



NUTRITION CARE AND SUPPORT FOR PEOPLE WITH HIV  
Nutrition Assessment, Counselling and Support  
(NACS)



TRAINING MANUAL FOR  
FACILITY-BASED PROVIDERS

**Participant Handouts**

2017



## **Nutrition Assessment, Counselling and Support (NACS) Training Manual for Facility-Based Providers: Facilitators' Guide**

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## Foreword

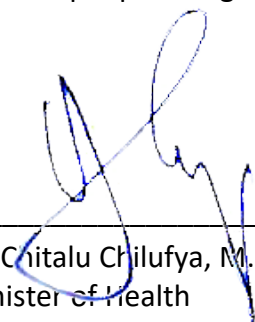
Zambia has made significant progress in reducing morbidity and mortality due to HIV and AIDS through the provision of free comprehensive HIV prevention services and antiretroviral drugs in all public health facilities. This has led to a reduction of new HIV infections from 77,500 in 2010 to approximately 46,000 in 2016. However, the devastating impact of HIV infection continues to be experienced by individuals, families, communities and the nation at large.

Evidence has shown that there is a relationship between HIV and nutrition. In the presence of HIV infection, nutrient requirements increase, and, HIV infection impairs nutrient intake and uptake. Poor nutrition therefore increases the risk of opportunistic infections and causes acceleration in progression of HIV to AIDS. In addition, maintaining good nutrition helps in reinforcing the effectiveness of antiretroviral drugs by improving their tolerance and safety. Thus, malnutrition and HIV/AIDS are interdependent and create a vicious cycle.

The Government of the Republic of Zambia recognizes that nutrition is an important component in the provision of quality care and support to people living with HIV and AIDS. This is in accordance with the National Health Strategic Plan 2017-2021, embedded in the 7th National Development Plan 2017-2021, that identifies the importance of a healthy nation in attaining middle income status by 2030.

These guidelines were therefore developed to define the necessary actions service providers need to take for them to include nutrition components at all sites providing HIV services and treatment including; maternal and child health (MCH) care services, services for orphans and vulnerable children (OVC), and home-based care (HBC) services. They seek to assist all categories of people infected with and/or affected by HIV.

In order to successfully implement quality nutritional care and support services to PLHIV, there is need for an inferred partnership between those affected and the different levels of care providers, as well as a coordinated effort by all stakeholders. I therefore call for the wide dissemination and use of these guidelines as a complement to other documents providing guidance on HIV prevention, treatment and support so as to improve the quality of life of people living with HIV and AIDS.



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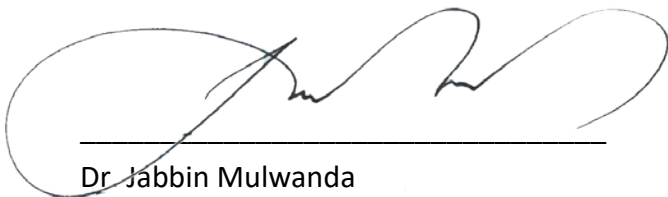
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## Abbreviations and Acronyms

AIDS	Acquired immune deficiency syndrome
ART	Antiretroviral therapy
ARV	Antiretroviral drug
BMI	Body mass index
DOTS	Directly observed (TB) treatment, short course
EBF	Exclusive breastfeeding
FAO	Food and Agriculture Organization of the United Nations
g	gramme(s)
HBC	Home-based care
HIV	Human immunodeficiency virus
kg	Kilogramme(s)
mg	Microgramme(s)
MOH	Ministry of Health
MUAC	Mid-upper arm circumference
NACS	Nutrition assessment, counselling and support
OI	Opportunistic infection
PMTCT	Prevention of mother-to-child transmission of HIV
RUTF	Ready-to-use therapeutic food
TB	Tuberculosis
UNICEF	United Nations Children’s Fund
USAID	United States Agency for International Development
WHO	World Health Organization
WHZ	Weight-for-height z-score



## Introduction

Undernutrition is one of the major complications of infection and can make it difficult for people with infections to stay healthy and keep working. People with chronic infectious diseases such as HIV need to consume more energy than healthy people to maintain their weight and strengthen their immune systems, but disease-related symptoms can reduce appetite and interfere with nutrient digestion and absorption. This cycle leads to weight loss, loss of muscle tissue and body fat, vitamin and mineral deficiencies, reduced immune function and competence and increased susceptibility to secondary infections.

Nutrition care and support can improve nutritional status, ensure adequate food intake, prevent food-borne illnesses, enhance the quality of life through symptom management and provide palliative care during the advanced stages of disease.

This training course aims to give you the knowledge and skills to assess nutritional status; counsel clients on how to improve their diets, manage their symptoms and avoid infections; and provide needed nutrition support. At the end of the course, you will develop an action plan to apply your skills in your workplace and then receive supportive supervision from trainers or supervisors.

The handouts and worksheets in this manual are used during the course and can be taken back to your workplace to use on the job. The annexes provide additional reference material.

By the end of this training, you should be able to:

- Advocate for and discuss the role of nutrition in care and treatment.
- Assess clients' nutritional status.
- Design nutrition care plans for malnourished clients.
- Prescribe specialised food products for malnourished clients.
- Counsel clients on issues identified during nutrition assessment, including meal planning, diet, management of illness-related symptoms, medication-food interactions and hygiene.

# Opening Session

## Purpose

This session introduces you to the other participants and the facilitators, introduces the objectives and expected outcomes of the course and allows you to discuss your expectations of the course and take a pre-test.

## Objectives

By the end of the session, you should be able to:

1. Discuss your expectations and relate them to the objectives of the training.
2. Communicate freely with other participants and facilitators.
3. Define the role of a health care provider in nutrition care and support.
4. Refer to national reference materials on nutrition.

## Materials

- Timetable
- Pre-test
- **Handout 0.1. Course Objectives**
- **Handout 0.2. Role of a Health Care Provider in NACS**

## HANDOUT 0.1. Course Objectives

This course aims to give you the knowledge and skills to:

- Advocate for and discuss the role of nutrition in care and treatment.
- Assess clients' nutritional status.
- Counsel clients on prevention and management of malnutrition.
- Prescribe specialised food products and provide other support to malnourished clients.
- Monitor and report on NACS services.

## HANDOUT 0.2. Role of a Health Care Provider in NACS

**As a facility-based health care provider, you are critical in integrating nutrition care and support into health services. Your roles are listed below.**

1. Assess, classify and record nutritional status.
2. Refer clients for medical treatment or inpatient care of severe acute malnutrition (SAM).
3. Provide nutrition education and counselling.
4. Demonstrate how to prepare nutritious foods.
5. Prescribe specialised food products for clinically malnourished clients.
6. Collect and report on nutrition data.

# SESSION 1. Basic Nutrition

## Purpose

This session gives an overview of basic nutrition and eating well.

## Objectives

By the end of the session, you should be able to:

1. Define selected nutrition terms.
2. Describe the conditions for good nutrition.
3. Discuss food choices to plan a mixed (balanced) diet.

## Materials

- *Nutrition Guidelines for Care and Support of People with HIV*
- **Handout 1.1. Definition of Nutrition Terms**
- **Handout 1.2. Conditions Necessary for Good Nutrition**
- **Handout 1.3. A Mixed (Balanced) Diet**
- **Handout 1.4. Good Eating Habits**
- **Worksheet 1.5. Meal Planning**

## HANDOUT 1.1. Definition of Nutrition Terms

**Food** is anything edible that provides the body with nutrients.

**The role of food in the body:**

- Developing, growing, maintaining, replacing and repairing cells and tissues
- Resisting and fighting infections
- Producing energy (warmth), movement and work

**Nutrients** are the substances in food that are broken down and released during digestion to maintain, repair or build body tissues. The body needs six types of nutrients from food: protein, carbohydrates, fat, fibre, vitamins and minerals and water.

Nutrients are divided into **macronutrients** (carbohydrates, protein and fat), which are needed in large amounts, and **micronutrients** (vitamins and minerals), which are needed only in small amounts.

**Nutrition** is the body's process of taking in, digesting, absorbing, transporting and using food for growth, development and health.

**Malnutrition** occurs when food intake does not match the body's needs. Malnutrition includes both undernutrition and overnutrition.

- **Undernutrition** is a result of lack of nutrients caused by an inadequate diet and/or disease. Undernutrition includes a range of conditions.
  - **Acute malnutrition** is caused by a decrease in food consumption and/or illness, resulting in bilateral pitting oedema or wasting. **Wasting** is defined by low mid-upper arm circumference (MUAC) or low weight-for-height z-score (WHZ).
  - **Chronic malnutrition** is caused by prolonged or repeated episodes of undernutrition starting before birth, resulting in stunting. **Stunting** is defined by low height-for-age.
  - **Micronutrient deficiencies** are a result of reduced micronutrient intake and/or absorption. The most common forms of micronutrient deficiencies are related to iron, vitamin A and iodine deficiency.
- **Overnutrition** is a result of excessive food intake, leading to overweight or obesity.

## HANDOUT 1.2. Conditions Necessary for Good Nutrition

The body can use food only if:

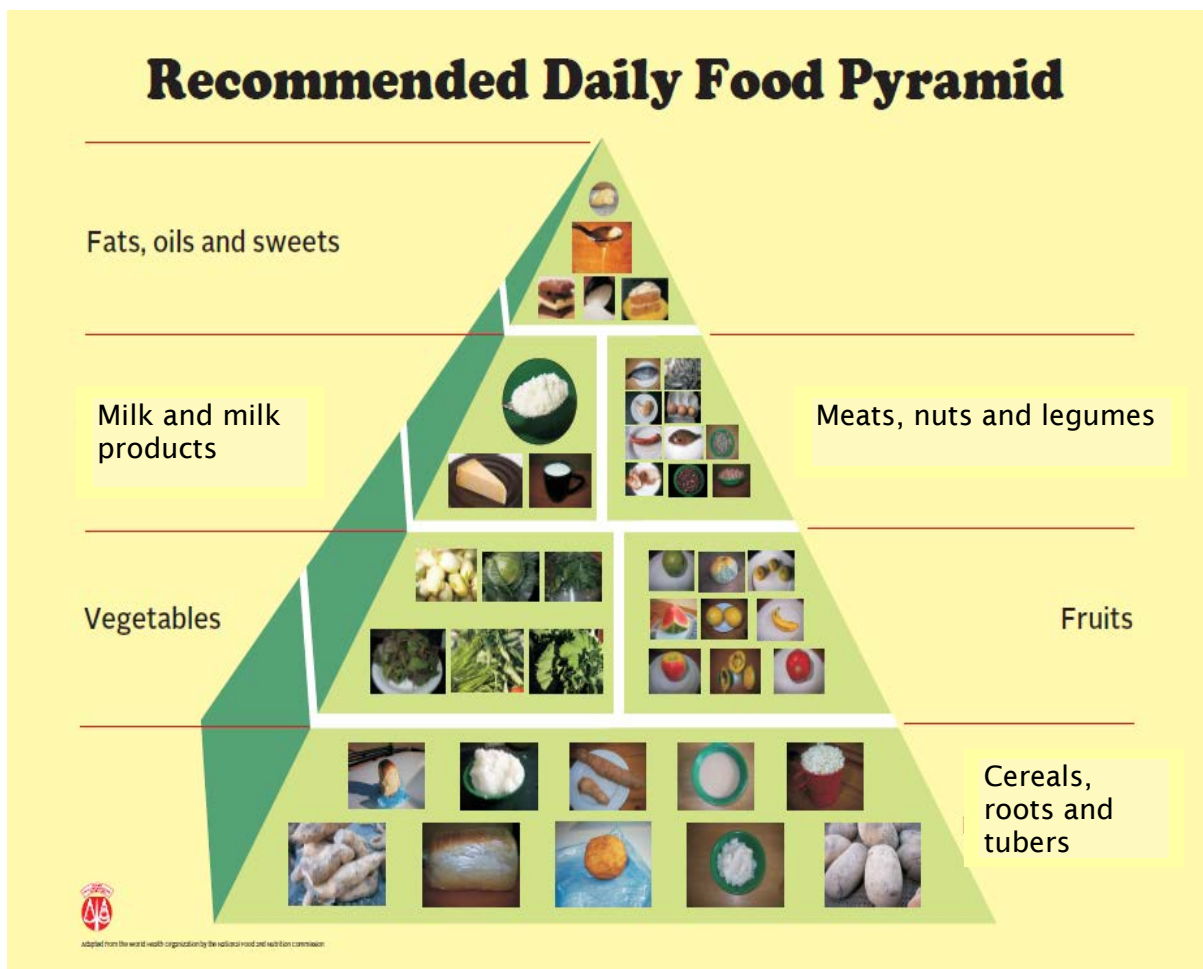
1. Enough food is available (**availability**). During some seasons fruits and vegetables may be difficult to find. People who live far from markets may not be able to buy enough food for a balanced diet.
2. Enough food is accessible (**accessibility**). People may not be able to buy adequate food of good quality.
3. Enough food is eaten (**intake**). Symptoms such as loss of appetite, mouth sores, constipation, diarrhoea, nausea and vomiting, taste changes, stress and depression can reduce appetite and food absorption. People may believe that sick people should not eat certain foods, even if they are nutritious.
4. Food is digested and absorbed (**utilisation**). Food intolerance, diarrhoea, constipation and poor gut integrity can decrease digestion and absorption. Infections, medication side effects, alcohol and lack of exercise can keep the body from metabolising the nutrients in food.
5. Unused food is excreted to remove toxins and waste. **Excretion** is affected by water intake, organ function and medications.

## HANDOUT 1.3. A Mixed Diet

A mixed (balanced) diet includes a variety of foods and all the nutrients in the right amounts and combinations daily to meet the body's needs. No single food, except breast milk for the first 6 months of life, provides all the nutrients the body needs to function well. A variety of foods from all food groups provides nutrients that are essential for good health.

The Zambia **food pyramid** can be used to help people make healthy food choices from a variety of foods to get all the nutrients the body needs. A mixed diet includes at least one food from each group in the food pyramid.

The food pyramid for Zambia divides foods into six different food groups. Each food group comprises foods that contains different nutrients the body needs to stay strong and healthy. The pyramid narrows from the bottom to the top to show that people should eat more of the foods from the bottom group than from the next group and the least amount of foods from the top group.





## 1. Cereals, roots and tubers

- These are energy-giving foods (carbohydrates) that provide most of the energy ('fuel') the body needs to function well.
- **Examples include** bread, *nshima*, rice and pasta, sweet potatoes and cassava and beverages such as *munkoyo*, *thobwa*, *chibwantu* and *maheu*

## 2. Fruits group

- These protective foods contain vitamins and minerals that help resist and fight infection
- Examples are oranges, mangos, pawpaw, pineapples, bananas, watermelon, lemons. guavas, *tusongole*, *masuku* and *masau*.

## 3. Vegetables group

- These are also protective foods that contain vitamins and minerals that help resist and fight infection.
- Examples are tomatoes, avocados, eggplants, *impwa*, carrots, onions, peppers, *mankolombwe*, okra, *sindambi*, cat whiskers, *ibondwe*, pumpkin, green leafy vegetables such as spinach and cassava and pumpkin leaves (*chibwabwa*) and *lumanda*.

## 4. Meat, nuts and legumes

- These body-building foods contain protein to make muscles and bones strong.
- Example of protein-rich foods from animal sources are fish, chicken, duck, *kapenta*, eggs and caterpillars.
- Example of protein-rich foods from plant sources are beans, soya, *bambara* nuts, groundnuts, lentils, cow peas and beans.

## 5. Milk and milk products

- These are also protein foods that make muscles and bones strong.
- Fermented foods like yoghurt and *mabisi* contain helpful bacteria that improve digestion.

## 6. Fats, oils and sweets

- These foods provide extra energy and should be eaten only in small amounts.
- They include chocolate, margarine, butter, oil, sugar, ice-cream and honey.

## HANDOUT 1.4. Good Eating Habits

Having good eating habits means eating a variety of foods in the right amounts and combinations to meet the body's needs. People with HIV should follow these guidelines to ensure they eat enough food and the right food to meet their increased nutritional needs.

1. Eat a variety of foods from all groups every day to stay healthy. Nutrients work as a team and need each other. The body cannot function properly if even one is missing or insufficient.
2. Eat staple foods (e.g., *nshima*, rice) with every meal.
3. Eat peas, beans, lentils, nuts and seeds, if possible, every day. These foods are a cheaper source of protein than animal foods such as beef and chicken. Most of them need thorough cooking to improve digestion.
4. Eat animal and milk products regularly. Poultry, meat, fish, eggs, milk and milk products are useful for growth and repair, making new blood and strengthening muscles and the immune system to fight infections.
5. Eat a wide variety of vegetables and fruits every day to keep the body functioning and the immune system strong. These are protective foods because they help prevent and fight infections. Most can be grown easily in our gardens. Seasonal vegetables and fruits are the best and may be cheaper. Mix vegetables and fruits of different colours (dark green, yellow, orange, purple and red). Vegetables lose some of their goodness if soaked or boiled for a long time. Wash vegetables before cutting and cook them immediately, as quickly as possible, with a small amount of water if needed. Use the cooking water in soups and other foods. Peel fruits or wash them thoroughly before eating.
6. Eat fats, oils, sugar and sugary foods in small amounts. These foods can improve energy intake and add flavour. Eating 1–2 teaspoons of fats or sugar more than the usual intake may help you gain weight.
7. Eat foods fortified with essential nutrients, if possible. Examples are iodated salt, maize meal with vitamins and minerals added and oil and sugar with vitamin A added. Read food labels for added nutrients and expiry dates. Fortified foods should not be overcooked because this remove some of their nutrients.
8. Drink plenty of safe water. Water is important for life. Drink water or other fluids whenever you are thirsty and even more water when it is very hot or to replace water lost from diarrhoea, vomiting or fever. Some medications may not work well if you are dehydrated. Breastfeeding women also need extra water. Exclusively breastfed babies (younger than 6 months) do not need extra water. Children need water, but they should not drink watery drinks in place of foods. Water from a protected well or river should be boiled for at least 10 minutes before drinking and stored in a clean container. Water can also come from juices, soups, vegetables, fruit, gravy and sauces. Tea, coffee and alcohol cannot replace water and can even cause dehydration and interfere with absorption of nutrients and medicines.

## HANDOUT 1.5. Principles of Meal Planning

There are six principles to guide meal planning.

1. **Adequacy:** The meal must provide enough energy and other nutrients to meet nutritional requirements. For example, people should eat iron-rich foods to prevent iron deficiency anaemia.
2. **Balance:** Meat, fish and poultry are rich in iron but poor in calcium. Milk and milk products are rich in calcium but poor in iron. Vegetables and fruit are rich in micronutrients. People therefore need to eat foods from each food group to get adequate nutrients in their diet.
3. **Energy:** To eat an adequate, balanced diet without overeating requires careful planning. The key to kilocalorie control is to select foods of high nutrient density.
4. **Nutrient density:** To eat well without overeating, select foods that deliver the most nutrients for the number of kilocalories. Foods low in nutrient density are called empty-calorie foods; delivering only energy (from sugar, fat or both) with little or no protein, vitamins or minerals.
5. **Moderation:** Foods rich in fat and sugar provide energy but relatively few nutrients and can lead to overweight when eaten in excess. Such foods should only be eaten occasionally. Eating foods low in fat and sugar automatically improves nutrient density.
6. **Variety:** To avoid eating the same food day after day, select foods from each of the food groups daily and vary choices within each food group. Variety is the spice of life, as the saying goes. Eating nutritious meals need not be boring. Foods in the same food group contain different assortments of nutrients. Among fruits, for example, guavas are especially rich in vitamin C, while pawpaw is rich in vitamin A (carotene).

## WORKSHEET 1.6. Meal Planning

**Step 1.** In small groups, list local foods under each group shown in the first column in the table below. Include nutritious foods that may be neglected, including wild fruits and vegetables. In the remarks column, comment on the availability and cost of the foods.

Food Groups	Specific food names	Remarks
Cereals, roots and tubers (carbohydrates)		
Meats, legumes and nuts (protein)		
Milk and milk products (protein)		
Fruits (vitamins and minerals)		
Vegetables (vitamins and minerals)		
Oils, fats and sweets (extra energy)		

**Step 2.** Plan a 1-day menu for one person using the foods in the chart above. As much as possible, use foods that are not expensive and are easily available in your area.

Meal	Menu
Breakfast	
Snack	
Lunch	
Snack	
Dinner	

## **SESSION 2. Nutrition and Infection**

### **Purpose**

This session explains the link between nutrition and infections. It also introduces the Critical Nutrition Actions.

### **Objectives**

By the end of the session, you should be able to:

1. Discuss the relationship between nutrition and infection.
2. Explain why good nutrition is important for people with infections.
3. Explain the recommended energy and nutrient intake for people with infections.
4. Describe the Critical Nutrition Actions.

### **Materials**

- **Handout 2.1. Relationship between Nutrition and Infection**
- **Handout 2.2 Energy and Nutrient Requirements of People with HIV**
- **Handout 2.3. Critical Nutrition Actions**

## HANDOUT 2.1. Relationship between Nutrition and Infection

Illness can affect nutritional status in three ways.

### 1. Illness can reduce food intake:

- Nausea and vomiting
- Poor appetite because of fatigue, depression and changed taste of food
- Difficulties eating or swallowing because of painful sores in the mouth and or throat
- Lack of money to buy nutritious food, inability to grow food and difficulty shopping and cooking
- Side effects of medications, including nausea, vomiting, metallic taste in the mouth, diarrhoea and abdominal cramps

### 2. Illness affects digestion and nutrient absorption:

- Digestion breaks food down into small parts called nutrients. These nutrients are absorbed from the gut into the bloodstream and used by the body. If the gut is damaged by infection and cell breakdown, absorption is reduced.
- Infections such as diarrhoea make the food pass too quickly through the gut, not giving enough time for digestion and absorption.

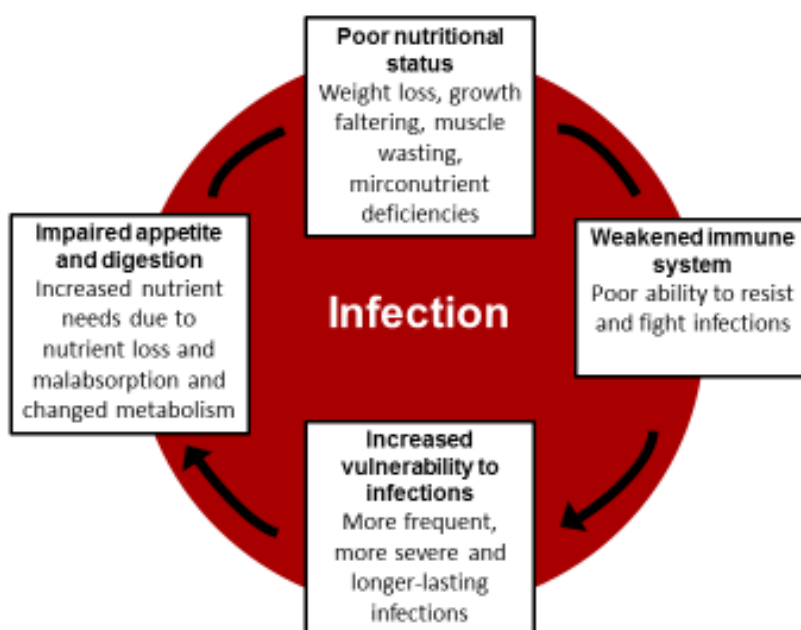
### 3. Illness can change metabolism (the way the body uses food):

- If people can't eat enough to meet their increased energy needs, muscles break down (muscle wasting). Muscle wasting leads to weight loss and swelling of the feet or body. Reduced production of saliva and other digestive fluids needed to break foods down into nutrients further reduces the absorption of food.
- The body can't use fats properly. Eating too much fat and too many fatty foods can increase the fat levels in the blood and other parts of the body.
- Altered metabolism can lead to difficulty controlling sugar in the blood and may lead to a condition called diabetes.

Figure 1 shows the impact of poor nutrition on illness.

- Weight loss and nutrient deficiencies
- Weakened immune system
- Increased vulnerability to infections
- Decreased appetite but increased nutrient needs and malabsorption

**Figure 1. Cycle of poor nutrition and infection**



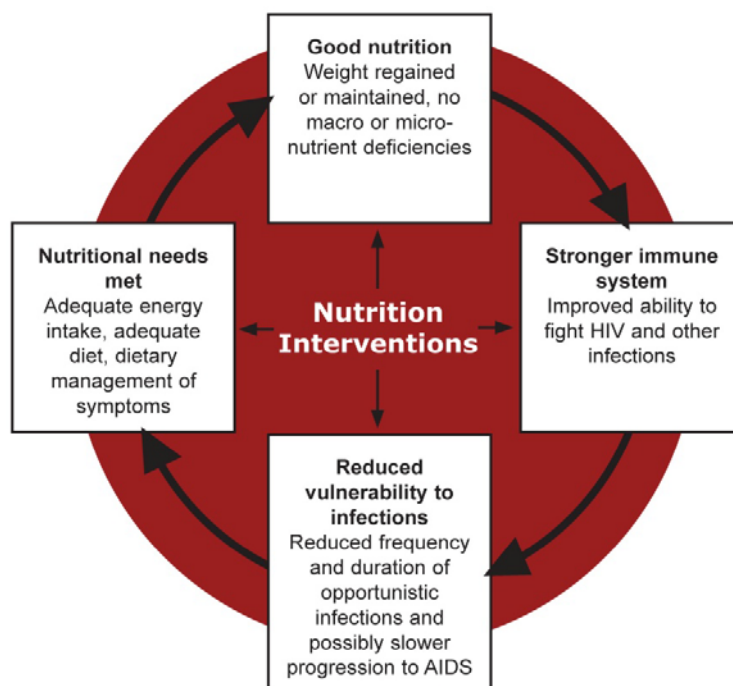
Poor nutritional status and chronic illness weaken the immune system and make people more vulnerable to other infections. In people with HIV, these infections are called 'opportunistic' because they take advantage of weak immune systems. Chronic illness also alters metabolism. Frequent infections and diseases make the body weaker and lead to faster progression of illness.

While chronic and frequent infections increase energy needs, people may not be able to eat enough to meet these needs because the infections reduce appetite and change the way the body uses food. This leads to weight loss and undernutrition, which further weakens the immune system, and the negative cycle continues.

Figure 2 shows the impact of good nutrition on infection.

- Healthy weight
- Stronger immune system
- Fewer infections and possibly slower disease progression
- Ability to manage symptoms of illness
- progression
- Ability to manage symptoms of illness

**Figure 2. Cycle of good nutrition and infection**





## HANDOUT 2.2. Human Energy and Nutrient Requirements

### Daily energy requirements (kcal<sup>1</sup>/day)

The table below shows energy requirements of different groups by age and physiological changes (pregnancy, breastfeeding). The table also shows the increased energy requirements of people with HIV by clinical stage of HIV.

Age group	Healthy	HIV positive		
		Asymptomatic	Symptomatic	If losing weight (children)
<b>Children and adolescents</b>				
Age		10% more energy	20% more energy (20–30% for children)	50–100% more energy
6–11 months	680	760	830	150–200 kcal/kg of body weight/day
12–23 months	900	990	1,080	150–200 kcal/kg of body weight/day
2–5 years	1,260	1,390	1,510	150–200 kcal/kg of body weight/day
6–9 years	1,650	1,815	1,980	75–100 kcal/kg of body weight/day
10 to 14 years	2,020	2,220	2,420	60–90 kcal/kg of body weight/day
15 to 17 years	2,800	3,080	3,360	
<b>Adults</b>				
Non-pregnant/ breastfeeding	2,000– 2,580	2,200–2,838	2,400–3,612	
Pregnant/ breastfeeding	2,460– 2,570	2,706–2,829	3,444–3,961	

Source: Adapted from WHO. 2009a. *Nutritional Care and Support for People Living with HIV/AIDS: A Training Course. Participant's Manual*. Geneva: WHO.

<sup>1</sup> A **calorie** is the amount of energy needed to increase the temperature of 1 g of water by 1° Celsius. These units of energy are so small that they are expressed in 1,000 calorie units known as kilocalories (kcal).

## Food equivalents to meet energy needs

Age group	Kcal/day	Sample food equivalents
<b>0–6 months</b>	518–639 (boys) 464–599 (girls)	Breast milk on demand
<b>6–11 months</b>	680	Breast milk on demand <b>AND</b> 2 of any of the following snacks: <ul style="list-style-type: none"> <li>▪ 2 bowls of maize porridge with sugar and oil</li> <li>▪ 1 banana</li> <li>▪ 1 large serving spoon of mashed boiled squash</li> <li>▪ 1 boiled egg</li> </ul>
<b>12–23 months</b>	900	Breast milk on demand <b>AND</b> all of the following: <ul style="list-style-type: none"> <li>▪ 1 bowl of porridge with sugar, milk and groundnut paste</li> <li>▪ 1 boiled egg</li> <li>▪ 2 bananas</li> <li>▪ 1 boiled sweet potato</li> <li>▪ 1 cup of mango juice</li> </ul>
<b>2–5 years</b>	1,260	All of the following: <ul style="list-style-type: none"> <li>▪ 3 bowls of maize porridge with margarine and sugar</li> <li>▪ 1 banana</li> <li>▪ 1 boiled sweet potato</li> <li>▪ 2 small serving spoons of boiled pumpkin</li> <li>▪ 1 cup of milk</li> <li>▪ 1 slice of bread with margarine and jam</li> </ul>
<b>6–9 years</b>	1,650	3 meals of 500 kcal each (example below) <ul style="list-style-type: none"> <li>▪ <i>Nshima</i> with boiled kidney beans and cassava leaves</li> </ul> <b>AND</b> 2 snacks (examples below) <ul style="list-style-type: none"> <li>▪ 1 banana</li> <li>▪ 1 egg</li> <li>▪ 1 slice of bread with margarine and jam</li> </ul>
<b>10–14 years</b>	2,020	3 meals of 600 kcal each (examples below) <ul style="list-style-type: none"> <li>▪ Banana porridge with dried fish and spinach</li> <li>▪ <i>Nshima</i>, pigeon peas and pumpkin</li> </ul> <b>AND</b> 2 snacks (examples below) <ul style="list-style-type: none"> <li>▪ 1 slice of bread with margarine and jam</li> <li>▪ 1 avocado</li> </ul>

Age group	Kcal/day	Sample food equivalents
		<ul style="list-style-type: none"> <li>▪ 1 handful of groundnuts</li> </ul>
<b>15–17 years</b>	2,800	<p>3 meals of 800 kcal each (examples below)</p> <ul style="list-style-type: none"> <li>▪ Pumpkin leaf broth with oil, cassava and spinach relish with groundnuts or 1 serving spoon of pigeon peas or 2 sweet potatoes</li> </ul> <p><b>AND</b> 2 snacks (examples below)</p> <ul style="list-style-type: none"> <li>▪ 1 slice of bread with margarine and jam</li> <li>▪ 1 avocado</li> <li>▪ 1 cup of orange juice</li> </ul>
<b>≥ 18 years</b>	2,170	<p>3 meals of 650 kcal each (example below)</p> <ul style="list-style-type: none"> <li>▪ Rice cooked with oil, boiled chicken and cassava leaf relish with groundnuts or 1 egg or 1 serving spoon of cooked lentils</li> </ul> <p><b>AND</b> 2 snacks (examples below)</p> <ul style="list-style-type: none"> <li>▪ 1 slice of bread with margarine and jam</li> <li>▪ 1 avocado</li> <li>▪ 1 handful of groundnuts</li> </ul>
<b>Pregnant/ breastfeeding</b>	2,455	<p>3 meals of 700 kcal each (examples below)</p> <ul style="list-style-type: none"> <li>▪ Banana porridge with meat and spinach</li> <li>▪ Cassava leaves, <i>nshima</i> and 1 boiled sweet potato</li> </ul> <p><b>AND</b> 3 snacks (examples below)</p> <ul style="list-style-type: none"> <li>▪ 1 slice of bread with margarine and jam</li> <li>▪ 1 avocado</li> <li>▪ 1 handful of groundnuts)</li> </ul>

## Food equivalents to meet extra energy needs of people with HIV

Group	Extra energy needs	Sample food equivalents
<b>HIV-positive child</b>	10% extra (asymptomatic)	<p>Any of the following:</p> <ul style="list-style-type: none"> <li>▪ Energy-dense, well-mashed or pureed foods twice a day (e.g., at 6 months: 2–3 tablespoons; at 7–8 months: 3–4 tablespoons)</li> <li>▪ Margarine, butter, oil, cooked eggs or groundnut paste added to foods if no diarrhoea</li> <li>▪ 1 cup of milk (<b>OR</b> 1 bowl of porridge) <b>AND</b> 1 energy-dense snack (e.g., 1 banana, 1 egg or 1 slice of bread with groundnut paste)</li> </ul>
	20–30% extra (symptomatic, with no weight loss)	<p>Any of the following:</p> <ul style="list-style-type: none"> <li>▪ 2 teaspoons of margarine or oil and 1–2 teaspoons of sugar added to porridge 3 times a day</li> <li>▪ 2 cups of milk</li> <li>▪ 2 slices of bread with groundnut paste</li> <li>▪ 1 banana plus 1 avocado or 1 egg</li> </ul>
	50–100% extra (symptomatic with weight loss)	<p>Any of the following:</p> <ul style="list-style-type: none"> <li>▪ 2 teaspoons of margarine or oil and 1–2 teaspoons of sugar added to porridge 4 times a day</li> <li>▪ 2–3 extra cups of milk <b>AND</b> 3 slices of bread with groundnut paste <b>AND</b> 2 bananas, avocados or eggs</li> </ul>
<b>HIV-positive adult</b>	10% extra (asymptomatic)	<p>Any of the following:</p> <ul style="list-style-type: none"> <li>▪ Cooked fistful of <i>nshima</i></li> <li>▪ 1 cup (250 ml) of porridge</li> <li>▪ 2 medium sweet potatoes</li> <li>▪ 2–3 large coffee cups of boiled milk</li> <li>▪ 2 bananas</li> <li>▪ 2 small serving spoons of boiled pumpkin</li> <li>▪ 1 small serving spoon of meat sauce and 1 small serving spoons of vegetables</li> <li>▪ 2 eggs</li> </ul>
	20% extra (symptomatic)	<p>Any of the following:</p> <ul style="list-style-type: none"> <li>▪ 2 cooked fistfuls of <i>nshima</i></li> <li>▪ 2 mugs (500 ml) of porridge</li> <li>▪ 4 medium sweet potatoes</li> <li>▪ 4 bananas</li> <li>▪ 2 small serving spoons of meat sauce and 2 small serving spoons of vegetables</li> <li>▪ 4 eggs</li> </ul>

## Protein

The normal human protein requirement is 12–15 percent of energy intake per day (50–80 g a day or 1 g per kg of ideal body weight). Below are the requirements per kg of body weight for different groups:

- 1.50 g per kg of body weight per day for infants
- 1.10 g per kg of body weight per day for children 1–3 years, 0.95 g per kg of body weight per day for children 4–13 years, 0.85 g per kg of body weight per day for adolescents 14–18 years, 0.80 g per kg of body weight per day for adults
- 1.10 g per kg of body weight per day for pregnant women (using pre-pregnancy weight) and breastfeeding women

## Protein requirements

Group	Grams per day
0–6 months	9
7–11 months	11
1–3 years	13
4–8 years	19
9–13 years	34
14–18 years	46 (females), 52 (males)
19→ 70 years	46 (females), 56 (males)
Pregnant 14–50 years	71
Breastfeeding 14–50 years	105

Sources: WHO, FAO and United Nations University (UNU). 2001. *Human Energy Requirements: Report of a Joint WHO/FAO/UNU Expert Consultation, 17–24 October, 2001*. Geneva: WHO. U.S. Department of Agriculture. 2011. *Dietary Reference Intakes (DRIs): Recommended Intakes for Individuals*. Washington, DC: U.S. Government.

