SESSION 11. NUTRITION CARE FOR CHILDREN LIVING WITH HIV

Purpose (slide 2)

The purpose of this session is to equip students with current knowledge and a general understanding of nutrition care and support of children 2–9 years old who are living with HIV.

Learning objectives (slide 3)

By the end of the session students will be able to:

- Describe the nutritional needs of and dietary recommendations for children 2–9 years old.
- Explain how HIV increases the risk of undernutrition and the etiology and consequences of growth failure and development in children infected with HIV.
- Describe dietary recommendations for children infected with HIV.
- Explain factors to consider when planning nutrition care and support for children 2–9 years old infected with HIV.

Prerequisite knowledge

- Basic science (human biology and physiology)
- Basics of HIV and AIDS in Africa (Session 1)
- Basics of nutrition throughout the life cycle (Session 2)
- The link between nutrition and HIV (Session 3)
- Basic counseling skills

Estimated time: 120 minutes, excluding the field visit

Session guide (slide 4)

Content	Methodology	Activities	Estimated time (minutes)
HIV infection in young children	Participatory lecture	Summarize the HIV situation for young children.	10
Effects of HIV on the nutritional status of young children	Participatory lecture	Ask students to brainstorm effects of HIV in young children.	10
Purpose of nutrition care for young HIV-infected children	Participatory lecture	Discuss the purpose and role of nutrition care in HIV services for young children.	15
Components of nutrition care and support of young HIV-infected children	Participatory lecture	Present the main components of nutrition care for young HIV-infected children and elicit examples.	15
	Group work	Facilitate group work on incorporating nutrition care and support into contact points in their areas that see children 2–9 yeas old.	20
	Role-play	Facilitate a counseling role-play on nutrition care of young HIV-infected children, followed by brief commentary and discussion in plenary.	30
Challenges for nutrition care and support for young HIV-infected children	Participatory lecture	Ask students to brainstorm issues and challenges for nutrition care and support of young HIV-infected children and how to address these.	10
Conclusions			5
Review			5
Total time			120

Required materials

- Flipchart stand and paper
- Writing pens
- Blackboard and chalk or whiteboard and markers
- Overhead projector and transparencies or LCD projector and laptop

Materials provided

- PowerPoint 11
- **Handout 11.1. Nutrition Actions for the Care and Support of HIV-Infected Children**
- **Handout 11.2. Checklist for Nutrition Assessment**
- **Handout 11.3. Monitoring the HIV-Positive Child**
- **Handout 11.4. Job Aids for Nutrition Counseling and Education**
- **Handout 11.5. Assessing Child Growth**
- **Handout 11.6. Physical Characteristics of Normal Nutrition and Undernutrition with Possible Nutrient Deficiency**
- **Handout 11.7. Job Aid for Counseling on Management of Common HIV Symptoms that Affect Children's Dietary Intake**
- **Handout 11.8. Job Aids for Counseling on Management of Inadequate Intake in HIV-Infected Children**
- **Handout 11.9. Job Aids for Counseling on Management of Feeding Difficulties in HIV-Infected Children**
- **Handout 11.10. Job Aid for Counseling on Management of Opportunistic Infections or Fever in HIV-Infected Children**
- **Handout 11.11. Job Aid for Counseling on Management of Gastrointestinal Problems in HIV-Infected Children**
- **Handout 11.12. Job Aid for Counseling on Management of Altered Taste in HIV-Infected Children**
- **Handout 11.13. Job Aid for Counseling on Socioeconomic Factors That May Affect Nutrition in HIV-Infected Children**

Preparation

1. Be familiar with Lecture Notes and PowerPoint 11.
2. Review handouts and exercises to identify relevant questions to help students master the concepts.
3. Review the role-play and modify the details (e.g., foods described) as appropriate for country and community contexts.
4. Contact sites for the field visit and arrange the timing and content.

Suggested reading

American Dietetic Association. 1998. Pediatric Manual of Clinical Dietetics. Chicago.

American Dietetic Association and Dietitians of Canada. 2000. Manual of Clinical Dietetics, 6th edition. Chicago.

Regional Centre for Quality of Health Care (RCQHC), FANTA Project, LINKAGES Project, and SARA Project. 2003. Nutrition and HIV/AIDS: A Training Manual. Kampala. Uganda.

World Health Organization (WHO), United Nations Children's Fund (UNICEF), and BASICS Project. 1999. Nutrition Essentials: A Guide for Health Managers. Geneva.

Tindyebwa, D., et al., eds. 2004. Handbook on Paediatric AIDS in Africa. Kampala, Uganda: African Network for the Care of Children Affected by AIDS (ANECCA).

World Health Organization, 2003. Nutrition requirements for people living with HIV/AIDS. Report of a technical consultation. Geneva.

Introduction

In Africa undernutrition is a significant cause of morbidity and mortality in children under 5. Moreover, undernutrition is endemic in sub-Saharan Africa, with approximately 10 percent of children under 5 suffering from moderate and severe wasting, 40 percent with moderate and severe stunting, and 29 percent with moderate and severe underweight (UNICEF 2003). Malnutrition compromises children's health and makes them more susceptible to illness and death. Approximately 17 percent of children in sub-Saharan Africa die during the first five years of life, largely from infectious diseases including acute respiratory infections, diarrhea, and malaria.

The burden of undernutrition among young children has been compounded by HIV and AIDS. By the end of 2005, an estimated 2.3 million children worldwide were HIV positive, almost 90 percent of them in sub-Saharan Africa (UNAIDS 2006). The synergy between undernutrition and HIV is well documented. Undernutrition weakens the immune system, increasing vulnerability to HIV infection, and HIV compromises nutritional status and increases vulnerability to infection.

Children infected with HIV are more vulnerable to undernutrition and growth failure. Adequate nutrition can help delay the progression of HIV if it starts early in the disease stage when the child is asymptomatic. However, for many children, it is not possible to start the nutrition intervention early because their status is not usually known until the disease has advanced.

HIV in children 2–9 years old (slides 5–7)

Most children 2–9 years old who are infected with HIV were infected in utero, during labor and delivery, through breastfeeding, through contaminated needles or blood, or through sexual abuse. HIV-infected children have more frequent common childhood infections such as ear infections and pneumonia than non-infected children. Other common infections include gastroenteritis and tuberculosis. Diarrhea and fever are usually more persistent and severe in children with HIV. In addition to the opportunistic infections (OIs), such children also experience developmental delays.

Routine diagnosis for pediatric AIDS is not done in many developing countries, mainly because the tests used for adults cannot be used for children under 18 months old. Tests that can detect HIV in children under 18 months old are expensive and not readily available in resource-limited settings. This poses a problem because early diagnosis of HIV can help provide effective intervention to reduce morbidity and mortality.

The World Health Organization (WHO) therefore has provided some clinical signs and symptoms that can be used to make an HIV diagnosis. However, these signs and symptoms also overlap with those of other common childhood diseases. Nonetheless, the presence of these clinical signs and conditions may indicate HIV infection in a child and thus serve to alert the health worker to obtain further history on the child such as the mother's health status, and laboratory tests were available. The most common signs and symptoms found in HIV-infected children according to WHO include the following:

- Weight loss
- Chronic diarrhea
- Failure to thrive

- Oral thrush
- Fever

In Ethiopia, South Africa, and Uganda, the Integrated Management of Childhood Illnesses (IMCI) guidelines include symptoms indicative of HIV. A child is classified as having symptomatic HIV if they have any four of the following (Tindyebwa et al, eds. 2004):

- Recurrent pneumonia
- Oral thrush
- Present or past ear discharge
- Very low weight
- Persistent diarrhea
- Enlarged lymph nodes
- Parotid enlargement

Where available, laboratory tests are encouraged to provide an accurate diagnosis.

These common signs and symptoms noted in HIV-infected children are the same signs and symptoms and commonly seen in HIV-negative sick children and are a common cause of mortality if not managed. Many of these deaths may be preventable by early diagnosis and correct management and interventions.

Effects of HIV on the nutritional status of the young child (slides 8 and 9)

Children 2–9 years old have distinct nutritional needs. Although the rapid growth rate experienced in the first 2 years of life slows down, the body continues to increase steadily in size. Appetite declines, and protein, mineral, and vitamin requirements increase. HIV infection affects these nutritional needs. Undernutrition tends to increase in HIV-infected children, even more so in resource-limited settings where undernutrition is already an endemic problem. Moreover, the effects of undernutrition in the HIV-infected child are further compounded by repeated infections.

For the HIV-infected child, linear growth is usually the first parameter negatively affected by HIV disease progression. Failure to thrive is also a problem, with children being unable to gain weight. HIV-infected children born to HIV-positive women have early and sustained stunting or low height for age, although they are usually not wasted. Micronutrient deficiencies such as low serum levels of vitamin A, E, B_6, B_{12}, and C and minerals zinc and selenium are also common among HIV-infected children.

An HIV-infected child faces a number of problems with nutrition implications. The following problems need to be addressed immediately:

- Inadequate food intake because of poor appetite, early satiety, mouth ulcers and oral thrush, high selectivity around food choices, abdominal pain, and decreased interest in food
- Increased nutrient losses because of malabsorption, diarrhea, vomiting, and HIV enteropathy
- Increased nutrient needs because of the hyper-metabolic and hyper-catabolic effects of infections, OIs, and HIV itself

- Feeding difficulties in infants resulting from poor sucking and swallowing and in children resulting from food aversions, thrush, and food refusal. All these difficulties distort the feeding relationship between the caregiver and the child with HIV.
- Socioeconomic factors such as poverty, illness of the parent(s), and food insecurity

Frequent infections, mouth and throat sores, and decreased appetite all have a profound impact on a child's nutritional status. Consequently, feeding the HIV-infected child requires extra patience and supervision to encourage eating and ensure adequate food intake. Box 1 lists some clinical indicators of malnutrition in HIV-infected children that can be used for assessment.

