IF FOOD INTAKE IS INSUFFICIENT THEN ALSO ASSESS ABILITY TO EAT

<p>3. Ability to eat (past 48 hours)</p> <p>Ask: does the child</p> <p>a. Vomit everything?</p> <p>b. Frequently vomit?</p> <p>c. Vomit occasionally?</p> <p>d. Have difficulty swallowing/chewing?</p> <p>e. Have mouth sores/ulcers?</p> <p>f. Eat well?</p>	<p>If any difficulty is identified then assess if there is a problem of</p> <ul style="list-style-type: none"> • poor appetite • sore mouth/throat • change in taste • vomiting • other 	<p>If vomiting everything then refer urgently, check for dehydration</p>
		<p>See Step 9 for guidance on children with specific needs</p> <p>If the child is on ART and vomiting – see Step 10 for children on ART</p>

* Assuming an energy density of 0.8-1 kcal/g.

These questions and answers do not necessarily 'classify' the mother, caregiver or child in any one category. The answers are important for guiding the healthcare worker and mother/caregiver as they decide how a nutritional care plan might be achieved, using foods that are available or identifying what other foods or support might be necessary.

In children with severe malnutrition assess if the child has a good appetite and decide if child can be managed at home or needs to be admitted to hospital.

<p>Ask about Appetite (past 48 hours)</p> <p>a. Keen to eat b. Reluctant to eat c. Has the child been eating less recently?</p>	<p>If a. then classify as Appetite good. Consider home management</p> <p>If b. or c. assess appetite of the child, if he/she does not accept food, then classify as Appetite poor. Plan admission</p>
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Counselling Sheet on Appropriate Feeding

If a child has Poor growth, then

1. Assess what foods are available in the community and what the family can afford.
 2. Discuss, (for children up to 2 years old see *Guiding Principles for Complementary Feeding* – Appendix V and Appendix VI).
 - the benefits and ways of providing a variety of foods each week (it may be impractical to provide all food groups every day) following these principles
 - ◆ Enjoy a variety of foods
 - ◆ Chicken, fish, milk (cow, goat etc.) and fermented milk, meat or eggs could be eaten daily
 - ◆ Eat plenty of vegetables and fruits everyday. Eat beans, peas, lentils and soy regularly
 - ◆ Use salt sparingly
 - ◆ Encourage the child to eat using a separate plate
 - ◆ Encourage and help the child to eat with patience
 - ◆ Drink clean, safe water
 - ◆ Be active
 - ways of increasing the energy intake of foods (see Suggestion sheet 1)
 - importance of making wise decisions so that limited resources are used in the best way
 - other local resources that may increase access to quality foods, such as garden projects or other community programmes
 - socio-economic support such as microcredit initiatives
 - local beliefs and practices regarding complementary feeds, foods for children with HIV
 - other traditional medicines or treatments
- and,**
3. Refer to someone who has the time and additional knowledge to offer the best advice on the same issues. This may be someone with additional training at the clinic, a nutrition advisor or a dietician.
 4. Check if demonstration kitchen is available to show methods of improving food offered.
 5. Check availability of local support groups/special follow-up clinics.

STEP 5. DISCUSS WHO GIVES THE CHILD HIS/HER FOOD AND HOW THE CHILD EATS

Key message 5

Children should be fed with care and patience. Before offering information and suggestions, first find out who is the main caregiver for the child and who else is involved with feeding and care. This helps to understand the quality and consistency of care practices.

The way that food is given to a child can be as important as the type of food offered; both can significantly influence the child's nutritional status and overall health.

Children are dependent on other people to provide food; they also need guidance and support to eat well. Young children in particular, need someone who is able and willing to feed them. For many reasons HIV can result in children being cared for by someone other than their mother or father. One parent may have died and the other parent needs to work in order to obtain money for food and other essentials. The parents may themselves be unwell physically or mentally e.g. depression and may not, therefore, be able to look after the child effectively. When an HIV-infected or HIV-exposed child loses his/her mother or both parents, he/she is sometimes moved between homes and cared for by other members of the family or within the community for short periods of time; at these times he/she may not receive a regular supply of adequate and appropriate foods. Sometimes the mother or father may decide to leave the child for some other reason and the child is cared for by the grandmother or other member of the family/community.

Each of these situations may put the child at risk of undernutrition.

For these reasons, it is essential that the primary caregiver i.e. the person that is responsible for feeding the child throughout each day is identified at each visit so that nutritional advice can be given to the most relevant person and vulnerability to poor access to food identified.

In addition, feeding a young child can be difficult even if both the caregiver and child are healthy. It requires patience, skill, attention and time. Young children, even if they seem well, go through periods when they are not interested in eating; this can be normal. When a child is unwell it may be even more difficult to feed him/her because the child is fussy or simply not hungry.

Young children also have small stomachs and so need more frequent meals than adults; for their size, children need more food than an adult does.

Responsive feeding describes the way of feeding a child.²

Responsive feeding practices include the following:³

- Feed infants directly and assist older children when they feed themselves. Children need help to learn the skills of eating.
- Be sensitive to hunger and to satiety cues or signs, which indicate that the child has eaten all that they want. For example infants may stop opening their mouths for food, turn away from food or spit food out.

² Participants may know the term *active feeding*, which is similar. However, *responsive feeding* includes two-way activity between child and caregiver, with each responding to the actions of the other.

³ For more information see *Guiding Principles for Complementary Feeding of the Breastfed Child* and *Feeding of the Non-breastfed Child* which are included in the Appendices.

http://www.who.int/nutrition/publications/infantfeeding/guidingprin_nonbreastfed_child.pdf and

http://www.who.int/nutrition/publications/infantfeeding/guiding_principles_compfeeding_breastfed.pdf

- Feed slowly and patiently, and encourage the child to eat, but do not force them.
- If the child refuses many foods, try different food combinations, tastes, textures and methods of encouragement.
- Minimize distractions during meals if the child loses interest easily.
- Remember that feeding times are periods of learning and love: talk to children during feeding, with eye-to-eye contact.

Step 5. Discuss who gives the child his/her food

Assess	Classify/Consider	Manage
<p>1. Caregiver and environment</p> <p>Ask:</p> <p>a. Who feeds the child most times each day?</p> <p>b. Who prepares the food for the child each day?</p> <p>c. Has the care of the child or household circumstances changed since the last visit or in the last 4 weeks?</p> <p>d. Is the mother living in the same household?</p> <p>e. Is the mother physically well (weight stable) or sick at present?</p>	<p>The answers to a. and b. are helpful to decide who is the most appropriate person with whom to discuss changes in feeding or food preparation.</p> <p>If the caregiver or circumstances (c) have changed in the past 4 weeks, then classify as Caregiving not stable.</p> <p>If the mother is living in another household or she is dead or unwell, then also classify as Caregiving not stable.</p>	<p>If Caregiving not stable then explore whether additional support might be helpful and whether referral to other services might be appropriate e.g. social worker or child protection or other local community resources.</p> <p>If the mother has recently died or is acutely unwell then make back up plan for child. Plan review of the child in 4 weeks to check he/she is being cared for adequately.</p> <p>Also check about other children in the household.</p> <p>Counsel about other resources that might be available e.g. NGOs, church groups etc.</p>

STEP 6. ASSESS IF THERE IS FOOD AND INCOME AT HOME

Key message 6

All children need regular, adequate and appropriate foods in order to grow, develop and maintain optimal body function. Nutrition is not just food but includes the entire process of having access to food, the quantity and quality of food, how it is given to a child, as well as how the body uses it.

All children, regardless of HIV status, need adequate amounts of appropriate foods in order to grow and develop normally and to maintain optimal body functions e.g. immunity. It is very common (as seen in sub-Saharan Africa) for poverty and chronic malnutrition to be found in the same communities where HIV is highly prevalent. Families often have difficulty providing regular and adequate amounts of good food with a balance of energy, animal-source proteins, vitamins and other micronutrients. As a result all children in these areas are at risk of undernutrition, which is commonly seen as stunting (low height-for-age) and underweight (low weight-for-age).

Although the exact mechanisms of wasting (extreme thinness or very low weight-for-height) in both adults and children with HIV infection are complex, insufficient food intake either because of inadequate access to food or poor appetite is a major factor in resource-poor settings.

Children with HIV infection are more susceptible to the effects of inadequate nutrition (quantity and quality) for several reasons. Firstly, HIV infection itself increases the body's need for energy and micronutrients. Secondly, common complications of HIV such as oral thrush or mouth ulcers from other causes decrease a child's appetite or willingness to eat e.g. because of pain. HIV can also cause severe loss of appetite (anorexia) even when there are no other superimposed infections. Thirdly, persistent diarrhoea results in malabsorption of nutrients and fourthly other inflammatory processes increase the rate at which nutrients are used up e.g. during pyrexial illnesses. In contrast to HIV-infected children in Europe and North America, children in developing countries are often exposed to a greater burden of infectious diseases in their homes and communities, including TB, malaria, and diarrhoeal diseases, which further increase their nutrient needs.

Household food security describes the means by which a household:

- **Produces or acquires food** i.e. how members of a household produce or acquire food throughout the year and use household resources, including time and money, to obtain this food.
- **Stores, processes and preserves the food** i.e. how households store, process and preserve their food to overcome seasonal shortages or improve the quality and safety of their food supply.
- **Shares food among the household members** i.e. how food is shared among the various household members to meet their specific needs.