## Protein requirements of people with HIV

According to the World Health Organization (WHO), people with HIV should consume the same proportion of protein in their diet as healthy non-infected people of the same age, sex and physical activity level. People with HIV should increase their protein intake proportionally as they increase fat and carbohydrate intake to meet their increased energy needs.

## **Fat**

The normal fat requirement is no more than 35 percent of total energy needs.

### **Fat needs of people with HIV**

There is no evidence that people with HIV need more fat than the normal requirements, but they may consume additional fat as they increase their energy intake. People on antiretroviral therapy (ART) or with persistent diarrhoea may need to eat less fat when they have diarrhoea or are taking certain medications.

## **Vitamins and minerals**

Eating a variety of foods from all food groups is the best way to ensure adequate intake of vitamins and minerals. However, if high-risk groups such as children and pregnant and breastfeeding women cannot consume enough vitamins and minerals through diet, they may need multiple micronutrient supplements. The recommended supplements are listed below.

### **Children younger than 5 years in resource-limited settings**

- 100,000 IU vitamin A every 6 months for infants 6–12 months
- 200,000 IU vitamin A every 6 months for children over 12 months
- Zinc supplement for children with diarrhoea
- There are no data on the efficacy of other micronutrient supplements for HIV-infected children.

### **Women who are pregnant and up to 6 months postpartum**

- 60 mg of elemental iron and 400 µg of folic acid daily for 6 months after the first trimester of pregnancy to prevent anaemia and twice daily to treat severe anaemia
- Single high-dose of vitamin A (200,000 IU) immediately after delivery, plus 200 mg of ferrous sulphate and 5 mg of folic acid

### **Vitamin and mineral needs of people with HIV**

Like HIV-negative people, people with HIV should consume no more than 1 Recommended Dietary Allowance (RDA) of micronutrients. A healthy diet is the best way to get enough vitamins and minerals. If diets cannot provide enough vitamins and minerals to correct deficiencies, HIV-positive women may need micronutrient supplements. Some supplements, e.g., vitamin A, zinc and iron, can produce adverse outcomes in HIV-positive people.

## HANDOUT 2.3. Critical Nutrition Actions

1. **Get weighed regularly** to keep track of your weight. HIV-positive people should be weighed at least every 2 months if symptomatic and every 3 months if asymptomatic.
2. **Eat a variety of nutritious foods and increase intake energy intake** according to the disease stage. If you do not have HIV-related symptoms, eat 10 percent more energy (one more snack) every day. If you have symptoms, eat 20–30 percent more energy (two–three more snacks) a day. Feed symptomatic children with HIV who are losing weight 50–100 percent more energy (oil or sugar added to porridge, extra staple food, three more snacks a day).
3. **Maintain good hygiene and sanitation.** Use boiled or treated water to prepare food, wash hands correctly, cover prepared food and get dewormed twice a year if you are living in areas where hookworm is common.
4. **Avoid habits that lead to poor nutrition and poor health**, including using condoms to avoid re-infection with HIV, avoiding alcohol and cigarettes and other tobacco products, avoiding junk foods and managing depression and stress.
5. **Get regular exercise** to strengthen or build muscles and increase appetite and health. Examples include normal household work, walking and gardening.
6. **Drink plenty of clean, safe water.** Use only filtered and boiled or chlorinated water to swallow medicines and to prepare juices.
7. **Get all infections treated early and manage symptoms through diet.**
8. **Manage food-medication interactions and medication side effects through diet.** Inform your health care provider if you are taking traditional remedies (herbs, medicines) or other nutrition supplements.

## **SESSION 3. Nutrition Assessment**

### **Purpose**

This session gives you skills to do anthropometric, clinical and dietary assessment and classify nutritional status.

### **Objectives**

By the end of the session, you should be able to:

1. Explain why nutrition assessment is important.
2. Explain different kinds of nutrition assessment and their uses.
3. Take accurate anthropometric measurements.
4. Do dietary assessment and know what factors affect food intake.
5. Interpret the results of various assessments to classify nutritional status.

### **Materials**

- **Handout 3.1. Anthropometric Indicators**
- **Handout 3.2. Measuring Weight**
- **Handout 3.3. Measuring Length and Height**
- **Handout 3.4. Measuring Mid-Upper Arm Circumference (MUAC)**
- **Handout 3.5. Finding Weight-for-Height Z-score (WHZ) for Children 6-59 Months**
- **Handout 3.6. Finding Body Mass Index (BMI) for Adults**
- **Handout 3.7. Finding BMI-for-Age for Children and Adolescents 5-14 Years**
- **Handout 3.8. Classification of Nutritional Status**
- **Handout 3.9. Clinical Nutrition Assessment**
- **Handout 3.10. Checking for Bilateral Pitting Oedema**
- **Handout 3.11. Biochemical Assessment**
- **Handout 3.12. Dietary Assessment**



## HANDOUT 3.1. Anthropometric Indicators

Indicator	Definition/measurement	Use
Birth weight	The weight at which a baby is born	An indicator of maternal nutrition and health that affects infant health and development. Low birth weight (< 2,500 g increases the risk of illness and death.
Body mass index (BMI)	Weight in kg divided by height in m <sup>2</sup> (kg/m <sup>2</sup> ), an indicator of nutritional status	Mainly used for non-pregnant adults. For pregnant/postpartum women, use MUAC instead.
Head circumference	Measurement around the head	A measure of brain development in the first 2 years of life
Height-for-age z-score (HAZ)	Length or height compared to the height of a child of the same age and sex from a reference population for age	Inadequate HAZ indicates <b>stunting</b> , an indicator of chronic malnutrition in children under 5
Mid-upper arm circumference (MUAC)	Measurement around the upper left arm (for right-handed people) midway between the tip of the shoulder and the top of the elbow	A measure of nutritional adequacy that can be used for all population groups and should be used for pregnant/postpartum women and clients whose weight and height cannot be taken
Weight-for-age z-score (WAZ)	Weight compared to the weight of a child of the same age and sex from a reference population	Inadequate WAZ indicates <b>underweight</b> , an indicator of both chronic and acute malnutrition.
Weight-for-height z-score (WHZ)	Weight compared to the weight of a child of the same height from a reference population	Inadequate WHZ identifies <b>wasting</b> , an indicator of acute malnutrition

## HANDOUT 3.2. Measuring Weight

### Weighing babies using a balance-beam scale

- Use a paediatric balance-beam scale that is accurate to within 10 g (0.01 kg).
- If using a cushion (e.g., a towel or diaper) in the pan, first weigh the cushion and then subtract its weight from the baby's weight.
- Weigh babies with no clothes or minimal clothing.
- Record the average of two or three weighings to the nearest 10 g (0.01 kg).
- If the baby moves too much to get an accurate weight, try again.

### Weighing babies using a mother/baby pair (Seca) scale

- Carefully turn over the scale so that the base is accessible. Press the closure of the battery compartment in the direction of the cover itself and open the battery compartment. Insert the supplied batteries into the battery compartment. Check that the batteries are inserted in correct direction. Close the cover and then turn the scale back up the right way. To activate the power supply, push the switch in position 'ON'
- Handle the scale carefully:
- Do not drop or bump the scale.
- Do not weigh loads totalling more than 150 kilograms.
- Protect the scale from excess moisture or humidity.
- Place the scale on a hard, level surface (wood, concrete or firm ground). Soft or uneven surfaces may cause small errors in weighing.
- Ask the mother to stand in the middle of the scale, feet slightly apart (on the foot prints, if marked), and to remain still.
- With the mother still on the scale and her weight displayed, press the two-in-one button. The scale will display 00.0
- Hand the baby to the mother. The baby's weight will appear on the display shown to the nearest 0.1kg. Record this weight as the weight of the baby.



### Weighing children who weigh up to 25 kg using weighing pants

- Undress the child completely and place him or her in the weighing pants.
- Make sure one of the child's arms passes in between the straps to prevent the child from falling. Make sure the child hangs freely and is not holding on to anything.
- When the child is settled and the arrow is steady, read the child's weight aloud to the nearest 100 g (for example, 6.4 kg). Ask another health care provider to repeat the weight for verification and record it.
- As children's weight may vary by up to 1 kg throughout the day, it is good practice to record the time the weight was measured.

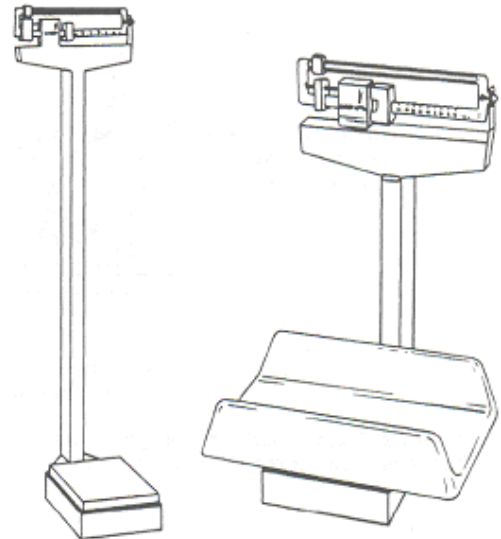


### Weighing older children, adolescents and adults using a Seca scale

- Re-zero the scale.
- Ask the client to take off shoes, hat, scarf and head wrap and remove everything from pockets.
- Ask the client to stand straight and unassisted on the centre of the scale.
- Stand in front of the scale to read the measurement.
- Record the weight to the nearest 100 g.

### Weighing adults using a balance beam scale

- Make sure the scale is on a flat, hard surface.
- Slide the weights on the horizontal beam until the beam balances at zero.
- Ask the client to remove any jacket, scarf, hat or head wrap and to remove anything from her/his pockets.
- Ask the client to stand still in the middle of the scale's platform without touching anything and with her/his body weight equally distributed on both feet.
- Read the weight to the nearest 100 g (0.1 kg) and record it immediately (two measurements taken in immediate succession should agree to within 100 g [0.1 kg]).
- As adults' weight may vary throughout the day by up to 2 kg, it is good practice to record the time the weight was measured.
- Two or three times a year, check the accuracy of the scales by using standard weights or get them checked by a professional dealer.



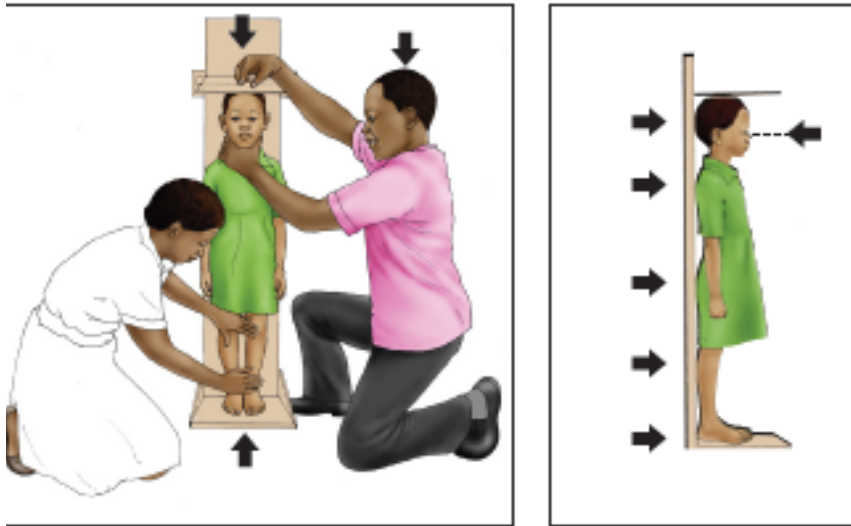
## HANDOUT 3.3. Measuring Length and Height

### **Measure length for children younger than 24 months or less than 87 cm long or who cannot be measured standing.**

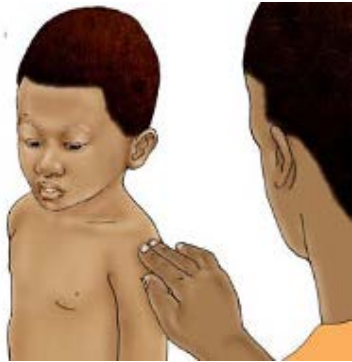
- The length board has a stationary headboard and moveable footboard.
- Place the length board on a table or the ground.
- The zero ends of the board should be at the edge of the headboard and allow the child's length to be read from the footboard.
- Remove the child's footwear and any head covering.
- Place the child on her/his back in the middle of the board with arms at the sides and feet at right angles to the board. The heels, knees, buttocks, back of the head and shoulders should touch the board.
- If two people are available, one person should gently hold the child's head so her/his eyes point straight up and bring the top of her/his head to the fixed end of the board.
- The crown of the child's head should securely touch the headboard. The Frankfort plane (eye-ear plane) should be perpendicular to the backboard. The long axis of the child's body should be aligned with the centre line of the backboard. The shoulders and buttocks should securely touch the backboard, and the shoulders and hips should be at right angles to the long axis of the body.
- The other person should gently hold the child's ankles or knees to keep the legs straight and against the backboard.
- Slide the footboard against the bottom of the bare feet so that both heels touch it with the toes pointing upward. The footboard should be pressed firmly enough to compress the soft tissues of the soles but not change the vertebral column length.
- Read the measurement aloud to the nearest 0.1 cm.
- Ask another health worker to repeat the measurement for verification and record it.

### **Measure height for children 24 months and older or 87 cm or taller and for adults.**

- Use a height board or fasten a non-stretchable tape measure securely to a wall.
- Place the height board vertically on a flat surface.
- Ask the caregiver or client to remove the client's shoes and headwear.
- Shoulder blades, buttocks and heels should touch the vertical surface of the board. Feet should be flat on the floor, close together and touching the back of the board. Legs and back should be straight, with arms at the sides. Shoulders should be relaxed and touching the board. The head need not touch the board.
- Ask the client to stand straight and tall and look straight ahead.
- Gently hold the client's head so she or he is looking straight ahead. Bring the moveable head piece to rest firmly on the top of the client's head. Ask another health worker to hold the client's feet.
- Read the measurement aloud to the nearest 0.1 cm.
- Ask another health care provider to repeat the measurement and record it.



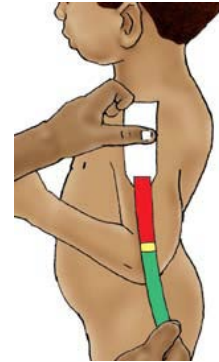
## HANDOUT 3.4. Measuring Mid-Upper Arm Circumference (MUAC)



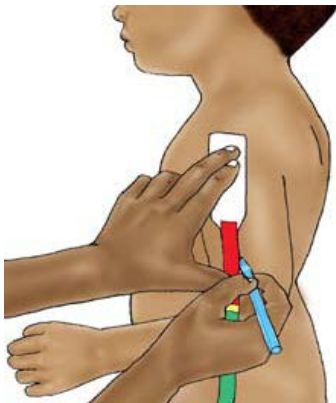
1. Bend the left arm at a 90° angle.



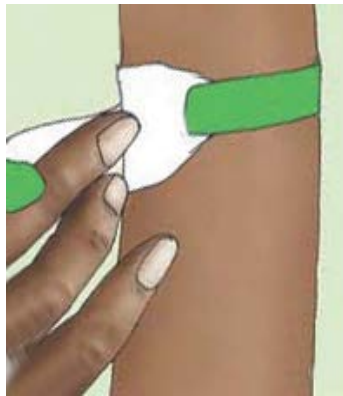
2. Find the top of the shoulder and the tip of the elbow.



3. Keep the tape at eye level and place it at the top of the shoulder. Put your right thumb on the tape where it meets the tip of the elbow (endpoint).



4. Find the middle of the upper arm by carefully folding the endpoint to the top edge of the tape. Place your left thumb on the point where the tape folds (midpoint). Mark the midpoint with a chalk or pen. Make sure the tape is not twisted and is parallel to the mark.



5. Straighten the arm so that it hangs loosely at the side and wrap the tape around the arm at the midpoint

Too loose

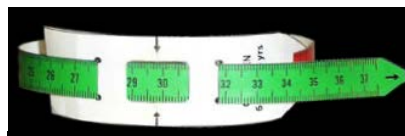


Too tight



6. Place the end of the tape through the window and correct the tension.

7. Read the measurement in cm in the window where the arrows point inward.



8. Record the measurement to the nearest 0.1 cm and note the color.

WHO has established cut-offs for classification of nutritional status in children under 5 and is working to establish cut-offs for older children and adults. Meanwhile, the cut-offs for in the table below are based on programme experience.

**MUAC cut-offs for classification of nutritional status**

<b>Group</b>	<b>Severe acute malnutrition (SAM)</b>	<b>Moderate acute malnutrition (MAM)</b>	<b>Normal nutritional status</b>
Children 6–59 months	< 11.5 cm	≥ 11.5 to < 12.5 cm	≥ 12.5 cm
Children 5–9 years	< 13.5 cm	≥ 13.5 to < 14.5 cm	≥ 14.5 cm
Children 10–14 years	< 16.0 cm	≥ 16.0 to < 18.5 cm	≥ 18.5 cm
Adults (non-pregnant/postpartum)	< 18.5 cm	≥ 18.5 to < 21.0 cm	≥ 21 cm
Pregnant/postpartum women	< 21.0 cm	≥ 21.0 to < 23.0 cm	≥ 23.0 cm

## HANDOUT 3.5. Finding Weight-for-Height Z-Score (WHZ) for Children 6–59 Months

A weight-for-height z-score (WHZ) compares a child’s weight to the weight of a child of the same length/height and sex to classify nutritional status. In the weight-for-height z-score (WHZ) charts below, the left column shows length or height in cm. Weights for boys are listed on the left side of the middle column, and weights for girls are listed on the right.

### To use the charts to classify children’s nutritional status:

1. Find the correct table for the child’s age (0–23 months or 24–59 months) and sex (boy or girl).
2. Find the figure closest to the child’s length/height in the left column.
3. Move your finger to the right to find the range that contains the child’s weight.
4. Look up the index row on top of the column to determine the Z-score range in which that child’s falls.
5. Look up the index row on top of the column to determine the Z-score range in which that child’s falls.
6. Report the nutritional status of that child by the figure closest to the median (e.g. if the weight falls between  $-1$  and  $-2$  z-scores, mark the z-score as  $< -1$ ).
7. Classify the child’s nutritional status by the column the weight falls under.

### WHZ cut-offs for classification of nutritional status

$< -3$	$\geq -3$ to $< -2$	$\geq -2$ to $\leq +2$	$> +2$ to $\leq +3$	$> +3$
Severe acute malnutrition (SAM)	Moderate acute malnutrition (MAM)	Normal nutritional status	Overweight	Obesity
Undernutrition			Overnutrition	

Exercise 1: Use the WHZ tables in the following pages to write the WHZ and nutritional status of the children in the table below.

ID	Sex	Age (months)	Height (cm)	Weight (kg)	WHZ	Nutritional status
1	F	35	98.2	11.5		
2	M	52	99.5	13.5		
3	M	9	69.9	7.5		
4	F	8	68.2	5.0		
5	M	21	97.2	11.9		
6	M	17	89.7	12.9		

Which of the children are malnourished?



## Weight-for-length (children 0–23 months)

BOYS, 0–23 months, weight-for-length					
Length (cm) ↓	SAM < -3	MAM ≥ -3 to < -2	Normal ≥ -2 to ≤ +2	Overweight > +2 to ≤ +3	Obesity > 3
	Weight (kg) →				
45	0–1.8	1.9	2.0–3.0	3.1–3.3	> 3.3
46	0–1.9	2.0–2.1	2.2–3.1	3.2–3.5	> 3.5
47	0–2.0	2.1–2.2	2.3–3.3	3.4–3.7	> 3.7
48	0–2.2	2.3–2.4	2.5–3.6	3.7–3.9	> 3.9
49	0–2.3	2.4–2.5	2.6–3.8	3.9–4.2	> 4.2
50	0–2.5	2.6–2.7	2.8–4.0	4.1–4.4	> 4.4
51	0–2.6	2.7–2.9	3.0–4.2	4.3–4.7	> 4.7
52	0–2.8	2.9–3.1	3.2–4.5	4.6–5.0	> 5.0
53	0–3.0	3.1–3.3	3.4–4.8	4.9–5.3	> 5.3
54	0–3.2	3.3–3.5	3.6–5.1	5.2–5.6	> 5.6
55	0–3.5	3.6–3.7	3.8–5.4	5.5–6.0	> 6.0
56	0–3.7	3.8–4.0	4.1–5.8	5.9–6.3	> 6.3
57	0–3.9	4.0–4.2	4.3–6.1	6.2–6.7	> 6.7
58	0–4.2	4.3–4.5	4.6–6.4	6.5–7.1	> 7.1
59	0–4.4	4.5–4.7	4.8–6.8	6.9–7.4	> 7.4
60	0–4.6	4.7–5.0	5.1–7.1	7.2–7.8	> 7.8
61	0–4.8	4.9–5.2	5.3–7.4	7.5–8.1	> 8.1
62	0–5.0	5.1–5.5	5.6–7.7	7.8–8.5	> 8.5
63	0–5.2	5.3–5.7	5.8–8.0	8.1–8.8	> 8.8
64	0–5.4	5.5–5.9	6.0–8.3	8.4–9.1	> 9.1
65	0–5.6	5.7–6.1	6.2–8.6	8.7–9.4	> 9.4
66	0–5.8	5.9–6.3	6.4–8.9	9.0–9.7	> 9.7
67	0–6.0	6.1–6.5	6.6–9.2	9.3–10.0	> 10.0
68	0–6.2	6.3–6.7	6.8–9.4	9.5–10.3	> 10.3
69	0–6.4	6.5–6.9	7.0–9.7	9.8–10.6	> 10.6
70	0–6.5	6.6–7.1	7.2–10.0	10.1–10.9	> 10.9
71	0–6.7	6.8–7.3	7.4–10.2	10.3–11.2	> 11.2
72	0–6.9	7.0–7.5	7.6–10.5	10.6–11.5	> 11.5
73	0–7.1	7.2–7.6	7.7–10.8	10.9–11.8	> 11.8
74	0–7.2	7.3–7.8	7.9–11.0	11.1–12.1	> 12.1
75	0–7.4	7.5–8.0	8.1–11.3	11.4–12.3	> 12.3
76	0–7.5	7.6–8.2	8.3–11.5	11.6–12.6	> 12.6
77	0–7.7	7.8–8.3	8.4–11.7	11.8–12.8	> 12.8
78	0–7.8	7.9–8.5	8.6–12.0	12.1–13.1	> 13.1
79	0–8.0	8.1–8.6	8.7–12.2	12.3–13.3	> 13.3
80	0–8.1	8.2–8.8	8.9–12.4	12.5–13.6	> 13.6
81	0–8.3	8.4–9.0	9.1–12.6	12.7–13.8	> 13.8

GIRLS, 0–23 months, weight-for-length					
Length (cm) ↓	SAM < -3	MAM ≥ -3 to < -2	Normal ≥ -2 to ≤ +2	Overweight > +2 to ≤ +3	Obesity > 3
	Weight (kg) →				
45	0–1.8	1.9–2.0	2.1–3.0	3.1–3.3	> 3.3
46	0–1.9	2.0–2.1	2.2–3.2	3.3–3.5	> 3.5
47	0–2.1	2.2–2.3	2.4–3.4	3.5–3.7	> 3.7
48	0–2.2	2.3–2.4	2.5–3.6	3.7–4.0	> 4.0
49	0–2.3	2.4–2.5	2.6–3.8	3.9–4.2	> 4.2
50	0–2.5	2.6–2.7	2.8–4.0	4.1–4.5	> 4.5
51	0–2.7	2.8–2.9	3.0–4.3	4.4–4.8	> 4.8
52	0–2.8	2.9–3.1	3.2–4.6	4.7–5.1	> 5.1
53	0–3.0	3.1–3.3	3.4–4.9	5.0–5.4	> 5.4
54	0–3.2	3.3–3.5	3.6–5.2	5.3–5.7	> 5.7
55	0–3.4	3.5–3.7	3.8–5.5	5.6–6.1	> 6.1
56	0–3.6	3.7–3.9	4.0–5.8	5.9–6.4	> 6.4
57	0–3.8	3.9–4.2	4.3–6.1	6.2–6.8	> 6.8
58	0–4.0	4.1–4.4	4.5–6.5	6.6–7.1	> 7.1
59	0–4.2	4.3–4.6	4.7–6.8	6.9–7.5	> 7.5
60	0–4.4	4.5–4.8	4.9–7.1	7.2–7.8	> 7.8
61	0–4.6	4.7–5.0	5.1–7.4	7.5–8.2	> 8.2
62	0–4.8	4.9–5.2	5.3–7.7	7.8–8.5	> 8.5
63	0–5.0	5.1–5.4	5.5–8.0	8.1–8.8	> 8.7
64	0–5.2	5.3–5.6	5.7–8.3	8.4–9.1	> 9.1
65	0–5.4	5.5–5.8	5.9–8.6	8.7–9.5	> 9.5
66	0–5.5	5.6–6.0	6.1–8.8	8.9–9.8	> 9.8
67	0–5.7	5.8–6.2	6.3–9.1	9.2–10.0	> 10.0
68	0–5.9	6.0–6.4	6.5–9.4	9.5–10.3	> 10.3
69	0–6.0	6.1–6.6	6.7–9.6	9.7–10.6	> 10.6
70	0–6.2	6.3–6.8	6.9–9.9	10.0–10.9	> 10.9
71	0–6.4	6.5–6.9	7.0–10.1	10.2–11.1	> 11.1
72	0–6.5	6.6–7.1	7.2–10.3	10.4–11.4	> 11.4
73	0–6.7	6.8–7.3	7.4–10.6	10.7–11.7	> 11.7
74	0–6.8	6.9–7.4	7.5–10.8	10.9–11.9	> 11.9
75	0–7.0	7.1–7.6	7.7–11.0	11.1–12.2	> 12.2
76	0–7.1	7.2–7.7	7.8–11.2	11.3–12.4	> 12.4
77	0–7.3	7.4–7.9	8.0–11.5	11.6–12.6	> 12.6
78	0–7.4	7.5–8.1	8.2–11.7	11.8–12.9	> 12.9
79	0–7.6	7.7–8.2	8.3–11.9	12.0–13.1	> 13.1
80	0–7.7	7.8–8.4	8.5–12.1	12.2–13.4	> 13.4
81	0–7.9	8.0–8.6	8.7–12.4	12.5–13.7	> 13.7

82	0–8.4	8.5–9.1	9.2–12.8	12.9–14.0	> 14.0
83	0–8.6	8.7–9.3	9.4–13.1	13.2–14.3	> 14.3
84	0–8.8	8.9–9.5	9.6–13.3	13.4–14.6	> 14.6
85	0–9.0	9.1–9.7	9.8–13.6	13.7–14.9	> 14.9
86	0–9.2	9.3–9.9	10.0–13.9	14.0–15.2	> 15.2
87	0–9.4	9.5–10.1	10.2–14.2	14.3–15.5	> 15.5

82	0–8.0	8.1–8.7	8.8–12.6	12.7–13.9	> 13.9
83	0–8.2	8.3–8.9	9.0–12.9	13.0–14.2	> 14.2
84	0–8.4	8.5–9.1	9.2–13.2	13.3–14.5	> 14.5
85	0–8.6	8.7–9.3	9.4–13.5	13.6–14.9	> 14.9
86	0–8.8	8.9–9.6	9.7–13.8	13.9–15.2	> 15.2
87	0–9.0	9.1–9.8	9.9–14.1	14.2–15.5	> 15.5

## Weight-for-height (children 24–59 months)

BOYS, 24–59 months, weight-for-height					
Height ↓ (cm)	SAM < -3	MAM ≥ -3 to < -2	Normal ≥ -2 to ≤ +2	Overweight > +2 to ≤ +3	Obesity > 3
	Weight (kg) →				
72	0–7.0	7.1–7.6	7.7–10.7	10.8–11.7	> 11.7
73	0–7.2	7.3–7.8	7.9–11.0	11.1–12.0	> 12.0
74	0–7.3	7.4–7.9	8.0–11.2	11.3–12.2	> 12.2
75	0–7.5	7.6–8.1	8.2–11.4	11.5–12.5	> 12.5
76	0–7.6	7.7–8.3	8.4–11.7	11.8–12.8	> 12.8
77	0–7.8	7.9–8.4	8.5–11.9	12.0–13.0	> 13.0
78	0–7.9	8.0–8.6	8.7–12.1	12.2–13.3	> 13.3
79	0–8.1	8.2–8.7	8.8–12.3	12.4–13.5	> 13.5
80	0–8.2	8.3–8.9	9.0–12.6	12.7–13.7	> 13.7
81	0–8.4	8.5–9.1	9.2–12.8	12.9–14.0	> 14.0
82	0–8.6	8.7–9.2	9.3–13.0	13.1–14.2	> 14.2
83	0–8.7	8.8–9.4	9.5–13.3	13.4–14.5	> 14.5
84	0–8.9	9.0–9.6	9.7–13.5	13.6–14.8	> 14.8
85	0–9.1	9.2–9.9	10.0–13.8	13.9–15.1	> 15.1
86	0–9.3	9.4–10.1	10.2–14.1	14.2–15.4	> 15.4
87	0–9.5	9.6–10.3	10.4–14.4	14.5–15.7	> 15.7
88	0–9.7	9.8–10.5	10.6–14.7	14.8–16.0	> 16.0
89	0–9.9	10.0–10.7	10.8–14.9	15.0–16.3	> 16.3
90	0–10.1	10.2–10.9	11.0–15.2	15.3–16.6	> 16.6
91	0–10.3	10.4–11.1	11.2–15.5	15.6–16.9	> 16.9
92	0–10.5	10.6–11.3	11.4–15.8	15.9–17.2	> 17.2
93	0–10.7	10.8–11.5	11.6–16.0	16.1–17.5	> 17.5
94	0–10.9	11.0–11.7	11.8–16.3	16.4–17.8	> 17.8
95	0–11.0	11.1–11.9	12.0–16.6	16.7–18.1	> 18.1
96	0–11.2	11.3–12.1	12.2–16.9	17.0–18.4	> 18.4
97	0–11.4	11.5–12.3	12.4–17.2	17.3–18.8	> 18.8
98	0–11.6	11.7–12.5	12.6–17.5	17.6–19.1	> 19.1
99	0–11.8	11.9–12.8	12.9–17.9	18.0–19.5	> 19.5
100	0–12.0	12.1–13.0	13.1–18.2	18.3–19.9	> 19.0
101	0–12.2	12.3–13.2	13.3–18.5	18.6–20.3	> 20.3

GIRLS, 24–59 months, weight-for-height					
Height ↓ (cm)	SAM < -3	MAM ≥ -3 to < -2	Normal ≥ -2 to ≤ +2	Overweight > +2 to ≤ +3	Obesity > 3
	Weight (kg) →				
72	0–6.6	6.7–7.2	7.3–10.5	10.6–11.6	> 11.6
73	0–6.8	6.9–7.4	7.5–10.7	10.8–11.8	> 11.8
74	0–6.9	7.0–7.5	7.6–11.0	11.1–12.1	> 12.1
75	0–7.1	7.2–7.7	7.8–11.2	11.3–12.3	> 12.3
76	0–7.2	7.3–7.9	8.0–11.4	11.5–12.6	> 12.6
77	0–7.4	7.5–8.0	8.1–11.6	11.7–12.8	> 12.8
78	0–7.5	7.6–8.2	8.3–11.8	11.9–13.1	> 13.1
79	0–7.7	7.8–8.3	8.4–12.1	12.2–13.3	> 13.3
80	0–7.8	7.9–8.5	8.6–12.3	12.4–13.6	> 13.6
81	0–8.0	8.1–8.7	8.8–12.6	12.7–13.9	> 13.9
82	0–8.2	8.3–8.9	9.0–12.8	12.9–14.1	> 14.1
83	0–8.4	8.5–9.1	9.2–13.1	13.2–14.5	> 14.5
84	0–8.5	8.6–9.3	9.4–13.4	13.5–14.8	> 14.8
85	0–8.7	8.8–9.5	9.6–13.7	13.8–15.1	> 15.1
86	0–8.9	9.0–9.7	9.8–14.0	14.1–15.4	> 15.4
87	0–9.1	9.2–9.9	10.0–14.3	14.4–15.8	> 15.8
88	0–9.3	9.4–10.1	10.2–14.6	14.7–16.1	> 16.1
89	0–9.5	9.6–10.3	10.4–14.9	15.0–16.4	> 16.4
90	0–9.7	9.8–10.5	10.6–15.2	15.3–16.8	> 16.8
91	0–9.9	10.0–10.8	10.9–15.5	15.6–17.1	> 17.1
92	0–10.1	10.2–11.0	11.1–15.8	15.9–17.4	> 17.4
93	0–10.3	10.4–11.2	11.3–16.1	16.2–17.8	> 17.8
94	0–10.5	10.6–11.4	11.5–16.4	16.5–18.1	> 18.1
95	0–10.7	10.8–11.6	11.7–16.7	16.8–18.5	> 18.5
96	0–10.8	10.9–11.8	11.9–17.0	17.1–18.8	> 18.8
97	0–11.0	11.1–12.0	12.1–17.4	17.5–19.2	> 19.2
98	0–11.2	11.3–12.2	12.3–17.7	17.8–19.5	> 19.5
99	0–11.4	11.5–12.4	12.5–18.0	18.1–19.9	> 19.0
100	0–11.6	11.7–12.7	12.8–18.4	18.5–20.3	> 20.3
101	0–11.9	12.0–12.9	13.0–18.7	18.8–20.7	> 20.7

102	0–12.4	12.5–13.5	13.6–18.9	19.0–20.7	> 20.7
103	0–12.7	12.8–13.7	13.8–19.3	19.4–21.1	> 21.1
104	0–12.9	13.0–13.9	14.0–19.7	19.8–21.6	> 21.6
105	0–13.1	13.2–14.2	14.3–20.1	20.2–22.0	> 22.0
106	0–13.3	13.4–14.4	14.5–20.5	20.6–22.5	> 22.5
107	0–13.6	13.7–14.7	14.8–20.9	21.0–22.9	> 22.9
108	0–13.8	13.9–15.0	15.1–21.3	21.4–23.4	> 23.4
109	0–14.0	14.1–15.2	15.3–21.8	21.9–23.9	> 23.9
110	0–14.3	14.4–15.5	15.6–22.2	22.3–24.4	> 24.4
111	0–14.5	14.6–15.8	15.9–22.7	22.8–25.0	> 25.0
112	0–14.8	14.9–16.1	16.2–23.1	23.2–25.5	> 25.5
113	0–15.1	15.2–16.4	16.5–23.6	23.7–26.0	> 26.0
114	0–15.3	15.4–16.7	16.8–24.1	24.2–26.6	> 26.6
115	0–15.6	15.7–17.0	17.1–24.6	24.7–27.2	> 27.2
116	0–15.9	16.0–17.3	17.4–25.1	25.2–27.8	> 27.8
117	0–16.1	16.2–17.6	17.7–25.6	25.7–28.3	> 28.3
118	0–16.4	16.5–17.9	18.0–26.1	26.2–28.9	> 28.9
119	0–16.7	16.8–18.2	18.3–26.6	26.7–29.5	> 29.5
120	0–17.0	17.1–18.5	18.6–27.2	27.3–30.1	> 30.1

102	0–12.1	12.2–13.2	13.3–19.1	19.2–21.1	> 21.1
103	0–12.3	12.4–13.4	13.5–19.5	19.6–21.6	> 21.6
104	0–12.5	12.6–13.7	13.8–19.9	20.0–22.0	> 22.0
105	0–12.8	12.9–13.9	14.0–20.3	20.4–22.5	> 22.5
106	0–13.0	13.1–14.2	14.3–20.8	20.9–23.0	> 23.0
107	0–13.3	13.4–14.5	14.6–21.2	21.3–23.5	> 23.5
108	0–13.6	13.7–14.8	14.9–21.7	21.8–24.0	> 24.0
109	0–13.8	13.9–15.1	15.2–22.1	22.2–24.5	> 24.5
110	0–14.1	14.2–15.4	15.5–22.6	22.7–25.1	> 25.1
111	0–14.4	14.5–15.7	15.8–23.1	23.2–25.7	> 25.7
112	0–14.7	14.8–16.1	16.2–23.6	23.7–26.2	> 26.2
113	0–15.0	15.1–16.4	16.5–24.2	24.3–26.8	> 26.8
114	0–15.3	15.4–16.7	16.8–24.7	24.8–27.4	> 27.4
115	0–15.6	15.7–17.1	17.2–25.2	25.3–28.1	> 28.1
116	0–15.9	16.0–17.4	17.5–25.8	25.9–28.7	> 28.7
117	0–16.2	16.3–17.7	17.8–26.3	26.4–29.3	> 29.3
118	0–16.5	16.6–18.1	18.2–26.9	27.0–29.9	> 29.9
119	0–16.8	16.9–18.4	18.5–27.4	27.5–30.6	> 30.6
120	0–17.2	17.3–18.8	18.9–28.0	28.1–31.2	> 31.2

## HANDOUT 3.6. Finding Body Mass Index (BMI) for Adults






$$\text{Body mass index (BMI)} = \frac{\text{weight (kg)}}{\text{height (m)}^2}$$

BMI is measured for adults (non-pregnant/postpartum).