Box 1. Clinical indicators of malnutrition in HIV-infected children

Moderate malnutrition

- Weight or weight for height < 90% of the National Center for Health Statistics (NCHS) median
- Weight for height < 5%
- Serum albumin < 3 g/dL

Severe malnutrition (requires admission to hospital for treatment if any one of these is present)

- Weight for height < 70% of the NCHS median
- Severe bilateral edema
- Visible wasting

Source: Tindyebwa et al., eds. 2004.

Purpose of nutrition care for children 2–9 years old in the context of HIV (slides 10 and 11)

Because of the many complications experienced by the HIV-infected child, nutrition care and support should be an integral component of treatment. Early nutrition intervention can help delay HIV disease progression or death in the HIV-positive child.

Nutrition interventions have the following objectives:

- Maintain and promote healthy weight, normal growth, and development.
- Preserve lean body mass.
- Prevent malnutrition and its effects on immunity.
- Provide adequate energy and nutrients.
- Minimize effects of gastrointestinal symptoms like diarrhea and vomiting.
- Prevent food and waterborne illness by promoting hygiene and food and water safety.
- Enhance response to therapy.
- Reduce morbidity and mortality.

Ongoing nutrition monitoring and intervention are necessary for all children with HIV, from the asymptomatic phase to AIDS. The earlier the monitoring in the better, as growth may be impaired even before symptomatic HIV disease. Nutrition intervention is crucial

as soon as growth—that is, height for age—appears to be suboptimal. This is important because successful weight gain is more likely before CD4 counts decrease. Any growth faltering should be followed up to determine the cause and identify the appropriate interventions. Health service providers should refer to local policies and practices on nutrition counseling and regular growth monitoring and promotion (monthly, if possible) to monitor the child's nutritional status and to make appropriate use of referral systems.

Nutrient requirements of the HIV-infected child 2−9 years old (slide 12–16)

Session 2 provides the recommended energy and nutrient intake for healthy non-infected children, including children 2−9 years old. This session discusses the nutrient requirements of the HIV-infected child 2−-9 years old, noting special considerations.

The HIV-infected child is at very high nutritional risk, as noted. HIV infection causes excess nutrient losses and malabsorption, further increasing nutritional requirements and the risk of undernutrition. Frequent infections increase energy needs as a result of the added metabolic stress of fever and often increased respiratory rates. The child may also have urinary losses of protein that increase protein requirements. HIV-related infections such as diarrhea have severe nutrition consequences that lead to appetite loss, weight loss, and wasting. Early diagnosis of HIV, prompt diagnosis and management of infections, and use of antiretroviral drugs (ARVs) where available can improve nutrition and health for the child.

Macronutrients

Energy (slide 12)

The estimated average daily energy requirements for healthy uninfected children are listed in table 1.

Table 1. Average daily energy requirements for children 2–9 years old

Age (years)	Energy requirement (kcal/day)	
	Girls	Boys
2–3	1,047	1,129
3–4	1,156	1,252
4–5	1,241	1,360
5–6	1,330	1,467
6–7	1,428	1,573
7–8	1,554	1,692
8–9	1,698	1,830

Source: FAO 2004.

The increased energy requirements of HIV-positive children 2–9 years old are explained in table 2.

Table 2. Summary of adjustments in energy requirements for HIV-infected children 2–9 years old

HIV phase	% of energy increase
Asymptomatic	10% increase to maintain growth
Symptomatic with no weight loss	20–30% increase
Symptomatic with weight loss	50–100% increase

For example, a 6-year-old boy who is HIV-positive and asymptomatic needs 10 percent more energy than non-infected boys his age.

Recommended normal intake = 1,428 kcal/day
10 percent more intake = 142 kcal
Total intake to maintain growth = 1,570 kcal/day

A 6-year-old boy who is HIV positive, symptomatic, and experiencing weight loss needs 50–100 percent more energy than the recommended intake for non-infected boys his age.

Recommended normal intake = 1,428 kcal/day
50–100 more intake = 714–1,428 kcal/day
Total intake to maintain growth = 2,142–2,856 kcal/day

Health care providers should follow the 1999 WHO *Management of Severe Malnutrition: A Manual for Physicians and Other Senior Health Workers* for management of severe malnutrition in children.

Translating calories to actual food intake (slides 13 and 14)

The increased energy requirement for HIV-infected children 2–9 years old needs to be translated into actual food intake. Caregivers should be counseled to increase children's energy intake by giving them an extra snack or meal every day. The kilocalories (kcal) in some common snack foods are listed below.

1 cooked egg = 77 kcal
1 banana = 109 kcal
1 tsp. margarine = 34 kcal
1 small−medium boiled potato = 116 kcal
1 tsp. peanut butter = 30 kcal

To increase energy intake in mashed boiled potatoes, for example, caregivers can add a boiled egg or 1 or 2 teaspoons of margarine. A snack of a cooked egg and a banana contain approximately 187 (77 + 109) kcal.

Dry maize flour has little water content and is high in energy, containing approximately 340 kcal per 100 g. When water is added to make porridge, the energy content per volume is reduced by more than two-thirds. The porridge is now mainly water, and the energy value is only approximately 115 kcal per 100 g.

High-fat foods such as vegetable oil, margarine, and peanut butter have very high energy content and can be fed to the HIV-positive child to meet increased energy requirements. Adding vegetable oil, margarine, or peanut butter to porridge increases the energy content. A teaspoon (5 g) of vegetable oil can add approximately 45 kcal to any food, and a teaspoon of peanut butter can add approximately 30 kcal. Because fats such as margarine and vegetable oil have higher energy content than carbohydrates, these fatty foods are usually recommended to improve the energy density of foods for young children. Caregivers can provide these goods to HIV-positive children, as long as the children are not suffering from fat malabsorption, diarrhea, nausea, or vomiting, conditions that fatty foods can worsen.

Protein (slide 15*)*

Protein is essential for growth and development, especially for the developing child. The recommended protein intake for healthy uninfected children is shown in table 3.

Table 3. Safe protein intake requirements for children, by age

Age (years)	Safe protein intake level (g/kg)
	Girls and boys combined
2–3	1.15
3–5	1.10
5–7	1.00
7–10	1.00

Source: FAO, WHO, and UNU 1985.

WHO (1985) recommends protein intake of approximately 1.1 grams per kilogram of weight per day for healthy non-infected children 2−9 years old. WHO currently does not recommend increasing protein intake for HIV-positive children over the normal requirements for health (12−15 percent of total energy intake). However, because energy requirements increase by 10 or 20−30 percent in HIV-positive children, protein requirements also increases, as protein is calculated as a percentage of total energy intake.

Fats (slide 15)

Fat restriction for children is not recommended, but fat intake should be no more than 30 percent of total calories in the diet. There is no recommendation to change fat intake in HIV-infected children above the recommendations for healthy non-infected children.

Micronutrients (slide 16)

WHO recommends that HIV-infected children eat healthy diets that meet the recommended daily allowance (RDA) of micronutrients. However, some HIV-infected children whose dietary intake is inadequate to meet their micronutrient needs may need

supplementation, especially if deficiencies exist. Micronutrient supplementation should follow WHO recommendations and should not exceed RDA levels.

Vitamin A

The WHO HIV/AIDS Technical Working Group recommends that children 6−59 months with HIV who live in resource-limited settings receive vitamin A supplements (200,000 IU for children > 12 months old) every 4−6 months. This level is consistent with current WHO recommendations for prevention of vitamin A deficiency in children. There is no recommended increased dose or frequency for vitamin A in HIV-infected children. Table 4 shows WHO's recommended schedule of high-dose vitamin A supplementation.

Table 4. WHO schedule of high-dose vitamin A supplementation

Age	Infant
0–5 months	**3 doses of 50,000 IU at 1-month intervals. Doses should be given at a health or immunization contact, in particular at each DTP (6, 10, and 14 weeks)**
6–11 months	**1 single dose of 100,000 IU given at any health or immunization contact, in particular at measles vaccination (9 months)**
12–59 months	**200,000 IU every 6 months at any health or immunization contact**

Zinc

Zinc losses occur with diarrhea, a common symptom of HIV disease. However, supplementation with zinc above the RDA level is not recommended because of the observed adverse effects of zinc on the immune system. Zinc supplementation of children with chronic diarrhea should follow IMCI or national guidelines. There is currently no recommendation for zinc supplementation in HIV-infected children different from the recommended levels for healthy non-infected children

Iron

HIV-infected children should be given iron supplements to prevent anemia, according to national protocols. WHO recommendations for iron supplementation in children to prevent anemia are shown in table 5.

Table 5. WHO recommendations for iron supplementation in children

Age (years)	Dosage
2–5*	20–30 mg/day
6–11	30–60 mg/day

*** Based on 2 mg iron/mg body weight/day**

Iodine

There is no recommendation to increase iodine intake for HIV-infected children above the RDA. However, it is important that all households use iodized salt to help prevent iodine deficiency.