At every clinic visit, the health worker should check if there have been any major changes in the child's circumstances from the last visit that might put the care of the child at risk, including access to food. Families' circumstances can change rapidly such that during one month the family may have adequate food and the next month they face food shortage or only be eating one or two food items (e.g. staple foods of poor nutritional quality). In these situations, health providers need to be able to respond. This might be through providing skilled nutritional advice to the primary caregiver, referring to local income generating projects or gardening/agricultural

projects, providing or referring to programmes that provide food parcels, or referring families for social welfare grants if available.

Advanced planning for times of food insecurity can reduce the family's and individual child's risk of becoming nutritionally vulnerable. Health providers should be familiar with locally available resources that can be offered to vulnerable children.

Step 6. Assess food access and financial support

(local adaptations to these guidelines should include resources/responses as appropriate)

Assess	Classify	Manage
<p>1. Financial support available to caregiver</p> <p>a. Does anyone in the household have regular income?</p>	<p>If yes, then classify as Financially supported</p> <p>If no, then classify as No Financial support</p>	<p>If No financial support explore whether additional support might be helpful and whether referral to other services might be appropriate e.g. social worker or child protection or other local community resources.</p> <p>(health worker needs to explore and know what other resources are available in the local communities)</p>
<p>2. Food access (past 4 weeks)</p> <p>a. Have there been days in the past 4 weeks when there has not been enough food available to feed to the child? For example when you have had to skip meals yourself or for the child or give smaller amounts?</p> <p>If yes, then ask</p> <p>b. Does this happen every week?</p>	<p>If the answer to a. and b. is yes, then classify as 'Serious food shortage'</p> <p>If the answer to a. is yes and to b. is no, then classify as 'Food shortage'</p>	<p>If classified as 'Serious food shortage' then refer urgently to local services for Family Food Support</p> <p>If classified as 'Food shortage' then refer to local services and other community resources for consideration of <u>Family Food Support</u>. Explore options for food gardens etc.</p>

When to provide Family Food Support

- If **Serious Food shortage** is identified then **urgent** support must be found
- If **Food shortage** is identified then programmes should explore ways of assisting the parent/caregiver which may include providing Food Support

When to stop Family Food Support* (consider combination of the criteria below)

- Until the acute circumstances have resolved, **or**
- Time-related e.g. 6 months, **or**
- If the child is gaining weight and at least -1 z-score for weight-for-height or weight-for-age. (see pages 18-19)

Support for entire family/other children. Local policies will need to decide if they will support individual children/+siblings/+entire family

* These criteria have not been formally tested in the context of HIV to know if they are valid and useful.

STEP 7. DISCUSS EXERCISE AND AVOIDING RISK FACTORS FOR MALNUTRITION

Key message 7

Physical activity and play help children to develop and maintain strong muscles and improve their sense of well-being. Maintaining good nutritional status enables HIV-infected children to fight and avoid infections such as diarrhoea. Preventive measures such as good hygiene, immunisations and regular vitamin A supplements similarly protect the child against infections and undernutrition.

- **Discuss importance of maintaining good nutritional status**
- **Discuss Exercise and Play**
- **Discuss Avoiding infections including avoiding contact with patients with active TB and use of insecticide-treated bednets (in malaria endemic areas)**
- **Discuss Hygiene and food safety**
- **Check that Immunizations are up to date**
- **Check that child is receiving daily cotrimoxazole, and regular supply of these medicines from the clinic**
- **Check that child has received deworming medicine every 6 months. If not, treat**
- **Check that child has received vitamin A - every 6 months (IMCI schedule). If not, then give**

Exercise and play

Healthy children enjoy playing; through play they learn and develop both intellectual and physical skills. HIV infected children, when their disease advances, often lose their muscle strength and the muscles become smaller. Losing muscle is harmful to the body and is a sign that the disease is progressing. At this stage the child probably needs ART.

Most clinics and hospitals cannot measure whether a child has a lot, or a little muscle in his/her body. Most facilities measure routinely only weight. Feeling the amount of muscle (muscle bulk) in the child's upper arm is helpful but not very accurate. Some hospitals and dieticians can do other measurements that can accurately measure muscle bulk but even at these facilities it is not necessary to measure muscle bulk at every visit.

When HIV-infected children are feeling well or only having occasional periods of illness, regular play and activity can help to build up their muscles. Regular exercise is also helpful in developing and maintaining their appetite. It is important for children to allocate time to build up their weight and especially muscle bulk through regular play and age-appropriate activity. And this is what children love to do – so they will feel better and will enjoy themselves more! It is also a great way for mothers, fathers, and other caregivers to show that they love the child and to enjoy their child.

When admitted to hospital, in addition to the discomfort of the physical illness and hospital procedures e.g. blood sampling, children are often extremely distressed by the separation from parents and caregivers. Play and exercise may be one way to help children deal with this stress and even help ward staff deal with their own emotions brought on by children crying or being distressed.

Avoiding infections

It is better to avoid infections than to need to treat them. There are several simple and practical ways by which parents and caregivers can help their children avoid common infections, and so protect against malnutrition. These suggestions also help the mother or father to take some

control and influence their child's health. Many HIV-infected mothers and fathers feel very guilty that they have 'given' HIV to their child and do not know how they can help the child remain well and be able to enjoy life. If mothers, fathers or other caregivers have simple guidance and knowledge about how they may improve the health of the child, they may recover their own sense of dignity and self-worth.

Ways to avoid infections

- Maintain good nutrition
- Hygiene and food safety
- Immunizations
- Regular (prophylactic) cotrimoxazole
- Regular (prophylactic) vitamin A
- Deworming
- Avoiding contact with patients with active TB
- Avoiding malaria through use of insecticide-treated bednets (in malaria endemic areas)

Hygiene and food safety

All children are more likely to get diarrhoea and become sick if parents and caregivers do not store and prepare food in a safe and hygienic way. Diarrhoeal illnesses increase nutritional losses and requirements and frequently cause weight loss in children. Children with HIV infection are especially vulnerable. This is also true for parents who are HIV-infected. Clean and safe food practices are therefore important for everyone. Unsafe water and food can make a person ill. Therefore, prevention of infection from contaminated food and water is very important. Health care workers should discuss with mothers and caregivers ways in which they can keep food clean and safe in their households. These include:⁴

- wash hands before preparing, and eating food;
- keep utensils and food preparation areas clean;
- separate raw and cooked foods;
- cook food thoroughly;
- keep food at a safe temperature.

Healthcare workers need to use good communication skills i.e. carefully look and listen to what a family is currently doing and find something in their practices to praise. Relevant information on what are safe practices for food preparation and handling can then be given. Healthcare workers can offer suggestions and discuss ways the household can apply safe food practices considering its particular situation. It is essential to check that the mothers or caregivers understand, decide and are able to carry out their decisions; it is not helpful to just tell them what they should do.

Immunizations

Routine childhood immunizations are very effective in preventing some common and serious childhood infections such as pertussis (whooping cough) and measles. HIV-infected children who develop measles have a more serious illness and are more likely to die.

⁴ There is more information on food hygiene included in the appendix.

Vaccine	Asymptomatic HIV infection	Symptomatic HIV infection	Timing of vaccine
BCG	Yes	No (e.g. at a later age if no scar is present or missed earlier vaccination)	Birth
DPT	Yes	Yes	6,10,14 weeks
OPV	Yes	Yes	birth,6,10,14 weeks
Measles	Yes	Yes	6 and 9 months
Hepatitis B	Yes	Yes	6,10,14 weeks
Haemophilus Influenza type B	Yes	Yes	6,10,14 weeks

In the event of exposure e.g. to chicken pox or measles, HIV-infected children especially those with severe immunosuppression should receive immunoglobulin.

- *Varicella immunoglobulin (0.15 ml/kg) within 3 days of exposure*
- *Measles immunoglobulin (0.5 ml/kg, max 15 ml) within 6 days of exposure*

Regular (prophylactic) cotrimoxazole⁵

All HIV-infected children should receive prophylactic cotrimoxazole following the guidelines provided below to prevent PCP pneumonia.

Cotrimoxazole formulations and dosage for infant and children living with HIV or exposed to HIV

Recommended daily dosage	Suspension (5 ml of syrup 200 mg/40 mg)	Child tablet (100 mg/20 mg)	Single-strength adult tablet (400 mg/80 mg) ⁶	Double strength adult tablet (800 mg/160 mg)
6 months-5 years 200 mg sulfamethoxazole/ 40 mg trimethoprim	5 ml ⁷	Two tablets	Half tablet	-
6-14 years 400 mg sulfamethoxazole/ 80 mg trimethoprim	10 ml ⁷	Four tablets	One tablet	Half tablet
Frequency - once a day				

With current evidence it is not yet clear if cotrimoxazole continues to provide protection after immune restoration is achieved.