You can find BMI using either a BMI wheel or a BMI chart.

### Finding BMI using the BMI chart

1. On the chart on the next page, find the client's height in the left-hand column, or y axis. If the height is an odd number, use the next higher (even) number (1 metre = 100 cm).
2. Find the client's weight in the bottom row (x axis). If the weight is an odd number, use the next lower (even) number.
3. The BMI is the point where the two lines meet.

-  Red shows severe acute malnutrition (BMI < 16.0).
-  Yellow shows moderate malnutrition (BMI ≥ 16.0 to < 18.5).
-  Green shows normal nutritional status (BMI ≥ 18.5 to < 25.0).
-  Light purple shows overweight (BMI ≥ 25.0 to < 30.0).
-  Purple shows obesity (BMI ≥ 30.0).

BMI = Weight ÷ height (m<sup>2</sup>)

1. Find height in the left-hand column (y axis).
2. Find weight in the bottom row (x axis).
3. The point where the two lines meet is the BMI.

- Red shows severe undernutrition (BMI < 16.0).
- Green shows adequate weight for height (BMI 18.5–24.9).
- Orange shows overweight (BMI 25.0–29.9).
- Light purple shows overweight
- Purple shows obesity (BMI > 30).

Height (m)

200	8	9	9	10	10	11	11	12	12	13	13	14	14	15	15	16	16	17	17	18	18	19	19	20	20	21	21	22	22	23	23	24	24	25	25	26	26	27	27	28	28	29	29		
198	8	9	9	10	10	11	11	12	12	13	13	14	14	15	15	16	16	17	17	18	18	19	19	20	20	21	21	22	22	23	23	24	24	25	26	26	27	27	28	28	29	29	30	30	
196	8	9	9	10	10	11	11	12	12	13	14	14	15	15	16	16	17	17	18	18	19	19	20	20	21	21	22	22	23	23	24	24	25	26	26	27	27	28	28	29	29	30	30		
194	9	9	10	10	11	11	12	12	13	13	14	14	15	15	16	16	17	18	18	19	19	20	20	21	21	22	22	23	23	24	24	25	26	26	27	27	28	28	29	29	30	30	31	31	
192	9	9	10	10	11	11	12	13	13	14	14	15	15	16	16	17	17	18	18	19	20	20	21	21	22	22	23	23	24	24	25	25	26	27	27	28	28	29	29	30	30	31	31		
190	9	10	10	11	11	12	12	13	13	14	14	15	15	16	16	17	17	18	18	19	19	20	20	21	22	22	23	23	24	24	25	25	26	27	27	28	28	29	30	30	31	31	32	32	
188	9	10	10	11	11	12	12	13	14	14	15	15	16	16	17	17	18	18	19	19	20	20	21	22	22	23	23	24	24	25	25	26	27	27	28	28	29	29	30	31	31	32	32	33	33
186	9	10	10	11	12	12	13	13	14	14	15	16	16	17	17	18	18	19	20	20	21	21	22	22	23	23	24	24	25	25	26	27	27	28	28	29	29	30	31	31	32	32	33	34	34
184	10	10	11	11	12	12	13	14	14	15	15	16	16	17	17	18	18	19	19	20	21	21	22	22	23	24	24	25	25	26	27	27	28	28	29	30	30	31	31	32	32	33	34	34	
182	10	10	11	11	12	13	13	14	14	15	16	16	17	18	18	19	19	20	21	21	22	22	23	24	24	25	25	26	27	27	28	28	29	30	30	31	31	32	33	33	34	34	35	35	
180	10	10	11	12	12	13	14	14	15	15	16	17	17	18	19	19	20	20	21	22	22	23	23	24	25	25	26	27	27	28	28	29	30	30	31	31	32	33	33	34	35	35	36	36	
178	10	10	11	12	13	13	14	15	15	16	16	17	18	18	19	20	20	21	21	22	22	23	24	25	25	26	27	27	28	28	29	30	30	31	32	32	33	33	34	35	35	36	37	37	
176	10	11	12	12	13	14	14	15	15	16	17	17	18	19	19	20	21	21	22	23	23	24	25	25	26	26	27	28	28	29	30	30	31	32	32	33	34	34	35	36	36	37	37		
174	10	11	12	13	13	14	15	15	16	17	17	18	18	19	20	20	21	22	22	23	24	24	25	26	26	27	28	28	29	30	30	31	32	32	33	34	34	35	36	36	37	38	38		
172	11	11	12	13	14	14	15	16	16	17	18	18	19	20	20	21	22	22	23	24	24	25	26	26	27	28	28	29	30	30	31	32	32	33	34	34	35	36	37	38	39	39			
170	11	12	12	13	14	15	15	16	17	17	18	19	19	20	21	21	22	23	24	24	25	26	26	27	28	28	29	30	30	31	32	33	33	34	35	35	36	37	37	38	39	39	40	40	
168	11	12	13	13	14	15	16	16	17	18	18	19	20	21	21	22	23	23	24	25	26	26	27	28	28	29	30	30	31	32	33	33	34	35	35	36	37	38	38	39	40	40	41	41	
166	12	12	13	14	15	15	16	17	17	18	19	20	20	21	22	22	23	24	25	25	26	27	28	28	29	30	30	31	32	33	33	34	35	36	36	37	38	38	39	40	41	41	42	42	
164	12	13	13	14	15	16	16	17	18	19	19	20	21	22	22	23	24	25	25	26	27	28	28	29	30	30	31	32	33	33	34	35	36	36	37	38	38	39	40	41	42	42	43	43	
162	12	13	14	14	15	16	17	18	18	19	20	21	21	22	23	24	24	25	26	27	27	28	29	30	30	31	32	33	34	34	35	36	37	37	38	39	39	40	41	42	43	43	44	44	
160	13	13	14	15	16	16	17	18	19	20	20	21	22	23	23	24	25	26	27	27	28	29	30	30	31	32	33	34	34	35	36	37	38	38	39	40	41	41	42	43	44	45	45		
158	13	14	14	15	16	17	18	18	19	20	21	22	22	23	24	25	26	26	27	28	29	30	30	31	32	33	34	34	35	36	37	38	38	39	40	41	42	42	43	44	45	46	46		
156	13	14	15	16	16	17	18	19	20	21	21	22	23	24	25	25	26	27	28	29	30	30	31	32	33	34	35	35	36	37	38	39	39	40	41	42	43	44	44	45	46	47	48	48	
154	14	14	15	16	17	18	19	19	20	21	22	23	24	24	25	26	27	28	29	30	30	31	32	33	34	35	35	36	37	38	39	40	40	41	42	43	44	45	46	46	47	48	49	49	
152	14	15	16	16	17	18	19	20	21	22	23	23	24	25	26	27	28	29	29	30	31	32	33	34	35	35	36	37	38	39	40	41	42	42	43	44	45	46	47	48	48	49	50	50	
150	14	15	16	17	18	18	19	20	21	22	23	24	25	26	27	27	28	29	30	31	31	32	33	34	36	36	37	38	39	40	41	41	42	43	44	45	45	46	47	48	49	50	51	51	
148	15	16	16	17	18	19	20	21	22	23	23	24	25	26	27	28	29	30	31	32	33	33	34	35	36	37	38	39	40	41	42	42	43	44	44	45	46	47	48	49	50	51	52	52	
146	15	16	17	18	19	20	21	22	23	23	24	25	26	27	28	29	31	32	33	34	35	35	35	36	37	38	39	40	41	42	43	43	44	45	46	46	47	48	49	50	51	52	53	53	
144	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	36	37	38	39	40	41	42	43	43	44	45	46	46	47	48	49	50	51	52	53	54	54	
Wt (kg)	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110	112	114	116		

## Finding BMI using a BMI wheel

BMI for adults is found on the front side of the wheel, where you can see the word 'Instructions'. The inner/smaller disc shows height. The outer/larger disc shows weight.

To find BMI:

1. Turn the top disc until the person's height aligns with the person's weight.
2. On the outer disc, read the number that the arrow labelled 'BMI' points to.
3. Look at the box at the bottom of the wheel labelled 'Nutritional status for adults 19 years and older'. Find the range that contains the person's BMI and classify the person's nutritional status.

Use the BMI wheel or the BMI chart to find the BMI and nutritional status for the clients in the table below.

ID	Sex	Height (cm)	Weight (kg)	BMI	Nutritional status
1	F	178	50		
2	M	190	68		
3	M	176	48		
4	F	156	102		
5	M	160	38		
6	M	174	84		

Now use the cut-offs below to add the nutritional status of each client in the last column.

### BMI cut-offs for classification of nutritional status

Group	Severe acute malnutrition (SAM)	Moderate malnutrition	Normal nutritional status	Overweight	Obesity
Adults	< 16.0	≥ 16.0 to < 18.5	≥ 18.5 to < 25.0	≥ 25.0 to < 30.0	≥ 30.0

Source: WHO. 2015. *Obesity and Overweight*. Fact Sheet No. 311.

<http://www.who.int/mediacentre/factsheets/fs311/en/>

## HANDOUT 3.7. Finding BMI-for-Age for Children and Adolescents 5–18 Years

Explain that for adults, simple BMI can be used as an indicator of nutritional status because most people over 18 years of age have stopped growing. But for children and adolescents 5–18 years who are still growing and developing, their age and sex need to be considered when using BMI to classify their nutritional status. BMI-for-age can be used to classify their nutritional status.

Like weight-for-height, BMI-for-age is measured in z-scores. A BMI-for-age z-score tells exactly how many standard deviations an individual’s BMI is away from the median BMI value of the reference population.

### Finding BMI-for-age using BMI and BMI-for-age tables

#### Step 1. Find BMI in the BMI Look-up Tables for Children and Adolescents 5–18 Years.

- Find height in the vertical column on the left (y axis). You may have to look through several tables.
- Find weight in the horizontal column (x axis) at the bottom.
- The place where the two rows (height and weight) cross is the BMI.

#### Step 2. Find BMI in the BMI-for-Age Tables.

- Round off the age to the nearest 6 months (for example, 6.0 for a child 6 years and 2 months and 6.6 for a child 6 years and 7 months).
- Find the row corresponding to years and months in the Age column.
- Move your finger straight across from left to right to find the child’s BMI (from Step 1). Find the child’s nutritional status in the top row.

### BMI-for-age cut-offs for classification of nutritional status

Group	Severe acute malnutrition (SAM)	Moderate malnutrition	Normal nutritional status	Overweight	Obesity
Children and adolescents 5–14 years	< -3 z-score	≥ -3 and < -2	≥ -2 and ≤ +1	≥ +1 to ≤ +2	> +2

Source: World Health Organization (WHO). 2007. ‘Growth Reference Data for 5–19 Years.’ <http://www.who.int/growthref/en/>

## BMI Look-up Table for Children and Adolescents 5–14 Years

Height (cm)	85–114 cm tall																											
	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
114	7.7	8.5	9.2	10.0	10.8	11.5	12.3	13.1	13.9	14.6	15.4	16.2	16.9	17.7	18.5	19.2	20.0	20.8	21.5	22.3	23.1	23.9	24.6	25.4	26.2	26.9	27.7	28.5
113	7.8	8.6	9.4	10.2	11.0	11.7	12.5	13.3	14.1	14.9	15.7	16.4	17.2	18.0	18.8	19.6	20.4	21.1	21.9	22.7	23.5	24.3	25.1	25.8	26.6	27.4	28.2	29.0
112	8.0	8.8	9.6	10.4	11.2	12.0	12.8	13.6	14.3	15.1	15.9	16.7	17.5	18.3	19.1	19.9	20.7	21.5	22.3	23.1	23.9	24.7	25.5	26.3	27.1	27.9	28.7	29.5
111	8.1	8.9	9.7	10.6	8.0	12.2	13.0	13.8	14.6	15.4	16.2	17.0	17.9	18.7	19.5	20.3	21.1	21.9	22.7	23.5	24.3	25.2	26.0	26.8	17.6	28.4	29.2	30.0
110	8.3	9.1	9.9	10.7	11.6	12.4	13.2	14.0	14.9	15.7	16.5	17.4	18.2	19.0	19.8	20.7	21.5	22.3	23.1	24.0	24.8	25.6	26.4	27.3	17.9	28.9	29.8	30.6
109	8.4	9.3	10.1	10.9	11.8	12.6	13.5	14.3	15.2	16.0	16.8	17.7	18.5	19.4	20.2	21.0	21.9	22.7	23.6	24.4	25.3	26.1	26.9	27.8	28.6	29.5	30.3	31.1
108	8.6	9.4	10.3	11.1	12.0	12.9	13.7	14.6	15.4	16.3	17.1	18.0	18.9	19.7	20.6	21.4	22.3	23.1	24.0	24.9	25.7	26.6	27.4	28.3	29.1	30.0	30.9	31.7
107	8.7	9.6	10.5	11.4	12.2	13.1	14.0	14.8	15.7	16.6	17.5	18.3	19.2	20.1	21.0	21.8	22.7	23.6	24.5	25.3	26.2	27.1	28.0	28.8	29.7	30.6	31.4	32.3
106	8.9	9.8	10.7	11.6	12.5	13.3	14.2	15.1	16.0	16.9	17.8	18.7	19.6	20.5	21.4	22.2	23.1	24.0	24.9	25.8	26.7	27.6	28.5	29.4	30.3	31.1	32.0	32.9
105	9.1	10.0	10.9	11.8	12.7	13.6	14.5	15.4	16.3	17.2	18.1	19.0	20.0	20.9	21.8	22.7	23.6	24.5	25.4	26.3	27.2	28.1	29.0	29.9	30.8	31.7	32.7	33.6
104	9.2	10.2	11.1	12.0	12.9	13.9	14.8	15.7	16.6	17.6	18.5	19.4	20.3	21.3	22.2	23.1	24.0	25.0	25.9	26.8	27.7	28.7	29.6	30.5	31.4	32.4	33.3	34.2
103	9.4	10.4	11.3	12.3	13.2	14.1	15.1	16.0	17.0	17.9	18.9	19.8	20.7	21.7	22.6	23.6	24.5	25.5	26.4	27.3	28.3	29.2	30.2	31.1	32.0	33.0	33.9	34.9
102	9.6	10.6	11.5	12.5	13.5	14.4	15.4	16.3	17.3	18.3	19.2	20.2	21.1	22.1	23.1	24.0	25.0	26.0	26.9	27.9	28.8	29.8	30.8	31.7	32.7	33.6	34.6	35.6
101	9.8	10.8	11.8	12.7	13.7	14.7	15.7	17.0	17.6	18.6	19.6	20.6	21.6	22.5	23.5	24.5	25.5	26.5	27.4	28.4	29.4	30.4	31.4	32.3	33.3	34.3	35.3	36.3
100	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.3	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0	36.0	37.0
99	10.2	11.2	12.2	13.3	14.3	15.3	16.3	17.7	18.4	19.4	20.4	21.4	22.4	23.5	24.5	25.5	26.5	27.5	28.6	29.6	30.6	31.6	32.6	33.7	34.7	35.7	36.7	37.8
98	10.4	11.5	12.5	13.5	14.6	15.6	16.7	18.1	18.7	19.8	20.8	21.9	22.9	23.9	25.0	26.0	27.1	28.1	29.2	30.2	31.2	32.3	33.3	34.4	35.4	36.4	37.5	38.5
97	10.6	11.7	12.8	13.8	14.9	15.9	17.0	18.4	19.1	20.2	21.3	22.3	23.4	24.4	25.5	26.6	27.6	28.7	29.8	30.8	31.9	32.9	34.0	35.1	36.1	37.2	38.3	39.3
96	10.9	11.9	13.0	14.1	15.2	16.3	17.4	18.8	19.5	20.6	21.7	22.8	23.9	25.0	26.0	27.1	28.20	29.3	30.4	31.5	32.6	33.6	34.7	35.8	36.9	38.0	39.1	40.1
95	11.1	12.2	13.3	14.4	15.5	16.6	17.7	19.2	19.9	21.1	22.2	23.3	24.4	25.5	26.6	27.7	28.8	29.9	31.0	32.1	33.2	34.3	35.5	36.6	37.7	38.8	39.9	41.0
94	11.3	12.4	13.6	14.7	15.8	17.0	18.1	19.7	20.4	21.5	22.6	23.8	24.9	26.0	27.2	28.3	29.4	30.6	31.7	32.8	34.0	35.1	36.2	37.3	38.5	39.6	40.7	41.9
93	11.6	12.7	13.9	15.0	16.2	17.3	18.5	12.6	20.8	22.0	23.1	24.3	25.4	26.6	27.7	28.9	30.1	31.2	32.4	33.5	34.7	35.8	37.0	38.2	39.3	40.5	41.6	42.8
92	11.8	13.0	14.2	15.4	16.5	17.7	18.9	20.1	21.3	22.4	23.6	24.8	26.0	27.2	28.4	29.5	30.7	31.9	33.1	34.3	35.4	36.6	37.8	39.0	40.2	41.4	42.5	43.7
91	12.1	13.3	14.5	15.7	16.9	18.1	19.3	20.5	21.7	22.9	24.2	25.4	26.6	27.8	29.0	30.2	31.4	32.6	33.8	35.0	36.2	37.4	38.6	39.9	41.1	42.3	43.5	44.7
90	12.3	13.6	14.8	16.0	17.3	18.5	19.8	21.0	22.2	23.5	24.7	25.9	27.2	28.4	29.6	30.9	32.1	33.3	34.6	35.8	37.0	38.3	39.5	40.7	42.0	43.2	44.4	45.7
89	12.6	13.9	15.1	16.4	17.7	18.9	20.2	21.5	22.7	24.0	25.2	26.5	27.8	29.0	30.3	31.6	32.8	34.1	35.3	36.6	37.9	39.1	40.4	41.7	42.9	44.2	45.4	46.7
88	12.9	14.2	15.5	16.8	18.1	19.4	20.7	22.0	23.2	24.5	25.8	27.1	28.4	29.7	31.0	32.3	33.6	34.9	36.2	37.4	38.7	40.0	41.3	42.6	43.9	45.2	46.5	47.8
87	13.2	14.5	15.9	17.2	18.5	19.8	21.1	22.5	23.8	25.1	26.4	27.7	29.1	30.4	31.7	33.0	34.4	35.7	37.0	38.3	39.6	41.0	42.3	43.6	44.9	46.2	47.6	48.9
86	13.5	14.9	16.2	17.6	18.9	20.3	21.6	23.0	24.3	25.7	27.0	28.4	29.7	31.1	32.4	33.8	35.2	36.5	37.9	39.2	40.6	41.9	43.3	44.6	46.0	47.3	48.7	50.0
85	13.8	15.2	16.6	18.0	19.4	20.8	22.1	23.5	24.9	26.3	27.7	29.1	30.4	31.8	33.2	34.6	36.0	37.4	38.8	40.1	41.5	42.9	44.3	45.7	47.1	48.4	49.8	51.2
Weight (kg)	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37



## BMI Look-up Table for Children and Adolescents 5–14 Years

Height (cm)	115–144 cm tall																																											
	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44											
144	5.8	6.3	6.8	7.2	7.7	8.2	8.7	9.2	9.6	10.1	10.6	11.1	11.6	12.1	12.5	13.0	13.5	14.0	14.5	14.9	15.4	15.9	16.4	16.9	17.4	17.8	18.3	18.8	19.3	19.8	20.3	20.7	21.2											
143	5.9	6.4	6.8	7.3	7.8	8.3	8.8	9.3	9.8	10.3	10.8	11.2	11.7	12.2	12.7	13.2	13.7	14.2	14.7	15.2	15.6	16.1	16.6	17.1	17.6	18.1	18.6	19.1	19.6	20.0	20.5	21.0	21.5											
142	6.0	6.4	6.9	7.4	7.9	8.4	8.9	9.4	9.9	10.4	10.9	11.4	11.9	12.4	12.9	13.4	13.9	14.4	14.9	15.4	15.9	16.4	16.9	17.4	17.9	18.3	18.8	19.3	19.8	20.3	20.8	21.3	21.8											
141	6.0	6.5	7.0	7.5	8.0	8.6	9.1	9.6	10.1	10.6	11.1	11.6	12.1	12.6	13.1	13.6	14.1	14.6	15.1	15.6	16.1	16.6	17.1	17.6	18.1	18.6	19.1	19.6	20.1	20.6	21.1	21.6	22.1											
140	6.1	6.6	7.1	7.7	8.2	8.7	9.2	9.7	10.2	10.7	11.2	11.7	12.2	12.8	13.3	13.8	14.3	14.8	15.3	15.8	16.3	16.8	17.3	17.9	18.4	18.9	19.4	19.9	20.4	20.9	21.4	21.9	22.4											
139	6.2	6.7	7.2	7.8	8.3	8.8	9.3	9.8	10.4	10.9	11.4	11.9	12.4	12.9	13.5	14.0	14.5	15.0	15.5	16.0	16.6	17.1	17.6	18.1	18.6	19.2	19.7	20.2	20.7	21.2	21.7	22.3	22.8											
138	6.3	6.8	7.4	7.9	8.4	8.9	9.5	10.0	10.5	11.0	11.6	12.1	12.6	13.1	13.7	14.2	14.7	15.2	15.8	16.3	16.8	17.3	17.9	18.4	18.9	19.4	20.0	20.5	21.0	21.5	22.1	22.6	23.1											
137	6.4	6.9	7.5	8.0	8.5	9.1	9.6	10.1	10.7	11.2	11.7	12.3	12.8	13.3	13.9	14.4	14.9	15.5	16.0	16.5	17.0	17.6	18.1	18.6	19.2	19.7	20.2	20.8	21.3	21.8	22.4	22.9	23.4											
136	6.5	7.0	7.6	8.1	8.7	9.2	9.7	10.3	10.8	11.4	11.9	12.4	13.0	13.5	14.1	14.6	15.1	15.7	16.2	16.8	17.3	17.8	18.4	18.9	19.5	20.0	20.5	21.1	21.6	22.2	22.7	23.2	23.8											
135	6.6	7.1	7.7	8.2	8.8	9.3	9.9	10.4	11.0	11.5	12.1	12.6	13.2	13.7	14.3	14.8	15.4	15.9	16.5	17.0	17.6	18.1	18.7	19.2	19.8	20.3	20.9	21.4	21.9	22.5	23.0	23.6	24.1											
134	6.7	7.2	7.8	8.4	8.9	9.5	10.0	10.6	11.1	11.7	12.3	12.8	13.4	13.9	14.5	15.0	15.6	16.2	16.7	17.3	17.8	18.4	18.9	19.5	20.0	20.6	21.2	21.7	22.3	22.8	23.4	23.9	24.5											
133	6.8	7.3	7.9	8.5	9.0	9.6	10.2	10.7	11.3	11.9	12.4	13.0	13.6	14.1	14.7	15.3	15.8	16.4	17.0	17.5	18.1	18.7	19.2	19.8	20.4	20.9	21.5	22.0	22.6	23.2	23.7	24.3	24.9											
132	6.9	7.5	8.0	8.6	9.2	9.8	10.3	10.9	11.5	12.1	12.6	13.2	13.8	14.3	14.9	15.5	16.1	16.6	17.2	17.8	18.4	18.9	19.5	20.1	20.7	21.2	21.8	22.4	23.0	23.5	24.1	24.7	25.3											
131	7.0	7.6	8.2	8.7	9.3	9.9	10.5	11.1	11.7	12.2	12.8	13.4	14.0	14.6	15.2	15.7	16.3	16.9	17.5	18.1	18.6	19.2	19.8	20.4	21.0	21.6	22.1	22.7	23.3	23.9	24.5	25.1	25.6											
130	7.1	7.7	8.3	8.9	9.5	10.1	10.7	11.2	11.8	12.4	13.0	13.6	14.2	14.8	15.4	16.0	16.6	17.2	17.8	18.3	18.9	19.5	20.1	20.7	21.3	21.9	22.5	23.1	23.7	24.3	24.9	25.4	26.0											
129	7.2	7.8	8.4	9.0	9.6	10.2	10.8	11.4	12.0	12.6	13.2	13.8	14.4	15.0	15.6	16.2	16.8	17.4	18.0	18.6	19.2	19.8	20.4	21.0	21.6	22.2	22.8	23.4	24.0	24.6	25.2	25.8	26.4											
128	7.3	7.9	8.5	9.2	9.8	10.4	11.0	11.6	12.2	12.8	13.4	14.0	14.6	15.3	15.9	16.5	17.1	17.7	18.3	18.9	19.5	20.1	20.8	21.4	22.0	22.6	23.2	23.8	24.4	25.0	25.6	26.2	26.9											
127	7.4	8.1	8.7	9.3	9.9	10.5	11.2	11.8	12.4	13.0	13.6	14.3	14.9	15.5	16.1	16.7	17.4	18.0	18.6	19.2	19.8	20.5	21.1	21.7	22.3	22.9	23.6	24.2	24.8	25.4	26.0	26.7	27.3											
126	7.6	8.2	8.8	9.4	10.1	10.7	11.3	12.0	12.6	13.2	13.9	14.5	15.1	15.7	16.4	17.0	17.6	18.3	18.9	19.5	20.2	20.8	21.4	22.0	22.7	23.3	23.9	24.6	25.2	25.8	26.5	27.1	27.7											
125	7.7	8.3	9.0	9.6	10.2	10.9	11.5	12.2	12.8	13.4	14.1	14.7	15.4	16.0	16.6	17.3	17.9	18.6	19.2	19.8	20.5	21.1	21.8	22.4	23.0	23.7	24.3	25.0	25.6	26.2	26.9	27.5	28.2											
124	7.8	8.5	9.1	9.8	10.4	11.1	11.7	12.4	13.0	13.7	14.3	15.0	15.6	16.3	16.9	17.6	18.2	18.9	19.5	20.2	20.8	21.5	22.1	22.8	23.4	24.1	24.7	25.4	26.0	26.7	27.3	28.0	28.6											
123	7.9	8.6	9.3	9.9	10.6	11.2	11.9	12.6	13.2	13.9	14.5	15.2	15.9	16.5	17.2	17.8	18.5	19.2	19.8	20.5	21.2	21.8	22.5	23.1	23.8	24.5	25.1	25.8	26.4	27.1	27.8	28.4	29.1											
122	8.1	8.7	9.4	10.1	10.7	11.4	12.1	12.8	13.4	14.1	14.8	15.5	16.1	16.8	17.5	18.1	18.8	19.5	20.2	20.8	21.5	22.2	22.8	23.5	24.2	24.9	25.5	26.2	26.9	27.5	28.2	28.9	29.6											
121	8.2	8.9	9.6	10.2	10.9	11.6	12.3	13.0	13.7	14.3	15.0	15.7	16.4	17.1	17.8	18.4	19.1	19.8	20.5	21.2	21.9	22.5	23.2	23.9	24.6	25.3	26.0	26.6	27.3	28.0	28.7	29.4	30.1											
120	8.3	9.0	9.7	10.4	11.1	11.8	12.5	13.2	13.9	14.6	15.3	16.0	16.7	17.4	18.1	18.8	19.4	20.1	20.8	21.5	22.2	22.9	23.6	24.3	25.0	25.7	26.4	27.1	27.8	28.5	29.2	29.9	30.6											
119	8.5	9.2	9.9	10.6	11.3	12.0	12.7	13.4	14.1	14.8	15.5	16.2	16.9	17.7	18.4	19.1	19.8	20.5	21.2	21.9	22.6	23.3	24.0	24.7	25.4	26.1	26.8	27.5	28.2	29.0	29.7	30.4	31.1											
118	8.6	9.3	10.1	10.8	11.5	12.2	12.9	13.6	14.4	15.1	15.8	16.5	17.2	18.0	18.7	19.4	20.1	20.8	21.5	22.3	23.0	23.7	24.4	25.1	25.9	26.6	27.3	28.0	28.7	29.4	30.2	30.9	31.6											
117	8.8	9.5	10.2	11.0	11.7	12.4	13.1	13.9	14.6	15.3	16.1	16.8	17.5	18.3	19.0	19.7	20.5	21.2	21.9	22.6	23.4	24.1	24.8	25.6	26.3	27.0	27.8	28.5	29.2	30.0	30.7	31.4	32.1											
116	8.9	9.7	10.4	11.1	11.9	12.6	13.4	14.1	14.9	15.6	16.3	17.1	17.8	18.6	19.3	20.1	20.8	21.6	22.3	23.0	23.8	24.5	25.3	26.0	26.8	27.5	28.2	29.0	29.7	30.5	31.2	32.0	32.7											
115	9.1	9.8	10.6	11.3	12.1	12.9	13.6	14.4	15.1	15.9	16.6	17.4	18.1	18.9	19.7	20.4	21.2	21.9	22.7	23.4	24.2	25.0	25.7	26.5	27.2	28.0	28.7	29.5	30.2	31.0	31.8	32.5	33.3											
Weight (kg)	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44											