Although HIV-infected children are often deficient in vitamin A and zinc, there are currently no recommendations to increase the dose or frequency of these micronutrients for these children. Where diet is inadequate to meet the RDA for micronutrients, children should receive a daily multivitamin supplement. The multivitamin supplement should not exceed the RDA levels for each nutrient. Supplementation with vitamin A, iron, and zinc should follow national guidelines or WHO recommendations for micronutrient supplementation for children of the same sex and age.

Components of nutrition care and support for young HIV-infected children (slide 17)

Nutrition care of children addresses issues of growth and development as well as tissue maintenance and repair and nutrient metabolism. The following key contact points are opportunities to support proper nutrition care and support for HIV-positive children:

- Well child and sick child visits (children over 2 years old do not routinely attend well child clinics)
- National Health Days
- Day care centers
- Community and nursery schools
- Primary schools

At each of these contact points, health service providers can provide nutrition advice, counseling, care, and support, and help to caregivers to help prevent undernutrition and promote optimal growth and development, especially for HIV-infected children.

Exercise 1. Group work

Ask the participants to identify the age group that would be served at each of the contact points listed above.

Divide the class into small groups. Ask each group to discuss the questions below:

- What contact points in your area would see HIV-infected children 2–9 years old?
- How can nutrition care and support of HIV-infected children be incorporated into services at these contact points?
- What components of nutrition care and support should be integrated into the job description of health service providers who come into contact with sick children 2–9 years old?

Ask each group to present its results in plenary.

The following components should be included in programs that provide nutrition care and support for HIV-infected children:

1. Nutrition screening and assessment
2. Management and treatment of common diet-related HIV symptoms
3. Improved diet to meet needs for growth and development
4. Promotion of good hygiene and food and water safety
5. Treatment of severe malnutrition
6. Provision of ARVs

1. **Nutrition screening and assessment** (slide 18)

Nutrition assessment provides valuable information about child growth and development. Nutrition assessment should be done at both well child and sick child visits to help identify risk factors that might restrict food intake and hinder proper child growth and development. A baseline nutrition screening should be done when a child is first seen or during a follow-up visit.

Children infected with HIV can be identified mainly by weight loss, failure to thrive, and medical history. Health service providers should do in-depth nutrition assessment for children identified as being at risk. The information collected includes the following:

- Anthropometrics (weight, height, and mid-upper arm circumference, or MUAC)
- Biochemical data
- Social history
- Clinical diagnosis and medical history
- Diet evaluation

Anthropometric measurements are important to monitor the health and nutritional status of children. Growth faltering is usually the first indication that there is something wrong nutritionally, medically, socially, or developmentally. In resource-limited settings where childhood undernutrition and HIV rates are high, growth monitoring and promotion are key child survival strategies. Children therefore should have their growth monitored at each visit regardless of their health and nutritional status. **Handout 11.5. Assessing Child Growth** provides guidance on child growth monitoring.

Growth is a sensitive indicator of HIV disease progression in children. Poor growth tends to precede a decline in CD4 count and development of OIs. Growth monitoring should be done every 3 months (monthly if the child's nutrition is altered). At each visit, health service providers should keep a record of the child's weight and height on a growth monitoring card so that any faltering can be caught quickly and early intervention or treatment provided. All health service providers working with children should be trained properly on the importance of taking accurate weight and height measurements in children, the techniques for doing so, and the interpretation of the results.

Health service providers should review the social history of the child because the following factors can affect nutritional status, development, and growth:

- Physical environment
- Caregiver's health and social history

- Role of food and rituals surrounding food preparation and consumption in the family and community
- School and social environment
- Psychosocial, mental health, and other social aspects related to care of orphans and vulnerable children (OVC), as these are major contributors to undernutrition in this group

Health service providers should make a clinical diagnosis and take a medical history of the following:

- Gastrointestinal problems (e.g., diarrhea, abdominal pain, nausea, vomiting)
- Pattern of bowel movements
- Presence of OIs
- Concurrent medical problems (e.g., diabetes, malaria, tuberculosis, ear infections, pneumonia)
- Medications the child is taking (ARVs, alternative therapies, other medications)
- Completion of primary health care actions such as immunizations, deworming, vitamin A supplementation, and Cotrimoxazole prophylaxis

Early nutrition intervention can help HIV-infected children preserve lean body mass and slow the progression of HIV disease to AIDS. It is important not to wait until the child shows signs of undernutrition to support nutrition in HIV-infected children.

Evaluating the child's dietary intake can show the adequacy or inadequacy of food intake and nutrition-related problems such as poor appetite, chewing and swallowing difficulties, and food intolerances and aversions. Health service providers should pay particular attention to age-related and developmental feeding capabilities, family cultural food preferences, and the caregiver-child feeding relationship. Conditions that affect appetite and food intake should be discussed with the caregiver and treated appropriately.

24-hour recall may be used to make a quick assessment of a child's dietary intake. This involves asking the mother what she gave her child to eat in the past 24 hours and what and how much the child actual ate. This method has the advantage of not requiring literacy or writing skills. However, 24-hour recall tends to underestimate the intake of most children and overestimate intake in undernourished children and does not give a good indication of day-to-day variability in diet.

When assessing children's diet and feeding problems, health service providers should collect information on the factors listed below (adapted from the American Dietetic Association and Dieticians of Canada 2000) to use to counsel parents or caregivers on how to prevent undernutrition and weight loss.

- Weight loss or gain (evaluate growth chart- no weight gain for 2–3 consecutive months)
- Appetite
- Environment in which the child is fed
- Caregiver involved in feeding the child
- Caregiver's access to food and preparation method
- Caregiver's health and social history

- Caregiver's ability to meet the child's calorie and nutrient needs financially (food security)
- Multivitamin or mineral supplements taken by the child
- Medications (e.g., Cotrimoxazole, ARVs) taken by the child
- Other co-morbidities, e.g., diabetes
- Frequency, type, amount, and variety of food and liquids taken by the child
- Food safety and hygiene (e.g., availability of clean drinking water)
- Food allergies and intolerances
- Chewing and swallowing difficulties
- Support and community resources available
- Alternative and traditional therapies used for the child
- Developmental and learning milestones according to the age of the child

Physical examination and observation are integral components of nutrition assessment of the child. A physical assessment can help identify protein or energy deficiencies, non-specific signs of nutrient deficiencies, growth anomalies, or signs of physical abuse. The following are common signs of problems in children:

- Poor muscle tone, development
- Nail, hair, or skin changes
- Pallor
- Easy bruising
- Edema
- Dehydration
- Red or bleeding gums
- Pale or dry mucous membranes

Health service providers should screen visually for severe wasting (**marasmus**). A child who looks very thin, has little fat or muscle, and looks like skin and bones is likely to be wasted. Wasting is also indicated by lack of muscle on the shoulder girdle, arms, buttocks, and legs and visibility of the outline of the child's rib cage. Marasmus requires urgent medical attention.

Edema or swelling of both feet resulting from retention of fluid in the child's tissues is known as **kwashiorkor**. Health service providers should press gently with their thumbs for a few seconds on the upper top of each foot to determine whether the swelling is a result of fluids. If a dent remains when the thumb is removed, the child has edema. Other signs of kwashiorkor include thin, sparse, and pale hair that falls out easily, dry scaly skin, especially on the arms and legs, and a puffy or moon face. See WHO, UNICEF, and BASICS 1999 for more information.

Handout 11.6. lists physical characteristics of normal and malnourished children with possible nutrient deficiency.

Exercise 2. Role-play

Ask three students volunteer to role-play a nurse, a caregiver, and a 5-year-old girl. Explain that the caregiver has brought her daughter for a sick child visit. The child has not been feeling well for the past week. She is lethargic, has a fever, and has been eating very poorly. She has also had diarrhea for the past 3 days. Give the volunteers 15 minutes for the role-play.

Ask the rest of the students to observe the role-play and fill in **Handout 11.2. Checklist for Nutrition Assessment**.

After 15 minutes, ask the class to discuss the following questions.

- Did the nurse address the important issues?
- Did the nurse provide appropriate interventions?
- What other information does the nurse need? Did she ask appropriate questions to get this information?
- What did the nurse do right?
- What did the nurse do that she shouldn't have done?
- What could the nurse have done better?
- What issues, if any, where not discussed?
- What would the nurse want to follow up on the next visit?

2. **Management of common diet related HIV symptoms** (slide 19)

HIV disease causes many symptoms, some of which can be managed using diet to minimize their impact on child nutritional status.

Handout 11.4. Job Aids for Nutrition Counseling and Education and **Handout 11.7. Job Aid for Counseling on Management of Common HIV Symptoms that Affect Children's Dietary Intake** can help health service providers manage common dietary problems and symptoms of HIV-infected children. **Handout 11.8. Job Aid for Counseling on Managing Inadequate Dietary Intake in HIV-Infected Children** can help health service providers counsel clients on inadequate nutrient intake resulting from poor appetite, early satiety, abdominal pain, nausea, and thrush/mouth sores. Other job aids that can help health service providers counsel caregivers to manage common symptoms in children with HIV are **Handout 11.10. Job Aid for Counseling on Management of Opportunistic Infections or Fever in HIV-Infected Children**, **Handout 11.11. Job Aid for Counseling on Management of Gastrointestinal Problems in HIV-Infected Children**, **Handout 11.12. Job Aid for Counseling on Management of Altered Taste in HIV-Infected Children**, and **Handout 11.13. Job Aid for Counseling on Socioeconomic Factors That May Affect Nutrition in HIV-Infected Children**.