How long should cotrimoxazole be given:

- HIV infected children:
 - where ARV treatment is not yet available, indefinitely
 - where ART is available, continue until five years of age

⁵ *Guidelines on cotrimoxazole prophylaxis for HIV-related infections among children, adolescents and adults: Recommendations for a public health approach. World Health Organization, Geneva 2006.*
<http://www.who.int/hiv/pub/guidelines/ctxguidelines.pdf>

⁶ *Splitting tablets into quarters is not considered best practice. This should be done only if syrup is not available.*

⁷ *Children of these ages (6 months-14 years) may swallow crushed tablets.*

- HIV exposed children⁸ – until HIV infection has been definitively ruled out AND the mother is no longer breastfeeding

Defining HIV infection: For children younger than 12-18 months, HIV infection can only be confirmed by virological testing. It is recommended that infants known to be exposed to HIV should have a virological test (HIV nucleic acid test) at 4-6 weeks of age or at the earliest opportunity for infants seen after 4-6 weeks. Additionally, urgent HIV testing is recommended for any infant presenting to health facilities with signs, symptoms or medical conditions that could indicate HIV infection.

Under what circumstances should cotrimoxazole be discontinued:

- Occurrence of severe cutaneous reactions such as Stevens Johnson syndrome, renal and/or hepatic insufficiency or severe haematological toxicity.
- In an *HIV-infected child*:
 - If the child is on ARV therapy, cotrimoxazole can be stopped ONLY when evidence of sustained immune restoration has occurred and the child is over 5 years of age.
 - Sustained immune restoration is achieved when the child is stable on antiretroviral therapy with good adherence, has secure access to antiretroviral therapy and has CD4 and clinical evidence of immune recovery in accordance with the recommendations for adults and adolescents (usually CD4% >15 or CD4 >200 for at least 6 months, demonstrated at two measurements, at least 3 to 6 months apart).
 - If ARV therapy is not available, cotrimoxazole should not be discontinued.
- In an *HIV exposed child or infant* ONLY once HIV infection has confidently been excluded and at least six weeks have elapsed after complete cessation of breastfeeding.
 - HIV exposed child or infant <18 months – negative virological testing if conducted 6 weeks after complete cessation of breastfeeding usually indicates the infant is not infected.
 - For a breastfed HIV-exposed child >18 months - negative HIV antibody testing 6 weeks after complete cessation of breastfeeding usually denotes the child is not infected.

Regular (prophylactic) vitamin A supplements every 4-6 months (IMCI schedule)

Regular vitamin A helps protect HIV-infected children against episodes of severe diarrhoea. In this way vitamin A protects against malnutrition and improves survival in HIV-infected children. For HIV-infected children 6 months to 5 years old, vitamin A supplementation can be given every 6 months in the following doses:

- 6-12 months 100 000 IU
- 1-5 years 200 000 IU

Do not give if child has received dose within the past month e.g. from hospital

For children >5 years, vitamin A should be provided through regular daily micronutrient supplements.

De-worming

Worm infestation of the intestines can result in poor appetite, anaemia and poor growth. In areas where worm infestations are common, regular deworming is recommended using Albendazole oral, 400 mg single dose every 6 months after the first year of life.

⁸ Defined as a child born to mother living with HIV or a child breastfeeding from a mother living with HIV.

Note.

1. *Referral sites need to reinforce and actively support the simple interventions suggested above. Parents and caregivers look to the doctors and nurses at hospitals etc. for approval and confidence on the advice given at clinics.*
2. *Referral sites need to take responsibility for checking that prophylactic cotrimoxazole, vitamin A and Albendazole are being dispensed and received by the child. Failures within the health system or movement of children between households and change of caregiver may result in children not receiving these interventions that are known to be beneficial. Referral sites might consider designing their patient review charts to ensure regular documentation of these interventions.*
3. *Referral sites and hospital wards/dietician offices may set up demonstration kitchens to practically show mothers and caregivers how best to hygienically prepare and store food.*
4. *Referral sites may also be able to go beyond the simple lists above and develop exercise and occupational care programme for children and parents.*
5. *When admitted to hospital, in addition to the discomfort of the physical illness and hospital procedures e.g. blood sampling, children are often extremely distressed by the separation from parents and caregivers. Physical activity e.g. play and exercise may be one way to help children deal with this stress and even help ward staff deal with their own emotions brought on by children crying or being distressed.*

STEP 8. DECIDE IF TO REFER AND WHEN TO REVIEW

Key message 8

HIV-infected children should be referred to other health care facilities when specific needs are identified or when health workers with other skills or other resources are required. The frequency and interval between reviews depends on the condition and needs of the child.

Children with HIV infection are frequently only identified when they present with more serious signs and symptoms indicating advanced HIV disease. Often it is only children with these more serious problems that receive appointments for follow-up assessments and care. This commonly happens when mothers who are found to have HIV infection through antenatal screening are not referred to postnatal services. As a result, children with HIV infection do not benefit from early care and support that might improve their basic health and delay more serious problems associated with HIV. The opportunity to provide early support is lost.

Refer

When risk factors for undernutrition such as a difficult or unstable caregiving environment (e.g. recent death or serious illness of parent or child being moved between households), poor knowledge of basic nutrition or food insecurity are identified, then health workers should refer to locally available groups or organisations. This may include formal structures such as Welfare or other social services or may be to local NGOs or community based organisations such as churches that have set up programmes to support people living with HIV/AIDS. Health workers need to actively set up effective referral mechanisms and develop effective communication channels with these structures/organisations.

Review

Condition	Review interval	Comment
The child who is well and growing appropriately	2-3 months	Unless needing to attend to receive routine cotrimoxazole/ micronutrient or other support/treatment, including ART
The child on ART	3 months	If gaining weight and no other problems
	2-4 weeks	If failing to gain weight
The child who has chronic increased nutritional needs but investigated and no other active problems	2-3 months	Tell caregiver to return earlier if problems arise
Child starting on Nutrition Care Plan B	First visit 1-2 weeks Then 1-2 months	Tell caregiver to return earlier if problems arise
The child who is unwell and/or showing signs of growth faltering or has had recent diarrhoeal illness	2-4 weeks	May require more frequent visits depending on clinical status and support offered or being provided
When the child is malnourished +/- other signs of disease progression e.g. history of recent severe weight loss or recent diarrhoea illness	Weekly	Only if fulfils criteria for management at home and no immediate need of other investigations that require hospitalisation
When a child is severely malnourished with medical complications or no appetite	Refer for hospitalization	

SECTION THREE – CHILDREN WITH SPECIAL NEEDS

STEP 9. THE HIV-INFECTED CHILD WITH SPECIAL NEEDS

Key message 9

HIV-infected children commonly experience weight loss, poor appetite and suffer from mouth sores and diarrhoea. In spite of these, the child can often still be managed at home if the correct help is offered early.

HIV-infected children can be expected to experience many difficulties in the course of their lives. Some of these can be made easier using simple techniques learned from other conditions. The following suggestions sheets are available in Appendix IV.

Suggestion sheet 1. How to add extra energy and protein to everyday foods

Suggestion sheet 2. What to try if the child does not feel like eating

Suggestion sheet 3. What to try if the child has a sore/dry mouth or throat

Suggestion sheet 4. What to try if the child has a change in taste

Suggestion sheet 5. What to try if the child has diarrhoea

Suggestion sheet 6. What to try if the child has nausea and/or vomiting

A. Eating during and when recovering from an illness – see Suggestion sheet 1

It is often difficult to encourage children to eat during a febrile illness or when otherwise unwell e.g. difficulty breathing. During these acute illnesses, HIV-infected children are likely to lose weight. If this weight is not recovered in the weeks after the illness, then the child's growth curve is likely to drop to a lower level in the long term. Hence it is important to optimise intake during illnesses if possible (in hospital this may require inserting a nasogastric tube) and targeting the recovery period to recover lost weight by ensuring the best care and nutritional intake. In the recovery period it is important to:

- increase energy and protein consumed in everyday foods;
- ensure that food is available day and night so that if the child is hungry then he/she has something appropriate to eat; and
- encourage the child in simple and loving ways.

Some of the ways to encourage a child to eat include the following:

- Make the child comfortable.
- Be patient and feed slowly.
- Feed small amounts frequently. Children may tire easily while eating, making it difficult to eat sufficient food at a sitting. Offering feeds frequently may be needed to increase food intake.
- Give foods that the child likes.
- Give a variety of foods and extra fluids.
- If the child is thirsty give fluids that have some energy e.g. milk, rather than commercial juices or fizzy drinks that have very little nutritional value.
- Pay attention to the child and make feeding a happy time.

Sick children need extra drinks and food during illness, for example if they have fever or diarrhoea. A sick young child may prefer breastfeeding to eating other foods. Do not withhold food from a sick child unless there is a medical reason.

B. Poor appetite (anorexia) – see Suggestion sheet 2

Children and adults with HIV infection frequently experience loss of appetite. This may be due to sores in the mouth, an acute illness or because HIV infection itself can cause a loss of appetite. Some antiretroviral or other medications may also cause poor appetite.

C. Sore mouth or throat – see Suggestion sheet 3

A sore mouth or throat can make it difficult to eat. Thrush, herpes and other infections, may cause a sore mouth or throat. Some conditions may respond to treatment; refer to a doctor if not sure whether there is such an infection. Mouth hygiene such as rinsing the mouth with clean water before and after meals and cleaning the teeth, is important and can help the child to feel better.

D. Change in taste – see Suggestion sheet 4

Children may find that they have a taste in their mouth or their food tastes different because of side-effects of medication or infections; this may be just temporary. Children may also be more aware of the texture or feel of foods in their mouth.

