

# INTEGRATING NUTRITION ASSESSMENT, COUNSELLING, AND SUPPORT INTO HEALTH SERVICE DELIVERY

Training Course for Facility-Based Health Providers

## **REFERENCE MANUAL**



# Foreword

Malnutrition is a major public health concern in Uganda, affecting all regions of the country and most segments of the population. According to the three most recent Uganda Demographic and Health Surveys (2001, 2006, 2011), key nutrition indicators for young children and their mothers have improved. However, more improvement is needed to attain our full health, education, and economic potential. As a result, the Government of Uganda has prioritized nutrition as a key factor in human development and economic productivity, as reflected in the draft National Development Plan II (2015/16–2019/20), Uganda Vision 2040, Health Sector Strategic and Investment Plan (HSSIP) (2010–2014), and the Uganda Nutrition Action Plan (2011–2016).

The Ministry of Health and development partners have provided targeted nutrition interventions to selected districts and health facilities using the nutrition assessment, counselling, and support (NACS) approach in services for people living with HIV (PLHIV). However, to sustain and scale up nutrition interventions, there is a need to refocus and strengthen nutrition care and quality improvement in targeted districts and health facilities.

The NACS approach aims to improve the nutritional status of individuals and populations by integrating nutrition into policies, programmes, and the health service delivery infrastructure. The approach strengthens the capacity of facility- and community-based health care providers to deliver nutrition-specific services while linking clients to nutrition-sensitive interventions provided by the health, agriculture, food security, social protection, education, and rural development sectors. The NACS approach also strengthens the broader health system by improving technical capacity that can be applied to other nutrition interventions, identifying referral pathways, establishing protocols for supervision and commodity management, improving client flow within health services, and improving data management.

As part of strengthening the NACS approach, the Ministry of Health, working in partnership with stakeholders, has developed this training manual, *Integrating Nutrition Assessment, Counselling, and Support into Health Service Delivery*. The course covers basic nutrition, maternal nutrition, infant and young child feeding, management of malnutrition, and the interaction between nutrition and infectious diseases including HIV and tuberculosis. The content covers the entire continuum of care—promotion, prevention, and treatment—at all health service delivery points.

It is my sincere hope that the users of this manual will find it a useful reference material in their daily work.

Dr. Aceng Jane Ruth Director General, Health Services Ministry of Health

# Acknowledgements

he *Integrating Nutrition Assessment, Counselling, and Support into Health Service Delivery* course is shaped by the guidelines for integrated management of acute malnutrition (2010); infant and young child feeding (2012); maternal nutrition (2011); nutrition care and support for people living with HIV (2005); and the integrated guidelines on antiretroviral therapy, prevention of mother-to-child transmission of HIV, and infant and young child feeding (2010).

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# Acronyms

AIDS	Acquired immunodeficiency syndrome	OTC	Outpatient therapeutic care
AMC	Average monthly consumption	PDSA	Plan, do, study, act
ART	Antiretroviral therapy	PLHIV	People living with HIV
ARV	Antiretroviral	PMTCT	Prevention of mother-to-child
BFHI	Baby-Friendly Hospital Initiative		transmission
BMI	Body mass index	QI	Quality improvement
CAM	Complementary and alternative	QIF	Quality Improvement Framework
	medicines	RUTF	Ready-to-use therapeutic food
CSB	Corn-soya blend	SAM	Severe acute malnutrition
FBF	Fortified blended food	SD	Standard deviation
GMP	Growth monitoring and promotion	SFP	Supplementary feeding programme
HAART	Highly active antiretroviral therapy	TASO	The AIDS Support Organization
HAZ	Height/length for age z-score	ТВ	Tuberculosis
HC	Health centre	UNICEF	United Nations Children's Fund
HFA	Height for age	WASH	Water, sanitation, and hygiene
HIV	Human immunodeficiency virus	WFA	Weight for age
HMIS	Health management information	WFH	Weight for height
	system	WHO	World Health Organization
HSD	Health sub-district	WHZ	Weight for height z-score
IMAM	Integrated management of malnutrition		
ITC	Inpatient therapeutic care		
ITN	Insecticide-treated nets		
IYCF	Infant and young child feeding		
JMS	Joint Medical Stores		
kcal	Kilocalorie		
MAM	Moderate acute malnutrition		
MCH	Maternal and child health		
МОН	Ministry of Health		
MTCT	Mother-to-child transmission		
MUAC	Mid-upper arm circumference		
NACS	Nutrition assessment, counselling, and support		
NMS	National Medical Stores		
Ols	Opportunistic infections		
OPD	Outpatient department		

# **INTRODUCTION TO THE COURSE**

## **COURSE OVERVIEW**

The Ministry of Health's Integrating Nutrition Assessment, Counselling, and Support into Health Service Delivery Training Course for Facility-Based Providers aims to strengthen health systems for delivery of quality nutrition services in the country. This course is a revision of the 2009–2012 Comprehensive Nutrition Care for People Living with HIV/AIDS course. It covers basic nutrition, management of malnutrition, maternal nutrition, infant and young child feeding, nutrition and infectious diseases including HIV and tuberculosis (TB), nutrition education and counselling, management of nutrition commodities and supplies, and monitoring and reporting on nutrition indicators. The content is based on Uganda's 2012 Integrated Management of Acute Malnutrition (IMAM) Guidelines; 2012 Policy Guidelines on Infant and Young Child Feeding; 2012 Integrated National Guidelines on Antiretroviral Therapy, Prevention of Mother-to-Child Transmission of HIV and Infant and Young Child Feeding; 2010 Guidelines on Maternal Nutrition in Uganda; and 2005 Nutritional Care and Support for People Living with HIV: Guidelines for Service Providers.

The course focuses on improving the capacity of health service providers at all levels to integrate nutrition assessment, counselling, and support (NACS) into all health service delivery points, including antenatal, maternity, postnatal, young child clinics, family planning, HIV, inpatient wards and outpatient clinics, and community outreach and village health team activities. An important aspect of this course is its increased focus on preventive nutrition services at both facility and community levels. Efforts have been put in place to strengthen linkages between health facilities and communities for increased uptake of and adherence to nutrition services, follow-up of patients, and two-way referrals between clinics and community support services.

The content has been broadened to cover the entire continuum of care—from prevention to treatment to promotion—at all health service delivery points. The course emphasizes quality improvement, and mentoring and coaching are provided 1 month after the course to ensure that participants are effectively implementing what they have learned.

### **Course Aim**

This course is designed to train health care providers to integrate NACS into health service delivery. The course will:

- Help providers appreciate the importance of nutrition in promoting good health and development
- Equip providers with knowledge, techniques, and skills to:
  - Assess clients' nutrition status at both facility and community levels
  - Provide counselling and appropriate support on nutrition actions to all clients, including pregnant and lactating women
  - Apply quality improvement principles in implementing NACS
  - Collect, monitor, report, disseminate, and use NACS data
  - Foster linkages among the health facility, community, and other services for improved food security and economic advancement

#### **Course Organization**

This course is divided into four units and 22 sessions to be covered in 6 days.

#### **Participants**

The course is intended for doctors, nutritionists, clinical officers, nurses, midwives, pharmacists, social workers, counsellors, district health team members, and tutors. Data officers and nursing assistants can be reached during mentorship and coaching sessions.

# INTRODUCTORY SESSION (CLIMATE SETTING)





## **Purpose**

To introduce participants to the course and create an environment conducive to learning.

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## **Session Objectives**

By the end of the session, participants should:	Duration
Know each other and complete the registration form	25 min.
Understand course expectations, identify 'leaders' that provide support for the training (e.g., timekeepers, leaders of energizers, coordination of groups, etc.), and determine course norms	30 min.
Understand nutrition trends in Uganda and identify key government efforts to combat malnutrition	15 min.

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Estimated Time/Duration (includes 5-minute wrap-up)

75 minutes

# **Key Points**

#### **Magnitude of Malnutrition**

In 2011, about 101 million children in the world under 5 were underweight and 165 million were stunted. About 90 percent of stunted children live in only 36 countries. Africa and Asia have the largest number of stunted children. Nearly 19 million children under 5 suffer from severe acute malnutrition (SAM), a life-threatening condition requiring urgent treatment. Reflecting the double burden of undernutrition and overnutrition, about 43 million children under 5 were overweight or obese in 2011. The worldwide prevalence of obesity in adults nearly doubled from 15 percent in 1980 to 35 percent in 2008<sup>1</sup>.

Micronutrient deficiency also affects a large proportion of the world's children, as well as women of reproductive age. The World Health Organization (WHO) estimates that about 190 million children under 5 (33.3 percent of the preschool-age population) have subclinical vitamin A deficiency. About 5.2 million children and 9.7 million women are affected by night blindness, which is related to insufficient vitamin A. However, iron is the most common nutritional deficiency, with approximately 2 billion people worldwide affected. In addition, 19.2 percent of pregnant women and 18 percent of children under 5 have iron deficiency anaemia<sup>2</sup>.

In Uganda, the populations most vulnerable to malnutrition are women, young children, and people with chronic diseases, including HIV and tuberculosis (TB). The prevalence of stunting in children under 5 years of age slightly decreased from 2006 to 2011, from 38 percent to 33 percent, but the prevalence of underweight and wasting has remained stagnant, with slight decreases from 6 percent to 5 percent for wasting and from 16 percent to 14 percent for underweight during the same period. The rate of exclusive breastfeeding in the first 6 months of life increased from 60 percent to 62 percent between 2006 and 2011, but vitamin A deficiency among children under 5 doubled (from 19 percent to 38 percent). Anaemia affects 49 percent of children under 5 and 23 percent of women of reproductive age in Uganda. Acute malnutrition affects 3 percent of women and 5 percent of men between 15 and 49 years of age<sup>3</sup>.

#### **Government Efforts to Address Food and Nutrition Insecurity**

The Uganda Nutrition Action Plan 2011–2016 (UNAP) emphasizes a multisectoral approach to improve the nutrition status of all Ugandans, with a special emphasis on women of reproductive age, infants, and young children. Also emphasized is the 1,000 days from the start of pregnancy through the child's second birthday—the window of opportunity when efforts to prevent malnutrition can yield the greatest returns. The UNAP also requires all districts and subcounties to have nutrition coordination committees supervised by the Office of the Prime Minister. Areas of focus have included the following:

#### **Micronutrient initiatives**

- Fortification of foods (e.g., adding vitamin A to vegetable oil, iodised salt)
- Vitamin A, iron, and zinc supplementation
- Promotion of nutritious foods such as yellow/orange sweet potatoes

<sup>1</sup> Black, R. et al. 2013. 'Maternal and Child Undernutrition and Overweight in Low-Income and Middle-Income Countries'. The Lancet. 382(9890): 427–451.

<sup>2</sup> Ibid.

<sup>3</sup> Uganda Bureau of Statistics (UBOS) and ICF International Inc. 2012. Uganda Demographic and Health Survey 2011. Kampala, Uganda: UBOS and Calverton, Maryland: ICF International Inc.

#### Health promotion strategies

- Universal National Expanded Programme for Immunization (UNEPI)
- Growth monitoring and promotion (GMP)
- Health/nutrition counselling and education
- Water, sanitation, and hygiene (WASH)
- Infant and young child feeding (IYCF)
- Family planning
- Breastfeeding

#### **Other initiatives**

- Microfinance (economic strengthening)
- National Agricultural Advisory Services (NAADS), currently known as 'Operations Wealth Creation' (OWC)
- National Agricultural Research Organization (NARO)

Despite these efforts and initiatives, malnutrition continues to be a major challenge in Uganda. This is largely due to inadequate awareness of nutrition's role as an integral element of development. In the health sector, nutrition interventions have been implemented separately from other health activities, with minimal impact on the nutritional status of vulnerable populations. This training manual is an important step in strengthening capacity to integrate the nutrition assessment, counselling, and support (NACS) approach into policies, programmes, and the health service delivery system.



# NUTRITION ASSESSMENT, COUNSELLING, AND SUPPORT

The unit contains the following sessions:

Session 1.1	Introduction to Nutrition	90 min.
Session 1.2	Malnutrition	100 min.
Session 1.3	Overview of the NACS Approach	40 min.
Session 1.4	Determining Nutritional Status of Individuals	275 min.
Session 1.5	Management of Acute Malnutrition	210 min.
Session 1.6	Counselling Skills for Nutrition	150 min.
Session 1.7	Nutrition and Health Education	100 min.
Session 1.8	Clinical Practice I (Nutrition Assessment)	210 min.

### **TOTAL DURATION**

19 hours



# INTRODUCTION TO NUTRITION



## Purpose

To enhance participants' knowledge of basic nutrition and foods rich in specific nutrients.

## Session Objectives

By the end of the session, participants should be able to:	
Define common nutrition terms	15 min.
Explain the importance of adequate nutrition for health	20 min.
Describe essential nutrients needed by the body and their roles	30 min.
Identify food sources of specific nutrients	20 min.



**Estimated Time/Duration** (includes 5-minute wrap-up)

#### 90 minutes

## **Key Nutrition-Related Terms**

- **Nutrition** is a process by which food and drink is taken, digested, absorbed, and used by the body for physical activity, growth, development, and health.
- **Food** is any substance—solid, semi-solid, or liquid—taken into the body to provide one or more nutrients.
- **Nutrients** are nourishing substances needed by the body for physical activity, growth, development, and health. Nutrients that cannot be synthesized by the body and must be consumed through food are considered 'essential nutrients'. Nutrients are divided into macronutrients and micronutrients.

**Macronutrients** are nutrients needed by the body in large quantities and provide energy to the body. Carbohydrates, fats, and proteins are macronutrients.

**Micronutrients** are nutrients needed by the body in very small amounts. They include vitamins and minerals.

- **Energy**, measured in kilocalories (kcal), is required for all functions of the body (e.g., movement, thought, work, growth, and reproduction). The body gets energy through consumption of macronutrients.
- A **balanced or nutritious diet** is a combination of foods from different food groups that, when eaten, provides the energy and nutrients the body needs in the right amounts and quality to maintain health, growth, and development.

## **Importance of Nutrition**

Adequate nutrition is required for:

- Developing, growing, maintaining, replacing, and repairing cells and tissues
- Resisting and fighting infection and recovering from illness
- Producing energy, warmth, movement, and work
- Carrying out chemical processes such as digestion

A person with poor nutrition is at increased risk of:

- Deficient growth and development
- Illness and infection
- Death
- Decreased ability to work, learn, and perform in school

## **Essential Nutrients**

Because the body does not synthesize all of the nutrients it needs, a person must consume an adequate diet that includes a variety of foods that provide the right balance of energy and nutrients for physical activity, growth, development and health. These include macronutrients (carbohydrates, fat, and proteins) and micronutrients (vitamins and minerals), as well as water.

### **Macronutrients**

• **Carbohydrates** include starches, fibre, and sugars and are the primary source of energy in most diets, fuelling physical activity and basic body functions. Grains/cereals (e.g., rice, millet, maize, sorghum, wheat), roots (cassava, potatoes), and starchy fruits and vegetables (matooke, plantain) are rich in energy from carbohydrates. In Uganda, staple foods such as matooke, posho, cassava, and millet, which are usually produced locally and are readily available, accessible, and affordable, are common sources of carbohydrates.

Whole grains contain the entire grain. They are richer in nutrients and fibre and a healthier choice than refined grains, which lose fibre, vitamins, and minerals in the milling process. Whole grains should be at least half of the grains consumed. Some refined grains are 'enriched' after being milled, to replace some lost nutrients, or 'fortified' to include additional nutrients. This does not replace lost fibre. If purchasing refined grains, consumers should select 'enriched' and/ or 'fortified' grains.

Although sweet foods such as sugar, jam, cakes, and sugary drinks are a source of carbohydrates, they should be consumed minimally because they do not provide any other nutrients and may increase risk of overweight.

• Fats, also known as lipids, are derived from both animal and plant sources. Fats are rich in energy. They build body cells, support brain development of infants, help body processes, and facilitate the absorption and use of fat-soluble vitamins A, D, E, and K. Fats should be consumed in small quantities by adolescents and adults.

Saturated fatty acids are solid at room temperature and include animal fats (butter, lard, tallow, ghee) and tropical oils (palm, coconut, palm kernel). Trans fats are also solid at room temperature and include partially hydrogenated vegetable oils (margarine, shortening). Consumption of saturated fats and trans fats increases risk of heart disease.

*Unsaturated fatty acids* are liquid at room temperature. These include monounsaturated and polyunsaturated fats and are found in vegetable oils such as sunflower, corn, soybean, canola, and olive oils. Replacing saturated fats with unsaturated fats lowers risk of heart disease.

• **Proteins** are body-building foods and are required for growth and development, maintenance and repair of tissues, production of metabolic and digestive enzymes, and formation of certain hormones and all cells and tissues. Rich plant sources of protein include beans and lentils. Animal sources include meat, fish, poultry, dairy products, and eggs.

### **Micronutrients**

**Vitamins** are organic compounds that perform specific metabolic functions in the body. There are two forms of vitamins:

- **Fat-soluble vitamins** are stored by the body and require dietary fat to be absorbed. They include vitamins A, D, E, and K. Fat-soluble vitamins are necessary for development and maintenance of body tissues and their functions, e.g., eyes (vitamin A), bones (vitamin D), muscles, blood clotting (vitamin K), protection of cells (vitamin E), synthesis of enzymes, and absorption of essential nutrients. Dietary sources of fat-soluble vitamins include:
  - Vitamin A: red and orange fruits and vegetables (e.g., carrots, peppers, pumpkin, mango, papaya), dark green leafy vegetables (e.g., sukuma wiki), liver, fish, and fortified dairy products, margarine, and oils
  - Vitamin D: fortified dairy products, oily fish. The body also synthesizes vitamin D through exposure to the sun
  - Vitamin E: vegetable oils, nuts, and seeds
  - Vitamin K: green leafy vegetables and vegetable oils
- Water-soluble vitamins are not stored in the body and must be consumed regularly. They include vitamins C (ascorbic acid), B1 (thiamine), B2 (riboflavin), B3 (niacin), B6 (pyridoxine), and B12 (cobalamin), as well as pantothenic acid and folic acid. Their functions include releasing energy, supporting utilisation of macronutrients, and synthesizing red blood cells. Dietary sources of water-soluble vitamins include fruits, dark leafy vegetables, whole grains, meat, fish, poultry, and fortified cereals, specifically:
  - Vitamin C: citrus fruits, red pepper, and other plant sources
  - Thiamine: whole grains, legumes, liver, enriched flours
  - Riboflavin: liver, eggs, legumes, dark green vegetables, whole grains, enriched flours
  - Niacin: peanuts, whole grains, enriched flours, liver, fish, poultry
  - B-6: whole grains and cereals, legumes, dark leafy greens, pork, poultry, and beef
  - B-12: animal-source foods such as liver, kidney, eggs, milk, fish
  - Folic acid: dark leafy greens, whole grains, meat, fish, legumes, citrus fruit

**Minerals** contribute to a variety of body processes, including growth, development, water balance, and neurological processes. Although minerals are present in many foods, they are more easily absorbed from some foods than from others. Essential minerals include the following:

- **Iron** is an essential component of blood and helps transfer oxygen to various tissues. Dietary sources include red meat, fish, poultry (easily absorbed), legumes, leafy green vegetables (less easily absorbed, but absorption increases if eaten with animal-source iron or vitamin C).
- **Calcium** is a key component of bones and teeth and is needed for a strong skeleton. Dietary sources include dairy products (most easily absorbed) and leafy greens (not well absorbed).
- **Iodine** is important for thyroid function and for mental development of children. The most important dietary source is iodised salt.
- **Zinc** enhances and strengthens the immune system, helps wounds heal, facilitates digestion, and is an important component of skeletal muscle. Dietary sources include beef, seafood, liver, nuts, beans, and whole grains.
- Other minerals involved in various body functions are chromium, copper, fluoride, magnesium, manganese, molybdenum, nickel, potassium, phosphorus, sodium, and selenium.

#### Water

Water is an essential nutrient necessary for body functions including digestion, absorption, and certain metabolic processes. Water is also a primary component of the body, representing over 60 percent of a person's weight. Water is regularly lost from the body through sweating, excretion, and breathing and must be replaced as often as lost. While people get some water from the foods they eat as well as drink, it is also important to drink boiled or treated water.

## Foods Rich in Specific Nutrients (Food Groups)

Foods can be classified into three categories—Go, Glow, and Grow—based on their main contribution to nutrition.

### 'Go' Foods (Energy Foods)

Go foods provide energy to the body and are essential for physical activity and basic functioning of the body. Go foods that are rich in carbohydrates are primary sources of energy and include whole grains, refined grains, roots, and starchy fruits and vegetables.

Fats, including oils and saturated and trans fats, are also an energy source and considered to be

Carbohydrates				
Whole Grains	Refined Grains	Roots	Starchy Fruits and Vegetables	
<ul> <li>Millet flour</li> <li>Sorghum flour</li> <li>Whole wheat flour (brown)</li> <li>Whole maize meal (brown)</li> <li>Brown rice</li> <li>Whole wheat bread</li> </ul>	<ul> <li>Corn flakes</li> <li>White wheat flour</li> <li>White maize meal</li> <li>White rice</li> <li>White bread</li> </ul>	<ul><li>Cassava</li><li>Irish potatoes</li><li>Sweet potatoes</li><li>Yams</li></ul>	<ul> <li>Matooke</li> <li>Gonja (plantains)</li> <li>Squash</li> <li>Pumpkin</li> </ul>	
Oils (Liquids) — Unsaturated		Fats (Solids) – Saturat	ted and Trans	
<b>Plant source:</b> Sunflower, soybean, corn/maize, cottonseed, canola, sesame, groundnut, olive, safflower, and walnut oils		<ul> <li>Animal source: Milk fat (ghee), butter, beef fat, chicken fat, pork fat (lard)</li> <li>Plant source: Margarine, kimbo, cowboy, coconut, palm oil</li> </ul>		

## Go foods.

Excessive consumption of saturated and trans fats increases risk of heart disease. Replacing with unsaturated fats may reduce risk of heart disease.

#### 'Grow' Foods (Body-Building Foods)

Grow foods are rich in protein and promote growth, development, and repair of body tissues. Grow foods come from animal and plant sources.

Animal Source	Plant Source	
Meats and ground meats (lean cuts): beef, lamb, pork, veal, and game meat (e.g., rabbit, guinea fowl, squirrel)	<b>Beans and peas:</b> black beans, black-eyed peas, chickpeas, kidney beans, lentils, lima beans, soy beans, split peas, white beans, bean burgers	
Organ meats: liver, giblets	Processed soy products: curd made from soy	
Game meats: rabbit, guinea fowl, squirrel	<b>Nuts and seeds:</b> cashews, mixed nuts, peanuts, peanut butter, pumpkin seeds, sesame seeds, sunflower seeds	
<b>Poultry:</b> chicken, duck, goose, turkey, ground chicken and turkey, eggs		
<b>Fish:</b> silver fish, Nile perch, tilapia, mudfish, catfish, cod, lobster, mussels, oysters, shrimp, canned fish (anchovies, tuna, sardines)		
Dairy products: milk, cheese, sour milk, yoghurt		
Edible insects: grasshoppers, termites, white ants, crickets, caterpillars		

#### 'Glow' Foods (Body-Protecting Foods)

Glow foods—rich in vitamins and minerals—are protective foods that provide key nutrients to regulate important body functions. This group primarily consists of fruits and vegetables. Fortified foods, including iodised salt, are also important Glow foods.

FRUITS	VEGETABLES
Commonly eaten fruits: bananas, pineapples, papaya (pawpaw), mangoes, guavas, oranges, jack fruit, tangerines, apples, brother hearts, custard fruit (staferi), avocado Wild fruits: tamarinds, berries, wild grapefruits Fruit juice (100 percent): passion, orange, apple, pineapple, melon, grape, grapefruit, hibiscus	<ul> <li>Dark green leafy vegetables: spinach, Dodo/ amarantha, sukuma wiki, cowpea leaves, pumpkin leaves, cassava leaves, fresh cowpea leaves, pumpkin leaves, cassava leaves, fresh cowpea leaves, field pea leaves, immature corn, green pea leaves, yam leaves, sweet potato leaves, broccoli, lettuce, hibiscus leaves (Malakwang)</li> <li>Red and orange vegetables: carrots, pumpkin, red peppers, tomatoes, tomato juice, red amarantha, red hibiscus</li> <li>Other vegetables: beet roots, cabbage, eggplant, cucumbers, cauliflower, green beans, green peppers, mushrooms, okra, opions, bean sprouts, celery</li> </ul>
	Wild vegetable: wild cucumber

**Note:** Foods may contribute to more than one category but are listed based on their primary contribution. For example, staple foods in Uganda are listed as Go foods because they are a primary source of energy. However, they also contain other essential nutrients such as protein, vitamins, and minerals to contribute to the body's ability to 'grow' and 'glow'.



# MALNUTRITION



## **Purpose**

To enhance participants' knowledge of the causes and consequences of malnutrition.

## Session Objectives

By the end of the session, participants should be able to:	
Explain the meaning of 'malnutrition'	5 min.
Explain the types of malnutrition	10 min.
Discuss the causes, consequences, and prevention of undernutrition	50 min.
Discuss the causes, consequences, and prevention of overnutrition	30 min.



**Estimated Time/Duration** (includes 5-minute wrap-up)

100 minutes

## **Meaning of 'Malnutrition'**

Malnutrition is the condition that develops when the body does not get the right amount of nutrients it needs to maintain healthy tissues and organ function.

## **Types of Malnutrition**

There are two main types of malnutrition: Undernutrition and overnutrition.

#### Figure 1.2.1 Types and Categories of Malnutrition



### **Undernutrition**

Undernutrition is a consequence of consuming too few essential nutrients, using or excreting them more rapidly than they can be replaced, or not being able to absorb the nutrients consumed, often due to illness or infection.

There are three categories of undernutrition, and patients may present with a combination of types:

- Acute malnutrition is caused by reduced food consumption and/or illness, resulting in wasting (thinness or low weight for height) or bilateral pitting oedema. Children with severe acute malnutrition (SAM) are at increased risk of death and need treatment urgently.
- **Chronic malnutrition** is caused by long-term or repeated food deprivation or illness that impedes growth (stunting) and development. A stunted child is too short for his or her age (low height for age). Stunting can begin in the womb, and children are at highest risk of stunting from conception through their second birthday. Stunting is largely irreversible after about age 2; hence it must be prevented.
- **Micronutrient deficiencies** occur when someone has inadequate intake or does not absorb micronutrients, often due to illness. Micronutrient deficiencies that are of concern in Uganda include deficiencies in iron, vitamin A, iodine, and zinc.

Note: This course focuses on undernutrition.

## **Causes of Undernutrition**

There are several interconnected causes of malnutrition, ranging from policy issues to underlying community and cultural situations to immediate household conditions (Figure 1.2.2).

#### Figure 1.2.2 Summary of Causes of Undernutrition (Conceptual Framework)



Adapted from: Black et al. 2008. 'Maternal and child undernutrition: global and regional exposures and health consequences'. *The Lancet.* 371: 243-60.

### **Immediate Causes**

- Inadequate dietary intake including poor quality and quantity of food in the diet
- Infection and disease such as malaria, diarrhoeal diseases, acute respiratory infections, worm infestations, HIV, and tuberculosis (TB)

As shown in Figure 1.2.3 on the next page, the two immediate causes of malnutrition, inadequate dietary intake and infectious disease, interact with each other in a cycle that increases a child's risk of both illness/infection and undernutrition.



#### Figure 1.2.3 The Vicious Cycle of Undernutrition and Infectious Diseases

Adapted from Tomkins, Andrew and Fiona Watson. 1989. 'Malnutrition and Infection–A review', *Nutrition Policy Discussion Paper No. 5.* Geneva: United Nations Administrative Committee on Coordination Subcommittee on Nutrition.

#### **Underlying Causes**

Underlying causes contribute to the immediate causes and must be dealt with to improve the overall nutrition situation. It is important to understand why some people are at higher risk for illness or are unable to consume an adequate diet. These are the underlying causes that must be addressed to improve health and diets and reduce undernutrition.

- Household food insecurity, including poor access to a diverse diet, inadequate quantity of food available and accessible, and seasonal fluctuations in food availability. These factors compromise the quality and quantity of dietary intake.
- Inadequate care and feeding practices, including suboptimal maternal nutrition and infant feeding practices, which are often associated with limited time and heavy workloads for women, frequent births, and poor hygiene and sanitation practices. These factors compromise the quality and quantity of dietary intake and increase risk of infection and disease.
- Unhealthy household environment and inadequate health services, including inadequate access to safe water and sanitation, poor access to health care, and low quality of health care. These factors lead to increased infection and disease.

#### **Basic Causes**

There are also societal-level issues that may increase the risk of malnutrition, especially among the most vulnerable.

• Limited access to quantity and quality of resources, including inadequate educational opportunities; limited livelihood opportunities; unequal economic structure; limited access to land, productive assets, and technology; and poverty.

- Inadequate financial, human, physical, and social capital, including social networks and movements, availability of skilled workers, and funding for social programmes.
- Sociocultural, economic, and political context, including legal framework, policies, and roles and rights of girls and women; allocation of public funding and other resources; quality and priorities of social and political leadership; and stability and conflict in the region.

## **Consequences of Undernutrition**

### High Child Mortality, Disease, and Disability

- Newborns who are born small for their gestational age are more likely to die than children born at a healthy weight.
- A severely stunted child is four times more likely to die than a healthy child (Black et al. 2008).
- A severely wasted child is nine times more likely to die than a healthy child (Black et al. 2008).
- Micronutrient deficiencies—including vitamin A, zinc, and iron—impair the immune system, increasing risk of illness and death.
- Vitamin A deficiency is a major cause of blindness.
- Iron deficiency anaemia in pregnant women increases risk of maternal and perinatal mortality and low birth weight.
- Maternal undernutrition affects foetal growth and the first 2 years of a child's life, contributing to children born small for gestational age, stunting, and also obesity and noncommunicable disease in adulthood (Victora et al. 2008).
- Children who are undernourished at birth, in infancy, and in young childhood and who also gain weight rapidly after age 2 are at increased risk for chronic disease in adulthood, including hypertension, cardiovascular disease, and high blood glucose concentrations.

### Weakened Brain Development and Nervous System

- Stunting is associated with impaired cognitive and motor development and poor school achievement and performance.
- Iron deficiency and iron deficiency anaemia impair cognitive development and can reduce children's school performance and adults' physical capacity for work.
- Developmental impairments result in diminished income-earning capacity in adulthood.
- Folic acid deficiency causes neural tube defects.
- Iodine deficiency causes mental retardation, physical growth retardation, or a combination of both (cretinism).
- Iodine deficiency disorders affect a child's ability to learn, school performance, likelihood of staying in school, and speech and hearing ability.

#### **Socioeconomic Consequences of Undernutrition**

- Increased or persistent poverty
- High costs of treating illnesses attributed to malnutrition
- Costs of caring for sick family members, including time away from work or school
- Lost care for household members who are not sick

### Impact of Undernutrition across the Life Cycle

Undernutrition affects the entire life cycle and occurs across generations. It often begins *in utero*, resulting in low birth weight babies who are at higher risk of developmental delays and death and more likely to be stunted in early life. Children with growth faltering in the first 2 years of life have increased risk of illness and death and impaired cognitive development and may be more likely to suffer from chronic disease in adulthood. The lost growth persists through school years, where malnourished children may have reduced attendance and school performance. A stunted child is more likely to enter adolescence stunted, when he or she will have limited opportunity to regain growth lost due to malnutrition in the first 2 years and cannot regain losses in cognitive development. The stunted adolescent will likely become a stunted adult, whose health and productivity are compromised. Stunted women and adolescents are more likely to have a low birth weight baby, continuing the cycle.

There is an urgent need to break this cycle of undernutrition. The principal points of intervention are (1) the 1,000-day period from pregnancy to age 2 and (2) the adolescent girl or woman even before she becomes pregnant (Figure 1.2.4).

#### **Groups Vulnerable to Undernutrition**

- Children from pregnancy to age 2
- Nonbreastfed children
- Pregnant and lactating women
- People suffering from infectious disease or chronic illness (HIV and TB)

#### Figure 1.2.4 Impact of Undernutrition across the Life Cycle



Source: Administrative Committee on Coordination Sub–Committee on Nutrition (ACC/SCN). 2000. Fourth Report on the World Nutrition Situation. Geneva: ACC/SCN in collaboration with the International Food Policy Research Institute (IFPRI). Available at http://www.unscn.org/layout/modules/resources/files/rwns4.pdf.

## **Prevention of Undernutrition**

Key practices to prevent undernutrition include:

- Promotion of exclusive breastfeeding for the first 6 months and continued breastfeeding to 2 years and beyond
- Appropriate complementary feeding practices
- Vitamin A and iron supplementation
- Immunization
- Deworming
- Promotion of maternal nutrition
- Water, sanitation, and hygiene practices
- Growth monitoring and promotion

## **Overnutrition**

Overnutrition is a condition caused by abnormal or excess fat accumulation in the body that may lead to health problems and reduced life expectancy. Overnutrition starts as overweight and if left uncontrolled may progress to obesity, a severe form of overnutrition associated with adverse health conditions.

#### **Predisposing Factors to Overnutrition**

The main predisposing factors are increased consumption of energy-dense-nutrient-poor foods combined with reduced physical activity. Other factors include:

- Medications: certain antidepressants or corticosteroids, antipsychotics, antiseizure drugs, and some antiretroviral drugs (ARVs)
- Metabolic syndrome
- Cushing's syndrome
- Hypothyroidism
- Modern conveniences/lifestyles: technology, TV, cars, elevators, fast foods
- Genetic factors/family history of obesity
- Company/peer pressure: socializing with people who overeat, and with those who are physically inactive
- Psychological factors: stress, emotional anxiety, depression, chronic pain, filling void
- Health conditions: illnesses, metabolic disorders, hormonal imbalance
- Environmental factors: educational attainment, income, access to food, safety of neighbourhood

## **Consequences of Overnutrition**

- Overnutrition (overweight and obesity) during pregnancy increases risk of childhood obesity which, in turn, increases the risk of adolescent and adult obesity.
- Overweight increases the risk of coronary heart diseases (CHD), type 2 diabetes, gout, and hypertension.
- Maternal obesity is associated with complications during delivery, gestational diabetes, preeclampsia, maternal death, and neonatal and infant death.
- Overnutrition predisposes to a medical condition, commonly known as the 'obese syndrome', which presents with one or more of the following:
  - Glucose intolerance
  - Insulin resistance
  - Type 2 diabetes
  - Hypertension
  - Cardiac arrhythmias
  - Elevated plasma lipid concentration
  - Increased visceral adiposity tissue
  - Increased risk of CHD and some cancers

#### **Related Medical Hazards Include:**

- Increased risk of stroke
- Major organ dysfunction and failures such as heart, kidney, and liver diseases
- High risk of joint damage; arthritis
- Increased likelihood of arteriosclerosis
- Varicose veins

### **Prevention of Overnutrition**

Overnutrition can be prevented through education and behaviour change at individual and programmatic levels:

#### a) Nutrition education and counselling

- Healthy food choices (whole grains, fruits and vegetables, healthy fats, protein sources) and beverage choices (water, fresh juices). Improving consumption of fruits and green vegetables on a daily basis.
- Reduced intake of refined grains, sweets, red meats, and sugary drinks. Consumption of snacks that are low in fat, sodium, and refined sugar and high in fibre, vitamins, and minerals.
- Healthy eating habits.
  - Eat healthy foods from childhood and moderate unhealthy foods among children.
  - Reduce consumption of junk food and candy.
  - Help children understand that foods high in sugar and fats are fine to eat as long as they are eaten in moderation.

- Increased physical activity to burn calories and improve metabolism.
  - Be more active and avoid sedentary lifestyle, develop light exercise programs such as evening walks, sports, and games.
  - Reduce television watching time/computer games
- Control the daily frequency of eating and the amount of foods that you eat.
- Improve sleep and reduce stress.

#### b) Routine nutrition assessment, categorization, counselling, and support

- Routine weight monitoring, nutrition education, and counselling to attain and maintain BMI 18.5– 24.9 (adults 18 and older) or normal BMI for age (children 2 to 18 years) and normal weight for height z-score (WHZ) (0–59 months)
- Capacity-building at all levels to be able to screen, identify, and support appropriately for weight loss
- Strengthened referrals for overweight and obese clients to appropriate medical care and support
- Strengthened school health and nutrition education

Sources: WHO. WHO Growth Reference 2007 (ages 5 to 19) http://www.who.int/growthref/en/; WHO Western Pacific Region, International Association for the Study of Obesity, International Obesity Taskforce. 2000. Redefining obesity and its treatment. Australia: Health Communications Australia; WHO & FAO. 2003. WHO Technical Report Series 916. Diet, nutrition and the prevention of chronic diseases. Geneva: WHO.; Goedecke, Julia; Jennings, Courtney L.; Lambert, Estelle. 2006. "Chapter 7: Obesity in South Africa" in Steyn et al. 2006. Chronic Diseases of Lifestyle in South Africa: 1995-2005. Cape Town: South African Medical Research Council.



# OVERVIEW OF THE NACS APPROACH



### Purpose

To introduce participants to the nutrition assessment, counselling, and support (NACS) approach.



## **Session Objectives**

By the end of the session, participants should be able to:	Duration
Explain the NACS approach and describe its components	25 min.
Discuss new elements of NACS that can help achieve better health and nutrition outcomes	5 min.
Explain the supporting elements of NACS	5 min.

**Estimated Time/Duration** (includes 5-minute wrap-up)

40 minutes



## **Explanation of the NACS Approach and its Components**

#### **The NACS Approach**

NACS stands for nutrition assessment, counselling, and support. The NACS approach aims to improve the nutritional status of individuals and populations by integrating nutrition into policies, programmes, and the health service delivery system.

NACS grew out of the Food by Prescription model, which provided specialised food products to clinically malnourished people with HIV. Although NACS began in the context of HIV, the approach is applicable to all health service delivery contact points and to people of all ages. In some countries, NACS is still implemented only for people living with HIV, while in others it has been broadened to apply to other clients. This is the case in Uganda, where the primary target groups for NACS are children under 2 years, pregnant and lactating mothers, children over 2 years with evidence of growth faltering, and adults in HIV care and treatment programmes.

### **Components of the NACS Approach**

**Nutrition assessment:** Good nutrition care starts with good assessment (measurement and classification) of nutritional status. Because poor nutritional status can delay recovery from illness and decrease the effectiveness of some medications, nutrition assessment should be part of all health facility care and support. Nutrition assessment can be used to:

- Identify medical complications that affect nutritional status
- Track growth and weight trends
- Detect diet habits and infant and young child feeding practices that make it difficult to improve health or that increase the risk of disease
- Inform nutrition counselling

In health facilities, nutrition assessment is usually part of a broader clinical assessment. In the community, nutrition screening can identify people who are malnourished or at risk of malnutrition and refer them to health facilities for more in-depth assessment, counselling, and treatment if needed.

**Nutrition counselling** is an interactive dialogue between an individual client and a trained counsellor who uses information from the nutrition assessment to decide what can be done to improve nutritional status. The client and counsellor examine the challenges of practicing healthy eating, hygiene, and care habits and adopting optimal infant and young child feeding and care practices; identify barriers to changing behaviours that can lead to malnutrition; and develop ways to overcome those barriers. With this information, the client and counsellor jointly plan actions to support healthy practices. The counsellor may use job aids to select appropriate messages and guide counselling.

While counselling is usually done with individuals, nutrition education can be provided to groups of people in health facility waiting rooms or community meetings, using print and audiovisual media where available.

Nutrition support can include:

- Therapeutic and supplementary foods to treat clinical malnutrition
- Complementary food supplements for children 6–23 months to prevent malnutrition
- Micronutrient supplements to prevent vitamin and mineral deficiencies
- Point-of-use water purification products to prevent water-borne disease
- Referral to household food support, home-based care, and economic strengthening and livelihood support

**Note:** Only trained health care providers can prescribe therapeutic and supplementary foods, but the other types of nutrition support can be provided at the community level.

Each NACS component is important. Nutrition assessment guides nutrition counselling for all clients and treatment of severe acute malnutrition (SAM) and moderate acute malnutrition (MAM). Individuals receiving counselling and treatment should also be connected to appropriate support including food security; water, sanitation, and hygiene (WASH); and economic strengthening programmes to maintain improved nutritional status and avoid relapsing into malnutrition.



#### Figure 1.3.1 The NACS Approach

Source: FANTA. 2012. Defining Nutrition Assessment Counseling and Support (NACS). Technical Note No. 13. Washington, DC: FHI 360/FANTA.

**Continuum of care, networks, and referrals:** NACS spans the continuum of care from the clinic to the community, and networks and referrals are critical to making NACS work. For effective prevention and treatment of malnutrition, facility-based health providers need to link with community service providers to ensure that clients who are being treated for malnutrition adhere to treatment and attend follow-up appointments. These links are also important in making sure that people who are identified as malnourished in the community are referred for further nutrition assessment and treatment as needed.

## Elements of NACS that can Help Achieve Better Health and Nutrition Outcomes

For better health and nutrition outcomes, NACS must be effectively linked to other services such as WASH promotion and economic strengthening/livelihoods. This includes referrals at the clinic and community levels.

### Water, Sanitation, and Hygiene (WASH)

Good WASH practices help to prevent food- and water-related diarrhoeal diseases, helping to ensure healthier households that are more resilient when facing nutritional challenges. Good WASH practices benefit everyone. Integrating them into nutrition assessment and care programmes provides additional opportunities and resources to improve overall health outcomes.

This can be achieved through a comprehensive approach:

- Promoting improvements in key hygiene practices (handwashing, treatment and safe storage of drinking water, safe disposal of faeces, and food hygiene)
- Improving access to safe water and sanitation technologies and products
- Facilitating or supporting an enabling environment (improved policies, community organization, institutional strengthening, and public-private partnerships)

When counselling on WASH practices, focus on measures that the client considers feasible. Take into account the current practice, available resources to improve the practice, and the particular social context. Negotiate with clients and families to identify one or two WASH practices they can improve to enhance their health and nutritional status.