## BMI Look-up Table for Children and Adolescents 5–14 Years

Height (cm)	145–175 cm tall																																																			
175	6.2	6.5	6.9	7.2	7.5	7.8	8.2	8.5	8.8	9.1	9.5	9.8	10.1	10.4	10.8	11.1	11.4	11.8	12.1	12.4	12.7	13.1	13.4	13.7	14.0	14.4	14.7	15.0	15.3	15.7	16.0	16.3	16.7	17.0																		
174	6.3	6.6	6.9	7.3	7.6	7.9	8.3	8.6	8.9	9.2	9.6	9.9	10.2	10.6	10.9	11.2	11.6	11.9	12.2	12.6	12.9	13.2	13.5	13.9	14.2	14.5	14.9	15.2	15.5	15.9	16.2	16.5	16.8	17.2																		
173	6.3	6.7	7.0	7.4	7.7	8.0	8.4	8.7	9.0	9.4	9.7	10.0	10.4	10.7	11.0	11.4	11.7	12.0	12.4	12.7	13.0	13.4	13.7	14.0	14.4	14.7	15.0	15.4	15.7	16.0	16.4	16.7	17.0	17.4																		
172	6.4	6.8	7.1	7.4	7.8	8.1	8.5	8.8	9.1	9.5	9.8	10.1	10.5	10.8	11.2	11.5	11.8	12.2	12.5	12.8	13.2	13.5	13.9	14.2	14.5	14.9	15.2	15.5	15.9	16.2	16.6	16.9	17.2	17.6																		
171	6.5	6.8	7.2	7.5	7.9	8.2	8.5	8.9	9.2	9.6	9.9	10.3	10.6	10.9	11.3	11.6	12.0	12.3	12.7	13.0	13.3	13.7	14.0	14.4	14.7	15.0	15.4	15.7	16.1	16.4	16.8	17.1	17.4	17.8																		
170	6.6	6.9	7.3	7.6	8.0	8.3	8.7	9.0	9.3	9.7	10.0	10.4	10.7	11.1	11.4	11.8	12.1	12.5	12.8	13.1	13.5	13.8	14.2	14.5	14.9	15.2	15.6	15.9	16.3	16.6	17.0	17.3	17.6	18.0																		
169	6.7	7.0	7.4	7.7	8.1	8.4	8.8	9.1	9.5	9.8	10.2	10.5	10.9	11.2	11.6	11.9	12.3	12.6	13.0	13.3	13.7	14.0	14.4	14.7	15.1	15.4	15.8	16.1	16.5	16.8	17.2	17.5	17.9	18.2																		
168	6.7	7.1	7.4	7.8	8.1	8.5	8.9	9.2	9.6	9.9	10.3	10.6	11.0	11.3	11.7	12.0	12.4	12.8	13.1	13.5	13.8	14.2	14.5	14.9	15.2	15.6	15.9	16.3	16.7	17.0	17.4	17.7	18.1	18.4																		
167	6.8	7.2	7.5	7.9	8.2	8.6	9.0	9.3	9.7	10.0	10.4	10.8	11.1	11.5	11.8	12.2	12.5	12.9	13.3	13.6	14.0	14.3	14.7	15.1	15.4	15.8	16.1	16.5	16.9	17.2	17.6	17.9	18.3	18.6																		
166	6.9	7.3	7.6	8.0	8.3	8.7	9.1	9.4	9.8	10.2	10.5	10.9	11.2	11.6	12.0	12.3	12.7	13.1	13.4	13.8	14.2	14.5	14.9	15.2	15.6	16.0	16.3	16.7	17.1	17.4	17.8	18.1	18.5	18.9																		
165	7.0	7.3	7.7	8.1	8.4	8.8	9.2	9.6	9.9	10.3	10.7	11.0	11.4	11.8	12.1	12.5	12.9	13.2	13.6	14.0	14.3	14.7	15.1	15.4	15.8	16.2	16.5	16.9	17.3	17.6	18.0	18.4	18.7	19.1																		
164	7.1	7.4	7.8	8.2	8.6	8.9	9.3	9.7	10.0	10.4	10.8	11.2	11.5	11.9	12.3	12.6	13.0	13.4	13.8	14.1	14.5	14.9	15.2	15.6	16.0	16.4	16.7	17.1	17.5	17.8	18.2	18.6	19.0	19.3																		
163	7.2	7.5	7.9	8.3	8.7	9.0	9.4	9.8	10.2	10.5	10.9	11.3	11.7	12.0	12.4	12.8	13.2	13.5	13.9	14.3	14.7	15.1	15.4	15.8	16.2	16.6	16.9	17.3	17.7	18.1	18.4	18.8	19.2	19.6																		
162	7.2	7.6	8.0	8.4	8.8	9.1	9.5	9.9	10.3	10.7	11.1	11.4	11.8	12.2	12.6	13.0	13.3	13.7	14.1	14.5	14.9	15.2	15.6	16.0	16.4	16.8	17.1	17.5	17.9	18.3	18.7	19.1	19.4	19.8																		
161	7.3	7.7	8.1	8.5	8.9	9.3	9.6	10.0	10.4	10.8	11.2	11.6	12.0	12.3	12.7	13.1	13.5	13.9	14.3	14.7	15.0	15.4	15.8	16.2	16.6	17.0	17.4	17.7	18.1	18.5	18.9	19.3	19.7	20.1																		
160	7.4	7.8	8.2	8.6	9.0	9.4	9.8	10.2	10.5	10.9	11.3	11.7	12.1	12.5	12.9	13.3	13.7	14.1	14.5	14.8	15.2	15.6	16.0	16.4	16.8	17.2	17.6	18.0	18.4	18.8	19.1	19.5	19.9	20.3																		
159	7.5	7.9	8.3	8.7	9.1	9.5	9.9	10.3	10.7	11.1	11.5	11.9	12.3	12.7	13.1	13.4	13.8	14.2	14.6	15.0	15.4	15.8	16.2	16.6	17.0	17.4	17.8	18.2	18.6	19.0	19.4	19.8	20.2	20.6																		
158	7.6	8.0	8.4	8.8	9.2	9.6	10.0	10.4	10.8	11.2	11.6	12.0	12.4	12.8	13.2	13.6	14.0	14.4	14.8	15.2	15.6	16.0	16.4	16.8	17.2	17.6	18.0	18.4	18.8	19.2	19.6	20.0	20.4	20.8																		
157	7.7	8.1	8.5	8.9	9.3	9.7	10.1	10.5	11.0	11.4	11.8	12.2	12.6	13.0	13.4	13.8	14.2	14.6	15.0	15.4	15.8	16.2	16.6	17.0	17.4	17.9	18.3	18.7	19.1	19.5	19.9	20.3	20.7	21.1																		
156	7.8	8.2	8.6	9.0	9.5	9.9	10.3	10.7	11.1	11.5	11.9	12.3	12.7	13.1	13.6	14.0	14.4	14.8	15.2	15.6	16.0	16.4	16.8	17.3	17.7	18.1	18.5	18.9	19.3	19.7	20.1	20.5	21.0	21.4																		
155	7.9	8.3	8.7	9.2	9.6	10.0	10.4	10.8	11.2	11.7	12.1	12.5	12.9	13.3	13.7	14.2	14.6	15.0	15.4	15.8	16.2	16.6	17.1	17.5	17.9	18.3	18.7	19.1	19.6	20.0	20.4	20.8	21.2	21.6																		
154	8.0	8.4	8.9	9.3	9.7	10.1	10.5	11.0	11.4	11.8	12.2	12.6	13.1	13.5	13.9	14.3	14.8	15.2	15.6	16.0	16.4	16.9	17.3	17.7	18.1	18.6	19.0	19.4	19.8	20.2	20.7	21.1	21.5	21.9																		
153	8.1	8.5	9.0	9.4	9.8	10.3	10.7	11.1	11.5	12.0	12.4	12.8	13.2	13.7	14.1	14.5	15.0	15.4	15.8	16.2	16.7	17.1	17.5	17.9	18.4	18.8	19.2	19.7	20.1	20.5	20.9	21.4	21.8	22.2																		
152	8.2	8.7	9.1	9.5	10.0	10.4	10.8	11.3	11.7	12.1	12.6	13.0	13.4	13.9	14.3	14.7	15.1	15.6	16.0	16.4	16.9	17.3	17.7	18.2	18.6	19.0	19.5	19.9	20.3	20.8	21.2	21.6	22.1	22.5																		
151	8.3	8.8	9.2	9.6	10.1	10.5	11.0	11.4	11.8	12.3	12.7	13.2	13.6	14.0	14.5	14.9	15.4	15.8	16.2	16.7	17.1	17.5	18.0	18.4	18.9	19.3	19.7	20.2	20.6	21.1	21.5	21.9	22.4	22.8																		
150	8.4	8.9	9.3	9.8	10.2	10.7	11.1	11.6	12.0	12.4	12.9	13.3	13.8	14.2	14.7	15.1	15.6	16.0	16.4	16.9	17.3	17.8	18.2	18.7	19.1	19.6	20.0	20.4	20.9	21.3	21.8	22.2	22.7	23.1																		
149	8.6	9.0	9.5	9.9	10.4	10.8	11.3	11.7	12.2	12.6	13.1	13.5	14.0	14.4	14.9	15.3	15.8	16.2	16.7	17.1	17.6	18.0	18.5	18.9	19.4	19.8	20.3	20.7	21.2	21.6	22.1	22.5	23.0	23.4																		
148	8.7	9.1	9.6	10.0	10.5	11.0	11.4	11.9	12.3	12.8	13.2	13.7	14.2	14.6	15.1	15.5	16.0	16.4	16.9	17.3	17.8	18.3	18.7	19.2	19.6	20.1	20.5	21.0	21.5	21.9	22.4	22.8	23.3	23.7																		
147	8.8	9.3	9.7	10.2	10.6	11.1	11.6	12.0	12.5	13.0	13.4	13.9	14.3	14.8	15.3	15.7	16.2	16.7	17.1	17.6	18.0	18.5	19.0	19.4	19.9	20.4	20.8	21.3	21.8	22.2	22.7	23.1	23.6	24.1																		
146	8.9	9.4	9.9	10.3	10.8	11.3	11.7	12.2	12.7	13.1	13.6	14.1	14.5	15.0	15.5	16.0	16.4	16.9	17.4	17.8	18.3	18.8	19.2	19.7	20.2	20.6	21.1	21.6	22.0	22.5	23.0	23.5	23.9	24.4																		
145	9.0	9.5	10.0	10.5	10.9	11.4	11.9	12.4	12.8	13.3	13.8	14.3	14.7	15.2	15.7	16.2	16.6	17.1	17.6	18.1	18.5	19.0	19.5	20.0	20.5	20.9	21.4	21.9	22.4	22.8	23.3	23.8	24.3	24.7																		
Weight (kg)	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52																		

## BMI Look-up Table for Children and Adolescents 5–14 Years

Height (cm)	176–200 cm tall																																				
200	11.3	11.5	11.8	12.0	12.3	12.5	12.8	13.0	13.3	13.5	13.8	14.0	14.3	14.5	14.8	15.0	15.3	15.5	15.8	16.0	16.3	16.5	16.8	17.0	17.3	17.5	17.8	18.0	18.3	18.5	18.8	19.0	19.3	19.5	19.8	20.0	20.3
199	11.4	11.6	11.9	12.1	12.4	12.6	12.9	13.1	13.4	13.6	13.9	14.1	14.4	14.6	14.9	15.2	15.4	15.7	15.9	16.2	16.4	16.7	16.9	17.2	17.4	17.7	17.9	18.2	18.4	18.7	18.9	19.2	19.4	19.7	19.9	20.2	20.5
198	11.5	11.7	12.0	12.2	12.5	12.8	13.0	13.3	13.5	13.8	14.0	14.3	14.5	14.8	15.0	15.3	15.6	15.8	16.1	16.3	16.6	16.8	17.1	17.3	17.6	17.9	18.1	18.4	18.6	18.9	19.1	19.4	19.6	19.9	20.2	20.4	20.7
197	11.6	11.9	12.1	12.4	12.6	12.9	13.1	13.4	13.7	13.9	14.2	14.4	14.7	14.9	15.2	15.5	15.7	16.0	16.2	16.5	16.7	17.0	17.3	17.5	17.8	18.0	18.3	18.6	18.8	19.1	19.3	19.6	19.8	20.1	20.4	20.6	20.9
196	11.7	12.0	12.2	12.5	12.8	13.0	13.3	13.5	13.8	14.1	14.3	14.6	14.8	15.1	15.4	15.6	15.9	16.1	16.4	16.7	16.9	17.2	17.4	17.7	18.0	18.2	18.5	18.7	19.0	19.3	19.5	19.8	20.0	20.3	20.6	20.8	21.1
195	11.8	12.1	12.4	12.6	12.9	13.1	13.4	13.7	13.9	14.2	14.5	14.7	15.0	15.3	15.5	15.8	16.0	16.3	16.6	16.8	17.1	17.4	17.6	17.9	18.1	18.4	18.7	18.9	19.2	19.5	19.7	20.0	20.2	20.5	20.8	21.0	21.3
194	12.0	12.2	12.5	12.8	13.0	13.3	13.6	13.8	14.1	14.3	14.6	14.9	15.1	15.4	15.7	15.9	16.2	16.5	16.7	17.0	17.3	17.5	17.8	18.1	18.3	18.6	18.9	19.1	19.4	19.7	19.9	20.2	20.5	20.7	21.0	21.3	21.5
193	12.1	12.3	12.6	12.9	13.2	13.4	13.7	14.0	14.2	14.5	14.8	15.0	15.3	15.6	15.8	16.1	16.4	16.6	16.9	17.2	17.5	17.7	18.0	18.3	18.5	18.8	19.1	19.3	19.6	19.9	20.1	20.4	20.7	20.9	21.2	21.5	21.7
192	12.2	12.5	12.7	13.0	13.3	13.6	13.8	14.1	14.4	14.6	14.9	15.2	15.5	15.7	16.0	16.3	16.5	16.8	17.1	17.4	17.6	17.9	18.2	18.4	18.7	19.0	19.3	19.5	19.8	20.1	20.3	20.6	20.9	21.2	21.4	21.7	22.0
191	12.3	12.6	12.9	13.2	13.4	13.7	14.0	14.3	14.5	14.8	15.1	15.4	15.6	15.9	16.2	16.4	16.7	17.0	17.3	17.5	17.8	18.1	18.4	18.6	18.9	19.2	19.5	19.7	20.0	20.3	20.6	20.8	21.1	21.4	21.7	21.9	22.2
190	12.5	12.7	13.0	13.3	13.6	13.9	14.1	14.4	14.7	15.0	15.2	15.5	15.8	16.1	16.3	16.6	16.9	17.2	17.5	17.7	18.0	18.3	18.6	18.8	19.1	19.4	19.7	19.9	20.2	20.5	20.8	21.1	21.3	21.6	21.9	22.2	22.4
189	12.6	12.9	13.2	13.4	13.7	14.0	14.3	14.6	14.8	15.1	15.4	15.7	16.0	16.2	16.5	16.8	17.1	17.4	17.6	17.9	18.2	18.5	18.8	19.0	19.3	19.6	19.9	20.2	20.4	20.7	21.0	21.3	21.6	21.8	22.1	22.4	22.7
188	12.7	13.0	13.3	13.6	13.9	14.1	14.4	14.7	15.0	15.3	15.6	15.8	16.1	16.4	16.7	17.0	17.3	17.5	17.8	18.1	18.4	18.7	19.0	19.2	19.5	19.8	20.1	20.4	20.7	20.9	21.2	21.5	21.8	22.1	22.4	22.6	22.9
187	12.9	13.2	13.4	13.7	14.0	14.3	14.6	14.9	15.2	15.4	15.7	16.0	16.3	16.6	16.9	17.2	17.4	17.7	18.0	18.3	18.6	18.9	19.2	19.4	19.7	20.0	20.3	20.6	20.9	21.2	21.4	21.7	22.0	22.3	22.6	22.9	23.2
186	13.0	13.3	13.6	13.9	14.2	14.5	14.7	15.0	15.3	15.6	15.9	16.2	16.5	16.8	17.1	17.3	17.6	17.9	18.2	18.5	18.8	19.1	19.4	19.7	19.9	20.2	20.5	20.8	21.1	21.4	21.7	22.0	22.3	22.5	22.8	23.1	23.4
185	13.1	13.4	13.7	14.0	14.3	14.6	14.9	15.2	15.5	15.8	16.1	16.4	16.7	16.9	17.2	17.5	17.8	18.1	18.4	18.7	19.0	19.3	19.6	19.9	20.2	20.5	20.7	21.0	21.3	21.6	21.9	22.2	22.5	22.8	23.1	23.4	23.7
184	13.3	13.6	13.9	14.2	14.5	14.8	15.1	15.4	15.7	15.9	16.2	16.5	16.8	17.1	17.4	17.7	18.0	18.3	18.6	18.9	19.2	19.5	19.8	20.1	20.4	20.7	21.0	21.3	21.6	21.9	22.2	22.4	22.7	23.0	23.3	23.6	23.9
183	13.4	13.7	14.0	14.3	14.6	14.9	15.2	15.5	15.8	16.1	16.4	16.7	17.0	17.3	17.6	17.9	18.2	18.5	18.8	19.1	19.4	19.7	20.0	20.3	20.6	20.9	21.2	21.5	21.8	22.1	22.4	22.7	23.0	23.3	23.6	23.9	24.2
182	13.6	13.9	14.2	14.5	14.8	15.1	15.4	15.7	16.0	16.3	16.6	16.9	17.2	17.5	17.8	18.1	18.4	18.7	19.0	19.3	19.6	19.9	20.2	20.5	20.8	21.1	21.4	21.7	22.0	22.3	22.6	22.9	23.2	23.5	23.8	24.2	24.5
181	13.7	14.0	14.3	14.7	15.0	15.3	15.6	15.9	16.2	16.5	16.8	17.1	17.4	17.7	18.0	18.3	18.6	18.9	19.2	19.5	19.8	20.1	20.5	20.8	21.1	21.4	21.7	22.0	22.3	22.6	22.9	23.2	23.5	23.8	24.1	24.4	24.7
180	13.9	14.2	14.5	14.8	15.1	15.4	15.7	16.0	16.4	16.7	17.0	17.3	17.6	17.9	18.2	18.5	18.8	19.1	19.4	19.8	20.1	20.4	20.7	21.0	21.3	21.6	21.9	22.2	22.5	22.8	23.1	23.5	23.8	24.1	24.4	24.7	25.0
179	14.0	14.4	14.7	15.0	15.3	15.6	15.9	16.2	16.5	16.9	17.2	17.5	17.8	18.1	18.4	18.7	19.0	19.4	19.7	20.0	20.3	20.6	20.9	21.2	21.5	21.8	22.2	22.5	22.8	23.1	23.4	23.7	24.0	24.3	24.7	25.0	25.3
178	14.2	14.5	14.8	15.1	15.5	15.8	16.1	16.4	16.7	17.0	17.4	17.7	18.0	18.3	18.6	18.9	19.3	19.6	19.9	20.2	20.5	20.8	21.1	21.5	21.8	22.1	22.4	22.7	23.0	23.4	23.7	24.0	24.3	24.6	24.9	25.2	25.6
177	14.4	14.7	15.0	15.3	15.6	16.0	16.3	16.6	16.9	17.2	17.6	17.9	18.2	18.5	18.8	19.2	19.5	19.8	20.1	20.4	20.7	21.1	21.4	21.7	22.0	22.3	22.7	23.0	23.3	23.6	23.9	24.3	24.6	24.9	25.2	25.5	25.9
176	14.5	14.9	15.2	15.5	15.8	16.1	16.5	16.8	17.1	17.4	17.8	18.1	18.4	18.7	19.0	19.4	19.7	20.0	20.3	20.7	21.0	21.3	21.6	22.0	22.3	22.6	22.9	23.2	23.6	23.9	24.2	24.5	24.9	25.2	25.5	25.8	26.1
Weight (kg)	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81

### BMI-for-Age Look-up Table, GIRLS 5–18 Years (WHO 2007)

Age (years: months)	Severe acute malnutrition < -3 (BMI)	Moderate malnutrition ≥ -3 to < -2 (BMI)	Normal ≥ -2 to ≤ +1 (BMI)	Overweight ≥ +1 to ≤ +2 (BMI)	Obese > +2 (BMI)
5:1	< 11.8	11.8–12.6	12.7–16.9	17.0–18.9	> 18.9
5:6	< 11.7	11.7–12.6	12.7–16.9	17.0–19.0	> 19.0
6:0	< 11.7	11.7–12.6	12.7–17.0	17.1–19.2	> 19.2
6:6	< 11.7	11.7–12.6	12.7–17.1	17.2–19.5	> 19.5
7:0	< 11.8	11.8–12.6	12.7–17.3	17.4–19.8	> 19.8
7:6	< 11.8	11.8–12.7	12.8–17.5	17.6–20.1	> 20.1
8:0	< 11.9	11.9–12.8	12.9–17.7	17.8–20.6	> 20.6
8:6	< 12.0	12.0–12.9	13.0–18.0	18.1–21.0	> 21.0
9:0	< 12.1	12.1–13.0	13.1–18.3	18.4–21.5	> 21.5
9:6	< 12.2	12.2–13.2	13.3–18.7	18.8–22.0	> 22.0
10:0	< 12.4	12.4–13.4	13.5–19.0	19.1–22.6	> 22.6
10:6	< 12.5	12.5–13.6	13.7–19.4	19.5–23.1	> 23.1
11:0	< 12.7	12.7–13.8	13.9–19.9	20.0–23.7	> 23.7
11:6	< 12.9	12.9–14.0	14.1–20.3	20.4–24.3	> 24.3
12:0	< 13.2	13.2–14.3	14.4–20.8	20.9–25.0	> 25.0
12:6	< 13.4	13.4–14.6	14.7–21.3	21.4–25.6	> 25.6
13:0	< 13.6	13.6–14.8	14.9–21.8	21.9–26.2	> 26.2
13:6	< 13.8	13.8–15.1	15.2–22.3	22.4–26.8	> 26.8
14:0	< 14.0	14.0–15.3	15.4–22.7	22.8–27.3	> 27.3
14:6	< 14.2	14.2–15.6	15.7–23.1	23.2–27.8	> 27.8
15:0	< 14.4	14.4–15.8	15.9–23.5	23.6–28.2	> 28.2
15:6	< 14.5	14.5–15.9	16.0–23.8	23.9–28.6	> 28.6
16:0	< 14.6	14.6–16.1	16.2–24.1	24.2–28.9	> 28.9
16:6	< 14.7	14.7–16.2	16.3–24.3	24.4–29.1	> 29.1
17:0	< 14.7	14.7–16.3	16.4–24.5	24.6–29.3	> 29.4
17:6	< 14.7	14.7–16.3	16.4–24.6	24.7–29.4	> 29.4
18:0	< 14.7	14.7–16.3	16.4–24.8	24.9–29.5	> 29.5

### BMI-for-Age Table, BOYS 5–18 Years (WHO 2007)

Age (years: months)	Severe acute malnutrition < -3 (BMI)	Moderate malnutrition ≥ -3 to < -2 (BMI)	Normal ≥ -2 to ≤ +1 (BMI)	Overweight ≥ +1 to ≤ +2 (BMI)	Obese > +2 (BMI)
5:1	< 12.1	12.1–12.9	13.0–16.6	16.7–18.3	> 18.3
5:6	< 12.1	12.1–12.9	13.0–16.7	16.8–18.4	> 18.4
6:0	< 12.1	12.1–12.9	13.0–16.8	16.9–18.5	> 18.5
6:6	< 12.2	12.2–13.0	13.1–16.9	17.0–18.7	> 18.7
7:0	< 12.3	12.3–13.0	13.1–17.0	17.1–19.0	> 19.0
7:6	< 12.3	12.3–13.1	13.2–17.2	17.3–19.3	> 19.3
8:0	< 12.4	12.4–13.2	13.3–17.4	17.5–19.7	> 19.7
8:6	< 12.5	12.5–13.3	13.4–17.7	17.8–20.1	> 20.1
9:0	< 12.6	12.6–13.4	13.5–17.9	18.0–20.5	> 20.5
9:6	< 12.7	12.7–13.5	13.6–18.2	18.3–20.9	> 20.9
10:0	< 12.8	12.8–13.6	13.7–18.5	18.6–21.4	> 21.4
10:6	< 12.9	12.9–13.8	13.9–18.8	18.9–21.9	> 21.9
11:0	< 13.1	13.1–14.0	14.1–19.2	19.3–22.5	> 22.5
1:6	< 13.2	13.2–14.1	14.2–19.5	19.6–23.0	> 23.0
12:0	< 13.4	13.4–14.4	14.5–19.9	20.0–23.6	> 23.6
12:6	< 13.6	13.6–14.6	14.7–20.4	20.5–24.2	> 24.2
13:0	< 13.8	13.8–14.8	14.9–20.8	20.9–24.8	> 24.8
13:6	< 14.0	14.0–15.1	15.2–21.3	21.4–25.3	> 25.3
14:0	< 14.3	14.3–15.4	15.5–21.8	21.9–25.9	> 25.9
14:6	< 14.5	14.5–15.6	15.7–22.2	22.3–26.5	> 26.5
15:0	< 14.7	14.7–15.9	16.0–22.7	22.8–27.0	> 27.0
15:6	< 14.9	14.9–16.2	16.3–23.1	23.2–27.4	> 27.4
16:0	< 15.1	15.1–16.4	16.5–23.5	23.6–27.9	> 27.9
16:6	< 15.3	15.3–16.6	16.7–23.9	24.0–28.3	> 28.3
17:0	< 15.4	15.4–16.8	16.9–24.3	24.4–28.6	> 28.6
17:6	< 15.6	15.6–17.0	17.1–24.6	24.7–29.0	> 29.0
18:0	< 15.7	15.7–17.2	17.3–24.9	25.0–29.2	> 29.2

## Finding BMI-for-age using a BMI wheel

1. Find the child's BMI on the front side of the wheel, using the instructions for finding BMI.
2. Flip the wheel over. Turn the inner disc until the arrow labelled 'age' points to the age closest to the child's age. Round up or down if needed. For example, if a child is 9 years and 5 months, point the arrow to 9. If the child is 9 years and 6 months, point the arrow to 10.
3. Select the box on the back side of the wheel labelled 'Girls' or 'Boys' based on the sex of the child.
4. With the wheel still pointing to the child's age, find the number range in the box (Girls or Boys) that contains the child's BMI-for-age. Classify the child's nutritional status based on the range in which the child's BMI-for-age falls.

### BMI-for-age cut-offs for classification of nutritional status

Group	Severe acute malnutrition (SAM)	Moderate malnutrition	Normal nutritional status	Overweight	Obesity
Children and adolescents 5–14 years	< -3 z-score	≥ -3 and < -2	≥ -2 and ≤ +1	≥ +1 to ≤ +2	> +2

Source: World Health Organization (WHO). 2007. 'Growth Reference Data for 5–19 Years.' <http://www.who.int/growthref/en/>

### Exercise: Classify nutritional status using BMI-for-age

ID	Sex	Age (years and months)	Height (cm)	Weight (kg)	BMI-for-age	Nutritional status
1	F	6 years and 2 months	111	18.8		
2	M	11years, 3 months	130	23.0		
3	F	13 years and 7 months	145	38		
4	M	8 years and 4 months	125	19		

## HANDOUT 3.8. Classification of Nutritional Status

Severe acute malnutrition (SAM)	Moderate acute malnutrition (MAM)	Normal nutritional status	Overweight	Obesity
<b>Children</b>				
Bilateral pitting oedema <b>OR</b> Severe visible wasting <b>OR</b> WHZ < -3 <b>OR</b> MUAC 6–59 months: < 11.5 cm 5–9 years: < 13.5 cm 10–14 years: < 16.0 cm	Confirmed weight loss > 5% since last visit <b>OR</b> Growth curve flattening <b>OR</b> WHZ <b>OR</b> BMI-for-age ≥ -3 to < -2 <b>OR</b> MUAC 6–59 months: ≥ 11.5 to < 12.5 cm 5–9 years: ≥ 13.5 to < 14.5 cm 10–14 years: ≥ 16.0 to < 18.5 cm	WHZ ≥ -2 to ≤ +2 <b>OR</b> BMI-for-age ≥ -2 to ≤ +1 <b>OR</b> MUAC 6–59 months: ≥ 12.5 cm 5–9 years: ≥ 14.5 cm 10–14 years: ≥ 18.5 cm	WHZ ≥ +2 to ≤ +3 <b>OR</b> BMI-for-age > +1 to ≤ +2	WHZ > +3 <b>OR</b> BMI-for-age > +2
<b>Older adolescents and adults (non-pregnant/postpartum)</b>				
Bilateral pitting oedema <b>OR</b> BMI < 16.0 <b>OR</b> BMI-for-age (up to 18 years) < -3 <b>OR</b> MUAC < 18.5 cm	BMI ≥ 16.0 to < 18.5 <b>OR</b> BMI-for-age (up to 18 years) ≥ -3 to < -2 <b>OR</b> MUAC ≥ 18.5 to < 21.0 cm	BMI ≥ 18.5 to ≤ 25.0 <b>OR</b> BMI-for-age (up to 18 years) ≥ -2 and ≤ +1 <b>OR</b> MUAC ≥ 21.0 cm	BMI > 25.0 to ≤ 30.0 <b>OR</b> BMI-for-age (up to 18 years) > +1 to ≤ +2	BMI > 30.0 <b>OR</b> BMI-for-age > +2
<b>Pregnant and postpartum women</b>				
MUAC < 21.0 cm	MUAC ≥ 21.0 to < 23.0 cm	≥ 23.0 cm	--	--

## HANDOUT 3.9. Clinical Nutrition Assessment

### 1. Check for medical complications.

- Severe anaemia (pale conjunctiva, gums, nails, palms and skin; breathlessness; rapid pulse; palpitation; weakness, dizziness or drowsiness)
- Severe dehydration
- Hypothermia
- Hypoglycaemia
- Extreme weakness
- Anorexia, poor appetite
- Persistent diarrhoea
- Nausea
- Vomiting
- High fever
- Rapid breathing
- Convulsions
- Mouth sores or thrush
- Lethargy or unconsciousness
- Opportunistic infections
- Extensive skin lesions

### 2. Check for signs of malnutrition.

- Bilateral pitting oedema
- Hair colour changes
- In children, baggy skin on buttocks

### 3. Do an appetite test (see Handout 3.11. Giving an Appetite Test)

### 4. Check for growth/weight problems.

- Inadequate weight gain in pregnancy
- Low birth weight
- Pre-term delivery
- Weight loss
- Growth faltering
- Slower growth rate

### 4. Find out what medications the client is taking.



## HANDOUT 3.10. Checking for Bilateral Pitting Oedema

Oedema is a sign of severe acute malnutrition (SAM) only if it is in both feet or both legs.

### To check for bilateral pitting oedema:

1. Press with your thumbs on both feet for 3 full seconds and then remove your thumbs.
2. If the skin stays depressed on **both** feet, the client has **grade + (mild)** bilateral pitting oedema.
3. Do the same test on the lower legs, hands and lower arms. If the skin stays depressed in these areas, look for swelling in the face, especially around the eyes.
4. If there is no swelling in the face, the client has **grade ++ (moderate)** bilateral pitting oedema. If there is swelling in the face, the client has **grade +++ (severe)** bilateral pitting oedema.

### Grades of bilateral pitting oedema

Grade	Definition	Action
+	<b>Mild</b> (in both feet or ankles)	Treat for SAM as outpatient.
++	<b>Moderate</b> (in both feet plus both lower legs, both hands or both lower arms)	Treat for SAM as outpatient.
+++	<b>Severe</b> (generalised, in both feet, both legs, both hands, both arms and face)	Treat for SAM as inpatient.

## HANDOUT 3.11. Giving an Appetite Test

Give all clients with severe acute malnutrition (SAM) an appetite test on admission and on every follow-up visit to find out whether they can eat ready-to-use therapeutic food (RUTF).

1. Ask the client (or caregiver if the client is a child) to wash her/his hands with soap and running water. Take the client (and caregiver if the client is a child) to a quiet, private area.
2. Give the client or caregiver a packet of RUTF and show how to open it and eat it from the packet or on a spoon.
3. Do not force the client to eat the RUTF. Children may need gentle encouragement to eat, especially if they are sick.
4. Offer plenty of boiled or treated drinking water to the client while eating the RUTF.
5. Watch to see how much the client eats (or ask the caregiver to give it to the child and watch how much the child eats). The test should take a short time but may take up to 30 minutes.

Minimum amount of RUTF the client should eat to pass the appetite test	
Client weight (kg)	Packets
< 4.0	$\frac{1}{8}$ – $\frac{1}{4}$
4.0–6.9	$\frac{1}{4}$ – $\frac{1}{3}$
7.0–9.9	$\frac{1}{3}$ – $\frac{1}{2}$
10.0–14.9	$\frac{1}{2}$ – $\frac{3}{4}$
15.0–29.0	$\frac{3}{4}$ –1
$\geq 30.0$	> 1

## HANDOUT 3.12. Biochemical Assessment

### Laboratory tests that provide nutrition information

Health facilities may not be able to do some of the tests listed below.

- Blood count, glucose, electrolyte levels and lipid levels produce useful nutrition information.
- Haematology (dried blood spots, haematocrit, haemoglobin, red and white blood cell counts) can assess mineral and vitamin status.
- Serum cholesterol and serum triglyceride levels can assess lipid status, which can be used to estimate biochemical deficiencies.
- Urinary measurements of body metabolism (e.g., creatinine, a product of muscle metabolism excreted into the urine) can estimate muscle mass utilisation.
- Serum albumin concentration is a lab measure of nutritional status. A reduction in serum albumin can be caused by poor nutritional status (not eating enough protein or losing protein during illness), kidney dysfunction, liver disease, heart conditions, stomach problems such as inflammatory bowel disease, cancer, infections such as tuberculosis (TB) or TB medication side effects. Malnutrition in the hospital setting is defined as serum albumin levels of less than 3.2 g per dL.
- Stool samples can show helminthic infection (e.g., hookworm and ascaris).

Test	Normal results	Low number	High number
<b>Metabolic tests</b>			
Glucose	70–99 milligrams (mg)/decilitre (dL)	Hypoglycaemia, liver disease, adrenal insufficiency, excess insulin	Hyperglycaemia, certain types of diabetes, prediabetes, pancreatitis, hyperthyroidism
Blood urea nitrogen (BUN)	7–20 mg/dL	Malnutrition	Liver or kidney disease, heart failure
Creatinine	0.8–1.4 mg/dL	Low muscle mass, malnutrition	Chronic or temporary decrease in kidney function
BUN/creatinine ratio	10:1 to 20:1	Malnutrition	Blood in bowels, kidney obstruction, dehydration
Calcium	8.5–10.9 mg/dL	Calcium, magnesium, or vitamin D deficiency, malnutrition, pancreatitis, neurological disorders	Excess vitamin D intake, kidney disease, cancer, hyperthyroidism

Test	Normal results	Low number	High number
Protein	6.3–7.9 g/dL	Liver or kidney disease, malnutrition	Dehydration, liver or kidney disease, multiple myeloma
Albumin	3.9–5.0 g/dL	Liver or kidney disease, malnutrition	Dehydration
Alkaline phosphatase (ALP)	44–147 international units (IU)/litre (L)	Malnutrition	Paget’s disease, liver cancer, bile duct obstruction
Alanine amino-transferase (ALT)	8–37 IU/L	Generally not a concern	Certain toxins such as excess acetaminophen or alcohol, hepatitis
<b>Blood tests</b>			
White blood cell count	4,500–10,000 cells/microlitre (mCL)	Autoimmune illness, bone marrow failure, viral infections	Infection, inflammation, cancer, stress, intense exercise
Red blood cell count	Male: 4.7–6.1 million cells/mCL Female: 4.2–5.4 million cells/mCL	Iron, vitamin B <sub>12</sub> , or folate deficiency, bone marrow damage	Dehydration, renal problems, pulmonary or congenital heart disease
Haemoglobin (Hb)	Male: 13.8–17.2 g/dL Female: 12.1–15.1 g/dL	Iron, vitamin B <sub>12</sub> , or folate deficiency, bone marrow damage	Dehydration, renal problems, pulmonary or congenital heart disease
Haematocrit	Male: 40.7%–50.3% Female: 36.1%–44.3%	Iron, vitamin B <sub>12</sub> , or folate deficiency, bone marrow damage	Dehydration, renal problems, pulmonary or congenital heart disease
Mean corpuscular volume (MCV)	80–95 femtolitres	Iron deficiency	Vitamin B <sub>12</sub> or folate deficiency
Mean corpuscular haemoglobin (MCH)	27–31 picograms	Iron deficiency	Vitamin B <sub>12</sub> or folate deficiency
Platelet count	150–400 thousand/mCL	Viral infections, lupus, pernicious anaemia (due to vitamin B <sub>12</sub> deficiency)	Leukaemia, inflammatory conditions
<i>Note:</i> Reference numbers are not standardised, and numbers may vary from lab to lab.			