E. Children with diarrhoea – see Suggestion sheet 5

When a child passes a loose or watery stool three or more times a day, he/she has diarrhoea. Diarrhoea can be a side effect of medicines or a symptom of disease. Diarrhoea is often caused by contamination of water or food related with poor hygiene and sanitation. It may also be linked with antiretroviral or antibiotic treatment.

Generally, diarrhoea will cease after a few days. A child should be seen at the clinic if the diarrhoea lasts for more than three days or if there is a fever or blood in the stool. An infant or young child who is not able to drink or breastfeed or is drinking poorly, becomes sicker and weak, has blood in the stool or develops a fever should be seen by a health worker immediately. A child should be referred to a hospital if the diarrhoea lasts more than 14 days and there is loss of weight. A severely malnourished child with diarrhoea and dehydration should be referred to a hospital.

Zinc supplements – any child with diarrhoea (acute, persistent or dysentery) should receive zinc. The dose for children older than 6 months is 20 mg daily for 2 weeks

Vitamin A supplements - children with diarrhoea should also receive an extra dose of vitamin A if they have **not** received their routine supplement in the previous month. This dose helps protect against serious later relapses of diarrhoea.

F. Nausea and/or vomiting – see Suggestion sheet 6

Nausea can be caused by infection, stress, certain foods, hunger, lack of water, unpleasant smells or a side-effect of some medications or treatments. Nausea may also reduce the appetite.

G. Anaemia

Anaemia is common in HIV-infected children and may be due to chronic opportunistic infections or direct effects of the virus on the bone marrow. Even in areas with high prevalence of worm infestation and iron deficiency, anaemia in HIV-infected children cannot be assumed to be due to iron deficiency.

Children with palmar or severe palmar pallor should be referred for investigation. Iron supplements should only be started if iron deficiency is confirmed.

STEP 10. CHILDREN ON ANTIRETROVIRAL TREATMENT

Key message 10

A time comes when HIV-infected children need ART. Appropriate and adequate nutrition is still needed however, to achieve the full benefits of ART. Growth of children on ART is a good indicator of response to treatment and ongoing adherence. Although ART can change the way the body uses fats, proteins and energy, these metabolic changes can generally be managed, without needing to stop the ART.

All HIV-infected children reach a point in their disease when they need antiretroviral treatment. Good nutritional care and support remains important if the child is to benefit optimally from ART. Most antiretroviral drugs do not need specific recommendations in relation to meals/foods, while some should not be taken with meals or with specific foods e.g. saquinavir and garlic. Although some antiretroviral drugs can lead to late complications such as anaemia, lipodystrophy, and diabetes these can generally be managed and ART continued. Overall the benefits of ART far outweigh possible difficulties.

All infants under 12 months of age with confirmed HIV infection should be started on ART, irrespective of clinical or immunological stage. For children age 12 months or older, clinical or immunological thresholds should be used to identify those who need to start ART. Severely malnourished children should - prior to take ART - benefit from nutritional rehabilitation.

Criteria to start ART				
Age	Infants <12 months	12 months through 35 months	36 months through 59 months	5 years or over
CD4%	All	<20	<20	<15
Absolute CD4*		<750 mm ³	<350 mm ³	As in adults (<200 mm)

* Absolute CD4 count is naturally less constant and more age-dependent than CD4%; it is not therefore appropriate to define a single threshold

In sites where CD4 is not available refer to clinical staging (see Appendix I)

As with any medicine, ART can have some side effects, most commonly nausea or vomiting, usually these are temporary. ART can cause side effects after many months of taking it. One of these is lipodystrophy, it is when the shape of a child's body changes because fat is lost or fat becomes stored in unusual places. Children on ART can become thin in their face, limbs or buttocks and larger around the tummy or upper part of their back with more fat than usual being stored there. This problem is sometimes also associated with increased levels of fats (lipids and cholesterol) in the blood and occasionally a child on ART can even develop diabetes.

Much more commonly children starting on ART become very hungry and regain weight over a period of several months - as long as they have access to a range of good food. This happens because they feel so much better, their appetite becomes stable and diarrhoea and other infections that stop them from feeling well usually settle down.

In general it takes about 6 months for the CD4 counts to return to almost normal and the amount of HIV virus (viral load) to fall to very low levels. During that time the malnourished child will need up to 50-100% **additional** energy, whilst recovering. Adequate amounts of fat,

protein and carbohydrate, vitamins and minerals are all needed to enable him/her to start growing again and recover weight and length. He/she may only require this very high additional energy intake for 6-10 weeks. Once the child has regained weight, he/she will only need the usual energy and protein requirements for his/her age and the extra 10% because he/she has HIV infection (see Step 2).

When the child's condition is stable it is still important to monitor the weight. Growth faltering may indicate a change in caregiving circumstances or there may not be enough food available; failure to gain weight appropriately may also indicate that the child is not receiving the ART correctly or has developed another infection e.g. TB. If this happens the child should be referred back to the main treatment site in order to decide if any investigations are needed or if additional treatment or changes to existing treatment are necessary.

There are still several unanswered questions such as: Whether small and/or underweight children handle (use up) antiretroviral drugs in the same way as older or better nourished children (i.e. the pharmacokinetics)? Do herbal treatments interfere with antiretroviral drugs or reduce their effectiveness? Does a child's initial nutritional status e.g. underweight or severely malnourished at the time of starting ART make it more or less likely whether he/she later develops diabetes, bone problems or lipodystrophy? Researchers are trying to answer these questions.

For all these reasons dietary and nutritional assessment is an essential part of comprehensive HIV care both before and during ART.

Step 10. Additional considerations for children on antiretroviral treatment

If the child is on ART, then ask:

1. Has there been any change in eating patterns or appetite since the last visit?
2. Has the child vomited? If yes, has there been any fast breathing/fever? – see below
3. Since the last visit has the child been taking any other medicines from a doctor/pharmacy/programmes, or from other sources including traditional medicines?
4. Have you noticed any change in body shape or appearance of the child?

What to do if a child on ART is gaining weight well

Most children will gain weight once started on ART. Remember to:

- Encourage the mother/father or caregiver and discuss the child's health progress.
- Check the health of the mother/father and assess if any of them needs ART.
- Check if doses of ART need to be increased with increasing weight.
- Review ART adherence and remind mother/father or caregiver of signs of OIs.

What to do if a child on ART is not gaining weight

If a child on ART is not gaining weight the healthcare worker should be thinking of:

- Failure to take ART correctly – either non-adherence or vomiting (severe wasting with other symptoms such as abdominal pain, vomiting or fast breathing may be a sign of lactic acidosis).
- Early side effects of ART e.g. nausea.
- Development of the immune reconstitution syndrome (only to be expected in first 3 months of starting ART).
- Presence of an opportunistic infection e.g. TB.
- Late ART-related side effects e.g. lactic acidosis or lipodystrophy.
- Inadequate food intake.
- Other nutritional problem e.g. inadequate food supply or preparation or caregiving.
- If on ART for more than 6 months then possible early sign of treatment failure.

Manage

- 1) If persisting very low weight or visible severe wasting or oedema of both feet then **Refer urgently**.
- 2) Depending on available resources the healthcare worker should:
 - i. assess ART adherence;
 - ii. if possible, repeat the CD4 to check whether there is immunological deterioration (sign of treatment failure);
 - iii. investigate and treat for any opportunistic infection or underlying disease – TB is especially important;
 - iv. assess dietary intake and food security. Make appropriate referral to dietician, welfare or social worker if necessary;

- v. if these resources are not available then **refer** to an ART referral site for investigation and management. If resources are available then review every 2-4 weeks and monitor growth until cause of poor weight gain is identified and managed;
- vi. if the child continues to lose weight then **refer urgently** to an ART referral site.

Note. Children who are referred for weight loss should be followed up following discharge from the referral centre and growth monitoring done on a regular basis (at least monthly, although it may be necessary to bring the child back more frequently or admit for observation in hospital).

What to do if the child has nausea and vomiting when taking antiretroviral drugs

- 1) At treatment initiation, children may experience temporary side effects such as nausea, vomiting, fatigue. It is important to know how to give the child the medicines, if signs persist.
- 2) All children who present nausea and vomiting should be assessed using IMCI/IMAI guidelines to assess and classify severity of the vomiting and to look for any danger signs. The presence of danger signs should also alert to possible lactic acidosis (see below).
- 3) If the child vomits doses for more than 2 days or complains of increased fatigue or difficulty breathing then **Refer urgently**.
- 4) Check if there has been a recent change in treatment.
- 5) If the child does not need urgent referral or other care e.g. rehydration, then manage as if the nausea and vomiting are related to the antiretroviral drug therapy:
 - If the child vomits the ART within 30 minutes of the dose, the dose should be repeated.
 - Nausea and vomiting may be related to the taste of the medicines. The following suggestions may be helpful to control these symptoms:
 - i. take ART drugs separately from other medications such as cotrimoxazole, IPT or TB treatment;
 - ii. do not mix all the ART syrups together;
 - iii. if dissolving capsules (e.g. stavudine) reduce the amount of fluid used to dissolve;
 - iv. if the child complains of the taste, then instruct mother or caregiver to place the syringe with medication near the back of mouth to give the medicine (to avoid the child tasting the medicine);
 - v. advise mother or caregiver to keep syrups in fridge to make more palatable (Ritonavir cannot be refrigerated);
 - vi. reassure the mother or caregiver that nausea and vomiting are common side effects of ART especially in the first few weeks. The symptoms usually settle, but if she is concerned or the child does not respond within two days she should return to the clinic;
 - vii. advise on use of fluids, ORS and prevention of dehydration.