### **Referral to Economic Strengthening/Livelihood Support**

The NACS approach aims to strengthen referrals to livelihood and economic strengthening interventions that will help to improve food security and nutritional status for vulnerable clients. While the health service provider would not be expected to provide these services, links with community agencies that do provide the following services are essential.

- Promotion (vocational training, income-generating activities, microcredit)
- Protection (gardening, savings groups)
- Provide (social grants, household food support)

## **Supporting Elements for NACS**

The immediate supporting elements needed to ensure the success of NACS are sufficient staffing to provide services; capacity-building through training, mentorship/supervision, and provision of materials to ensure that health workers have the knowledge and skills they need to implement NACS; and continuous quality improvement to assure the efficiency and effectiveness of the delivery processes. To support these elements it is essential to have:

- National policies, strategies, and guidelines
- A strong health management information system
- Supply chain management
- Funding (public-private partnerships, government, donors)
- A functioning referral system
- Monitoring and evaluation

#### **Figure 1.3.2 Key Supporting Elements for NACS**



# DETERMINING NUTRITIONAL STATUS OF INDIVIDUALS



### **Purpose**

**SESSION** 

To equip participants with the knowledge and skills to conduct anthropometric and clinical nutritional assessments and to classify nutritional status.

# **Session Objectives**

By the end of the session, participants should be able to:	Duration
Demonstrate ability to use common anthropometric equipment to take accurate measurements	90 min.
Use a combination of anthropometric measurements to determine nutritional status of individuals	90 min.
Appreciate the use of anthropometric indices in growth monitoring and promotion of infants 0–2 years	30 min.
Describe common clinical signs associated with severe acute malnutrition	60 min.

**Estimated Time/Duration** (includes 5-minute wrap-up) **275 minutes** 

## Anthropometry

#### **Definition of Anthropometry**

Anthropometry is the measurement of the human body. Anthropometric measurements are used to assess the nutritional status of individuals. Common measures include weight, height, and mid-upper arm circumference (MUAC). Some anthropometric measurements are presented as indices, including weight for length/height, weight for age, height for age, body mass index (BMI), and BMI for age. The measure (such as MUAC) or index (such as BMI) is compared to standardized cut-offs, which may be based on age, sex, or in the case of MUAC, pregnancy status.

#### **Anthropometric Equipment**

- Weighing scales for infants, children, and adults
- Height/length boards for children and adults; infantometer for infants
- MUAC tapes for all age groups including: children 6–59 months, children 5 to < 10 years, children 10 to < 15 years, children 15 to < 18 years, adults 18–59 years (including pregnant women and lactating mothers), elderly people 60 years and older</li>

## **Anthropometric Measurements**

### Age

A client's age should be recorded as accurately as possible so that the correct cut-off can be used to determine nutritional status. A client's age can be determined from official documents (health card, immunization card, and birth certificate). If official documents are not available, use a local calendar of events to determine the month and year of birth. If a child's length or height is less than 110 cm or if the child cannot touch his/her ear with the opposite hand by extending the arm over the head, he/she should be treated as under 5 years.

#### Weight

Two people are needed to weigh a child under 5 years. A mother or caregiver can act as an assistant to the health care worker.

**Note:** To ensure accuracy, all scales should be tested every morning with a fixed weight (10 kg). If the measurement does not match the weight, the scale should be sent to the district for calibration.

## Infants (0–12 Months)

Infants should be weighed using a paediatric balance beam scale precise to within 10 g (0.01 kg). If a paediatric balance beam scale is not available, infants can also be weighed in their caregiver's arms on an electronic scale or in a basket or basin firmly anchored to a hanging spring (Salter) scale. However, these scales are usually not as precise as a paediatric balance beam scale.

Place the scale on a hard, flat surface, such as a table. Line the basin with a sheet, shawl, or blanket.
Zero the scale by sliding the main and fractional weights to zero, and adjust the 'zero weight' until the horizontal beam is balanced.
Ask the assistant (usually mother or caregiver) to undress the infant, leaving the child with no or minimal clothing.
Ask the assistant to place the infant on the scale.
Move the main weight away from zero until the horizontal beam falls below the centro point, then move it back one notch. Move the fractional weights until the horizontal beam is balanced, pointing at the centre point.
Read the weight out loud and ask the assistant to repeat it to you as you check it.
Record the baby's weight to the nearest 10 g (0.01 kg).

#### Weighing an Infant, Held by an Adult, Using an Electronic Scale

- Place the scale on a hard, flat surface, making sure the scale is level.
- 2 Turn the scale on by waving your hand over the window.
- 3 Make sure the scale is set at zero.
- 4 Ask the caregiver/adult to step on the centre of scale and stand straight and still.
- 5 Record the weight of the adult to the nearest 100 g (0.1 kg).
- 6 Place the infant in the arms of the caregiver/adult.
- 7 Record the total weight to the nearest 100 g (0.1 kg).
- 8 Subtract the caregiver/adult's weight from the total weight. This is the weight of the infant.
- **9** Read the infant's weight aloud and ask the assistant or caregiver to repeat it aloud.
- 10 Record the weight to the nearest 100 g (0.1 kg).

*Note:* Some electronic scales can calculate the child's weight for the health care worker. These are called taring scales.





#### Weighing an Infant with a Hanging Spring (Salter) Scale

See instructions for 'weighing children 25 kg or less' (below) and follow instructions for using a basket or basin. *Do not place an infant in weighing pants.*
# **Children Weighing 25 kg or Less**

Children weighing 25 kg or less should be weighed using a hanging spring (Salter) scale. A Salter scale can weigh children up to 25 kg and is graduated in measurements of 0.1 kg (100 g).

It is better to use a basin than weighing pants, which are uncomfortable and easily soiled. It is not advisable to use weighing pants after they have been soiled; the pants should be washed before being used with the next child.

1	Hook the scale securely to a tree, a beam in the building's roof, a frame, a tripod, or (if you are in the community) a pole held by two people, horizontally at eye level.		
2	Suspend the weighing pants or basin/basket from the lower hook of the scale.		
3	Reset the scale to zero.		
4	If using weighing pants, remove the weighing pants from the scale and explain to the caregiver what you are going to do.		
5	Ask the caregiver to undress the child and place him or her in the weighing pants. Make sure one of the pants' straps is in front of the child and the other is behind to keep the child from falling out.		
6	Ask the caregiver to lift the child so that the weighing pants may be hung from the lower hook of the scale. Do not carry the child by the straps of the weighing pants. If a hanging basin/basket is used instead of the pants, place the child sitting upright in the basin/basket.		
7	Wait until the needle of the dial on the scale is steady. Make sure that nobody touches the pants or the scale during the weighing. Then read aloud the weight to the nearest 100 grams (0.1 kg), asking the assistant/caregiver to repeat it to you.		
}	Record the weight.		
	<image/>		

# Children Weighing Greater than 25 kg, Adolescents, and Adults

Children weighing greater than 25 kg, adolescents, and adults should be weighed using a balance beam scale with nondetachable weights or an electronic scale.

# Weighing Children Greater than 25 kg, Adolescents, and Adults with an Electronic Scale

See steps 1–5 of 'Weighing an Infant, Held by an Adult, on an Electronic Scale'.



# Weighing Children Greater than 25 kg, Adolescents, and Adults with a Balance Beam Scale

1	Place the scale on a hard, flat surface.
2	Zero the scale: make sure the scale's horizontal beam is set at zero. If necessary, slide the main and fractional weights to their respective zero positions and adjust the 'zero weight' until the horizontal beam balances at zero.
3	Make sure the client is wearing minimal clothing, with shoes/sandals off. Ask adults to empty their pockets of contents that can increase weight.
4	Ask the client to stand still and straight on the middle of the scale's platform, with the body equally distributed on both feet. Ask the client to not touch anything.
5	Slide the main weight on the balance beam's lower arm to the right until the beam tips all the way down on the right. Then slide the weight back one notch. Slide the fractional weight on the upper arm until the beam is horizontal.
6	Take the reading to the nearest 100 g (0.1 kg), read aloud to inform the client/caregiver, and record immediately.
7	Use standard weights to regularly check the scale's accuracy. Scales should be recalibrated once or twice a year by professional dealers.

*Note:* Spring-type bathroom scales do not provide measurements accurate enough to classify nutritional status and should not be used.



# Length/Height

Length and height should be measured using recommended length/height boards. Boards can be made locally from wood and measuring tape using standard World Health Organization (WHO) specifications. At least one person should assist the health care worker in measuring a child's length. If possible, the mother/caregiver should be involved.

# **Children Under 2 Years**

Children under 2 years should be measured while they are lying down. Older children and adults who are too weak to stand also can be measured while they are lying down; use a measuring tape instead of a child-length board.

*Note:* If a child's age cannot be determined, measure children less than 87 cm (or those who cannot stand) while they are lying down.

# Measuring the Length of Children Under 2 Years

1	Place the measuring board horizontally on the ground or on a table.
2	Remove the child's shoes or sandals and any head covering.
3	With the help of one or two assistants, place the child on the board with his/her head against the fixed (immovable) end.
4	Ask an assistant/caregiver to hold the child's head so that the child's eyes are pointing straight up and then to gently pull the child's head so that it touches the fixed end of the board.
5	With one hand, gently push the child's knees to straighten them as much as possible. (Note: Newborns' knees do not straighten as much as older children's knees. Apply minimum pressure so as not to injure them.) Make sure the child's heels, buttocks, shoulders, and back of head are touching the board.
6	With the other hand, slide the movable footboard until it touches the soles of the child's feet.
7	Immediately remove the child's feet from contact with the footboard with one hand (to prevent the child from kicking and moving the footboard) while holding the footboard securely in place with the other hand.
8	Read aloud the measurement to the nearest 0.1 cm and record.

# **Children 2 Years or Older**

Children 2 years or older are measured using a height board, with the child standing. If you do not have a height board, you can also fasten a nonstretchable tape measure securely to a wall. Note: If a child's age cannot be determined, children 87 cm or greater are measured standing.

Place the height board vertically on a flat surface.		
Ask the caregiver (or an assistant) to remove the child's footwear or head covering.		
Place the child so that the shoulder blades, buttocks, and heels touch the vertical surface of the board. The feet must be flat on the floor, slightly apart, with the legs and back straight and arms at the sides. The shoulders must be relaxed and in contact with the board. The head does not need to touch the board.		
Ask the child to stand 'straight and tall' and look straight ahead.		
Ask an assistant to check that the child is standing with feet flat on the board and knees straight.		
The shoulders and buttocks should be in line with the heels. Ask the assistant to hold the child's ankles and gently push the knees to straighten them.		
Slide the movable headpiece down firmly on the crown of the child's head, gently holding the head so that the child's eyes point forward.		
Read the measurement to the nearest 0.1 cm and record.		

# **Adolescents and Adults**

1	Place the measuring board on a hard, flat surface against a wall and ensure that it is stable. Alternatively use a microtoise (portable mountable measuring tape fixed to the wall. If measuring board or microtoise is unavailable, you can use a ruler drawn on a straight wall that meets the floor at a 90 degree angle.
2	Ask the person to take off his/her shoes and remove any head coverings that might interfere with the height measurement. Ask the person to stand on the base of the height measuring board, with his/her back to the wall.
3	Ask the person to look straight ahead, making sure shoulders are level and hands are at his/her sides. At least the buttocks should touch the back of the height board/wall.
4	Lower the headpiece to the top of the person's head. Read aloud the measurement to the nearest 0.1 cm. Record the measurement clearly.

# **Mid-Upper Arm Circumference**

MUAC is used to measure the nutritional status of children 6 months and older, adolescents, and adults, including pregnant and lactating women. MUAC should always be used instead of BMI to assess the nutritional status of women who are pregnant or up to 6 months postpartum because their weight is not an indication of their nutritional status. MUAC is simple to measure, both in the clinic and in the community, and requires no height measurement. MUAC is measured with special tapes, some of which are colour-coded with sections in red (for severe malnutrition), yellow (for moderate malnutrition), and green (for normal nutritional status). A millimetre tape is recommended, but a centimetre tape can also be used.

## **Measuring Mid-Upper Arm Circumference**



Bend the left arm at a 90° angle.

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



Keep the tape at eye level and place it at 0 cm at the top of the shoulder.

Pull tape past tip of bent elbow.



Mark the length of the upper arm by putting your right thumb on the tape where it meets the tip of the elbow.

Take the point where your right thumb marked and bring it to meet the 0-cm point on the shoulder, folding the tape.

Place your left thumb on the point where the tape folds (midpoint). Mark the midpoint with a finger or pen.



Straighten the client's arm and wrap the tape around the arm at the midpoint.

Place the tape through the window and correct the tape tension.



Too loose



Too tight



Read the measurement to the nearest 1 mm (0.1 cm) in the window where the arrows point inward.

Record the measurement to the nearest 1 mm (0.1 cm) and record the colour.

# **Anthropometric Indices**

Weight and height alone do not provide enough information to determine nutritional status. They are combined with other information to form anthropometric indices, which provide important nutritional information. Common indices are:

- Height for age (HFA), used to identify stunting
- Weight for age (WFA), used to identify underweight and used for growth monitoring
- Weight for height (WFH), used to identify wasting
- Body mass index (BMI), a ratio of weight for height that indicates body fat

#### Figure 1.4.1 Building Blocks for Anthropometric Indices



# **Classification of Nutritional Status**

# **Z-Scores**

Z-scores are measured in standard deviations (SD), which indicate the tendency of a measurement toward the median reference measurement (the 2006 WHO Child Growth Standards<sup>4</sup> for children under 5 or the WHO Growth Reference 2007 for children and adolescents 5–19 years). The z-score for the median measurement is 0. A measurement lower than the median is indicated with a negative sign (e.g., –1 z-score), and a measurement greater than the median is indicated with a positive sign or no sign (e.g., +2 z-score or 2 z-score).

The further away a measurement is from the median on either side, the greater the risk of malnutrition. In Figure 1.4.2, which applies to the 2006 WHO Growth Standards for children under 5, a z-score to the left of the median (e.g., -3 z-score) indicates undernutrition, while a z-score to the right of the median (e.g., 3 z-score) indicates overnutrition. Figure 1.4.3 shows levels of malnutrition indicated by z-scores.

<sup>&</sup>lt;sup>4</sup> The WHO Child Growth Standards were released in 2006 and reflect the way a healthy child should grow. The standards, developed based on data from the WHO Multicentre Growth Reference Study, describe normal growth of all children from birth to 5 years under optimal conditions. The WHO Growth Reference (2007) applies to children and adolescents 5–19 years and has different overweight cut-offs than the WHO Child Growth Standards.





### Figure 1.4.3 Levels of Malnutrition Indicated by Z-Scores



<sup>5</sup> Tallness, or HFA > 1 z-score, is not considered to be a problem. If a medical professional suspects that a very tall child (HFA > 3 z-score) may have an endocrine disorder, he or she can refer the child to a specialist. WFA is not used to assess overweight; WFH and BMI for age are more appropriate indices (WHO 2008).

# Weight for Age Z-Score

Weight for age compares a child's weight to the expected weight of a healthy child of the same age and sex, according to the 2006 WHO Child Growth Standards. Weight for age z-score (WAZ) can be used to determine the nutritional status of children under 2 years, specifically whether they are underweight, and is used in growth monitoring and promotion programmes. WHO has made standardized growth curves/charts and field tables available to help classify a child's weight for age. There are separate weight for age tables and growth curves for boys and girls in the WHO Child Growth Standards.

## Finding Weight for Age Z-Score Using Growth Curves/Charts

Select the correct growth chart for the child's age and sex
Sciect the contest growth chart for the china's age and sex.

- 2 Use the vertical line (y axis) to find the weight in kilograms.
- 3 Use the horizontal line (x axis) to find the child's age.
- **4** Find where the two lines meet and determine the z-score category under which the measurement falls.

## Finding Weight for Age Z-Score Using Field Tables

WHO has developed field tables with which to determine z-scores (expressed as standard deviations, or SDs, in the tables) and classify nutritional status. The middle column in each table lists the median weight for age. To either side of the middle column are z-scores based on age (in years or months). Using this information, you can determine in which z-score range a child's WFA falls (e.g., < -2 z-score and > -3 z-score).

- 1 Select the correct field table for the child's age and sex.
- 2 Using the two left-hand columns, find the child's age in years (first column) or months (second column).
- In the row that corresponds to the child's age, find where the child's weight falls.
  - a. If the child weighs less than the median, find the z-score column that lists the lowest weight that is higher than the child's weight. Confirm that the child weighs more than the weight listed in the column to the left. For example, if the child weighs less than the weight that corresponds to -1 z-score, but more than the weight that corresponds to -2 z-score, he or she is < -1 z-score and > -2 z-score and is considered to be at risk/ mildly malnourished.
  - b. If the child weighs more than the median, find the z-score column that lists the highest weight that is lower than the child's weight. Confirm that the child weighs less than the weight listed in the column to the right. For example, if the child weighs more than the weight that corresponds to +2 z-score, but less than the weight that corresponds to +3 z-score, the child is > +2 z-score and < +3 z-score.</li>

# Weight for Height Z-Score

Weight for height z-score (WHZ) is used to classify a child's nutritional status by comparing a child's weight to the expected weight of a child of the same length/height and sex in the WHO Child Growth Standards. WHZ is used to identify acute malnutrition (wasting) as well as overweight and is key to the management of MAM and SAM. There are separate WHO Child Growth Standards for weight for length (for children from birth to 2 years) and weight for height (for children from 2 to 5 years). WHO has made standardized growth curves/charts and field tables available to help classify a child's weight for height.

# Finding Weight for Length/Height Z-Score for Children 0–59 Months Using Growth Curves/Charts

Find the connect of	ant fan tha abild's ago (0	22 mageths are 2	I FO magnetical and again
Find the correct ch	art for the child's age (O	-23 months of $24$	4–59 months) and sex.

- 2 Find the child's weight in kilograms on the vertical line (y axis).
- Find the child's length or height on the horizontal line (x axis).
- 4 Read the number where the two lines meet.

## Finding Weight for Length/Height Z-Score Using Field Tables

WHO has developed field tables with which to determine z-scores (expressed as standard deviations, or SDs, in the tables) and classify nutritional status. The middle column in each table lists the median weight for length or height. To either side of the middle column are z-scores based on age (in years or months). Using this information, you can determine in which z-score range a child's weight for length/height falls (e.g., < -2 z-score and > -3 z-score).

- Select the correct field table for the child's age and sex.
- 2 Using the two left-hand columns, find the child's height in centimetres.
- In the row that corresponds to the child's height, find where the child's weight falls.
  - a. If the child weighs less than the median, find the z-score column that lists the lowest weight that is higher than the child's weight. Confirm that the child weighs more than the weight listed in the column to the left. For example, if the child weighs less than the weight that corresponds to -1 z-score, but more than the weight that corresponds to -2 z-score, he or she is < -1 z-score and > -2 z-score and is considered to be at risk/ mildly malnourished.
  - b. If the child weighs more than the median, find the z-score column that lists the highest weight that is lower than the child's weight. Confirm that the child weighs less than the weight listed in the column to the right. For example, if the child weighs more than the weight that corresponds to +2 z-score, but less than the weight that corresponds to +3 z-score, the child is > +2 z-score and < +3 z-score.</p>

# Height/Length for Age Z-Score

Height/length for age z-score (HAZ) classifies a child's nutritional status by comparing a child's height to the expected height of a healthy child of the same age and sex based on the WHO Child Growth Standards. HAZ is used to identify stunting, or short stature, which indicates chronic malnutrition. There are separate WHO Child Growth Standards for length for age (for children from birth to 2 years) and height for age (from 2 to 5 years) and also for boys and girls. WHO has made standardized growth curves/charts and field tables available to help classify a child's height for age.

# Finding Height/Length for Age Z-Score for Children 0–59 Months Using Growth Curves/Charts

- Find the correct chart for the child's age (0–23 months or 24–59 months) and sex.
- 2 Find the child's height in centimetres on the vertical line (y axis).
- 3 Find the child's age on the horizontal line (x axis).
- 4 Read the number where the two lines meet.

## Finding Height/Length for Age Z-Score for Children 0–59 Months Using Field Tables

WHO has developed field tables with which to determine z-scores (expressed as standard deviations, or SDs, in the tables) and classify nutritional status. The middle column in each table lists the median height for a given age. To either side of the middle column are z-scores based on age in years or months. Using this information, you can determine in which z-score range a child's HFA falls (e.g., < -2 z-score and > -3 z-score).

- 1 Select the correct field table for the child's age and sex.
- 2 Using the two left-hand vertical columns, find the child's age in years (first column) or months (second column).
- In the row that corresponds to the child's age, find where the child's height/length (cm) falls.
  - a. If the child is shorter than the median, find the z-score column that lists the lowest height that is greater than the child's height. Confirm that the child is taller than the height listed in the column to the left. For example, if the child is shorter than the height that corresponds to -1 z-score but taller than the height that corresponds to -2 z-score, he or she is < -1 z-score and > -2 z-score and is considered to be at risk/mildly stunted.
  - b. If the child is taller than the median, find the z-score column that lists the largest height that is lower than the child's height. Confirm that the child is shorter than the height listed in the column to the right. For example, if the child is taller than the height that corresponds to +2 z-score but shorter than the height that corresponds to +3 z-score, the child is > +2-score and < +3 z-score.</li>



# **Classify Nutritional Status Using Z-Scores**

Use the weight for length/height growth curves/charts and tables to find the z-scores for the following children and classify their nutritional status.

Use the weight for length/height growth curves/charts and tables to find the children and classify their nutritional status.	z-scores for the following ANSWERS	
A boy 1 year with a length of 62 cm and weight of 5 kg		
A girl 3 years with weight of 7.6 kg and height of 70 cm		
Use the weight for age growth curves/charts and tables to find the z-scores classify their nutritional status.	for the following children and ANSWERS	
A boy 4 years, 8 months, who weighs 11.8 kg		
A girl 8 months, who weighs 7.2 kg		
Use the height/length for age growth curves/charts and tables to find the z-scores for the following children		
and classify their nutritional status.	ANSWERS	
A girl who is 2 years, 4 months and is 92 cm		
A boy who is 1 year, 5 months and 74 cm		

# **Body Mass Index**

BMI is a reliable indicator of body fatness and an inexpensive and simple way to measure malnutrition in adults 19 and older. A BMI below the WHO cut-offs indicates a need for nutrition interventions to slow or reverse weight loss.

BMI is not an accurate indicator of nutritional status in pregnant women, lactating women in their first six months postpartum, or adults with oedema, whose weight gain is not linked to their nutritional status. Use MUAC for these groups.

	Measure and record the client's weight in kilograms and height in centimetres. Example: Weight = 81 kg and height = 185 cm
	Convert centimetres into metres (100 cm = 1 m, so 185 cm = 1.85 m).
	Calculate BMI using the formula below:
	weight in kilograms (height in metres) <sup>2</sup>
	Example: $81/1.85^{2}$ ( $81/1.85^{2}1.85$ ) = $81/3.4225$ = 23.6669
	Round to the nearest whole or half number (the nearest 0.5, such as 19.5, 20, 20.5).
	Example: 23.6669 rounded to the nearest 0.5 = 23.5
	BMI = 23.5
C	an also be found on a BMI reference table or BMI wheel.

## Finding BMI on the BMI Reference Table

1	Find the correct table for the client's age and height. (Note: BMI is not used for pregnant or lactating women.)
2	Find the weight in kilograms in the row at the bottom of the table (round to the nearest whole number).
3	Find the client's height in centimetres in the first column on the left side of the table.
4	Read the number where the two lines meet. This is the BMI.

## Finding BMI and Classifying Nutritional Status of Adults Using the BMI Wheel

The BMI wheel is another tool that can be used to calculate both BMI and BMI for age. BMI for adults is found on the side of the wheel with the word 'Instructions' at the top.

NB: On the BMI wheel, 'severely underweight' means severe acute malnutrition (SAM), 'moderately underweight' means moderate acute malnutrition (MAM), and 'mildly underweight' means 'at risk' of malnutrition.

# Find BMI

BMI	Nutritional status
	BMI

Find BMI on the BMI table for the following clients.	BMI
A man weighing 60 kg with a height of 154 cm	
A woman weighing 90 kg with a height 160 cm	
A woman weighing 45.6 kg with a height of 159 cm	

## **Classification of Nutritional Status of Adults 18 and Older Using BMI**

Table 1.4.1 shows BMI cut-off points and the classifications of nutritional status for each cut-off point.

## Table 1.4.1 BMI and Nutritional Status

BMI (kg/m²)	Classification
< 16.0	Severe acute malnutrition
16.0–16.9	Moderate acute malnutrition
17.0–18.4	At risk/mild malnutrition
18.5–24.9	Normal nutritional status
25.0–29.9	Overweight
≥ 30.0	Obesity

Note: For consistency, Uganda uses the terms 'severe acute malnutrition' and 'moderate acute malnutrition' according to the above BMI cut-offs. Internationally, these are sometimes referred to as 'moderate underweight' and 'severe underweight' or 'moderate thinness' and 'severe thinness'.

# **Classification of Children and Adolescents 5–18 Years Using BMI for Age Z-Score**

BMI for age z-score can be used to find the nutritional status of children and adolescents 5–18 years. This indicator, which reflects sex as well as age, is used instead of BMI alone because children and adolescents are still growing and their body composition varies with age and gender. For adolescent girls 15–18 years who are pregnant or within 6 months postpartum, MUAC should be used to classify nutritional status. Otherwise, BMI for age is the preferred method for children and adolescents. The chart below indicates cut-offs for BMI for age z-scores for children 5–18 years. Note that overweight begins when BMI for age is > +1 z-score in adolescents.

BMI for Age Cut-offs									
SAM	Moderate	Mild	Normal	Overweight	Obese				
< -3	≥ -3 to < -2	-2 to -1	≥ -1 to ≤ +1	> +1 to ≤ +2	> +2				

## Finding BMI for Age Z-Score for Children and Adolescents 5–18 Years

- 1. Find the client's BMI (as shown previously).
- 2. Find the correct BMI for age table for the client's sex (available at <u>www.fantaproject.org/tools/</u> <u>bmi-look-up-tables</u>).
- 3. Round the age to the nearest 6 months and find it in the table's first column (y axis).
- 4. In the row to the right of the client's age, find the range that includes the client's BMI and read the z-score range in the table's top row.

Example: A boy 5 years and 9 months with a BMI of 12.5 has a z-score between -3 and -2 and is moderately malnourished.

# **Classifying Nutritional Status of Children 5–18 Years Using the BMI Wheel**

Follow the instructions on the BMI wheel to find a child's BMI, BMI for age, and nutritional status.



Calculate the BMI and then use the BMI for age charts to find the BMI for age z-score and the malnutrit								
classification for the following children.	ANSWERS							
A boy 6 years with a height of 94 cm and weight of 10.5 kg								
A girl 10 years with a height of 105 cm and weight of 20.7 kg								

USE THE RMI WHEEL TO THE RMI AND HUTTEIONAL STATUS.							
A man 17 years, 3 months weighing 43.2 kg with a height of 160 cm	BMI	Nutritional status					
A girl 14 years, 7 months weighing 38 kg with a height 145 cm							
A boy 8 years, 4 months weighing 19 kg with a height of 125 cm							
A girl 7 years, 6 months weighing 23 kg with a height of 110 cm							



# **Classify Nutritional Status**

Use the appropriate reference tables and charts to determine the z-scores and degree of malnutrition for the clients below.

	ANSWENS
Boy, 2 years, 70 cm long, weighing 7.8 kg (use the weight for length chart)	
Girl, 13 years, 157 cm tall, weighing 30 kg (use the BMI for age chart)	
Man, 174 cm tall, weighing 75 kg (use the BMI chart)	
Nonpregnant/nonpostpartum woman, 156 cm tall, weighing 40 kg (use the BMI chart)	

### Use the appropriate reference tables and charts to complete the missing information in the table below.

	AN	SWER	S		
Client	Weight for height z-score	BMI	BMI for age z-score	Bilateral pitting oedema	Classification
Girl, 2 years, 82 cm long, weighing 8.6 kg					
Boy, 1 year, 74 cm long, weighing 7.2 kg					
Girl, 6 months, 55 cm long, weighing 3.9 kg					
Girl, 1.5 years, 102 cm long, weighing 12 kg					
Girl, 10 years, 3 months, 150 cm tall, weighing 26.3 kg					
Man, 20 years, 174 cm tall, weighing 47 kg					
Woman, 50 years, 179 cm tall, weighing 82 kg					
Man, 45 years, 162 cm tall, weighing 36 kg					
Man, 19 years, 154 cm tall, weighing 35 kg					
Pregnant girl, 16 years, 154 cm tall, weighing 40 kg					
Lactating woman, 157 cm tall, weighing 70 kg					
Boy, 8 years, 156 cm tall, weighing 46 kg					
Girl, 10 years, 151 cm, weighing 50 kg					

# **Classification of Nutritional Status Using MUAC**

Cut-off points are measurements above or below which the risk of malnutrition increases.

## Table 1.4.2 MUAC Cut-off Points and Nutritional Status Classifications for Children and Adults

Group		Severe acuteModerate acutemalnutrition (SAM)malnutrition (MAM)		Normal
	6 months to < 5 years	< 11.5 cm	≥ 11.5 to < 12.5 cm	≥ 12.5 cm
Infants	Children 5 to < 10 years	< 13.5 cm	≥ 13.5 to < 14.5 cm	≥ 14.5 cm
and children	Children/ adolescents 10 to < 15 years	< 16.0 cm	≥ 16.0 to < 18.5 cm	≥ 18.5 cm
	Adolescents 15 to < 18	< 18.5 cm	≥ 18.5 to < 21.0 cm	≥ 21.0 cm
Adults 18 years and older		< 19.0 cm	≥ 19.0 to < 22.0 cm	≥ 22.0 cm
Pregnant women or mothers with infants up to 6 months		< 19.0 cm	≥ 19.0 to < 22.0 cm	≥ 22.0 cm
Elderly peo	pple 60 years and older	< 16.0 cm	≥ 16.0 to < 18.5 cm	≥ 18.5 cm

Source: Republic of Uganda Ministry of Health, February 2015 (draft).

The following are nutrition classification summaries for quick reference.

## Table 1.4.3 Nutrition Classification Summary: Infants, Children, Adolescents, and Adults

Age Group	Measure	Severe Acute Malnutrition (SAM)	Moderate Acute Malnutrition (MAM)	At Risk
< 6 months	Weight for length	<ul> <li>&lt; -3 z-score</li> <li>Other signs:</li> <li>Too weak to suckle/feed</li> <li>Body weight &lt; 3 kg</li> </ul>	≥ -3 to < -2 z-score	Static weight/ losing weight at home
6 months to < 5 years	Weight for length or weight for height	< -3 z-score	≥ -3 to < -2 z-score	≥ -2 to < -1 z-score
,	MUAC	< 11.5 cm	≥ 11.5 to < 12.5 cm	
5 to < 18 years	BMI for age	< -3 z-score	≥ -3 to < -2 z score	≥ -2 to -1 z-score
5 to < 10 years	MUAC	< 13.5 cm	≥ 13.5 to < 14.5 cm	
10 to < 15 years	MUAC	< 16.0 cm	≥ 16.0 to < 18.5 cm	
15 to < 18 years	MUAC	< 18.5 cm	≥ 18.5 to < 21.0 cm	
Adults (18 years	вмі	< 16	≥ 16 to < 17	≥ 17 to < 18.5
pregnant women)	MUAC	< 19.0 cm	≥ 19.0 to < 22.0 cm	
Pregnant women or mothers with infants up to 6 months	MUAC	< 19.0 cm	≥ 19.0 to < 22.0 cm	
Elderly 60 years and older	MUAC	< 16.0 cm	≥ 16.0 to < 18.5	
All age groups	Bilateral pitting oedema	Present		
Age Group	Measure	Severe Overweight (Obesity)	Overweight	
5 to < 19 years	BMI for age	>2	> 1 to ≤ 2	
18 years and above	BMI	≥ 30	25.0 – 29.9	

# Use of Weight for Age in Growth Monitoring and Promotion of Infants 0–2 Years

Growth monitoring and promotion (GMP) is the process of regularly weighing and assessing the growth of children up to 2 years and fostering actions to improve or maintain the children's growth. The information is shared with mothers/caregivers to help them maintain or improve the growth and health of their children. Communities are also kept informed, so that they can help create a supportive climate for families to take appropriate actions and to stimulate community efforts to improve the health and nutritional status of children.

The benefits of GMP include:

- Identifying and addressing growth problems early, before a child is malnourished
- Serving as a diagnostic tool for nutritional status
- Providing an opportunity to counsel mothers about the relationship between diet and illness
- Providing regular contact with health services for timely care

During growth monitoring sessions, the health worker:

- Takes a child's weight regularly and plots it on a growth chart in the Child Health Card
- Compares the child's growth pattern with the growth of healthy children and determines whether the child's growth is adequate
- Assesses the child's health and feeding
- Counsels the caregiver on the child's feeding and care, based on the assessment and information on the child

Community workers follow up with the caregiver between sessions.

#### Using the Child Health Card

- Weigh the child at each visit and plot the weight on the growth chart. The weight can be taken from the Child Health Card if necessary.
- Compare the plotted slope of the child's growth curve to the slope of the closest line on the growth chart.
- Determine the adequacy of the child's growth.
- Counsel accordingly.

NOTE: The Ministry of health has developed a comprehensive training package on Growth Monitoring and Promotion (2014).



## Figure 1.4.4 Child Health Card

# Plotting Growth (Weight for Age) on a Child Growth Chart

# Use the information below to plot the growth, using weight for age, for Denis and Angella.

Denis was born with 2.7 kg on 12 June 2009. He presented with the following monthly weights.

	2009					2010								
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	July	Aug
Weight (kg)	3.0	3.2	3.5	3.9	4.2	5.1	5.1	4.8	5.2	5.6	6.2	6.8	7.3	7.6

Plot Denis' growth pattern on the growth promotion card.

Angella was born in December 2014 with a weight of 3.6 kg. During 2015, her weights have varied as indicated below.

	2015											
Month	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Weight (kg)	3.8	3.8	4.2	5.2	6.0	7.0	7.2	7.8	8.5	9.0	9.2	9.5

Plot Angella's growth pattern on the growth promotion card.

# **Clinical Assessment and Classification of Nutritional Status**

Clinical assessment is part of determining a client's nutritional status and should be combined with anthropometric assessment. Clinical assessment involves screening at the triage, taking the client's health history, and conducting a physical examination for signs of malnutrition (e.g., bilateral pitting oedema and severe wasting).

# **Taking a Client's Health History**

Taking a client's health history should include:

### **General History**

- Recent unintentional weight loss (≥ 5 kg)
- Any illness the client has had (e.g., active tuberculosis, diarrhoea for more than 7 days, other chronic opportunistic infections, oesophageal infections, and tumours)
- Any medication/treatment the client is on
- Any symptoms the client has been experiencing, such as cough; fever; diarrhoea; vomiting; nausea; loss of appetite; persistent fatigue; dry or flaking skin; mouth sores or difficulty swallowing; pallor of the palms, nails, or mucous membranes (anaemia); disorientation; night blindness; irritability; anxiety; attention deficit; goitre (enlarged thyroid gland); muscle twitches; or scaling and cracking of the lips and mouth

### **Dietary History (Diet Assessment)**

Dietary history is a process of assessing what the client eats e.g., quantity of food eaten at each meal and food groups eaten each day. Common methods used in a clinical setting include the 24-hour dietary recall and diet history.

#### **24-Hour Recall**

The 24-hour recall is a retrospective assessment method in which an interviewer asks the client/ caregiver to recall and describe all foods and beverages the client consumed in the preceding 24 hours/previous day. It is the simplest method, but it does not show the client's usual eating habits.

#### **Diet History**

The diet history questionnaire is a retrospective assessment method of ascertaining a respondent's 'usual' food intake by collecting detailed information about each food and the amount eaten. The questionnaire may include questions about meal patterns, lists of common foods, and groups of generic foods. The questionnaire is typically administered by a trained interviewer either in person or by telephone but also can be completed by the client.

## **Physical Examination**

Physical examination includes looking for body changes associated with malnutrition, Table 1.4.4.

## Table 1.4.4 Examples of Physical Changes Associated with SAM

#### Face

- Full, puffy
- Cheeks drawn in

#### Mouth

- Angular stomatitis (ulcers at the corner of the mouth)
- Cheilosis (chapping, fissuring of lips)

#### Skin

- Dry (xerosis) and scaly
- Dermatitis
- Follicular hyperkeratosis
- Delayed wound healing
- Xanthoma (yellowish papules)
- Decubitus ulcers
- Dermatitis
- Herpetiformis

#### Nails

- Koilonychia (spoon nails)
- Eggshell nails
- Blue lunula

#### Feet

• Swelling of both feet and/or body

#### Eyes

- Corneal or conjunctival dryness
- Conjunctival pallor
- Corneal vascularization (bilateral)
- Redness
- Fissuring of eyelid corners

#### Hair

- Colour change
- Dry, dull
- Alopecia (baldness)
- Brittle
- Early greying

#### Mental

- Apathy
- Depression
- Confusion
- Dementia

#### Abdomen

- Distension
- Flatus

#### **Muscles and bones**

- Reduced strength
- Bone pain
- Bowed legs
- 'Pigeon chest' (protruding sternum and ribs)
- Signs of wasting:
  - Prominent bones (ribs)
  - Skinny limbs
  - Loose skin (on lifting) around the buttocks (like baggy pants)

#### Tongue

- Colour (magenta, scarlet)
- Pain
- Oedema
- Smooth texture
- Pallor
- Papillary atrophy
- Papillary hypertrophy
- Fissuring
- Taste changes
- Glossitis

#### Other

- Sensory neuropathy
- Tetany

# **Clinical Signs of Severe Acute Malnutrition in Children**

# **Bilateral Pitting Oedema (Nutritional Oedema)**

Oedema is the presence of an abnormally large amount of fluid in the body's tissues. While oedema can be caused by conditions such as congestive heart disease, lymphatic disorders, and kidney disease, it can also be caused by malnutrition. Oedema is of nutritional significance only if it is bilateral (in both feet or legs) and is pitting (when pressure on the skin leaves an indentation that remains after the pressure is removed). Bilateral pitting oedema is a sign of SAM, and any client with bilateral pitting oedema should be classified as having SAM, regardless of any other anthropometric measurements.

Other signs of bilateral pitting oedema, also called kwashiorkor, include:

- Swollen cheeks: 'Moon face'
- Dermatosis: flaky skin or patches of abnormally light or dark skin (in severe cases)
- Apathy, little energy
- Loss of appetite
- Hair changes: change of colour; dull, dry, and brittle; falls out easily
- Irritability (child cries easily)

There are three grades of bilateral pitting oedema. When there is no bilateral pitting oedema, the grade is 'absent'. Grades of bilateral pitting oedema are classified by plus signs.

# **Checking for Bilateral Pitting Oedema**

- 1 Test for bilateral pitting oedema with thumb pressure, not just by looking.
- 2 Press gently with your thumbs on both of the client's feet for 3 seconds (approximately the time it takes to say 'one thousand one, one thousand two, one thousand three').
- 3 If a shallow indentation or pit remains on both feet when the thumbs are lifted, then the client has bilateral pitting (nutritional) oedema.



Apply gentle pressure with your thumbs.



Release after 3 seconds.

## Table 1.4.5 Grades of Bilateral Pitting Oedema

Grade	Definition
Absent	No oedema
Grade +	Mild: both feet/ankles
Grade ++	Moderate: both feet, plus lower legs, hands, or lower arms
Grade +++	Severe: generalised bilateral pitting oedema, including both feet, legs, arms, and face

# **Signs of Severe Wasting**

Clients also should be examined for signs of severe wasting (also called marasmus).

- Thin appearance ('old man' face)
- Apathy: is very quiet and does not cry
- Ribs and bones easily seen
- Skin under the upper arms appears loose
- On the back, the ribs and shoulder bones easily seen
- In extreme cases, the skin on the buttocks has a 'baggy pants' look
- No bilateral pitting oedema

### Figure 1.4.5 Clinical Signs of Severe Acute Malnutrition







#### Bilateral Pitting Oedema (kwashiorkor)

- 'Moon face'
- Dermatosis: flaky skin or patches of abnormally light or dark skin (in severe cases)
- Apathy, little energy
- Loss of appetite
- Hair changes: colour change; dull, dry, brittle; falls out easily
- Irritability (child cries easily)

#### Severe Wasting (marasmus)

- Thin appearance ('old man' face)
- Apathy: is very quiet and does not cry
- Ribs and bones easily seen on the back and shoulder
- Skin under the upper arms appears loose
- In extreme cases, the skin on the buttocks has a 'baggy pants' look
- No bilateral pitting oedema



# MANAGEMENT OF ACUTE MALNUTRITION



# Purpose

To enhance participants' knowledge of the concept and protocols of comprehensive outpatient therapeutic care (OTC) for children, adults, and pregnant and lactating women.

# **Session Objectives**

By the end of the session, participants should be able to:	Duration
Describe common types of therapeutic and supplementary foods used in nutrition care	20 min.
Describe types of care in management of acute malnutrition	40 min.
Discuss the protocols of comprehensive OTC	120 min.
Describe the discharge criteria/outcomes of OTC	25 min.

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Estimated Time/Duration (includes 5-minute wrap-up)

210 minutes

# **Introduction to Types of Care**

Integrated management of malnutrition (IMAM) aims at maximizing coverage and access to care of malnutrition through timely detection and appropriate management.

IMAM has four components:

- 1) Inpatient therapeutic care (ITC) for patients with acute malnutrition and medical complications and infants less than 6 months of age who have visible signs of acute malnutrition or who have failed to feed
- 2) Outpatient therapeutic care (OTC) for acute malnutrition with no medical complications
- 3) Supplementary feeding program (SFP), used in difficult circumstances
- 4) Community linkage for early identification, referral, and follow-up of acutely malnourished cases

Patients can be transferred from one type of care to another, depending on medical complications, response to treatment, availability of functional community structures and programs.