3. **Improved diet to meet needs for growth and development** (slide 20 and 21)

Many HIV-positive children fail to thrive or lose weight. Their diets must be individualized to provide adequate calories and nutrients based on their age, weight, and symptoms.

Health service providers should review HIV-infected children's diet at every well and sick child visit and counsel caregivers to 1) improve the diet taking into consideration the child's age, local resources, and the family circumstances, feed locally available nutrient-dense foods from all the food groups, and feed an extra meal after illness to help the child catch up growth, as per IMCI guidelines, 2) manage diet-related symptoms with appropriate nutrition interventions, and 3) address feeding difficulties such as food aversion and food refusal in order to maximize food intake. **Handout 11.9. Job Aid for Counseling on Management of Feeding Difficulties in HIV-Infected Children** can help health service providers counsel caregivers on managing these problems. HIV-infected children should receive multivitamin supplementation, including prophylactic vitamin A supplementation, where available, according to national recommendations. Other nutrition or nutrition-related interventions include presumptive deworming every 6 months, using insecticide-treated bed nets to prevent malaria, and using iodized salt in food preparation.

Inadequate energy and micronutrient intake affect growth and development. The diet of the HIV-infected child can be improved by increasing energy intake and providing micronutrient supplementation or fortification to help meet the increased energy demands of HIV infection and the needs for growth and development. The actions listed below can help caregivers increase the caloric intake of HIV-infected children who may be ill frequently and suffer from fever, mouth sores, and decreased appetite.

- Increase the frequency of meals (6–8 small meals throughout the day).
- Feed small amounts of nutrient-dense foods every 2 hours to maximize intake if appetite is very poor.
- Feed high-energy and nutrient-dense foods (e.g., fortified, germinated, or fermented foods).
- If available and the child does not have diarrhea or malabsorption, add high-calorie, high-protein foods such as margarine, butter, vegetable oil, dry milk powder, cooked eggs, cheese, or peanut butter to foods for the child.
- Feed a variety of locally available fruits, vegetables, legumes, animal products, cereals, and fortified foods.
- Give the child nutritious and energy-dense snacks between meals.
- Give the child soft foods that require less chewing or are easy to eat.
- Feed the child patiently and persistently with supervision and love.

4. **Promotion of good hygiene and food and water safety** (slide 22)

Good hygiene and food and water safety can avoid pathogenic contamination (e.g., diarrhea, dysentery, cholera, or typhoid) that can further weaken the immune system and speed up HIV disease progression. Caregivers should follow the same safe and hygienic practices for food handling and preparation for children as for adults. They also should teach children how to wash their hands before they handle food and after they use the toilet and how to say politely, "No, thank you" when they are offered "unsafe" food or water. Session 8 includes a list of these practices.

5. **Prompt treatment of secondary infections** (slide 23)

Secondary infections such as tuberculosis, oral thrush, fever, persistent diarrhea, and pneumonia in HIV-infected children should be promptly treated. Maintaining the child's

food intake can help minimize the nutrition impact of these infections. Some medications to treat OIs and other diseases may have side effects that affect intake. Side effects that are diet related, such as nausea and vomiting, taste changes, and loss of appetite, may be managed through diet. Session 4 discusses the management of HIV-related complications. The child should be give presumptive treatment such as Cotrimoxazole for infections.

6. **Treatment of severe malnutrition** (slides 24 and 25)

Many HIV-infected children are at risk of malnutrition. Severely malnourished children should be referred to an appropriate nutrition rehabilitation center (therapeutic feeding center, community therapeutic care program, or hospital-based unit). Health service providers should follow the 1999 WHO *Management of Severe Malnutrition: A Manual for Physicians and Other Senior Health Workers* if there are no applicable national guidelines. WHO guidelines do not specifically address HIV-positive malnourished children, but offer the following general principles for managing severe acute malnutrition:

- Categorize the extent of malnutrition by both anthropometric and clinical and biomedical methods and determine current intake patterns to assess adequacy and determine optimal intervention.

- Treat any infections, especially those that affect food intake and absorption.

  - Prevent and control hypoglycemia (low blood sugar).
  - Use oral rehydration therapy to replace lost fluids.
  - Regulate body temperature to prevent hypothermia.
  - Use antibiotics as necessary to treat infections.

- Provide adequate nutrition therapy.

  - Provide F-75 therapeutic milk during initial stabilization while life-threatening illnesses are treated and until appetite returns. For severely anorexic children, consider nasogastric feeding, which is reserved as a last resort as it may increase risk of infection.
  - Provide F-100 therapeutic milk or ready-to-use therapeutic food (RUTF) during the rehabilitation phase to gain weight. Supplement with nutrient and energy-dense local foods.
  - Encourage active feeding by caregivers.
  - Provide deworming and vitamin A supplementation according to national protocols (e.g., 200,000 IU on admission, a second dose the next day, and a follow-up dose 14 days later).

- Provide nutrition counseling to caregivers.
- Follow up the child after discharge to monitor weight, adequacy of the diet, and infections.

Community-based management of acute malnutrition (slide 26)

Community-based management of acute malnutrition (CMAM) has been shown to maximize the coverage and timeliness of the treatment of severe acute malnutrition (SAM) by allowing children to be treated in their homes instead of hospitals or therapeutic feeding centers. CMAM focuses on children under 5, traditionally the age group most vulnerable to SAM.

WHO classifies malnutrition has two categories: SAM and moderate acute malnutrition (MAM), defined by anthropometric measurements and the presence of bilateral pitting edema. Traditionally these categories have been used to determine eligibility for 1) inpatient therapeutic feeding for children with SAM and 2) outpatient supplementary feeding for children with MAM. CMAM involves a third mode of treatment: Outpatient therapeutic feeding for children with SAM and no additional medical complications.

Table 6 shows the CMAM classification of malnutrition, which is used to determine the mode of treatment.

Table 6. CMAM classification of acute malnutrition

Type of malnutrition	SAM with complications	SAM without complications	MAM
Characteristics	< 80% of median weight for height OR Bilateral pitting edema +++ OR MUAC < 125 mm AND One of the following: Anorexia, lower respiratory tract infection, high fever, severe dehydration, severe anemia, lack of alertness, hypoglycemia, hypothermia	< 70% of median weight for height OR Bilateral pitting edema + or ++ OR MUAC < 110 mm AND Appetite, clinical wellness, alertness	70–80% of median weight for height AND No edema OR MUAC 110–125 mm AND Appetite, clinical wellness, alertness
Treatment	Inpatient stabilization and care using IMCI/WHO protocols	Outpatient therapeutic care	Outpatient supplementary feeding

7. **Provision of antiretroviral therapy** (slides 27 and 28)

Antiretroviral therapy (ART) helps prolong HIV-infected children's survival and enhance their quality of life by reducing viral load and hence delaying disease progression. ART can also help improve growth parameters including weight, weight for height, and muscle mass. Some common side effects of ARVs—nausea, vomiting, diarrhea,

constipation, anorexia, and taste changes—are similar to the common symptoms of HIV infection that affect dietary intake. Management of these side effects is crucial to ensure drug efficacy and tolerance and continued food intake to maintain food nutritional status.

Some ARVs are best taken on an empty stomach, others should be taken with food, and others can be taken with or without food. Treatment of HIV-infected children should follow national recommendations where available. The first line of ARVs recommended for children > 3 years old and/or weighing > 10 kg are Zidovudine/ Lamuvidine/Efavirenz (African Network for the Care of Children Affected by AIDS 2005). Health service providers should be familiar with the ARVs available in the country for children, possible side effects that might affect dietary intake, whether or not they should be taken on an empty stomach or with food, and associated drug-food interactions. Counseling and education on timing of medications, meals, and snacks and on food composition are important components of ART. Other medical management may include Cotrimoxazole prophylaxis and Immunization according to local policies.

Field visit

If possible, arrange for the class to observe a National Health Day or similar event and discuss afterward whether this is a good contact point for nutrition interventions for HIV-infected children in the area. If not, ask how the nutrition care and support interventions can be incorporated into other contact points for children 2–9 years old.

Nutrition actions for care of the HIV-infected child (slide 29)

Health service providers should practice the following actions to provide care and support for HIV-infected children:

- Review the child's diet for appropriate food and nutrient intake.
- Counsel the caregiver on correct amount and variety of foods.
- Counsel the caregiver on appropriate feeding practices.
- Promote good hygiene and food preparation.
- Routinely monitor growth.
- Promote essential child services (immunization and supplementation).
- Help identify OIs.
- Identify community support services for nutrition.
- Refer the caregiver to programs offering ARVs.

Issues and challenges for nutrition care and support of HIV-infected children (slide 30)

Metabolic complications are associated with the long-term use of ARVs in children. Such complications include glucose metabolism and bone metabolism. Much is still unknown about the long-term impact of ARV treatment in children, especially malnourished children, and about the effect of HIV infection on children's micronutrient, protein, and fat requirements. Another challenge is the fact that many settings lack the human resource capacity to provide the care and support needed to ensure survival of the HIV-infected child.

Conclusions (slide 31)

Children with HIV are vulnerable to undernutrition and growth failure. HIV causes excess nutrient losses and malabsorption, further increasing nutritional requirements and the risk of undernutrition. Micronutrient deficiencies, frequent infections, mouth and throat sores, and decreased appetite all affect nutritional status. Because of the many complications experienced by the HIV-infected child, nutrition care and support should be an integral component of treatment.

Early nutrition intervention can help delay HIV disease progression or death in the HIV-positive child. Components of nutrition care and support for young HIV-infected children include nutrition screening and assessment, management and treatment of common diet-related HIV symptoms, improved diet to meet needs for growth and development, promotion of good hygiene and food and water safety, treatment of severe malnutrition, and provision of ARVs.