Check for metabolic abnormalities

Lactic acidosis

Lactic acidosis is a possible serious side-effect of the nucleoside analogue reverse transcriptase inhibitors (NRTIs) most commonly seen with d4T (stavudine) and less so with AZT (zidovudine). Although rare, when it does occur there is a high chance of death, even if it is treated immediately; cases have occurred as early as 1 month and as late as 20 months after starting ART.

Initial symptoms of lactic acidosis include nausea, lack of appetite and malaise, as well as fatigue and difficulty in breathing. Muscle pain and numbness or tingling sensations have also been reported. The liver may become enlarged and tender, and liver enzymes may be elevated. Symptoms of acute lactic acidosis include difficulty in breathing and hyperventilation. Laboratory tests do not clearly predict which child is at risk of lactic acidosis.

Any child on ART who presents these symptoms should be referred **immediately** to exclude lactic acidosis especially if any of the symptoms are severe or any IMCI danger signs are present.

Clinical features:

- Generalised fatigue, weakness.
- Gastrointestinal symptoms (nausea, vomiting, diarrhoea, abdominal pain, hepatomegaly, anorexia, and/or sudden unexplained weight loss).
- Respiratory symptoms (tachypnoea and dyspnoea).
- Neurological symptoms (including motor weakness).

Laboratory abnormalities:

- Lactate: mild – less than x 2 upper limit of normal without acidosis;
moderate - ≥ 2.0 x upper limit of normal without acidosis;
severe - increased lactate with pH < 7.3 without life-threatening consequences or related condition present;
life threatening - increased lactate with pH < 7.3 with life-threatening consequences (e.g. neurological findings, coma) or related condition present.
- Increased anion gap $[(Na+K) - (Cl+HCO_3)]$; normal < 15 .
- Elevated aminotransferases, CPK, LDH, lipase and amylase.

There are no good screening tests to detect lactic acidosis and a high index of suspicion should be maintained.

Managing lactic acidosis

- **Stop antiretroviral treatment.**
- Therapy is primarily supportive (fluids, bicarbonate administration and respiratory support).
- Administration of riboflavin, thiamine and/or L-carnitine has been reported by some to have some benefit in uncontrolled case reports.
- Symptoms associated with lactic acidosis may continue, or even worsen, after stopping ART.

Altered Glucose metabolism

High levels of glucose and resistance to insulin have been noted in individuals with lipodystrophy. Diabetes mellitus is a condition caused by the inability to use sugar in the blood properly. High blood sugar (hyperglycaemia) can be a sign of diabetes.

Although this is a rare side effect of ART, all children on ART, especially those on protease inhibitor based ART should have regular monitoring of their blood sugars - see table below or according to local guidelines for monitoring.

At primary health care clinics children can be monitored using a blood glucose meter. Any child with a reading over 7 mmol/l should be referred for a formal fasting glucose and further management.

Lipodystrophy

Lipodystrophy means a change in the way the body stores fat; changes include both fat gain and fat loss. This is usually a complication of long term ART. It should be looked for in all children who have been on ART for longer than 6 months. It is associated with stavudine and protease inhibitors in particular. This may result in a combination of any of the following:

- increased waist size (without rolls of fat)
- increased breast size
- fat gain around the back of the neck and upper back
- fat gain around the neck and jaw
- facial wasting, especially of the cheeks
- wasting of the buttocks
- prominent veins in the arms and legs (because of fat loss).

These changes do not necessarily result in poor health unless accompanied by the metabolic changes, but may be stigmatising; so it is important to identify these early to minimise ongoing changes.

Lipodystrophy can also be associated with metabolic changes such as increases in cholesterol, triglycerides and glucose in the blood as part of a metabolic syndrome. All children should be monitored according to local guidelines (e.g. see table below).

Children with suspected lipodystrophy should be referred to their ART site for evaluation and monitoring. One antiretroviral drug or even the child's entire treatment regimen may need to be changed. This should be done by someone experienced in ART.

Managing lipodystrophy syndrome

- Children on ART should be monitored for metabolic disorders.
- There are no established methods for treating lipodystrophy.
- Encourage exercise to reduce fat accumulation.
- Some patients improve if the most likely causative drug (usually d4T or PI if PI-based regimen is used) is substituted.
- Insulin resistance can be improved with anti-diabetic agents.
- Lipoatrophy may improve if d4T or AZT is replaced with abacavir.
- If there is a need to discontinue ART, it is advisable to discontinue all antiretroviral drugs rather than continuing with one or two drugs only. When a patient discontinues an NNRTI-containing regimen, attempt to continue the NRTI component for 2 weeks after stopping the NNRTI.

Reporting Adverse reactions

All health workers, especially those at referral sites, should ensure that adverse drug reactions (noxious and unintended response to the drug including decreased/lack of efficacy) are reported to the appropriate national pharmaco-vigilance programme e.g. medicine control council.

Routine monitoring of children on ART for metabolic disorders

Children on ART require regular monitoring of the viral and immune response as well as for possible metabolic and other adverse effects. The tests will depend on the ART being used; the site of screening e.g. clinic or referral site will depend on national/local protocols.

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

Diagnosis and monitoring laboratory tests	Baseline (at entry into care)	At initiation of first-line or second-line ARV regimen	Every six months	As required or symptom-directed
HIV diagnostic testing: virological and Ab testing	✓	-	-	-
Haemoglobin ^a	✓	✓	-	✓
WBC and differential ^b	✓	✓	-	✓
CD4%+ or absolute CD4 cell count ^c	✓	✓	✓	✓
Pregnancy testing in adolescent girls ^d	-	-	-	✓
Full chemistry (including, but not restricted to, ALT, ^e liver enzymes, renal function, glucose, lipids, amylase, lipase and serum electrolytes) ^f	-	-	-	✓
HIV viral load measurement ^g	-	-	-	✓

^a Haemoglobin monitoring at weeks 4, 8 and 12 after initiation of ART is recommended by some experts if AZT is used.

^b Monitoring at weeks 4, 8 and 12 after initiation of ART is optional.

^c Children not yet eligible for ART should be monitored with CD4 every six months. For infants and children who develop new or recurrent WHO stage 2 or 3 events or whose CD4 approach threshold values the frequency of CD4 measurement can be increased. CD4% is preferred in children <5 years of age.

^d Pregnancy testing may be needed for adolescent girls prior to initiating a regimen containing EFV.

^e The predictive value of pre-emptive liver enzyme monitoring is considered very low by some experts. WHO recommends liver enzyme monitoring in a symptom-directed approach. However, regular monitoring during the first three months of treatment and symptom-directed measurement of liver enzymes thereafter has been considered by some experts for children on nevirapine-based regimens, or for adolescent girls with CD4 values over 250 cells/mm³ and for infants and children coinfecting with hepatitis B or hepatitis C virus or other hepatic disease.

^f Regular monitoring (every six months) of full chemistry, particularly lipid levels, liver enzymes and renal function, should be considered for infants and children on second-line drugs.

^g At present, viral load measurement is not recommended for decision-making on the initiation or regular monitoring of ART in resource-limited settings. Tests for assessment of HIV RNA viral load can also be used to diagnose HIV infection, and to assess discordant clinical and CD4 findings in children suspected of failing ART.

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Appendix I – Staging criteria for children infected with HIV

	WHO Paediatric Clinical Stage 1 - Asymptomatic	WHO Paediatric Clinical Stage 2 – Mild disease	WHO Paediatric Clinical Stage 3 – Moderate disease	WHO Paediatric Clinical Stage 4 – Severe disease (AIDS)
Growth	-	-	Moderate unexplained malnutrition not responding to standard therapy	Severe unexplained wasting/severe malnutrition not responding to standard therapy
Symptoms/Signs	No symptoms or only: Persistent generalised lymphadenopathy (PGL)	Unexplained persistent large liver and/or spleen Unexplained persistent enlarged parotid Skin conditions (prurigo, seborrhoeic dermatitis, expensive molluscum contagiosum or warts, fungal nail infections, herpes zoster) Mouth conditions (recurrent mouth ulceration, lineal gingival erythema) Recurrent or chronic upper RTI (sinusitis, ear infections, tonsillitis, otorrhoea)	<ul style="list-style-type: none"> • Oral thrush (outside neonatal period) • Oral hairy leukoplakia • Unexplained and unresponsive to standard therapy re. <ul style="list-style-type: none"> ◆ Diarrhoea >14 days ◆ Fever >1 month ◆ Thrombocytopaenia* (<50 000/mm³) for >1 month ◆ Anaemia* (Hb <8 g/dl) for >1 month • Recurrent severe bacterial pneumonia • Pulmonary TB • Lymph node TB • Symptomatic LIP* • Acute necrotizing ulcerative gingivitis/periodontitis • Chronic HIV associated lung disease including bronchiectasis 	<ul style="list-style-type: none"> • Oesophageal thrush • More than one month of herpes simplex ulcerations • Severe multiple or recurrent bacterial infections ≥2 episodes in a year (not including pneumonia) • <i>Pneumocystis</i> pneumonia (PCP)* • Kaposi's sarcoma • Extrapulmonary tuberculosis • Toxoplasma brain abscess* • Cryptococcal meningitis* • Chronic cryptosporidiosis • Chronic isosporiasis • Acquired HIV-associated rectal fistula • HIV encephalopathy* • Cerebral B cell non-Hodgkin's lymphoma • HIV-associated cardiomyopathy/nephropathy
Antiretroviral therapy (ART)	Indicated only if CD4 is available: 12-35 mo and CD4 ≤20% (or ≤750 cells) 36-59 mo and CD4 ≤20% (or ≤350 cells) ≥ 5 yrs and CD4 ≤15% (or <200 cells)	Indicated only if CD4 or TLC# is available: Same as stage 1 OR 12-35 mo and TLC ≤3000 36-59 mo and TLC ≤2500 ≥ 5-8 yrs TLC ≤2000 (there is not adequate data for children older than 8 yrs)	Start ART: In all children irrespective of CD4 count or TLC; For infants ≤11 months For children >12 mo with TB, LIP or oral hairy leukoplakia or low platelets, ART initiation may be deferred if CD4 count is above threshold	Start ART irrespective of CD4 count: Start ART as soon as possible Also for infants with Presumptive severe HIV infection defined as HIV antibody positive infants <18 months, without confirmed HIV infection but having an AIDS-indicator condition or any two of: severe sepsis, severe pneumonia or mouth thrush as defined by IMCI
*Conditions requiring diagnosis by a doctor or nurse. #Total lymphocyte count (TLC#) has been proposed as a surrogate marker or an alternative to CD4 cell counts or CD4% in resource-constrained settings.				