## **Advantages of Integrated Management**

- Reduces unnecessary exposure to additional infection risks in health facilities
- Results in caregiver spending less time in hospital, away from home and family
- Causes less disruption of caregiver's economic activities
- Reduces congestion in the health facility and health worker workload
- Reduces health facility costs and allows reallocation of resources to other priorities
- Contributes to early diagnosis of HIV infection for better care and outcome

## Figure 1.5.1 Types of Care in Management of Acute Malnutrition



## **Therapeutic Foods Used for Management of Acute Malnutrition**

- Therapeutic foods are specially formulated for specific nutritional and therapeutic purposes.
- Therapeutic foods are used to feed patients with SAM or to supplement the diets of patients with special nutrition requirements.
- Therapeutic foods should be provided according to prescribed doses.

## **Types of Therapeutic Foods**

#### 1) Formula 75 (F-75) and Formula 100 (F-100)

F-75 and F-100 are milk-based diets and contain powdered milk, sugar, and other ingredients designed to provide an easily absorbed and medically appropriate amount of energy, carbohydrates, protein, fat, and essential micronutrients. They come in powder form and are reconstituted with water.

- F-75 is used in phase 1 (stabilization phase) of ITC, which is for children who have SAM with medical complications. F-75 (75 kcal/100 ml and 0.9 g protein/100 ml) contains modest amounts of energy, fats, and sodium, and is rich in carbohydrates. It is prescribed and fed every 2–3 hours for 2–7 days from admission to ITC.
- **F-100** is used in phase 2 (rehabilitation/catch-up growth) of ITC, which begins when there is improvement in the child's appetite and clinical condition. A child in ITC transitions from F-75 to F-100 (or RUTF), which is higher in energy and protein (100 kcal/100 ml, 2.9 g protein/100 ml) and designed to promote weight gain6.

#### **Benefits of Milk-Based Diets**

- Formulas are mixed according to prescription (based on weight of the client) and at time of feeding to avoid contamination and waste.
- Formulas are liquid that can be fed through feeding tubes, especially for very ill people with no appetite.
- Formulas have the complete appropriate mix of nutrients (including vitamins and minerals) required for treating SAM, and no additional vitamin supplements are needed.

#### 2) Ready-to-Use Therapeutic Food

RUTF is a lipid-based, energy-dense, mineral/vitamin-enriched food with a formulation nearly equivalent to F-100 (RUTF has iron) that can be given to people over 6 months of age. RUTF is specifically designed to treat SAM in OTC or phase 2 of ITC. It has been shown to promote a faster rate of recovery from SAM than standard F-100. The most common RUTF is a paste made from peanuts, milk powder, oil, sugar, and a mineral/vitamin mix. Common RUTFs available in Uganda are Plumpy'Nut, which is imported, and RUTAFA, which is produced locally.

#### **Benefits of RUTF**

- Is prescribed based on the child's weight, making the quantity to distribute easy to calculate
- Has a long shelf life—will remain safe for several months in simple packaging even without refrigeration and up to 2 years in airtight packaging
- Is usually oil-based, contains little water, and does not need to be mixed with water, reducing risk of bacterial growth and contamination

- Can be eaten directly from the packet and does not require preparation or cooking
- Can be fed to the child at home, allowing for OTC for SAM

## **Supplementary Foods for Managing MAM**

#### Fortified Blended Food (FBF)

FBF is a variety of blends of partially precooked and milled cereals, soya beans, and pulses fortified with micronutrients (vitamins and minerals). Special formulations may contain vegetable oil or milk powder. FBF is a good source of energy, protein, carbohydrates, fat, and micronutrients. FBF is used for supplementary feeding of children with moderate malnutrition as well as to prevent and address nutritional deficiencies among other children. FBF is usually mixed with water and oil and cooked as a porridge. Commonly used FBFs include corn-soya blend (CSB), super cereal (CSB+), and super cereal plus (CSB++).

#### Benefits of FBF

- Can be prepared like other foods from home
- Can be used for treatment of moderate malnutrition in the family/household
- Is preferred by many moderately malnourished adults over RUTF

# **Inpatient Therapeutic Care (ITC)**

ITC is for management of patients who present with acute malnutrition (SAM or MAM) and medical complications as inpatients. The purpose of ITC is to concurrently treat medical complications and provide nutrition therapy. The length of stay at the health facility varies from 1 to 6 weeks, depending on severity, response to treatment, and time taken to regain appetite.

Management of ITC is provided in phases. Phase 1 (stabilization phase) lasts between 2 and 7 days. Identified medical complications are treated appropriately. Therapeutic foods (F-75) are fed every 2–3 hours by mouth or through a feeding tube. The patient is transitioned to phase 2 when appetite improves and medical complications are controlled.

In phase 2 (the rehabilitation/catch-up phase lasting 2–6 weeks), patients receive F-100 and gradually transition to RUTF and/or a normal local diet. A client may be transferred to OTC once medical complications are resolving, and he or she is alert, clinically well, and has a good appetite.

Note: The Ministry of Health has developed a 5-day comprehensive in-service course on inpatient management of acute malnutrition (Inpatient Management of Acute Malnutrition, training course, 2015).

# **Outpatient Therapeutic Care (OTC)**

## **Concepts and Protocols**

OTC provides home-based treatment and rehabilitation for children, adults, and pregnant/ lactating women who are severely acutely malnourished but have appetite and are free of medical complications. OTC is based on three key factors:

- 1. Absence of medical complications
- 2. Availability of RUTF
- 3. Availability of functional community structures

## **Integration of OTC into Health Care Services**

In order for health facilities to include OTC among their routine health services, they must have functioning and accurate anthropometric equipment; a dependable and sufficient supply of therapeutic foods and adequate storage; appropriate counselling materials and job aids; and tools and forms for monitoring, evaluation, and reporting. Health facilities also need trained health staff who receive regular mentorship and supervision. Linkages between the health facility and community services are also essential: referrals from the community to the health facility are important for identifying acute malnutrition early, and referrals back to the community support systems help families to prevent relapse.

#### **Referrals to OTC and Entry/Admission Criteria**

Clients may be referred from/by:

- Wards, counselling units, and immunization points
- ITC (when their condition improves)
- Community volunteers, other community structures (village health teams, community-based organizations, community development officers)
- Themselves/caregivers

Table 1.5.1 lists the entry/admission criteria for OTC.

Age Group	SAM	Must Apply to All Cases	
6 months to < 5 yrs	MUAC < 11.5 cm or WEH < -3 z-score	Passed appetite test	
	or bilateral pitting oedema + or ++	Well/mild infection	
5 yrs to < 10 yrs	MUAC < 13.5 cm or BMI for age < -3 z-score or bilateral pitting oedema + or ++	Alert Caregiver willing to treat at home	
10 to < 15 yrs	MUAC < 16.0 cm or BMI for age < -3 z-score or bilateral pitting oedema + or ++	required feeding No hypertension, diabetes mellitus, or renal disease	
15 to < 18 yrs	MUAC < 18.50 cm or BMI for age < -3 z-score or bilateral pitting oedema + or ++		
Adults (≥ 18 yrs)	MUAC < 19.0 cm or BMI < 16 Presence of bilateral pitting oedema (other medical causes should be ruled out first)		
Pregnant/lactating women with infants up to 6 months	MUAC < 19.0 cm		
Elderly 60 years and older	MUAC < 16.0 cm		

## Table 1.5.1 OTC Entry/Admission Criteria

Adapted from Uganda Ministry of Health (MOH) 2015 (draft).

## **Management Protocol for OTC**

Figure 1.5.2 gives a general overview of how activities flow in OTC.

#### Figure 1.5.2 Generic Flow of Activities in OTC



#### Triage and Health and Nutrition Education

On arrival, clients and caregivers should be directed to the waiting area. Sick children should be sent for a medical examination immediately. For other clients, the health care worker will provide health and nutrition education on how to prepare inexpensive nutritious meals for the client. Clients and caregivers should also be counselled on HIV testing.

#### 2 Nutritional Assessment/Anthropometric Measurements

At all visits, MUAC, weight, and height should be measured, and oedema status should be checked. Based on the nutrition classification, the client will be referred for enrolment or counselling.

#### 3 Clinical Assessment

Clinical assessment—including medical history, physical examination, and screening for TB and HIV—is used to determine whether a client has medical complications that require referral to ITC. Clients with SAM with no medical complications are enrolled in OTC if they have appetite (see next section on 'appetite test').

**Clients with MAM:** If an individual has MAM as determined by anthropometry, her/his HIV status should be determined and he/she should be assessed for other medical complications. Clients with MAM and other medical complications may be referred to ITC. If the HIV status of an individual with MAM is unknown, she/he should be referred immediately to a testing and counselling centre within the facility. If the client (HIV positive or negative) has MAM and has no serious medical conditions/complications, nutritional counselling should be provided, and the individual can be referred to SFP, if available. However, the client cannot be admitted into OTC.

#### 4 Appetite Test

Lack of appetite is considered to be a medical complication, and a client must be able to eat RUTF to be enrolled in OTC. An appetite test is used to determine whether a client can be admitted to OTC. To pass the appetite test, which can be given during the clinical assessment, a client receives a packet of RUTF and must eat a minimum amount based on her/his weight (see Table 1.5.2). The client MUST be observed eating RUTF before the client can be accepted for OTC. (Note: A client may refuse to eat the RUTF because he/she is in an unfamiliar or strange environment. In this case, the caregiver and health care worker should take the client to a comfortable setting and slowly encourage the client to try the RUTF.)

RUTF					
Weight of client (kg)	Sachets				
< 4 kg	¼ to ¼ sachet				
4 – 6.9 kg	> ¼ sachet				
7 – 9.9 kg	½ sachet				
10 – 14.9 kg	½ to ¾ sachet				
15 – 29 kg	¾ to 1 sachet				
> 30 kg	> 1 sachet				

### Table 1.5.2 Minimum Amount a Malnourished Client Must Eat to Pass Appetite Test

Adapted from Uganda MOH 2015 (draft)

#### 5 Registration in OTC

When a client meets the entry criteria, the registrar should:

- Explain what this means to the client and the caregiver (e.g., reasons for admission, type of treatment, rules to be followed).
- Fill out an OTC client card (allocate registration number, fill out all required information on the client and caregiver).
- Fill out the OTC ration card, which will be given to the client or caregiver. The client/ caregiver should be instructed to bring the ration card to every visit.
- Keep all OTC cards in the client file, which stays at the OTC site.

#### **6** Counselling on RUTF Administration

During the initial visit, the service provider should explain that:

- RUTF should only be used as medicine to treat the malnourished client and should not be shared with other members of the family or community who are hungry.
- Doses of RUTF are administered by cutting the packet at one corner and having the client eat the paste from the sachet or on a clean spoon.
- RUTF should be given to the client frequently, and the client should consume all of the RUTF possible at each feeding.
- The day's entire dose should be consumed each day before consuming any other food.
- For children who are breastfeeding, RUTF should be given soon after breastfeeding. Breastfeeding should continue even though the child is taking RUTF.
- Generous amounts of boiled or treated water must always be given to the individual while eating RUTF because it might cause choking.
- The client's hands must be washed with soap and water before feeding.
- RUTF must be kept in a secure place and out of reach of children or other people in the house.

- RUTF will not spoil in the 2 weeks between OTC visits and does not need to be refrigerated. However, it should be kept out of the sun to preserve nutrients.
- If some RUTF is left over after a feed, the packet should be kept for the next feed. The top of the packet should be rolled down for safety and kept away from insects, pests, or rodents.
- In rare cases, RUTF may cause complications such as diarrhoea, vomiting, fever, swelling, rashes, hives, skin infections, shortness of breath, or shock. If these symptoms are present, the caregiver must stop giving the RUTF and immediately bring the client to the OTC or to the nearest health facility.

#### **Dispensing RUTF and Medicine**

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• Clients or caregivers will receive a 2-week ration of RUTF according to the prescription based on the client's weight or age if 14 years or older (see Table 1.5.3). All clients should leave the centre once their ration is received. Clients also receive routine medical treatment as shown in Table 1.5.4.

Weight (kg) or Age (years)	Sachets/Day	Sachets/Week	Sachets/2 Weeks
3.0–3.4 kg	1¼	9	18
3.5–3.9 kg	1½	11	22
4.0–5.4 kg	2	14	28
5.5–6.9 kg	2 1⁄2	18	36
7.0–8.4 kg	3	21	42
8.5–9.4 kg	3½	25	50
9.5–10.4 kg	4	28	56
10.5–11.9 kg	4½	32	64
≥ 12.0 kg	5	35	70
14 years and older	6	42	84

#### Table 1.5.3 Dosage of RUTF According to Weight or Age
## Table 1.5.4 Routine Treatments for People with SAM

Treatment	Comments
Antibiotics (if no medical complications)	On admission
	<b>Children:</b> Amoxicillin oral (50 mg/kg body weight) daily divided in 2 doses (twice daily for minimum 5 days)
	Adults: Amoxicillin capsule, 500 mg 3 times/day for 7 days
Antifungal treatment, if required,	<b>Nystatin oral suspension</b> , given until at least 48 hours after disappearance of symptoms/up to 14 days:
(uncomplicated,	Neonates: 100,000 units 4 times/day
nonsystemic fungal	> 1 month to < 12 months of age: 200,000 units 4 times/day
Infections)	<b>1 year to adult</b> : 500,000 units 4 times/day or 1 to 2 oral lozenges (200,000 to 400,000 units) 4 to 5 times/day
	Fluconazole
	Children: 3–6 mg/kg once daily for 2 weeks
	Adults: 100-200 mg/day for 2 weeks
Prophylaxis for	In addition to amoxicillin or other relevant antibiotics, give cotrimoxazole (Septrin):
pneumocystis carinii pneumonia (PCP) for	Child 6–59 months: 6–8 mg daily or 2 paediatric tablets
HIV-exposed/infected children	Child ≥ 5 years: 1 adult tablet
Measles vaccination	On admission, check vaccination card. Vaccinate children 9–59 months who are not vaccinated or cannot show proof of vaccination.
Vitamin A supplementation (if not received within previous 1 month)	Children 6–59 months with SAM should receive the daily recommended intake of vitamin A throughout the treatment, either as part of therapeutic foods or supplementation. Children who are receiving F-75, F-100, or RUTF that complies with WHO specifications do not require a high dose of vitamin A (WHO 2013).
	If a child with SAM requires a vitamin A dose, follow this guidance:
	<b>6–11 months:</b> 50,000 IU
	<b>1–2 years:</b> 100,000 IU
	> <b>2</b> years: 200,000 IU
	The following people should not receive the high dose vitamin A:
	• Any patient receiving F-75, F-100, or RUTF that complies with WHO specifications
	<ul> <li>People who have received vitamin A supplementation/treatment within the past month</li> </ul>
	Pregnant women
	<b>Note:</b> People with signs of vitamin A deficiency should receive treatment according to the national protocol.

Antihelminthic	Many malnourished individuals are infested with intestinal parasites. Routine deworming treatment should be given to all clients over 1 year (8 kg) at second visit to OTC.
	Mebendazole
	<b>1–2 years:</b> 250 mg, given once (single dose)
	> 2 years and adults: 500 mg, given once (single dose)
	Albendazole
	<b>1–2 years:</b> 200 mg, given once
	> 2 years and adults: 400 mg, given once (single dose)
Iron/folate	There is sufficient iron and folate in RUTF. Iron and folate should not be administered unless recommended by a medical doctor for treatment of confirmed anaemia.
Malaria testing and treatment (if	Malaria is a leading cause of morbidity and mortality in children. The following actions should be taken for malaria management.
applicable)	• Clients should be systematically tested on admission or during clinical examination.
	Give treatment when necessary as confirmed by positive test.
	<ul> <li>Complicated and severe malaria should be immediately referred to medical personnel.</li> </ul>
	• These services should be available at the OTC site, and drugs should be provided at the OTC dispensing point.

#### **Follow-up of OTC Clients**

Health care workers should monitor the progress of clients by requiring them to visit the OTC site initially every 2 weeks, depending on progress. For clients with health conditions requiring routine visits, these visits should be harmonised with clinic appointment dates until clients are discharged. At each appointment visit, the health care worker should:

- Assess nutritional status: Take the client's anthropometric measurements (weight, height, MUAC, oedema check) and adjust the ration if needed.
- *Conduct physical examinations:* Determine whether to continue with treatment or to discharge or transfer the client.
- Conduct appetite test.
- Update the client card and inform client/caregiver of current nutrition status.
- Counsel on good nutrition behaviours, including preparing and feeding/consuming balanced, nutritious food and adopting Essential Nutrition Actions.
- Conduct food demonstration or demonstration garden session.
- Provide needed medicine and RUTF.
- Emphasize the importance of visiting the clinic throughout the duration of treatment.

#### Transfer to ITC

If any of the following symptoms are noticed during the visits to OTC or routine clinic visits, the client should be referred to an inpatient facility immediately:

- Oedema grade +++ or worsening oedema
- Severely reduced appetite
- Coughing
- High fever
- Diarrhoea
- Anaemia or pallor
- Extreme weakness or convulsions
- Abnormally cold extremities
- Lack of alertness

These signs should also be assessed by outreach workers when visiting clients' households. Outreach workers should refer the client to inpatient care immediately if any of the signs are present.

#### Clients Who Do Not Respond While in OTC

Some clients might not respond to treatment (see Table 1.5.5). For clients who are not responding to the RUTF treatment within the third visit and whose HIV status is unknown, the health care worker should:

- Refer the client to the nearest HIV testing and counselling services.
- If the client is a child under 18 months, refer the child to a clinic for polymerase chain reaction (PCR) testing.

#### Table 1.5.5 Possible Causes of Failure to Respond

Client-Related Factors	Response	
<ul> <li>Receiving insufficient quantity and/or quality of food at home</li> </ul>	<ul> <li>Counsel client/caregiver and stress RUTF is therapy, not food, and should not be shared</li> </ul>	
Sharing RUTF	Re-assess appetite	
Not consuming all the RUTF prescribed	Counsel client/caregiver, conduct home visits, and     light to graphly a company bit and a company of the second se	
<ul> <li>Irregular visits to OTC (absenteeism)</li> </ul>		
Malabsorption	Refer for medical assessment	
Unresolved infections (HIV/AIDS, malaria.	<ul> <li>Refer to ITC/medical reassessment</li> </ul>	
diarrhoea/enteric conditions, RTI/ pneumonia/ TB, urinary infection)	<ul> <li>If HIV status unknown and not responding by third visit, refer to HIV testing and counselling services</li> </ul>	
OTC-Related Factors	Response	
<ul> <li>Inadequate instructions given to the client/ caregiver</li> <li>Incorrect quantity of RUTF dispensed to client</li> </ul>	<ul> <li>Strengthen capacity, provide supervision and mentorship for health workers, provide easy-to-use job aids</li> </ul>	

#### **Role of Community Resource People**

Community volunteers play a vital role in community outreach for OTC. Community volunteers:

- Identify and refer patients with malnutrition for further investigation
- Provide counselling on proper nutrition and feeding practices
- Follow up with clients who have defaulted from the OTC and encourage them to return
- Promote healthy practices in the community
- Link patients in care to available livelihood programs

# **Discharge Criteria/Outcomes for OTC**

#### **Discharged as 'Cured' (Recovered)**

A client 6–59 months should be discharged from OTC as 'cured' based on the following criteria.

- The client has spent a minimum of 4 weeks in the programme, with a minimum of three visits to OTC sites, including the initial visit.
- The client is free of oedema for at least 2 weeks.
- The client is clinically well, with no medical complications.
- The client meets anthropometric criteria summarized in Table 1.5.6.

**Note:** The anthropometric indicator used to confirm SAM at admission should be used to assess recovery (e.g., a client admitted based on MUAC should be discharged based on MUAC). Children admitted based on oedema only should be discharged based on the most routinely used indicator.

#### Table 1.5.6 Criteria for a 'Cured' OTC Discharge

Age Group	Discharge Criteria	Must Apply to All Cases	
	MUAC ≥ 12.5 cm	No oedema for 2 weeks and clinically well and alert	
6 months to < 5 years	or WFH/L ≥ -2 z-score		
	(use same indicator used at admission)		
5 to < 10 years	BMI for age ≥ -2 z-scores		
5 to < 10 years	or MUAC $\geq$ 14.5 cm		
$10 \pm 0 < 15$ years	BMI for age $\geq$ -2 z-scores		
	or MUAC ≥ 18.5 cm	No oedema for 2 consecutive visits and clinically well and	
15  to < 18  years	BMI for age $\geq$ -2 z-scores		
13 to < 18 years	or MUAC ≥ 21.0 cm		
Adults 18 years and older	BMI ≥ 18	alert	
(including those who are HIV+)	or MUAC ≥ 22.0 cm		
Pregnant women and lactating/ nonlactating women with infants under 6 months (including HIV+)	MUAC ≥ 22.0 cm		
Elderly 60 years and older	MUAC ≥ 18.5 cm		

Sources: WHO 2013; Uganda MOH 2015 (draft)

For all 'cured' clients, the final OTC visit should include:

- Provision of a 1-week supply of RUTF (RUTAFA, Plumpy'Nut)
- Link or referral to other facility or community services such as growth monitoring, livelihood programs, SFP (if applicable), or HIV or TB care and treatment
- Counselling on good nutrition and feeding practices, including demonstration and preparation of inexpensive nutritious meals

#### **Discharged as 'Death'**

If the client dies while enrolled in OTC, the file should be completed and closed.

## **Discharged as 'Defaulter'**

The client should be considered a 'defaulter' if he/she is absent for two consecutive OTC visits. Make a follow-up visit to the home to assess the situation and support the family. The client may re-enter the OTC programme if he/she meets the entrance criteria, but the health care worker should fill out a new OTC card with the same registration number.

#### **Discharged as 'Nonrespondent' (No Progress)**

A client should be discharged from the OTC programme if he/she has not reached the 'cured' criteria after 3 months of regular OTC visits (4 months if HIV/TB patient). He/she should be referred to health facility for re-assessment or ITC. (Note: Action should be taken if the client does not respond within three visits.)

#### **Discharged as 'Medical Transfer'**

The client should be discharged as 'medical transfer' if his/her condition deteriorates and he/she needs medical attention at a facility other than the one providing OTC services (not ITC). Complete a referral slip with information, medications, and reason for transfer.

# **Discharged as 'Transfer to Inpatient Care'**

The client should be discharged as 'transfer to inpatient care' if he/she is admitted into inpatient care (e.g., nutrition rehabilitation unit/therapeutic feeding centre). Complete a referral form with information including medicines and reason for transfer.

#### **Discharged as 'Transfer to Other OTC'**

The client should be discharged as 'transfer to other OTC' if he/she is admitted into another OTC programme. Complete a referral form and state reason for transfer.

# **Group Work: Malnutrition Status and Programme Admission and Discharge**

Determine the degree of malnutrition (if present) of each client in the examples below and the ideal programme admission for the client (OTC, ITC, or neither). For example:

*Robert: 15-month-old male, MUAC 105 mm, weight 9.2 kg, HIV negative, with no bilateral pitting oedema and no other complications.* 

Answer: The client has SAM without oedema and should be admitted into OTC.

Remember:

- If the client is moderately or severely malnourished and her/his HIV status is unknown, the client should be encouraged to go for HIV testing.
- If the client is moderately malnourished, she/he must also be HIV positive to be admitted into OTC.



# Determine Program Admission, Whether to Discharge, and How to Classify Discharge

Determine whether to admit (exercise 1) or discharge (exercise 2) the following clients and how to classify the discharge (cured, default, death, nonrespondent, medical transfer, transfer to ITC, transfer to other OTC).

ANSWERS
ANSWERS



# COUNSELLING SKILLS FOR NUTRITION



# Purpose

To enhance participants' knowledge and skills in counselling and communicating with clients and caregivers about nutrition.

# **Session Objectives**

By the end of the session, participants should be able to:	Duration
Explain the importance of counselling in nutrition	10 min.
Describe counselling skills	20 min.
Demonstrate the ability to counsel in nutrition	115 min.



**Estimated Time/Duration** (includes 5-minute wrap-up)

150 minutes

# **Definition of Counselling and its Importance in Nutrition**

#### What Counselling Is

Counselling is a form of interpersonal communication through which a person is helped to assess his/ her current situation and explore possible ways to address problems. Effective counselling respects the client's own thoughts, beliefs, and culture. Counselling involves:

- Helping a person share his/her problems and express his/her concerns
- Appreciating the client's efforts to address their problems (which can strengthen the client's self-confidence)
- Providing information about the problems
- Helping a person examine the causes of the problems
- Suggesting and exploring possible interventions or action plans to resolve problems or reduce risk
- Helping a person to make informed decisions

#### What Counselling is Not

Health workers should keep in mind that counselling is not:

- Telling a client what you think he/she should do
- Pushing the client toward a particular action
- Arguing with the client

#### **Importance of Counselling in Nutrition**

Counselling helps:

- The health worker understand the client's/caregiver's health, diet, or feeding practices and what influences those practices
- The client understand a problem and its causes and consequences
- Identify actions to address the problem
- Identify possibilities for food availability and preparation
- Strengthen the client's self-confidence and trust in the health worker

# **The GATHER Approach to Counselling**

GATHER—Greet, Ask, Tell, Help, Explain, Reassure/Return/Refer—is an approach that encompasses the characteristics of effective counselling.

#### **Steps in the GATHER Approach**

2

#### Greet the Client (and Develop Rapport)

- Provide a seat for the client and introduce yourself.
- Discuss the client's status and well-being since the last visit.
- Ask How the Client/Caregiver Feels About His/Her Nutritional Status and Food Intake or that of His/Her Child
  - Ask about any symptoms, nutritional problems, and concerns.
  - Conduct a nutrition assessment, if one has not been done already. If the assessment has been done, share the results (e.g., dietary history; anthropometry [weight, height, MUAC, WFH, or BMI] and any changes; biochemical or clinical assessments).
  - Ask the client/caregiver about his/her or the child's eating and drinking practices to understand if he/she/child is:
    - Eating enough to meet energy and nutrient needs, based on the individual's situation (pregnancy, lactation, infant, young child, HIV+ or other infection)
    - Eating a balanced diet rich in a variety of foods appropriate to his/her/the child's situation (e.g., infant, young child, adult)
    - Practicing good infant and young child feeding practices
    - Drinking enough clean, safe water
    - If HIV positive:

Managing symptoms using dietary approaches

- Adhering to drug-food plans
- Identify any nutritional needs (e.g., determine whether the client is not gaining weight adequately, is not adhering to drug–food plans, is having trouble with breastfeeding, experiencing challenges introducing foods to child, needing dietary approaches to manage symptoms).
- Find out what the client has done in the past to address these problems and whether those efforts worked and help identify any barriers to addressing the problem.

#### 3 Tell the Client/Caregiver about Options for Addressing the Nutritional Problems

• Use the counselling cards, choosing the appropriate set of cards that relate to the problem identified above.

#### 4 Help the Client/Caregiver Make Informed Choices

- Help the client/caregiver set nutritional goals to address the problem.
  - Make sure the nutritional goal/objective is specific, measurable, achievable, realistic, and time-bound (SMART). Example: 'I will gain 4 kilograms by the end of March'.
- Help the client/caregiver identify practical, realistic, and relevant actions that he/she can take to attain the goal. Examples of actions include:
  - Get weighed every month to assess whether I am meeting my goal.
  - Use the handout to manage any symptoms that may affect my nutrition/dietary intake.
  - Increase my energy intake by:
    - Having one extra snack every day
    - Adding groundnut paste or a spoon of ghee to my evening meals
  - Increase the number of times a day I feed soft foods to my baby in addition to breast milk and try for at least three times a day.
  - Feed my child eggs, chicken, or fish at least two times each week.
  - Make sure that all drinking water (including the water I use to mix juice) is treated or boiled for at least 8 to 10 minutes and stored in a covered container, and that I wash my hands under flowing water before preparing or eating food.
  - Make sure all my fruits are well washed with clean water before I eat them.

#### 5 Explain Fully the Choice(s) the Client/Caregiver has Made

- Discuss any barriers the client/caregiver may have in implementing his/her choices.
- Explain why these choices will help improve the client's nutritional status.
- Ensure that the client/caregiver can explain the actions he/she will take. Demonstrate them if necessary.
- Summarize what has been agreed upon and how it will be done (the client/caregiver also can do this).

# **6** Reassure the Client/Caregiver about Her/His Choices and Give a Return Date for the Next Visit

# **Counselling Skills: Active Listening**

Active listening and counselling skills that strengthen a client's confidence and help her/him feel supported are helpful tools for effective nutrition counselling.

# **Active Listening**

Active listening helps counsellors build rapport with a client and learn about her/his beliefs, level of knowledge, feelings, and practices/behaviours that might affect the client's nutritional status. Active listening includes techniques such as using nonverbal communication, asking 'open' questions, 'reflecting back' what the client says, showing empathy, and using nonjudging words.

# **Using Nonverbal Communication**

Nonverbal communication involves using posture, facial expressions, eye contact, gestures, and other unspoken actions to reflect a nonjudgmental, positive attitude toward the client. With helpful nonverbal communication, a client will be more likely to feel calm; safe; comfortable; and willing to speak, listen, and interact with the counsellor. Unhelpful nonverbal communication can make a client feel intimidated, judged, disrespected, and less willing to participate fully in the counselling session.

#### **Tips for Ensuring Helpful Nonverbal Communication**

- Sit at the same level as your client, making eye contact.
- Remove any physical barriers between you and the client, such as a desk or folders of papers.
- Pay close attention to the client, avoid distractions, and show you are listening by nodding, smiling, and using other appropriate gestures.
- Let the client finish speaking before saying anything in return.
- Take time without hurrying or looking at your watch.
- Touch the client appropriately (e.g., a reassuring hand on the client's shoulder), as culturally accepted.

# **Asking 'Open' Questions**

Open questions are phrased in a way that generates more informative answers, as compared to 'closed' questions, which require simply 'yes', 'no', or 'I do not know'. Open questions usually start with 'how', 'what', 'why', 'when', or 'where'. For example: 'How are you feeding your baby'?

In this role play, ask participants to play the roles of health worker and mother, and read the script. As a group, determine whether the health worker is asking open or closed questions and observe how the mother responds.

#### **Role Play 1a: Asking 'Open' Questions**

Health worker:	Good morning. Are you and your baby well today?
Mother:	Yes, we are well.
Health worker:	Do you have any difficulties?
Mother:	No.
Health worker:	Is baby feeding often?
Mother:	Yes.

#### **Comment:**

The health worker did not learn much and it is difficult to continue the conversation.

#### **Role Play 1b**

Health worker:	Good morning. How are you and your baby today?
Mother:	We are well.
Health worker:	Tell me, how are you feeding your baby?
Mother:	I breastfeed her often with one bottle in the evening.
Health worker:	What made you decide to give a bottle in the evening?
Mother:	My baby wakes during the night, so my milk must not be enough for her/ him.
Comment:	

The mother offered information in her reply, letting the health worker learn more.

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# 'Reflecting Back' what the Client Says

'Reflecting back' means repeating in different words what a client says to indicate that you understood her/him, to allow him/her to clarify if necessary, and to show interest in what was said. This can help build rapport with the client, which can encourage her/him to share more information. Nodding, smiling, and using phrases like 'um hmm' or 'go on' also can demonstrate interest in what the client is saying.

In this role play, determine whether the health worker is showing that she/he is listening to the client and observe whether that helps the health worker to learn more from the client.

<b>Role Play</b>	y 2: 'Re <sup>.</sup>	flecting	<b>Back</b> '
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Health worker:	Good morning, how are you today?
Client:	I am very tired of this endless suffering.
Health worker:	Oh, dear (looks concerned).
Client:	I keep awake all night trying to force my child to eat.
Health worker:	You keep awake all night?
Client:	Yes, my child has refused all foods and only takes sweet drinks.
Health worker:	Mmm (Nods).
Client:	From the time she fell sick, she has refused all foods and has lost weight.
Health worker:	Oh, tell me more.

#### Comment:

Responses such as 'Oh dear' and 'mmm' and reflecting back what the client says show that the health worker was attentive.

# **Showing Empathy**

To empathize means to understand another person's feelings about a situation. With empathy, the interaction/conversation focuses on the client's feelings or concerns and the counsellor tries to understand the situation from the perspective of the client. The counsellor can ask questions to understand the client's feelings.

In these role plays, determine whether the health worker is showing empathy.

K	Role Play 3a: Sho	wing Empathy
	Health worker:	Good morning. How are you and your child today?
	Mother:	He has not been feeding well for the past few days. I don't know what to do. (Looks concerned)
	Health worker:	What happened? He was doing well last time you were here. What changed?
	Mother:	I don't know.
	Comment:	
	What did you hea showing concern a	r? The health worker is ignoring the mother's feelings of concern, instead of as well.
K	Role Play 3b	
	Health worker:	Good morning, Rukia. How are you and Assad today?
	Mother	Assad has not been feeding well for the past few days, and I don't know

Mother:	Assad has not been feeding well for the past few days, and I don't know what to do.
Health worker:	You are worried about Assad.
Mother:	Yes. I am worried he miaht be sick because he is not feeding well.

#### Comment:

Here the health worker focuses on the mother's feelings. This health worker empathized with the mother by reflecting back the mother's concern about the child's failure to feed.

## **Using Nonjudging Words**

Using judging words can make a client feel that she/he has to meet a standard. For example, 'are you feeding well' implies that there is a standard to be met. A client may hide how things are going if the client feels that she/he will be judged. Words that may sound judging include right, wrong, well, bad, good, enough, properly, adequate, problem. It is more helpful to use open questions, which can generate more information from the client.

In these role plays, determine whether the health worker is using nonjudging words.



# **Counselling Skills: Confidence-Building and Support**

Building a client's confidence and providing support can help the client carry out her/his decisions and resist pressure from other people. These confidence-building and supportive skills include accepting the client's thoughts and feelings, recognizing and praising what the client is doing right, providing practical help, providing relevant information in simple language, making suggestions to the client instead of giving commands, and arranging for follow-up and ongoing support.

#### **Accepting the Client's Thoughts and Feelings**

Accepting means responding neutrally to a client's feelings and ideas, even if the ideas are inaccurate. In this way, the counsellor can maintain rapport with the client and continue the conversation, which will allow the counsellor to learn more from the client and provide correct information.



## **Recognizing and Praising What the Client is Doing Right**

Recognizing and praising what a client is doing right or achieving can help build a client's confidence and encourage her/him to continue the practice. For example, a counsellor could acknowledge the client's efforts to eat well and/or take medicine and suggest that the client keep up the good work.

## **Providing Practical Help**

Practical help means providing physical support to a client when appropriate, e.g., positioning the baby at the breast, feeding a patient, or providing relief for a discomfort. Giving the client practical help is one way of empathizing with her/his feelings and can strengthen rapport.

# **Providing Relevant Information in Simple Language**

Relevant information addresses the client's most pressing need. It is important to prioritize which issues to address to avoid overwhelming the client with less relevant information. The information must be provided in simple language the client can easily understand.

#### ) Role Play 6a: Relevant Information

Health worker:	Good morning. What can I do for you today?
Client:	Good morning. I have sores in my mouth, haven't been hungry for more than 3 months, and haven't gained any weight in the past three visits.
Health worker:	Thank you for coming to the clinic today. You have to make sure you eat a balanced diet, have nutritious snacks in between meals, and drink plenty of fluids to help you regain the weight and prevent infections from occurring frequently. Keep yourself and the environment clean, get enough rest every day, and always boil your drinking water.

#### Comment:

The health worker gave too much irrelevant information using complicated language.

#### Role Play 6b

Health worker:	Good morning. What can I do for you today?			
Client:	Good morning. I have sores in my mouth, haven't been hungry for more than 3 months, and haven't gained any weight in the past 3 visits.			
Health worker:	Thank you for coming to the clinic today. Mouth sores are quite disturbing! Try washing your mouth with salty water before and after meals, and before going to bed. This will quickly help you and allow you to eat better. I am referring you to the doctor for more medical help.			
Comment:				
The health worker prioritized the problem and gave relevant information using simple language.				

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#### **Making Suggestions, not Commands**

While counselling, you may see that it would be helpful if a client did something differently, e.g., feeding a baby more often or holding him in a different way. However, you must be careful not to command a client to do something and not to overwhelm the client with a list of do's and don'ts. This could make a client feel as if she/he is not in control and lose confidence. Instead, offer one or two relevant suggestions that the client can decide whether to try. You can phrase your suggestion as a question, e.g., 'Have you thought of feeding her more often? Sometimes that helps'.

#### Arranging for Follow-up and Ongoing Support

When the counselling session is over, the client may still have questions/concerns or think of something else to discuss. The counsellor can schedule a follow-up or ongoing support visit to continue the discussion. Through these visits, the counsellor also can learn what help may be available from the client's family and friends and find out whether the agreed-upon suggestions are working for the client.

#### **Case Scenarios: Counselling Using the GATHER Approach**

Practice basic counselling based on the accompanying case scenarios using the GATHER approach, active listening skills, and confidence-building/supportive skills.

#### **Case Scenario 1**

Achi—an HIV-positive woman who is married, has two children, and is 5 months pregnant comes to the clinic for a refill of ARVs. The assessment shows 10% weight loss, and she complains of fevers on and off, vomiting, and general body weakness. The feeding history shows that she takes a cup of tea in the morning, sometimes with something to eat. She has one main meal that includes a staple food, plant protein sometimes, and always a vegetable like tomatoes. She has no stable income.

#### **Case Scenario 2**

Amon, 37 years old, has been on TB treatment for 3 months. His weight is 32 kg, and his haemoglobin level is 6 mg/ml. He feels dizzy and too weak to support himself upright for a long time. He has low appetite and always feels full. He is the breadwinner for a family of five and runs a kiosk near his home. His wife tends a small garden that supplies the household with some foods.

#### **Case Scenario 3**

Mari, a 3-year-old girl, is brought to the clinic with weight of 8 kg, low-grade fever, diarrhoea, and a swollen abdomen. She wants to eat all the time. The available foods in the house are maize flour, cabbage, tomatoes, matooke, and sometimes beans. Mari only wants to eat maize meal and cabbage.

# **Preparing for the Counselling Session**

Before the counselling sessions, the counsellor should:

- 1) Ensure he/she has enough time to give the client.
- 2) Have a private place where the client can discuss issues comfortably without any intrusions.
- 3) Understand the content of the counselling cards.
- 4) Have the following tools/materials in place:
  - Visual aids such as counselling cards, food demonstration models, calorie guides, and handouts/references for clients
  - Functioning and accurate weighing scale
  - Meal plan/drug–food plan
  - Data/information collection forms, tally sheet, and referral forms
  - Register or calendar to record the next appointment for a follow-up session with the client, based on own and client availability
  - Notes on previous action(s) taken with the client, if this is a follow-up visit



# NUTRITION AND HEALTH EDUCATION



# Purpose

To equip participants with knowledge and skills to plan, conduct, and evaluate nutrition and health talks.

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# **Session Objectives**

By the end of the session, participants should be able to:	Duration
Define 'nutrition and health education'.	10 min.
Describe the benefits of effective nutrition and health education.	10 min.
Describe channels for providing nutrition and health education to communities.	10 min.
Describe the qualities of effective nutrition and health talks.	20 min.
Identify steps for organizing and facilitating a nutrition and health talk.	45 min.

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Estimated Time/Duration (includes 5-minute wrap-up)

# 100 minutes

# Nutrition and Health Education: Definition, Benefits, and Channels

#### **Definition of Nutrition and Health Education**

- A form of social and behaviour change communication
- Any combination of learning experiences designed to help individuals and communities improve their nutrition and/or health by increasing their knowledge or influencing their attitudes (adapted from WHO)
- The development of individual, group, institutional, community, and systemic strategies to improve knowledge, attitudes, skills, and behaviours that contribute to improved nutrition and/or health
- An interactive meeting in which a health worker or community volunteer talks with a group of individuals in a community on a topic relevant to the nutrition and health issues of that community

## **Benefits of Effective Nutrition and Health Education in Communities**

The benefits of conducting nutrition and health education in the community include:

- Increased awareness of services available at the facility and in the community
- Potential for dispelling rumours/myths
- Opportunity to learn about the needs and expectations of a community so they can be addressed
- Increased community ownership of programmes and increased cooperation
- Stronger linkages between health facility and community, helping ensure continuum of care
- Improved care-seeking practices

#### **Channels for Providing Nutrition and Health Education**

- Interpersonal communication, including one-on-one meetings, counselling sessions, peer interactions, and small group trainings or discussions
  - Can provide tailored communication
  - Able to better explain complex information
  - Interactive
  - Often most time intensive
  - Can build skills
- Community-based communication, including community meetings and events, rallies, community drama, games, bulletin boards
  - Provides social support
  - Inspires collective ownership and motivates collective solutions
- Mass media including brochures, booklets, banners, billboards, flyers, other promotional materials, newspaper articles, television, radio, social media, health games like the "Good Life" show
  - Extensive reach
  - Efficient and consistent repetition of messages

Interpersonal communication is the communication channel most frequently used by health workers, although they may participate in others. This training manual will focus on building skills in health talks and counselling, two forms of interpersonal communication often provided at health facilities.

# **Organizing and Facilitating Effective Nutrition and Health Talks<sup>6</sup>**

#### Before the Talk

- Identify the target group (e.g., HIV-positive pregnant women) and one or two specific, relevant topics (e.g., how these women can improve their diet during pregnancy).
- Identify some of the common barriers and facilitators of healthy practices by reviewing findings from research studies along with consultations with community members.
- Taking into account the target audience, determine the best approach for helping them learn and participate (e.g., if your audience is illiterate, use picture cards to facilitate discussion).
- Determine key messages the audience should learn from the talk and prioritize them according to what they 'must know', 'should know', and 'could know'.
- Make objectives for the session, based on what participants need to learn. Objectives should be SMART.
- Review information on the topic so that it is familiar and make sure it is up to date.
- Prepare the materials you will need to conduct the session (e.g., handouts, flyers, counselling cards, flip charts, demonstration foods). Prepare brief prompting notes for yourself.
- Inform the community or participants about the date, time, venue, and topic of discussion.
- Get to the venue at least 30 minutes before the start time to make sure the venue is in order and you have sufficient time to set up your materials.