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Handout 11.1. Nutrition Actions for the Care and Support of HIV-Infected Children

- Review children's nutritional status (including weight and height) at every clinic visit to ensure appropriate and adequate food intake.

- Counsel caregivers to increase the amount and variety of foods given to children, especially after illness, emphasizing locally available energy-dense, high protein, fortified foods and fruits and vegetables.

- Counsel caregivers to give children family foods rich in energy (cereals, cooking bananas, roots, tubers), protein (pulses, nuts, foods of animal origin), and vitamins and minerals (fruits, vegetables, fats, and oils) at least three times a day and nutritious snacks between meals at least twice a day.

- Counsel caregivers to feed smaller, more frequent meals six–eight times a day if children have poor appetite or are not feeling well. Nutrient dense foods every 2–3 hours can help maximize nutrient intake for children with poor appetite.

- Counsel caregivers on cultural feeding habits, traditional therapies, and other practices that may be harmful to young children or reduce food intake.

- Promote good hygiene and food and water safety to prevent infections.

- Promote the use of safe, clean, and boiled water for drinking and food preparation.

- Promote the use of iodized salt for cooking and insecticide-treated bednets for sleeping.

- Regularly and accurately monitor child weight and height to identify growth faltering and undernutrition and appropriate interventions.

- Provide or refer caregivers to routine essential infant and child services (immunization, vitamin A supplementation, and deworming) according to national guidelines.

- Counsel caregivers to identify opportunistic infections (OIs) such as oral thrush, fever, and gastrointestinal problems or other infections such as malaria, acute respiratory infections, and diarrhea in children and seek early treatment from health service providers.

- Provide oral rehydration salts to prevent dehydration from diarrhea, a common symptom in HIV-infected children.

- Counsel caregivers to identify support services and programs in their communities that may improve nutrition, quality of living, and well being for HIV-infected children.

- Refer caregivers to programs that treat OIs and provide antiretroviral drugs for young children.

- Refer caregivers to presumptive treatment such as Cotrimoxazole to help prevent infections in children.

- Refer caregivers to food assistance or food supplementation if food security is an issue

Handout 11.2. Checklist for Nutrition Assessment

Did you …	YES	NO
Accurately weigh and measure the child and plot the weight and height on the growth chart?		
Evaluate and review any growth faltering shown on the growth chart with the caregiver?		
Provide an appropriate intervention to manage the growth faltering?		
Assess the child's typical intake and review the child's diet with the caregiver?		
Review the caregiver's ability to financially meet the child's energy and nutrient needs (food security issues)?		
Recommend ways to increase energy and nutrient intake in the child's diet using locally available foods?		
Investigate and provide appropriate nutrition interventions for poor intake or excessive losses through diarrhea or vomiting?		
Review the medications and/or ARVs the child is taking and provide appropriate interventions for any side effects noted?		
Recommend a daily multivitamin supplement, if available?		
Assess any physical signs of malnutrition and provide an appropriate intervention if present?		
Check whether the child has received routine essential infant and child services (immunization, deworming, and vitamin A supplementation) according to national guidelines and advise the caregiver accordingly?		
Discuss hygiene and food and water safety issues if necessary?		
Ask whether the caregiver has any questions or concerns about the child's nutrition or health?		
Schedule a follow-up appointment with the caregiver?		

Handout 11.3 Monitoring the HIV-Positive Child

1. Do a baseline nutrition assessment as soon a child is diagnosed with HIV to identify needed actions to prevent malnutrition and growth failure.

2. Follow up the nutrition assessment every 6 months or more frequently if the child has clinical symptoms or growth failure. A complete nutrition assessment includes weight, height, body composition (skin fold and mid-upper arm circumference, or MUAC).

3. Evaluate the child's weight and height growth velocities using the growth charts. Any growth faltering indicates the need to evaluate for nutritional intervention.

4. Where testing is available, monitor the biochemical markers albumin and hemoglobin.

5. Assess the child's typical dietary intake using 24-hour recall. Investigate and take appropriate action if there is any indication of poor intake or excessive losses through diarrhea or vomiting.

6. Schedule a follow-up appointment with the caregiver.

Handout 11.4. Job Aid for Nutrition Counseling and Education

This algorithm assumes that the child's weight has been taken, recorded, and evaluated.

Excessive losses through diarrhea
Counsel caregiver to:

- Use oral rehydration salts to avoid dehydration
- Ensure that the child drinks plenty of fluids, offering diluted fruit juices or clean boiled water every 1–2 hours.
- Reduce or avoid the use of cooking oil and fat in food.
- Give the child smaller but more frequent meals every 2 hours or so.
- Feed the child soft, moist foods such as plain rice, ripe bananas, plain bread, boiled potatoes, and boiled meat.
- If milk makes the diarrhea worse, avoid giving it to the child until he/she is better.
- Give multivitamin supplements if available.

Poor appetite
Counsel caregiver to:

- Give the child favorite foods in small amounts every 2–3 hours.
- Make every bite count by giving the child energy-dense foods and increasing the protein in the foods by adding peanut butter, egg, or fish powder to vegetable soup or porridge.
- Provide a multivitamin supplement where available.

Difficulty chewing and swallowing because of thrush/mouth sores
Counsel caregiver to:

- Give the child pureed or soft, moist, non-spicy foods at room temperature.
- Avoid acidic foods and sugar.
- Give the child a straw for drinking.
- If possible, rinse the child's mouth with warm water at least three times a day, preferably after eating.

Excessive losses through vomiting
Counsel caregiver to:

- Give the child plenty of fluids to replace fluids lost and prevent dehydration.
- Offer small meals every 2 hours and fluids every 1–2 hours.
- Try feeding the child plain foods such as dry bread, plain toast, and chapatti.
- Give oral rehydration salts if vomiting is severe to avoid dehydration.
- Avoid feeding the child foods with strong or unpleasant odors or greasy or fried foods.
- Feed cool foods and foods that are soft and moist.

Handout 11.5. Assessing Child Growth

Is the child's growth optimal?

- Weigh the child and measure his/her height.
- Plot the weight and height on the growth chart.
- Assess whether the child is growing optimally by comparing his/her weight and height to the reference charts.

If yes

- Praise the caregiver and encourage continuing to provide a balanced diet to the child to maintain weight and lean body mass.
- Stress good hygiene and food and water safety.
- Encourage the caregiver to seek immediate medical care if the child is ill.
- Ensure child has had all the appropriate immunizations.
- Encourage the use of iodized salt in food preparation.
- Provide presumptive deworming every 6 months as required.
- Promote the use of insecticide-treated bednets to prevent malaria.

If no

- Review the diet to make sure it is adequate. If not,
- Counsel the caregiver on appropriate feeding for the child's age.
- Discuss with the caregiver ways to increase the child's energy and nutrient intake.
- Address diet-related symptoms of HIV that affect food intake.
- If the child's growth faltering is not related to nutrition, refer the child for appropriate management, encourage the caregiver to seek treatment of the child's opportunistic infections, and make sure the child has had all the appropriate immunizations for his/her age.
- Encourage the caregiver to have the child weighed regularly.

Handout 11.6. Physical Characteristics of Normal Nutrition and Malnutrition with Possible Nutrient Deficiency

Normal appearance	Malnutrition	Possible Nutrient Deficiency
Hair		
Shiny Difficult to pluck Normal distribution	Dry, dull Alopecia (baldness) Brittle Early graying	Protein, energy, or essential fatty acid deficiency Protein, zinc or biotin Protein, energy or copper Vitamin B_{12}
Face		
Uniform Not swollen	Full Puffy Cheeks drawn in	Protein Protein, energy Protein, energy
Eyes		
Bright, clear, shiny Membranes moist, pink No broken vessels	Corneal or conjunctival dryness Conjunctival pallor Corneal vascularization Bilateral redness and fissuring of eyelid corners	Vitamin A Iron, folic acid Riboflavin, vitamin B-complex Riboflavin, vitamin B-complex, vitamin B_{12}
Lips		
Pink, moist, smooth	Angular stomatitis Cheilosis (chapping, fissuring)	Niacin, riboflavin, iron, vitamin B_6 Niacin, riboflavin, vitamin B_6
Tongue		
Taste buds over dorsum and sides of tongue Pink, moist, smooth	Magenta, painful, edema Scarlet, painful, smooth Pallor Papillary atrophy Papillary hypertrophy Fissuring, edema Taste changes Glossitis	Riboflavin, biotin Niacin, folic acid, vitamin B6 Biotin, iron vitamin B12 Iron, folic acid, vitamin B12, niacin, riboflavin Niacin, riboflavin, vitamin B12 Niacin Zinc, vitamin A Iron, vitamin B12, folic acid, riboflavin, pyridoxine, vitamin B6

Normal appearance	Malnutrition	Possible Nutrient Deficiency
Gums and Teeth		
Pink, moist, smooth 32 teeth, white, shiny	Bleeding, receding Gingivitis, stomatitis Fluorosis Carious	Vitamin C Folic acid, vitamin B_{12} Fluoride excess Protein, energy, fluoride
Skin		
Smooth No rashes, swelling or scales	Xerosis (dryness) Scaly dermatitis Follicular hyperkeratosis Delayed wound healing Xanthoma (yellowish papules) Decubitus ulcers Dematitis herpertiformis	Vitamin A. essential fatty acids, zinc Riboflavin, biotin, zinc, essential fatty acids Vitamin A, essential fatty acids Zinc, protein, vitamin C Elevated cholesterol Zinc, protein, vitamin C Gluten enteropathy
Nails		
Firm, Pink	Koilonychia (spoon nails) Egg shell nails Blue lunula	Iron, chromium Vitamin A Copper excess
Abdomen		
Symmetrical, flat	Distension Flatus	Protein, energy Lactose intolerance, low fiber
Musculoskeletal		
Good tone with some fat Normal movement	Wasting Tenderness Reduced strength Bone pain Dowagers's hump Bowed legs, pigeon chest	Protein, energy, thiamin Thiamin, Selenium Protein, energy, calcium, sodium, vitamin D, potassium Vitamin D, calcium phosphate Calcium, vitamin D Vitamin D, calcium

Normal appearance	Malnutrition	Possible Nutrient Deficiency
Neurological		
Psychological stability Normal reflexes	Depression Confusion Dementia Sensory neuropathy Tetany	Pyridoxine, zinc, niacin, vitamin B_{12} Thiamin, niacin, vitamin B_{12} Niacin, vitamin B_{12} Vitamin B_{12}, vitamin B-complex, vitamin E Calcium, magnesium

Source: American Dietetic Association and Dieticians of Canada 2000.