Appendix II– Composition of different Therapeutic Feeding options

Composition of F 75 and F 100 diets

Constituent	Amount per 100 ml	
	F 75	F 100
Energy	75 kcal (315 kJ)	100 kcal (420 kJ)
Protein	0.9 g	2.9 g
Lactose	1.3 g	4.2 g
Potassium	3.6 mmol	5.9 mmol
Sodium	0.6 mmol	1.9 mmol
Magnesium	0.43 mmol	0.73 mmol
Zinc	2.0 mg	2.3 mg
Copper	0.25 mg	0.25 mg
Percentages of energy from		
- protein	5%	12%
- fat	32%	53%
Osmolarity	333 mOsm/L	419 mOsm/L

A typical recipe for ready to use therapeutic food (RUTF)

Ingredient	% weight
Full-fat milk	30
Sugar	28
Vegetable oil	15
Peanut butter	25
Mineral-vitamin mix	1.6

Nutritional composition of RUTF

Ingredient	Quantity
Moisture content	2.5% maximum
Energy	520-550 Kcal/100 g
Proteins	10 to 12 % total energy
Lipids	45 to 60 % total energy
Sodium	290 mg/100 g maximum
Potassium	1100 to 1400 mg/100 g
Calcium	300 to 600 mg/100 g
Phosphorus (excluding phytate)	300 to 600 mg/100 g
Magnesium	80 to 140 mg/100 g
Iron	10 to 14 mg/100 g
Zinc	11 to 14 mg/100 g
Copper	1.4 to 1.8 mg/100 g
Selenium	20 to 40 µg/100 g
Iodine	70 to 140 µg/100 g
Vitamin A	0.8 to 1.1 mg/100 g
Vitamin D	15 to 20 µg/100 g
Vitamin E	20 mg/100 g minimum
Vitamin K	15 to 30 µg/100 g
Vitamin B1	0.5 mg/100 g minimum
Vitamin B2	1.6 mg/100 g minimum
Vitamin C	50 mg/100 g minimum
Vitamin B6	0.6 mg/100 g minimum
Vitamin B12	1.6 µg/100 g minimum
Folic acid	200 µg/100 g minimum
Niacin	5 mg/100 g minimum
Pantothenic acid	3 mg/100 g minimum
Biotin	60 µg/100 g minimum
n-6 fatty acids	3-10% of total energy
n-3 fatty acids	0.3-2.5% of total energy

Appendix III– Home-based foods to increase energy intake

Give in addition to in between meal snacks
<p><u>6-11 months [900-1300 kcal]</u></p> <ul style="list-style-type: none"> • 2 tsp margarine/oil to porridge/food and 1 tsp sugar to porridge/food - aim to add to 5 foods per day • 2 extra cups of full cream yoghurt/milk
<p><u>1-6 years [1700-2300 kcal]</u></p> <ul style="list-style-type: none"> • 3 tsp margarine/oil to porridge/food and 2 tsp sugar to porridge/food - aim to add to 5 foods per day • 1 extra cup of enriched full cream milk • 1 extra cup of yoghurt • 2 cheese/peanut butter/egg sandwich [4 slices]
<p><u>7-14 years [2200-3300 kcal]</u></p> <ul style="list-style-type: none"> • 3 tsp margarine/oil to porridge/food and 2 tsp sugar to porridge/food - aim to add to 5 foods per day • 2 extra cup of enriched full cream milk • 2 extra cup of yoghurt • 3 cheese/peanut butter/egg sandwich [6 slices]

Appendix IV – Suggestion sheets to improve food intake

Suggestion sheet 1. How to add extra energy and protein to everyday foods

(Adapt according to local practices)

- Add milk, cheese, butter or oil to mashed vegetables, potatoes, rice, soups and stews, and other foods.
- To make fortified milk: add 4 spoons (15 ml spoons) of milk powder to 500 ml of cow's milk. Stir well and keep in a cool place. Use full fat milk powder if available instead of skimmed milk powder. Use this fortified milk in tea, on cereals, and in cooking.
- Milk powder can also be added to soup to give more protein.
- Stir a beaten egg into hot porridge or mashed potatoes and cook for a few minutes more to cook the egg. Do not feed the child raw or undercooked eggs. Always cook eggs.
- Put extra spread on sandwiches: nut spreads, jam, butter/margarine, tinned fish.
- Nuts are a good source of energy, keep them near to feed the child as a snack and put chopped nuts or nut paste into foods.
- Add cream, evaporated milk, or yoghurt to soups, puddings, cereals and milky drinks.
- Use local foods that are rich in fat, such as avocado, fatty fish, coconut, oil and fried foods, if tolerated.
- Sprinkle crispy fried onions, fried fatty meat or similar on top of meals.
- Feed the child dried fruits such as raisins and dates – as an extra, not as a replacement for a meal.

Suggestion sheet 2. What to try if the child does not feel like eating

(Adapt according to local practices)

- Give the child small, frequent meals – so he/she eats something every 2–3 hours.
- Give the child food whenever he/she is hungry or feels like eating. Do not wait until a mealtime.
- Choose foods that the child enjoys most. Some children are very ‘picky’ eaters and are more likely to eat these foods.
- On days the child feels well or is eating well, try to give extra meals.
- Take the child for a walk in the fresh air before eating and eating in a well-ventilated room may help.
- Feed the child with family or other people so it is a social event. If the child is in bed, have the family eating at his/her bedside. Children sometimes eat better when others are present and sometimes they are better alone as other people may cause unhelpful distraction. Be prepared to try different ways. Always stay with the child while eating, both to watch for difficulties and to encourage eating.
- Make sure the child has enough liquid in the day. Try to use fluids such as milk and other energy-containing drinks.
- Encourage the child to eat slowly and relax for a while after eating. Avoid him/her lying down immediately after a meal.
- Make meals as attractive as possible – garnish, carefully served, set table nicely.
- Some foods may stimulate the appetite such as ginger tea, or lemon juice in clean boiled water.
- When the appetite has returned or the illness has passed, be sure to feed the child an extra meal (or increased amount per meal) to make up for the missed meals.
- Lack of appetite may be a sign of an infection such as tuberculosis or of depression; talk to your doctor about it.

Suggestion sheet 3. What to try if the child has a sore/dry mouth or throat

(These are suggestions. Always check for oral and oesophageal thrush or mouth sores, e.g. herpes stomatitis or Kaposi lesions)

Sore mouth

- If oral thrush is visible or other mouth ulcers are present then specific treatment might be required e.g. oral fluconazole and/or nystatin. If these are not available then apply gentian violet (GV) to the mouth after washing your hands. Wash again after applying the GV. Do not give any fluids or feeds for 20 minutes after giving oral nystatin or applying gentian violet. Refer children with a sore mouth/mouth ulcers if mother/caregiver says that child is not eating, child has lost weight in past week or is clinically dehydrated.
- Clean mouth frequently, at least twice a day morning and evening, preferably after every meal. Rinse with slightly salty warm water: use clean boiled water.
- Use cinnamon tea as a mouthwash (1/4 teaspoon of cinnamon to one cup of boiling water; cover and allow to cool).
- Add gravy, sauce or custard to meals to make them moist but not sticky or dip foods in liquid.
- Suggest that the child uses a straw to drink.
- Chop or mash food.
- Avoid rough foods such as toast or raw vegetables.
- Avoid sticky foods such as peanut butter.
- Avoid very hot or very cold foods.
- Avoid spicy, salty or acidic foods that irritate the mouth of the child.
- Suggest that the child drinks sour/fermented milk or yoghurt.

If mouth ulcers are present, local anaesthetic e.g. lignocaine 1% can be applied with a cotton wool ball onto ulcer. Can be repeated every 3-4 hours or 10 minutes prior to meals.