*Note:* It may be helpful to prepare a simple chart that lists target group, objectives, key messages, strategy, and/or materials.

# **During the Talk**

- Create rapport with the group.
  - In a friendly and respectful manner, introduce yourself and anyone who may be assisting you.
  - Introduce the topic in a stimulating way and share the intended result/outcome.
  - Ask participants what they expect from the discussion.
  - Observe participants' interest and level of engagement.
  - Ensure that your nonverbal communication, such as posture and facial expression, communicates warmth and respect.
- Encourage discussion and participation.
  - Give others the opportunity to respond freely to participant contributions before offering an answer or opinion; the discussion may not unfold fully if you give your opinion right away.
  - Use active listening techniques described in the module on counselling.

<sup>6</sup> While this focuses on health talks, these steps apply to other social and behaviour change activities as well.

- Ask the group's opinion when you are asked questions by participants; encourage the exchange of ideas, intervening only to facilitate respectful discussion or ensure accuracy of information.
- Keep the discussion focused and moving.
  - Revive any important questions that got lost in the discussion without resolution.
  - Re-focus or terminate long discussions.
  - For complex issues, identify the points on which participants agree so you can say, 'Okay, we all agree on this' and move on to other points that need to be addressed.
  - Avoid returning to a topic that was already discussed.
- Ensure that participants understand key points.
  - Ask a few questions about the topic to assess whether the information was understood.
  - After sufficient discussion, address any questions raised, clarifying as needed, and provide information on where participants can learn more or obtain services.
  - Conclude by recalling the main results and emphasizing key messages and actions.
  - Give participants appropriate material to take home if available, and encourage them to share the discussion with family members and friends.

#### After the Talk

- Ask whether the participants felt the session was helpful and how they might use what they learned.
- Write a report about the activity (attendance, feedback from the group).
- Do a self-evaluation (or ask a colleague to provide feedback using Handout 1.7.1 Health Talk Observation Checklist) to identify what you did well and what needs improvement.

# Handout 1.7.1 Health Talk Observation Checklist

During the group session, did the counsellor:	Yes	No	Comments/Observations
Speak slowly and clearly (e.g., participants were able to understand the content)			
Encourage participation (e.g., everyone was given an opportunity to speak)			
Keep the discussion focused on the topic			
Maintain an open and nonjudgmental atmosphere (e.g., supported participants when they contributed; did not use judging words)			
Engage in active listening (e.g., did not interrupt and paid attention to questions and comments)			
Create a feeling of safety/comfort (i.e., put participants at ease)			
Promote problem-solving among participants (e.g., asked participants how they would overcome challenges)			
Show empathy, understanding, and caring			
Use welcoming facial expressions and gestures that encourages participation (e.g., looked at participants, sat at their level), as appropriate			
Effectively use visual/job aids			
Plan for follow-up of unanswered questions			
Discuss practical solutions and encourage suggestions from the group			
Provide up-to-date, accurate information			
Offer referrals appropriately (have this pre-printed if appropriate)			

Source: Strengthening Health Talks Training Manual. PATH/IYCN, 2011. http://iycn.wpengine.netdna-cdn.com/files/IYCN\_Strengthening-Health-Talks-Manual\_0311.pdf

# 



# **Purpose**

To practice nutrition assessment and categorization skills and explore how nutrition can be integrated into routine health services.



# **Session Objectives**

#### By the end of the session, participants should be able to:

Practice measuring weight, height/length, and MUAC

Identify clinical signs of acute malnutrition

Conduct appetite test when RUTF is available

Categorize clients' nutritional status

Identify contact points where nutrition can be/is being integrated

Document their work on the Clinical Practice Report Form



**210** mins

# **Clinical Practice Report Form**

Client Name/No.	Age (mos./ years)	Sex M/F	Weight (kg)	Height/ Length (metres)	MUAC (cm)	вмі	WFH z-score	Nutritional Status	Action Taken/ Recommendation



# MATERNAL AND YOUNG CHILD NUTRITION

This unit discusses maternal nutrition and health, as well as infant and young child feeding (IYCF) practices such as breastfeeding and complementary feeding. The unit is guided by the *Uganda Maternal Nutrition Guidelines* (2010), *Infant and Young Child Feeding Policy Guidelines* (2012 edition), and Baby-Friendly Health Facility Initiative implementation guidelines. The unit comprises the following sessions:

Session 2.1	Maternal Nutrition	65 min.
Session 2.2	Optimal Breastfeeding Practices	75 min.
Session 2.3	Complementary Feeding Practices	120 min.
Session 2.4	Feeding Children during Illness, Recovery, and Other Difficult Circumstances	70 min.
Session 2.5	Clinical Practice 2 (Breastfeeding Assessment Skills)	100 min.

#### **TOTAL DURATION**

7 hours, 10 minutes



# **MATERNAL NUTRITION**



#### **Purpose**

To empower health workers with the knowledge and skills to deliver integrated maternal nutrition services at all contact points.

# Session Objectives

By the end of the session, participants should be able to:	Duration
Explain the importance of maternal nutrition	10 min.
Explain the causes and consequences of maternal malnutrition	30 min.
Discuss interventions and strategies to break the cyle of maternal malnutrition cycle	20 min.



**Estimated Time/Duration** (includes 5-minute wrap-up)

65 minutes

# **Definition and Importance of Maternal Nutrition**

Maternal nutrition refers to a woman's or adolescent girl's consumption and utilisation of food during any stage of her reproductive life, ages 15–49. Maternal nutrition is important because a woman's nutritional status before and during pregnancy and lactation influences the baby's health and her own. Pregnancy and lactation increase the body's demand for energy, protein, and other nutrients. Women who cannot increase their consumption to meet these needs have a higher risk of malnutrition and mortality.

# **Causes and Consequences of Maternal Malnutrition**

Maternal malnutrition, including overweight/obesity and underweight, has several immediate, underlying, and basic causes.

#### **Maternal Consequences**

- Increased risk of maternal death
- Increased risk of infections
- Lethargy and weakness
- Reduced capacity to care for children

#### Poor Infant and Child Health and Nutrition

- Intrauterine growth retardation, low birth weight, premature birth
- Increased risk of illness
- Increased risk of neonatal and infant death
- Increased risk of stunting

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• Impaired cognitive development

#### **Maternal Malnutrition**

- Maternal underweight
- Maternal overweight/obesity
- Anaemia
- Micronutrient deficiency

Increased maternal illness and infection

Poor diet (quantity and quality)

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Inadequate maternal care (e.g., frequent births, heavy workload, negative practices) Household food insecurity

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Poor access to basic health services

Poor water, hygiene, and sanitation

#### **Basic Causes**

- Political structure, inadequate policies
- Limited education
- Lack of women's empowerment
- Poverty/limited livelihood options
- Insufficient funding

Maternal overweight/obesity and underweight both increase risks for mother and child. In Uganda, underweight has remained at approximately the same levels in recent years, while overweight has increased to about 19 percent of women.

#### Figure 2.1.1 Women's Nutrition Status (Percent Distribution of Women 15-49 Years of Age)



# **Interventions and Strategies to Break the Cycle of Maternal Malnutrition**

## The Intergenerational Cycle of Maternal Malnutrition

Many women in Uganda are caught in an intergenerational cycle of malnutrition. They are undernourished at birth, are stunted during childhood, have low weight and height (and sometimes become pregnant) during adolescence, and become small adult women who are underfed and overworked during pregnancy and lactation. If there are no interventions, these women have low birth weight babies. Girls with low birth weight are more likely to become stunted women, thereby perpetuating the cycle (see Figure 2.1.2).

#### Figure 2.1.2 The Intergenerational Cycle of Maternal Malnutrition



# **Breaking the Maternal Malnutrition Cycle**

Interventions can be applied at any point in the cycle. For example, initiatives aiming to improve child survival should start long before conception. This may include improving the health status of children, adolescents, and/or pre-pregnant women and should include initiatives that address their economic and social problems.

Integrating nutrition into routine health care services is an important first step in implementing interventions to break the cycle. When a woman or adolescent girl comes to the health facility:

- First provide the service the woman has come for while observing her or her child for signs of malnutrition
- Conduct a nutrition assessment, including dietary history
- Offer nutrition counselling accordingly

# Key Interventions to Break the Cycle at Different Life Stages

#### Stage

# Adolescent Girl/Woman of Reproductive Age (Preconception)

Aim: Prevent adolescent girl or woman of reproductive age from becoming malnourished

#### Assess Assess Nutritional Status

For adolescents and other women of reproductive age who may not have regular contact with health services, contact points for nutritional assessment could include family planning visits and community outreach. Measure weight, height (calculate body mass index [BMI] for women 19 and over and BMI for age for adolescents up to age 19), and mid-upper arm circumference (MUAC). Refer as needed for treatment. This allows for a pre-pregnancy weight and nutritional status to be on record and provides opportunities to encourage attaining and maintaining a healthy weight.

#### **Counsel** Promote Healthy Diet

- Based on nutritional status, discuss options for achieving and maintaining a healthy weight.
- Encourage eating a variety of foods including fruits, vegetables, animal products, and fortified foods each day.
- Encourage replacing sweetened beverages, biscuits, candy, and other processed foods with fresh and healthy foods.
- Encourage drinking plenty of treated or boiled water.

#### Hygiene

Support

 Encourage washing hands with soap or ash under flowing water before preparing or eating food.

#### **Delayed Pregnancy**

- Counsel the adolescent girl/woman of reproductive age about the range of methods to delay pregnancy and encourage her to practice an appropriate method.
- Provide folic acid supplementation, 400  $\mu\text{g}/\text{day}$  for 1 month prior to conception.
- Provide iron supplementation, 60 mg/week for 3 months prior to conception.

# Stage **Pregnant Woman**

*Aim: Prevent or manage malnutrition in the pregnant woman and prevent low birth weight* 

Assess

#### SS Assess Nutritional Status and Address Problems

- Conduct nutritional assessment during first visit (including dietary history, MUAC, weight, anaemia, iodine, and vitamin A) to detect risks.
  - Address any identified problems.
  - Encourage the woman to attend at least four antenatal visits.
- Monitor weight throughout the pregnancy. Monitor progress and encourage the woman to gain 1 to 1.5 kilograms per month in the second and third trimesters (overweight or obese women should aim to gain 1 kilogram per month in the second and third trimesters).

# *Note: Focus on a few messages based on what is most relevant to the client's situation.*

#### **Counsel** Promote Healthy Diet

- Encourage increased food intake; recommend that the woman eat at least one extra meal per day.
- Counsel the woman to eat a variety of foods daily, including fruits, vegetables, animal products, and fortified foods.
- Counsel men on their involvement in providing a nutritious diet.

#### **Promote Hygiene Practices**

- Encourage washing hands with soap or ash under flowing water before preparing or eating food.
- Encourage drinking plenty of treated or boiled water.

#### **Encourage Optimal Maternal and Child Care Practices**

- Encourage the woman to gain 1 to 1.5 kilograms per month in the second and third trimesters (overweight or obese women should aim to gain 1 kilogram per month in the second and third trimesters).
- Counsel the woman to rest more during pregnancy; encourage men to help women with household chores or workload so they can get more rest.
- Educate/encourage the woman to initiate breastfeeding in the first hour after giving birth and to breastfeed exclusively for 6 months.
- Promote compliance with iron/folic acid supplementation for 90 days during pregnancy (counselling on challenges).



# Stage Lactating Woman/Newborn Baby

*Aim: Promote healthy growth of baby and prevent baby from becoming a malnourished child* 

Assess

Counsel

Conduct nutritional assessment (including MUAC, BMI after 6 months postpartum, and anaemia) and encourage the woman to attend regular nutritional assessment.

#### **Promote Healthy Diet**

- Encourage the woman to increase food intake, including eating the equivalent of at least two extra meals per day.
- Counsel on diet diversification and encourage daily consumption of fruits, vegetables, animal products, and fortified foods.
- Counsel men on their involvement in providing a nutritious diet for lactating women.

#### **Promote Hygiene Practices**

- Encourage the woman to wash hands with soap or ash under flowing water before preparing or eating food or feeding child.
- Encourage the woman to wash hands after using latrine or disposing of faeces.
- Encourage the woman to drink plenty of treated or boiled water.

#### **Encourage Optimal Maternal and Child Care Practices**

- Encourage the woman to initiate breastfeeding in the first hour after giving birth and to breastfeed exclusively for 6 months.
- Encourage the woman to rest more than usual during lactation.
- Encourage men to help women with household chores or workload so they can get more rest.
- Educate the woman on a range of methods to delay her next pregnancy and encourage her to practice an appropriate method.
- Counsel men on their involvement in child spacing and encourage them to accompany women to family planning services.
- Counsel women to take iron/folic acid supplements for 3 months postpartum.

#### **Promote Practices to Prevent and Treat Malaria and Other Infections**

- Encourage use of ITN and other insecticide-treated materials.
- Encourage the household to eliminate breeding grounds for mosquitoes by clearing bushes around homes and removing discarded cups, pots, and other items where water can collect.
- Encourage women to seek early treatment for infections.

## Support

- Prescribe and make accessible iron/folic acid supplements (60 mg of iron and 400 µg of folic acid) or multiple micronutrient supplements, and encourage the woman to take the supplements daily during the first 3 months postpartum.
- Treat severe anaemia in women; prescribe a daily dose of 120 mg of iron and at least 400  $\mu$ g of folic acid for 3 months.
- Treat infections such as intestinal worms and infections of the urinary and respiratory tracts.
- For HIV-positive women, continue ART and cotrimoxazole at each visit.

# Stage Low Birth Weight Baby

*Aim: Promote healthy growth of baby and prevent baby from becoming a malnourished child* 

Note: Low birth weight babies should receive the support described below in addition to the support described above for normal weight newborn babies.

#### **Counsel** Promote Optimal Feeding

 Encourage the woman to follow guidelines for feeding low birth weight babies: If child is able to suckle, encourage mother to breastfeed; if child cannot suckle well, encourage and assist mother in expressing breast milk and feeding child with cup, spoon, or naso-gastric tube (in facility) (see details in IYCF guidelines).

#### Support Counsel on Newborn Care

- Follow guidelines for care of newborn.
- Encourage the woman to ensure warmth for the baby by providing 'kangaroo' mother care, which involves continuous skin-to-skin contact between mother and child, and promotes exclusive breastfeeding<sup>7</sup>.

<sup>7</sup> More information on kangaroo mother care can be found at: <u>http://whqlibdoc.who.int/publications/2003/9241590351.pdf?ua=1.</u>

Stage	Child
	Aim: Prevent the child from becoming a malnourished adolescent
Assess	Regularly monitor growth (including nutritional history, MUAC, weight, height).
Counsel	<ul> <li>Promote Healthy Feeding Practices</li> <li>Encourage exclusive breastfeeding for first 6 months.</li> <li>Encourage complementary feeding starting at 6 months with continued breastfeeding until age 2 or older (more details in Session 2.3 Optimal Complementary Feeding Practices).</li> <li>Practice Optimal Child Care <ul> <li>Encourage caregivers to have the child attend regular nutritional assessments, such as community-based growth promotion, to promote optimal growth.</li> <li>To promote growth, encourage caregivers to complete immunization schedule, deworming, and vitamin A supplementation.</li> <li>Provide guidance on feeding a sick child, such as continuing feeding, and increasing fluids (during diarrhoea) using oral rehydration solution (ORS).</li> <li>Encourage the household to eliminate breeding grounds for mosquitoes by clearing bushes around homes and removing discarded cups, pots, and other items where water can collect.</li> <li>Encourage caregivers to seek early treatment for infections.</li> </ul> </li> </ul>
	<ul> <li>Encourage use of ITNs.</li> </ul>
Support	<ul> <li>Treat infections such as malaria, intestinal worms, and infections of the urinary and respiratory tracts.</li> <li>Provide preventive deworming and vitamin A supplementation, according to national protocol.</li> <li>Provide therapeutic care for children with severe acute malnutrition (SAM), according to national protocol.</li> <li>Provide ORS for diarrhoea.</li> </ul>


# OPTIMAL BREASTFEEDING PRACTICES



# **Purpose**

To equip participants with knowledge and skills on optimal breastfeeding practices.

# Session Objectives

By the end of the session, participants should be able to:	Duration
Describe optimal breastfeeding practices	10 min.
Describe the breast milk production process	30 min.
Examine factors and conditions that can affect breastfeeding	30 min.

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**Estimated Time/Duration** (includes 5-minute wrap-up)

75 minutes

# **Breastfeeding Terms, Advantages, and Recommendations**

# Key Terms in Infant and Young Child Feeding

- Early initiation of breastfeeding means starting breastfeeding within 1 hour of birth.
- **Exclusive breastfeeding** means giving a baby only breast milk and no other food or drink, not even water, except for medicines and vitamin/mineral drops. Exclusive breastfeeding is recommended until a baby is 6 months old.
- **Prelacteal feeds** are food/fluids such as sugary water, animal milk, herbal mix, alcohol (malwa, ajono), honey, and soups that some people give to babies before they are breastfed. This normally is done soon after birth, when the newborn has not yet been given the breast to suckle. Prelacteal feeds are harmful because they displace breast milk and can expose children to infection and must be discouraged.
- **Replacement feeding** means giving a child who is not breastfeeding a diet that provides all the nutrients the child needs until she/he can get all essential nutrients from family food.
- **Mixed feeding** means giving other food or milks to the infant in addition to breast milk during the first 6 months.
- **Complementary feeding** means giving other foods in addition to breast milk to a baby starting at 6 months of age (i.e., 180 days of age). At that age, breast milk no longer provides all the nutrients the baby needs; complementary foods fill the nutrient gap. These foods complement breast milk and not vice versa.

# Advantages of Breast Milk and Breastfeeding<sup>8</sup>

Breast milk:

- Contains all the energy, nutrients, and water the baby needs for the first 6 months of life
- Is easily digested and efficiently used by the baby's body
- Protects a baby against infection, particularly from gastrointestinal and respiratory infections
- Is free and always available and does not need any preparation

Breastfeeding:

- Helps a baby's growth and development
- Can help delay a new pregnancy (lactational amenorrhoea method [LAM])
- Helps the uterus to return to its previous size after delivery, which can reduce bleeding postpartum and may help prevent anaemia
- Reduces the risk of ovarian and breast cancer in the mother
- Reduces the baby's risk of death, including from pneumonia and diarrhoea
- Can strengthen the bond between mother and baby

# **Positive and Harmful Breastfeeding Practices in the Community**

Positive breastfeeding practices in the communities include:

• Use of lactogogues, substances believed to increase milk production, including porridge, vegetables like malakwang, ntula, mushroom soup, and kyogero

<sup>8</sup> Adapted from WHO, 2009. Infant and Young Child Feeding: Model Chapter for textbooks for medical students and allied health professionals. Geneva: WHO.

- Mothers taking plenty of hot porridge and teas during the immediate postpartum period and the entire period of breastfeeding to increase their strength and return to health after delivery
- Having newly delivered mothers rest and stay close to their babies until the cord is healed to allow bonding between the mother and infant, frequent nursing to build a mother's milk supply, and healing of the mother after delivery

Harmful breastfeeding practices should be discouraged, including:

- Discarding colostrum (first milk from the breast)
- Giving the baby prelacteal feeds (liquids other than breast milk given before breastfeeding is initiated, including sugary water, animal milk, baby formula, herbal mix, alcohol [malwa/ajono] and soups)
- Delaying initiation of breastfeeding until the mother and baby take the first bath
- Delaying initiation of breastfeeding until the father comes to see the baby

# **National Recommendations for Infant and Young Child Feeding**

Uganda's national recommendations for infant and young child feeding are designed to use optimal feeding to improve the nutritional status, growth, development, health, and thus survival of infants and young children. The Uganda national recommendations are:

- Start breastfeeding within 1 hour of birth
- Breastfeed exclusively from 0 to 6 months of age
- Give complementary foods to all children from 6 months
- Continue breastfeeding up to 2 years or beyond

### Figure 2.2.1 Infant Feeding Recommendation



Start breastfeeding within 1 hour of birth. Breastfeed exclusively from birth up to 6 months.



Give complementary foods to all children starting at 6 months of age.



Continue breastfeeding up to 2 years or beyond.

The risk of HIV transmission through breastfeeding is a challenge to ensuring optimal feeding and child survival. Current evidence indicates that exclusive breastfeeding and the use of ARVs greatly reduce MTCT. The effectiveness of ARV interventions with continued breastfeeding by HIV-infected mothers until infant are 12 months of age capitalizes on the maximum benefit of breastfeeding to improve the infant's chances of survival while reducing the risk of HIV transmission. For this reason, Uganda has adopted WHO's 'Option B+', which provides lifelong ARVs to all HIV-positive pregnant women, and daily ARV treatment for babies until 6 weeks of age while the mother also breastfeeds. Health workers should counsel women during pregnancy about their infant feeding options, the benefits and management of breastfeeding, MTCT, and the importance of adhering to their ARV regimen.

## National Recommendations for Infants Born to HIV-infected Mothers

- Start ARV treatment during pregnancy. Mothers known to be HIV positive should be provided with lifelong antiretroviral therapy (ART) to reduce HIV transmission through pregnancy, labour, delivery and breastfeeding; in order to prevent MTCT in future pregnancies; and to reduce transmission to partners.
- Start the baby on daily nevirapine (NVP) or zidovudine (AZT) prophylaxis from birth. For infants born to HIV-positive mothers, NVP or AZT prophylaxis should be given daily from birth until 4–6 weeks of age.
- Test the infant for HIV infection by 6 weeks of age. All infants who test HIV positive should be referred to an ART clinic and started on ARVs. If the test result is negative and the child has breastfed within 6 weeks of the test, a second test should be done 6 weeks after cessation of breastfeeding.
- Start breastfeeding within 1 hour of birth. Pay particular attention to positioning and attachment to prevent conditions such as cracked nipples and mastitis, which increase the risk of HIV transmissions.
- Exclusively breastfeed all infants from 0 to 6 months.
- Give complementary foods to all children starting at 6 months of age.
- For HIV-positive infants, continue breastfeeding for 2 years or beyond.
- For HIV-negative infants, continue breastfeeding until the infant is 12 months of age. After 12 months, breastfeeding should be stopped only if a nutritionally adequate and safe diet that includes a source of milk can be provided (previously referred to as: acceptable, feasible, affordable, sustainable, and safe [AFASS]).

# **Breast Milk Production**

# **Anatomy of the Breast**

To help mothers breastfeed successfully, it is essential to know the anatomy of the breast and how it is involved in getting milk from the breast to the baby:

- Fat and supporting tissue give the breast its size and shape (Figure 2.2.2).
- The nipple is surrounded by dark skin called the areola. In the areola are small glands (called Montgomery's glands) that secrete an oily fluid to keep the skin healthy.
- Inside the breast are millions of very small sacs made of milk-secreting cells called alveoli.
- Around the alveoli are muscle cells, which can contract to squeeze out the milk.
- Secreted milk flows to the nipple through milk ducts. Toward the nipple, behind the areola, are lactiferous sinuses, which are enlarged parts of the milk ducts where milk collects before the child suckles.

## Figure 2.2.2 Anatomy of the Breast



# **Overview of the Breast Milk Production and Removal Process**

Production of milk involves both hormonal and physical stimuli. Breast milk production is dependent on the infant's removal of milk from the breast through effective suckling.

- When a mother places her baby at the breast, the baby's suckling movements (produced by the infant's tongue and jaw) stimulates nerve endings in the nipple and areola. These nerves transmit messages to the pituitary gland in the brain to release the lactation hormones, prolactin and oxytocin.
- Prolactin stimulates the aveoli to produce milk (further discussed below).
- Oxytocin causes the muscle cells around the alveoli to contract and eject milk down the milk ducts. This is called the 'let-down' or milk ejection reflex (discussed in more detail below).

- The action of the baby's tongue and jaw while suckling presses down on the lactiferous sinuses, creating suction, which causes the milk to flow out of the breast through the nipple.
- Breast milk production in the aveoli is stimulated when milk is removed from the breast. Thus, more frequent feedings stimulate greater breast milk production.

Breast milk removal by the infant through suckling is dependent on three infant reflexes: rooting, sucking, and swallowing.

- **Rooting:** When the breast touches the baby's lips (or the baby smells milk), the baby puts his or her head back slightly, opens the mouth wide, and puts the tongue down and forward to seek the breast. This is the rooting reflex.
- **Sucking:** When the baby is close enough to the breast and takes a large enough mouthful, the baby can bring the nipple back into the mouth until it touches the soft palate. This stimulates the sucking reflex.
  - The muscles then move the tongue in a wave from the front to the back of the mouth, expressing the milk from the ducts beneath the areola into the baby's mouth. At the same time, the oxytocin reflex makes the milk flow along the ducts.
- Swallowing: The baby swallows when the back of the mouth fills with milk (the swallowing reflex).

The rooting, sucking, and swallowing reflexes happen automatically in a healthy, term baby. Taking the breast far enough into his or her mouth is not completely automatic, and many babies need help. A baby who is sleepy from his or her mother's labour medications, or who is premature or ill may need more help to attach effectively.

# **Hormonal Control of Breastfeeding**

Two hormones directly affect breastfeeding: prolactin and oxytocin.

#### **Prolactin**

When a baby suckles at the breast, sensory impulses go from the nipple to the brain. In response, the pituitary gland at the base of the brain secretes prolactin into the bloodstream. Prolactin flows to the breast and makes the milk-secreting cells in the alveoli produce milk. Prolactin levels are highest about 30 minutes after the feed, when the breast is less full, which indicates that prolactin helps make the breast produce milk for the next feed.

This process shows that the more a baby suckles and removes milk from the breast, the more milk the mother's breasts make. If a mother has two babies and they both suckle, her breasts make milk for two. If a baby stops suckling, the breasts will stop making milk. Some people believe that giving a mother more to eat, more to drink, more rest, or medicines will help her produce more milk. While these things are important for a mother's health, they do not help her to produce milk if her baby does not suckle.

Other characteristics of prolactin:

- More prolactin is produced at night, so mothers should be encouraged to breastfeed at night.
- Prolactin suppresses ovulation, meaning frequent breastfeeding can help to delay a new pregnancy.

## Figure 2.2.3 Production and Function of Prolactin



## **Oxytocin and the Oxytocin Reflex**

Oxytocin causes the muscle cells around the alveoli to contract. This makes the milk in the alveoli flow along the ducts to the lactiferous sinuses beneath the areola, where the milk is stored temporarily during the feed. The increased flow is called the 'oxytocin reflex', 'milk ejection reflex', or 'let-down reflex'. The pressure of the baby's tongue and jaw on the sinuses while suckling causes the milk to flow out through the nipple to the baby.

## Figure 2.2.4 Oxytocin Reflex



## Signs and Sensations of an Active Oxytocin Reflex

Oxytocin is produced more quickly than prolactin. It can start making milk flow before a baby suckles, when a mother simply anticipates feeding her baby. The reflex also can be triggered if the mother touches or sees her baby or hears him/her cry. A mother often is aware of her oxytocin reflex. There are several signs of an active reflex that she, or you, may notice:

- A squeezing or tingling sensation in her breasts just before she feeds her baby or during a feed
- Milk flowing from her breasts when she thinks of her baby or hears him/her crying
- Milk dripping from her other breast when her baby is suckling
- Milk flowing from her breasts in fine streams if her baby comes off the breast during a feed
- Slow deep sucking and swallowing by the baby, which show that breast milk is flowing into his/her mouth

Oxytocin also makes a mother's uterus contract after delivery. This helps to reduce bleeding, but it sometimes causes potentially severe uterine pain or cramping (particularly for multiparous women) and can trigger a rush of blood during a feed for the first few days after delivery. Mothers should be informed that these 'after pains' are a normal process of the uterus contracting to return to its former size; however, very heavy bleeding (more than 2–3 pads soaked in 30 minutes) or bleeding that increases rather than decreases after delivery are signs that she should return to a health centre or hospital immediately.

### Supporting a Woman's Milk Supply

The vast majority of women can produce sufficient breast milk for their infant. However, perceptions of inadequate milk supply and a lack of confidence in being able to exclusively breastfeed are common reasons for women to start providing other food or drink to their infant before 6 months of age. As a result, during health visits, it is critical to support a breastfeeding woman's confidence in her ability to breastfeed her infant. Health care workers can support breastfeeding women by providing accurate information on how to build and maintain their milk supply and building their confidence in the following ways.

- Explain to mothers that breast milk is the only food or liquid her infant needs for the first 6 months of life.
- Explain to breastfeeding mothers that putting her baby to the breast frequently is the best way to ensure she makes enough milk. More frequent suckling will increase breast milk production and supply.
- Remind mothers that breastfed babies need to eat frequently, as their stomachs are small and breast milk is easily digested. Frequent nursing is not a sign that the baby 'isn't getting enough' and needs other liquids or solid foods.
- Reassure women that they can produce enough milk regardless of their breast size. Some mothers may think their breasts are too small to produce enough milk. That is not true. Breast size depends more on the amount of fibrous and fatty tissue than the amount of milk glands. Small breasts may have the same amount of gland tissue as larger breasts and can still make plenty of milk. Unequal breast sizes are also completely normal and will not affect breast milk production or supply. (Figure 2.2.5 shows different sized breasts. All can provide enough breast milk for the baby.)

- Remind mothers of the importance of correct positioning so that the baby gets enough milk, the mother has adequate milk supply, and there is lower risk of problems such as engorged breasts.
- Help build a woman's confidence in her ability to breastfeed by using confidence building and supportive skills, particularly:
  - Accepting what a mother thinks and feels: Health workers should accept a mother's ideas and feelings, which is not the same as agreeing that she is right. Correct information can be provided later.
  - Recognizing and acknowledging what is right: Health workers should recognize and praise a mother's decision and efforts to do the best for her child by breastfeeding, particularly if she is struggling. Positive feelings—such as loving thoughts about her baby, or confidence that her milk is the best for the child—can help the oxytocin reflex to work well and cause her milk to flow. In contrast, a mother's negative feelings—such as pain, worry, or doubt that she has enough milk—can hinder the oxytocin reflex and stop her milk from flowing. Health workers should not be critical of her efforts and should avoid saying anything that may make her doubt her breast milk supply.
  - Giving practical help: Encourage mothers to express their concerns and problems with breastfeeding so that they can be addressed. Making sure women are comfortable and relaxed will help them breastfeed.
  - Providing relevant information using suitable language: Use words that the mother will understand and don't overwhelm her with information. Find out what she needs to know to address her problem.
  - *Making suggestions rather than commands*: Provide choices so she can decide what is best for her. Do not tell her what she should do or must not do.

#### **Figure 2.2.5 Breasts of Different Sizes**

# **Composition of Breast Milk**

# **Types of Breast Milk and Their Characteristics**

Breast milk changes to adapt to the needs of the developing and growing baby. Breast milk, as it transitions to meet those needs, can be classified into two main types: colostrum and mature milk. Mature milk is further separated into fore milk and hind milk.

Colostrum is the yellowish thick milk produced starting midway through pregnancy and generally for the first 2–3 days after delivery. Although a baby receives colostrum only for a short period, colostrum has several very important benefits to a baby's health.

- It is rich in antibodies (specifically immunoglobulins), proteins that protect against infection from bacteria and viruses. These antibodies reflect the antibodies that the mother produces in response to diseases she has had. Through colostrum, the mother passes on these antibodies to her infant. Thus, colostrum is the newborn's first immunization against many pathogens, particularly those that are commonly present in the newborn's environment.
- It contains high levels of white blood cells and growth factors, which protect against infection.
- It has laxative qualities, stimulating gut motility and helping to remove meconium as well as bilirubin from the body, which prevents jaundice from becoming severe.
- It is rich in protein, which is important for the rapid growth and development of the newborn.
- It is rich in vitamin A (which gives colostrum its yellow-gold colour), which reduces the severity of infections and supports eye health.
- It helps to establish normal bacteria and microbes in the digestive tract.

It is important for babies to receive colostrum in their first days of life. Mothers should be encouraged to put their babies to the breast as soon as possible after delivery. Though the quantity of colostrum given to the baby at these initial feeds will be very small, a newborn's stomach is also very small. Mothers may need to be reassured that their infant is receiving adequate nutrition and that other foods or liquids are not needed and in fact can cause infection. Frequent feedings during the first days of life will also help a mother's milk to 'come in' (increase in volume) sooner.

Breast milk begins to transition from colostrum to **mature milk** around the 7th to 14th day of life (during this time it is referred to as 'transitional milk'). Mature milk is thinner and paler in colour than colostrum, though the appearance may differ depending on the mother's diet. Mature milk is also produced in much greater quantities than colostrum and has a lower protein concentration. However, the important bioactive factors of colostrum are largely maintained in mature milk. Fore milk is the thinner milk produced early in a feed. Hind milk is the white, thicker milk produced later in a feed; it contains more fat than fore milk. It is important to ensure that the baby takes both fore and hind milk for adequate growth. The mother should be encouraged to empty one breast at a time so that the baby obtains the hind milk.

# Factors That Affect Breastfeeding: Positioning, Attachment, and Breast Conditions

# Positioning and Attachment of the Baby during Breastfeeding

Optimal breastfeeding requires that a baby be positioned (how the baby's body relates to the mother's body) and attached to the breast (meaning how the baby takes the breast into her/his mouth, sometimes referred to as the latch) in a way that enables the baby to suckle effectively. Poor positioning and attachment can mean that the baby cannot remove enough breast milk, which can cause engorged breasts. Positioning and attachment problems also can cause sore nipples and fissures or cracks in the nipples. These breast problems can result in a poor milk transfer to the baby, which leads to an unsatisfied baby who wants to feed a lot, but the ineffective suckling means that the breast makes less milk. The baby then becomes frustrated, refuses to suckle, and hence fails to gain weight.

### Figure 2.2.6 How to Position a Baby to the Breast



**Cradle position** 

Lying down



Cross cradle for small infants



Under arm position



**Cross position for twins** 



Under arm position for twins

# Four Key Points for Positioning the Baby to the Breast

- 1. The baby's head and body are aligned in a straight line. A baby cannot suckle or swallow easily if his head is twisted or bent.
- 2. The baby is held close to and facing his mother's body, which is in a comfortable, relaxed, and supported position. A baby cannot attach well to the breast if he is far away from it. At the same time, mothers should not lean forward or lean over to feed their baby; they should be comfortable and relaxed, with their back supported if seated. The baby should be brought to the breast, and the baby's body should be turned away just enough for him to be able to look at her face. This is the best position for the baby to take the breast, because most nipples point slightly downward.

- 3. The baby's whole body is supported to allow effective attachment and suckling. There are different ways of holding an infant while breastfeeding, and mothers should find the position most comfortable for them. However, particularly for newborns and young babies with poor head and muscular control, positions should support the baby's entire body, for example, with a mother's arm along the baby's back, or a pillow.
- 4. **The baby approaches breast, nose to nipple, chin touching (or almost touching) the breast.** The infant should be positioned so that he is able to take in a large mouthful of breast from below (i.e., an asymmetrical latch, where more breast tissue below the nipple is taken into the mouth).

# Attachment of the Baby to the Breast

Attachment refers to the way a baby takes the breast into his mouth. A baby must be well attached to the breast for effective suckling and to avoid pain and damage to the nipple. While a term baby is born with the reflexes to suckle, attachment is a technique that the mother must learn. To ensure good attachment, health workers should show a mother how to:

- Touch her baby's lips with her nipple to stimulate the infant to open his/her mouth
- Wait until her baby's mouth is open wide
- Move her baby quickly onto her breast, aiming his/her lower lip below the nipple
- Depending on the mother's breast size, she may need to help 'shape' or support the breast with her hand to allow the infant to more easily attach. The mother should take care not to place her fingers too close to the nipple, which can prevent the baby from getting a large enough mouthful of breast. She may want to support the breast with her hand farther back on the breast, closer to the ribcage, or press slightly on the top of the breast with her thumb to help shape the breast (flatten it slightly) to allow the infant to attach more easily.

### **Signs of Good Attachment**



- Baby takes a large mouthful of breast into the mouth, with more of the areola visible above the baby's top lip than below the lower lip (asymmetrical latch). The infant should not be suckling on only the nipple. However, seeing a lot or a little of the areola is not a reliable sign of attachment. Some women have a large areola and some have a small areola. It is more reliable to compare how much areola you see above and below a baby's mouth (if any is visible).
- The baby's mouth is wide open, with the lower lip turned or curled outward.
- The baby's chin is touching or almost touching the breast.
- The baby is taking slow, deep suckles followed by a visible or audible swallow about once per second.

- The baby's cheeks remain full and round during a feed.
- There is no smacking or clicking sound during breastfeeding.
- The mother is not in pain.
- Baby finishes feed by him/herself and seems satisfied.

#### Some Common Signs and Symptoms of Poor Attachment

- The mother experiences pain during breastfeeding and/or has sore nipples.
- The milk ducts under the areola are not in the child's mouth.
- The nipple is not deep enough in the mouth, and the tongue is in the back of the mouth.
- The baby may suck harder, and there may be a clicking sound.
- It may take longer to feed as the baby tries to get milk.

#### **Potential Results of Poor Attachment**

- Sore, cracked nipples
- Engorged breasts, because the baby is unable to effectively remove the milk
- Reduced milk supply, as the body adjusts to the quantity of milk consumed

## **Breast Conditions that Affect Breastfeeding**

#### **Flat and Inverted Nipples**

Mothers' nipples come in different shapes and sizes. While most nipples protrude and are easy for baby to grasp, there are some variations—flat and inverted nipples, for example—that may make breastfeeding more challenging. A baby's suckling reflex is stimulated by the nipple touching the soft palate of the baby's mouth, which may be more difficult with some flat or inverted nipples. However, most flat nipples are protractile, meaning that they stretch if the mother pulls them out with her fingers, much the same way the baby will do with his mouth. A baby should have no difficulty suckling from a protractile nipple. In addition, nipples become more protractile in late pregnancy and the first weeks of birth.

#### Figure 2.2.7 An Inverted Nipple



## **Engorged Breasts**

Women will experience full breasts when their milk comes in 3-5 days after delivery. Mothers may feel uncomfortable; their breasts will feel heavy, hot, and hard. The milk flows well and sometimes drips from the breast. Mothers should be encouraged to feed their infant frequently to remove the milk, and their milk production will adjust to the baby's needs in a few days.

Breasts become engorged when milk is not removed adequately from the breast (due to delayed initiation of breastfeeding, infrequent feeds, poor attachment, or ineffective suckling), combined with increased blood flow to the breast. Engorged breasts are swollen and oedematous, and the skin looks shiny and diffusely red. Generally both breasts are affected and they are painful. The mother may have a fever, and the nipples may become stretched tight and flat, making it difficult for the baby to attach. Milk does not flow well from engorged breasts.

#### **Blocked Ducts and Mastitis**

A lactating woman's milk ducts can become blocked. A blocked milk duct is characterized by a tender localized lump in one breast, with redness in the skin over the lump. Blocked milk ducts are caused by failure to remove milk from part of the breast, which may be due to infrequent breastfeeds, poor attachment, tight clothing, or trauma to the breast. Sometimes the duct to one part of the breast is blocked by thickened milk.

When it causes milk stasis (i.e., milk staying in the breast), a blocked duct can lead to mastitis, an infection of the breast. Mastitis is characterized by a hard swelling in the breast, with redness of the overlying skin and severe pain. Usually only a part of one breast is affected. The woman has a fever and feels ill. Other causes of mastitis in addition to blocked ducts include long periods between feedings, poor attachment leading to incomplete milk removal, unrelieved engorgement, and frequent pressure on one part of the breast from fingers or tight clothing and trauma. Milk stasis leads to noninfective inflammation; if the stasis persists or the mother has a cracked nipple that becomes infected, infective mastitis results.



## Figure 2.2.8 Blocked Ducts: Common Symptoms and Progression to Mastitis

## Figure 2.2.9 Signs of Mastitis



# Sore Nipples

Sore nipples are characterized by severe nipple pain when the infant nurses. In some cases there may be visible cracks at the tip of the nipple or around the base. The nipple may also appear flattened after a feed, with a white pressure line across the tip.

Figure 2.2.10 Sore Nipple Caused by Poor Positioning of a Baby to the Breast



#### **Candida of the Breast**

Breastfeeding mothers can experience Candida albicans (fungal) infection of the breast, frequently occurring after the use of antibiotics in the mother or the baby. Symptoms in the mother include sore nipples with pain continuing between feeds; pain like sharp needles going deep into the breast that is not relieved with improved attachment; and red or flaky rash on the areola with itching and depigmentation. The baby may exhibit 'thrush' (white spots inside the cheeks or over the tongue that cannot be easily removed), mouth soreness (exhibited as pulling away from the breast, short feedings, or fussiness at the breast), or a red rash in the diaper/nappy area.

Figure 2.2.11 Breast Infected with Candida and Causing Sore Nipple



# **Summary of Main Points**

- Breast milk is the ideal food for infants, containing all the energy, nutrients, and water needed for the first 6 months of life and for protecting the infant from disease. In addition, it is easily digested, and helps a baby's development.
- National guidelines in Uganda recommend exclusive breastfeeding starting within 1 hour of birth and continuing for the first 6 months of life followed by continued breastfeeding to 2 years of age or beyond.

Infants born to HIV-positive mothers should also be exclusively breastfed starting within the first hour of birth and continuing through 6 months of age. For HIV-positive infants, breastfeeding should continue for 2 years or more. For HIV-negative infants, breastfeeding should continue for the first year. HIV-positive mothers should receive lifelong ARV treatment starting in pregnancy; infants should begin NVP/AZT prophylaxis for the first 4–6 weeks of life and be tested for HIV by 6 weeks of age.