Handout 11.7. Strategies for Managing Common HIV Symptoms That Affect Children's Dietary Intake

Symptom	Nutrition intervention
Sores in mouth and throat	Give the child pureed or soft, moist, non-spicy foods at room temperature. Avoid giving the child acidic foods and sugar. Give the child a straw for drinking. If possible, rinse the child's mouth with warm water at least three times a day, preferably after eating.
Fever	Encourage the child to drink plenty of fluids (water, juice, soup, tea). Offer sips of fluid almost every hour. Mix oral rehydration solution (ORS) to give the child to drink. Continue to encourage food intake, give energy- and nutrient-dense foods in small amounts and more often. Offer soft foods as tolerated. Give the child multivitamin supplements, if available.
Diarrhea	Give the child ORS to avoid dehydration. Make sure the child drinks plenty of diluted fruit juices or clean boiled water every 1–2 hours. Reduce or avoid the use of cooking oil and fat in food. Give the child smaller but more frequent meals every 2 hours or so. Feed the child soft foods such as plain rice, ripe bananas, plain bread, boiled potatoes, and boiled meat. If milk makes diarrhea worse, do not give it until the child is better. Give the child multivitamin supplements, if available.
Decreased appetite (anorexia)	Give the child favorite foods in small amounts and more frequently, every 2–3 hours. Make every bite count by feeding the child energy-dense foods and increasing the protein content of the food by adding peanut butter, egg, or fish powder to vegetable soup or porridge. Give the child multivitamin supplements, if available.
Nausea and vomiting	Give the child plenty of fluids to drink to replace fluids lost and prevent dehydration. Offer small meals every 2 hours and fluids every 1–2 hours. Feed the child plain foods such as dry bread and chapatti. Give oral rehydration salts if vomiting is severe to avoid dehydration. Avoid feeding the child foods with strong or unpleasant odors and greasy or fried foods. Feed cool foods and foods that are soft and moist.

Symptom	Nutrition intervention
Lactose intolerance	Limit or avoid feeding the child milk and milk products and reintroduce them slowly once symptoms subside.
Taste changes	Give the child favorite foods in small quantities. Use a variety of flavor enhancers to increase taste acuity and mask unpleasant taste sensations. Try different textures of food. Encourage the child to chew food well.

Handout 11.8. Job Aid for Counseling on Management of Inadequate Intake in HIV-Infected Children

Children with HIV may not eat enough food to maintain their nutritional status because of poor appetite, early satiety, abdominal pain, nausea, thrush/mouth sores, or side effects of medication.

1. Try to determine the cause of the inadequate intake.

    - If the caregiver is providing replacement feeding, find out whether the formula is prepared correctly and advise accordingly.

2. Assess the child's growth if possible.

    - Weigh the child and plot the weight on a growth chart.
    - If the chart shows early growth faltering, determine whether the child needs medical attention or increased energy intake and advise the caregiver accordingly.

3. Ask about the child's current eating habits.

    - Use a list of locally available food to determine what the child is eating.
    - Counsel the caregiver on what foods to prepare to increase energy intake, especially if the child is losing weight.
    - Ensure that the caregiver uses iodized salt to prepare the child's food.

4. Encourage the caregiver to feed the child small but nutritious meals more frequently.

    - Advise the caregiver to give the child something to eat every 2–4 hours.
    - Advise the caregiver to give the child energy-dense foods and snacks and increase the amount.
    - Advise the caregiver to give the child a variety of foods from all the food groups.
    - Advise the caregiver to give the child fluids such as clean boiled water between meals.
    - Advise the caregiver to give the child favorite foods whenever he/she wants.
    - If the child has thrush/mouth sores, advise the caregiver to feed the child room-temperature foods, avoid citrus fruits, sugar, and dry, sticky, or hard foods and clean the child's mouth after each meal with cotton wool and lightly salted, clean, boiled warm water and to give an older child a straw for drinking.

5. Encourage the caregiver to feed the child patiently and persistently, with supervision and love.

6. Counsel the caregiver to take the child for medical treatment if the condition persists for a long time to help prevent growth failure and undernutrition.

7. Encourage the caregiver to continue giving the child medication as prescribed but to seek medical attention if the side effects of the medication are the cause of the food aversion or refusal.

8. Refer the caregiver to routine essential infant and child services such as immunization, vitamin A supplementation, iron supplementation, and deworming according to national guidelines.

Handout 11.9. Job Aid for Counseling on Management of Feeding Difficulties in HIV-Infected Children

Children with HIV may have aversions to or refuse certain foods.

1. Assess the child's growth if possible.

    - Weigh the child and plot the weight on a growth chart.
    - If the chart shows early growth faltering, determine whether the child needs medical attention or increased energy intake and advise the caregiver accordingly.

2. Ask about the child's current eating habits.

3. Counsel the caregiver to mitigate the nutritional effects of the child's food aversion.

    - Advise the caregiver to increase the energy of the foods the child is eating by adding margarine, butter, vegetable oil, milk powder, groundnut paste, or cooked egg to prevent weight loss.
    - Advise the caregiver to avoid giving the child excessive amounts of fruit juices or sodas because they fill up the child, replace more energy- and nutrient-dense foods, and have no nutritional value.

4. Counsel the caregiver on how to manage food aversion or refusal.

    - Encourage the caregiver to offer the child small, frequent meals of favorite foods.
    - Advise the caregiver to concentrate on feeding the child nutrient- and energy-dense foods.
    - Advise the caregiver to give the child a variety of foods.
    - Encourage the caregiver to feed the child patiently and persistently, with supervision and love.

5. Counsel the caregiver to take the child for medical treatment if the condition persists for a long time to help prevent growth failure and undernutrition.

6. Encourage the caregiver to continue giving the child medication as prescribed but to seek medical attention if the side effects of the medication are the cause of the food aversion or refusal.

7. Refer the caregiver to routine essential infant and child services such as immunization, vitamin A supplementation, iron supplementation, and deworming according to national guidelines.

Handout 11.10. Job Aid for Counseling on Management of Opportunistic Infections or Fever in HIV-Infected Children

1. Ask the caregiver how long the child has had the infection.

    - If the condition has persisted despite all efforts by the caregiver and is accompanied by fever, refer the caregiver for immediate medical treatment.

2. Ask how long the child has had the fever and advise the caretaker to seek medical attention.

    - The fever has lasted for several days and is not relieved with medication.
    - The child has lost consciousness.
    - The child has yellow eyes.
    - The child has convulsions or seizures.
    - The child has severe diarrhea.

3. Ensure the child is not dehydrated if he/she has a fever.

    - Signs and symptoms of dehydration include: lethargy, low or no urine output, dry oral membranes, rapid breathing, and decreased skin elasticity (turgor).
    - If the child shows any of these signs, refer him/her for immediate medical treatment.

4. Ask the caregiver whether the child has been given fluids and what kind.

    - Ensure the child is given plenty of fluids to avoid dehydration.

5. Assess the child's growth if possible.

    - Weigh the child and plot the weight on a growth chart.
    - If the chart shows early growth faltering, determine whether the child needs medical attention or increased energy intake and advise the caregiver accordingly.

6. Counsel the caregiver to continue feeding the child.

    - Counsel to provide small but more frequent meals.
    - Counsel to feed the child high-energy and high-protein foods.
    - Counsel to add calories with sugar and/or milk, for example, in porridge.
    - Counsel to give the child extra food, especially if he/she lost weight with the fever.

7. Refer the caregiver to routine essential infant and child services such as immunization, vitamin A supplementation, iron supplementation, and deworming according to national guidelines.

Handout 11.11. Job Aid for Counseling on Management of Gastrointestinal Problems in HIV-Infected Children

Diarrhea

1. Ask the caregiver whether the child is taking any medications such as antiretroviral drugs (ARVs).

    - If the diarrhea is related to medication, encourage the caregiver to continue giving the child the medication but to seek medical care immediately if the diarrhea gets worse or lasts more than 2 days.
    - If the diarrhea is related to an alternative or traditional therapy, discuss with the caregiver the possibility that the therapy may harm the child's health (and the diarrhea will deplete the nutrients in the child) and ask the caregiver to stop giving it to the child.