Sore throat

The suggestions above for a sore mouth may be helpful. Also, try the following:

- Honey with water has a soothing effect: one tea spoon of honey in half cup of luke warm water .
- Feed the child soft foods that are easy to swallow.
- Offer the child nourishing liquids if solid food is too hard to eat.

Dry mouth

- Stimulate saliva production by offering the child a hard sweet, or chewing gum.
- Serve liquids with meals and make the child sip cold drinks frequently during the day.
- Rinse mouth with clean warm salty water.
- Avoid very hard foods and drinks high in caffeine such as coffee, strong tea and sodas.

Suggestion sheet 4. What to try if the child has a change in taste**(These are suggestions)**

- Clean the child's mouth frequently. Rinse with slightly salty warm water: use clean boiled water.
- Use salt, sugar, spices, vinegar, lemon, and other flavours to mask any unpleasant taste in the child's mouth. Some medications may make mint, garlic and ginger taste less pleasant.
- Feed the child the foods he/she likes.
- Try a variety of foods as the child's taste may come back after a few weeks.
- Very cold foods may taste better.
- Fresh fruits and fruit juice are refreshing and may leave a pleasant taste in the child's mouth.

Suggestion sheet 5. What to try if the child has diarrhoea

All children with diarrhoea should receive oral zinc supplements for 2 weeks.

Children older than 6 months, should receive 20 mg daily for 2 weeks

(These are suggestions)

- Encourage the child to continue eating and drinking when there is diarrhoea. The child should eat foods he/she can tolerate.
- Encourage the child to drink lots of fluids: more than 8 cups a day, especially clean boiled water, to prevent dehydration. If dehydrated, make up oral rehydration solution (see below).
- Feed the child small meals, five or more times in the day. He/she should eat slowly and chew well.
- Give particular attention to food hygiene. Use clean boiled water, keep food and utensils very clean, store food for as short a time as possible in a cold place. If you are reheating food, make sure it is very hot. Keep raw food separate from cooked foods.
- Make rice soup. Boil one cup of rice in 5–6 cups of clean water with a bit of salt for 1 hour. Feed the child both the rice and the rice water.
- Feed the child ripe yellow banana, cooked apple or mango; avoid unripe fruits.
- Peel and cook vegetables rather than feeding the child raw vegetables.
- Feed the child refined cereals rather than wholegrain cereals and flour while he/she has diarrhoea.
- Avoid beans, gas-forming foods, fizzy drinks and highly-spiced foods.
- Feed the child warm foods, rather than very hot or cold foods.
- Fat is a good source of energy, so do not cut out fat if it is not causing the child a problem. Reduce fatty foods temporarily if they make the child feel worse but introduce again later.
- For children: sometimes cow's milk or dried milks purchased from the shops can be a problem. If breastfeeding, continue, or increase breastfeeding. Fermented milks, when available, can be used for the older child.
- Be prepared to try different foods until you find something that suits you or your child.
- Some medications may cause diarrhoea. Talk to your doctor or nurse.
- Oral rehydration solution is not needed in ordinary diarrhoea of short duration where the child is not dehydrated.

Preparation of oral rehydration solution (ORS) to use if there is dehydration

- Use clean water, boiled if possible.
- *From a packet:* Follow directions on the packet.
- *With salt and sugar:* To one litre of water, add one-half teaspoon of salt and eight teaspoons of sugar. Stir or shake well. The water should taste no more salty than tears.
- *With powdered cereals:* To one litre of water, add one-half teaspoon of salt and eight teaspoons of powdered cereals. Rice is best, but fine ground wheat flour, maize, sorghum or cooked mashed potatoes can also be used. Boil for five to seven minutes to make a liquid soup or watery porridge. Cool the drink quickly.
- In addition to ORS, also have the child eating and drinking foods and fluids that are tolerated.

Suggestion sheet 6. What to try if the child has nausea and/or vomiting

(These are suggestions)

- Make sure the child has enough liquid in the day. Try to use fluids such as milk and other energy-containing drinks.
- Encourage the child to drink liquids about half an hour after meals, rather than with meals.
- Encourage the child to drink liquids slowly.
- Feed the child small, frequent meals: eat something every 2–3 hours.
- Feed the child whenever he/she is hungry or feel like eating. Do not wait until a mealtime.
- On days the child is well, try to increase the quantity and variety of food intake.
- Let the child chew foods well to make them easier to digest.
- Have the child eating slowly and relaxing for a while after eating. Avoid him/her lying down immediately after a meal.
- Keep some high energy snacks available: nuts, yoghurt, bread with a spread.
- Some children find sour foods easier to eat than sweet foods.
- Avoid cooking smells: prepare food away from the child.
- Take the child for a walk in the fresh air before eating and eating in a well-ventilated room may help.
- Try dry foods such as dry bread, toast or plain biscuits and keep meals dry.
- Avoid large amounts of fizzy drinks and beer that can make you feel bloated and gassy.
- Choose foods that do not have a strong smell. Cold foods generally have less smell.
- Increase starchy foods and reduce fatty foods temporarily.
- When the illness has passed, be sure to feed the child an extra meal (or increased amount per meal) to make up for the missed meals.
- Nausea may be a side-effect of drug treatments; talk to your doctor about it.
- There are also medications which can reduce nausea, so discuss these with a health worker if needed.

Appendix V – Guiding Principles for Complementary Feeding of the Breastfed Child (2003)

1. DURATION OF EXCLUSIVE BREASTFEEDING AND AGE OF INTRODUCTION OF COMPLEMENTARY FOODS

Practise exclusive breastfeeding from birth to six months of age, and introduce complementary foods at six months of age (180 days) while continuing to breastfeed.

2. MAINTENANCE OF BREASTFEEDING

Continue frequent, on-demand breastfeeding until two years of age or beyond.

3. RESPONSIVE FEEDING

Practise responsive feeding, applying the principles of psycho-social care.

- a. Feed infants directly and assist older children when they feed themselves, being sensitive to their hunger and satiety cues.
- b. Feed slowly and patiently, and encourage children to eat, but do not force them.
- c. If children refuse many foods, experiment with different food combinations, tastes, textures and methods of encouragement.
- d. Minimize distractions during meals if the child loses interest easily.
- e. Remember that feeding times are periods of learning and love. Talk to children during feeding, with eye-to-eye contact.

4. SAFE PREPARATION AND STORAGE OF COMPLEMENTARY FOODS

Practise good hygiene and proper food handling by:

- a. washing caregivers' and children's hands before food preparation and eating;
- b. storing foods safely and serving foods immediately after preparation;
- c. using clean utensils to prepare and serve food;
- d. using clean cups and bowls when feeding children;
- e. avoiding the use of feeding bottles, which are difficult to keep clean.

5. AMOUNT OF COMPLEMENTARY FOOD NEEDED

Start at six months of age with small amounts of food and increase the quantity as the child gets older, while maintaining frequent breastfeeding. In developing countries, complementary foods should provide infants whose breast milk intake is average with approximately 200 kcal per day at 6–8 months of age, 300 kcal per day at 9–11 months and 550 kcal per day at 12–23 months of age. In industrialized countries these estimates differ somewhat (130, 310 and 580 kcal/d at 6–8, 9–11 and 12–23 months, respectively) because of differences in average breast milk intake.

6. FOOD CONSISTENCY

Gradually increase food consistency and variety as the infant gets older, adapting to the infant's requirements and abilities. Infants can eat pureed, mashed and semi-solid foods beginning at six months. By eight months most infants can also eat "finger foods" (snacks that can be eaten by children alone). By twelve months, most children can eat the same types of foods as consumed by the rest of the family (keeping in mind the need for nutrient-dense foods, as explained in #8 below). Avoid foods that may cause choking (i.e. items that have a shape or consistency that may cause them to become lodged in the trachea, such as nuts, grapes or raw carrots).

7. MEAL FREQUENCY AND ENERGY DENSITY

Increase the number of times that the child is fed complementary foods as he/she gets older. The appropriate number of feedings depends on the energy density of the local foods and the usual amounts consumed at each feeding. For the average healthy breastfed infant, meals of complementary foods should be provided 2–3 times per day at 6–8 months of age and 3–4 times per day at 9–11 and 12–24 months of age, with additional nutritious snacks (such as a piece of fruit or bread or chapatti with nut paste) offered once or twice a day, as desired. Snacks are defined as foods eaten between meals, usually self-fed, convenient and easy to prepare. If energy density or amount of food per meal is low, or the child is no longer breastfed, more frequent meals may be required.

8. NUTRIENT CONTENT OF COMPLEMENTARY FOODS

Feed a variety of foods to ensure that nutrient needs are met. Meat, poultry, fish or eggs should be eaten daily, or as often as possible. Vegetarian diets cannot meet nutrient needs at this age unless nutrient supplements or fortified products are used (see #9 below). Fruits and vegetables rich in vitamin A should be eaten daily. Provide diets with adequate fat content. Avoid giving drinks with low nutrient value, such as tea, coffee and sugary drinks such as soda. Limit the amount of juice offered so as to avoid displacing more nutrient-rich foods.

9. USE OF VITAMIN–MINERAL SUPPLEMENTS OR FORTIFIED PRODUCTS FOR INFANT AND MOTHER

Use fortified complementary foods or vitamin–mineral supplements for the infant, as needed. In some populations, breastfeeding mothers too may need vitamin–mineral supplements or fortified products, both for their own health and to ensure normal concentrations of certain nutrients (particularly vitamins) in their breast milk [such products may also be beneficial for pre-pregnant and pregnant women].