- Breast milk production involves both maternal and infant processes. Milk production in the breast involves hormonal control (prolactin and oxytocin), and milk removal from the breast requires infant reflexes (rooting, sucking, and swallowing).
- Prolactin stimulates milk-secreting cells in the alveoli to produce milk; oxytocin causes the muscle cells around the alveoli to contract, causing milk to flow ('oxytocin reflex').
- The vast majority of women can produce sufficient breast milk for their infant. The more an infant suckles, the more milk a mother will produce. It is critical to support a woman's confidence in her ability to breastfeed her infant.

- Breast milk changes to meet the needs of the growing and developing infant. Colostrum is the first milk produced and is rich in antibodies, growth factors, protein, and vitamin A to provide the infant's 'first immunization'. It is essential that babies receive colostrum. By the second week of life, colostrum has transitioned to mature milk.
- Formula milk is generally made from cow's milk and other ingredients (soya, vegetable oils) and is processed to be similar to breast milk, but it will never be equivalent, nor will other animal milks. Breast milk varies from other animal milks and formula in the quantity of macro- and micronutrients it contains, as well as the bioactive compounds that are unique to breast milk.
- Optimal breastfeeding requires appropriate *positioning* and *attachment* to allow the baby to suckle effectively and avoid breast problems for the mother.
- To be positioned correctly for breastfeeding, a baby's head and body should be aligned in a straight line; the baby held close to and facing the mother's body, which is in a comfortable, relaxed and supported position; the baby's entire body supported; the baby's nose approaches the nipple, with the chin touching (or almost touching) the breast.
- Proper attachment should allow the infant to take a large mouthful of breast, with more of the
  areola visible above the baby's top lip. Signs of good attachment to the breast include baby's
  mouth being wide open, and the lower lip turned outward; baby taking slow, deep suckles
  followed by visible or audible swallows; baby's cheeks being full and round during a feed; no
  clicking or smacking noises; mother is not in pain; baby finishes a feed by him/herself and seems
  satisfied.
- Women may have or develop breast conditions that make breastfeeding more challenging and may require additional support or treatment. These include flat/inverted nipples, engorgement, blocked ducts, mastitis, sore nipples, and candida of the breast. As part of managing all of these conditions, health workers should support and build a woman's confidence in her ability to breastfeed.



# COMPLEMENTARY FEEDING PRACTICES



# Purpose

To equip participants with knowledge and skills on complementary feeding practices.

# **Session Objectives**

By the end of the session, participants should be able to:	Duration
Describe what complementary feeding is and why it is needed	10 min.
Describe nutrition gaps in breast milk after 6 months and appropriate foods to fill the gaps	15 min.
Describe principles for optimal complementary feeding, including optimal hygiene practices	30 min.
Demonstrate ability to use locally available foods for complementary feeding	60 min.

**Estimated Time/Duration** (includes 5-minute wrap-up)

120 minutes

# **Introduction to Complementary Feeding**

Complementary feeding means giving other foods in addition to breast milk to a baby starting at 6 months of age (i.e., 180 days of age). At this point, breast milk alone no longer provides the child with all the energy and nutrients needed for proper growth and development. Therefore, it is important to start timely complementary feeding at 6 months of age.

While introducing complementary foods too late is problematic, introducing complementary foods earlier than 6 months of age is also problematic. Many infants will not have developed the ability to eat semi-solid foods before 6 months of age. In addition, complementary foods are a primary way for an infant to ingest disease-causing pathogens. Finally, before 6 months of age, breast milk is a more nutritious food than almost any complementary food that would be introduced, and it does not run the risk of causing infection in the child.

During the period of complementary feeding, the young child gradually becomes accustomed to eating family foods. However, breastfeeding should continue because breast milk is still an important source of nutrients and protective factors until the child is at least 2 years old.

# **Nutrient Gaps in Breast Milk after 6 Months**

The nutrient gaps in breast milk after 6 months of age include energy, protein, iron, calcium, zinc, vitamin A, the B vitamins, and potentially iodine. Children must be given adequate amounts of nutritious complementary foods to fill these gaps. Some nutrient needs, like iron, calcium, zinc, and vitamin A, are more challenging to fill than others that are needed in smaller amounts, are more readily available in common foods fed to children, or are provided in greater quantities in breastmilk. Small children eat very small amounts of food, so the foods they are provided must be very nutritionally rich (energy and nutrient 'dense') to meet their needs and help the child to grow and develop well. One of the challenges with complementary feeding is identifying and preparing foods that are nutritionally appropriate for the needs of young children.

# **Energy Gap**

Complementary foods need to be energy rich to help meet the energy needs for growth and development that are not provided through breast milk. At 6–8 months of age, infants need about 200 kcal from complementary foods; at 9–11 months 300 kcal is required; and at 12–23 months of age 550 kcal from complementary foods are required.

Energy-rich foods include maize, millet, and wheat flour as well as rice, cassava, potatoes, matoke, and yams.

It is important to note that while many of these staple foods provide energy (as carbohydrates), they are not necessarily good sources of other needed nutrients, like protein (for example, cassava and yams) or iron or zinc. Thus they should not be the only complementary food provided.

Fats and oils are also good sources of energy and are an important component of the diets of infants and young children. Roughly 30–45 percent of calories from breast milk and complementary foods should be provided by fat for a child under 2 years of age. Fats also provide essential fatty acids and improve the absorption of fat-soluble vitamins (vitamins A, D, E, and K).

# **Protein Gap**

Proteins are required for growth, development, repair, and maintenance of the body. Protein deficiency in a child's diet can cause slowed growth and development and severe deficiencies may lead to conditions like kwashiorkor and marasmus, which are life threatening. Slightly less than half of the protein requirements for a child 12 to 23 months needs to come from complementary foods. Protein-rich foods include:

- Animal sources: Meat, milk and milk products, fish, eggs
- Plant sources: Beans, groundnuts, peas, simsim, soybeans

## **Iron Gap**

Iron is needed to make new blood cells to assist in growth and development. Insufficient iron can cause a child to develop anaemia and can negatively and permanently affect brain development. While iron stores are high at birth, they are gradually used up over the first 6 months of life. Breast milk is not high in iron, though the iron it does contain is relatively well-absorbed. Thus, of the nutrient gaps that need to be filled by complementary foods, the iron gap is the largest. Ironrich foods include:

- Animal sources: meat, organs/offal (liver, heart, and blood), and seafood such fish and crab
- Plant sources: legumes or pulses such as beans, peas, and lentils; nuts and seeds; dark green leafy vegetables such as nakati, boo/gobe, malakwang, dodo, pumpkin leaves, yam leaves, cassava leaves, and potato leaves; and seaweed
- Foods/condiments fortified with iron: fortified wheat flour

Other factors that affect how much iron is absorbed from the diet include:

- The amount of iron in the food
- Source of iron, i.e., animal-source iron (also called 'heme iron') is better absorbed than plantsource iron
- Consumption of foods rich in vitamin C, which facilitate absorption (e.g., fruits such as oranges, tangerines, pineapples, and pawpaw)
- Consumption of foods that interfere with absorption, such as tea and coffee, high-fibre foods (e.g., yams), and calcium-rich foods (e.g., milk)
- Iron status of the individual: iron-deficient individuals will absorb more iron from their diet than those with adequate iron status

It is important to note that vegetarian (plant-based) complementary foods will not by themselves provide enough iron (or zinc, discussed below) to meet all the needs of an infant or young child 6–23 months of age.

# **Calcium Gap**

Calcium is required for healthy bones and teeth and is needed for muscle function, nerve transmission, and contraction and dilation of blood vessels. Foods that are rich in calcium include:

- Animal sources: milk and milk products (yoghurt, cheese), small fish with bones
- **Plant sources:** leafy greens (cabbage, kale, collards); legumes or pulses such as beans, peas, and lentils

# Zinc Gap

Zinc is important for immune function and normal growth and development during pregnancy, childhood, and adolescence. A daily intake of zinc is required because the body has no zinc storage system. A large portion of the zinc requirements (as much as 85 percent) for infants 6 to 23 months needs to come from complementary foods. Foods that are rich in zinc include:

- Animal sources: meat (chicken and beef), organ meats/offal (liver, blood), fish and shellfish (oysters, crab), dairy products, egg yolk
- Plant sources: whole grains; legumes or pulses such as beans, peas, and lentils; nuts and seeds

Animal sources of zinc are more easily absorbed than plant sources due to the presence of phytates in plants, which inhibit zinc absorption.

# Vitamin A Gap

Vitamin A deficiency causes poor vision, lowered immunity, and dry skin and mucus membranes. Vitamin A is required in minimal amounts and is stored for a limited period in the body. Breast milk supplies a large part of the vitamin A the child needs if the mother's diet is not deficient (thus the importance of supplying lactating women with adequate vitamin A, generally done through supplementation). Roughly 75 percent of the vitamin A needs for a child 12 to 23 months comes from breast milk. However, in many situations, the vitamin A status of the mother may be inadequate, and a greater proportion of a child's requirements will need to come from complementary foods. Foods rich in Vitamin A include:

- Plant sources: dark green leafy vegetables (e.g., spinach) and orange-fleshed vegetables and fruits (e.g., carrots, pumpkins, orange-fleshed sweet potatoes, mangoes, papaya)
- Animal sources: organ foods/offal from animals (liver), milk and milk products, egg yolk
- Margarine and foods fortified with vitamin A

# **Other Nutrient Gaps**

Some B vitamins (thiamin and riboflavin) and iodine may also be inadequate in breast milk after 6 months of age, particularly if mothers are deficient in these nutrients and thus less is provided through breast milk.

# **Principles for Optimal Complementary Feeding**

# **FATVAH Principles**

To fill the nutrient gaps discussed earlier, complementary feeding practices should reflect the FATVAH principles, which cover:

- Frequency of feeding
- Amount/quantity of food
- Thickness of food
- Variety of food
- Active feeding
- Hygiene

#### Frequency

The appropriate frequency of feeding is dependent on:

- Child's stomach size: Young infants have small stomachs and can only eat small amounts at each meal.
- Child's energy needs: As a child grows, his/her energy needs from complementary foods increase, and he/she will need more meals to meet his/her needs.
- The 'energy density' of the complementary foods provided: Foods that are less energy rich will need to be provided in larger amounts in order to meet a child's energy needs; and may need to be divided into multiple meals.

Ensuring appropriate feeding frequency is essential because:

- If a child eats too few meals, the child will not meet his/her energy requirements
- If a child eats too many meals, the child will reduce his/her breast milk intake which may reduce the child's overall nutrient intake.

### **Amount/Quantity**

The stomach of a young child is small. The stomach of an infant weighing 8 kg (the median weight of an 8-month-old) can hold about 240 mls (30 ml/kg body weight) at one time (approximately 1 cup). The amount given to a child should increase as the child grows and can handle larger quantities of food. Start with 2–3 small spoonfuls of food twice a day at 6 months of age and increase gradually as summarized in Table 2.3.1. Ensure that the caregiver washes her hands before preparing the food, that any water used to prepare the food is treated, and that children wash their hands if they will be feeding themselves.

Table 2.3.1.	Recommended	<b>Food Texture</b>	, Frequency, a	and Amount,	by Age for	Children 6–23	Months of	Age
Who Breas	tfeed on Deman	nd						

Age	Texture	Frequency	Amount
6–8 months	Start with thick porridge, well mashed foods. Continue with mashed family foods Foods prepared with treated water.	2–3 meals per day plus frequent breastfeeding; based on a child's appetite, 1–2 snacks may be offered.	Start with 2–3 tbsp per feed, increasing gradually to ½ of a 250-ml cup
9–11 months	Finely chopped or mashed food and foods that the baby can pick up with his/ her fingers Wash child's hands if feeding him or herself.	3–4 meals per day plus frequent breastfeeding. Based on a child's appetite, 1–2 snacks may be offered.	½ cup at each meal
12–23 months	Family foods, chopped or mashed if necessary Wash child's hands if feeding him or herself.	3–4 meals per day plus frequent breastfeeding. Based on a child's appetite, 1–2 snacks may be offered.	¾ 0f a 250-ml cup

## **Thickness**

A complementary food should be thick enough so that it stays on a spoon and does not drip off. Generally, foods that are thicker or more solid are more energy- and nutrient-dense than thin, watery or soft foods. However, foods that are too thick or solid are difficult for a young infant to eat and can be dangerous. As a child develops, s/he is able to handle increasingly more solid foods that are finely chopped. Beginning at 6 months, an infant can eat pureed, mashed, or semi-solid foods. By 8 months, most infants can also eat finger foods. By 12 months, most children can eat the same types of foods as consumed by the rest of the family.

## Figure 2.3.1 How to Determine the Right Consistency of Baby Food Using a Spoon

Just right



## Variety

Complementary feeding should include a variety of foods with different nutrients like proteins, carbohydrates, fats, minerals, and vitamins. Giving the child foods with a range of colours—yellow, red, orange, brown, green, and white—and from both plant and animal sources will help ensure that she/he is getting a variety of nutrients. Complementary foods from plant sources alone will not meet infant and young child iron and zinc requirements. Varied tastes and textures also prevent the diet from becoming monotonous, which can decrease a child's appetite. Note that when complementary feeding is started, a child needs time to get accustomed to the taste and texture of new foods. If a child is very fussy and won't eat certain foods, it is important to keep trying new foods that he or she may eat.

### **Active Feeding**

Optimal infant and young child feeding not only depends on what to feed, but also how, when, where, and by whom the child is fed. Active feeding (also called 'responsive feeding') means engaging a child while feeding her/him to encourage the child to eat. This includes practices such as talking to the child and making eye contact while feeding her/him, which can make feeding more fun for the child. Infants should be fed directly and older children assisted when they feed themselves. Caregivers should feed slowly and patiently, encourage but not force children to eat, and minimize distractions. A child should have his or her own clean plate or bowl so that the caregiver knows if the child is getting enough food. A clean utensil such as a small spoon, or just a clean hand (washed in soap and water) may be used to feed a child.

#### Hygiene

To reduce the risk of contamination—particularly by human and animal faeces—and illness, good hygiene practices must be used when preparing complementary foods and feeding children. This includes appropriate hand washing with soap and flowing water (by caregiver and child) before food preparation and feeding; preparation of foods with treated water only; and storage (of cooked and raw foods) in covered containers. Only treated water should be consumed; store it in a covered container, and serve water by pouring or using a ladle.

Food hygiene is discussed in more detail in the next section on water, sanitation, and hygiene (WASH). The risk of diarrhoeal infections greatly increases after 6 months of age, because complementary foods provide a potential route of infection by disease-causing pathogens. Thus, appropriate food hygiene practices are essential.

# WASH

The term WASH refers to the following;

- Water: access, quantity, and quality
- **Sanitation:** safe handling and disposal of human excreta (faeces, urine, menstrual blood, sputum, and sweat), management of waste (including trash, wastewater, storm water, sewage, and hazardous wastes) and control of disease vectors (such as mosquitoes and flies)
- **Hygiene practices:** hand washing with soap, treatment and safe storage of drinking water, and food hygiene

### **Priority WASH Actions to Promote Nutrition**

WASH practices help to prevent caregivers and other household members from contracting waterand food-related diarrhoeal diseases. A healthier and stronger household is more economically viable and resilient in the face of nutritional challenges. WASH practices benefit everyone, and integrating them into nutrition care programmes provides additional opportunities and resources to improve overall health outcomes.

When implementing priority WASH practices, the focus should be on measures considered feasible by the household, taking into account the current practice, available resources, and the particular social context.

The home visitor, counsellor, family member, or clinician must assess what the current barriers are to each WASH practice and how they can be overcome. They can then negotiate a commitment to try a few practices that seem feasible, worth changing, and safe, from the point of view of the household.

#### Water-Priority Actions

Access to safe, quality, water is a basic human need and is essential to preventing disease and malnutrition. Many health and hygiene behaviours depend on water, such as hand-washing, bathing, cleaning food, and cooking surfaces. Simple technologies for treating and safely storing water can reduce the risk of diarrhoeal disease by up to 30–40 percent.

- **Treat drinking water.** Even where a reliable source of water is available, it is often difficult to assure safe transport and storage practices; it is therefore good practice to treat drinking water where it is used, with chlorination systems (Aqua Safe or Water Guard), solar disinfection, boiling, or filtration. Treated water should also be used for washing foods that will not be cooked and for mixing into already cooked foods like a child's porridge.
- Store treated drinking water safely. Ideally, treated water would be stored in a covered container or jerry can with a narrow mouth and lid to prevent recontamination of treated water. If possible, it should be served by pouring, preferably with a tap or spigot, otherwise it should be served using a ladle that hangs on the wall.

#### **Sanitation**—**Priority Actions**

Safe disposal of faeces reduces risk of diarrhoeal disease by 30 percent or more. Malnourished individuals, who are at additional risk of disease, are particularly susceptible to diarrhoeal disease.

- Handle and dispose of faeces safely. Support construction and use of simple waste disposal systems, such as latrines, for all household members. Dispose of waste from children's nappies in the latrines as well. Latrines should meet minimum standards, including cleanable platform, cover over the pit, housing that provides privacy, and a hand-washing station with soap or ash nearby. Maintain clean latrines with a clear pathway. When latrines are not available, bury faeces away from the house.
- Maintain a clean environment. Keep animals out of the house and away from food preparation areas. Sweep the compound daily to remove animal faeces. Ensure that toddlers do not crawl or play in areas with faeces on the ground.

## Hygiene (Personal, Food Hygiene)—Priority Actions

Both personal and food hygiene help to prevent illness and malnutrition. If done properly and at critical times, washing hands with soap or an abrasive substance such as ash can reduce the risk of diarrhoea by 42 to 44 percent<sup>9</sup>. Although statistics of foodborne illnesses are scant in Uganda, contaminated food is thought to be a primary cause of diarrhoeal disease. Contamination of food—including complementary food—can occur before preparation (if the food is spoiled or has come into contact with human or animal faeces), during preparation (if hands or cooking surfaces are not clean, or if the food is not washed/peeled or is washed with untreated water), during serving/feeding (if hands or eating surfaces are not clean), or during storage (if temperatures or storage containers are not adequate or the food is not adequately heated before reserving). Health workers can discuss options to help clients follow key hygiene actions.

- Wash hands with soap (or an abrasive substance) and clean flowing (or poured) water. Proper hand washing means:
  - Using soap or ash every time you wash your hands.
  - Washing hands under poured or flowing water. This removes the dirt and germs. A washbasin in which many people wash their hands in the same water does not prevent infection.
  - Washing hands before handling, preparing, or eating food; before feeding someone or giving medicines; and often during food preparation. Before preparing food or feeding a child, mothers should wash their own hands with soap (or ash) and clean flowing (or poured) water. Children's hands should be washed with soap (or ash) and clean flowing (or poured) water prior to eating.
  - Washing hands after going to the toilet; cleaning a person who has defecated; blowing your nose, coughing, sneezing; handling an animal or animal waste; and both before and after tending to someone who is sick.
  - Installing a tippy tap near the latrine and food preparation areas is convenient, can save water, and reminds people to wash their hands.
  - It is not necessary to wash hands with treated water, as long as soap, ash, or sand is used.
- **Prepare, handle and store food safely.** Proper food hygiene and safe food handling and storage, with particular references to IYCF practices, include:
  - Protecting food from insects, pests, and animals by covering it with netting, a cloth, or keeping it in a covered container.
  - Keeping food preparation areas and serving/eating utensils clean.
    - Washing all surfaces and equipment used to prepare or serve food with soap and water.
    - Avoiding feeding with a bottle or spouted cup (which are harder to clean); always use an open cup.
    - Washing the cup, bowl, or mixing utensils for the infant's food thoroughly with soap and water. Boil them if possible, or dry them in the sun. Bacteria breed in food that sticks to utensils.
  - Separating raw and cooked food.
    - Keeping raw eggs, meat, poultry, fish, and seafood away from other foods; they can easily contaminate other foods with illness-causing bacteria.

<sup>9</sup>WASHPlus. 2013. Integrating water, sanitation and hygiene into nutrition programming. Washington, DC: WASHPlus.

- Cooking food thoroughly, especially meat, poultry, eggs, fish, and seafood. For meat and poultry, make sure juices are clear, not pink.
  - Bringing soups and stews to the boiling point until the first big bubble is seen.
  - Reheating cooked food thoroughly; bring it to a boil or heat it until it is steaming or too hot.
     Stir while reheating.
  - Cooling foods before serving to infants and young children.
- Keeping foods at safe temperatures.
  - Not leaving cooked food at room temperature for more than 2 hours.
  - Before reserving, reheating cooked food that has been stored until it is steaming.
  - Preparing fresh food for infants, young children, and other people with compromised immune systems; do not store it after cooking.
- Using safe water and raw materials.
  - Always using treated water for drinking and mixing with foods for children.
  - Using pasteurized milk or boiling milk before use.
  - Washing raw vegetables/fruits with treated water or peeling the skin before eating.

# **Summary of Main Points**

- Starting at 6 months of age, children need more nutrients that breast milk alone can provide. Therefore, feed them complementary foods in addition to breastfeeding them.
- Continue breastfeeding until child is at least 2 years of age.
- Start with 1 to 2 spoonfuls of mashed food twice a day and gradually increase frequency, amount, and texture of food as child gets older.
- Provide a variety of foods (not just the staple food), including animal and plant foods in a range of colours to ensure the child is getting a variety of nutrients.
- Actively engage the child while feeding to encourage him or her to eat.
- Practice good hygiene, including good food hygiene.
- Wash hands with soap and flowing/poured water before preparing food and feeding.
  - Treat drinking water and water for washing or mixing into foods that will not be cooked further.
  - Store treated water in a covered container with a small mouth. Serve water by pouring or using with a clean ladle.
  - Cover food with a cloth, net, or lid and avoid contamination of cooked food with raw food.
  - Cook and reheat food thoroughly (heat to steaming).
- Promote WASH practices: water, sanitation, hygiene.



# FEEDING CHILDREN DURING ILLNESS, RECOVERY, AND DIFFICULT CIRCUMSTANCES



# Purpose

To equip participants to support and promote continued feeding of children under 2 during children's illness, recovery, and other difficult circumstances.

# **Session Objectives**

By the end of the session, participants should be able to:	Duration
Explain the importance of feeding children during illness and recovery	15 min.
Discuss feeding practices for children during illness and recovery	20 min.
Discuss feeding options for children in difficult circumstances	30 min.

Estimated Time/Duration (includes 5-minute wrap-up)

70 minutes

# **Importance of Feeding Children during Illness and Recovery**

Optimal infant and young child feeding during illness and recovery reduces the risk of malnutrition and weight loss as a result of illness and can help the child recover faster. As shown in Figure 2.4.1, illness leads to malnutrition through loss of appetite, additional calories burned during illness, and in some cases reduced absorption of nutrients. Malnutrition itself can lead to illness, or worsening of illness, or death due to reduced immune function.



#### Figure 2.4.1 Relationship between Illness and Feeding

# **Feeding Practices during Illness and Recovery**

Reasons children may fail to eat or breastfeed during illness and recovery include the following:

- The child does not feel hungry.
- The child is weak and/or lethargic.
- The child is vomiting or nauseous.
- The child's mouth or throat is sore, or the child has difficulty swallowing.
- The child has a blocked nose due to upper respiratory infection, which makes eating and suckling more difficult.
- The child is on oral bitter/sour medicines, which make eating unappetizing.

• The caregiver withholds certain foods or fluids because she/he thinks the child cannot tolerate them, she/he thinks they should not be provided during illness, or because the child has become more selective about food.

Reasons for encouraging sick children to breastfeed, eat, and drink more during illness and recovery include:

- To prevent malnutrition
- To replace lost fluids (especially important for a child with diarrhoea)
- To help comfort the sick child (in the case of breastfeeding)
- To help the child regain the previous growth trend before illness
- To hasten recovery from illness

Note: Sick mothers can still breastfeed their babies.

When a child is sick, their appetite for food often decreases, and their desire to breastfeed frequently increases. Their need for fluids (particularly if they are losing fluids through diarrhoea) also increases. Breastfeeding may become a primary source of both fluid and nutrient intake. During illness, the goal is to continue feeding (feed the child the same or more than before illness) and increase fluid intake. Special care must be given to the feeding of nonbreastfed children to cover the nutrient and fluid gap created by lack of breast milk. Health workers should counsel caregivers not to withhold food or drink from a sick child.

# **Appropriate Feeding Practices during Illness**

### For Children Under 6 Months of Age

- Breastfeed more frequently and longer at each feed.
- Children who are not breastfed should be given their usual breast milk substitute at least every 3 hours by cup, depending on age<sup>10</sup>.
- Children who are not exclusively breastfed, should be given plenty to drink every 1–2 hours. Treated water, rice water, yoghurt drinks, and other nutritious liquids should be given rather than sodas or artificially sweetened fruit juices. Additional liquids should be fed by spoon or cup, not a bottle.

### For Children 6–23 Months of Age

- Continue to breastfeed the child, providing more frequent feeds (on demand).
- Increase fluid intake. Treated water, rice water, yoghurt drinks, and other nutritious liquids should be given rather than sodas or artificially sweetened fruit juices.
  - Children with SAM and dehydration should be given ReSoMal, an oral rehydration solution formulated specifically for people with SAM. This should be given under direct medical supervision in inpatient care<sup>11</sup>.
  - Children with diarrhoea and mild to moderate dehydration who do not have SAM should be given oral rehydration therapy and zinc.
- Feed the child more frequently with small amounts of nutritious food/drink. (Intake is likely to be less at any one meal because of the child's appetite, thus more frequent meals are needed.)

<sup>10</sup> Rehydration Project. 'Low-osmolarity Oral Rehydration Salts - Frequently Asked Technical Questions'. Available at: <u>http://rehydrate.</u> <u>org/ors/low-osmolarity-ors-tech-qa.htm</u>.

<sup>&</sup>lt;sup>11</sup> Detailed guidance on rehydrating children with SAM can be found at <u>http://www.who.int/elena/titles/dehydration\_sam/en/.</u>

- Give the child his or her favourite foods. Soft and appetizing foods may be most appealing.
- Give the child a variety of nutrient-rich foods.
- Give the child mashed foods to ease chewing and digestion or if there is difficulty swallowing. However, do not dilute foods or drinks.
- Feed the child slowly and very patiently in a loving way. Encourage the child to drink and/or eat; be persistent, but do not force.
- Always wash hands with soap (or ash) and clean flowing water before preparing food or feeding the child and before and after tending to the sick child.
- Only use treated water.

#### The Five Feeding 'Extras' During Recovery

The goal during recovery from illness is to provide more food than normal. Paying extra attention to feeding after illness is important, as the child is regaining appetite, and caregivers need to be responsive to the child's increased hunger. Children recovering from illness will also need additional nutrients and energy to 'catch up' in their slowed growth caused by the illness. Caregivers should be taught how to follow the five 'extras' for at least 2 weeks or until the child gains the recommended weight for age and is growing well.

- 1. Give the child **extra** breastfeeds.
- 2. Feed the child an extra meal (and extra snacks).
- 3. Give the child an **extra** portion of food.
- 4. Use extra nutrient-rich foods (for example, meat, fish, liver, eggs, milk, and oil).
- 5. Feed the child with **extra** patience and love.

#### **Feeding Low Birth Weight Babies**

A child with low birth weight may be a pre-term birth (< 37 weeks gestation), a term birth but small for gestational age), or both born too early and small for gestational age. Low birth weight is both a direct and indirect cause of neonatal mortality and requires specialized care<sup>12</sup>. The guidelines below are based on gestational age and should be adapted based on individual baby needs. However, in many cases it can be challenging to know the true gestational age of an infant, so birthweight is frequently used as a proxy if gestational age is unknown: > 2,000 g = term; 1,500–2,000 g = 32–36 weeks gestation; < 1,500 g = < 32 weeks gestation.

Whether low birth weight (< 2.5 kg) infants can suckle effectively largely depends on their maturity rather than their weight.

- Low birth weight, *term* infants (less than 2.5 kg but 37 weeks gestation or more)
   'Small-for-date' or 'small-for-gestational-age' babies who are not preterm usually can suckle effectively immediately after birth.
  - Health workers should help the mother place the infant in skin-to-skin contact and let the baby try to suckle as soon as possible after delivery.
  - Ensure correct positioning and attachment. Under arm and cross cradle holds/positions may be easier for nursing small babies.

<sup>&</sup>lt;sup>12</sup> The information provided here is a summary. More information can be found in the Uganda clinical guidelines and WHO. 2009. *Infant and Young Child Feeding: Model Chapter for textbooks for medical students and allied health professionals*. Geneva: WHO. Available at: <u>http://www.who.int/maternal\_child\_adolescent/documents/9789241597494/en/</u>.

- Low birth weight babies tend to pause while breastfeeding, so they should not be removed from the breast immediately when they stop feeding. Feedings may take a long time (an hour or so).
- The baby should be allowed to suckle every three hours or on demand more frequently.
- Low birth weight, premature infants (less than 2.5 kg and less than 37 weeks gestation)

# **Feeding Options for Children in Difficult Circumstances**

Babies who are born preterm may have difficulty suckling effectively at first because it is difficult for them to latch onto the breast. Depending on their gestational age, the reflexes needed for breastfeeding (rooting, sucking, and swallowing) may be immature. These infants can be provided with expressed breast milk from the baby's mother, donor breast milk, or infant formula (in that order of preference). It is important for the mother to receive assistance to start expressing milk on the first day—within 6 hours of delivery if possible—to help get the breast milk flowing. She should express milk at least eight times in a 24-hour period.

It is also important to maintain good hygiene, monitor children for infection, and provide prompt treatment of infection in this vulnerable group.

#### **Babies of 32–36 Weeks Gestation**

- These babies may be able to suckle but also may need to be partially or fully fed expressed breast milk by cup or spoon until full breastfeeding can be established later.
- Feeds can be started as soon as the infant is clinically stable, if possible within the first hour of life, and given based on demand. The smaller the infant, the more frequent feeds need to be, but they should be given at least every 2–3 hours.
- The mother should continue putting the baby to the breast to allow the baby to lick and suckle to stimulate breastfeeding. Expressing milk directly into the infant's mouth will also stimulate the sucking and swallowing reflexes.
- Low birth weight babies tend to pause while breastfeeding, so they should not be removed from the breast immediately if they seem to stop feeding. Feedings may take a long time (an hour or so).
- The rest of the feed can be provided by cup; the amount of breast milk fed by cup can gradually be reduced as the baby starts to suckle well.
- Placing the infant in skin-to-skin contact (as part of Kangaroo Mother Care) is beneficial for the infant and mother.

#### **Babies Fewer than 32 Weeks Gestation**

- These babies usually need to be fed by gastric tube in a health facility for a period of time (babies 30–32 weeks may be able to be fed from a cup or spoon; increase volume of cup feeds by 5 ml to adjust for spills).
- Give the baby expressed breast milk (if possible from the baby's mother), starting with 60 ml/kg body weight per day divided into 8 to 12 feeds per day, given every 2–3 hours.

- If expressed breast milk is not available (either from the mother or donor), give the child formula mixed according to the instructions. Increase the daily feed volume by 10 to 20 ml/kg per day over 7 days up to 160 ml/kg/day.
- After 7 days, if the infant is still receiving breast milk by gastric tube or cup, increase the quantity given by 20 ml/kg each day until the infant is receiving 180 ml/kg/day. The mother should start putting the baby to the breast to allow the baby to lick and suckle to stimulate breastfeeding as soon as the baby is well enough (~32 weeks of age). Expressing milk directly into the infant's mouth will also stimulate the sucking and swallowing reflexes.
- Placing the infant in skin-to-skin contact (as part of Kangaroo Mother Care) is beneficial for the infant and mother.
- As the baby begins to breastfeed more frequently, the amount of expressed breast milk given by gastric tube or cup may be reduced gradually.
- The size of individual feeds may vary, so it is important to record and check the baby's 24-hour intake and weigh the infant regularly to make sure that he or she is receiving the total ml/kg body weight required.

Gestational Age*	36+ weeks	Preterm 32-36 Weeks	Preterm < 30 Weeks		
	Able to Suckle	Difficulties Suckling			
Feeding Approach	Full breastfeeding Timing: as soon as possible after birth (within 1 hour) Frequency: on demand, at least every 3 hours Tips: allow extra time for feeding, baby may take small breaks and resume feeding	Breastfeeding + cup/spoon feeding expressed breastmilk Timing: as soon as stable, within one hour if possible Frequency: every 2–3 hours Tips: allow extra time for feeding, baby may take small breaks and resume feeding	Expressed breast milk through gastric tube Babies 30–32 weeks may be able to be fed expressed breast milk with cup/spoon. Timing: start 12–24 hours after birth Frequency: every 1–2 hours Tips: Small amounts, increase daily Gradually reduce gastric feeding as child is able to consume via cup or suckle		
Other Supportive Care	Kangaroo Mother Care or skin-to-skin contact	Kangaroo Mother Care or skin-to-skin contact Put child to breast to lick and suckle	Kangaroo Mother Care or skin-to- skin contact. Put child to breast to lick and suckle		
Location of Care	Home	Home	Health facility until stable/able		

### Table 2.4.1 Summary of Infant Feeding for Low Birth Weight Infants

\* If gestational age is unknown, use the following guidelines based on birthweight as a proxy for gestational age: Term LBW = > 2000 g; 32–36 weeks = 1500-2000 g; < 32 weeks = < 1500 g.

Day of Life	Fluid Requirement (ml/kg/day)	Volume per Feed (ml)	Fluid Requirement (ml/kg/day)	Volume per Feed (ml)	Fluid Requirement (ml/kg/day)	Volume per Feed (ml)*
Weight of Baby	2000–2500 g (every 3 hours)		1500–2000 g (every 3 hours)		1000–1500 g (every 2 hours)	
1	60	17	60	12	60	6
2	80	22	75	16	70	7
3	100	27	90	20	80	8
4	120	32	115	24	90	9
5	140	37	130	28	110	11
6	150	40	145	32	130	13
7	160+	42	160	35	150**	16

### Table 2.4.2 Recommended Fluid Intake and Feed Volumes for Low Birth Weight Infants

Source: Adapted from WHO 2009.

\* Infants < 1250 g who do not show signs of feeding readiness should start with 1-to-2 ml feeds every 1–2 hours and receive the rest of the fluid as intravenous fluids.

\*\* If the infant is on intravenous fluids, do not increase above 140 ml/kg/day.

# **Feeding Infants of HIV-Positive Mothers**

As discussed in Session 2.2, the risk of HIV transmission through breastfeeding is a challenge to optimal feeding and child survival. Transmission through breastfeeding accounts for up to 20 percent of MTCT, yet the risk of death from malnutrition, diarrhoea, and pneumonia among nonbreastfed infants is significant. Current evidence indicates that exclusive breastfeeding and the use of antiretroviral drugs greatly reduce MTCT. The effectiveness of ARV interventions with continued breastfeeding by HIV-infected mothers until the infant is 12 months of age capitalizes on the maximum benefit of breastfeeding to improve the infant's chances of survival while reducing the risk of HIV transmission.

Health workers should counsel women during pregnancy on the benefits and management of breastfeeding, MTCT, and the importance of adhering to their ARV regimen.

Below are national recommendations for infants born to HIV-infected mothers.

- Start ARV treatment during pregnancy. Mothers known to be HIV positive should be provided with lifelong ART to reduce HIV transmission throughout pregnancy, labour, delivery, and breastfeeding; to prevent MTCT in future pregnancies; and reduce transmission to partners.
- Start the baby on daily NVP or AZT prophylaxis from birth. For infants born to HIV-positive mothers, NVP or AZT prophylaxis should be given daily from birth until 4–6 weeks of age.
- Test the infant for HIV infection by 6 weeks of age. All infants who are HIV positive should be referred to an ART clinic and started on ARVs. If the test result is negative and the child has breastfed within 6 weeks of the test, a second test should be done 6 weeks after cessation of breastfeeding.
- Start breastfeeding within 1 hour of birth. Pay particular attention to positioning and attachment to prevent conditions such as cracked nipples and mastitis, which increase the risk of HIV transmission.
- Exclusively breastfeed all infants from 0 to 6 months of age.
- Give complementary foods to all children starting at 6 months of age.

- Continue breastfeeding HIV-positive infants for 2 years or longer.
- Continue breastfeeding HIV-negative infants until they are 12 months old. After 12 months, breastfeeding should be stopped only if a nutritionally adequate and safe diet that includes a source of milk can be provided. (This was previously referred to as 'acceptable, feasible, affordable, sustainable, and safe' or AFASS.)

## **Feeding HIV-Positive Children**

Children infected with HIV are more vulnerable to malnutrition and growth failure if they are not appropriately fed. Optimal and appropriate feeding delays the progression of HIV infection.

- HIV-positive children who are asymptomatic need 10 percent more energy than the recommended intake for noninfected children their age.
- HIV-positive children who are symptomatic need 20 to 30 percent more energy than the recommended intake for noninfected children their age.
- HIV-positive children who are symptomatic *and* experiencing weight loss require 50 to 100 percent more energy than the recommended intake for noninfected children their age.

At the health facility, health workers should:

- Counsel the caregiver on appropriate feeding practices, including the amount and variety of foods (guidelines for optimal complementary feeding apply).
- Ensure that the caregiver receives education on good hygiene and food preparation.
- Encourage the caregiver to use essential child services (immunization, vitamin A supplementation, deworming, use of insecticide-treated nets).
- Identify community support services for nutrition and refer caregivers to them.
- Regularly monitor the child's growth by taking and plotting weight and MUAC.
- Ensure early referral of children with growth faltering to appropriate counselling or nutrition care and support.

# Feeding Children who are Orphaned, Abandoned, or in Emergencies (Orphans and Vulnerable Children)

#### **Orphaned/Abandoned Infants**

- Children under 6 months of age usually need to be on replacement feeding, using infant formula.
  - These artificial feeds must be provided in accordance with the National Regulations on Marketing of Infant and Young Child Foods. Caregivers should be instructed on and follow appropriate and hygienic preparation and use of breast milk substitutes.
- Children 6 months of age should receive complementary foods (following the same guidelines and principles previously covered), in addition to either infant formula or animal milk. They should have meals, including milk/formula, about four to five times a day with nutritional snacks one to two times per day.
- Children more than 6 months of age who are not breastfed also need to consume plain, treated water, several times per day.

**Emergencies:** In emergency settings, infants and young children are at greater risk of malnutrition and disease than older age groups due to disruption of basic necessities (clean water, shelter, food, etc.).

Mothers may be ill or traumatized or become separated from their infants. However, the principles and recommendations for feeding infants and young children in emergency situations are exactly the same as for infants in ordinary circumstances: protecting, promoting, and supporting breastfeeding (which is even more important in emergencies) and ensuring timely, safe, and appropriate complementary feeding.

- Children who are with their mothers should be exclusively breastfed for the first 6 months and then started on complementary feeding using locally available ingredients as much as possible.
- In the case of children under 6 months who cannot be breastfed (because the mother is dead/ absent/ill/traumatized and rejects the infant, or is HIV positive and has chosen to replacement feed), breast milk substitutes should be procured and distributed as part of the regular inventory of foods and medicines, in quantities only as needed. Caregivers should be instructed on appropriate and hygienic use and preparation of breastmilk substitutes, and care should be taken to avoid 'spillover' of breast milk substitute use among the general population.

# **Summary of Main Points**

- Ill children may resist eating and drinking. However, to prevent malnutrition and dehydration and hasten recovery, it is important that they continue feeding as much as or more than they did before illness and that they increase fluid intake.
- Low birth weight children are fed according to specialized protocols. The amount, frequency, and mode of feeding depend on their gestational age and weight. Children more than 36 weeks of age should be able to breastfeed normally, children 32 to 36 weeks of age will need to be fed partially or fully on expressed breast milk via cup, and children under 32 weeks of age will likely need to be fed via gastric tube.
- For HIV-positive women and their children, exclusive breastfeeding and ARVs greatly reduce MTCT while improving the infant's chance of overall survival.
- Health workers should counsel caregivers of HIV-exposed children on feeding practices, hygiene, essential health services, and available community support. They should regularly monitor a child's growth, making referrals as necessary.
- Orphans under 6 months of age usually need to be on replacement feeding, usually infant formula. They can begin consuming animal milk and complementary foods at 6 months. They should also consume plain, treated water.
- In emergencies, children are at greater risk of malnutrition; it is urgent to protect, promote, and support breastfeeding and ensure safe, timely, and appropriate complementary feeding. Breast milk substitutes should be distributed, as needed, to children under 6 months of age who are unable to breastfeed. Care should be taken to avoid spillover into the greater population.
# CLINICAL PRACTICE 2 BREASTFEEDING ASSESSMENT SKILLS



### Purpose

To practice helping mothers adopt optimal breastfeeding practices for infants.

### Session Objectives

#### During the practicum, participants will be able to:

Help a mother to position her baby at the breast

Explain the benefits of breastfeeding to the mother

Identify and assist with challenges related to breastfeeding

#### After the practicum, participants will:

SESSION

Discuss challenges related to assisting and counselling breastfeeding women

### ${\bf \mathfrak{G}}$ Estimated Time/Duration

### **100** minutes

### Handout 1. Guidance for Counsellors

This handout provides guidance to follow as you practice counselling new mothers. Remember: be calm and gentle with mothers, let them decide freely whether or not to participate, and seek support from your mentor as needed.

#### 1. Introduce yourself and seek permission.

- Introduce yourself to the mother and ask her permission to talk to her.
- Introduce the group and say you are interested in infant feeding or in 'how babies feed' and that you would be interested in seeing how she feeds her baby, if she is willing.
- If a mother is not currently feeding, ask the mother when her infant last fed.
  - If it was recently (in the last hour) ask if you and your group can return later when her infant is ready to nurse. In the meantime, move on to another mother.
  - If the infant has not fed for more than 1–2 hours, ask the mother if she would be willing to be observed while she feeds her baby as she normally does when the baby seems ready.