2. Ask the caregiver how long the child has had diarrhea.

    - If the diarrhea is severe and has lasted for more than 2 days or is bloody, refer the child for immediate medical treatment.

3. Stress with the caregiver that diarrhea in very young children can be life threatening because of the risk of dehydration.

    - Advise the caregiver to give the child oral rehydration solution (ORS) after each bout of diarrhea. Provide information on where to get ORS or show the caregiver how to prepare it by mixing one pinch of salt and one tablespoon of sugar in one cup of clean boiled water.
    - Advise the caregiver to keep giving the child other fluids as well.
    - If the child is dehydrated (shows symptoms such as lethargy, low or no urine output, dry oral membranes, rapid breathing, or decreased skin elasticity), advise the caregiver to seek treatment immediately.

4. Counsel the caregiver to give the child food that can slow down the diarrhea.

    - Advise the caregiver to feed the child soft, moist foods such as bananas, soft boiled white rice, potatoes, and lentils.
    - Advise the caregiver to avoid giving the child large quantities of juice or milk and milk products until the symptoms improve.
    - Advise the caregiver to feed the child small amounts of food more often.

5. Assess the child's growth if possible.

    - Weigh the child and plot the weight on a growth chart.
    - If the chart shows early growth faltering, determine whether the child needs medical attention or increased energy intake and advise the caregiver accordingly.

6. Advise the caregiver to resume the child's regular diet once the diarrhea stops.

7. Advise the caregiver to give the child a little extra food after the diarrhea stops, especially if the child lost weight with the diarrhea.

8. Remind the caregiver of the importance of food safety and hygiene.

   - Stress washing hands with soap and water after using the toilet and before handling and preparing food to prevent infection.
   - Advise the caregiver to make sure the food served to the child is well cooked.
   - Advise the caregiver to use clean boiled water to make juice and prepare food.

Vomiting

1. Counsel the caregiver that young children get dehydrated very quickly and that the caregiver should take the following measures to replace fluids lost to vomiting and prevent dehydration:

   - Give the child plenty of fluids.
   - Give the child ORS.
   - If the caregiver is unable to do the above, advise to seek medical attention immediately to avoid dehydration in the child.

2. Counsel the caregiver to avoid giving the child foods with strong or unpleasant odors or greasy or fried foods.

3. Counsel the caregiver to give the child foods at room temperature that are soft, moist, and easy to chew and swallow.

4. Counsel the caregiver to give the child small but more frequent meals.

5. Counsel the caregiver to give the child foods at room temperature that are soft, moist, and easy to chew and swallow.

6. Instruct the caregiver where to get immediate medical attention if the vomiting lasts more than 24 hours; the child is unable to eat, drink, or keep food down; or the vomiting is accompanied by fever.

7. Stress to the caregiver that young children get dehydrated very quickly.

8. Assess the child's growth if possible.

   - Weigh the child and plot the weight on a growth chart.
   - If the chart shows early growth faltering, determine whether the child needs medical attention or increased energy intake and advise the caregiver accordingly.

Malabsorption

1. Advise the caregiver to do the following to reduce the risk of malabsorption in the child:

- Eliminate the use of oils, butter, ghee, or margarine in the child's food.
- Reduce the use of cooking oil and other fats in the food.
- Avoid giving the child deep-fried, greasy, or high-fat foods.
- Feed the child smaller but more frequent meals evenly throughout the day.
- Seek medical attention if the child loses weight and the condition persists.

2. Assess the child's growth if possible.

   - Weigh the child and plot the weight on a growth chart.
   - If the chart shows early growth faltering, determine whether the child needs medical attention or increased energy intake and advise the caregiver accordingly.

3. Refer the caregiver to routine essential infant and child services such as immunization, vitamin A supplementation, iron supplementation, and deworming according to national guidelines.

Handout 11.12. Job Aid for Counseling on Management of Altered Taste in HIC-Infected Children

HIV-infected children may experience altered taste as a result of HIV infection, malnutrition, or medications. Signs of altered taste may be refusing to eat some or all foods and spitting up foods. Altered taste may be difficult to evaluate in small children who cannot yet talk.

1. Ask the caregiver whether the child is taking any medications and whether the condition started when the child started taking the medications.

2. Ask about the child's current eating habits.

   - Use a list of locally available food to determine what the child is eating.
   - Counsel the caregiver on what foods to prepare to increase energy intake, especially if the child is losing weight.
   - Ensure that the caregiver uses iodized salt to prepare the child's food.

3. Counsel the caregiver to encourage the child to eat by:

   - Giving the child favorite foods in small quantities
   - Using flavor enhancers such as salt and sugar to increase taste acuity and mask unpleasant taste sensations.
   - Feeding the food different textures of food (pureed, minced, soft, and moist)
   - Feeding the child patiently and persistently with supervision and love

4. Assess the child's growth, if possible.

   - Weigh the child and plot the weight on a growth chart.
   - Address early growth faltering if noted by referring the child for medical attention and/or advising the caregiver to increase the child's energy intake to promote weight gain.

5. Refer the caregiver to routine essential infant and child services such as immunization, vitamin A supplementation, iron supplementation, and deworming according to national guidelines.

Handout 11.13. Job Aid for Counseling on Socioeconomic Factors That May Affect Nutrition in HIV-Infected Children

Feeding relationship between the child and caregiver

1. If possible, observe a feeding session.

   - Assess whether the child is fed patiently and persistently, with supervision and love.
   - Assess whether the child is eating foods appropriate for his/her age and developmental level.
   - If the meal is not balanced, advise the caregiver to feed the child locally available foods from each food group.
   - Advise the caregiver to feed the child a staple food together with a combination of foods from the other food groups at each meal.
   - Discuss with the caregiver any other concerns you have.

2. Assess the environment in which the child is fed.

   - Advise the caregiver to remove any distractions that can make the child lose interest in eating.
   - Advise the caregiver to feed the child from his/her own plate or bowl.
   - Advise the caregiver to feed the child patiently, talk to him/her lovingly, look into his/her eyes, and actively encourage him/her to eat or help an older child feed himself/herself.
   - Address with the caregiver any food safety and hygiene issues you notice.

3. Discuss the importance of feeding small, frequent meals, especially to a sick child.

   - Explain to the caregiver that HIV-infected children get sick more often and more easily than non-infected children and that sick children may not have an appetite.
   - Advise the caregiver to feed the child small amounts often throughout the day to make sure he/she gets enough food.

Poverty and food insecurity

1. Assess the caregiver's ability to access and prepare food.

   - Assess the caregiver's health.
   - Assess whether the caregiver has a steady income.
   - Assess how many meals the caregiver can afford to feed the child every day.

2. Refer the caregiver to any of the following community resources, if available, for support in providing enough nutritious food for the child.

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   - Food bank
   - Food rations
   - Food assistance
   - Micronutrient supplements
   - Therapeutic feeding of severely malnourished children

- Supplementary feeding of moderately malnourished children
- Community support groups
- Community gardens
- Community kitchens

Session 11: Nutrition Care of Children 2–9 Years Old Living with HIV

Purpose

Provide current knowledge and a general understanding of nutrition care and support of children 2–9 years old who are living with HIV

2

Learning Objectives

- Describe the nutritional needs of and dietary recommendations for children 2–9 years old.
- Explain how HIV increases the risk of undernutrition and the etiology and consequences of growth failure and development in children infected with HIV.
- Describe dietary recommendations for children infected with HIV.
- Explain factors to consider when planning nutrition care and support for children 2–9 years old infected with HIV.

3

Session Outline

- Undernutrition in young children
- HIV infection in young children
- Effects of HIV on the nutritional status of young children
- Purpose of nutrition care and support for young HIV-infected children
- Components of nutrition care and support for young HIV-infected children

4

HIV in Children 2–9 Years Old

- Most children with HIV are infected:
  - In utero
  - During labor and delivery
  - During breastfeeding
  - From contaminated needles
  - From blood
  - From sexual abuse
- Children with HIV are vulnerable to childhood illnesses and disease.

5

HIV in Children 2–9 Years Old, Cont.

- Routine diagnosis of pediatric HIV is not done in many developing countries:
  - Early diagnosis of pediatric AIDS is difficult.
  - Tests for adults cannot be used for children < 18 months old.
  - Child HIV tests are expensive.
- Signs and symptoms of HIV (WHO)
  - Weight loss
  - Chronic diarrhea
  - Failure to thrive
  - Oral thrush
  - Fever

6

HIV in Children 2–9 Years Old, Cont.

- Children with four of the following symptoms are classified as having HIV (IMCI guidelines):
  - Recurrent pneumonia
  - Oral thrush
  - Present and past ear discharge
  - Very low weight
  - Persistent diarrhea
  - Enlarged lymph nodes
  - Parotid enlargement
- Lab tests are encouraged for accurate diagnosis.

7

Effects of HIV on the Nutritional Status of Young Children

- Heightened nutritional needs
  - Increased undernutrition
  - Repeated infections
  - Micronutrient deficiencies (vitamins A, E, B_6, B_{12}, and C and minerals zinc and selenium)
- Negative linear growth
- Failure to thrive
- Early and sustained stunting (although not usually wasting)

8

Effects of HIV on the Nutritional Status of Young Children, Cont.