Test	Normal results	Low number	High number
<b>Stool sample analysis</b>			
Helminth infection (hookworm and ascaris)			Anaemia

### Anaemia cut-off points

Anaemia is a significant public health problem in Zambian children. There has been no significant reduction in anaemia among children 6–59 months for the past two decades. Younger babies are more affected than older children, with an estimated prevalence of 60 percent in children 6–14 months in 2009 (Malaria National Survey 2009). Below are the haemoglobin cut-off points for anaemia in different age groups.

Group	Haemoglobin level (g/dl)			
	Normal	Mild	Moderate	Severe
Children 6–59 months	≥ 11.0	10.0–10.9	7.0–9.9	< 7.0
Children 5–11 years	≥ 11.5	11.0–11.4	8.0–10.9	< 8.0
Children 12–14 years	≥ 12.0	11.0–11.9	8.0–10.9	< 8.0
Pregnant women	≥ 11.0	10.0–10.9	7.0–9.9	< 7.0
Non-pregnant women > 15 years	≥ 12.0	11.0–11.9	8.0–10.9	< 8.0
Men > 15 years	≥ 13.0	11.0–12.9	8.0–10.9	< 8.0

### Cholesterol cut-off points

Cholesterol type	Desirable (mg/dL)	Borderline (mg/dL)	High risk (mg/dL)
Total cholesterol	Less than 200	200–239	240 or higher
High-density lipoprotein (HDL)	40 or higher	N/A	< 40 for men < 50 for women
Low-density lipoprotein (LDL)	Less than 100	130–159	160 or higher
Triglycerides	Less than 150	150–199	200 or higher

## HANDOUT 3.13. Dietary Assessment

Dietary assessment is important to find out whether clients are eating the quantity and diversity of food to provide enough energy and essential nutrients. Factors that affect dietary intake are listed in the box below.

### Factors that affect dietary intake

- Food availability and access
- Symptoms
- Medications
- Smoking
- Alcohol
- Drug abuse
- Food taboos
- Stigma
- Depression
- Preparation time
- Fuel
- Family support

### 24-hour recall

Use the following questions to guide you in filling out the **24-hour recall form**:

1. Ask the client or caregiver what the client ate and/or drank the previous day. Start by asking what foods were eaten for a) breakfast, b) lunch, c) dinner, d) snacks and e) other (specify).
2. Include everything the client ate and drank at home and outside the home, even juices, soda, milk, snacks, fruits, or other foods. WHEN THE RESPONDENT STOPS, ASK: Anything else?
4. Ask how much of each food item the client actually ate or drank.
  - *Volume* (teaspoon, tablespoon, cup)
  - *Number*
  - *Size* (large, medium, small). Use plate size to estimate quantities.

5. Record the food eaten at different times in the table below.
6. Then use dietary recall to find out whether the client ate foods in each of the different food groups.
  - Cereals, roots and tubers
  - Fruits
  - Vegetables
  - Meat, poultry, fish, beans, eggs and nuts
  - Milk, yoghurt and cheese
  - Fats, oils and sweets
7. Estimate whether the client ate enough food given her/his age, body size, activity level and sex.

**24-hour recall form**

Name _____ Age _____ Sex _____ Reference no. _____		
Mealtime	Food or drink consumed	Quantity
Breakfast		
Mid-morning snack		
Lunch		
Afternoon snack		
Dinner		
Snacks before/after bedtime		
Notes		
Nutritionist _____ Signature _____ Date _____		

## Food group chart

Show the client the food group pyramid.



Ask whether the client ate any of the foods in each food group the previous day. If so, tick the right-hand column.

Food group	Tick (✓)
Cereals, roots and tubers	
Fruits	
Vegetables	
Meat, poultry, fish, beans, eggs and nuts	
Milk, yoghurt and cheese	
Fats, oils and sweets	

Counsel the client to add foods from groups that are not ticked and to eat foods from each group every day.



## **SESSION 4. Nutrition Counselling**

### **Purpose**

This session will help you provide effective nutrition counselling.

### **Objectives**

By the end of the session, you should be able to:

1. Define counselling and list the skills needed for effective counselling.
2. List key considerations for planning a counselling session.
3. Counsel using the GATHER approach.

### **Materials**

- *Nutrition Guidelines for Care and Support of People with HIV*
- **Worksheet 4.1. Review of Session 4**
- **Handout 4.2. Communication Skills for Effective Counselling**
- **Handout 4.3. Conducting a Nutrition Counselling Session**
- **Handout 4.4. The GATHER Approach to Counselling**
- **Handout 4.5. Checklist of Recommended Counselling Techniques**
- **Handout 4.6. Counselling on Maintaining Desired Weight**
- **Handout 4.7. Counselling on Managing Symptoms of Illness through Diet**
- **Handout 4.8. Common Herbs and Spices**
- **Handout 4.9. Case Scenarios**

## WORKSHEET 4.1. Review of Session 3

High-energy protein supplement (HEPS)	Mid-upper arm circumference (MUAC)	Normal
Severe acute malnutrition (SAM)	Bilateral pitting oedema and wasting	SAM with medical complications and no appetite
Extreme thinness or wasting	Stabilisation	< 11.5 cm

## HANDOUT 4.2. Communication Skills for Effective Counselling

Good communication is:

- Listening to and understanding what clients say about their problems
- Exploring and evaluating with clients the options available to solve their problems
- Providing information for clients to make informed decisions
- Helping clients reach the best decisions to solve their problems
- Coaching clients to solve their problems successfully
- Identifying support needed and determining the next steps
- Following up with clients to evaluate how plans are going
- Helping client changes the planned actions if needed

***Counselling aims to increase clients' confidence to adopt new practices.***

### Listening and learning skills that facilitate counselling

1. *Use helpful non-verbal communication.*

- Non-verbal communication means showing your attitude through your posture, expressions and gestures without speaking.
- Non-verbal communication can either help or hinder communication.

Non-verbal communication	That helps communication	That hinders communication
Posture	Sitting with your head level with the client's head	Standing with your head higher than the client's head
Eye contact	Looking at the client and paying attention while he or she talks	Looking away at something else or down at your notes
Barriers	Sitting directly in front of the client	Sitting behind a table or writing notes while you talk
Taking time	Sitting down, greeting the client without hurrying, smiling and waiting for the client to respond	Greeting the client quickly, showing impatience and looking at your watch
Touch	Gently and appropriately touching the client to show you understand	Touching the client roughly or inappropriately

2. *Use responses or gestures that show interest*

- To encourage clients to continue talking, show that you are listening and interested in what they are saying. For example, maintain eye contact, nod and smile, saying 'I see' or 'Mmm'.

3. *Show empathy.*

- Empathy is not the same as sympathy. When you sympathize with people, you are sorry for them, looking at their concerns from your own point of view. When you empathize, you try to understand their feelings from their point of view.

4. *Ask open-ended questions.*

- To encourage clients to talk, ask open-ended questions starting with 'How?', 'What?', 'When?', 'Where?' and 'Why?' instead of questions that have to be answered with 'Yes' or 'No'. For example, ask, 'What do you usually eat in the morning?' instead of 'Are you eating well?'
- If clients answer 'Yes' or 'No', do not ask 'Why?' or 'Why not?' This may make them uneasy or defensive. Instead, say, 'Can you tell me the reasons why (or why not)?'
- Ask only one question at a time. Otherwise, clients have to choose which question to ask and may avoid ones they don't want to answer.

5. *Reflect what clients say.*

- Repeat what clients say in a slightly different way so it does not sound as if you are copying them. This shows that you understand and makes clients more likely to say more about what is important to them. For example: If a client says, 'I feel too weak to fetch vegetables from the garden', you could say, 'You are weak because you are ill, and that makes it difficult to do some things'.

6. *Avoid words that sound judgemental.*

- Try not to use words that make clients feel you are judging them, such as 'right', 'wrong', 'good', 'bad', 'well', 'badly', 'enough' or 'properly'. For example, instead of asking, 'Are you feeding your baby properly?', ask, 'How are you feeding your baby?'

***When you make clients comfortable and listen to what they say,  
you show you care about them.***

**Skills that build confidence and give support**

1. *Accept what a client thinks and feels.*

- Respond in a neutral way to what the client says, without agreeing or disagreeing. For example, if the client says, 'I don't eat fish because it's bad for someone with HIV', say, 'I see' instead of criticising the client for believing false information.

2. *Recognise and praise what the client is doing correctly.*

- Don't just look for what clients are doing wrong and try to correct them. First recognize what they are doing right and praise their good practices.
- This helps build clients' confidence to continue the practices and makes it easier for them to accept suggestions later.

3. *Give practical help.*

- Practical help is the most useful support.
- Help clients walk through the steps that will give them confidence to solve their problems. For example, if a mother says, 'I don't think I can continue exclusive breastfeeding because I am not producing enough breast milk', you could ask, 'Why do you think you don't have enough breast milk?' or 'Does your baby keep crying after feeding?' and suggest that she try breastfeeding more often because that can produce more milk.

4. *Give a little relevant information at a time.*

- Suggest practical measures clients can take right away rather than in the future.
- Suggest only one or two measures at a time.
- Give the information in a positive way so that it does not sound critical or make clients think they have been doing something wrong, especially if you want to correct mistaken ideas.
- Give new information or correct mistaken ideas only after you have built clients' confidence by accepting what they say and praising what they do well.

5. *Use simple language.*

- Explain things to clients using familiar terms, not medical terms or technical jargon. For example, instead of 'exclusive breastfeeding', say 'giving a baby breast milk only and not any other milk or food, not even water'.

6. *Make one or two suggestions rather than giving commands.*

- Telling clients to do something using words such as 'must', 'should', 'always' or 'never' does not help them feel confident.
- Instead, make clients feel in control of their decisions by saying 'Have you considered . . .?', 'Would you be able to . . .?', 'Would it be possible to . . .?', 'What about trying this to see if it works for you?', 'Have you thought about doing this instead?', 'Perhaps this might work', or 'This may not suit you, but some people do it'.

Check that clients understand the information and are able and willing to apply the suggestions.

Follow up to evaluate how well clients implement their decisions.

***When you assure clients that the information they give you will be confidential and praise their positive nutrition practices, you build their self-confidence.***

## HANDOUT 4.3. Conducting a Nutrition Counselling Session

### *Before the counselling starts:*

1. Make sure you have at least 15 minutes to spend with the client.
2. Choose a place where the client will be comfortable and have privacy.
3. Understand the content of the materials you will use to counsel your client.
4. Have the following materials handy:
  - *Eating and Living Well: Good Nutrition Makes a Difference for People Living with Illness* counselling flipchart
  - Data collection forms
  - Referral forms
  - Register or calendar to record the next appointment
  - Notes on previous actions if this is a follow-up visit

### *During the counselling:*

1. Set goals with the client. Discuss the results of her/his nutrition assessment and agree with her/him on specific and achievable goals to improve her/his nutritional status. Do not give the client more than one or two goals because too many changes at one time are overwhelming. Add other goals after the first ones are achieved.
2. Plan with the client how to achieve the goals set. Counsel her/him on eating well, preventing infections, maintaining physical activity and managing symptoms, depending on her/his needs. Then discuss challenges the client may face in making the recommended changes.
3. Set the date and time of the next appointment.

## HANDOUT 4.4. The GATHER Approach to Counselling

**Greet** the client. Ask him or her to sit down and exchange introductions. Discuss the client's nutritional status and well-being since the last visit.

**Ask** how the client feels.

- Ask about symptoms and nutrition problems and concerns.
- Do nutrition assessments or share the results if you have already done the assessments. Ask if the client is eating enough to meet additional energy needs, eating a balanced diet, drinking enough clean, safe water, managing symptoms through diet and managing ARVs without problems.
- Find out what the client has done to address any nutrition problems and how successful he or she has been.

**Tell** the client about different ways to address her/his nutrition problems.

- Use counselling cards related to the client's problems.
- Help the client set specific, measurable, achievable, realistic and time-bound (SMART) nutrition goals (e.g., 'I will gain 4 kg by the end of March') to address the problems.

**Help** the client make informed choices.

- With the client (and family or caregiver), help the client find ways to reach the nutrition goal he or she has set.
- As much as possible, let the client come up with choices that are practical and relevant. For example:
  - 'Get weighed every month to see whether I am meeting my goal'.
  - 'Manage symptoms by changing my diet'.
  - 'Eat one extra snack every day (groundnut paste added to my evening meal or a mug of porridge made from fermented millet/sorghum for breakfast)'.
  - Boil all the water I use to drink and mix juice for at least 8–10 minutes and wash my hands before preparing or eating food'.

**Explain** fully the choices the client has made.

- Explain why these choices will help improve the client's nutritional status.
- Discuss barriers that might make it difficult to make these changes.
- Ask the client to explain the actions, doing demonstrations if necessary.
- Summarise (or ask the client to summarise) what you have agreed and how it will be done.

**Reassure the client and give a return date** for the next visit. Ask the client to repeat the date.

## HANDOUT 4.5. Checklist of Recommended Counselling Techniques

Skills and techniques	Did the counsellor . . .	Tick (✓)
Greet	• Say hello (and shake hands if appropriate)?	
	• Offer the client a seat?	
	• Introduce himself/herself?	
Ask	• Look at the client when talking?	
	• Ask questions relevant to the topic?	
	• Ask more open-ended than closed-ended questions?	
	• Listen carefully and actively?	
	• Use body language to indicate interest (e.g., lean forward)?	
	• Treat the client with respect?	
	• Use encouraging words?	
	• Occasionally sum up the client's statements?	
	• Show interest, concern and care rather than interrogating?	
	• Give the client time to think of answers or questions?	
	• Check what the client said to ensure correct understanding?	
	• Probe for information?	
Tell	• Recognise and praise what the client is doing correctly?	
	• Avoid judgemental or critical words?	
	• Suggest acceptable, affordable and feasible options?	
	• Use simple language?	
	• Give a little relevant information at a time?	
	• Make one or two suggestions without giving commands?	
Help	• Help the client find practical and realistic solutions?	
	• Reflect the client's statements to show he/she was understood?	
	• Accept what the client thought and felt?	



Skills and techniques	Did the counsellor . . .	Tick (✓)
Explain	<ul style="list-style-type: none"> <li>Clearly communicate important nutrition information based on the client's knowledge, cultural values and beliefs?</li> </ul>	
	<ul style="list-style-type: none"> <li>Explain the reasons for the recommendations given?</li> </ul>	
Reassure and give a return date	<ul style="list-style-type: none"> <li>Summarise the information the client shared?</li> </ul>	
	<ul style="list-style-type: none"> <li>Check whether the client understood the important information?</li> </ul>	
	<ul style="list-style-type: none"> <li>Discuss appropriate follow-up?</li> </ul>	
	<ul style="list-style-type: none"> <li>Encourage the client to adhere to the follow-up plan?</li> </ul>	

## HANDOUT 4.6. Counselling on Maintaining Desired Weight

1. Compare the client's current and previous weight.
2. If the client is severely malnourished, immediately give an appetite test and begin outpatient treatment (if he/she passes the appetite test) or refer to inpatient treatment (if he/she fails the appetite test).
3. Counsel the client on how to manage symptoms of opportunistic infections (OIs) or other illness through diet.
4. Find out if the client is eating enough energy-giving foods and three meals a day plus snacks between meals. Counsel to:
  - Eat high-energy foods and snacks such as enriched porridge, mashed bananas, baked bananas, sweet potatoes or nuts and enrich staple foods with oil or honey.
  - Add milk, cheese, butter or oil to foods.
  - Fortify milk by adding 4 spoons (15 mL) of milk powder to 500 mL of 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.
  - Add milk powder to soup for more protein.
  - Add cream, evaporated milk or yoghurt to soups, puddings, cereals and milky drinks.
  - Stir a beaten egg into hot porridge or mashed potatoes and cook for a few minutes more to cook the egg. Do not eat raw eggs.
  - Put extra spread on sandwiches—nut spreads, jam, butter/margarine, mayonnaise or tinned fish mixed with mayonnaise, if available.
  - Eat nuts as a snack and put chopped nuts or nut paste into foods.
  - Eat foods rich in fat, such as avocado, fatty fish, coconut and oil if tolerated.
  - Eat fermented and germinated (sprouted) foods.
  - Sprinkle crispy fried onions or fried fatty meat on top of meals.
  - Eat dried fruits such as raisins and dates as snacks (not as replacements for meals).
5. If the client is not eating enough energy-giving foods, ask about medication side effects such as nausea and loss of appetite. If dietary management of side effects is not effective, refer the client to a physician, who may prescribe appetite stimulants, anti-emetics to prevent vomiting or anti-diarrhoeal medications.
6. If the client does not have access to sufficient food, refer her/him to economic or social support.
7. Counsel the client to exercise moderately (walking, housework) three or four times a week when possible to build muscles. If the client has difficulty exercising, refer her/him to a physiotherapist if available.
8. If dietary intake is adequate and the client has no OIs or side effects that affect nutrient absorption, weight loss may be the result of metabolic changes or other problems. In this case, refer the client to a physician.
9. If the client is overweight, ask about daily food intake. Help the client find ways to eat less high-fat and high-energy foods, especially sugar, alcohol and oil. If has increased rapidly without consumption of these foods, refer the client to a physician for further assessment.

## HANDOUT 4.7. Counselling on Managing Symptoms of Illness through Diet

Illness	Diet	Care and nutrition practices
Anorexia (appetite loss)	<ul style="list-style-type: none"> <li>• Stimulate appetite by eating favourite foods.</li> <li>• Eat small amounts of food more often.</li> <li>• Eat more energy-dense foods.</li> <li>• Avoid strong-smelling foods.</li> </ul>	If appetite loss is a result of illness, seek medical treatment.
Diarrhoea	<ul style="list-style-type: none"> <li>• Drink a lot of fluids (soups, diluted fruit juice, boiled or treated water or herbal teas) to avoid dehydration.</li> <li>• Avoid orange and lemon juice, which irritate the stomach.</li> <li>• Eat fibre-rich foods (millet, banana, peas and lentils) to help retain fluids.</li> <li>• Eat fermented foods (porridge, yogurt).</li> <li>• Eat easily digestible foods (rice, bread, millet, porridge, potato, crackers).</li> <li>• Eat soft, mashed fruits and vegetables.</li> <li>• Eat small amounts of food frequently.</li> <li>• Continue to eat after illness to recover weight and nutrient loss.</li> <li>• Drink non-fat milk if there is no problem with lactose.</li> <li>• Boil or steam foods if diarrhoea is associated with fat malabsorption.</li> <li>• Avoid or eat less dairy products; coffee, tea and alcohol; fatty and fried foods; extra oil, lard or butter; and gas-forming foods (cabbage, onions and carbonated soft drinks).</li> </ul>	<p><b>Prevention</b></p> <ul style="list-style-type: none"> <li>• Drink boiled or treated water.</li> <li>• Wash hands with water and soap before handling, preparing, serving, or storing food and after using a toilet or latrine or cleaning a child after defecation.</li> </ul> <p><b>Treatment</b></p> <ul style="list-style-type: none"> <li>• Drink oral rehydration solution (ORS).</li> <li>• Go to a health facility if you have symptoms such as severe dehydration (low or no urine output), fainting, dizziness, shortness of breath, bloody stools, high fever, vomiting, severe abdominal pain or diarrhoea) for more than 3 days.</li> </ul>
Fever	<ul style="list-style-type: none"> <li>• Eat soups with maize or potatoes for energy.</li> <li>• Drink plenty of fluids, especially boiled or treated water.</li> <li>• Drink teas from lemon, guava and gum tree leaves.</li> <li>• Continue to eat small, frequent meals as tolerated.</li> </ul>	<ul style="list-style-type: none"> <li>• Bathe in cool water.</li> <li>• Rest more.</li> <li>• Take two Panadol with each meal morning, afternoon and evening.</li> <li>• Go to a health facility if your fever lasts several days and is not relieved with aspirin or you lose consciousness or have severe body pain, yellow eyes, severe diarrhoea or convulsions and seizures.</li> </ul>
Nausea and	<ul style="list-style-type: none"> <li>• Eat small, frequent meals.</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid an empty stomach—</li> </ul>

Illness	Diet	Care and nutrition practices
vomiting	<ul style="list-style-type: none"> <li>• Eat soups, unsweetened porridge and fruits such as bananas.</li> <li>• Eat lightly salty, dry foods such as crackers to calm the stomach.</li> <li>• Drink herbal teas or lemon juice in hot water and avoid coffee, tea and alcohol.</li> <li>• Avoid spicy and fatty foods.</li> </ul>	<p>nausea is worse if nothing is in the stomach.</p> <ul style="list-style-type: none"> <li>• Avoid lying down immediately after eating—wait at least 20 minutes.</li> <li>• Rest between meals.</li> </ul>
Thrush	<ul style="list-style-type: none"> <li>• Eat soft, mashed carrots, scrambled eggs, mashed potatoes or bananas and soups and porridge.</li> <li>• Eat foods cold or at room temperature.</li> <li>• Avoid spicy, salty or sticky foods that may irritate mouth sores.</li> <li>• Avoid sugary foods—they make yeast grow.</li> <li>• Avoid strong citrus fruits and juices—they can irritate mouth sores.</li> <li>• Avoid alcohol and drink plenty of fluids.</li> </ul>	<ul style="list-style-type: none"> <li>• Seek medical treatment.</li> <li>• Use a spoon or cup to eat small amounts of foods.</li> <li>• Tilt your head back when eating to help with swallowing.</li> <li>• Rinse your mouth with boiled warm, salty water after eating to reduce irritation and keep infected areas clean so yeast cannot grow.</li> </ul>
Constipation	<ul style="list-style-type: none"> <li>• Eat high-fibre foods (maize, whole wheat bread, green vegetables and washed fruits with the peel).</li> <li>• Drink plenty of fluids.</li> <li>• Avoid processed or refined foods.</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid cleansing practices such as enemas and medications.</li> </ul>
Anaemia	<ul style="list-style-type: none"> <li>• Eat iron-rich foods such as eggs, fish, meat, liver, green leafy vegetables, beans, lentils, groundnuts, oil seeds and fortified cereals.</li> <li>• Take iron supplements.</li> </ul>	<ul style="list-style-type: none"> <li>• Take an iron tablet daily with vitamin C-rich food (orange juice or tomatoes) to help with absorption.</li> <li>• Drink fluids to avoid constipation.</li> <li>• Treat malaria and hookworm.</li> </ul>
Muscle wasting	<ul style="list-style-type: none"> <li>• Eat more food and more often.</li> <li>• Eat foods from all food groups.</li> <li>• Eat more protein.</li> <li>• Eat more starchy foods (e.g., <i>nshima</i>).</li> <li>• Do regular weight-bearing exercise to build muscles.</li> </ul>	
Bloating or heartburn	<ul style="list-style-type: none"> <li>• Eat small, frequent meals.</li> <li>• Avoid gas-forming foods such as cabbage and soda.</li> <li>• Drink plenty of fluids.</li> </ul>	<ul style="list-style-type: none"> <li>• Eat at least 1 hour before sleeping so that food can digest.</li> </ul>
Tuberculosis	<ul style="list-style-type: none"> <li>• Eat foods high in protein, energy, iron and vitamins.</li> </ul>	<ul style="list-style-type: none"> <li>• Seek medical attention.</li> <li>• If taking Isoniazid, take a vitamin B<sub>6</sub> supplement.</li> </ul>
Loss of taste	<ul style="list-style-type: none"> <li>• Eat small, frequent meals.</li> </ul>	

Illness	Diet	Care and nutrition practices
or abnormal taste	<ul style="list-style-type: none"> <li>• Use salt, spices, herbs or lemon to improve the taste of food.</li> <li>• Chew food well and move it around in the mouth to stimulate receptors.</li> </ul>	

## HANDOUT 4.8. Common Herbs and Spices

Herbs and spices can improve digestion, stimulate appetite and preserve foods. The table below lists herbs and spices and their benefits.

Herb or spice	Reported benefits	How to use
Aloe	Helps relieve constipation	Boil extract in water and drink. Use limited amounts and stop if it causes cramps or diarrhoea.
Basil	Helps relieve nausea and aid digestion; has an antiseptic function for mouth sores	Add to food to treat nausea and digestive problems or use as a gargle for mouth sores.
Calendula	Flower heads have antiseptic, anti-inflammatory effects and help heal upper digestive tract infections	Use as a compress to treat infected wounds or prepare as tea to help digestion.
Cardamom	Helps relieve digestive problems, pain, diarrhoea, nausea, vomiting and loss of appetite	Add to food during cooking or prepare as tea.
Cayenne	Stimulates appetite, helps fight infection and heals ulcers and intestinal inflammation	Add a pinch to cooked or raw foods or add to fruit juice or water for an energizing drink.
Camomile	Helps digestion and relieves nausea	Prepare tea from the leaves and flowers and drink several cups throughout the day.
Cinnamon	Relieves colds, weakness after colds or flu, chills, diarrhoea and nausea; stimulates appetite; stimulates digestive juices, encouraging bowel movements	Add to meals or prepare as tea with ginger for chest colds or tuberculosis.
Clove	Stimulates appetite; helps weak digestion; and relieves diarrhoea, nausea and vomiting	Use in soups, stews, warmed fruit juice and tea.
Coriander	Helps increase appetite, reduce flatulence and control bacteria and fungi	Add to meals.
Eucalyptus	Has an antibacterial effect, especially for bronchitis. Oil from leaves increases blood flow and reduces symptoms of inflammation.	Prepare tea from the leaves or extract.

Herb or spice	Reported benefits	How to use
Fennel	Helps increase appetite, combat flatulence and expel gas	Add to foods or prepare tea from the seeds. Use a limited amount.
Garlic	Helps digestion and has antibacterial, antiviral and antifungal effects, particularly in the gut, intestines, lungs and vagina (for thrush, throat infections, herpes and diarrhoea)	Make tea or energy drink or use in food.
Ginger	Improves digestion; energizes; relieves diarrhoea, colds, flu and nausea; and stimulates appetite	Use as a spice in meals or boil in water to prepare tea.
Lemon	Has antibacterial properties and helps digestion	Add juice to food or drinks.
Lemon grass	Has a calming effect and soothes digestion	Use as tea.
Mint	Has an anti-inflammatory effect and helps digestion	Use as tea or gargle for mouth sores; chew leaves to aid digestion.
Neem	Brings down fever	Cut a fresh twig, remove the leaves, boil the bark in water and drink as tea. The bark can also be chewed.
Parsley	Reduces intestinal colic and stimulates stomach secretions and appetite. The seed removes excess water from the body.	Add raw or cooked to food.
Peppermint	Relieves nausea, abdominal pain and cramps; helps control diarrhoea and vomiting; and relieves tension and insomnia	Prepare tea by boiling the leaves for about 10 minutes. Add to food.
Thyme	Has antiseptic and antifungal effects, relaxes nervous coughing and increases mucosal secretions (particularly in the gut) and stimulates digestion and growth of good intestinal flora	Use as a gargle, mouthwash or vaginal douche or to prepare tea.
Turmeric/ yellow root	Aids digestion and has antiseptic and antioxidant effects	Use powdered in rice, cereals, etc.

## HANDOUT 4.9. Case Scenarios

**Case scenario 1. Festus**, a 46-year-old shopkeeper, comes to the clinic because he feels weak. He has had watery diarrhoea on and off for the past 3 weeks and has lost 7 kg over the past 6 months. His mouth is painful, and he has difficulty swallowing. His mouth has extensive whitish exudates, and his pharynx is very red. He is a skinny, depressed and worried man who cannot stand without help.

**Case scenario 2. Henry** has come to the clinic for the second time. He says he sometimes has nausea and diarrhoea and that a friend told him that he may have anaemia. He works full time and eats very little, if anything, for lunch. In the morning, he normally eats a small bowl of porridge, and his main meal is dinner. His BMI is 20.

**Case scenario 3. Joyce** lives with many family members in a small house near Lusaka. Recently she has not been feeling well and has lost about 5 kg in the past month. She has been having diarrhoea and vomiting for the past 2 weeks and feels weak and nauseated.

**Case scenario 4. Bisa**, a 19-year-old woman with a CD4 of 50 who is not on ART, comes to the clinic complaining of severe pain when she swallows. She also has had diarrhoea, nausea and vomiting in the past 2 weeks. Her BMI is 16.5. She is dehydrated and has oral candidiasis.

**Case scenario 5. Prudence**, a 29-year-old woman, comes to the clinic complaining of losing fat from her thighs and arms and gaining fat around her stomach. She started ART (Zidovudine, Lamivudine and Efavirenz) 12 months ago. Her chart from that time lists a CD4 of 233, weight of 67 kg and BMI of 23.8. On examination, you find she has gained 3 kg in the past year.

**Case scenario 6. Nkulu**, a 38-year-old HIV-positive man, comes to the clinic. His health has declined seriously in recent months. After the doctor measured his CD4 count and viral load, she informed him that he was eligible for ART and explained the programme in detail. Nkulu was also diagnosed with TB. After prescribing Rifampicin and Isoniazid, the doctor explained how many tablets he should take a day and how often. She referred him for counselling on how to manage the side effects of these medications and their interaction with food.

**Case scenario 7. Luwi** is a 22-year-old HIV-positive pregnant woman. She has come to the health centre for regular follow-up. She is 36 weeks pregnant, and her Hb is 8.5 g/dl. Her MUAC is 18.5 cm. She says she doesn't take iron tablets because they make her feel nauseated. She also says that she is worried about how to feed her newborn after delivery, because friends told her HIV could be transmitted through breast milk. Luwi lives with her mother-in-law in a house with no running water.

**Case scenario 8. Chichi** is a 16-year-old boy who comes to the clinic with his mother, who is worried about him because he has had severe diarrhoea for several days. He has not been tested for HIV. His weight is 40 kg and his height is 150 cm. He has bilateral pitting oedema, and his mother says he hasn't been eating very much.



**Case scenario 9. Rose** is a 34-year-old HIV-positive woman. She is not pregnant. She has had diarrhoea for the past 2 weeks. She lives in an area where tap water is not available. Her BMI is 22, and her Hb is 10 g/dL. She was told that she is eligible for ART. She is afraid of starting ARVs because she does not have enough food and a friend told her that ‘taking medication without good food can kill’.

## **SESSION 5. Nutrition and Antiretroviral Therapy**

### **Purpose**

This session explains the interaction between antiretroviral drugs (ARVs) and food and gives you information to prepare medication-food plans for clients to maximize the effectiveness and minimize the side effects of antiretroviral therapy (ART).

### **Objectives**

By the end of the session, you should be able to:

1. Describe the interaction between ARVs and food and the effects of ARVs on nutrition.
2. Counsel people with HIV on managing medication side effects and medication-food interactions through diet.

### **Materials**

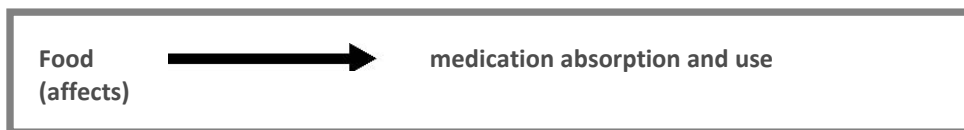
- **Handout 5.1. Interaction between ARVs and Nutrition**
- **Handout 5.2. Drug-Food Plan**
- **Handout 5.3. HIV and TB Medication-Food Interactions and Side Effects**
- **Handout 5.4. Counselling on Nutrition and ART**

## HANDOUT 5.1. Interaction between ARVs and Nutrition

Some risks are associated with ARVs for people with low BMI.

BMI	ARV	Risk
< 18.0	Tenofovir (TDF)	Tubular renal syndrome Fanconi syndrome
18.0	Zidovudine (AZT)	Lactic acidosis Severe hepatomegaly with steatosis

Certain foods eaten with ARVs may increase or reduce the body's use of the medication. For example, fatty foods can reduce the absorption of Zidovudine (AZT).



Certain ARVs affect how the body uses nutrients. For example, AZT can change the way the body uses fat and carbohydrates and cause lipodystrophy. A person who eats fatty foods while taking these ARVs has an increased fat level in the blood, which increases the risk of heart problems. Eating sugary foods increases blood sugar levels, increasing the risk of diabetes.



Side effects such as changes in taste, headache, fever, diarrhoea and vomiting reduce appetite and nutrient absorption and lead to weight loss. For example, Lamivudine (3TC) can cause taste changes and AZT causes nausea and vomiting.

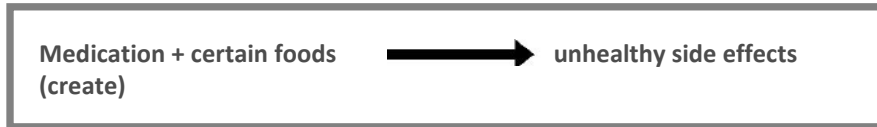


Combining certain ARVs with certain foods can create unhealthy side effects. For example, drinking alcohol may cause liver and pancreas problems. Eating garlic and some herbal remedies with ARVs may increase severe side effects. Herbs may be sold under the pretext of curing HIV or opportunistic infections. Many herbs have not been clinically researched, and their toxicity is unknown. People with HIV may use herbal remedies as long as they:

- Do not replace standard therapy.
- Are not toxic.
- Do not overburden the body's ability to metabolise them.

- Do not negatively interact with medications.
- Can prevent, reduce or cure symptoms such as severe diarrhoea, poor appetite and digestion or depression.