#### 2. Establish rapport before the baby begins feeding.

- Be in a comfortable position to assist the mother, perhaps sitting on a chair or stool.
- Introduce friendly conversation (see examples below).
  - Encourage the mother to tell you about herself, her situation, and her baby.
  - Talk about ordinary life, not just breastfeeding.
  - Talk with her about how she knows when her baby is ready to feed and/or hungry (i.e., what signs does she look for?).
- You can also help her practice positioning her baby while you wait for the baby to feed. You could say something like, 'I see your baby seems to be sleepy now, but may I share with you a good way to hold him when he is ready to feed'? Then show the mother the four key points of positioning. This can be done with dolls/models, if needed.

### 3. Observe feeding (only use checklist discreetly, if at all, and do not write notes while mother is talking).

- Help mother to be in a comfortable position. If she is seated, her back should be supported and her shoulders relaxed. Assist her if she needs additional support—like a pillow—for herself or for supporting her infant.
- Quietly observe. Do not immediately offer help unless the mother requests it or a difficulty arises.
  - If the mother is having difficulty or requests assistance, explain what might help, and ask the mother if she would like you to show her.
- Assess the four key points of positioning and look for signs of good attachment and effective suckling.
- Ask her how she feels while the infant suckles. If she reports that she is in pain or uncomfortable help her to adjust the positioning or attachment to make her more comfortable.

- Practice the six confidence and support skills as much as possible. In particular, try to:
  - Listen to what the mother thinks and feels.
  - Give practical help.
  - Praise two things that the mother and baby are doing right.
  - Give the mother two pieces of relevant information that she can use in her immediate circumstances.
- 4. Thank the mother for her time and willingness to let you observe.

### Handout 2. Breastfeeding Observation Form

Mother's name:	 Date:	

Baby's name: \_\_\_\_\_\_

Baby s age:
-------------

#### Signs that breastfeeding is going well

#### MOTHER:

- Mother looks healthy
- Mother looks relaxed and comfortable
- Signs of bonding between mother and baby

#### BABY:

- Baby looks healthy
- Baby is calm and relaxed
- Baby reaches or roots for breast if hungry

#### BREASTS

- Breasts look healthy
- No sign of pain or discomfort
- Breast well supported with fingers

#### BABY'S POSITION

- Baby's head and body aligned
- Baby held close to mother's body
- Baby's whole body supported
- Baby approaches breast, nose to nipple

#### BABY'S ATTACHMENT

- More areola seen above baby's top lip
- Baby's mouth wide open
- $\hfill\square$  Lower lip turned outward
- Baby's chin touches breast

#### SUCKLING

- $\hfill\square$  Slow, deep sucks with pauses
- $\hfill\square$  Cheeks round when suckling
- Baby releases breast when finished
- D Mother notices signs of oxytocin reflex

#### Signs of possible difficulty

#### MOTHER:

- Mother looks ill or depressed
- D Mother looks tense and uncomfortable
- No mother/baby eye contact

#### BABY:

- Baby looks sleepy or ill
- Baby is restless or crying
- Baby does not reach or root

#### BREASTS

- □ Breasts look red, swollen, or sore
- □ Signs of pain in breast or nipple
- Breast held with fingers on areola away from nipple

#### BABY'S POSITION

- Baby's neck and head twisted to feed
- Baby not held close
- Baby supported by head and neck only

Baby approaches breast, lower lip/chin to nipple

#### BABY'S ATTACHMENT

- □ More areola seen below baby's bottom lip
- Baby's mouth not open wide
- Lips pointing forward or turned in
- Baby's chin not touching breast

#### SUCKLING

- □ Rapid shallow sucks
- $\hfill\square$  Cheeks pulled in when suckling
- Mother takes baby off the breast
- No signs of oxytocin reflex noticed

### Handout 3. Counselling Skills Observation Form

Practical skills are best developed by introducing and demonstrating skills, observing participants as they practice the skills, discussing what participants experienced themselves and observed in others, and providing feedback. Feedback should include praise for things done well and gentle suggestions for overcoming any difficulties.

Use the questions below to guide your observations and feedback discussions.

Overall				
Counsellor/Participants Who Practiced	Observer			
What did you do well?	What did the counsellor/participant do well?			
What difficulties did you have?	Who does most of the talking?			
What would you do differently in the future?	Does the counsellor ask open questions?			
What additional support or guidance do you feel you need?	Does the mother talk freely and seem to enjoy the conversation?			
	Does the counsellor identify the problem (if any) and its cause? Does he/she give the appropriate solution?			
	Which feasible action does the mother agree to do?			
	What difficulties did you observe?			
	What suggestions do you have?			
What special difficulties or situations helped you to lea	rn?			
What was the most interesting thing that you learned from this practical session?				
Active Listening Skills				
Which active listening skills did you use?	Which active listening skills did you observe?			
Was the mother willing to talk?	Which ones most engaged the mother?			
Did the mother ask any questions? How did you respond?	How did the counsellor handle questions from the mother?			
Did you empathize with the mother? Give an	What went well?			
example.	What suggestions do you have?			
Confidence and Support Skills				
Which confidence and support skills did you use?	Which confidence and support skills were used?			
Which skills were most difficult to use?	Did the counsellor praise and offer two relevant			
What was the mother's response to your suggestions?	suggestions?			
What will you do differently in the future?	What suggestions do you have?			
Key Messages				
Which messages for breastfeeding did you use? (In particular, observers should check whether only a	How relevant were the messages that the counsellor gave to the mother?			
few relevant messages were used.)	Did the counsellor focus on only a few?			
What was the mother's response to your suggestions?	How did the mother respond?			
	What suggestions do you have?			

Note: See Handout 4 for refresher on counselling skills, active listening, and confidence building from Unit 1.

### Handout 4. Counselling Skills

Counselling skills were covered in more detail in session 1.6. Below is a reminder of key principles to keep in mind when counselling and observing counselling sessions.

#### **Counselling Skills**

The GATHER approach is a commonly used method of counselling.

**Greet:** Provide a seat for the client and introduce yourself. Discuss the client's status and well-being since the last visit.

Ask: About feeding practices, problems, symptoms, and concerns.

Tell: Use counselling cards to share options for addressing problems.

Help: Help client set realistic goals and feasible actions to take to achieve them.

**Explain:** Discuss any barriers to achieving the actions or goals (and how to overcome them); ensure that the client understands what he/she is agreeing to.

Reassure/Return: Help build confidence and make sure client comes back for additional support.

#### **Active Listening Skills**

**Nonverbal communication:** Use posture, facial expressions, eye contact, gestures, and other unspoken actions to reflect a reassuring, nonjudgmental, positive attitude toward the client. This ensures that the client feels safe and interacts well.

**Open questions:** To get the best, most complete information from your clients, ask what, why, when, where, and how—avoid yes/no questions.

**Reflecting back:** 'Reflecting back' means repeating in different words what a client says to indicate that you understood her/him, to allow him/her to clarify if necessary, and to show interest in what he/she said. This can help build rapport with the client, which can encourage her/him to share more information. Nodding, smiling, and using phrases like 'um hmm' or 'go on' also can demonstrate interest in what the client is saying.

**Empathy:** This means to understand another person's feelings about a situation. With empathy, the interaction/conversation focuses on the client's feelings or concerns and the counsellor tries to understand the situation from the perspective of the client.

**Nonjudging words:** Words that may sound judging include right, wrong, well, bad, good, enough, properly, adequate, problem. It is more helpful to use open questions, which can generate more information from the client.

### **Confidence Building and Support**

**Accept thoughts and feelings:** Neither agree nor disagree with a client's mistaken ideas and feelings. By responding neutrally, the counsellor can maintain rapport with the client and continue the conversation, which will give the counsellor an opportunity to provide correct information.

**Recognise and praise what the client is doing right:** This can help build a client's confidence and encourage her/him to continue the practice.

**Provide practical help:** This includes providing physical support to a client when appropriate, e.g., positioning the baby at the breast or providing relief for discomfort. Giving the client practical help is one way of empathizing with her/his feelings and can strengthen rapport.

**Provide relevant information in simple language:** This refers to information about the most pressing need. Prioritize issues to address so the client is not overwhelmed. Use simple language to make sure the client understands.

**Make suggestions, not commands:** Be careful not to command or overwhelm a client with a list of do's and don'ts. Instead, offer one or two relevant suggestions that the client can decide whether to try. You can phrase your suggestion as a question, e.g., 'Have you thought of feeding her more often? Sometimes that helps'.

**Arrange for follow-up and ongoing support:** The client may still have questions/concerns or think of something else to discuss. The counsellor can schedule a follow-up or ongoing support visit to continue the discussion. Through these visits, the counsellor also can learn what help may be available from the client's family and friends and find out whether the agreed-upon suggestions are working for the client.



## NUTRITION CARE AND SUPPORT FOR PEOPLE LIVING WITH HIV AND/OR TUBERCULOSIS

8 hours

The unit discusses nutrition assessment, counselling, and support for people living with HIV/AIDS (PLHIV) and/or tuberculosis (TB). The unit highlights drugfood interactions for these patients and related nutrition care. The last session is clinical practice in HIV/AIDS and TB care service points to assess, categorize, counsel, and support malnourished clients. The unit comprises the following sessions:

Session 3.1	Interaction Between HIV and Nutrition	105 min.
Session 3.2	Interaction Between TB and Nutrition Assessment, Counselling, and Support (NACS) for Clients with Active Tuberculosis	80 min.
Session 3.3	Using Diet to Manage Drug Interactions and Side Effects from Common HIV/AIDS and Tuberculosis Therapies	75 min.
Session 3.4	Clinical Practice (Nutrition Care and Support for PLHIV and TB)	225 min.
		0.1

### TOTAL DURATION

Note: In these sessions, facilitators and participants are advised to refer to the following guidelines for more specific information:

Integrated National Guidelines on Antiretroviral Therapy, Prevention of Mother to Child Transmission of HIV and on Infant & Young Child Feeding

*Improving the Quality of Life through Nutrition: A Guide for Feeding People Living with HIV/AIDS* 

*Nutritional Care and Support for People Living with HIV/AIDS in Uganda: Guidelines for Service Providers* 



# INTERACTION BETWEEN HIV AND NUTRITION



#### **Purpose**

To provide participants with information about the relationship between nutrition and HIV/AIDS.



### **Session Objectives**

By the end of the session, participants should be able to:	
Explain the relationship between undernutrition and HIV	25 min.
Describe how HIV/AIDS affects nutrition among PLHIV	15 min.
Discuss the benefits of good nutrition for PLHIV	20 min.
Explain recommendations for nutrition assessment, counselling, and support for PLHIV	40 min.



**Estimated Time/Duration** (includes 5-minute wrap-up)

105 minutes

### **Relationship between HIV and Undernutrition**

#### The Cycle of Undernutrition and HIV/AIDS

Undernutrition is one of the major complications of HIV infections. Undernutrition can be both a significant contributor to and a result of HIV as it progresses. In addition, a combination of HIV infection and undernutrition further reduces a person's ability to fight opportunistic infections and remain healthy. Consequently, undernutrition and HIV infection reinforce each other, creating a vicious cycle. However, improving and maintaining good nutrition may prolong health and delay HIV disease progression.

#### Figure 3.1.1 Relationship between HIV and Undernutrition



Adapted from Tomkins, Andrew and Fiona Watson. 1989. 'Malnutrition and Infection–A review', Nutrition Policy Discussion Paper No. 5. Geneva: United Nations Administrative Committee on Coordination Subcommittee on Nutrition.

#### **How HIV Affects Nutritional Status**

Individuals with HIV are at greater risk of undernutrition. Even in the early stages of HIV infection, before symptoms appear, HIV is already affecting nutritional status in multiple ways. As a result of the various ways that HIV impairs nutritional intake, absorption, utilisation, and increases losses, PLHIV suffer weight loss—both muscle mass and body fat—and also develop vitamin and mineral deficiencies.

#### 1. HIV increases energy requirements.

• Energy requirements are estimated to be 10 percent more for asymptomatic HIV patients and 20–30 percent more for symptomatic HIV patients.

#### 2. HIV leads to reduced food consumption due to several factors.

- Mouth and throat sores
- Loss of appetite
- Fatigue and/or weakness
- Depression and changes in mental state
- Side effects of medication
- Abdominal pain
- Household food insecurity (due to lack of money to buy food, inability to grow food, difficulty shopping/cooking)
- 3. HIV impairs nutrient absorption and increases nutrient losses in several ways.
  - The effect of the HIV virus on the gastrointestinal tract (intestinal cell damage)
  - Malabsorption of fats, protein, and carbohydrates, even before HIV symptoms appear
  - Diarrhoea and vomiting
  - Opportunistic infections
  - Poor absorption of fat-soluble vitamins (A, D, E, K) due to malabsorption of fats

#### 4. HIV changes body metabolism.

- Increased use of antioxidants (vitamins E and C, β-carotene, zinc, selenium,) to support body in fighting frequent infections.
- HIV causes loss of muscle tissue/wasting.
- Lipodystrophy, also known as fat redistribution, is fat loss or fat buildup in certain parts of the body in patients with HIV. This may be caused by treatment with antiretrovirals or from the HIV virus itself.

#### 5. Undernutrition can cause opportunistic infections.

HIV and undernutrition also lead to opportunistic infections and illnesses. These are illnesses that the body would normally prevent but can't because of a weakened immune system. These infections (e.g., TB) can further worsen nutritional status and speed HIV progression.

#### 6. HIV/AIDS can lead to associated wasting syndrome.

- Loss of lean body mass: 10 percent loss in weight, often with fever and chronic diarrhoea or fatigue for more than 30 days.
- Occurs in late stages of disease progression.
- Related to:
  - Reduced food intake and increased nutrient requirements
  - Malabsorption from gastrointestinal disorders and diarrhoea
  - Infections
  - Metabolic changes
- Managed through treatment of HIV infection (with antiretroviral therapy [ART]) and secondary infections.

### **Effects of Undernutrition on HIV/AIDS**

#### **Effects of Undernutrition on HIV/AIDS Outcomes**

HIV directly attacks the body's immune system. Undernutrition (both vitamin and mineral deficiencies, as well as inadequate food intake) also weakens the immune system and can speed the progression of disease in HIV patients.

Undernutrition speeds up disease progression through:

- Increased HIV replication and viral load
- Reduced immune functions and immune response
- Increased susceptibility to secondary infections (e.g., TB)

Undernutrition also worsens HIV outcomes:

- Faster progression from HIV to AIDS
- Increased risk of mortality
- Increased risk of mother-to-child transmission of HIV

**Note:** While vitamins, minerals, and antioxidants play an important role in maintaining health, there are currently no recommendations for HIV-positive people to take supplements of any specific micronutrients or antioxidants. Rather, clients should be advised to eat a well-rounded, balanced diet that provides the recommended daily allowances of all nutrients through food. Supplements may be taken as needed for micronutrient deficiencies or other conditions as prescribed/recommended by a health provider.

#### **Common Effects of Undernutrition and HIV**

Both undernutrition and HIV infection impair cell-mediated immunity. Signs include reduced:

- CD4 T-lymphocytes
- CD4/CD8 ratio
- Serological response after immunisation
- Immune response to infection

Undernutrition and HIV infection also both impair delayed skin hypersensitivity so that diagnostic tests such as the Mantoux-test for tuberculosis (also known as the tuberculin sensitivity test or PPD), which require mounting a delayed hypersensitivity immune response, may result in inaccurate results (false negatives).

### **Nutritional Management of HIV Patients**

#### **Recommendations for Nutrition Assessment, Counselling, and Support (NACS) of Patients** with HIV

Nutritional assessment, counselling, and support should start early in the course of the HIV infection, even before other disease symptoms are observed. The purposes of NACS for PLHIV are to improve nutritional status and minimize loss of muscle mass, promote and improve adherence to ART, improve treatment efficacy and help manage side effects, slow disease progression, and improve quality of life.

#### Assessment

Nutrition assessment of PLHIV should occur regularly and include the following types of assessment.

- Anthropometric: Regular measurement of height and weight (at every visit) and calculation of body mass index (BMI) for nonpregnant/postpartum adults and mid-upper arm circumference (MUAC) for pregnant/postpartum women or those who cannot stand.
  - Adult PLHIV who lose 10 percent of their body weight over 1 month should seek medical and nutritional care.
- **Biochemical:** Blood tests (e.g., haemoglobin, serum albumin, micronutrients) may help identify nutrient deficiencies. These tests are not routine and are given if indicated by clinical findings. A lipid profile for clients on highly active antiretroviral therapy (HAART), measuring cholesterol (LDL and HDL) and triglyceride levels, is recommended on an annual basis or as requested by physician.
- **Clinical:** PLHIV should be assessed for symptoms that affect food intake (diarrhoea, nausea, vomiting, anorexia, mouth/throat sores, oral thrush), signs of clinical undernutrition (wasting, weight loss, oedema, skin or hair changes), signs of anaemia (pale conjunctiva, gums, nails, skin; breathlessness, rapid pulse, oedema).
- **Dietary:** Information about the types and amounts of food being consumed, appetite, and eating behaviours may help identify factors that affect food intake such as food availability, access, and use; side effects of medications; or food taboos. Health workers should ask PLHIV if they are taking any herbs or traditional medicines or dietary supplements.
- Living environment: Assessing the cleanliness and sanitation of the client's environment, access to and use of safe water, and personal and food hygiene behaviours is important for immunocompromised HIV patients.
- Lifestyle practices: Smoking, alcohol, and drug abuse can affect food intake and decrease effectiveness of some medications.

#### Counselling

- Counselling should be guided by the results of the nutrition assessment and whether a client is categorized as normal, having moderate or severe acute malnutrition, or overweight.
- **Counsel PLHIV to consume more food and a wider variety of food than they normally do.** PLHIV should consume diverse, energy- and nutrient-rich diets based on locally-available and culturally appropriate foods as well as fortified foods. Eating a variety of foods at every meal will help in meeting nutrient requirements.
- For PLHIV who are undernourished, encourage patients to increase food consumption by eating smaller meals (and snacks) more frequently throughout the day, particularly if they have a small appetite. Adults and children living with HIV need more food, especially during infections

and symptomatic period of HIV or if losing weight. Healthy adults without HIV require 1,990–2,580 kcal per day. The additional energy required by PLHIV depends on stage of disease:

- **Asymptomatic HIV-infected adults:** 10 percent more energy, or approximately 200–300 kcal extra per day, equivalent to one additional snack per day
- **Symptomatic HIV-infected adults:** 20–30 percent more energy, or approximately 420–630 kcal extra per day, equivalent to two to three additional snacks
- HIV-infected children: 10 percent more energy to maintain growth if asymptomatic; 20–30 percent more energy to maintain growth if symptomatic; 50–100 percent more energy if losing weight (exact calorie requirements vary based on child's age)
- **Identifying and preparing favourite foods** may also help ensure adequate energy intake, particularly if appetite is poor.
- Encourage PLHIV to take plenty of fluids to avoid dehydration, which can decrease appetite. Teas, treated water (boiled, filtered, or chlorinated), and fresh fruit juice (prepared with treated water) may be taken throughout the day. Note that this guidance is not appropriate for severely malnourished PLHIV with oedema, who need specialized care.
- Encourage adequate protein intake from both animal and plant sources. Adequate protein intake ensures that the body uses protein to build and maintain muscle mass and supports the immune system. Protein from animal sources is of higher quality than from plant sources and also tends to have vitamins and minerals that are more easily absorbed. Protein should be about 12–15 percent of the diet for both PLHIV and those who are HIV negative.
- PLHIV without fat malabsorption or diarrhoea can be encouraged to consume fat in moderation to help meet their increased energy needs. Fats and oils are rich sources of energy and add flavour to food, which may help stimulate appetite. They also help absorption of fat-soluble vitamins.
- **PLHIV should be counselled to treat illness promptly.** Because PLHIV are prone to infections, which can further exacerbate undernutrition, all illnesses should be treated quickly.
- PLHIV should be encouraged to practice proper personal and food hygiene behaviours, good sanitation, and methods to ensure water safety. Diarrhoeal infections can speed HIV progression and are commonly caused by contaminated water or food or unsafe sanitation and hygiene practices. PLHIV should be counselled on proper hand washing with soap and clean flowing water, appropriate water treatment methods, safe handling and disposing of garbage and faeces, and safe preparation and storage of food.
- PLHIV should practice positive living behaviours, including safer sex (condom use), avoidance of alcohol and tobacco, and management of depression and stress.

#### **Support**

Nutrition support for PLHIV may include prescribing specialized food products to clinically malnourished individuals who meet specific criteria for a specific amount of time. These foods are dense in energy, protein, and micronutrients and are safe and easy to use. They include ready-to-use therapeutic food (RUTF) and therapeutic milks used for severely malnourished individuals (adults with BMI < 16 kg/m<sup>2</sup>) and fortified blended foods (FBF), which are nutrient dense and fortified with essential nutrients, for moderately malnourished patients (adults with BMI < 18.5 kg/m<sup>2</sup>). PLHIV who are unable to meet their nutrient requirements using locally-available food sources may also need multiple micronutrient supplements, if recommended or prescribed by a health professional.

In addition to providing nutritional support, you should refer HIV patients to other available services in the community such as livelihood programmes, social development services, and other complementary programmes.

#### Special Considerations for Pregnant Women with HIV and HIV-Exposed Newborns

A woman's nutritional status before and during pregnancy affects her health and the health and nutritional status of her baby. Both HIV and pregnancy increase a woman's nutritional needs. As with other mothers, it is important to ensure that an HIV-positive woman eats enough food, at least one additional meal per day, and a variety of foods from the available and affordable food groups; gets prompt treatment for illness and infection; takes iron folate supplements; and has her weight gain monitored routinely, each time she visits the health facility.

In addition, Uganda has made ensuring HIV-free survival of children born to HIV-positive mothers a top priority and has adopted Option B+. This regimen includes lifelong ARV treatment for pregnant women regardless of CD4 count, ARVs for the newborn baby for 6 weeks, testing HIV status at 6 weeks, exclusive breastfeeding for 6 months, and continued breastfeeding until the child is 12 months (or 24 months if HIV-positive). This is the best option to prevent transmission of HIV and to ensure the overall health and well-being of mother and child.

#### **Special Considerations for Children with HIV**

HIV-infected children are growing and developing, fighting a chronic disease, and are dependent on others to feed and care for them. Each of these factors independently increases their risk for undernutrition, and the combination makes them especially vulnerable. HIV infection, even in early stages, increases nutrition requirements. Children with no symptoms need 10 percent more energy than an uninfected child to maintain growth; they need 20 to 30 percent more energy if they have an infection such as pneumonia or TB, and they need 50 to 100 percent more energy if losing weight (exact calorie requirements vary based on child's age and weight). These nutrition needs are best met through a balanced and diversified diet derived from the food groups including fortified/biofortified foods. However, even with a good diet, HIV-infected children may still have trouble achieving healthy growth and may become malnourished. These children should be referred for additional clinical assessment and treatment. For all of these reasons, health care workers must pay special attention to HIV-infected children, including:

- Ensuring that they get appropriate treatment for HIV (ART and treatment for opportunistic infections)
- Regularly monitoring their growth and health status to assess their nutritional needs, monitor HIV progression, and identify and deal with complications
- Developing a nutrition care plan, based on nutrition needs, family economic circumstances, and care practices; supplements may be needed in certain circumstances
- Promoting good water, hygiene, and sanitation behaviours among caregivers, to prevent infection:
  - Wash hands with soap under flowing water (e.g., tippy tap) before preparing food or feeding the child, after using the toilet, after changing children's diapers.
  - Only use treated or boiled water to drink, give medicine, or mix juice.
  - Keep treated drinking water in narrow neck, covered, clean containers.
  - Keep food covered and heat before eating left over foods.

• Sweep compound daily and keep free of animal and human fecal contamination (dispose in latrine or bury).

### **Key Points**

- There is a synergistic and cyclical relationship between HIV and undernutrition.
- HIV impairs nutritional intake, absorption, and utilisation and increases losses; PLHIV suffer weight loss—both muscle mass and body fat—and also develop vitamin and mineral deficiencies.
- Poor nutritional status is associated with faster HIV disease progression and death.
- Improving and maintaining good nutrition may prolong health and delay HIV disease progression.
- Nutritional assessment and counselling should start early in the course of the HIV infection, even before other disease symptoms are observed.



NUTRITION CARE AND SUPPORT FOR CLIENTS WITH ACTIVE TUBERCULOSIS



#### Purpose

To equip participants with the knowledge and skills needed to provide nutrition care and support for patients living with tuberculosis (TB).



### **Session Objectives**

By the end of the session, participants should be able to:	Duration
Describe the interaction between nutrition and TB and TB-HIV co- infections	30 min.
Describe nutrition management for people with active TB	45 min.



**Estimated Time/Duration** (includes 5-minute wrap-up)

80 minutes

### **The Interaction between Undernutrition and Tuberculosis**

Undernutrition and tuberculosis (TB) are major public health challenges in most developing countries, and they are interrelated. Undernutrition is an important risk factor for, and consequence of, TB.

- Undernutrition weakens the immune system, increasing the risk that latent TB infection will become active TB disease. Undernourished individuals are also more at risk of becoming infected with TB.
- TB also makes undernutrition worse. People with TB often lose their appetite, so they eat less. Diarrhoea, vomiting, and altered metabolism also make people with TB lose the nutrients they are able to eat. In addition, when a person has active TB disease, his or her energy needs increase. Thus, patients with active TB are more likely to suffer from wasting or have lower a BMI than healthy individuals.
- Though it is challenging to establish which condition came first (undernutrition or active TB) because of their cyclical relationship, the combination of both conditions leads to delayed recovery, high mortality, and risk of relapse. A low BMI and inadequate weight gain among TB patients are signs of severe TB, treatment failure, or other infections.
- TB is also aggravated by HIV/AIDS co-infection, accelerating the progression of TB disease and further impairing the patient's nutritional status. TB is the most common opportunistic infection among PLHIV, and TB among PLHIV is more difficult to treat. HIV increases the risk of getting TB, the risk of latent TB becoming active, and the risk of relapse after treatment. In turn, TB speeds HIV progression. Undernutrition may be more severe in people with TB–HIV co-infection.

#### Figure 3.2.1 Cycle of Undernutrition and Active TB Infection



#### **Can Nutritional Support Affect Recovery in Tuberculosis Patients?**

- Nutritional assessment, care, and support is an essential component of TB treatment and care. However, there is limited evidence on how and what specific types of nutritional care and support can be provided to improve TB treatment outcomes.
- A healthy, diverse diet once was generally considered to be an important, if not essential, factor in treatment of TB. Cod liver oil (a source of vitamins A and D) was once a common treatment for TB to boost the immune system. The introduction of specific anti-TB drugs lessened the focus on diet as an important component of management of the disease. However, increasingly, the need for nutritional care and support of TB patients is again being recognized, particularly because of the challenges of HIV–TB co-infection as well as multidrug-resistant TB (both of which are less responsive to standard drug treatments).
- An adequate diet containing all essential macro- and micronutrients is necessary for the wellbeing and health of all people, including TB patients.

# Can Raising Nutritional Status of the General Population Reduce the Burden of TB in the General Population?

- General undernutrition is associated with increased risk of TB, and TB and undernutrition coexist in many high-burden TB countries.
- Other conditions—particularly high HIV prevalence and poverty—are also strongly associated with high TB burden and also positively related to undernutrition.
- Reducing undernutrition in the general population should reduce the incidence of TB. However, there is no evidence on the effect of population-level interventions to improve nutrition on levels of TB infection and disease.

#### What are the Advantages of Good Nutrition for TB Clients?

Though TB drug treatment will generally improve some measures of nutritional status (weight gain) among TB patients, treatment alone is generally not sufficient to fully restore nutritional status, particularly in food-insecure populations. Supporting optimal nutrition addresses the multiple ways that TB affects nutritional status, specifically by:

- Boosting immune function: Undernutrition affects cell-mediated immunity, which is the main defence against TB infection and preventing the progression from latent to active disease. Intake of nutrients that support the immune system may be helpful for TB patients.
- Helping to prevent weight loss and regain weight: TB affects protein metabolism, increases energy expenditure, and decreases appetite. Ensuring adequate energy intake and adequate protein intake is important for TB patients.
- Reducing oxidative damage caused by TB disease: Active TB causes tissue damage and inflammation. Nutrients with antioxidant properties can help reduce this damage.
- Alleviating drug side effects: TB patients on isoniazid therapy may have side effects that are alleviated through intake of vitamin B6.

### NACS for Patients with Active TB<sup>13</sup>

All individuals with active TB should receive a nutritional assessment and appropriate counselling based on their nutritional status at diagnosis and throughout treatment. TB patients should receive the same care and support as other individuals or populations of similar nutritional status. Food supplementation is available to malnourished clients.

#### Assessment

Because many individuals diagnosed with TB are also undernourished, nutritional assessment (anthropometric, clinical, dietary, and food security) is needed for providing adequate nutritional care. Nutritional assessment should occur at both diagnosis of TB as well as follow-up care.

#### **At Diagnosis**

- Anthropometric measurements/indicators (age appropriate):
  - Children 0-59 months: height, weight (weight for height), and MUAC (children 6-59 months)
  - Children 5-18 years: BMI for age, MUAC
  - Adults 18 and over (nonpregnant): BMI, MUAC
  - Adults 18 and over (pregnant): MUAC
- Clinical measurements: history of weight loss, signs of undernutrition (visible wasting or oedema), other health conditions and ongoing treatments. WHO recommends that all TB patients be tested for HIV and positive cases referred for care and treatment.
- Diet assessment if nutritional status indicates malnutrition.

#### At Follow-Up

- Anthropometric measures of weight, BMI, change in weight, and BMI since diagnosis or last visit.
- Classification of nutrition status. In those classified with moderate malnutrition or severe acute malnutrition, further risk factor and dietary assessment is needed, including TB treatment adherence/response or resistance to TB drugs; clinical assessment for other nondietary causes of malnutrition (HIV, diabetes, alcohol/drug abuse); biochemical assessment; dietary assessment including food security.
- Weight loss or failure to regain/maintain a healthy weight requires further assessment and appropriate interventions.

#### **Counselling and Support**

Nutrition counselling as a part of TB care aims to improve dietary intake during recovery; to provide for extra energy needs; to support improved immune function; and to manage symptoms and sideeffects of TB drugs, such as nausea, vomiting, anorexia, diarrhoea, and altered taste. Undernourished children and adults with TB should receive the same care and support as other undernourished individuals in their age group. Health providers should help patients develop strategies to:

<sup>13</sup>This section adapted from: WHO. 2013. Guideline: Nutritional care and support for patients with tuberculosis. Geneva: WHO.

- Eat nutrient-rich, diverse diets, using, where possible, locally-available, culturallyappropriate foods.
- Increase energy intake; energy needs are likely to increase similarly to those of HIV-infected people.
- Increase consumption of nutrient-rich foods to meet their vitamin and mineral requirements and/ or take a vitamin and mineral supplement if food sources are unable to meet vitamin and mineral needs. A daily multiple micronutrient supplement providing 1x the recommended nutrient intake (for age/sex/physiologic group) is recommended. For clients on TB medication, supplementation with vitamin B6 is recommended.
  - Particular nutrients can help boost the immune system, reduce oxidative stress associated with active TB, counteract nutritional deficiencies stemming from the disease, and alleviate side effects from the medications used to treat it. Thus, nutrients known for their antioxidant properties or ability to boost immune function may be particularly important.
- Consume foods rich in protein, which is needed for tissue repair and may be helpful to restore lean body mass. Animal sources include meat, fish, chicken, silver fish, eggs, milk, and milk products. Plant sources include legumes (beans and soya) and nuts.
- Avoid smoking, alcohol, and recreational drugs, which impair the immune system's ability to fight infection during TB treatment. Smoking is even more dangerous when the patient has a lung infection.
- Malnourished clients may be referred for nutritional support, including supplementary or therapeutic feeding.
- Clients may also be referred to livelihood support activities.

Nutrient	Potential Role in TB Management	Sources
Vitamin A	Immune function	Eggs, meat, milk, cheese, squash, pumpkin, carrots, and sweet potatoes
Vitamin B6	Counteracts drug side effect (peripheral neuropathy in patients receiving isoniazid treatment)	Fish, beef liver, organ meats, potatoes, starchy vegetables, fruit (other than citrus), whole cereals, maize, avocado, and watermelon Note: Isoniazid may cause reactions with foods such as bananas/plantains, beer, tea, soda, yoghurt, chocolate, smoked pickled fish, and liver in some individuals
Vitamin C	Antioxidant	Fresh fruits (e.g., guava, oranges, pineapples, mangoes, pawpaw, watermelon) and green leafy vegetables
Vitamin D	Immune function (resistance to infection)	Fatty fish such as Nile perch, milk products, cereals fortified with vitamin D, and exposure to sunlight
Vitamin E	Antioxidant	Nuts, peanuts, seeds, vegetable oils, and green leafy vegetables
Selenium	Antioxidant	Seafood, organ meat, meat, cereals/grains, dairy products, and eggs
Zinc	Antioxidant and immune function	Red meat, poultry, beans, nuts, whole grains, dairy products

#### Table 3.2.1 Recommended Sources for Key Vitamins and Minerals

#### **Special Considerations for Children with TB**

Children are particularly vulnerable to TB because of their relatively immature immune systems. Detection and management of the disease are also complicated by undernutrition. Undernutrition increases their risk of contracting TB and developing active TB disease. Undernutrition also makes detection of TB challenging because undernutrition dampens a child's response to the TB skin test, leading to missed diagnoses.

Children who are malnourished or failing to thrive and do not respond to normal treatment must be evaluated for possible TB. All HIV-infected and exposed infants and children should be evaluated for TB symptoms, and be evaluated for contact with a TB source case.

- Children with active TB should be fed foods with adequate energy and nutrients to avoid undernutrition or failure to thrive. The rapid growth during infancy and childhood can only be maintained if a child's nutrient intake is optimal. TB further increases nutritional needs which, if not met, can lead to impaired growth and undernutrition.
  - Because young children have limited stomach capacity and appetite, meeting nutritional demands for growth and development and increased demands due to TB is challenging, and foods need to be particularly nutrient dense for this age group.

Children with active TB who are diagnosed as being malnourished (severe acute malnutrition or moderate malnutrition) should receive the same care and support outlined for any other child with these conditions.

#### **Special Considerations for Pregnant Women with TB**

Pregnant women with TB are more likely to deliver a low birth weight infant, as well as have an increased risk of premature delivery; perinatal death of the infant; and increased pregnancy complications, particularly hypertensive disorders such as pre-eclampsia. Adequate weight gain is particularly challenging for pregnant women with TB.

- Pregnant women with active TB should receive multiple micronutrient supplements containing iron and folic acid and other vitamins and minerals.
  - Regardless of TB status, pregnant women have increased micronutrient needs.
  - While there is no evidence from pregnant women with TB, multiple-micronutrient supplementation in non-HIV-infected populations has been shown to reduce low birth weight, small for gestational age infants and anaemia.
- Pregnant women with active TB in settings where calcium intake is deficient, should receive calcium supplementation as part of prenatal care, particularly for women at greater risk of developing pre-eclampsia.
- Pregnant women with active TB and moderate undernutrition or inadequate weight gain should be provided with locally available nutrient-rich or fortified supplementary foods as needed to restore normal nutritional status.

### **Key Points**

- Undernutrition increases risk of TB infection and the likelihood that latent TB infection will become active TB disease.
- Because TB causes decreased appetite, increased dietary needs, altered metabolism and nutrition losses through diarrhoea and vomiting, TB increases the risk of undernutrition and makes existing undernutrition worse.
- Good nutrition can strengthen immunity, prevent weight loss, reduce tissue damage, and counteract drug side effects.
- All TB patients should receive appropriate nutrition assessment and counselling at diagnosis.
- Undernourished people with TB should receive the same treatment as other undernourished people with the same condition. There are no TB-specific guidelines for managing undernutrition.
- Pregnant women and children with TB are at greater risk for undernutrition and require extra attention.

**3.3** SESSION

USING DIET TO MANAGE DRUG INTERACTIONS AND SIDE EFFECTS FROM COMMON HIV/ AIDS AND TUBERCULOSIS THERAPIES



#### Purpose

To enhance participants' knowledge of dietary management of drug–food interactions and drug side effects for HIV/AIDS and TB clients.



### **Session Objectives**

By the end of the session, participants should be able to:		
Identify common therapies used by people living with HIV and TB	15 min.	
Discuss drug-food interactions and side effects related to HIV and TB therapies	40 min.	
Discuss drug-food interactions and side effects related to complementary and		
alternative medicines		



Estimated Time/Duration (includes 5-minute wrap-up)

75 minutes

### **Common Therapies Used by PLHIV**

#### Introduction

People living with HIV/AIDS (PLHIV) take medications to treat HIV and opportunistic infections (OIs) caused by HIV (e.g., TB), reduce symptoms, and treat other diseases such as malaria, and to treat intestinal parasites. Medical treatment can slow the progress of HIV, reduce OIs, and ease symptoms. Antiretroviral therapy (ART), which has become simpler to administer and more accessible, also has the potential to help improve nutritional status via many pathways, including reducing viral load, reducing OIs, and restoring appetite.

However, drugs can also interact with certain foods and nutrients, affecting the drugs' efficacy and clients' adherence to the drugs. Interactions between drugs and food/nutrients can also impair nutritional status by reducing food intake or nutrient utilisation, which may lead to weight loss and undernutrition. In addition, drug side effects can affect food intake and nutrient absorption and can reduce adherence.

To ensure that ART is successful, nurses and other service providers should stay informed about food and nutrition interactions and side effects of drugs, help clients understand them, and help clients identify and implement appropriate responses.

Service providers should pay special attention to any side effects and dietary effects of antiretrovirals (ARVs) among undernourished clients and pregnant and lactating women.

- Undernourished clients initiating treatment are at increased risk of death and should be monitored more closely. Food insecurity can be one factor that prevents PLHIV from following optimal food and nutrition recommendations. Service providers should help clients identify alternative responses that are feasible under the circumstances and when possible seek options to improve food security.
- Pregnant and lactating women with HIV have increased nutrition needs. Therefore, it is important to ensure that drug and food interactions do not reduce their food intake or nutrient absorption. Timely management of drug-food interactions is needed to protect the health of the mother and infant. Managing drug-food interactions for pregnant and lactating women is similar to that for other PLHIV.

#### **Common Therapies**

PLHIV commonly use both traditional and modern therapies to manage HIV and OIs and alleviate symptoms.

#### **Modern Therapies**

ART significantly reduces the replication of HIV in the body to slow the progression of HIV into disease. The main types of ARVs used in sub-Saharan Africa are non-nucleoside reverse transcriptase inhibitors (NNRTI), nucleoside/nucleotide analogue reverse transcriptase inhibitors (NRTI), and protease inhibitors (PI).

Each type of ARV is active at different stages of viral replication. Multiple ARVs are combined to better suppress viral replication. This is referred to as combination therapy or highly active antiretroviral therapy (HAART).

#### Table 3.3.1 The Four First-Line ARV Combinations for Adults in Uganda\*

Regimen	Sources	
Preferred		
Tenofovir disoproxil Fumarate (TDF)/Lamivudine (3TC) + Efavirenz (EFV) OR TDF/3TC + Nevirapine (NVP)	<ul> <li>TDF/3TC/EFV has low toxicity, is administered once daily, and is effective against hepatitis B.</li> </ul>	
Alternative		
Zidovudine (AZT)/3TC + NVP	Relatively inexpensive first-line regimen.	
OR	AZT may cause anaemia.	
AZT/3TC + EFV	• If patient is anaemic, start with TDF.	

Source: Uganda MOH. 2011. The Integrated National Guidelines on Antiretroviral Therapy, Prevention of Mother to Child Transmission of HIV and Infant and Young Child Feeding.

\*Note: this table is for basic reference and does not provide details for specific situations. Decision making for prescribing ART should be guided by the Integrated National Guidelines.

Common types of drugs taken by PLHIV include:

- Antifungal drugs (e.g., Nystatin, Nizoral, and fluconazole)
- TB therapy (e.g., Rifampin)
- Antibiotics (e.g., Cotrimoxazole) as prophylaxis against pneumocystis pneumonia (PCP)
- Antimalarial drugs (e.g., Coartem and quinine)
- Antihelminthic drugs (e.g., mebendazole, albendazole) to treat intestinal parasites and worms

#### **Traditional Therapies**

PLHIV commonly use traditional therapies such as herbs, teas, and infusions to alleviate symptoms and increase their sense of hope and control over their health problems. Traditional therapies vary from one place to another, and their toxicity, side effects, and effect on HIV infection have not been well-documented and are generally unknown for most traditional therapies.

PLHIV often take multiple traditional and modern therapies simultaneously. These can interact with one another or with foods, affecting efficacy, and potentially harming health or nutritional status. Service providers should help clients understand and manage interactions and side effects appropriately to maximise the effectiveness of therapies and ensure that interactions do not affect their diet, their body's ability to use nutrients, or their adherence to ART or other medications.

# Modern Therapies: Drug–Food Interactions and Side Effects and their Dietary Management

Advising patients on drug-food interactions and side effects and helping them to develop a nutrition plan are critical parts of HIV care and treatment. Nutrition care plans and strategies for managing interactions and side effects can:

- Maximise the effectiveness of medical treatment
- Prevent the development of specific nutrient deficiencies
- Optimise nutritional status, immunity, and overall well-being
- Prevent and manage medication side effects that can affect food intake or nutrient absorption
- Prevent loss of weight and lean body mass

These are some key recommendations for counselling clients on drug–food interactions and side effects.

- Ask clients about all therapies (modern and traditional) they are taking.
- Advise clients to follow all instructions for taking medication and to complete the entire course of treatment.
- If a client is taking several drugs, consider the interactions of each drug and possible drug-drug interactions. The nutrition implications of a drug combination may differ from the implications of the drugs individually.
- Involve the client fully in understanding interactions, identifying feasible responses, and adjusting or improving responses as needed.
- Advise clients on whether specific drugs should be taken with or without food.
- Help the client develop a meal plan and drug timetable that can minimize side effects
- Work with clients to monitor the effects of their medications on health and nutritional status. Document these on their medical record and note any actions taken. Note: Clients' responses to medications will vary; pay attention to client-specific reactions. Not all symptoms will be drug side effects; some could be due to infections. Prompt treatment is necessary.
- When possible, make sure that recommended dietary actions build on the client's practices and preferences.