10. FEEDING DURING AND AFTER ILLNESS

Increase fluid intake during illness, including more frequent breastfeeding, and encourage the child to eat soft, varied, appetizing, favourite foods. After illness, give food more often than usual and encourage the child to eat more.

The Guiding Principles are intended to guide policy and programmatic action at global, national and community levels. Their implementation will require additional research in most settings to identify culturally acceptable and affordable foods that can be promoted in meal preparation and as snacks, to identify factors that facilitate or are barriers to adopting improved feeding behaviours by caregivers and families and to translate each guideline into specific messages that are understood by health care providers, mothers and other caregivers.

Acknowledgements

The 'Guiding Principles for Complementary Feeding of the Breastfed Child (2003)' was written by Kathryn Dewey. Chessa Lutter was the responsible technical officer and provided comments and technical oversight. Jose Martines and Bernadette Daelmans provided extensive comments. An earlier draft was reviewed and commented on by the participants at the WHO Global Consultation on Complementary Feeding, 10–13 December, 2001.

Guiding Principles for Complementary Feeding of the Breastfed Child. PAHO/WHO, Division of Health Promotion and Protection/Food and Nutrition Program, Washington, DC, USA, 2003.

Appendix VI – Guiding principles for feeding non-breastfed children 6-24 months of age (2005)

1. AMOUNT OF FOOD NEEDED

Ensure that energy needs are met. These needs are approximately 600 kcal per day at 6-8 months of age, 700 kcal per day at 9-11 months of age, and 900 kcal per day at 12-23 months of age.

2. FOOD CONSISTENCY

Gradually increase food consistency and variety as the infant gets older, adapting to the infant's requirements and abilities. Infants can eat pureed, mashed and semi-solid foods beginning at six months. By eight months most infants can also eat "finger foods" (snacks that can be eaten by children alone). By twelve months, most children can eat the same types of foods as consumed by the rest of the family (keeping in mind the need for nutrient-dense foods, as explained in #4 below). Avoid foods that may cause choking (i.e. items that have a shape or consistency that may cause them to become lodged in the trachea, such as whole nuts, whole grapes or raw carrots, whole or in pieces).

3. MEAL FREQUENCY AND ENERGY DENSITY

For the average healthy infant, meals should be provided 4-5 times per day, with additional nutritious snacks (such as pieces of fruit or breads or chapatti with nut paste) offered 1-2 times per day, as desired. The appropriate number of feedings depends on the energy density of the local foods and the usual amounts consumed at each feeding. If energy density or amount of food per meal is low, more frequent meals may be required.

4. NUTRIENT CONTENT OF FOODS

Feed a variety of foods to ensure that nutrient needs are met:

- Meat, poultry, fish or eggs should be eaten daily, or as often as possible.
- If adequate amounts of other animal-source foods are consumed regularly, the amount of milk needed is ~200-400 mL/d; otherwise, the amount of milk needed is ~300-500 mL/d.
- If milk and other animal-source foods are not eaten in adequate amounts, both grains and legumes should be consumed daily.
- Dairy products are the richest sources of calcium. If dairy products are not consumed in adequate amounts, other foods that contain relatively large amounts of calcium such as small fish that include the bones and lime-treated maize tortillas, can fill the gap.
- The daily diet should include Vitamin A-rich foods; vitamin C-rich foods consumed with meals to enhance iron absorption; and foods rich in the B vitamins.
- Provide diets with adequate fat content.
- Avoid giving drinks with low nutrient value, such as tea, coffee and sugary drinks such as soda. Limit the amount of juice offered so as to avoid displacing more nutrient-rich foods.

5. USE OF VITAMIN-MINERAL SUPPLEMENTS OR FORTIFIED PRODUCTS

As needed, use fortified complementary foods or vitamin-mineral supplements (preferably mixed with or fed with food) that contain iron (8-10 mg/d at 6-12 months, 5-7 mg/d at 12-24 months). If adequate amounts of animal-source foods are not consumed, these fortified foods or supplements should also contain other micronutrients, particularly zinc, calcium and vitamin B12. In countries where vitamin A deficiency is prevalent or where the under-five mortality rate is over 50 per 1000, it is recommended that children 6-24 months old receive a high-dose

vitamin A supplement (100,000 IU once for infants 6-12 months old and 200,000 IU bi-annually for young children 12-23 months old).

6. FLUID NEEDS

Non-breastfed infants and young children need at least 400-600 mL/d of extra fluids (in addition to the 200-700 mL/d of water that is estimated to come from milk and other foods) in a temperate climate, and 800-1200 mL/d in a hot climate. Plain, clean (boiled, if necessary) water should be offered several times per day to ensure that the infant's thirst is satisfied.

7. SAFE PREPARATION AND STORAGE OF COMPLEMENTARY FOODS

Practise good hygiene and proper food handling by:

- a. washing caregivers' and children's hands before food preparation and eating;
- b. storing foods safely and serving foods immediately after preparation;
- c. using clean utensils to prepare and serve food;
- d. using clean cups and bowls when feeding children;
- e. avoiding the use of feeding bottles, which are difficult to keep clean.

8. RESPONSIVE FEEDING

Practise responsive feeding, applying the principles of psycho-social care.

- a. Feed infants directly and assist older children when they feed themselves, being sensitive to their hunger and satiety cues.
- b. Feed slowly and patiently, and encourage children to eat, but do not force them.
- c. If children refuse many foods, experiment with different food combinations, tastes, textures and methods of encouragement.
- d. Minimize distractions during meals if the child loses interest easily.
- e. Remember that feeding times are periods of learning and love. Talk to children during feeding, with eye-to-eye contact.

9. FEEDING DURING AND AFTER ILLNESS

Increase fluid intake during illness, including more frequent breastfeeding, and encourage the child to eat soft, varied, appetizing, favourite foods. After illness, give food more often than usual and encourage the child to eat more.

The Guiding Principles are intended to guide policy and programmatic action at global, national and community levels. Their implementation will require additional research in most settings to identify culturally acceptable and affordable foods that can be promoted in meal preparation and as snacks, to identify factors that facilitate or are barriers to adopting improved feeding behaviours by caregivers and families and to translate each guideline into specific messages that are understood by health care providers, mothers and other caregivers.

Acknowledgements

The 'Guiding principles for feeding non-breastfed children 6-24 months of age' was written by Kathryn Dewey based on the conclusions of an informal meeting on feeding of non-breastfed children, convened by WHO's Department for Child and Adolescent Health and Development (CAH) and Nutrition for Health and Development (NHD) in Geneva, 8-10 March 2004. Kathryn Dewey and Roberta Cohen prepared the background paper for the meeting. Staff in WHO/CAH commissioned the preparation of this document and provided technical oversight. Participants in the informal meeting reviewed and commented on various draft versions.

Guiding principles for feeding non-breastfed children 6-24 months of age. Geneva, World Health Organization, 2005.

Appendix VII – Five Keys to Safer Food⁹

1. Keep clean

- Wash your hands before handling food and often during food preparation.
- Wash your hands after going to the toilet, changing the baby or being in contact with animals.
- Wash very clean all surfaces and equipment used for food preparation or serving.
- Protect kitchen areas and food from insects, pests and other animals.

2. Separate raw and cooked foods

- Separate raw meat, poultry, fish and seafood from other foods.
- Use separate equipment and utensils such as knives and cutting boards for handling raw foods.
- Store foods in covered containers to avoid contact between raw and cooked foods.

3. Cook thoroughly

- Cook food thoroughly, especially meat, poultry, eggs, fish and seafood. For meat and poultry, make sure juices are clear, not pink.
- Bring foods like soups and stews to boiling point.
- Reheat cooked food thoroughly. Bring to the boil or heat until too hot to touch. Stir while re-heating.

4. Keep food at safe temperatures

- Do not leave cooked food at room temperature for more than two hours.
- Do not store food too long, even in a refrigerator.
- Do not thaw frozen food at room temperature.
- Food for infants and young children and other people with low immune systems should ideally be freshly prepared and not stored at all after cooking.

5. Use safe water and foods

- Use safe water or treat it to make it safe.
- Choose fresh and wholesome foods.
- Do not use food beyond its expiry date.
- Use pasteurized milk or boil milk before use.
- Wash fruits and vegetables in safe water, especially if eaten raw.

⁹ Adapted from Food Safety Unit, WHO, Geneva, 2001(WHO/SDE/PHE/FOS/01.1).

In the area of nutrition and HIV, children deserve special attention because of their additional needs to ensure growth and development and their dependency on adults for adequate care. It was therefore proposed to first develop guidelines for children and thereafter consider a similar approach for other specific groups.

The content of these guidelines acknowledges that wasting and undernutrition in HIV-infected children reflect a series of failures within the health system, the home and community and not just a biological process related to virus and host interactions. In trying to protect the nutritional well-being or reverse the undernutrition experienced by infected children, issues of food insecurity, food quantity and quality as well as absorption and digestion of nutrients are considered. Interventions are proposed that are practical and feasible in resource-poor settings and offer a prospect for clinical improvement.

The guidelines do not cover the feeding of infants 0 to 6 months old, because the specialised care in this age group is already addressed in other WHO guidelines and documents.

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ISBN 978 92 4 159752 4