**Some herbal remedies or supplements may be dangerous for people on ARVs.**



## HANDOUT 5.2. HIV and TB Medication-Food Interactions and Side Effects

Medication	Nutrition guidance	Avoid	Possible side effects
<b>Antiretroviral drugs (ARVs)</b>			
<b>Nucleoside and nucleotide reverse transcriptase inhibitors (NRTIs)</b>			
Abacavir (ABC)	Take with or without food, but taking with food reduces side effects. Alcohol increases levels of side effects.	Alcohol	Nausea, vomiting, fever, allergic reaction, anorexia, abdominal pain, diarrhoea, anaemia, rash, hypotension, pancreatitis, dyspnea, weakness and insomnia, cough, headache
Emtricitabine (FTC)	Take before bedtime, with or without food.	Fatty food	Dizziness, drowsiness, insomnia, abnormal dreams, impaired concentration, headache, diarrhoea, nausea, rash, skin discoloration
Lamivudine (3TC)	Take with or without food.	Alcohol	Nausea, vomiting, headache, dizziness, diarrhoea, anaemia, abdominal pain, nasal symptoms, cough, fatigue, pancreatitis
Stavudine (d4T)	Take with or without food.	Alcohol	Nausea, vomiting, diarrhoea, peripheral neuropathy, chills and fever, appetite loss, rash, stomatitis, anaemia, headaches, pancreatitis, lipodystrophy, hyperlipidemia, increased liver enzymes
Zidovudine (AZT)	Take with or without food.	Alcohol, fatty food	Anaemia, anorexia, nausea, vomiting, bone marrow suppression, headache, fatigue, constipation, fever, dizziness, dyspnea, insomnia, muscle pain, rash, lipodystrophy, cardiovascular disease
<b>Non-nucleoside reverse transcriptase inhibitors (NNRTIs)</b>			
Efavirenz (EFV)	Take with or without food just before bedtime.	Alcohol, high-fat meals	Elevated blood cholesterol levels, elevated triglycerides, rash, dizziness, anorexia, nausea, vomiting, diarrhoea, dyspepsia, abdominal pain, flatulence

Medication	Nutrition guidance	Avoid	Possible side effects
Etravirine (ETV)	Always take after a meal.	Taking on an empty stomach	Severe skin rash, allergic reactions, immune reconstitution inflammatory syndrome (IRIS), gain or loss of body fat, tingling, numbness or pain in hands or feet (peripheral neuropathy)
Nevirapine (NVP)	Take with or without food.	St. John's wort	Nausea, vomiting, rash, fever, headache, skin reactions, fatigue, stomatitis, abdominal pain, drowsiness, paraesthesia, high hepatotoxicity
<b>Protease inhibitors (PIs)</b>			
Atazanavir/Ritonavir (ATV/r)	Take with food.	Alcohol, St. John's wort	Diarrhoea, gas, nausea, fat maldistribution, vomiting, stomach pain, kidney stones, hyperglycaemia, lactic acidosis (rare), hyperlipidaemia
Darunavir/Ritonavir (RTV)	Take th food.		Liver problems, skin reactions or rash, dark-colored urine, jaundice, pale-colored feces, nausea, vomiting, appetite loss, fatigue, pain or tender-ness on right side under ribs
Lopinavir/Ritonavir (LPV-r)	Take with or without food.	St. John's wort	Nausea, vomiting, weakness, diarrhoea, headache, dizziness, abdominal pain, fever, diabetes, anorexia, hepatitis, jaundice
Ritonavir (RTV)	Take with food.	St. John's wort	Nausea, vomiting, diarrhea, taste changes, hepatitis, jaundice, weakness, appetite loss, abdominal pain, fever, diabetes, pancreatitis, headache, dizziness, possible increased risk of lipodystrophy, increase triglyceride levels, increased uric acid, increased liver enzymes
<b>Integrase strand transfer inhibitor (INSTI)</b>			

Medication	Nutrition guidance	Avoid	Possible side effects
Dolutegravir (DTG)	Take with or without food.		Allergic reaction, liver problems, gain or loss of body fa, immune reconstitution inflammatory syndrome (IRIS), trouble sleeping, fatigue, headache
<b>Antibacterial medications for TB</b>			
Rifampicin	Take on an empty stomach, 1 hour before or 2 hours after a meal. Supplement with 10 mg vitamin B <sub>6</sub> daily.	Alcohol	Gastrointestinal irritation, anemia, jaundice, pancreatitis, altered taste, anorexia
Rifabutin	Take with or without food (with food if stomach is upset).	High-fat food	Urine discoloration, neutropenia, leukopenia, thrombocytopenia, rash, diarrhoea, headache

Source: Republic of Zambia Ministry of Health Directorate of Clinical Care and Diagnostic Services. 2016. *Zambia Consolidated Guidelines for Treatment and Prevention of HIV Infection*. Lusaka, Zambia: MOH. <http://www.hivpolicywatch.org/duremaps/data/guidelines/ZambiaARTguidelines2013.pdf>; WHO. 2016. *Consolidated Guidelines on the Use of Antiretroviral Drugs for Treating and Preventing HIV Infection: Recommendations for a Public Health Approach*. 2nd edition. Geneva: WHO. [http://apps.who.int/iris/bitstream/10665/208825/1/9789241549684\\_eng.pdf?ua=1](http://apps.who.int/iris/bitstream/10665/208825/1/9789241549684_eng.pdf?ua=1)

## HANDOUT 5.3. Medication-Food Plan

A **medication-food plan** is a schedule to guide clients on how take medications correctly, in the right dosages at the correct times and with or without food. The purpose is to minimise side effects and maximise medication effectiveness.

Make a daily medication-food plan for a client who is taking ARVs. Include each ARV he/she has been prescribed; whether to take the medication with or without food; what side effects the medication may cause; and what meals can maximise the effectiveness of the medication, ensure good nutrition and minimise side effects.

### Medication-food plan

Date	Medication	Possible side effects	Special food instruction	Timing				
				Morning	Mid-day	Afternoon	Mid-afternoon	Night

- In the **Date** column, write the day, month and year.
- In the **Drug** column, write all the medications the client is taking.
- In the **Possible side effects** column, write any side effects the medication may cause.
- In the **Special food instruction** column, write diet-related instructions (whether to take with or without food, foods to avoid). Refer to **Handout 5.2. ART and TB Drug-Food Interactions and Side Effects**.
- In the **Timing** column, tick the time of day the client should take the ARV (if specified). For each time of day, help the client list or draw foods to eat to provide a balanced diet with enough energy for the client's stage of HIV (symptomatic or asymptomatic).



## HANDOUT 5.4. Counselling on Nutrition and ART

1. Explain that HIV attacks and kills the white blood cells in the blood (CD4 cells) that fight infection. When you have a low CD4 count, you get infections more easily.
2. Explain how HIV affects nutrition.
  - HIV increases the body's energy needs.
  - HIV leads to opportunistic infections, which increase nutritional needs and reduce appetite.
  - Increased nutrient needs plus poor food intake and absorption can lead to malnutrition.
3. Explain the benefits of ART.
  - ART protects CD4 cells and strengthens the body's ability to fight disease and reduce opportunistic infections. Without ART, HIV multiplies and kills more CD4 cells.
  - ART reduces the amount of HIV in your blood ('viral load').
  - It can slow the progression of HIV to AIDS
4. Explain that some foods and ARVs affect each other.
  - Some ARVs affect the availability, absorption and use of nutrients.
  - Some ARVs have side effects that reduce appetite or nutrient absorption or cause overweight. Side effects from ARVs are usually not serious, and most go away within a few weeks.
  - However, symptoms may be caused by opportunistic infections. Any symptoms should be reported to health care providers as soon as possible.
  - Some foods taken with ARVs can reduce medication effectiveness and worsen side effects.
  - Alcohol reduces the effectiveness of many ARVs and can cause dangerous side effects.
  - Drink plenty of boiled or treated water every day when taking ARVs.
4. Explain the importance of taking ARVs exactly as prescribed by health care providers.
  - If you don't take ARVs as prescribed, they may stop working (your HIV may become resistant to the medications). Then you can get infections more easily and may need even stronger ARVs.
  - Do not skip doses or stop taking medications, even if you have side effects. You can manage many side effects by changing your diet.
  - Take ARVs at the same time every day so you always have protection in your blood.

## **SESSION 6. Food and Water Safety and Hygiene**

### **Purpose**

This session explains the importance of food and water safety and hygiene.

### **Objectives**

By the end of the session, you should be able to:

1. Explain how food and water can be sources of infection.
2. Describe how to keep food and water safe.
3. Counsel clients on food and water safety and hygiene.

### **Materials**

- *Nutrition Guidelines for Care and Support of People with HIV*
- **Handout 6.1. Food- and Water-Borne Illness**
- **Handout 6.2. Importance of Food and Water Safety**
- **Handout 6.3. Counselling Messages on Food and Water Safety**

## HANDOUT 6.1. Food- and Water-Borne Illness

**Food safety** refers to the conditions and practices (proper food handling, cooking, preparation and storage of food) that preserve the quality of food to prevent contamination and food-borne illness.

**Water safety** refers to the conditions and practices undertaken in preventing water contamination and water-borne illness through proper handling, treatment and storage.

**Hygiene** involves conditions or practices that help maintain health and prevent disease, especially through cleanliness

**Safe** food and water contain no dangerous germs or toxins at levels that could cause health risks.

Germs are very small living things, too small to see with the naked eye. It takes 1 million germs to cover the head of a pin. Bacteria, viruses, yeasts, moulds and parasites are all germs. Some germs can be useful for making food and drinks such as cheese, yogurt, beer and medicines such as penicillin. They can also help digest food in the gut. But germs can make food smell bad, taste horrible and look disgusting. However, most germs do not change the appearance, taste or smell of food, so it is difficult to tell whether food is spoiled. Dangerous germs can make people sick and even kill them. Germs are everywhere, but are mostly found in:

- Human and animal faeces
- Soil (1 teaspoon of soil contains more than 1 billion germs)
- All living things (animals' feet, mouths and skin; people's bowels, mouths, noses, intestines, hands, fingernails and skin)
- Contaminated food and water

Germs need a way to help them move around. Hands are the most common way to move germs. Most germs grow by multiplying. To multiply, they need food, water, time and warmth. Meat, seafood, cooked rice and pasta, milk, cheese and eggs provide ideal conditions for germs to grow. Raw and under-cooked chicken, meat, fish and eggs, milk, contaminated raw vegetables, raw and smoked fish and unsafe water can contain dangerous germs. Diarrhoea is the most common symptom of illness from contaminated food or water. Even healthy people can get stomach pains, diarrhoea, nausea and vomiting from contaminated or spoiled food.

People can also get sick from natural toxins, metals and environmental pollutants, chemicals for treating animals, pesticides, cleaning chemicals and some food additives. Natural toxins include aflatoxin, which is caused by mould growing on maize and peanuts stored in damp places and can harm the liver and lead to cancer. Some types of cassava cause cyanide poisoning when they are not processed well. In severe cases, this may lead to kidney failure and death. Food grown near roads where vehicles use leaded fuel can cause lead toxicity. Cookware and utensils glazed with materials containing lead or cadmium can cause chemical poisoning.

## HANDOUT 6.2. Importance of Food and Water Safety

Every person is vulnerable to food- and water-borne illness, and even healthy people sometimes get stomach pains, diarrhoea, nausea and vomiting from eating contaminated food or water. These symptoms may also affect appetite and absorption of nutrients and increase the need for nutrients to fight infection. Food- and water-borne illness may cause weight loss and further lower the body's resistance to other infections. Food and water-borne illnesses are difficult to treat and can come back again and again.

A healthy person's immune system is well equipped to fight harmful germs, but a weakened immune system is not. Food and water can carry germs that cause illness and serious infections in people with compromised immune systems.

Some scientists think that poor hygiene and sanitation and contaminated drinking water cause more child stunting than poor child feeding practices or nutrient deficiencies. This is because children who come into contact with germs in faeces through soil or unclean water can get an intestinal illness. This illness reduces the ability to absorb the nutrients in food. The children's bodies also spend energy that otherwise would be used to help the children grow on fighting the illness. This condition is called environmental enteropathy.

Food and water safety and hygiene is important for people with HIV because:

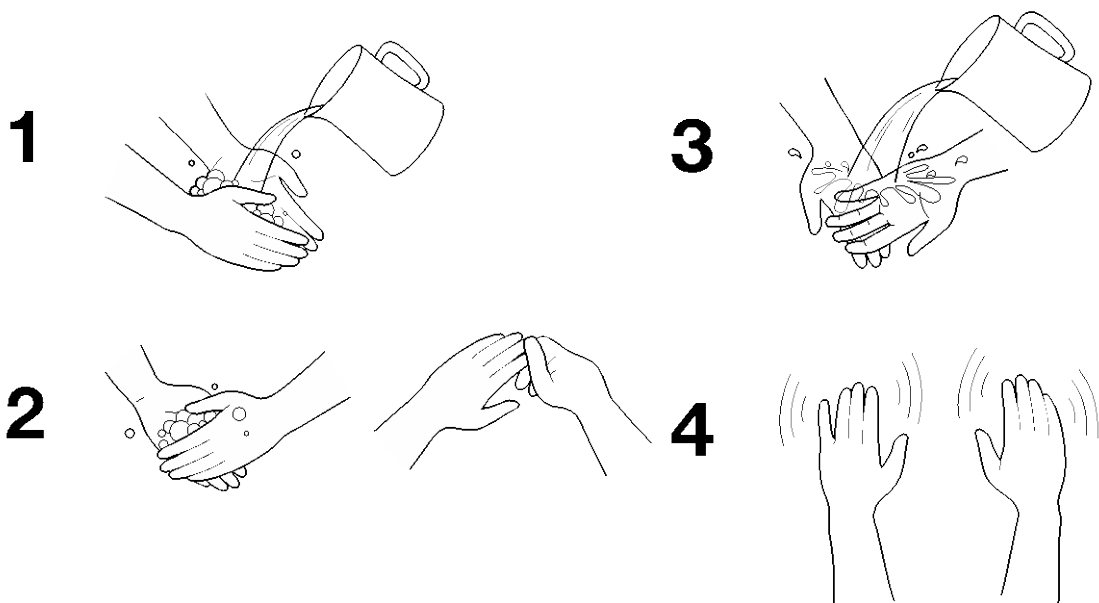
1. They have low immunity and are at higher risk of infections
2. They experience more severe symptoms of food-borne illness, which are more likely to cause serious conditions such as meningitis.
3. They may have a hard time recovering from illness.
4. Food- and water-borne illness can cause weight loss and further lower resistance to opportunistic infections.

## HANDOUT 6.3. How to Reduce the Risk of Illness from Contaminated Food or Water

No food or water is 100 percent safe at all times for all people, but following the rules below can prevent most food- and water-borne disease.

### 1. Wash hands correctly.

- Wash hands with soap or ash (fig 1).
- Rub your hands together and clean under nails (fig 2).
- Rinse hands under poured or flowing water to remove dirt and germs (fig 3). Do not use a washbasin where other people have washed their hands.
- Dry hands by shaking them in the air (fig 4), not by wiping them on a cloth that has been touched by others and may carry germs.



- Wash hands **before and while** handling, preparing and eating food; **before** feeding someone, breastfeeding or giving medications; **after** going to the toilet, cleaning a person or child who has passed stool, changing a baby's nappy, blowing the nose, coughing, sneezing or touching an animal or animal waste; and **before and after** tending to someone who is sick.

### 2. Keep surroundings clean.

- Wash all surfaces and equipment used to prepare or serve food with soap and, if possible, bleach such as Jik or disinfectant.
- Protect kitchen areas and food from insects, pests and other animals.

### **3. Use safe water and foods.**

- Boil or filter water or treat it with chlorine before using it to drink, prepare food or take medicines.
- Store clean water in a container with a tight-fitting lid.
- Serve water from the container with a clean ladle so that nothing dirty (hands or cups) touches it.
- Do not buy fruit and vegetables with mould or rotten spots.
- Do not use food beyond its expiry date.
- Use pasteurised milk or boil milk before use.
- If fruits or vegetables will be eaten raw, wash them in safe water and peel them.

### **4. Separate raw and cooked foods.**

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

### **5. Cook food thoroughly.**

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

### **6. Store food safely.**

- Do not leave cooked food at room temperature for more than 2 hours.
- Do not store food too long, even in a refrigerator (no longer than 4–5 weeks for raw eggs; 1 week for cooked eggs; 1 week for milk or yoghurt; 5 days for meat; 2 days for chicken, fish or sausage; 4 days for cooked food).
- Do not thaw frozen food at room temperature.
- Prepare food freshly for babies and young children and people with HIV and do not store it after cooking.
- Protect food from pests by covering it with netting or cloth or keeping it in sealed containers.

# **SESSION 7. Nutrition Care for Pregnant and Breastfeeding Women**

## **Purpose**

This session gives an overview of the nutritional needs of pregnant and postpartum women.

## **Objectives**

By the end of the session, you should be able to:

- Discuss the nutritional needs of pregnant and breastfeeding women.
- Explain nutrition actions for pregnant and breastfeeding women.
- Counsel pregnant and breastfeeding women on good nutrition practices.

## **Materials**

- **Handout 7.1. Energy Needs of Pregnant and Breastfeeding Women**
- **Handout 7.2. Counselling on Good Nutrition in Pregnancy**
- **Handout 7.3. Counselling Pregnant and Breastfeeding Women on Anaemia**

## Handout 7.1. Energy Needs of Pregnant and Breastfeeding Women

Group	Average required energy intake (kcal)	Increased energy requirements for pregnancy and lactation (kcal)	Increased energy requirements for HIV (kcal)	Total energy intake (kcal)	Extra food to meet additional energy requirements
<b>Pregnant</b>					
HIV negative	2,140	200–285 (depending on activity level)		2,340–2,425	One additional serving of staple food per day
HIV positive, asymptomatic	2,140	280	10% (210)	2,630	One nutritious snack
HIV positive, symptomatic	2,140	280	20–30% (428–642)	2,848–3,062	Two nutritious snacks
<b>Breastfeeding</b>					
HIV negative	2,140	500		2,640	One small balanced meal
HIV positive, asymptomatic	2,140	500	10% (210)	2,850	One small balanced meal and one snack
HIV positive, symptomatic	2,140	500	20–30% (428–642)	3,068–3,282	One small balanced meal and two snacks

Pregnant women need extra energy because of the changes in their bodies and the needs of their fetuses. Healthy pregnant women need an extra 200–285 kcal per day, depending on their activity level. This translates into one additional serving of the staple food each day. HIV increases energy requirements to allow adequate weight gain during pregnancy, strengthen the immune system, reduce susceptibility to infections and slow the progression of HIV to AIDS.

Pregnant women also need more protein for the development of foetal and maternal tissue, including the placenta, and an increased red blood cell mass. Non-pregnant women need 0.8 g protein/kg/day, while pregnant women need 1.1 g/kg/day, or approximately 71 g each day. Foods rich in protein include pulses (e.g., chickpeas, lentils, cowpeas and beans), oil seeds (e.g., pumpkin, sunflower and melon) and animal-source food (e.g., meat, eggs and milk). More protein, zinc, selenium and iron from animal-source foods enter the body and have an active effect than the same nutrients from plant-source food. There is no evidence that HIV-positive pregnant women need more protein than HIV-negative women.



## HANDOUT 7.2. Counselling on Good Nutrition in Pregnancy

Pregnant woman should:

- Eat a variety of foods to get all the nutrients they need.
- Eat small, frequent meals.
- Eat more animal foods, which are valuable sources of iron that is well absorbed by the body. Iron reduces anaemia, which is common in women during pregnancy.
- Eat foods rich in vitamin C such as tomatoes, oranges, guavas or lemons to increase the absorption of iron in beans, peas, lentils and dark green leafy vegetables.
- Eat plenty of vegetables, fruits and wholegrain cereals such as roller meal, sorghum, or millet every day.
- Take iron, folic acid and other supplements as recommended.
- Use iodated salt.
- Eat an extra meal and/or snack a day, especially if weight is not increasing.
- Do physical activity and get fresh air.
- Avoid foods that make them feel ill, especially if experiencing heartburn and nausea.
- Drink plenty of clean water (about 8 glasses a day).
- Avoid tea or coffee during meals because these contain compounds that block iron absorption.
- Maintain good food and water safety and hygiene.
- Rest at least 1 hour each day.
- Sleep under an insecticide-treated mosquito net to prevent malaria and seek prompt treatment of malaria.
- Seek prompt treatment of constipation, heartburn, fever, cough, vomiting and other problems common in pregnancy.

## HANDOUT 7.3. Counselling Pregnant Women on Anaemia

Anaemia is a condition in which the haemoglobin concentration in the blood is low, reducing the oxygen-carrying capacity of the red blood cells. Pregnant women and children are the most vulnerable to this deficiency.

### Explain the possible causes of anaemia:

- Inadequate intake of food, especially foods rich in iron
- Diseases such as malaria, hookworm and HIV
- Too many or too close pregnancies
- Heavy menstrual bleeding

### Explain that anaemia leads to:

- Decreased working and intellectual capacity
- Decreased immunity
- Premature delivery, stillbirth, abortion, low birth weight and possibly death during delivery even from normal blood loss
- Delayed growth and development, frequent illnesses and possibly death in children under 5

### Counsel to prevent anaemia by:

- Eating iron-rich foods (meat, fish, liver, green leafy vegetables, germinated or fermented cereals or pulses)
- Taking iron or iron/folate supplements
- Sleeping under insecticide-treated mosquito nets to prevent malaria, which can cause severe anaemia, and taking antimalarials to treat it
- Wearing shoes and disposing of faeces safely to avoid parasite infections
- Getting dewormed in the 2<sup>nd</sup> trimester of pregnancy and every 6 months if not pregnant (hookworm causes blood loss, which leads to anaemia)
- Spacing births

### Counsel to increase the amount of iron absorbed from food by:

- Eating vitamin C-rich foods (tomatoes, guavas, mangos, pineapple, pawpaw, oranges and other citrus fruits) to help the body process iron
- Eating germinated or fermented cereals or pulses with eggs, milk and plant-source foods
- Eating small amounts of organ meats of animals, birds and fish
- Avoiding tea, coffee and high-fibre foods such as bran cereal, which decrease iron absorption

## SESSION 8. Nutrition Care for Infants and Young Children

### Purpose

This session will help you support mothers in feeding children 0–24 months of age.

### Objectives

By the end of the session, you will be able to:

1. Describe how HIV can be transmitted from mother to child.
2. Describe the risks and benefits of different infant feeding practices
3. Counsel mothers on exclusive breastfeeding and complementary feeding.
4. Counsel caregivers on feeding children older than 6 months.

### Materials

- *Maternal, Infant and Young Child Nutrition Operational Framework 2014–2018*
- *Nutrition Guidelines for Care and Support of People with HIV*
- **Handout 8.1. Recommended Infant Feeding Practices**
- **Handout 8.2. Breastfeeding**
- **Handout 8.3. Mother-to-Child Transmission of HIV**
- **Handout 8.4. Risks and Benefits of Different Infant Feeding Options**
- **Handout 8.5. Infant Feeding in the Context of HIV**
- **Handout 8.6. Feeding Children Older than 6 Months**

## HANDOUT 8.1. Recommended Infant Feeding Practices

### 1. Exclusive breastfeeding

Exclusive breastfeeding is feeding a baby only breast milk, with no other food or liquids, not even water, gripe water or juice, except for oral rehydration solution or vitamin or medicine drops or syrup, for the first 6 months of life, unless medically indicated.

Exclusive breastfeeding is the single most effective way to prevent child deaths.

- Babies younger than 2 months who are not breastfed are six times more likely to die from diarrhoea or acute respiratory infections than babies who are breastfed.
- Breast milk, especially the first thick, yellow milk called colostrum, contains antibacterial and antiviral agents and high levels of vitamin A that protect babies against disease.
- Breastfed babies have a lower risk of sudden infant death syndrome.
- Exclusive breastfeeding lowers the risk of mother-to-child transmission of HIV.

Breast milk is 88 percent water. Healthy babies who are exclusively breastfed do not need any additional liquids, even in very hot weather. Giving water to babies younger than 6 months reduces breast milk intake, interferes with the absorption of nutrients in breast milk and increases the risk of illness from contaminated water and feeding bottles.

#### *Challenges for exclusive breastfeeding*

- Lack of knowledge of the benefits
- Inappropriate advice from health care providers
- Lack of skilled support to breastfeeding mothers
- Harmful lactation management practices
- Lack of confidence in mothers,
- Promotion of breast milk substitutes
- Cultural practices and beliefs (e.g., the belief that young babies need water or other foods, the use of pacifiers)
- Mothers' need to leave their babies to go to work
- HIV and emergency situations

#### *Disadvantages of exclusive breastfeeding*

- HIV can be transmitted through breast milk.
- Mothers need energy to support the demands of breastfeeding.
- Other people may pressure mothers to give water and other liquids or foods to babies while breastfeeding. This is known as mixed feeding, and it increases the risk of HIV, diarrhoea and other infections.

## **2. Introduction of appropriate complementary foods at 6 months**

- At the age of 6 months, most babies have at least doubled their birth weight and are becoming more active. Breast milk alone is no longer enough to meet all energy and nutrient needs.
- At about 6 months, babies' digestive systems are mature enough to digest the starch, protein and fat in a non-milk diet.
- Start at 6 months with small amounts of food (2–3 small spoonful twice a day).
- Introduce new foods over a few days.
- Gradually increase the amount and consistency (thickness) of the food.

## **3. Continued breastfeeding until 2 years or beyond**

- Breast milk can provide one-half or more of a child's energy needs between 6 and 12 months and one-third of needs between 12 and 24 months.
- Encourage babies to breastfeed after introducing complementary foods to make sure they get enough breast milk.

## **4. Responsive feeding**

- Feed slowly and patiently, encouraging but not forcing children to eat.
- Experiment with different food combinations.
- Feed children from their own bowls or plates.

## **5. Fortifying complementary foods or giving micronutrient supplements according to national recommendations**

## **6. Handling foods hygienically to avoid infection**

- Wash all feeding utensils thoroughly with soap.
- Wash hands properly before feeding/eating.
- Do not store prepared food for more than 2 hours. Contaminated foods are a major cause of diarrhoea in children 6–12 months.
- Avoid feeding liquids from bottles with teats that can be contaminated with germs and cause diarrhoea.

## **7. Continued feeding during illness**

- Give children increased fluids and encourage them to eat when they are ill.
- After illness, feed more often than usual and encourage children to eat more.

## HANDOUT 8.2. Breastfeeding

Breastfeeding is a key strategy for child survival. Breastfed babies are generally healthier and grow and develop better than babies who are fed commercial milk formula.

Breastfeeding is at the heart of the family, an expression of love, care and protection and a way of nurturing the young. It is an extension of maternal protection that transitions the baby from the shelter of the mother's womb.

Breastfeeding has many **benefits for babies**:

- It is the baby's perfect food, providing all the energy, protein, fat, vitamins and minerals a baby needs for the first 6 months of life.
- It is clean, at the right temperature and always ready to use.
- It contains antibodies that protect the baby from common infectious such as diarrhoea and pneumonia.
- It is easily digested and efficiently used.
- It overcomes the deficits from low birth weight and reduces stunting.
- It supplies key nutrients that are critical for physical and mental growth.
- It gives the baby a sense of security and stimulates the developing brain.

Breastfeeding also has **benefits for mothers**:

- It helps them recover from childbirth.
- It helps the uterus return to its previous size and reduces bleeding after delivery, therefore preventing anaemia.
- It reduces the risk of premenopausal ovarian and breast cancer.
- It helps delay a new pregnancy.
- It strengthens mother-baby bonding.
- It is free, is always available and requires no special preparation.

**Early initiation of breastfeeding** is breastfeeding within the first hour after birth.

Early initiation of breastfeeding has many **benefits for babies**:

- Early breast milk is rich in immune and non-immune components important for early gut growth and resistance to infection.
- It significantly increases the chances of infant survival.
- It facilitates the sucking reflex, which helps stimulate breast milk production.
- It encourages bonding between mother and baby pair, resulting in better latch.
- It helps maintain the baby's body temperature to promote warmth and protect against hypothermia.
- Colostrum, the yellow, thick 'first milk', is the baby's first immunization protection.
  - It provides antibodies to fight infections, especially respiratory and gastrointestinal infections, otitis media, meningitis, sepsis and allergies.
  - It also contains growth factors which help babies digest and absorb breast milk.
  - It is a laxative, allowing the baby to pass soft stools.

Early initiation of breastfeeding also has **benefits for mothers**:

- It gives the mother confidence in herself and her baby's ability to breastfeed.
- It gives the mother a better chance of successfully establishing and sustaining breastfeeding throughout infancy.
- Stimulation of the mother's breast helps the milk come in (flow) early.
- The uterus returns to its normal size more quickly.
- Bleeding is reduced.

**Mixed feeding** is feeding a baby breast milk along with other foods or liquids for the first 6 months of life. This is dangerous because:

- It carries a risk of diarrhoea and other infectious diseases from unclean water or utensils.
- Babies can get too little breast milk and become malnourished.
- Babies are more likely to develop allergic conditions such as eczema and possibly asthma.
- The risk of some chronic diseases such as diabetes is increased.
- Babies may not develop well mentally and score lower on intelligence tests.
- Mothers who do not breastfeed consistently can get pregnant again sooner.
- It increases the risk of HIV transmission because other liquids and foods given to babies along with breast milk can damage the gut wall and allow the virus to be transmitted more easily.

### **Infant feeding for HIV-positive mothers**

Exclusive breastfeeding is recommended for every woman, regardless of HIV status. Exclusive breastfeeding while taking ARVs reduces the risk of transmission of HIV from mother to baby and prevents babies from getting life-threatening infections such as diarrhoea and pneumonia.

### **Replacement feeding**

In special circumstances, replacement feeding using commercial formula can be considered. This means feeding a baby who is not breastfeeding with a diet that provides all the nutrients the baby needs until he or she is fully fed on family foods.

Counsel mothers who choose to provide replacement feeding that their babies risk infection and death unless:

- Replacement feeding is acceptable, feasible, affordable, sustainable and safe (**AFASS**).
  - Safe water and sanitation are assured in the household and community.
  - The mother or caregiver can reliably provide sufficient formula to support normal infant growth and development.
  - The mother or caregiver can prepare formula cleanly and frequently enough so that it is safe and carries a low risk of diarrhoea and malnutrition.
  - The mother or caregiver can feed formula exclusively in the first 6 months.
  - The family supports this practice.

- The mother or caregiver has access to comprehensive child health services.<sup>2</sup>
- The baby receives replacement feeding exclusively, with no other foods or liquids, including breast milk, for the first 6 months of life.
- The baby is fed by cup (**bottle feeding is not recommended** because bottles can be contaminated with germs).
- The replacement milk is prepared fresh for every feed.

Do not discuss replacement feeding in public except in very rare circumstances when a mother insists that she would rather not breastfeed because she understands the risks associated with breastfeeding in her condition. Discuss replacement feeding with HIV-positive mothers in private to avoid the ‘spillover effect’ (women who do not know their HIV status may opt to replacement feed for fear of transmitting HIV to their babies).

### **Dangers of replacement feeding**

- High risk of serious diarrhoeal infections from unclean water or feeding bottles
- Increased risk of malnutrition if too much water is added to formula to save money
- Missing out on the general health benefits of breast milk
- Increased risk of HIV transmission from mixed feeding (giving formula feeds and breastfeeding)

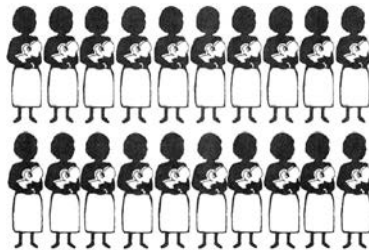
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<sup>2</sup> WHO. 2013. *Consolidated Guidelines on the Use of Antiretroviral Drugs for Treating and Preventing HIV Infection: Recommendations for a Public Health Approach*. Geneva: WHO; WHO. 2010. *Guidelines on HIV and Infant Feeding 2010: Principles and Recommendations for Infant Feeding in the Context of HIV and a Summary of Evidence*. Geneva: WHO.



# HANDOUT 8.3. Mother-to-Child Transmission of HIV

If 100 pregnant women attend the maternal and child health (MCH) clinic, and the HIV prevalence rate among pregnant women is 20 percent, then 20 women out of the 100 will be HIV positive. These HIV-positive women will have 20 babies, shown below.



Without PMTCT and ARVs, up to 10 percent of these babies will be infected with HIV during pregnancy. Draw a circle around 10 percent of the babies.



Without PMTCT and ARVs, an average of 15 percent of these babies will be infected with HIV during labour and delivery. Draw a rectangle around 15 percent of the babies.



Without PMTCT and ARVs, an average of 12 percent of these babies will be infected with HIV during breastfeeding for up to 2 years. Draw a rectangle around 12 percent of the babies.

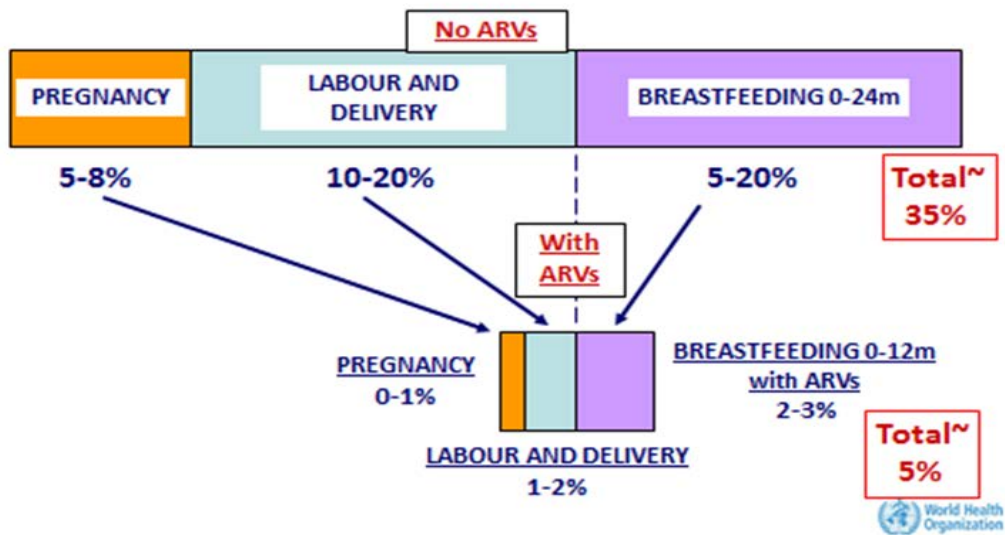
With PMTCT and ARVs, less than 5 percent of these babies will be infected with HIV from their mothers. Draw a circle around 5 percent of the babies.