#### **Impact of Food on Drug Efficacy**

Some foods can enhance or inhibit the absorption, metabolism, distribution, or excretion of certain drugs. Whether and how food will affect drug efficacy varies from one drug to another. Dietary responses to optimise drug efficacy should be based on the specific interactions of the drugs taken. These responses may include taking the drug with or without certain foods or on an empty stomach (see Table 3.3.3 at the end of this session). Service providers can help clients to devise a meal plan and drugs timetable, indicating when to take medications based on the effects of food on the drugs the clients are taking. This can minimize food–drug interactions.

#### **Impact of Drugs on Nutrition**

Certain drugs can disrupt nutrient absorption, metabolism, distribution, or excretion thereby worsening nutritional status. To compensate, patients may need to adjust their food/nutrient intake (increasing or decreasing) or take a supplement to compensate for the nutrient affected. Some common nutritional impacts of TB and HIV medications include:

**Vitamin B6:** The TB medication isoniazid inhibits the metabolism of vitamin B6. Clients taking isoniazid may need vitamin B6 supplementation.

**Fat abnormalities:** Studies have linked some ARVs to lipid (or fat) abnormalities, including elevated levels of triglycerides and cholesterol (dyslipidemia) and lipodystrophy (fat redistribution). Dyslipidemia is associated with an increased risk of developing plaque and thickening of the arteries (atherogenesis and atherosclerosis), raising concern that PLHIV living longer on HAART may have an increased risk of heart disease.

- Increases in lipid levels may require both dietary and medical responses. Clients should be counselled to increase exercise (daily), and to eat more fruits and vegetables, whole grains, legumes, nuts, and fish. Instead of animal-based fats like butter, use vegetable oils like canola, olive, or soybean oil. They should also reduce intake of refined carbohydrates and sugar, and limit intake of saturated fats to less than 7 percent of total calories and intake of trans-fatty acids to less than 1 percent of total calories. Clients should avoid alcohol and smoking. Clients with increased lipid/cholesterol should be managed by a physician and may need to take medication to lower lipid/cholesterol levels.
- Lipodystrophy is a disturbance in the way the body produces, uses, and distributes fat. PLHIV on ART may show changes in body shape from changes in fat distribution, with loss of subcutaneous fat in some areas (face, extremities, buttocks) and increased deposits in others (abdomen, back of shoulders, and neck). For example, Stavudine (d4T) has been associated with subcutaneous fat loss, and substitution of AZT or Abacavir (ABC) may increase subcutaneous fat. To date, a way of effectively managing it has not been established. Changes in the ARV regimen may help—e.g., substituting AZT or ABC for Stavudine, or replacing PI with a reverse transcriptase inhibitor, but there is no evidence that changes in diet affect lipodystrophy.

**Glucose metabolism:** Some ARVs may affect glucose metabolism, affecting blood glucose levels, and cause insulin resistance, which is associated with increased risk of diabetes.

- Mild cases of abnormal blood glucose can be managed by decreasing intake of refined carbohydrates, sugars, and saturated and trans-fats and increasing exercise.
- Moderate and severe cases need insulin-sensitizing agents, and insulin therapy, respectively.
- Substituting PIs with nonprotease inhibitors may also be beneficial.

**Bone disorders:** Some ARVs are also linked to increased risk of bone disorders such as osteoporosis, osteopenia, and osteomalacia, which may require medical and dietary responses. Increasing intake of high-calcium foods such as milk, yoghurt, cheese, and green vegetables; reducing intake of meat, fish, grains, legumes, nuts, sweet carbonated drinks, and caffeine; and reducing smoking is advised. Calcium and vitamin D supplements may be required along with a medical response. This is especially important for populations already at risk of calcium deficiency and for pregnant and lactating women, who have increased calcium needs.

**Side effects:** Side effects from HIV and TB treatments can result in reduced food intake and absorption or increased nutrient losses. Side effects also can contribute to weight loss, undernutrition, and wasting. However, appropriate dietary responses can help maintain food intake, compensate for nutrient losses, and in some cases, help reduce the severity of side effects.

- **Changes in taste:** If drugs cause taste changes, PLHIV can add salt, sugar, spices, vinegar, or lemon to enhance the flavour of food, stimulate the taste buds, increase taste acuity, and mask unpleasant flavours.
- Loss of appetite (anorexia): Prepare favourite foods and use a wide variety of foods.
  - Eat small amounts of energy-dense food more often.
  - Avoid strong smelling foods.
- Nausea, bloating, and heartburn: Eat small, frequent meals of soups, unsweetened porridge, and fruits such as bananas.
  - Eat lightly salted and dry foods to calm the stomach.
  - Drink herbal teas and lemon juice in hot water.
  - Avoid spicy foods, fatty foods, coffee, tea, and alcohol.
  - Drink liquids, including clean boiled (or treated) water.
- Vomiting and diarrhoea: Eat energy- and nutrient-dense foods such as groundnuts, avocados, and carrots, and drink plenty of liquids to help replace nutrient losses and prevent dehydration during fever, vomiting, or diarrhoea.
- Side effects that cause a lot of discomfort or that prevent clients from eating properly can contribute to nonadherence to a drug regimen (failure to take a drug properly or discontinuing a drug before completing the necessary course), which for ARVs could last many years. Interrupting or terminating drug regimens can significantly worsen the health status of PLHIV, speed the progression of HIV, and even lead to drug-resistant strains of HIV, which are difficult or impossible to treat. Managing side effects and other drug–food interactions can help ensure adherence to drug regimens.

Nonadherence, in turn, can increase the incidence of OIs. Drug side effects and OI symptoms are often difficult to distinguish from each other. Patients should be counselled that not all symptoms are necessarily due to side effects of drugs. For example, diarrhoea, vomiting, headaches, malaise, and fever may be side effects of drugs or symptoms of OI. Prompt treatment is necessary for any infections, allergies, and other conditions.

### Complementary, Alternative, and Traditional Medicine: Interactions and Side Effects

Complementary and alternative medicine (CAM) can be defined as any treatment used in conjunction with (complementary) or in place of (alternative) standard medical treatment. CAM consists of alternative supplements/natural health products—including traditional medicine—and alternative therapies.

Alternative supplements/natural health products include:

- Herbs, plants or parts of plants, or a combination of both (e.g., traditional and Chinese herbal medicines, Echinacea species, marijuana, goldenseal, aloe)
- Nutritional supplements such as vitamins (commonly A, B6, B12, C, and E), beta carotene, acidophilus, garlic, zinc, ginseng, selenium, and coenzyme Q10

Alternative therapies include:

- Acupuncture
- Massage
- Yoga
- Chiropractic treatment
- Mental imagery
- Meditation
- Qigong (an approach using breathing, movement, and meditation)
- Therapeutic touch

In Africa, the majority of HIV patients rely on traditional herbal medicine in addition to modern therapies to manage side effects and meet other primary health care needs. Some developing countries have large numbers of traditional health practitioners in the treatment of HIV/AIDS. In Uganda, a study at two centres of The AIDS Support Organization (TASO) estimated the prevalence of CAM among clients on HAART at 33.7 percent. Patients who had been on HAART for less than 4 years, had HAART side effects, were younger than 39 years, and had HAART adherence levels < 95 percent were more likely to use CAM<sup>14</sup>.

#### Interactions and Side Effects of Traditional Medicine and Other Forms of CAM

Clinicians often have positive attitudes about traditional medicine and other forms of CAM. A number of them believe that CAM is 'often' or 'usually' helpful for HIV-infected patients and recommend CAM modalities, including high-dose vitamins and herbal products. While many health care providers and patients believe that traditional herbal medicines are unlikely to be harmful, there is limited knowledge about their effectiveness and their interaction with modern therapies and other CAM. Moreover, clinicians are often unaware of their patients' use of CAM. It is important for health providers to ask about any CAM their clients are using.

<sup>14</sup> Namuddu et al. 2011. 'Prevalence and factors associated with traditional herbal medicine use among patients on highly active antiretroviral therapy in Uganda'. *BMC Public Health*. Vol. 11:855. As do modern therapies, CAM can have adverse effects and side effects. For example, many traditional herbal medicines are likely to contain a complex mixture of organic compounds that may induce and/ or inhibit drug metabolising enzymes and drug transporters. Interactions between traditional herbal medicines and ARV drugs may result in increased toxicity and decreased effectiveness of both. Some traditional herbal medicines may interact with foods to cause unhealthy side effects.

#### Lack of Standardisation for Traditional Medicines and Natural Health Products

Traditional herbal medicines and other natural health products are widely marketed in Uganda using claims of high therapeutic value. However, these products are loosely regulated in Uganda: there is no requirement to standardize the chemical components of these products, nor are they subjected to quality control tests in recognised laboratories. Thus, there may be great variability in recommended dosages, labelling, and the content of a product's active constituents, even among different brands of the same herb. Due to the varying contents of these products, and lack of standardisation of formulations and quality control measures, studies to understand their pharmacokinetic interactions are challenging to perform. In some cases, commercial products may not contain the labelled herb at all.

#### **Guidance for Counselling on CAM**

Although there is limited evidence to support CAM, it is commonly used. Health workers should ask about any CAM that clients are taking, advise them of any known risks, and work with them to ensure that the CAMs are used as safely as possible. CAM may be used in conjunction with modern medicine if:

- The CAM used do not interfere with drug treatments (see Table 3.3.3 at the end of this session).
  - High doses of garlic may reduce Saquinivir effectiveness.
  - St John's wort reduces effectiveness of Nevirapine, Idionavir, and Ritonvir.
- They complement or supplement standard therapy, but do not replace it.
- The CAM can prevent, alleviate, or cure symptoms (e.g., improve digestion, increase energy).
- They are not toxic.

#### Table 3.3.2 Traditional Medicines Commonly Used in Uganda

Traditional Medicine	Biological Name	Commonly Used For
Mpafu	Erythrina abyssinica	Fever, cough, weakness
Kadomola mixture (refers to many different mixtures, can include juice from food, tree bark, plant stems)	NA: Made of various ingredients	Fever, cough, oral thrush, stomach problems, pain, appetite, diarrhoea
Kigagi/ Enkoko rutanga	Aloe vera/Aloe barbadensis	Fever, herpes zoster, weakness, diarrhoea
Bazukuza Bafu	Hibiscus	Anaemia
Kamunye herb	Hoslundia opposita	Fever, stomach problems
Molinga herb	Oleifera	Fever, weakness, appetite

#### Session 3.3 Using Diet to Manage Drug Interactions and Side Effects from Common HIV/AIDS and Tuberculosis Therapies

Traditional Medicine	Biological Name	Commonly Used For	
Muzukizi herb	Dicliptera relaxata	Fever	
Mululuza herb, Olubirizi/ Ekibirizi herb	Vernonia amygdalina	Fever, general rash, pain (headache, backache), cough, stomach ache	
Boombo herb	Momordica foetida	Cough	
Naloongo herb	Justicia betonica	Fever	
Kanzironziro herb	P sorospermum febrifugum	Body weakness	
Ngetwa herb	Consists of 54 herbs (mainly from Tanzania)	Cough, fever, appetite, stomach pain, headache	
Kalitunsi	Eucalyptus ssp.	Cough	
Amapeera	Psidium guajava	Cough	
Omuyembe/ amababig'emiyembe	Mangifera indica	Cough	

Adapted and modified from Langlois-Klassen et al., 2007 and Namuddu et al., 2011.

### **Summary of Key Recommendations**

The following recommendations can guide service providers in addressing food and nutrition implications of HIV and AIDS therapy. These recommendations can be supplemented by national guidelines.

- Service providers should be particularly attentive to any side effects and nutrition implications of ARVs among undernourished clients and pregnant and lactating women with HIV.
  - Undernourished clients initiating treatment are at increased risk of death and should be monitored more closely. Food insecurity can be one factor that prevents PLHIV from following optimal food and nutrition recommendations. Service providers should help clients identify alternative responses that are feasible in the circumstances and when possible seek options to improve food security.
  - Pregnant and lactating women with HIV have increased nutrition needs. Therefore, it is important to ensure that drug and food interactions do not reduce their food intake or nutrient absorption. Timely management of drug–food interactions is needed to protect the health of the mother and infant. Managing drug–food interactions for pregnant and lactating women is similar to that for other PLHIV.
- If a client is taking several drugs, consider the interactions of each drug and possible drug–drug interactions. The nutrition implications of a drug combination may differ from the implications of the drugs individually.
- Because different drugs have different food interactions, recommendations should be drugspecific. Understand the specific interactions of each drug used and counsel accordingly.
- Recognise that all clients will not have the same response to medications. Clients taking the same drugs should not be treated the same. Stay attentive and responsive to clientspecific reactions.
- If the client is taking traditional therapies, pay attention to their side effects and nutrition implications. While some side effects of traditional medicines are known, there may be other

side effects or nutrition implications that are not known. Help clients who are using traditional therapies to identify side effects and interactions, as well as dietary responses that can help address them.

- Involve the client fully in understanding interactions, identifying feasible responses, and adjusting or improving responses as needed.
- When possible, make sure that recommended dietary actions build on the client's practices and preferences.
- Some side effects of medications are similar to symptoms of OIs. It is important to try to distinguish between side effects and OI symptoms that may require referral for treatment.

### Table 3.3.3 Medication Interaction Table

Medication	Purpose	Recommended dietary practice	Most common side effects	Severe side effects
Abacavir (ABC) (nucleoside/ nucleotide analogue reverse transcriptase inhibitor [NRTI])	Antiretroviral	Take with or without food. Avoid alcohol.	<ul> <li>Bad dreams/sleep problems</li> <li>Nausea</li> <li>Headache</li> <li>Tiredness</li> <li>Vomiting</li> </ul>	<ul> <li>Serious allergic (hypersensitivity) reaction</li> <li>Lactic acidosis</li> <li>Liver problems</li> <li>Changes in body fat (lypodystrophy)</li> <li>Increased risk of heart attack</li> </ul>
Didanosine (ddl) NRTI	Antiretroviral	Take with water only, 1 hour before or 2 hours after eating (food reduces absorption). Avoid alcohol, which can cause pancreatitis and liver problems if consumed while taking Didanosine.	<ul> <li>Diarrhoea</li> <li>Stomach pain</li> <li>Nausea</li> <li>Vomiting</li> <li>Headache</li> <li>Rash</li> <li>Peripheral neuropathy</li> <li>Insomnia</li> <li>Irritability/ restlessness</li> </ul>	<ul> <li>Pancreatitis</li> <li>Lactic acidosis</li> <li>Liver problems (Hepatic toxicity and noncirrhotic portal hypertension)</li> <li>Vision changes (retinal changes and optic neuritis)</li> <li>Immune system changes (immune reconstitution syndrome)</li> <li>Changes in body fat (lypodystrophy)</li> </ul>
Efavirenz (EFV)(non- nucleoside reverse transcriptase inhibitor [NNRTI])	Antiretroviral	Take with or without food but not with a high-fat meal (which increases absorption to potentially harmful levels). Avoid alcohol and St. John's wort. Do not give to clients with known psychiatric diseases.	<ul> <li>Rash</li> <li>Dizziness</li> <li>Nausea</li> <li>Headache</li> <li>Difficulty concentrating</li> <li>Abnormal dreams</li> <li>Tiredness</li> <li>Insomnia</li> <li>Vomiting</li> </ul>	<ul> <li>Serious mental health problems</li> <li>Nervous system symptoms</li> <li>Severe skin rash</li> <li>Liver problems (liver failure)</li> <li>Seizures</li> <li>Immune system changes (immune reconstitution syndrome)</li> <li>Changes in body fat (lypodystrophy)</li> </ul>
Indinavir (IDV) (protease inhibitor [PI])	Antiretroviral	Take 1 hour before or 2 hours after meal, or with a light nonfat meal (3 grams) or low-protein snack (6 grams) of 300 kcal. Do not take with a high- fat or high-protein meal. Drink at least 1,500 ml of liquid daily to prevent kidney stones. Do not drink grapefruit juice, which may lower the level of medicine in the blood. Avoid St. John's wort.	<ul> <li>Elevated bilirubin levels (jaundice)</li> <li>Nausea</li> <li>Headache</li> <li>Fatigue</li> <li>Abdominal pain</li> <li>Vomiting</li> <li>Rash</li> <li>Dry skin</li> <li>Taste changes</li> </ul>	<ul> <li>Kidney stones</li> <li>Kidney problems (kidney failure, inflammation of kidneys, kidney infection)</li> <li>Hemolytic anaemia</li> <li>Liver problems</li> <li>Severe muscle pain/weakness (if also taking cholesterol-lowering medication)</li> <li>Changes in body fat (lypodystrophy)</li> <li>Diabetes/high blood sugar</li> <li>Immune system changes (immune reconstitution syndrome)</li> </ul>

#### Session 3.3 Using Diet to Manage Drug Interactions and Side Effects from Common HIV/AIDS and Tuberculosis Therapies

Medication	Purpose	Recommended dietary practice	Most common side effects	Severe side effects
Lamivudine (3TC) NRTI	Antiretroviral	Take with or without food. Avoid alcohol.	<ul> <li>Headache</li> <li>Nausea</li> <li>Malaise</li> <li>Fatigue</li> <li>Nasal signs/ symptoms</li> <li>Diarrhoea</li> <li>Cough</li> </ul>	<ul> <li>Lactic acidosis</li> <li>Severe liver problems (severe hepatomegaly with steatosis)</li> <li>Pancreatitis</li> <li>Severe acute exacerbations of hepatitis B</li> <li>Pancreatitis</li> </ul>
Lopinavir PI	Antiretroviral	Take with food to aid absorption and reduce stomach upset. Avoid St. John's wort.	<ul> <li>Weakness</li> <li>Diarhhoea</li> <li>Gas</li> <li>Heartburn</li> <li>Weight loss</li> <li>Headache</li> <li>Sleep disruptions</li> <li>Muscle pain</li> <li>Numbness, tingling, or burning in hands or feet</li> </ul>	<ul> <li>Liver problems</li> <li>Pancreatitis</li> <li>Heart rhythm problems</li> <li>Severe allergic reactions</li> <li>Life threatening drug interactions</li> </ul>
Nelfinavir (NFV) Pl	Antiretroviral	Take with a meal or light snack that includes protein. Take with high-fat food for better absorption. Avoid St. John's wort.	<ul> <li>Diarrhea</li> <li>Nausea</li> <li>Gas/flatulence</li> <li>Rash</li> </ul>	<ul> <li>Diabetes/high blood sugar (hyperglycemia)</li> <li>Increased bleeding in hemophiliacs</li> <li>Changes in body fat (lypodystrophy)</li> <li>Immune system changes (immune reconstitution syndrome)</li> </ul>
Nevirapine (NVP) NNRTI	Antiretroviral	Take with or without food. Avoid St. John's wort.	• Rash	<ul> <li>Severe liver problems</li> <li>Severe rash and skin reactions</li> <li>Changes in body fat (lypodystrophy)</li> <li>Immune system changes (immune reconstitution syndrome)</li> </ul>
Ritonavir (RTV) PI	Antiretroviral	Take with a meal if possible. Avoid St. John's wort.	<ul> <li>Diarrhoea</li> <li>Nausea</li> <li>Vomiting</li> <li>Abdominal pain</li> <li>Tingling/numbness in hands/feet or around lips (peripheral neuropathy)</li> <li>Rash</li> <li>Weakness/fatigue</li> </ul>	<ul> <li>Liver disease</li> <li>Pancreatitis</li> <li>Severe allergic reactions</li> <li>Changes in the electrical activity of the heart (PR prolongation)</li> <li>Changes in cholesterol/triglyceride levels (dyslipidemia)</li> <li>Diabetes/high blood sugar (hyperglycemia)</li> <li>Changes in body fat (lypodystrophy)</li> <li>Immune system changes (immune reconstitution syndrome)</li> </ul>

#### Session 3.3 Using Diet to Manage Drug Interactions and Side Effects from Common HIV/AIDS and Tuberculosis Therapies

Medication	Purpose	Recommended dietary practice	Most common side effects	Severe side effects
Saquinavir (SQV) PI	Antiretroviral	Take with a meal or light snack within 2 hours of full meal. Avoid garlic supplements, St. John's wort, grapefruit juice, and alcohol.	<ul> <li>Nausea</li> <li>Vomiting</li> <li>Diarrhoea</li> <li>Abdominal pain</li> <li>Tiredness</li> <li>Pneumonia</li> <li>Changes in body fat (lypodystrophy)</li> </ul>	<ul> <li>Changes in the electrical activity of the heart</li> <li>Serious/life-threatening interactions with certain medicines</li> <li>Diabetes/high blood sugar (hyperglycemia)</li> <li>Liver problems (in those with pre-existing liver conditions or alcoholics)</li> <li>Increased bleeding in hemophiliacs</li> <li>Changes in cholesterol/ triglyceride levels (dyslipidemia)</li> <li>Immune system changes (immune reconstitution syndrome)</li> </ul>
Stavudine (d4T) NRTI	Antiretroviral	Take without regard to food but taking with food can decrease side effects. Limit alcohol.	<ul> <li>Headache</li> <li>Diarrhoea</li> <li>Rash</li> <li>Nausea</li> <li>Vomiting</li> </ul>	<ul> <li>Lactic acidosis</li> <li>Liver problems (hepatomegaly, steatosis, liver failure)</li> <li>Pancreatitis</li> <li>Neurologic symptoms (weakness of legs, feet, arms, or hands; numbness/tingling in hands or feet)</li> <li>Changes in body fat (lypodystrophy)</li> <li>Immune system changes (immune reconstitution syndrome)</li> <li>Nausea, vomiting, diarrhoea, peripheral neuropathy,</li> <li>Chills and fever, anorexia, stomatitis, anaemia, headaches, dizziness, insomnia, rash, bone marrow suppression, pancreatitis; may increase the risk of lipodystrophy, lactic acidosis</li> </ul>
Tenofovir Disoproxil Fumarate (TDF, Tenofovir DF, Viread) NRTI	Antiretroviral	Take with or without food. A high-fat meal can increase the bioavailability of tenofovir.	<ul> <li>Nausea</li> <li>Rash</li> <li>Diarrhoea</li> <li>Headache</li> <li>Pain</li> <li>Depression</li> <li>Muscle weakness</li> </ul>	<ul> <li>Lactic acidosis</li> <li>Severe liver problems (hepatomegaly, steatosis)</li> <li>Kidney problems (kidney failure)</li> <li>Bone problems (bone pain, softening or thinning)</li> <li>Changes in body fat (lypodystrophy)</li> <li>Immune system changes (immune reconstitution syndrome)</li> </ul>
#### Session 3.3 Using Diet to Manage Drug Interactions and Side Effects from Common HIV/AIDS and Tuberculosis Therapies

Medication	Purpose	Recommended dietary practice	Most common side effects	Severe side effects
Zidovudine (AZT) NRTI	Antiretroviral	Take without food or with a low-fat meal if nausea or stomach problems. Do not take with a high-fat meal (decreases absorption). Avoid alcohol. May require zinc and copper supplementation.	<ul> <li>Headache</li> <li>Malaise</li> <li>Nausea</li> <li>Anorexia</li> <li>Vomiting</li> </ul>	<ul> <li>Neutropenia and/or anaemia</li> <li>Lactic acidosis</li> <li>Liver problems</li> <li>Muscle weakness</li> <li>Changes in body fat (lypodystrophy)</li> <li>Immune system changes (immune reconstitution syndrome)</li> </ul>
Isoniazid	TB treatment	Administration with food has been shown to decrease drug bioavailability. Take 1 hour before or 2 hours after meals. May react with foods such as bananas, beer, avocados, liver, smoked pickled fish, yeast, yoghurt. May interfere with vitamin B6 metabolism and require B6 supplements. Avoid alcohol, which can damage the liver if consumed while taking isopiazid	<ul> <li>Peripheral neuropathy (particularly in undernourished individuals)</li> </ul>	<ul> <li>Hepatitis (increased risk with alcohol consumption and increased age, those with chronic liver disease)</li> </ul>
Rifampin	TB treatment	Administration with food has been shown to decrease drug bioavailability. Take on an empty stomach 1 hour before or 2 hours after meals with a full glass of water. Avoid alcohol, which can damage the liver if consumed while taking rifampin. Avoid concomitant use with Pls or Nevirapine.	<ul> <li>Pink/purple/red urine, tears, sweat and sputum</li> <li>Diarrhoea</li> <li>Abdominal cramping</li> </ul>	

#### Session 3.3 Using Diet to Manage Drug Interactions and Side Effects from Common HIV/AIDS and Tuberculosis Therapies

Medication	Purpose	Recommended dietary practice	Most common side effects	Severe side effects
Ethambutol	TB treatment	Take without regard to food. If upset stomach results, take with food. Antacids interfere with ethambutol. Take 1 hour before or 2 hours after antacids.	<ul> <li>Appetite loss</li> <li>Dizziness</li> <li>Headache</li> <li>Nausea</li> <li>Stomach upset/pain</li> <li>Vomiting</li> <li>Numbness/tingling in hands or feet</li> </ul>	<ul> <li>Decreases in visual acuity (optic neuropathy)</li> <li>Increases in uric acid in the blood</li> <li>Gout</li> </ul>
Pyrazinamide	TB treatment	Take without regard to food. Avoid alcohol, which can damage the liver if consumed while taking TB medications.	<ul> <li>Upset stomach</li> <li>Fatigue</li> <li>Mild arthralgia (joint pain)</li> <li>Myalgia</li> </ul>	<ul> <li>Liver problems (yellowing of skin or eyes)</li> <li>Skin rash</li> <li>Fever</li> <li>Vomiting</li> <li>Bleeding or bruising</li> </ul>
Aspirin (acetylsalicylic acid)	To treat fever and relieve pain	Take with a full glass of water.	<ul><li>Nausea</li><li>Vomiting</li><li>Stomach pain</li><li>Heartburn</li></ul>	<ul> <li>Hives</li> <li>Rash</li> <li>Swelling of eyes, face, lips, tongue</li> <li>Difficulty breathing</li> </ul>
Fluconazole	Treatment of thrush (candida)	Take with food. Can be taken during breastfeeding.	<ul> <li>Nausea</li> <li>Vomiting</li> <li>Diarrhoea</li> <li>Stomach upset/pain</li> <li>Headache</li> <li>Dizziness</li> <li>Hair loss</li> </ul>	<ul> <li>Serious liver disease (rare)</li> <li>Serious allergic reaction (rare)</li> </ul>
Nystatin	Treatment of thrush (candida)	Take with food.	<ul> <li>Infrequent occurrence of diarrhoea</li> <li>Vomiting</li> <li>Nausea</li> <li>Mouth irritation</li> <li>Stomach upset</li> </ul>	
Sulfonamides: Sulfamethoxaz- ole, Cotrimox- azole (Bactrim and Septra) (antibiotic)	Antibiotic: treatment of bacterial in- fections (e.g. pneumonia, toxoplasmo- sis)	Take with food.	<ul> <li>Gas</li> <li>Nausea</li> <li>Vomiting</li> <li>Loss of appetite</li> </ul>	<ul><li>Serious rash</li><li>Sore throat</li></ul>
Coartem	Treatment of malaria	Take with food. Not recommended for infants < 5 kg.	<ul> <li>Headache</li> <li>Stomach pain</li> <li>Loss of appetite</li> <li>Nausea, vomiting</li> <li>Chills, cough</li> <li>Muscle aches, unusual tiredness/ weakness</li> </ul>	<ul> <li>Abnormal heartbeat</li> <li>Fainting</li> <li>Difficulty breathing</li> <li>Swelling of lips, face, throat</li> </ul>

#### Session 3.3 Using Diet to Manage Drug Interactions and Side Effects from Common HIV/AIDS and Tuberculosis Therapies

Medication	Purpose	Recommended dietary practice	Most common side effects	Severe side effects
Quinine	Treatment of malaria	Take with food.	<ul> <li>Abdominal or stomach pain, diarrhoea, nausea, vomiting</li> </ul>	
Sulfadoxine and pyrimethamine (Fansidar)	Treatment of malaria	Take with food and continuously drink clean boiled water. Not recommended if folate-deficient or breastfeeding.	• Diarrhoea	

Sources include: Uganda MOH. Nutritional Care and Support for People Living with HIV/AIDS in Uganda: Guidelines for Service Providers; Pronsky, Z.M.; Meyer, S.A.; and Fields-Gardner, C. 2001. HIV Medications, Food Interactions (and So Much More). 2nd edition. Birchrunville, PA: Food-Medication Interaction; Nerad et al. 2003. 'General Nutrition Management in Patients Infected with Human Immunodeficiency Virus'. *Clinical Infectious Diseases*. Vol. 36, supplement 2; U.S. Department of Health and Human Services. 'AIDSinfo Drug Database'. Available at: http://aidsinfo.nih.gov/drugs; U.S. National Library of Medicine, MedlinePlus. 'Drugs, Herbs and Supplements'. Available at: <u>http://www.nlm.nih.gov/medlineplus/druginformation.html</u>; Mayo Clinic. 'Drugs and Supplements'. Available at: <u>http://www.mayoclinic.org/drugs-supplements</u>.





### **Purpose**

To practice identifying and supporting malnourished people living with HIV and/or TB in service points.

### **Session Objectives**

During the practicum, participants will be able to work with clients who are living with HIV and/or have TB to:

Assess clients' nutritional status.

**SESSION** 

Provide counselling and support based on nutritional assessment and the client's treatment plan/medication regimen.

Group Work: Sharing Field Experience

## •

### **Estimated Time/Duration**

### 225 minutes

### TIPS

#### **Service Provider**

- Introduce yourself and colleagues to the client.
- Ask permission to conduct the assessment and explain what you will be doing before you do it.
- Be encouraging and try to establish rapport with the client.
- Listen actively while the client talks and do not pass judgement on the information provided.
- Adapt the counselling to the client's needs.
- Provide referral as needed.

#### Observers

- Remain as still and quiet as possible.
- Observe your colleague's approach to assessment.
- If your colleague needs support, provide it. Otherwise provide feedback after the session is over.

#### Service Provision

- Meet with individual clients and conduct nutrition assessment (anthropometric, clinical, dietary).
  - Anthropometry: record weight, height (BMI), MUAC.
  - **Clinical:** review history of weight loss, visible wasting or oedema, signs of anaemia, other health conditions and ongoing medications and treatments; symptoms that affect food intake (diarrhoea, nausea, vomiting, anorexia, mouth/throat sores, oral thrush); side effects of medications.
  - **Dietary:** request information about the types and amounts of food being consumed, appetite, and eating behaviours; identify factors that affect food intake such as food availability, access, and utilization; discuss food taboos. Health workers should ask PLHIV if they are taking any herbs or traditional medicines or dietary supplements.
  - Living environment/lifestyle: assess the cleanliness and sanitation of the client's environment; access to and use of safe water; personal and food hygiene behaviours; and smoking, alcohol, and drug use.
- Counsel client based on the results of the assessment, using the nutrition care and support counselling cards.



## SYSTEM STRENGTHENING

This unit enhances participants' knowledge of strengthening health systems. The unit comprises the following sessions:

		55 1111
Session 4.4	NACS Monitoring and Reporting	95 min.
Session 4.3	NACS Supplies and Logistics Management	85 min.
Session 4.2	Health Facility–Community Linkages for Nutri Care and Support	tion 55 min.
Session 4.1	Using Quality Improvement to Integrate NACS Routine Health Services	5 into 120 min.

### TOTAL DURATION

5 hours, 55 minutes

# **41** SESSION

## USING QUALITY IMPROVEMENT TO INTEGRATE NACS INTO ROUTINE HEALTH SERVICES



### Purpose

To equip participants with knowledge and skills to use quality improvement to integrate NACS into routine health services.



### **Session Objectives**

By the end of the session, participants will be able to:	Duration
Explain the concept of quality improvement	75 min.
Describe how the steps of quality improvement can be used to integrate NACS into routine health services	15 min.
Develop a plan for integrating the seven steps of NACS implementation within their care systems	25 min.

**Estimated Time/Duration** (includes 5-minute wrap-up)

120 minutes

### **Quality Improvement: Key Terms and Principles**

Success in management of malnutrition depends on supplies and equipment, but most of all, on dedicated and appropriately trained health workers. Each client requires proper treatment, care, and attention at each phase of care. When this is done, the risk of death can be substantially reduced and the opportunity for full recovery greatly improved.

Successful therapeutic management of severe malnutrition requires that both medical and social problems be recognized and corrected. Otherwise, the client is likely to relapse when he or she returns home, and other family members remain at risk of developing the same problem.

### What is Quality?

Quality is the extent to which health care services, systems, and programmes conform to national or international standards, requirements, or specifications. According to the Institute of Medicine, quality health care is safe, effective, patient-centred, timely, efficient, and equitable.

The quality improvement (QI) approach has been used to integrate and improve nutrition interventions in routine HIV care services.

### **Dimensions of Quality**

These nine dimensions of quality are good to keep in mind when assessing the quality of nutrition care provided through nutrition assessment, counselling, and support (NACS) at health facilities.

- **Technical performance:** the degree to which the tasks carried out by health workers and facilities meet the expectations of technical quality (comply with standards)
- Effectiveness of care: the degree to which desired results (outcomes) of care are achieved
- Efficiency of service delivery: the ratio of the outputs of services to the associated costs of producing those services
- **Safety:** the degree to which the risks of injury, infections, or other harmful side effects are minimized
- Access to services: the degree to which health care services are unrestricted by geographic, economic, social, organizational, or linguistic barriers
- Interpersonal relations: trust, respect, confidentiality, courtesy, responsiveness, empathy, effective listening, and communication between providers and clients
- **Continuity of services:** delivery of care by the same provider throughout the course of care (when appropriate) and timely referral and communication among providers
- **Physical infrastructure and comfort:** the physical appearance of the facility, cleanliness, comfort, privacy, and other aspects that are important to clients
- Choice: when appropriate, client choice of provider, insurance plan, or treatment

Another important concept is the idea of 'doing the right things right'. Doing 'right things' means to use effective **interventions** that meet client needs. Doing 'things right' entails managing work **processes** so that the work is organized in a way that works correctly, **efficiently**, and on time. So, it is not enough to perform the right intervention, you must do the intervention correctly to truly achieve quality.

	+ How You Do It	_
	Right Things Right	Right Things Wrong
	<ul><li>EXAMPLES:</li><li>Conducted lab test as requested on schedule and conducted it correctly</li></ul>	<ul><li>EXAMPLES:</li><li>Completed lab test as requested on schedule but conducted it incorrectly</li></ul>
+ What You	• Filled out correct form and provided accurate information	<ul> <li>Filled out correct form but provided inaccurate information</li> </ul>
Do	Wrong Things Right	Wrong Things Wrong
	EXAMPLES:	EXAMPLES:
	<ul> <li>Conducted wrong lab test but conducted it correctly</li> </ul>	<ul> <li>Conducted wrong lab test and conducted it incorrectly</li> </ul>
	<ul> <li>Filled out incorrect form but provided accurate information</li> </ul>	<ul> <li>Filled out incorrect form and provided inaccurate information</li> </ul>

Source: URC Quality Assurance Project. 2002. Quality Improvement in Health Care - Core Course.

### What is Quality Improvement in Health Care?

Quality improvement is a management approach to improving and maintaining quality that emphasizes internally driven and continual assessment of progress. Quality improvement includes:

- Applying appropriate methods to close the gap between current and expected levels of quality/ performance as defined by standards
- Systematically improving service quality by identifying and addressing any gaps between services actually provided and desired standards
- Using quality management tools and principles to understand and address system deficiencies, enhance strengths, and improve health care processes

Quality improvement also requires:

- Continuous improvement and innovation (not changing just for change's sake)
- Leadership commitment: to build a QI culture, the organization's strategic plan should be connected to performance improvement

### Four Key Principles of Quality Improvement

- 1. Client focus. Services should be designed to meet the needs and the expectations of the clients or community. This requires gathering information about and from clients. When health facilities meet or exceed client expectations, clients return, are more likely to comply with advice, and will refer others to the services.
- **2.** Focus on systems and processes. A system is a set of interacting and interdependent parts and processes. A process is a series of steps used to perform a task or accomplish a goal. Health providers must understand the service system and key service processes to analyse gaps and address causes of poor performance.

- **3. Testing changes and emphasizing the use of data.** Changes are tested, and data are used to analyse processes, identify problems, and determine whether the changes resulted in the required improvement.
- **4. Teamwork.** A team is a group of people working together to achieve a common goal for which they share responsibility. Improvement can be achieved through the team approach to problem solving and quality improvement.

### **Health Sector Quality Improvement Framework**

In March 2012, the Ministry of Health launched the *Health Sector Quality Improvement Framework and Strategic Plan 2010/11–2014/15* to provide a common framework for all public and private health institutions, partners, and stakeholders to coordinate, plan, mobilise resources for, implement, monitor, and evaluate QI initiatives.

Quality improvement efforts should be coordinated through committees at national, regional, district, hospital, health sub-district, and health facility levels.

### Excerpt from executive summary on page v of MOH. 2011. Health Sector Quality Improvement Framework and Strategic Plan 2010/11–2014/15

The National Quality Improvement Framework (QIF) and Strategic Plan has been developed in recognition that the health sector needs to institutionalize, harmonize and coordinate Quality Management interventions in Uganda. The National QIF and Strategic Plan provides a common framework for all public and private health institutions, partners and stakeholders to coordinate, plan, mobilize resources, implement, monitor and evaluate quality improvement initiatives in order to 'ensure provision of high quality health services and contribute to the attainment of good quality of life and well-being at all levels of health care'. The framework has two sets of objectives. The first set of objectives and the related interventions are designed to improve the capacity of the health system to provide high quality services. The second set of objectives contributes to improvement of health outcomes in the priority areas set out in the HSSIP 2010/11 – 2014/15.

Districts and partners involved in QI shall develop their own plans and implement evidence based QI interventions which apply the principle of an iterative cycle of improvement – Plan, Do, Study, Act (PDSA cycle) in addition to the 5S-CQI-TQM methodology as a fundamental background to continuous quality improvement. A QI coordination structure has been created to enhance the QI policy, strategy development, communication and capacity building activities in a coordinated manner. QI committees / team meetings, supervision / monitoring visits and periodic performance reviews will be carried out for monitoring QI initiatives at the various levels.





Source: MOH 2011

This framework requires evidence-based norms, standards, protocols, and guidelines to be in place and used to identify gaps and measure performance improvement. The framework emphasizes the concept of 'doing right things right' that was discussed earlier.

- The outcome is a combination of content of care ('what is done') and process of care ('how it is done').
- Improvement can be achieved by addressing either of these components.
- The most powerful impact, however, occurs by addressing both content and process of care at the same time.
- This approach supports the ability to provide quality care with increased access and decreased waste and often at a lower cost.
- Content of care emphasizes effectiveness, whereas focusing on processes of care emphasizes issues related to efficiency, or 'doing right things right'.

### **Steps in Quality Improvement**

### Four Steps of Quality Improvement

Quality improvement steps try to answer fundamental questions that form the basis for improvement.

- What are we trying to accomplish?
- What changes can we make that will result in improvement?
- How will we know that a change is an improvement?

There are four steps in this approach.

#### **1. Identify the Problem**

Quality improvement starts by asking questions to identify the gap between the actual and desired performance.

- What is the problem? (For example, not all clients in the HIV clinic have their nutritional status assessed.)
- How do you know it is a problem? (For example, mid-upper arm circumference [MUAC] is not recorded for many clients in the register.)

- How frequently does the problem occur or how long has it existed? (For example, the problem has been ongoing since MUAC introduced.)
- What are the effects of this problem? (For example, malnourished clients are not identified on time.)
- How will you know when it is resolved? (For example, MUAC is recorded for all clients seen.)

Ways to identify the problem:

- Survey data
- Review of records
- Observation
- Client feedback

#### 2. Analyse the Problem

The purpose of analysing the problem is to measure performance of the process or system that produces the effect. Analysis involves asking the following questions.

- Who is involved or affected?
- Why, when, and where does the problem occur?
- What happens when the problem occurs?

Analysis tools and techniques include flow charts, cause-and-effect (fishbone) diagrams, and review of existing data.

#### 3. Develop Possible Solutions (Changes)

Changes are possible solutions that are based on data, knowledge, and beliefs about the problem's likely causes and solutions. Quality improvement teams should hypothesize what changes will improve the problem (e.g., assessment of clients will improve if expert clients are trained to measure MUAC at triage and record in the register, leaving more time for staff to run the HIV clinic).

#### 4. Test/Implement the Possible Solution

Not every proposed solution/change will lead to improvement. Teams should test changes that are feasible, realistic, and likely to lead to improvement. Proposed solutions should be tested on a small scale over a specific period to determine whether they are effective. Based on the results, the team can decide whether to abandon, modify, or implement the solution.

### Models for Quality Improvement in Uganda

In Uganda, the two main QI models are the 5-S model and the PDSA cycle.

#### Table 4.1.1 Quality Improvement Models Used in Uganda

The 5-S Model Preliminary step to improve the health care environment	The Iterative PDSA Cycle Improves health care systems and processes
1. Sort	1. Plan
2. Set	2. Do
3. Shine	3. Study
4. Standardize	4. Act
5. Sustain	

### 5-S Model

The objectives of the 5-S model are:

- Improved productivity
- Improved work environment and infrastructure maintenance
- Improved health and safety

Sort. Eliminate unnecessary stuff; reduce clutter.

• Go through all tools and materials. Keep essential items in easily accessible places and eliminate what is not required.

Set in order. Organize all items to promote efficient workflow.

- Have a clearly labelled place for everything, and keep everything in its place.
- Store equipment that is used most often in a place that is nearby and keep items close to where they will be used.

Shine (cleanliness). Keep workspace clean and organized.

Standardize. The three S's described above are norms in every section of the workplace.

- Work practices should be consistent and standardized.
- All work stations for a particular job should be identical.
- Everyone should know exactly what their responsibilities are for adhering to the first three S's.