- Inadequate food intake resulting from poor appetite, early satiety, mouth sores, abdominal pain, and decreased interest in food
- Increased nutrient losses from malabsorption, diarrhea, vomiting, and HIV enteropathy
- Increased nutrient needs because of hyper-metabolic and hyper-catabolic effects of infections, OIs, and HIV itself
- Feeding difficulties because of food aversions, thrush, and food refusal
- Socioeconomic factors such as poverty, illness of parent(s), and food security affecting food access

9

Purpose of Nutrition Care and Support for Young HIV-Infected Children

- Improve the immune system and delay the onset of AIDS.
- Maintain and promote healthy weight, growth, and development.
- Preserve lean body mass.
- Minimize gastrointestinal symptoms such as diarrhea.
- Prevent water- and food-borne illnesses.
- Enhance response to therapy.
- Reduce morbidity and mortality.

10

Purpose of Nutrition Care and Support for Young HIV-Infected Children, Cont.

- Early monitoring to avoid growth impairment even before symptomatic HIV disease
- Nutrition intervention as soon as suboptimal height for age is noted
- Follow-up growth faltering to determine the cause and identify appropriate interventions
- Referral to needed services

11

Nutrient Requirements

- Energy: HIV negative (WHO)
  - Boys: from 1,360 kcal/day at age 2 to 2,260 kcal/day at age 9
  - Girls: from 1,350 kcal/day at age 2 to 2,110 kcal/day at age 9
- Energy: HIV positive (WHO)
  - Asymptomatic: 10% increase to maintain growth
  - Symptomatic and no weight loss: 20−30% increase
  - Symptomatic with weight loss: 50−100% increase

12

Translating Calories to Food Intake

- Give the child an extra snack or meal to help meet increased energy requirements.
  - 1 cooked egg: 77 kcal
  - 1 banana: 109 kcal
  - 1 small or medium boiled potato: 116 kcal
  - 1 tsp. margarine: 34 kcal
  - 1 tsp. peanut butter: 30 kcal
- Increase energy in mashed boiled potato by adding a boiled egg or 1−2 tsp. margarine.
- A snack of a cooked egg and a banana can add 187 kcal (77 + 109).

13

Translating Calories to Food Intake, Cont.

- Dry maize flour has little water and high energy.
  - Dry maize flour: 340 kcal/100 g
  - With water added: Energy content reduced by more than ⅓, to 115 kcal/100 g.
- High-fat foods increase energy content: 1 tsp. peanut butter adds 30 kcal.
- Energy content is higher from fats than from carbohydrates.
- Fatty foods improve energy density if child does not have fat malabsorption, diarrhea, nausea, or vomiting.

14

Nutrient Requirements, Cont.

- Protein (same as for healthy non-infected children)
  - 2−3 years: 1.15 g/kg
  - 3−5 years: 1.10 g/kg
  - 5−7 years: 1.00 g/kg
  - 7−10 years 1.00 g/kg
  - Should meet 12−15% of total energy intake
- Fats (same as for healthy non-infected children)
  - No more than 30% of total calories
  - Fat restriction not recommended

15

Nutrient Requirements, Cont.

- Micronutrients
  - WHO recommends HIV-infected children eat healthy diets to meet RDA and does NOT recommended changes in RDA.
  - Some children may need supplementation.
    - Multivitamin supplementation recommended but not over RDA for each nutrient
    - WHO supplementation recommendations
      - Vitamin A: WHO schedule for children under 5
      - Iron: National protocols or WHO schedule for children 2−11 years old: 2−5 years: 20−30 mg/day, 6−11 years: 30−60 mg/day
      - Zinc: Not above RDA; during chronic diarrhea, follow IMCI or national guidelines

16

Components of Nutrition Care and Support for Young HIV-Infected Children

1. Nutrition screening and assessment
2. Prompt management and treatment of symptoms
3. Improved diet to meet growth and development needs
4. Promotion of good hygiene and food and water safety
5. Prompt treatment of secondary infections
6. Treatment of severe malnutrition
7. Provision of antiretroviral drugs

17

1. Nutrition Screening and Assessment

- Useful for monitoring growth and development and identifying children at risk
- Assessment measurements
  - Anthropometrics: Body composition by weight, height, age
  - Social history: Physical environment, caregiver health, family food preparation and consumption
  - Clinical diagnosis: Gastrointestinal problems, bowel movement patterns, presence of OIs, current medical problems, and medication taken
  - Dietary examination: Food intake and preferences, appetite and taste changes, use of vitamin supplements
  - Physical examination and observation: Marasmus and kwashiorkor; poor muscle tone; nail, hair, and skin changes; dehydration; easy bruising; pallor

18

2. Symptom Management

- Sore mouth and throat: Eat soft, moist foods, avoid acidic foods, use a straw for drinking, rinse mouth with warm water.
- Fever: Drink plenty of liquids, sipping liquids almost hourly, eat small frequent meals, use ORS.
- Diarrhea: Eat small, frequent meals, use ORS, reduce oil in food.
- Decreased appetite: Eat small amounts of favorite foods, use energy-dense foods.
- Vomiting: Increase fluid intake, avoid unpleasant or greasy and oily foods.
- Lactose intolerance: Limit intake of dairy products

19

3. Improved Diet

- Individualized diet to provide adequate calories and nutrients based on age, weight, and symptoms
  - Review diet at every well and sick child visit.
  - Advise and counsel on how to improve the diet.
  - Manage diet-related symptoms with appropriate interventions.
  - Provide multivitamin supplements if available.

20

3. Improved Diet, Cont.

- Other nutrition related interventions
  - Provide presumptive de-worming every 6 months.
  - Promote use of mosquito treated bed nets.
  - Give an extra meal after episodes of illness to allow for catch-up growth as per IMCI guidelines.
  - Use iodized salt in food preparation.
  - Increase energy.
  - Provide micronutrient supplementation or fortification.

21

4. Promotion of Good Hygiene and Food and Water Safety

- Avoid pathogenic contamination from diarrhea, dysentery, cholera, and typhoid, which can further weaken immune system speed up disease progression.
- Teach children how to wash their hands before food handling and after toilet.
- Teach children about “unsafe” food and water and how to politely say no when offered “unsafe” food or water.

22

5. Prompt Treatment of Secondary Infections

- Promptly treat secondary infections (e.g., fever. TB, pneumonia, oral thrush, persistent diarrhea).
- Maintain food intake to minimize the nutritional impact of these infections.
- Manage diet-related side effects of medications such as vomiting, nausea, taste changes, and anorexia through diet.
- Ensure presumptive treatment such as Cotrimoxazole, where available, for infections.
- Immunize children according to local policies.

23

6. Treatment of Severe Malnutrition

- Malnutrition likely among HIV-positive children
- Management according to WHO guidelines:
  - Categorize by anthropometric and clinical methods.
  - Treat infections, esp. those that affect food intake and absorption.
  - Provide adequate nutrition therapy.
  - Provide nutrition counseling to caregivers.
  - Provide and ensure follow-up after discharge.
  - Monitor weight, adequacy of diet, and other infections.

24

6. Treatment of Severe Malnutrition, Cont.

- Community-based management of acute malnutrition (CMAM)
  - Treats children in the home instead of a hospital or clinic
  - Focuses on children under 5, who are most vulnerable to mortality and morbidity in emergencies

25

Classification and Treatment of Malnutrition

Severe acute malnutrition (SAM) with complications	SAM without complications	Moderate acute malnutrition (MAM) without complications
< 80 % of median weight for height OR bipedal pitting edema OR MUAC < 110 mm AND one of the following: Anorexia, lower respiratory tract infection, high fever, severe dehydration, severe anemia, no alertness	< 70 % of median weight for height OR bipedal pitting edema OR MUAC < 110 mm AND Appetite Clinically well Alert	70−80% of median weight for height AND no edema OR MUAC 110−125 mm AND Appetite Clinically well Alert
Inpatient IMCI/WHO protocols	Outpatient therapeutic care	Outpatient supplementary feeding

26

7. Provision of Antiretroviral Drugs

- Prolong survival and enhance quality of life by reducing viral load
- Help improve growth parameters including weight, weight for height, and muscle mass
- Have side effects similar to symptoms of HIV (nausea, diarrhea, constipation, anorexia, taste changes) that can affect dietary intake

27

7. Provision of Antiretroviral Drugs, Cont.

- Service providers should:
  - Be familiar with the ARV medications available
  - Know potential side effects.
  - Know how ARVs should be taken (on an empty stomach or with food).
  - Know food interactions associated with the ARVs.
  - Treat HIV-infected children following national recommendations if available.

28

Nutrition Actions for Care and Support of the HIV-Infected Child

- Review diet for appropriate food and nutrient intake.
- Counsel caregiver on correct amount and variety of foods.
- Counsel caregiver on appropriate feeding practices.
- Promote good hygiene and food preparation.
- Routinely monitor growth.
- Promote essential child services (immunization and supplementation).
- Help identify OIs.
- Identify community support services for nutrition.
- Refer caregiver to programs offering ARVs.

29

Challenges for Nutrition Care and Support of Children

- Metabolic complications associated with long-term ARV use in children (glucose and bone metabolism)
- Largely unknown long-term impact of ARVs in children, especially malnourished children
- Largely unknown effect of HIV on children's micronutrient, protein, and fat requirements
- Lack of human resource capacity

30

Conclusions

- Children with HIV are vulnerable to undernutrition, growth failure, micronutrient deficiencies, frequent infections, and decreased appetite.
- Early nutrition intervention can help delay disease progression or death in the HIV-positive child.
- Components of nutrition care and support for HIV-infected children include the following:
  - Nutrition screening and assessment
  - Management of diet-related HIV symptoms
  - Improved diet
  - Promotion of good hygiene and food/water safety
  - Treatment of severe malnutrition
  - ART

31