The risk of HIV transmission from mother to child can be reduced by:

- Pregnant women getting tested for HIV so they know their status
- Both mothers and babies taking ARVs to reduce the risk of HIV transmission
- Breastfeeding exclusively breastfeeding for the first 6 months

**Mother-to-child transmission of HIV without and with ARVs**



## HANDOUT 8.4. Risks and Benefits of Breastfeeding and Not Breastfeeding

Feeding method	Benefits	Risks
<b>Exclusive breastfeeding</b>	<ul style="list-style-type: none"> <li>• Breast milk contains all the nutrients babies need for the first 6 months and is an important nutrient-rich food for babies 6–24 months.</li> <li>• Breast milk is easy to digest.</li> <li>• Breast milk protects the baby from diarrhoea, pneumonia and other infections.</li> <li>• Breast milk is free and always available and does not need any special preparation.</li> <li>• Breastfeeding creates a bond between a mother and her baby.</li> <li>• Early initiation of breastfeeding (within 1 hour of delivery) and exclusive breastfeeding help mothers recover from childbirth and protect them from getting pregnant again too soon.</li> <li>• For HIV-positive mothers who cannot replacement feed safely, exclusive breastfeeding lowers the risk of transmitting HIV to their babies.</li> </ul>	<ul style="list-style-type: none"> <li>• As long as a baby is breastfed, there is a risk of passing HIV to the baby.</li> <li>• The mother needs additional energy to support the demands of breastfeeding.</li> <li>• Other family members may pressure the mother to give water and other liquids or foods to the baby while she is breastfeeding or give the baby other liquids and food themselves. This is mixed feeding, and it increases the risk of diarrhoea and other infections, including HIV transmission.</li> </ul>

Feeding method	Benefits	Risks
<b>Exclusive replacement feeding</b>	<ul style="list-style-type: none"> <li>• There is no risk of HIV transmission from the mother to the infant.</li> <li>• The mother’s nutrient stores are spared, reducing her risk of vitamin and mineral deficiencies that weaken the immune system’s ability to prevent and fight infections.</li> <li>• Other members of the household can help with infant feeding.</li> </ul>	<ul style="list-style-type: none"> <li>• Infants do not get the protective antibodies from breast milk to protect against diarrhoea and respiratory infections.</li> <li>• Formula is expensive.</li> <li>• Preparing formula hygienically requires time, clean water and fuel.</li> <li>• Formula prepared with unclean water or in unclean bottles can cause serious and sometimes fatal diarrhoeal infections.</li> <li>• If formula isn’t mixed according to instructions, infants can become malnourished.</li> <li>• Not breastfeeding carries stigma.</li> <li>• Women who do not breastfeed become pregnant again sooner.</li> </ul>

## HANDOUT 8.5. Infant Feeding in the Context of HIV

Refer mothers who are HIV positive and not on ART for assessment of eligibility for ART. Both mothers and infants should take ARVs to reduce the risk of HIV transmission during breastfeeding.

Refer mothers who develop symptoms of full-blown AIDS or have CD4 counts < 200 and are too sick to breastfeed to be put on an ART regimen to for their stage of HIV. Counsel mothers who can breastfeed to do so while they follow the recommended ART regimen and to eat an adequate diet.

Since 2010 WHO has recommended that:

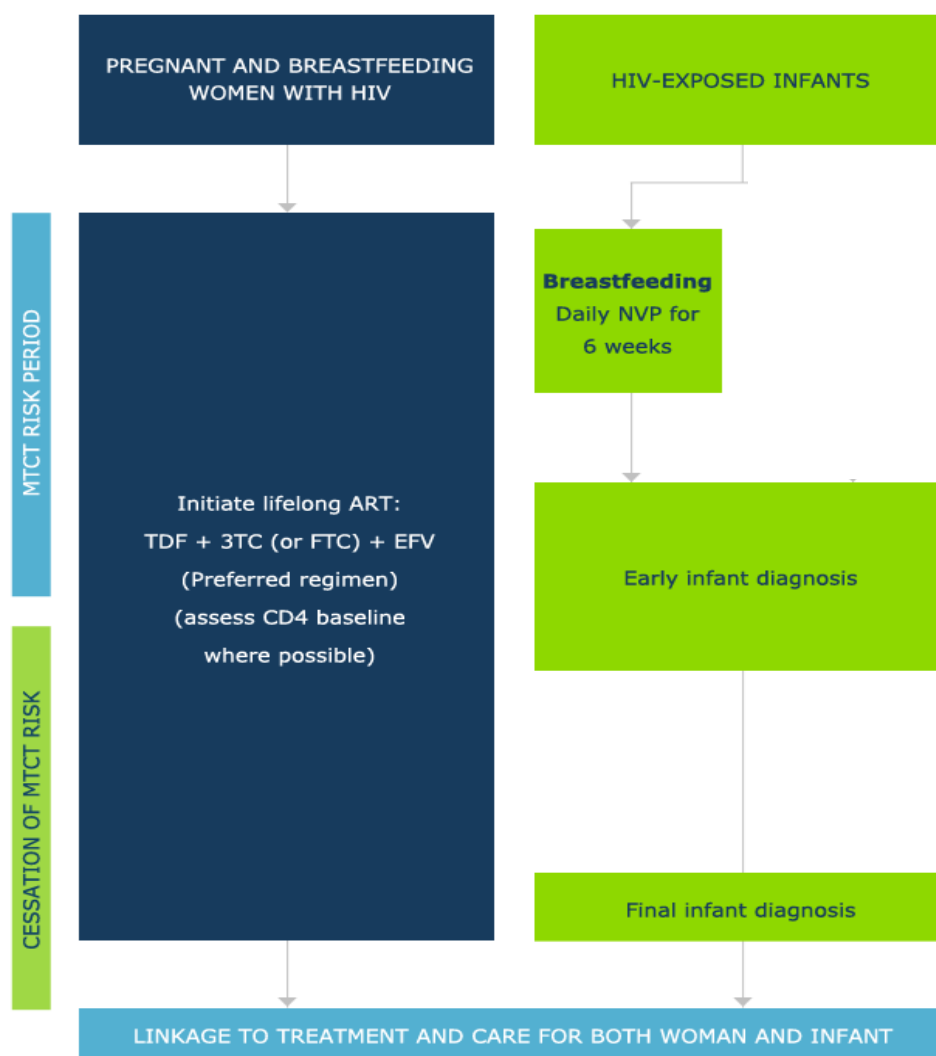
- **Mothers who are HIV positive and whose infants are HIV negative or of unknown status** should breastfeed exclusively for the first 6 months, introduce appropriate complementary foods thereafter and continue breastfeeding for the first 12 months of life. HIV-positive mothers may continue breastfeeding for up to 24 months or longer (similar to the general population) while being fully supported for ART adherence.
- Where ART is available, both mothers and infants should take ARVs to reduce the risk of HIV transmission during breastfeeding.
- Breastfeeding should stop only when mothers can provide a nutritionally adequate and safe diet without breast milk. Breastfeeding should be stopped **gradually**, within 1 month.
- ONLY in special circumstances (e.g., mothers are too sick to breastfeed or infants are orphaned or abandoned), HIV-positive women should **exclusively** replacement feed their infants ONLY if:
  - They have access to safe water and sanitation.
  - They can get enough formula to support normal infant growth and development.
  - They can prepare formula correctly and often enough so that it is safe and carries a low risk of diarrhoea and malnutrition.
  - They can feed formula exclusively for the first 6 months.
  - Their families support this practice.
  - They have access to comprehensive child health services.

The goal is to ensure that children of HIV-positive mothers have a safe and nutritious diet and **reach the age of 18 months both HIV free and alive.**

Mother's HIV status	Infant HIV status	Recommended infant feeding	Timing of complementary feeding	Timing of complete cessation of breastfeeding
HIV-positive on combined ART (c-ART)	HIV-negative or unknown	Exclusive breastfeeding (EBF) for 6 months	After 6 months	At 12 months if AFASS is assured Up to 2 years if AFASS is not assured
HIV-positive	HIV-	EBF for 6 months		Up to 2 years

	positive			
HIV-negative or unknown	N/A	EBF for 6 months		Up to 2 years

Zambia recommends that HIV-positive pregnant and breastfeeding women take a triple-drug ARV regimen throughout pregnancy, delivery and breastfeeding and continue for life, regardless of CD4 count or HIV clinical stage (see the diagram below).<sup>3</sup>



Source: <http://www.avert.org/who-guidelines-pmtct-breastfeeding.htm>; WHO. 2013. *Consolidated Guidelines on the Use of Antiretroviral Drugs for Treating and Preventing HIV Infections: Recommendations for a Public Health Approach*. Geneva: WHO; Zambia Ministry of Health. 2016. *Zambia Consolidated Guidelines for Treatment and Prevention of HIV Infection*. Lusaka: MOH.

<sup>3</sup> This recommendation was called Option B+, one of three infant feeding options for HIV-positive mothers in the 2013 WHO *Consolidated Guidelines on the Use of Antiretroviral Drugs for Treating and Preventing HIV Infections: Recommendations for a Public Health Approach*. The 2016 version of the WHO *Consolidated Guidelines* recommended only this approach to prevent mother-to-child transmission of HIV.

## HANDOUT 8.6. Feeding Children Older than 6 Months

Gradually increase food consistency, variety and quantity as infants grow older and feed children actively (feed children slowly and patiently, make eye contact and feed children when they are hungry). Complementary feeding involves not only what is fed to the child but *how* it is fed—Frequent feeding, Adequate food, appropriate Texture and Variety, Active feeding, Hygienically prepared. You can remember this by the acronym **FATVAH**.

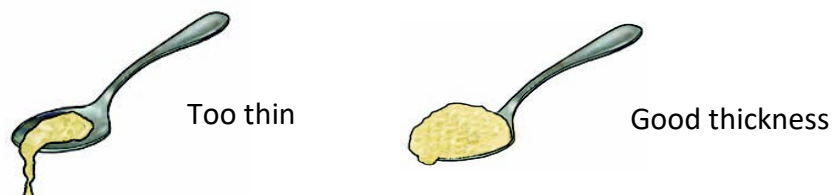
### Complementary feeding according to age

- At 6 months, babies can eat pureed, mashed or semi-solid foods.
- At 8 months, most can also eat finger foods.
- At 10 months, introduce 'lumpy' foods.
- At 12 months, feed the same foods the rest of the family eats.

Age	Energy needed per day in addition to energy from breast milk	Texture	Frequency	Amount to feed at each meal
6–8 months	200 kcal	Start with thick porridge and well-mashed foods. Continue with mashed family foods	2–3 meals per day plus 1–2 snacks if child has enough appetite	Start with 2–3 tablespoons per feed and increase gradually to $\frac{2}{3}$ cup.
9–11 months	300 kcal	Finely chopped or mashed foods and foods the infant can pick up	3–4 meals per day plus 1–2 snacks if child has enough appetite	Increase gradually to $\frac{3}{4}$ cup.
12–24 months	550 kcal	Family foods, chopped or mashed if necessary	3–4 meals per day plus 1–2 snacks if child has enough appetite	1 cup

### Consistency of complementary foods

Babies' small stomachs can hold only about 200 ml at a time. Thin foods and liquids fill their stomachs quickly before their energy needs are met. This is why babies need to eat small amounts of thicker food often. Complementary foods should be thick enough to stay on a spoon without dripping off.



## Quality of complementary foods

- Feed a variety of nutrient-rich foods from all food groups.
  - The solid parts of meat, organs, chicken, eggs or fish and milk or milk products
  - Finely flaked fish, eggs, beans, ground-up nuts, finely sliced meat or other soft and easily digestible foods from the family pot
  - Beans, peas and nuts
  - Mashed fruits and vegetables such as ripe banana and avocado
  - Mashed orange-coloured fruits and vegetables such as pumpkin and pawpaw as often as possible
  - Fermented, germinated or fortified foods
  - Fats and oils
  - Snacks such as sliced fruit or bread with butter
- Do NOT feed:
  - Sugar, sugary drinks or sodas (they damage teeth and decrease babies' appetite for nutritious foods)
  - Tea or coffee (they decrease iron absorption)
  - Foods that can cause choking, such as whole groundnuts
  - Spicy foods (they may make babies afraid to try other foods)
- Give children boiled or treated water to drink after they eat, even if they are still breastfeeding.
- Add 1–2 teaspoons of oil, butter, margarine, milk or groundnut/sesame paste to each cup of food to increase energy density.
- Give children who are not receiving breast milk or animal foods a vitamin and mineral supplement.

## Feeding children during illness

- Children who are sick often may become malnourished and be at higher risk for more illness. Children with HIV may have poor growth, frequent illness and undernutrition because they need extra calories but may have difficulty eating because of poor appetite, difficulty swallowing, nausea, vomiting or taste changes. Very sick children with HIV are at risk of dying and take a longer time to recover unless they get extra calories and nutrients.
- Even if children do not seem to have an appetite, they need to eat when they are ill to get enough nutrients to make up for losses from diarrhoea, vomiting and appetite loss and to strengthen their immune systems.
- Continue to breastfeed—sick children may breastfeed more often.
- Make the child comfortable.
- Be patient and feed slowly.
- Give food that the child likes.
- Feed small, frequent meals
- Give a variety of foods and extra fluids.
- Pay attention to the child and make feeding time happy.
- Feed the child a variety of nutrient-rich foods.



### Feeding children during recovery

- Very sick children take longer to recover from illness than healthy children and may die if they do not get additional feeding.
- A child’s appetite usually increases after illness. This is a good time to give extra food so the child can regain lost weight quickly and catch up growth. Young children need extra food until they have regained all their lost weight and are growing at a healthy rate. Children recover more quickly from illness and lose less weight if they are helped to eat when they are ill and recovering
- If exclusively breastfeeding, breastfeed more often.
- Feed the child more often than usual and give an extra meal if the child is older than 6 months.
- Give extra food at each meal if the child’s appetite is good.
- Give fruits and foods with extra rich energy and/or nutrients such as enriched porridge.
- Be extra patient in encouraging the child to eat and making the child comfortable.
- Give the child extra fluids and make sure drinking water is boiled and treated.

Below is a sample meal plan for children during illness and recovery.

### Sample daily meal plan for children during illness and recovery

Meal	Foods
<b>Breakfast</b>	2 tablespoons fresh fruit juice mixed with clean, boiled water 1 cup porridge with milk 1 small slice of bread with butter or margarine 1 small glass of milk
<b>Mid-morning snack</b>	1 small banana 1 glass of boiled or treated water 1 slice of bread with butter or margarine
<b>Lunch</b>	½ cup of mashed meat, chicken or fish 3 tablespoons boiled vegetables ½ cup of yoghurt or <i>maheu</i> 1 glass of boiled or treated water
<b>Afternoon snack</b>	1 small glass of milk or <i>maheu</i> ½ cup of finely chopped mango 1 small carrot, chopped fine 1 glass of boiled or treated water
<b>Dinner</b>	Minced meat, chicken or fish in gravy ½ cup of mashed potatoes or sweet potatoes or <i>nshima</i> ½ cup of pumpkin or cassava leaves, chopped fine 1 small banana

## **SESSION 9. Nutrition Support**

### **Purpose**

This session describes types of nutrition support that health facilities can provide, including prescribing specialised food products to treat malnutrition.

### **Objectives**

By the end of the session, you should be able to:

1. List nutrition support health facilities can provide.
2. Describe the types and purposes of specialised food products.
3. List entry and exit criteria for specialised food products.
4. Order, store, prescribe, record and report on NACS commodities.
5. Refer malnourished clients to other needed support.

### **Materials**

- **Handout 9.1. Recommended Micronutrient Supplements in Zambia**
- **Handout 9.2. Specialised Food Products**
- **Worksheet 9.3. Specialised Food Product Exercise**
- **Handout 9.4. Specialised Food Product Entry, Transition and Exit Criteria**
- **Handout 9.5. Counselling Messages on Specialised Food Products**
- **Handout 9.6. Specialised Food Product Logistics and Supply Chain Management**

## HANDOUT 9.1. Recommended Micronutrient Supplements in Zambia

The following vitamin and mineral supplements are recommended to prevent micronutrient deficiencies:

### Vitamin A for children

Group	Dosage	Amount of vitamin A given	
Non-breastfed infant 0–5 months	50,000 IU	½ the blue capsule	Do NOT give the red capsule to this age group.
Infants 6–11 months, including breastfed HIV-positive infants	100,000 IU	All drops in one blue capsule	Give ½ of the dose in one red capsule.
Child 12–59 months, including breastfed HIV-positive children	200,000 IU	All drops in two blue capsules	Give all drops in one red capsule.
Infants of HIV-positive mothers who are not breastfed	50,000 IU	½ the blue capsule	Do NOT give the red capsule.

### Iron and folate for pregnant and postpartum women

- Daily antenatal iron and folic acid supplementation starting early in pregnancy and continuing until 3 months postpartum or post-abortion to prevent anaemia (defined as Hb levels < 11 g/dL or no pallor).
- Iron/folate supplementation for adolescent girls 12 years and older through schools
- Iron supplementation to treat moderate anaemia (Hb 7–11 g/dL or pallor of the conjunctiva or palms) and severe anaemia (Hb < 7 g/dL and/or severe pallor of the conjunctiva and palm or any pallor with > 30 breaths per minute, breathlessness at rest or easy feeling of tiredness). Pregnant women with severe anaemia should be referred to a hospital and monitored after 2 weeks.

<b>Iron and folate for pregnant and postpartum women</b>		
<b>Group</b>	<b>Non-anaemic women (prevention of anaemia)</b>	<b>Women with anaemia (treatment)</b>
<b>Pregnant women (regardless of HIV status)</b>	1 tablet of 200 mg iron daily 1 tablet of 5 ug folic acid daily throughout pregnancy 60 mg of elemental iron and 400 ug of folic acid daily for 6 months after the first trimester	1 tablet of iron 3 times a day 1 tablet of folic acid daily for 3 months 60 mg of elemental iron and 400 ug of folic acid twice a day for 6 months after the first trimester
<b>Postpartum women</b>	200,000 IU no later than 6 weeks after delivery plus 200 mg of ferrous sulphate and 5 mg of folic acid	

### **Zinc for children with diarrhoea**

Zinc supplements for children with diarrhoea can reduce the duration and severity of diarrhoea and provide protective effects 2–4 months following the episode.

## HANDOUT 9.2. Specialised Food Products

The aim of nutrition care and support is to improve nutritional status and minimise wasting. Malnourished clients may need special high-energy foods to help them recover from severe acute malnutrition (SAM) or prevent clients with moderate malnutrition from becoming severely malnourished. These foods are called specialised food products. They are designed specifically to treat malnutrition.

### Types of specialised food products

#### 1. Therapeutic food

- F-75 and F-100 therapeutic milks for inpatient treatment of SAM
- RUTF packaged in 92 g packets that provide 500 kcal each (or 543 kcal/100 g)

#### 2. Supplementary food

- High-energy protein supplement (HEPS) packaged in 100 g bags

### Purpose of specialised food products

- Manage severe and moderate undernutrition.
- Improve adherence to ART or TB treatment.
- Improve the effectiveness of medicines and help manage side effects.
- Improve birth outcomes of HIV-positive pregnant women and promote HIV-free survival of infants and children.
- Improve functioning and quality of life.

**IMPORTANT! Specialised food products are not appropriate for babies under 6 months** because they can interfere with exclusive breastfeeding and are not nutritionally adequate for babies on exclusive replacement feeding.

### Target groups for specialised food products

1. HIV-affected children 6–23 months regardless of HIV or nutritional status
2. Malnourished HIV-positive children 24 months–14 years
3. Malnourished HIV-positive adolescents and adults, including pregnant and postpartum women

Health care providers should be careful not to make clients dependent on specialised food products as gifts or benefits. They are strictly used to treat malnutrition and can only be provided to clients who meet strict entry criteria. These criteria must be communicated to clients and posted where clients can easily see them.

## WORKSHEET 9.3. Specialised Food Product Exercise

Question	RUTF	HEPS
1. Name of the specialised food product		
2. Number of grams in the packet		
3. Total kilocalories per packet		
4. Micronutrients		
5. Level of Recommended Dietary Allowance (RDA) of most of the micronutrients		
6. Is water needed for preparation? (Y/N)		
7. Is water needed when you eat the food? (Y/N)		
8. Taste, consistency and texture		
9. Expiry date		

1. If water is needed to prepare or eat these foods, what problems might clients face?

What are the possible solutions?

2. What challenges might clients face in using these foods at home?

What are the possible solutions?

## HANDOUT 9.4. Specialised Food Product Entry, Transition and Exit Criteria

Target group	Entry criteria	Prescription (RUTF in 92 g packets providing 500 kcal, HEPS in 100 g bags)	Transition/exit criteria
Infants < 6 months	<p><b><u>Severe acute malnutrition (SAM)</u></b></p> <p>Any pitting oedema</p> <p><b>OR</b></p> <p>Recent weight loss or failure to gain weight</p> <p><b>OR</b></p> <p>Danger sign (inability to drink or breastfeed, severe vomiting, convulsions, lethargy, unconsciousness)</p> <p><b>OR</b></p> <p>Ineffective feeding (positioning, attachment, suckling)</p> <p><b>OR</b></p> <p>Any medical or social issue needing more detailed assessment or intensive support (e.g., disability, depressed caregiver, other adverse social circumstances)</p>		Admit all infants < 6 months of age with SAM for inpatient treatment and follow national treatment protocol.

Target group	Entry criteria	Prescription (RUTF in 92 g packets providing 500 kcal, HEPS in 100 g bags)	Transition/exit criteria																																			
Children 6–23 months	<p><b>Severe acute malnutrition (SAM)</b></p> <p>Bilateral pitting oedema of any grade</p> <p><b>OR</b></p> <p>WHZ &lt; -3</p> <p><b>OR</b></p> <p>MUAC &lt; 11.5 cm</p>	<p>Outpatient treatment: 200 kcal/kg/day of RUTF to last until the next visit. See dosage table below.</p> <table border="1"> <thead> <tr> <th colspan="3">RUTF dosage table: Number of 92 g sachets</th> </tr> <tr> <th rowspan="2">Weight (kg)</th> <th colspan="2">200 kcal/kg/day</th> </tr> <tr> <th>Per day</th> <th>Per week</th> </tr> </thead> <tbody> <tr> <td>3.0–3.5</td> <td>1</td> <td>7</td> </tr> <tr> <td>3.5–3.9</td> <td>1½</td> <td>11</td> </tr> <tr> <td>4.0–4.9</td> <td>2</td> <td>14</td> </tr> <tr> <td>5.0–6.9</td> <td>2½</td> <td>18</td> </tr> <tr> <td>7.0–8.4</td> <td>3</td> <td>21</td> </tr> <tr> <td>8.5–9.4</td> <td>3½</td> <td>25</td> </tr> <tr> <td>9.5–10.4</td> <td>4</td> <td>28</td> </tr> <tr> <td>10.5–11.9</td> <td>4½</td> <td>32</td> </tr> <tr> <td>12 +</td> <td>5</td> <td>35</td> </tr> </tbody> </table>	RUTF dosage table: Number of 92 g sachets			Weight (kg)	200 kcal/kg/day		Per day	Per week	3.0–3.5	1	7	3.5–3.9	1½	11	4.0–4.9	2	14	5.0–6.9	2½	18	7.0–8.4	3	21	8.5–9.4	3½	25	9.5–10.4	4	28	10.5–11.9	4½	32	12 +	5	35	<p><b>Transition to MAM if:</b></p> <p>No bilateral pitting oedema for more than 2 weeks</p> <p><b>OR</b></p> <p>WHZ ≥ -3</p> <p><b>OR</b></p> <p>MUAC ≥ 11.5 cm</p>
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<p>All HIV-exposed children regardless of nutritional status</p>		<p>Exit non-malnourished HIV-exposed children at 24 months.</p>																																				



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Children and adolescents 2–17 years	<p><b>SAM</b></p> <p>Bilateral pitting oedema of any grade</p> <p><b>OR</b></p> <p>WHZ &lt; –3</p> <p><b>OR</b></p> <p>MUAC</p> <p>24–59 months: &lt; 11.5 cm</p> <p>5–9 years: &lt; 13.5 cm</p> <p>10–14 years: &lt; 16.0 cm</p> <p>15–18 years: &lt; 18.5 cm</p>	<p><b>Outpatient treatment</b></p> <p>24–59 months: 200 kcal/kg/day to last until next visit</p> <p>5–10 years: 100 kcal/kg/day to last until next visit</p> <p>11–14 years: 75 kcal/kg/day to last until next visit</p> <p>15–17 years: 2 packets to last until next visit</p> <table border="1"> <thead> <tr> <th colspan="7">RUTF dosage table</th> </tr> <tr> <th rowspan="3">Weight (kg)</th> <th colspan="2">24–59 months</th> <th colspan="2">5–10 years</th> <th colspan="2">11–17 years</th> </tr> <tr> <th colspan="2">200 kcal/kg/day</th> <th colspan="2">100 kcal/kg/day</th> <th colspan="2">75 kcal/kg/day</th> </tr> <tr> <th>Per day</th> <th>Per week</th> <th>Per day</th> <th>Per week</th> <th>Per day</th> <th>Per week</th> </tr> </thead> <tbody> <tr> <td>3.0–3.5</td> <td>1</td> <td>7</td> <td>½</td> <td>3½</td> <td>½</td> <td>3</td> </tr> <tr> <td>3.5–3.9</td> <td>1½</td> <td>11</td> <td>¾</td> <td>6</td> <td>½</td> <td>4¼</td> </tr> <tr> <td>4.0–4.9</td> <td>2</td> <td>14</td> <td>1</td> <td>7</td> <td>¾</td> <td>5¼</td> </tr> <tr> <td>5.0–6.9</td> <td>2½</td> <td>18</td> <td>2¼</td> <td>9</td> <td>1</td> <td>6¾</td> </tr> <tr> <td>7.0–8.4</td> <td>3</td> <td>21</td> <td>1½</td> <td>11</td> <td>1¼</td> <td>8</td> </tr> <tr> <td>8.5–9.4</td> <td>3½</td> <td>25</td> <td>1¾</td> <td>13</td> <td>1½</td> <td>9½</td> </tr> <tr> <td>9.5–10.4</td> <td>4</td> <td>28</td> <td>2</td> <td>14</td> <td>1½</td> <td>10½</td> </tr> <tr> <td>10.5–11.9</td> <td>4½</td> <td>32</td> <td>2¼</td> <td>16</td> <td>1¾</td> <td>12</td> </tr> <tr> <td>12–19.9</td> <td>5</td> <td>35</td> <td>2½</td> <td>18</td> <td>2</td> <td>14</td> </tr> </tbody> </table>	RUTF dosage table							Weight (kg)	24–59 months		5–10 years		11–17 years		200 kcal/kg/day		100 kcal/kg/day		75 kcal/kg/day		Per day	Per week	Per day	Per week	Per day	Per week	3.0–3.5	1	7	½	3½	½	3	3.5–3.9	1½	11	¾	6	½	4¼	4.0–4.9	2	14	1	7	¾	5¼	5.0–6.9	2½	18	2¼	9	1	6¾	7.0–8.4	3	21	1½	11	1¼	8	8.5–9.4	3½	25	1¾	13	1½	9½	9.5–10.4	4	28	2	14	1½	10½	10.5–11.9	4½	32	2¼	16	1¾	12	12–19.9	5	35	2½	18	2	14	<p>Transition to MAM if:</p> <p>WHZ &gt; –3</p> <p><b>OR</b></p> <p>MUAC</p> <p>24–59 months: ≥ 11.5 cm</p> <p>5–9 years: ≥ 13.5 cm</p> <p>10–14 years: ≥ 16.0 cm</p> <p>15–18 years: ≥ 18.5 cm</p> <p><b>AND</b></p> <p>No oedema for more than 2 consecutive weeks</p> <p><b>AND</b></p> <p>On RUTF for at least 8 weeks</p>
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Target group	Entry criteria	Prescription (RUTF in 92 g packets providing 500 kcal, HEPS in 100 g bags)	Transition/exit criteria
Adults (non-pregnant/postpartum)	<b><u>SAM</u></b> Bilateral pitting oedema <b>OR</b> MUAC < 18.5 cm <b>OR</b> BMI < 16.0	<b><i>Outpatient treatment</i></b> 276 g (3 packets) of RUTF/day <b>PLUS</b> 400 g (4 bags) of HEPS/day to last until next visit	<u>Transition to moderate malnutrition if:</u> Sustained weight gain <b>AND</b> no oedema for the past two visits <b>AND</b> MUAC ≥ 18.5 cm <b>OR</b> BMI ≥ 16.0
	<b><u>Moderate malnutrition</u></b> MUAC ≥ 18.5 and < 21.0 cm <b>OR</b> BMI ≥ 16.0 and < 18.5	400 g (4 bags) of HEPS/day to last until next visit	<u>Transition to normal nutritional status if:</u> MUAC ≥ 21.0 cm for the past two visits <b>OR</b> BMI ≥ 18.5 for the past two visits
Pregnant women and women ≤ 6 months postpartum	<b><u>SAM</u></b> Bilateral pitting oedema <b>OR</b> MUAC < 21.0 cm	<b><i>Outpatient treatment:</i></b> 92 g (1 packet) of RUTF/day <b>PLUS</b> 400 g (4 bags) of HEPS/day to last until next visit	<u>Transition to moderate malnutrition if:</u> MUAC ≥ 21.0 cm
	<b><u>Moderate malnutrition</u></b> MUAC 21.0–< 23.0 cm <b>OR</b> If pregnant: Weight loss for the past two visits	400 g (4 bags) of HEPS/day to last until next visit	<u>Transition to normal nutritional status if:</u> MUAC ≥ 23.0 cm <b>AND (if pregnant)</b> Weight gain for the past two visits

## HANDOUT 9.5. Counselling Messages on Specialised Food Products

### How to use ready-to-use therapeutic food (RUTF)

- Do NOT share the RUTF with others in the family. It is meant to treat severe malnutrition, and without the full amount prescribed, you or your child will not recover.
- If breastfeeding, continue to breastfeed before giving RUTF. Offer breast milk first before RUTF.
- Adults should complete the whole daily ration of RUTF before eating any other foods. Children who are prescribed RUTF should NOT be given any other food except breast milk until they are recovering well.
- Use soap and clean running water to wash your hands and/or the child's hands before feeding or eating the RUTF.
- Malnourished children often don't like to eat. Encourage them to eat the RUTF often (5–6 times a day).
- Do not stop eating or feeding children RUTF in case of diarrhoea.
- RUTF causes thirst, and you or your child will have to drink more than usual when eating it.
- Tell a health care provider if the child has diarrhoea, vomiting or other symptoms while eating RUTF.
- Return to the health facility whenever you're or your child's condition gets worse or your child is not eating enough.
- If the whole packet is not finished, roll it up after every use. Put the rest into a sealed plastic bag until it's time for the next dose.
- Keep the RUTF in a dry place out of the reach of other people, animals, insects and sun (e.g., in a covered basket raised above the ground or a closed pot or cupboard).
- Do not burn or throw away the empty packets, which will pollute the environment. When you pick up your next prescription, take the empty packets back to the health facility, which will dispose of them safely.

### How to use high-energy protein supplement (HEPS)

- Do NOT share the HEPS with others in the family. It has been prescribed to treat malnutrition, and the full amount is needed for that purpose. Otherwise, moderate malnutrition can become severe malnutrition, which is much more serious.
- Cook the HEPS using boiled or treated water after washing your hands thoroughly. Boil the HEPS, stirring continuously. Add more water if the porridge is too thick.
- Eat or feed your child the full daily ration that was prescribed.
- Tell a health care provider if diarrhoea, vomiting or other symptoms are experienced while eating HEPS.
- Keep the HEPS in a dry place out of the reach of other people, animals, insects and sun, for example, in a covered basket raised above the ground or a closed pot or cupboard.
- Do not burn or throw away the empty packets, which will pollute the environment. When you pick up your next prescription, take the empty packets back to the health facility, which will dispose of them safely.

## HANDOUT 9.6. Specialised Food Product Logistics and Supply Chain Management

### 1. Receiving supplies

When specialised food products arrive at the district warehouse or health facility, the person in charge of receiving them should:

- a. Collect the supplies from the warehouse using an **Internal Requisition Form** signed by the facility in-charge. The Internal Requisition Form Book should be taken to the warehouse every time a facility goes to pick up specialised food products.
- b. Inspect the **Delivery Note or Dispatch Note** to make sure it matches the supplies received. Record any damaged or missing supplies on the Delivery Note or Dispatch Note.
- c. For each delivery, verify the **Certificate of Analysis**.
- d. Check the expiry date to make sure the items have not expired. Check the batch numbers on the supplies. Sign the Delivery Note. Keep one copy in the file and send another copy back with the transporter.
- e. Enter the goods received in good condition on a **Goods Received Note**. The Goods Received Note should stay at the warehouse or health facility. It is an auditable document.

### 2. Recording stock

Fill out a **Stock Record Card** every time specialised food products are received at the health facility. Fill out separate stock cards for RUTF and HEPS. Enter only one transaction on each line. This card shows what supplies are received and what supplies are issued each day. It should stay with the supplies on the shelf in the store room or pharmacy. Update this card every time specialised food products are dispensed.

When both sides of the Stock Record Card are full, attach a new one to the top of the old one. Write 'B/F' for 'balance brought forward' on the first line. Write the quantity brought forward from the old card in the first Quantity Received space in the new card. At the end of each month, skip a line, leave it blank and start recording the next month's transactions on the next line.

Update Stock Record Cards every time supplies are issued (or once a month). Check them regularly to make sure the information on the cards matches the actual supplies. If not, report the difference to the in-charge.

### 3. Storing specialised food products

RUTF and HEPS must be stored carefully to protect their quality and make them easily available for use. Storage space should be:

- Well-lit
- Ventilated
- Dry
- Free of insects and rodents

Store specialised food products:

- Away from equipment, chemicals, medicines and other supplies if possible
- On pallets at least 10 cm off the ground and stacked no higher than 2.5 m high
- With arrows pointing up and expiry date and product name clearly visible
- With new stock in back of old stock

Only authorized people should have access to the store room.

Use **FIFO** ('first in/expired, first out') procedures. Never use expired products.

### 4. Prescribing and dispensing specialised food products

Write a new **Prescription Form** every time you prescribe specialised food products for a malnourished client.

Clients should take the Prescription Forms to the dispenser to be filled. The dispenser should keep all the Prescription Forms in a box file for future audit.

The dispenser should give each malnourished client a **Ration Card** with the kind and amount of products prescribed and dispensed and sign it.

### NACS RATION CARD

Facility name

District

Client name

Client no.

Address

Telephone

Visit no.	Weight (kg)	Target weight (kg)	RUTF (92 g sachets)			HEPS (100 g bags)			Chlorine (250 g bottles)	Date to return to clinic (or date of discharge)	Signature
			# prescribed	# received	Amount to eat per day	# prescribed	# received	Amount to eat per day			

Clients should bring back their Ration Cards on every visit for the dispenser to update. When clients are discharged, attach the Ration Cards to their files in the health facility.

The pharmacist or other person who gives out specialised food products should fill out the **Master Beneficiary Register** with the type and amount prescribed and dispensed. This register stays in the pharmacy or other point where commodities are dispensed.

### 5. Reordering specialised food products

The in-charge or pharmacist should use the **Internal Requisition Form** or **Supply Voucher** to order supplies. The in-charge should sign the completed form or voucher and give it to the District Nutritionist for counter-signature.



MINISTRY OF HEALTH

KITWE DISTRICT HEALTH OFFICE

#### SUPPLY VOUCHER

TO (Name of Store): \_\_\_\_\_

FROM (Health Centre): \_\_\_\_\_

Requested by: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Authorized by: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

ITEM CODE	UNIT	STOCK ON HAND	QUANTITY RECEIVED	AVERAGE MONTHLY CONSUMPTION	QUANTITY ORDERED	QUANTITY SUPPLIED	REMARKS

APPROVED BY \_\_\_\_\_ ISSUED BY \_\_\_\_\_ DELIVERED BY \_\_\_\_\_ RECEIVED BY \_\_\_\_\_

SIGNATURE \_\_\_\_\_ SIGNATURE \_\_\_\_\_ SIGNATURE \_\_\_\_\_ SIGNATURE \_\_\_\_\_

DATE \_\_\_\_\_ DATE \_\_\_\_\_ DATE \_\_\_\_\_ DATE \_\_\_\_\_

## **6. Disposing of empty or damaged specialised food product packets**

The packaging of RUTF and HEPS is not biodegradable and will pollute the environment. Counsel clients NOT to burn or throw away the empty packets. Instead, ask them to take them back to the health facility for disposal.

Notify the Environmental Health Team if any specialised food products are damaged or expired so they can dispose of them safely.

## **SESSION 10. Visit to a Health Facility**

### **Purpose**

In this session, you will observe and assess NACS services in a clinic or community setting.

### **Objectives**

By the end of the session, you should be able to:

1. Assess the content, quality and delivery of NACS services you observed.
2. Discuss how you can apply the knowledge and skills learned in this course to provide NACS services in your workplace.

### **Materials**

- **Handout 10.1. Site Visit Guide**



## HANDOUT 10.1. Site Visit Guide

1. What NACS services are provided in this health facility?
2. Who does nutrition assessment in the facility?
3. How is nutrition integrated into different services?
4. What job aids and guidelines, if any, do health care providers use to assess and counsel clients?
5. What nutrition messages, if any, did you hear health care providers give to clients? Were the messages correct?
6. What nutrition data does the facility collect? Using what forms?
7. What challenges do the health care providers face in providing NACS services?
8. How do they address the challenges?
9. How do you think the facility could improve the quality of NACS services?
10. Record weight; height; either WHZ, BMI or MUAC; and counselling messages given for at least 3 clients you assess.

### Results

Age	Height	Weight	WHZ	BMI	MUAC	Counselling message

## **SESSION 11. Household Food Security and Nutrition**

### **Purpose**

This session will help you understand how food insecurity can affect clients' nutritional status and what kinds of support can improve their household food security.

### **Objectives**

By the end of the session, you should be able to:

1. Describe how food insecurity can affect nutrition.
2. Discuss how to help clients improve their food security.

### **Materials**

- *Nutrition Guidelines for Care and Support of People with HIV*
- **Handout 11.1. Support to Improve Access to Food**

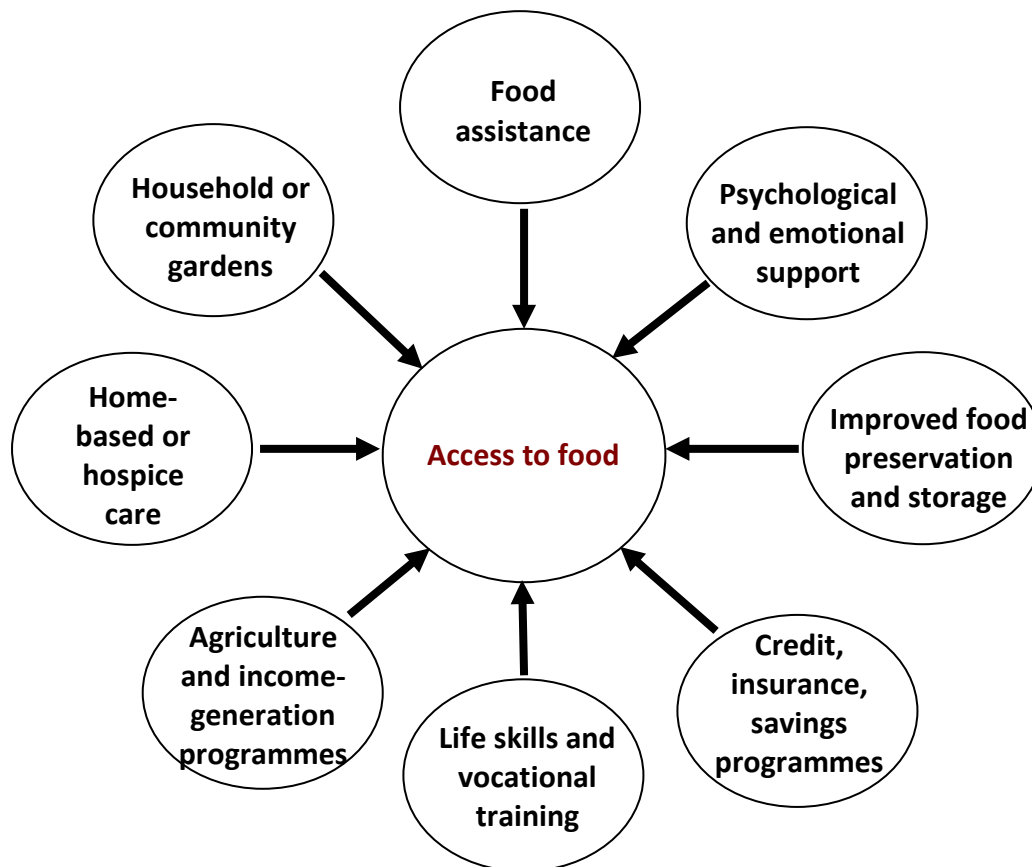
## HANDOUT 11.1. Support to Improve Access to Food

Food security means all people at all times having sufficient, safe and nutritious foods that meet their needs for an active and healthy life.

Food security has four components.

- **Availability**—Enough nutritious food at all times
- **Access**—Enough money to buy nutritious foods to maintain good health.
- **Utilisation**—Proper use of nutrients by the body, good care and feeding practices, food preparation, diversity of the diet and equitable distribution of food to all members of the household
- **Stability**—The other three components are not affected by adverse weather, political instability or economic factors (unemployment, rising food prices)

The actions in the figure below can help people with HIV get access to the nutritious food they need to stay healthy and maximise the effectiveness of treatment.



Source: WHO and FAO 2007

## **SESSION 12. Health Facility-Community Linkages**

### **Purpose**

This session will help you understand the need for continuum of care between health facilities and community support services to improve clients' nutritional status.

### **Objectives**

By the end of the session, you should be able to:

1. Explain why it is important to follow up malnourished clients to ensure they recover from malnutrition and are not lost to follow-up.
2. Refer clients to medical or community support services.
3. Receive clients needing medical care referred from the community.

### **Materials**

- *Nutrition Guidelines for Care and Support of People with HIV*
- **Handout 12.1. Health Facility-Community Linkages**
- **Handout 12.2. Continuum of Care**
- **Handout 12.3. Types of Community- and Home-Based Care**
- **Handout 12.4. Sample Referral Form**

## HANDOUT 12.1. Health Facility-Community Linkages

The needs of people at risk of malnutrition cannot all be met by health facilities alone. Health facilities are often under-resourced and far from where clients live. Clients may need support that is not related to health and may respond better to non-medical people.

Communities can support delivery of health services in many ways to improve the quality of care. They can disseminate information on good health practices, provide counselling and psychosocial/spiritual support, help clients follow health care providers' advice and adhere to prescribed medications and make sure that people attend health facilities when ill and do not miss follow-up appointments.

Community **prevention and treatment literacy** is knowing how to prevent disease and understanding the reasons for and types of medical care needed. Community support can encourage community members to seek medical treatment when needed and help health facilities provide effective services.

Community involvement in NACS can be formal or informal. **Formal** community structures include:

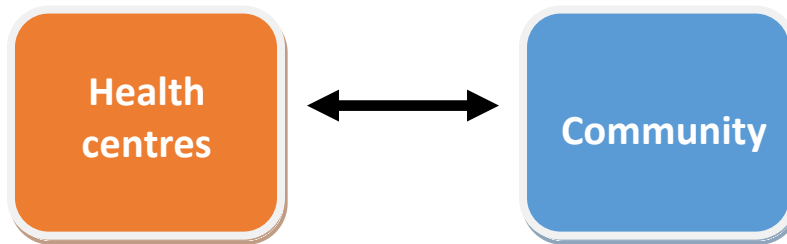
- Community-based organisations
- Faith-based organisations
- Community health workers supervised by health facility staff or NGOs
- Supporters of TB-DOTS (directly observed TB treatment, short course)
- Peer counsellors for high-risk groups
- Home-based and palliative care providers

**Informal** community resources include support groups, friends, families and peers. **Peer support groups** can help with treatment support, providing information and allowing members to discuss both positive and negative experiences. They can help people deal with side effects of illness and feelings of isolation. They can be either facility or community based. Support groups can help people with chronic illnesses such as HIV and TB deal with the psychosocial impact of illness.

Community members can help **track and follow up** clients who do not return for scheduled health facility appointments. Follow-up mechanisms include home visits and mobile phone reminders. Clients must consent to this tracking, which must be confidential.

## HANDOUT 12.2. Continuum of Care

Continuum of care is the core of good client care. NACS aims to provide nutrition services appropriate to clients' needs at both the facility and community level.



Health facilities provide nutrition assessment using MUAC, WHZ or BMI and either treat malnourished clients or refer them for treatment.

The continuum of care between health facilities and communities links prevention, treatment and follow-up. Health facility staff need to follow up malnourished clients to make sure they are adhering to treatment and recovering. Community health workers and health facility staff should jointly review the progress of malnourished clients who were referred to health facilities and clients who were referred back to community support services.

### Client follow-up

Clients should be followed up continually both in the health facility and in the community.

1. **Health care providers** should monitor clients' nutritional status on every visit, including:
  - Measuring MUAC
  - Checking child growth cards
  - Assessing for bilateral pitting oedema.
  - Assessing food availability and dietary intake
  - Demonstrating how to make nutritious meals with locally available foods
  - Demonstrating specialised food product preparation and use
  - Counselling on the Critical Nutrition Actions
  - Counselling on dietary management of symptoms and medication side effects
  - Providing infant and young child feeding counselling and support
  - Referring clients to other service providers with more skills, experience or equipment, for example:
    - For inpatient treatment of severe acute malnutrition with complications
    - For treatment of medical conditions such as severe vomiting, dehydration, anaemia, high fever, convulsions, hypothermia or opportunistic infections
    - For treatment of psychiatric conditions (depression, stress)
    - For food insecurity
    - For psychosocial or spiritual counselling
    - For prevention of mother-to-child transmission of HIV (PMTCT) services

- For HIV counselling and testing
- For assessment of eligibility for ART
- For economic strengthening and food security support

2. **Community volunteers** can support health facilities in identifying, referring and following up NACS clients by:

- Active case finding and screening using MUAC
- Checking child growth cards
- Referring clients to health facilities for further assessment and medical attention
- Counselling on infant and young child feeding and eating a balanced diet
- Making sure clients return for health facility appointments and don't relapse into malnutrition

### **NACS partnerships**

NACS interventions will be more sustainable if community members work with health care providers. Community volunteers can help mobilize people to attend NACS services and follow up NACS clients in the community, reducing the burden on health care providers' time. Health facilities should develop plans for working with communities in their outreach catchment areas to strengthen health and nutrition activities. This can help make NACS services accessible and appropriate to meet the needs of clients.

## HANDOUT 12.3. Types of Home-Based Care

Many families provide care and support for loved ones suffering from HIV. Home-based care (HBC) is a system to provide care and support services in the home for people suffering from prolonged illness and their families. Much of the care for people with HIV is provided at home by immediate family and friends, as well as by home-based care organizations.

### Types of home-based care

1. **Facility-based or outreach HBC.** Health care providers visit people with HIV in their homes to provide prevention, care and support services.
2. **Community-based HBC.** Volunteers provide basic nursing care as well as emotional and spiritual support to clients and families. They are linked to health facilities for professional support, referral, monitoring, supervision and supplies.
3. **Hospice (nursing home).** Health care providers or social workers provide care and support to chronically ill and aged clients who can no longer be taken care of by relatives at home or stay in a hospital. Because the services can be very expensive, community and family members are often expected to contribute to upkeep costs.
4. **Palliative care.** Palliative care improves the quality of life for clients and families facing life-threatening illness by preventing and relieving suffering through early identification, assessment and treatment of pain and other physical, psychosocial and spiritual problems, in addition to nutrition care and support.



## HANDOUT 12.4. Sample Referral Form

Name of health facility: \_\_\_\_\_

Name of client: \_\_\_\_\_ Date: \_\_\_\_\_

Age: \_\_\_\_\_ Sex: \_\_\_\_\_

Hospital number: \_\_\_\_\_

Date last seen: \_\_\_\_\_

Nutrition assessment notes:

Reasons for referral:

Name of service provider: \_\_\_\_\_

Signature of service provider: \_\_\_\_\_

(Cut here ✂)

### Feedback

Name: \_\_\_\_\_ Ref. #: \_\_\_\_\_

Date client received: \_\_\_\_\_

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Signature: \_\_\_\_\_ Title: \_\_\_\_\_

Place/facility: \_\_\_\_\_

## **SESSION 13. NACS Data Collection and Reporting**

### **Purpose**

This session explains the importance of nutrition data and the process of NACS data collection and reporting.

### **Objectives**

By the end of the session, you should be able to:

1. Explain the purpose of collecting NACS data.
2. Identify NACS indicators.
3. Describe NACS monitoring and reporting requirements.
4. Complete data collection and reporting forms accurately.
5. Interpret nutrition data.

### **Materials**

- **Handout 13.1. NACS Data Management**
- **Handout 13.2. Instructions for Filling out the Nutrition Register**
- **Handout 13.3. NACS Client Card**

## HANDOUT 13.1. NACS Data Management

Monitoring and evaluation (M&E) information can be used to inform and improve programme design, management and supervision and to report results (outcomes and impacts) of food and nutrition interventions for accountability and advocacy for support and expansion of effective approaches. Collecting nutrition-related information from clients is an important component of nutrition care and support. It is used to monitor the nutritional status and survival outcomes of people with HIV and assess the impact of interventions on nutritional and health status. It also helps increase awareness among people with HIV, counsellors and other service providers of the impact of improved dietary practices and treatment of malnutrition, thereby supporting care, treatment and counselling.

### Purpose of data collection

- Inform and improve programme design, implementation, supervision and management.
- Share information with other programs and stakeholders to improve programming and support advocacy for nutrition services.
- Report progress and results to national governments, donors and others.
- Inform and educate clients about progress in nutritional and functional status as part of treatment, care and counselling.
- Inform service providers and counsellors of client status and progress to guide service provision.
- Determine eligibility of clients for services such as food by prescription.
- Evaluate the impact of policy and services.
- Inform resource allocation.

### Steps for collecting data

1. Understand the data to be collected.
2. Record the data on every client visit on appropriate forms.
3. Record all the data requested on the forms, including noting when a service was not provided.
4. Record the data in the same way every time. Data should be consistent and reliable. When it is not possible to record the same data in the same way, make a note that describes the changes.
5. Keep the information confidential. Information should be kept under lock and key, especially if clients' names are recorded. Unless it is for health care purposes, do not share the information with other people without clients' permission.
6. At the end of each month, complete the monthly report using the data from the register and submit the report on time.

### Challenges in data collection and management

- Clients may feel that the questions health care providers ask are intrusive or exploitative.
- Collecting data takes a lot of time and increases health care providers' workloads.

- It may not be clear who is responsible for collecting and reporting nutrition data if there is no nutritionist in the health facility.
- Health care facilities may lack standard data collection tools.
- Weak data collection systems generate incomplete and inaccurate data that may be useless for decision making at health facility, district, or central level.
- Data collectors may lack support from supervisors.
- Health facilities and programmes may not receive feedback on the data they collect and submit to higher levels.
- Data analysis skills may be weak.
- Changes in nutritional status or other outcomes cannot be attributed to NACS only.
- Changes in the client base resulting from client entry, graduation and dropouts may affect the interpretation of results.
- Data on defaulting clients remain incomplete.

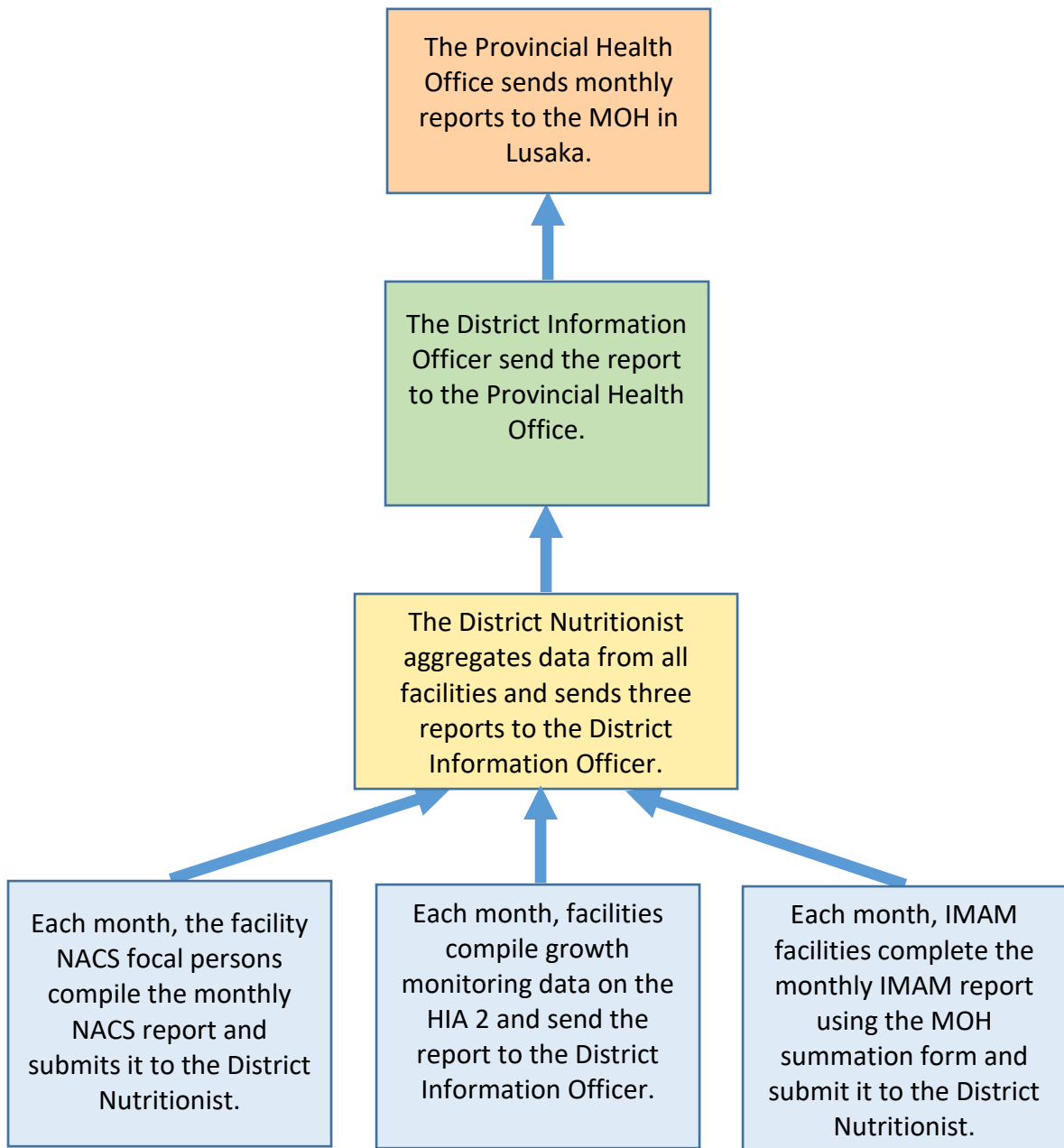
## HANDOUT 13.2. Instructions for Filling out the Nutrition Register

Data group	Column ID	Data element	Instructions
<b>1<sup>st</sup> VISIT</b>			
Client information	(a)	Date	Write the date you first see the client using mm/dd/yyyy.
	(b)	Service number (e.g., under 5, SMH, ART no.)	Use serial numbers, beginning with the first client seen that year.
	(c)	Client type code	Enter only one code: O for orphans and vulnerable children (OVC), P for pregnant, L for lactating, PL for people with HIV or N/A if the client does not belong to any of the above.
	(d)	Name	Write the client's name.
	(e)	Address	Write the client's address, including the community or area and house number if known.
	(f)	Sex	Write M for male or F for female.
	(g)	Date of birth	Write the client's date of birth using mm/dd/yyyy.
HIV status	(h)	HIV status	Tick the appropriate box (positive, negative, unknown).
Anthropometric measures	(i)	Weight	Write the client's weight on this visit in kg.
		Height	Write the client's height on this visit in cm.
		Body mass index (BMI)	Write the BMI for non-pregnant/non-lactating clients 15 years and older.
		Weight-for-height z-score (WHZ)	Write the WHZ for children under 5 years.
		Mid-upper arm circumference (MUAC)	Write the client's MUAC in cm.
		Bilateral pitting oedema	Write Y for yes or N for no.
Nutritional status	(j)	Nutritional status	Tick the appropriate box (SAM, MAM, overweight/obese).
Nutrition counselling	(k)	Counselled on nutrition?	Write Y for yes or N for no.
Nutrition support	(l)	Specialised food products	Tick the appropriate box for each kind of specialised food product prescribed (F-75, F-100, RUTF, HEPS).
		Micronutrients	Tick if micronutrient supplements were provided.
		Deworming	Tick if deworming medication was provided.
Infant feeding practice	(m)	Infant feeding practice	Tick all boxes that apply (exclusive breastfeeding, exclusive replacement feeding, mixed feeding, breast conditions).
Date of next	(n)	Date of next visit	Write the date of the client's next

Data group	Column ID	Data element	Instructions
visit			appointment using mm/dd/yyyy.
<b>2<sup>nd</sup> TO 6<sup>th</sup> VISITS</b>			
Date of follow-up visit	(o)	Date of next appointment	Write the date you next see the client using mm/dd/yyyy.
Anthropometric measures	(i)	Weight	Write the client's weight on this visit in kg.
		Height	Write the client's height on this visit in cm.
		Body mass index (BMI)	Write the BMI for non-pregnant/non-lactating clients 15 years and older.
		Weight-for-height z-score (WHZ)	Write the WHZ for children under 5 years.
		Mid-upper arm circumference (MUAC)	Write the client's MUAC in cm.
		Bilateral pitting oedema	Write Y for yes or N for no.
Nutritional status	(j)	Nutritional status	Tick the appropriate box (SAM, MAM, overweight/obese).
Nutrition counselling	(k)	Counselled on nutrition?	Write Y for yes or N for no.
Nutrition support	(l)	Specialised food products	Tick the appropriate box for each kind of specialised food product prescribed (F-75, F-100, RUTF, HEPS).
		Micronutrients	Tick if micronutrient supplements were provided.
		Deworming	Tick if deworming medication was provided.
Outcome code	(t)	Outcome of treatment for malnutrition	Fill out this column whenever the client graduates successfully from treatment of malnutrition (1), fails to respond to treatment (2), does not return for 2 consecutive appointments (3), is lost to follow-up (4), died (5) or is transferred to another facility (6).
Date of next visit	(n)	Date of next appointment	Write the date of the client's next appointment using mm/dd/yyyy.
Remarks	(p)		Write any comments or additional information about the client that will help you track her/his nutritional status.



## HANDOUT 13.4. NACS Reporting Flow Chart





# SESSION 14. NACS Action Plans

## **Purpose:**

This session helps you make a plan to improve the quality of NACS for people with HIV in your workplace.

## **Objectives of the session:**

By the end of the session, you will have:

1. Described MOH expectations regarding NACS implementation and reporting
2. Made an action plan to integrate NACS into health services or strengthen NACS in routine services.

## **Materials**

- **Handout 14.1. NACS Action Plan Matrix**



## **SESSION 15. Post-test and Course Evaluation**

### **Purpose:**

In this session, you will take a post-test, evaluate how well the course met your expectations and suggest how to improve future courses.

### **Objectives of the session:**

By the end of the session, you will have:

1. Compared your expectations to the course objectives
2. Taken a post-test to assess how much you learned in the course
3. Completed a final course evaluation

### **Materials**

- **Handout 15.1. Course Evaluation Form**

## HANDOUT 15.1. Final Course Evaluation Form

1. Please rate each aspect of the course using the number scale below.

**1 = Excellent 2 = Very good 3 = Average 4 = Poor 5 = Very poor**

	Rating	Comments
Time allocated		
Relevance of the content to your work		
Presentation of content		
Support from facilitators		

2. Please check the boxes below for 'Yes' or 'No' for each objective of the course.

Tick Y or N. Do you feel this course gave you information and skills that will help you:

Course objectives	Y	N
1. Discuss the role of nutrition in care and treatment?		
2. Assess clients' nutritional status?		
3. Counsel clients on prevention and management of malnutrition?		
4. Prescribe specialised food products and provide other support to malnourished clients?		
5. Monitor and report on NACS services?		
<b>Facilitators:</b> Tally the number of ticks under Y and write in the box.	<input style="width: 40px; height: 20px;" type="text"/>	

3. What useful skills, knowledge and attitudes did you learn from this course?

4. I wish more time had been spent on \_\_\_\_\_.

5. I wish less time had been spent on: \_\_\_\_\_.

6. What would you recommend to improve the course?

# **ANNEX 1. Contents of the Zambia Nutrition Guidelines for Care and Support of People with HIV**

**Chapter 1.** Introduction. Background, policy and institution framework, rationale for the guidelines, targets, layout and instructions for use

**Chapter 2.** HIV and Nutrition. HIV and its progression, basic nutrition, link between nutrition and HIV, nutrition requirements of adults with HIV and the use of local or indigenous foods.

**Chapter 3.** Nutrition Care and Support for Adults with HIV. Periodic nutrition screening and assessment; ensuring adequate nutrient and energy intake; nutrition education and counselling; promotion of physical activity, safer sex and psychological support; prompt treatment of illness and symptoms that may affect food intake; nutrition supplementation where appropriate; and enteral and parental nutritional support

**Chapter 4.** Nutrition Care for HIV-Positive Pregnant and Postpartum Women. Nutritional requirements and actions

**Chapter 5.** Nutrition Care for Infants and Young Children of HIV-Positive Mothers. Feeding portions and nutrition interventions for HIV-positive children

**Chapter 6.** Nutrition and Antiretroviral Therapy (ART). Nutrition counseling for people on ART

**Chapter 7.** Food and Water Safety and Hygiene. Water and environmental hygiene and sanitation, food hygiene and sanitation and control of infectious diseases such as malaria, worms and other vectors

**Chapter 8.** Food Security in Households with People with HIV

**Chapter 9.** Community Participation in Nutrition Care and Support of People with HIV

**Chapter 10.** NACS Data Collection and Management

**Annex 1.** Macronutrients and Micronutrients Needed for Good Nutrition

**Annex 2.** Micronutrient Supplementation Recommendations for Zambia

**Annex 3.** Nutritional Benefits of Zambian Foods

**Annex 4.** Types of Nutrition Assessment

**Annex 5.** Counselling People with HIV to Maintain Desirable Weight

**Annex 6.** Dietary Management of HIV-Related Symptoms

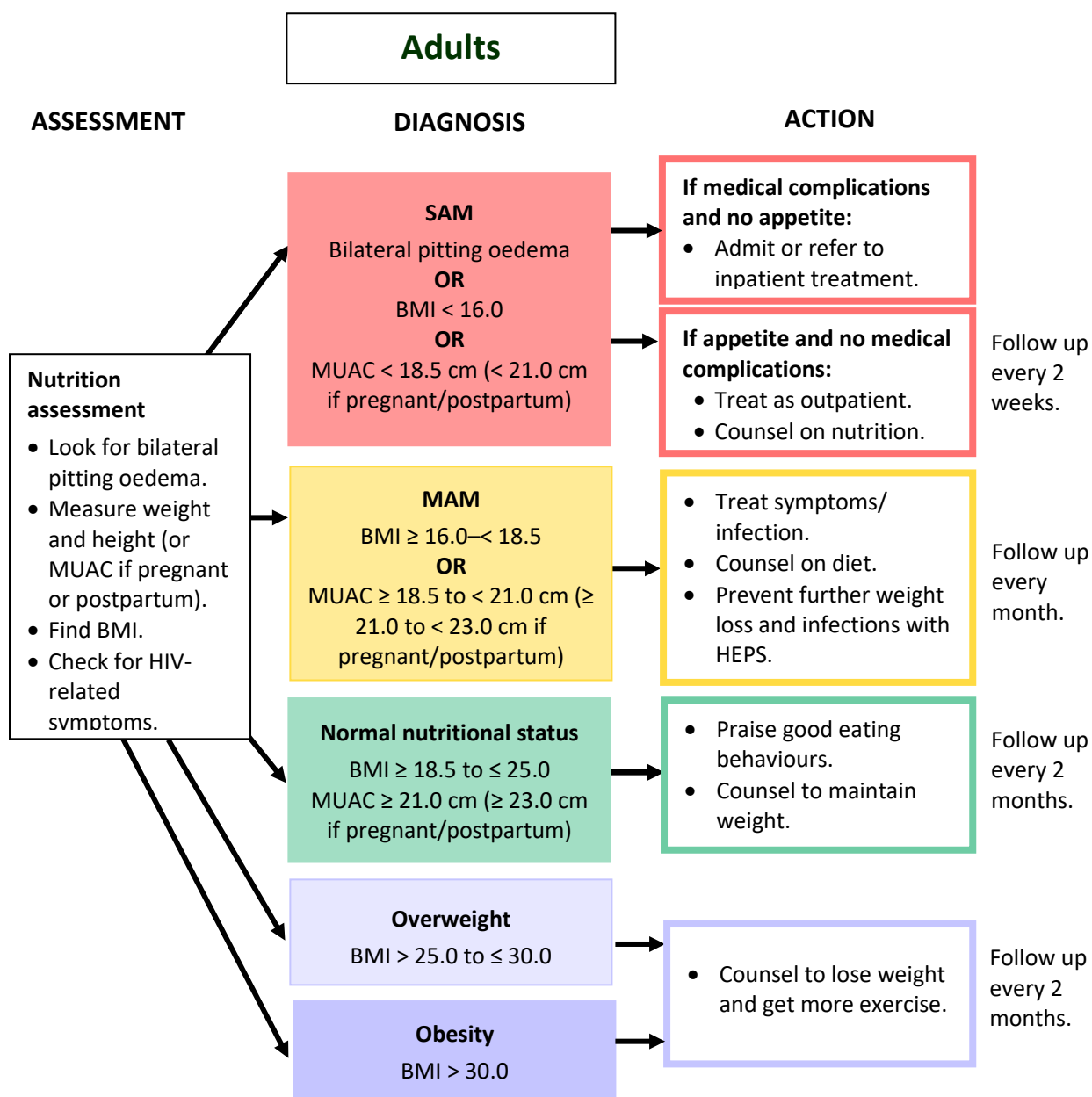
**Annex 7.** Specialised Food Product Entry, Transition and Exit Criteria

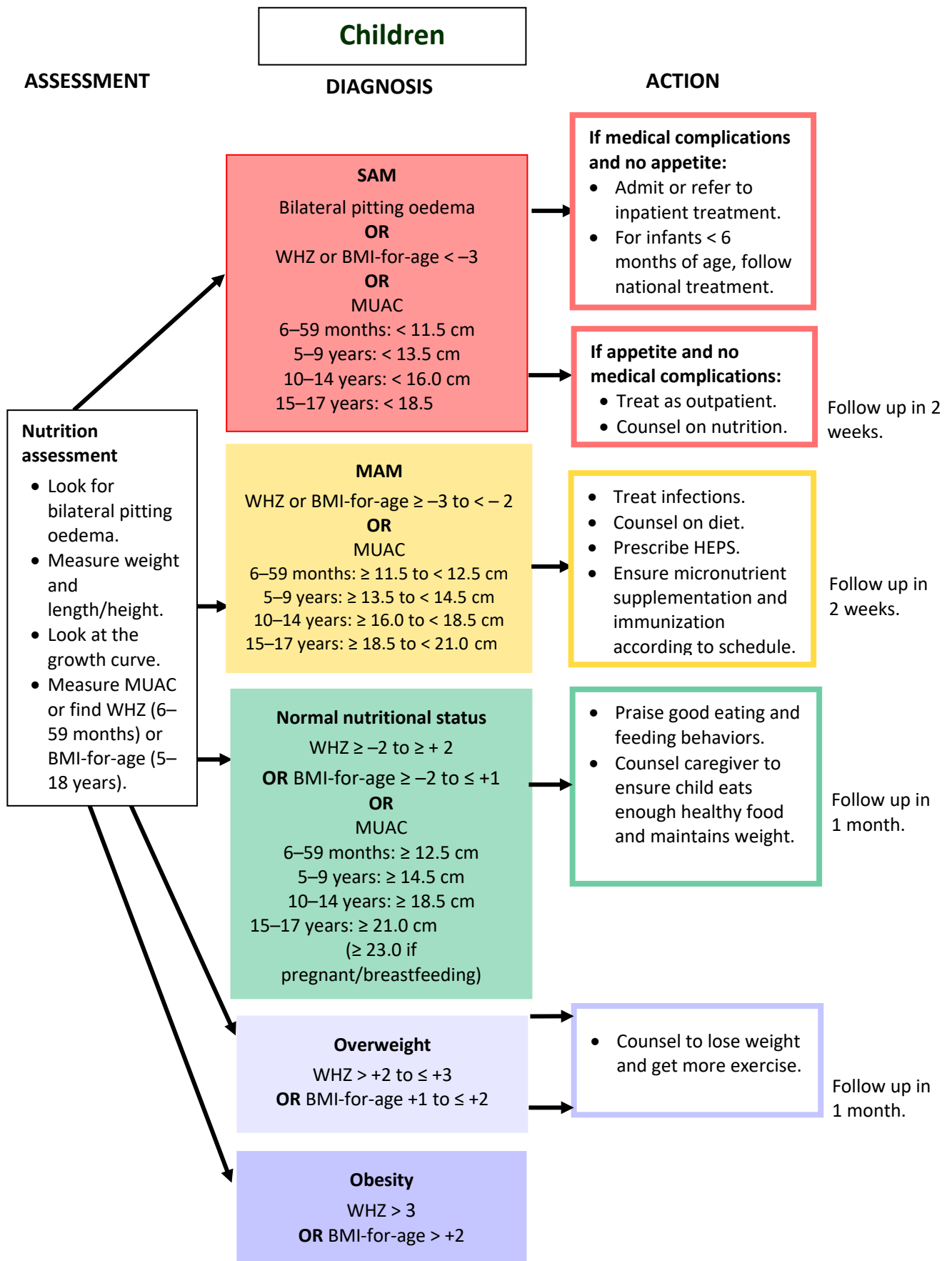
**Annex 8.** Managing Side Effects of Common HIV Medications

**Annex 9.** Counselling People with HIV on Nutrition and Antiretroviral Drugs

**Annex 10.** Common Herbs and Spices

## ANNEX 2. Algorithms for Management of Malnutrition











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