**Sustain the discipline**. Maintain focus on this new way and do not allow a gradual decline back to the old ways.

• Contemplate better ways, make changes as appropriate.

### The PDSA Cycle

This iterative model allows QI teams to systematically work through challenges and test changes (proposed solutions) on a small scale before they are implemented on a larger scale. PDSA cycles:

- Let teams try ideas for improvement before deciding to implement them
- Allow teams to know quickly whether the change will work
- Facilitate collection of data to convince colleagues that the changes work

#### Plan

- Develop a plan of change to address the following questions.
  - What changes will occur and why?
  - Who is responsible for making the change?
  - When and how the changes will occur?
- Collect baseline data to measure the effects of change. Plan to monitor the effects of change through a data collection system.
- Educate and communicate with others about the change. Inform and include people involved in the change and make sure they accept it.

#### Do

- Test the change (intervention).
- Verify that the change is being implemented as planned.
- Collect data about the process being changed.
  - Check that the data are complete.
  - Document any changes not included in the original plan.

#### Study

- Verify that the change was implemented according to the plan.
- See if the data are complete and accurate.
- Compare the data with the baseline information to look for improvement.
- Compare predicted or desired results with the results from the test.

#### Act

- Summarise and communicate what was learnt from the previous steps.
- If the plan does not yield the desired results, modify or abandon the plan and repeat the PDSA cycle if necessary.
- Implement the change as standard procedure if it proved to be successful.
- Monitor the change over time to check for improvements and problems.

### **Quality Improvement Tools**

### **Cause-and-Effect Diagram**

A cause-and-effect diagram provides a systematic way of looking at problems and identifying all possible root causes. The diagram looks like a fish with the problem at the 'head' and the problem's causes as 'bones'. A cause-and-effect diagram helps teams:

- Agree on a problem to address
- Brainstorm major factors that could affect the problem (e.g., equipment/supplies, people, environment, processes, funding)
- Brainstorm possible causes under each major factor



#### Figure 4.1.2 Example Cause-and-Effect Diagram

### **Brainstorming (Scenario Discussion)**

- A way for a group to generate as many ideas as possible in a very short time by tapping into group knowledge, experience, and individual creativity
- Produces ideas by encouraging participation of all group members through structured and unstructured thought processes on a given subject
- Requires participants to be willing to express their ideas without evaluating them, remain open to new ideas, and refrain from criticizing suggestions
- Works best in an uninhibited environment where ideas are freely generated and built upon

### The Five Whys

This process involves asking five times in succession why a problem exists in order to get to the problem's root cause. See the example below.

- Why was this person's MUAC not taken? Because the nurse did not know how.
- Why did the nurse not know how?
   Because she was trained a long time ago and did not remember.
- Why didn't she remember? Because she never used the skill after training and has not received mentorship, refresher training, or supervision.
- Why did she not receive mentorship, refresher training, or supervision? Because these actions were not prioritised by her health facility.
- Why were these actions not prioritised? Because nutrition is not appreciated as a serious problem by the director, who is more focused on clinical treatment of infectious disease and doesn't value nutrition's role.

### Flow Chart/Process Map

This kind of chart or map explains the process of doing something from beginning to end. Completing a process map helps teams understand where bottlenecks exist and can draw attention to key steps in the process.



#### Figure 4.1.3 Example of a Process Map for an HIV Clinic (Client Flow)

### **Run Chart/Time Series Chart**

Time series or run charts are used to determine if the changes made are improving quality of care. They track and document the performance of a process over time, including when specific changes were introduced, their impact on a process, and whether improvement is sustained over time. Creating this chart does not require a computer; it can be done with pencil and paper. This tool:

- Tracks the performance of a process over time and documents the improvement
- Plots observations over time and helps detect shifts, trends, or other nonrandom variations in the process
  - Allows user to react quickly to changes and identify underperformance
  - Helps determine if improvement is sustained
- Presents a visual way to see and understand trends and patterns

There are four steps for creating a run chart/time series chart.

- 1. Collect data over time, recording when each measurement was taken in chronological order.
- 2. Determine the scales for vertical (outcome) and horizontal axes (time).
- 3. Draw and label the axes with scales and unit of measure (e.g., percentage or month).
- 4. Plot the points and connect them with a straight line between each point.



#### Figure 4.1.4 Example of a Run Chart/Time Series Chart

#### **Documentation Journal**

The documentation journal is a detailed record for reviewing and reflecting on the QI work. The journal can help teams share lessons learnt and contribute to change. Teams use it to continuously document their changes and results; the goals they are trying to accomplish and why these goals were selected; the changes they have implemented at the site, including notation of the changes' effectiveness and the dates when they were started or ended; and graphs of their data or results. Teams can also use the documentation journal to annotate their run charts to see what impact they are having.

### **Using Quality Improvement to Integrate NACS into Routine Health Services**

Implementing NACS involves seven steps.

- 1. Nutrition education. All clients in the health system should receive education on good nutrition and hygiene.
- **2. Nutrition assessment.** All clients should receive nutrition assessment as part of routine health care.
- **3. Classification of nutritional status.** The nutritional status of all clients should be recorded on the appropriate care cards or nutrition registers.
- **4. Nutrition counselling.** All clients should receive nutrition counselling based on their nutritional status.
- **5. Specialized food products.** Health care staff should prescribe and dispense specialized food products to malnourished clients.
- 6. Follow-up of clients. All malnourished clients should receive follow-up.
- 7. Community links. Links between the community and the facility should be established.

The thorough analyses of health systems and processes conducted as part of QI can identify potential areas where the NACS implementation steps can be integrated into routine services. The QI steps can be used to help determine how and when to integrate each NACS implementation step. Moreover, QI is essential for strengthening the efficiency and effectiveness of NACS services once they are integrated.

In determining where to integrate NACS, health care teams should 'think big, start small'. Select one area in the system for implementing NACS before scaling it up to other sections. For example, start by integrating an aspect of NACS in the antenatal or HIV clinic and document the results. If the changes are working, spread them to other sections of the health facility, such as the ART clinic.

Developing an action plan will help determine the approach to be used and communicate the next steps to all stakeholders.

### **Action Plan for NACS**

Setting goals enables health care providers or managers to focus efforts on specific outcomes and verify that each step is implemented. Indicators enable measurement of change. NACS QI indicators are normally the same information as recorded in the client record and thus can be easily retrieved.

### **Action Plan Template**

Action Plan for Integrating NACS into Routine Health Services

Facility \_\_\_\_\_

Date prepared \_\_\_\_\_\_

No.	Improvements or Next Steps	Activities to Achieve the Improvement	Responsible Person(s)	Dates

### **Sample Documentation Journal for QI Activities**

Name of the facility:	_District:	_Region:
Team leader:	Team members: _	
Start date for improvement project:		_End date:

#### Part 1: Description of situation

Improvement objective	Indicator for the objective

#### **Description of problem**

Briefly describe the problem being addressed and gaps between the current situation and your improvement objectives. State the differences between the MOH standard of care and the current practices. Also describe some of the challenges with the current situation.

#### Part 2: Changes Worksheet — QI Team Activities

Please list below the changes that the team has tried in order to achieve the improvement objective. Write all changes, whether effective or not. Also note when each change was started and when it ended (where applicable) to enable you to annotate the results.

<b>Planned and tested changes</b> In the space below, list all of the changes that you are implementing to address the improvement objective. Write one to two sentences to briefly describe the tested change.	Start date DD/MM/YY	<b>End date</b> (if applicable) DD/MM/YY	Was any improvement registered? (Yes/No)	<b>Comments</b> Note any potential reasons why the change did or did not yield improvement; also note any change in indicator value observed related to this change.
1.				
2.				
3.				
4.				
5.				
6.				
7.				

#### Part 3: Graph Template – Annotated Results

Use the graph below to document your progress. Indicate the value of the numerator and denominator.

#### TITLE

Indicator Value													
Time	0	1	2	3	4	5	6	7	8	9	10	11	12
Numerator													
Denominator													
%													

**Notes on the indicators.** Write down any additional comments you may have on the performance of indicators. Write anything derived from the changes worksheet and the graph template that might explain the performance trends of the improvement objective.

**Notes on other observed effects (lessons learnt).** Please write here any effects (positive or negative) you are currently observing as a result of the quality improvement effort, such as comments from patients, changes in your performance or motivation, improved efficiency, or the survival story of a sick patient. You may use your notes to tell the complete story at the next learning session(s).

### **Key Points**

- Quality is the extent to which health care services, systems, and programmes conform to national or international standards, requirements, or specifications. According to the Institute of Medicine, quality health care is safe, effective, patient-centred, timely, efficient, and equitable.
- Quality improvement (QI) is a management approach to improving and maintaining quality that emphasizes internally driven and continual assessment of progress.
- Quality improvement has four key principles: client focus, focus on systems and processes, testing changes and emphasizing the use of data, and teamwork.
- The four steps in QI are to identify the problem, analyse the problem, develop possible solutions (changes), and test/implement the possible solution.
- The two models used to implement QI in Uganda are:
  - 5-S: sort, set, shine, standardize, sustain (used to improve the health care environment)
  - PDSA: plan, do, study, act (used to improve systems and processes)
- Tools to implement QI include:
  - Cause-and-effect diagrams
  - Five whys
  - Brainstorming
  - Flow chart/process map
  - Time-series charts
  - Documentation journal
- Using QI to implement the seven steps of NACS can help (1) identify how to integrate or improve nutrition services into health care and (2) develop an action plan for improvement.



## HEALTH FACILITY—COMMUNITY LINKAGES FOR NUTRITION CARE AND SUPPORT



### Purpose

Enhance participants' knowledge of facility-community linkages.

### **Session Objectives**

By the end of the session, participants will be able to:	Duration			
Identify available community structures for nutrition care and support	10 min.			
Explain the role of community volunteers in nutrition care and support	10 min.			
Explain the importance of linking health facilities to communities for nutrition care and support				
Explain the process of linking health facilities to the communities	15 min.			



Estimated Time/Duration (includes 5-minute wrap-up)

### 55 minutes

## Community Structures and the Role of Community Volunteers in Nutrition Care and Support

### **Community Structures for Nutrition Care and Support**

- Parish development committee
- Local council 2
- Local council
- Village health team
- Village farmers development cell
- Health centre 2
- Farmers groups
- Community-based organizations

### **Community Volunteers and Their Roles in Nutrition Care and Support**

Community volunteers include:

- Community village health teams
- Community-level support people
- Expert clients
- Members of mother support groups

Community volunteers' roles include:

- Helping to prevent malnutrition and promote good nutrition. Volunteers may:
  - Monitor and promote growth
  - Promote and support exclusive breastfeeding for the first 6 months and continued breastfeeding thereafter
  - Promote complementary feeding using FATVAH principles (frequency, amount, thickness/ consistency, variety, active feeding, and hygiene)
  - Promote maternal nutrition
  - Counsel about and encourage vitamin A supplementation
  - Promote use of iodised salt in the household
  - Promote WASH (water, sanitation, and hygiene)
  - Refer for immunization
  - Advocate for demonstration gardens
  - Conduct food demonstrations
- Identifying malnourished or high-risk clients and referring them to the health facility. Volunteers may:

- Assess nutritional status using MUAC and signs of bilateral pitting oedema, weight loss, ill health, and loss of appetite
- Refer high-risk infants to a health facility for assessment because they cannot be assessed using MUAC; all non-breastfeeding infants under 6 months are at high risk for malnutrition
- Following up with malnourished clients and linking them to support services, which includes providing counselling and health and nutrition education.

### **Importance of Linking the Health Facility to the Community**

Facility-community linkages:

- Connect clients to other support services in the community such as supplementary feeding programmes (SFPs), mother support groups, WASH programmes, growth monitoring and promotion (GMP), National Agricultural Advisory Services (NAADS), livelihood programmes, and family planning. These linkages create a continuum of care that ensures that clients receive home visits, follow-up, and support. This in turn leads to better nutrition care through:
  - Improved adherence to ready-to-use therapeutic food (RUTF)
  - Improved adherence to ARV, TB therapy, and other treatment
  - Nutrition, hygiene, and health messages that are tailored for individuals
- Enhance community learning from health workers and vice versa.
- Help improve facilities' access to and communication with community leaders.

### **Process of Creating Facility—Community Linkages**

### In the Community

During planned community outreach activities, community volunteers can:

- Mobilise communities to respond to key health and nutrition issues
- Identify severely and moderately malnourished individuals based on MUAC, bilateral pitting oedema, weight loss, ill health, loss of appetite, and growth faltering (using the child health card)
  - Refer malnourished individuals to the health facility for further assessment and treatment
  - Refer nonbreastfed infants under 6 months, who are all at high risk, to the health facility for assessment
- Follow up with clients who have received treatment to ensure that they are taking the prescribed RUTF and provide ongoing counselling and support on nutrition habits
  - Conduct home visits for defaulters or those who need follow-up
  - Provide counselling for mothers or caretakers of children under 2 years on optimal infant and young child feeding practices
- · Link individuals identified for sustainable livelihood support to partner organizations
- Record the number of referrals for monitoring, evaluation, and follow-up purposes

### At the Facility

Facility staff should:

- Warmly receive clients referred by community volunteers and refer them to relevant departments for further assessment
- Counsel and provide treatment for enrolled patients (as needed) and refer them back to the community for continued support from the community volunteers
- Screen, identify, and refer individuals for malnutrition care through other routine services at the facility, including antenatal care and the young child clinic
- Meet with community coordinators monthly to share progress, determine what areas need improvement, and build on existing opportunities

### **Key Points**

- Facility–community linkages connect clients to other support services in the community to create a continuum of care that leads to better nutrition care and support.
- Community volunteers and resource people can promote good nutrition and mobilize the community; identify, refer, and follow up on malnourished or at-risk individuals; and ensure that those at risk of malnourishment receive complementary social support services.
- Facilities can provide assessment, treatment, counselling, and referral within the health facility and refer back to the community for follow-up and complementary social services.



## NACS SUPPLIES AND LOGISTICS MANAGEMENT



### **Purpose**

To provide participants with basic knowledge on how to order, receive, and store NACS supplies.



### **Session Objectives**

By the end of the session, participants will be able to:	Duration
Explain the logistics system	30 min.
Identify essential nutrition items for NACS	10 min.
Describe logistics management tools for ordering, receiving, storing, and distributing NACS supplies	30 min.
Describe considerations for storing NACS supplies	10 min.

**Estimated Time/Duration** (includes 5-minute wrap-up)

### 85 minutes

### **The Logistics System**

Logistics is a system for procuring, managing, and dispensing supplies.

### The 'Seven Rights' of a Logistics System

The purpose of a logistics system is to provide good customer service by delivering:

- 1. The RIGHT QUANTITIES
- 2. of the RIGHT GOODS
- 3. to the RIGHT PLACE
- 4. at the RIGHT TIME
- 5. in the RIGHT CONDITION
- 6. at the RIGHT COST
- 7. to the RIGHT PERSON

#### The Logistics Cycle and the Logistics Management Information System

#### Figure 4.3.1 The Logistics Cycle



The logistics cycle involves product selection, forecasting and procurement; inventory management; and customer service. At the centre of the cycle is the logistics management information system (LMIS). The system captures, processes, and reports data needed to make decisions in areas that affect the logistics system, including:

- Forecasting
- Procurement
- Product selection
- Pipeline monitoring
- Storage
- Distribution

The essential information that must be collected includes stock on hand, losses and adjustments, and consumption data. This information will help determine how much of which products are needed, when they are needed, how long supplies will last, whether the product's cost is affecting its use, and whether there are any problems with quality.

Human and financial resources also are required to run the logistics system. Because logistics data are collected by people, human resources are the most important part of the engine that drives the logistics cycle. If people do not collect the required data accurately, then logistics decisions will be affected. For instance, if 50 percent of health facilities did not submit data on supplies, then overall supply forecasts would be off substantially.

Quality monitoring must be in place for all logistics functions throughout the cycle. Quality monitoring is not limited to when the drugs and supplies are being imported into the country. Uganda's National Medical Stores (NMS) and Joint Medical Stores (JMS) ensure that appropriate conditions are maintained during storage and distribution. At the health facility, proper storage conditions must be maintained and patients must be counselled to ensure that drugs and supplies they are prescribed are stored in good condition at home.

### **Key Logistics Terms**

- **The logistics pipeline** is the entire chain of storage facilities and transportation links through which commodities/supplies move from the manufacturer to the consumer, including the port facilities, the central warehouse, regional warehouses, district warehouses, all service delivery points, and transport vehicles.
- A **pull system** is a distribution system in which personnel who receive the commodities determine the quantities to order. In a push system, personnel who issue the supplies determine the quantities to be issued. In Uganda, the push system is used for Health Centre III and below and the pull system is used for Health Centre IV and above.
- **Buffer stock** is the reserve stock kept on hand to protect against stock-outs caused by delayed deliveries or other unexpected events.
- A **delivery schedule** of medicines and medical supplies is published by the NMS to make delivery predictable throughout the year and to ensure effective stock management so that health facilities do not run out of supplies. The delivery schedule is available at the District Health Offices and health facilities.
- The National Medical Stores and JMS divided the country into **distribution zones** to ensure effective delivery of supplies. These zones are reflected in the delivery schedule.

### Facility-Level Components of a Logistics System

There are many actors involved in getting NACS supplies from warehouses to facilities. Every tier in the supply chain must have organized logistics systems in order for things to go smoothly. At the facility level, there usually are three main parts in a logistics system.

- 1. The dispensing facility receives and stores NACS supplies and distributes them within the clinic.
- 2. Transportation links connect different stations within the clinic that handle NACS supplies.
- 3. Service delivery points receive NACS supplies at the different stations within the clinic.

### **Essential Nutrition Items for NACS**

#### Table 4.3.1 Example of Essential Nutrition Items for NACS

ltem	Form	Formulation
Formula 75	Powder	75 kcal/100 ml
Formula 100	Powder	100 kcal/100 ml
Ready-to-use therapeutic food (RUTF)	Paste	500 kcal/92 g
Combined mineral-vitamin mix (CMV)	Powder	800 gm/tin
ReSoMal	Powder	37.5 mmol Na, 40 mmol K, 3 mmol mg/l
Glucose infusion	Infusion	10%

### **Tools for Ordering, Receiving, and Distributing NACS Supplies**

Key tools used in logistics management include the stock card, the dispensing log, and the order form.

### **The Stock Card**

The stock card is used to account for nutrition items and supplies. It shows how much stock is on hand and helps to monitor stock to prevent losses or thefts and to indicate when and how much to order. The stock card shows how much of each item moves in and out of the facility store over a certain period and which department used it. Each item should have its own stock card. If similar items have different sizes, strengths, packages, or formulations, then they should have different stock cards.

Stock cards can be obtained from private pharmacies, donations, supplies from implementing partners, or stock received from another health facility.

### Health Management Information System (HMIS) Form 015: Stock Card<sup>15</sup>

(1) Health Unit Name: \_\_\_\_\_ (2) Health Unit Code: \_\_\_\_\_

(3) Financial Year \_\_\_\_\_

(4) Item Description (Name, formulation, strength):					(5) Pack Size:		(6) Ite No:	(6) Item Code No:		
(7) Special storage conditions:										
(8) Unit of Issue: (9)Maximum Stock Level:						(10) Minimum Stock Level:				
(11) Date	(12) To or From	(13) Voucher number	(14) Quantity In	(15) Quantity out	(16) Losses/ Adjustments	(17) Balance on Hand	(18) (19) (20) (21) Expiry Batch Remarks Initials d date No.			

<sup>15</sup> Republic of Uganda. Ministry of Health. 2014. *Health Management Information System, Health Unit and Community Procedure Manual*. Kampala: Ministry of Health Resource Centre.

### **Completing the Stock Card**

To complete the stock card, enter the following information:

- Header information (e.g., health unit name)
- Item description:
  - Item name (e.g., F-75 therapeutic milk, RUTF)
  - Dosage form/formulation (e.g., tablet or syrup) and strength (e.g., 75 kcal/100ml)
- Pack size (e.g., tin of 1,000 tablets) and issue unit (e.g., pack, tablet, ml)
- Special storage requirements (e.g., refrigeration)
- Maximum stock: the largest amount of stock that can be held by the facility; calculate by multiplying average monthly consumption (AMC) by 4
- Minimum stock: the lowest amount of stock that can be held by the facility; calculate by multiplying AMC by 2
- Date: the date the transaction is made; each transaction is made on a separate row
- To or from: the location the item is being sent to or is coming from
- Voucher number: recorded if transaction is accompanied by a voucher
- Quantity in: the quantity of item received, according to the issue unit (e.g., packs, tablets, ml)
- Quantity out: the quantity issued, according to the issue unit (e.g., packs, tablets, ml)
- Losses/adjustments:
  - Positive adjustments are items received by the facility from sources other than the national system (NMS and JMS)
  - Losses (also called negative adjustments) include spillage/wastage, expiry, theft, stock given to another facility, any other stock disposed of (e.g., due to contamination)
- Balance on hand: the balance after adding the quantities received and subtracting the quantities issued or making adjustments for losses
- Expiry date
- Batch number: usually provided by the manufacturer
- Remarks: any necessary comments, notes, or explanations (e.g., physical count)
- Initials of the person updating the stock card

### **Physical Count**

Always conduct a physical count at the end of each 2-month cycle (as determined by the NMS delivery schedule) and update the stock card accordingly. The physical count helps to:

- Verify stock levels of nutrition supplies
- Verify accuracy of recordkeeping
- Detect losses in the store
- Ensure that the stock is usable (not damaged or expired)
- Determine whether stock will be used up before the expiry date or whether it should be redistributed to another facility

### The Dispensing Log<sup>16</sup>

The dispensing log tracks the quantities of therapeutic food or drugs dispensed to patients. Each time an item is dispensed, it must be recorded in the log, which is kept where patients receive drugs in the facility. When completed correctly, the dispensing log provides the exact amount of each nutrition item that has been dispensed so facility staff can determine how much to order. The information collected in the logs will be incorporated into the end-of-cycle logistics reports and new patient reports.

#### **Completing the Dispensing Log**

Whenever providing a nutrition item to a client, staff should enter the following information in the dispensing log:

- Date
- Client's patient identification number (outpatient department [OPD]/inpatient department (IPD) number)
- Names of therapeutic food or drugs dispensed
- The amount given (in units, e.g., ml, tablets, pack)

### HMIS Form 016: Daily Dispensing Log

(1)Health Facility Name



#### Order Form for Essential Medicines and Health Supplies (HMIS Form 085)<sup>17</sup>

HMIS Form 085 is used to order essential medicines and health supplies from the NMS each time an order is made. It is completed by the health facility in-charge, approved by the health sub-district (HSD) in-charge, and confirmed by the district health officer.

<sup>&</sup>lt;sup>16</sup> Republic of Uganda. Ministry of Health. 2014. *Health Management Information System, Health Unit and Community Procedure Manual*. Kampala: Ministry of Health Resource Centre. <sup>17</sup> Ibid.

The order form includes the following columns:

- 1. Order to NMS/JMS/others: where the order is being sent
- 2. Facility name
- 3. District: district where the health facility is located
- 4. Level: the level of care of the facility
- 5. HSD: name of the HSD where facility belongs
- 6. Date: day, month, and year when order form is being filled out
- 7. Order details:
  - Facility code: HMIS facility code
  - Year: the calendar year when the order was prepared
  - Month
  - **Order number:** the figure corresponding to number of orders made by the facility in the respective year
  - Item code: the code reflected in the NMS catalogue; each item (medicines and health supplies) being ordered requires its own code
- 8. Item description: the name, dosage form, and strength
- **9.** Pack unit: the unit provided in the NMS/JMS catalogue; e.g., for Cotrimoxazole 400mg/80 mg, tin of 1,000 tabs
- **10.Pack unit price:** the price provided in the NMS/JMS catalogue; note that some items (e.g., contraceptives) do not have prices because they are donated (their cost is therefore not borne by the health facility and does not reduce the credit line balance)
- 11.AMC: the quantity consumed on average per month
- **12.Quantity needed:** number obtained by subtracting the current stock balance from the maximum stock level; this depends on the AMC recorded in the stock book
- 13. Total cost: number determined by multiplying the pack unit price by the quantity needed
- 14. Ordered by: the name of the health facility in-charge
- **15.Approved by:** the name of the HSD in-charge; he or she should confirm that the cost of the order lies within the facility budget at NMS
- 16.Signature and date: the signatures of both the person ordering and the one approving
- **17.Confirmed by:** confirmation by the District Health Office of the quantities and accuracy of the order form

### HMIS Form 085: Order Form for Essential Medicines and Health Supplies

(1) Order	to (NMS, JMS, Other):	(2)Facility Name:					
(3)District		(4)Level: II		/ General Hospital Referral Hospital			
HSD:							
	(7)Order details:         Facility Code:       Year:         Month:			Order no:			
(7) (8) Item		(9)	(10) Pack	(11)	(12)	(13)	
Code	Item Description	Pack Unit	Unit Price	АМС	Quantity Ordered	Total Cost (UGX)	
(14)Ordere Signature	ed by: & date:			(15) Approv Signature &	ved by: & date:		
	(16) Confirmed by:		Sigr	nature & date	):		

### **Storage of NACS Supplies**

Like a bank, which stores money that can be deposited and withdrawn, a store provides storage for nutrition supplies that are received and dispatched<sup>18</sup>.

### **Characteristics of an Ideal Store**

An ideal store must:

- Be situated in a secure area to protect against theft
- Have strong doors secure from theft and rodents
- Have a safe and intact roof to protect against rain
- Be easily accessible by road or rail
- Allow for easy intake and dispatch of commodities
- Have complete files and books for recordkeeping
- Have proper and adequate ventilation
- Have a strong concrete floor or packed earth to protect against rodents burrowing under stacks

### **Supplies' Shelf Life and Safety**

Because of the compromised health status of many beneficiaries, the safety of nutrition supplies particularly food commodities such as RUTF—is critical. Stores must pay particular attention to supplies' shelf life. Food commodities, for example, are stored for short periods—frequently less than 3 months and almost never for more than 12 months. Note: RUTF has a shelf life of 24 months from date of manufacture.

### **Storage-Related Roles of Key Staff at Health Centres**

#### **Senior Staff**

- Ensure compliance with standard operating procedures
- Maintain key control log
- Conduct periodic, unannounced checks on infestation and documentation requirements
- Monitor and train all relevant staff
- Notify their supervisors immediately if there is any problem (e.g., missing commodities, excessive damage)

#### Storekeeper

- Maintain accurate stocks and records as per standard operating procedures
- Accept and release cargo as per standard operating procedures
- Prepare required monthly store reports

<sup>18</sup> This section adapted from: Uganda Ministry of Health. Comprehensive Nutrition Care for PLHIV. http://www.urc-chs.com/uploads/ resourcefiles/cnc\_manual\_facility\_providers.pdf.
- Keep stacks of supplies orderly
- Be accountable for RUTF at his/her store
- Ensure that the store is always clean and free from infestation
- Advise relevant senior staff immediately of any losses/damages at the store
- Ensure that the correct amount of RUTF stock is maintained and that relevant senior staff are immediately advised when the re-order level is reached

#### **Dispenser**

- Dispense RUTF to beneficiaries according to specified quantities
- Manage the beneficiary distribution register
- Fill out the daily distribution report (loss report if any incurred)

# **Key Points**

- Logistics systems are used for procuring, managing, and dispensing supplies.
- The LMIS captures, processes, and reports information that is needed to make decisions in areas that affect the logistics system, including forecasting, procurement, product selection, pipeline monitoring, storage, and distribution.
- Key tools used in logistics management are the stock card, dispensing log, and order form, which must be filled out correctly to ensure proper management of supplies.
- Safety of nutrition supplies is critical; stores must pay particular attention to supplies' shelf life and expiry dates.
- An ideal store is secure against theft and pests. The store should have a strong door and concrete floor, secure roof to protect against rain, and adequate ventilation. It should be readily accessible, and its staff must keep complete records.



# NACS MONITORING AND REPORTING



#### Purpose

To equip participants with knowledge and skills in monitoring and reporting of NACS implementation.



# **Session Objectives**

By the end of the session, participants should be able to:	Duration
Explain monitoring and reporting and their importance	30 min.
Identify indicators for monitoring and reporting of NACS	20 min.
Demonstrate how to fill out data collection tools	40 min.



## **Estimated Time/Duration** (includes 5-minute wrap-up)

#### 95 minutes

# **Definition of Monitoring, Evaluation, and Reporting**

#### Introduction

This session introduces participants to the basic principles of monitoring and reporting on nutrition activities, the key nutrition indicators and their implementation, and the data flow cycle.

#### **Definition of Monitoring, Evaluation, And Reporting**

**Monitoring** is the systematic collection of information on key aspects of the project while it is being implemented. Monitoring involves continuous and systematic checking or observing of the programme/project activities to ensure that they are being implemented as planned.

**Evaluation** involves carefully examining data about a project/programme's results to determine whether and how well the project/programme met its objectives. Evaluation helps determine causality—linking a particular output or outcome directly to an intervention over a set period. Evaluation also can show the extent to which changes in outcomes can be attributed to the project/ programme's interventions. This is commonly referred to as 'impact evaluation'.

**Reporting** is the formal presentation of monitoring and evaluation data—usually a written account of what a programme has done, achieved, or experienced—for management, auditing, or tracking purposes. Reporting is done routinely.

#### **Differences between Monitoring and Evaluation**

Monitoring is the routine tracking of key elements of a project/programme's performance, usually inputs and outputs. It also may include tracking short-term programme outcomes. Evaluation is the episodic/periodic assessment of changes that can be attributed to the project/programme's interventions.

#### Table 4.4.1 Monitoring versus Evaluation

Monitoring	Evaluation
Is done continuously to keep track of daily activities	Is done once or periodically; takes long-range view through in-depth study
Accepts project's/programme's objectives and targets	Questions pertinence and validity of project's/programme's objectives and targets
Checks progress toward output targets	Measures performance in terms of objectives
Stresses conversion of inputs to outputs	Emphasizes achievement of overall objectives
Reports on current progress at short intervals for immediate corrective actions	Provides an in-depth assessment of performance for future feedback

# Importance and Benefits of Monitoring, Evaluation, and Reporting

Projects/programmes have to contend with human fallibility and mistakes in execution, so we must measure performance in order to make improvements and remain on course. To do this, we must collect and use data to demonstrate how well activities were performed and whether outcomes and impact were achieved. The nutrition activities implemented at health facilities are monitored based on set indicators.

### **Benefits of Monitoring, Evaluation, and Reporting for Nutrition Services**

The process of monitoring, evaluation, and reporting helps:

- Prove that the programme is achieving or has achieved intended results
- Show accountability for resources expended
- Yield data to use in response to any critics of the programme
- Justify replication, scale-up, or continuation of the programme
- Generate information to use in advocating for policy and resources
- Generate knowledge
- Improve cost-effectiveness and efficiency

# **Nutrition Data Management Tools**

Nutrition data elements have been incorporated in most of the registers at most health facility entry points. Instructions for filling out the registers are included in the *Health Management Information System, Health Unit and Community Procedure Manual, October 2014*. Nutrition data are included in the following forms:

- Integrated nutrition register (HMIS Form 077)
- Pre-ART and ART registers (HMIS Form 080, 081)
- Antenatal, maternity, and postnatal registers (HMIS Forms 071, 072, 078)
- TB register (HMIS Form 096a)
- Child health and HIV-exposed infant (early infant diagnosis) registers (HMIS Forms 073 and 082)

This session will focus specifically on HMIS Form 077, the integrated nutrition register.

### Integrated Nutrition Register (HMIS Form 077)<sup>19</sup>

**Objective:** Used to record detailed information about each client enrolled in any feeding programme (e.g., outpatient therapeutic care [OTC] and supplementary feeding programme [SFP]) at each visit. This register stays at the health unit and preferably in the nutrition unit or nutrition corner.

Responsibility: Health unit in-charge.

#### **Procedure**

- 1. On the front cover, write the date the register was started, the name of the health unit, and the date the register was finished.
- 2. Use pre-printed formats, which should be available for this register. However, if they are not available, use counter books. If counter books are used, then draw lines and write headings, as shown in the HMIS Form 077 below.
- 3. At each visit, monitor the nutrition status of clients in any feeding programme and their response to management of malnutrition and report monthly/quarterly. Classification of nutrition status is found in the Integrated Management of Acute Malnutrition guidelines. Report the exact age of the client in the register.
- 4. For the first visit, clearly indicate whether the client is a new enrolment or re-admission.
- 5. Record the height of adults once and at each of the visit for children.
- 6. All clients on any feeding programme should be discharged through the Integrated Nutrition Register.

<sup>19</sup> Republic of Uganda. Ministry of Health. 2014. *The Health Management Information System. Health Unit and Community Procedure Manual. Volume 1.* Kampala: Ministry of Health Resource Centre.

(1)	(2)	(3)	(4)	(9)	(9)	(2)	(8)	(6)	(10)	(11)	(12)
ent	Date	Name Of Client	Clients Address	Sex	Age	Infant Feeding Practice(for children less than 2 yrs)	Pregnancy/ Lactating Status	Type of Admission	Type of Nutrition management	Entry Care Point	Nutrition Status at Enrolment
c	1 cm	5 cm	5 cm	1 cm	1 cm	5 cm	5 cm	5 cm	5 cm	2cm	5cm
		Surname	Parish						ITC		MAM
		First Name	Village						OTC		SAM without oedema
		Name of next of Kin	Telephone No.						SFP		SAM with oedema (+,
		Contact:									(++,++)

(18)	t EXIT OUTCOME (Put The	Appropriate Code For The Outcome and Insert Date)			Code for the								Exist Date					
(11)	Target exit criteria		MUAC Cu off at exit Weight for height/Len th Z- scores at exit															
(16)	Assessment at exit				Oedema	Weight(kg)	Height / Length	(cm)	MI IAC: Color	(cm)/Weight for	height/lengthZ	score	Therapeutic/	supplementary-	feeds	Counseling	code	
		Visit 8	Appointment date	Visit date	Oedema	Weight(kg)	Height /	Length (cm)	MUAC Color	(cm)/Weight	101 hainht/lannth7	Score	Therapeutic/	supplementary	- feeds	Counseling	code	
		Visit 7	Appointment date	Visit date	Oedema	Weight(kg)	Height /	Length (cm)	MUAC Color	(cm)/Weight	101 hainht/lannth7	Score	Therapeutic/	supplementary	- feeds	Counseling	code	
(15)	ENROLLMENT AND RE-VISITS	Visit 6	Appointment date	Visit date	Oedema	Weight(kg)	Height /	Length (cm)	MUAC Color	(cm)/Weight	101 haidht/landth7	score	Therapeutic/	supplementary	- feeds	Counseling	code	
		Visit 5	Appointment date	Visit date	Oedema	Weight(kg)	Height /	Length (cm)	MUAC Color	(cm)/Weight	101 hainht/lannth7	Score	Therapeutic/	supplementary	- feeds	Counseling	code	
		Visit 4	Appointment date	Visit date	Oedema	Weight(kg)	Height /	Length (cm)	MUAC Color	(cm)/Weight	IUI hainht/lannth7	Score	Therapeutic/	supplementary	- feeds	Counseling	code	
		Visit 3	Appointment date	Visit date	Oedema	Weight(kg)	Height /	Length (cm)	MUAC Color	(cm)/Weight	101 haidht/landth7	SCOLE	Therapeutic/	supplementary	- feeds	Counseling	code	
		Visit 2	Appointment date	Visit date	Oedema	Weight(kg)	Height /	Length (cm)	MUAC Color	(cm)/Weight	haidht/landth7	Score	Therapeutic/	supplementary	- feeds	Counseling	code	
		Visit 1	Appointment date	Visit date	Oedema	Weight(kg)	Height /	Length (cm)	MUAC Color	(cm)/Weight	101 haidht/landth7	Score	Therapeutic/	supplementary	- feeds	Counseling	code	
		On Admission to a feeding program		Visit date	Oedema	Weight(kg)	Height /	Length (cm)	MUAC Color	(cm)/Weight	101 hainht/lannth7	Score	Therapeutic/	supplementary	- feeds	Counseling	code	
(14)	ART Servic	es at enroll ment																
(13)	HIV Status	at enroll ment																F

# HMIS Form 077: Integrated Nutrition Register

**Session 4.4 NACS Monitoring and Reporting** 

# **DESCRIPTION OF COLUMNS**

The date is written on the first blank row. Nothing else is written on that row.

- 1. Client number: assignment of client numbers starts at the beginning of the financial year (1 July) and is assigned at the OTC (for example, 0001). This number does not change for the subsequent visits at any feeding programme. An 'R' is added to the number if the client is a referral from another facility with a feeding programme, e.g., 0001R.
- 2. Date: date of registration/enrolment.
- **3.** Client name: surname, given name, and other name. Names of the next of kin should also be provided.
- **4. Client address:** address of the client by district, sub-county, parish/village; a contact telephone number should also be listed.
- 5. Sex: M for male or F for female.
- 6. Age: complete years for adults and in months for children under 5 years.
- 7. Infant feeding practice: for children under 1 year, infant feeding practices should be indicated with codes as follows: 1 = exclusive breastfeeding (EB); 2 = replacement feeding (RF); 3 = mixed feeding (MF); 4 = complementary feeding (CF); 5 = no longer breastfeeding (NLB).
- **8. Pregnancy/lactating status:** '1' for pregnancy, '2' for lactating, and '3' for nonlactating but with child under 6 months.
- 9. Type of admission

**New admission:** clients newly enrolled in the current financial year should be noted as new admissions.

**Re-admission:** clients enrolled more than once in the same financial year are noted as re-admissions. Re-admissions might result from relapse or default. Clients re-admitted in a different financial year are registered as new clients.

- **10. Type of management:** indicates the type of nutrition management the client is being offered. 'ITC' (inpatient therapeutic care) is used for clients with severe acute malnutrition (SAM) with medical complications, admitted in the health facility, and treated for acute malnutrition and other medical conditions on inpatient basis. 'OTC' (outpatient therapeutic care) is used for clients with moderate acute malnutrition (MAM) or SAM with no medical complications and who are treated with therapeutic feeds on outpatient basis. 'SFP' is used for clients with MAM treated with supplementary feeds on an outpatient basis.
- 11. Entry care point: the clinic where the client has been referred, as indicated by the following codes: YCC = Young Child Clinic, ANC = Antenatal Clinic, MC = Maternity Clinic, PNC = Postnatal Clinic, ART = Antiretroviral Treatment Clinic, Pre-ART = Pre Antiretroviral Treatment Clinic, OPD = Out Patient department, TB = TB clinic, CHW= referral by community health worker.

#### 12. Nutrition status at enrolment

MAM: moderate acute malnutrition.

SAM without oedema: severe acute malnutrition with no oedema.

**SAM with oedema:** severe acute malnutrition with oedema. Write '+' for grade one oedema (below the ankles); '++' for grade two oedema (below the knees); and '+++' for grade three oedema (observed on feet, legs, arms, and face).

**13. HIV status at enrolment:** 'Pos' for HIV positive, 'Neg' for HIV negative, 'Unknown' for those whose status is not known, and 'exposed' for HIV-exposed children.

**14. ART services at enrolment:** 'ART' if client is on ART treatment (including Option B+ for HIV positive mothers); 'Pre-ART' if client is enrolled in HIV clinic but not yet on ART; 'NA' for those not yet enrolled and for HIV negative clients.

#### 15. Enrolment and re-visits

Indicate the enrolment date; check for oedema and record +, ++, +++; take and record the weight in kilograms on enrolment and at each visit; take and record the height in centimetres (measure once for adults and older children on enrolment and at each visit for the children under 5 years); and record the date of next appointment.

In this column, under the MUAC colour, indicate the MUAC colour code (for clients over 6 months) and the measurement in cm. Red is an indication of SAM, yellow indicates MAM, and green is normal nutrition status. Write 'R' for red, 'Y' for yellow, and 'G' for green.

In this column, underweight for height/length z-score, indicate the z-score (for clients under 6 months). Write 'N' for normal nutritional status if client's z-score ranges between  $\geq$  -2 SD and < 2 SD; 'MAM' for moderate acute malnutrition if client's z-score ranges between  $\geq$  -3 SD and < -2 SD, 'SAM' for severe acute malnutrition if client's z-score is < -3 SD.

This also measures stunting; write 'N' for normal nutritional status if client's z-score is  $\geq$  -2 SD and 'S' for stunting if the client's z-score is < -2 SD.

In this column, under type of the therapeutic/supplementary feeds given, indicate therapeutic feeds (RUTF, F-75, F-100, and ReSoMal) or supplementary food, e.g., FBF.

- **16. Counselling code:** Write '1' for optimal dietary practices for adults, including pregnant and lactating women; '2' for use of therapeutic foods; '3' for infant and young child feeding (IYCF); '4' for water, hygiene, and sanitation (WASH); '5' for ARV adherence; and '6' for other.
- **17.** Assessment at exit: check for oedema, take and record the weight in kilograms and height/length in centimetres.
- **18. Target exit criteria:** indicate the target MUAC cut-off or weight for height/length z-scores at enrolment, depending on enrolment criteria (target exit criteria for MUAC is  $\geq$  12.5 cm and for weight for height/length z-score is  $\geq$  -2 SD).
- 19. Exit outcome and date

Write the code to indicate how the client left the feeding programme: 'C' if client was cured (attained the target weight within the target date); 'NR' for nonresponse client; 'DF' if the client defaulted; 'IPD' if the client was transferred to in-patient ward, e.g., medical ward, TB; 'D' if the client died; and 'TO' if the client was transferred to another OTC/ITC facility.

20. Exit date: date when the client's exit outcome occurred.

## **National Indicators and Reporting Forms**

Nutrition information from the health facilities is reported to the Ministry of Health through the national HMIS. The HMIS 105 form is used for monthly reporting, and the HMIS 106A form is used for quarterly reporting.

- HMIS 105 (Health Unit Outpatient Monthly Report) reports the monthly attendance figures for OPD, OPD diagnoses, maternal and child health, HIV/AIDS, lab, and financial and stock-out data. Two forms are completed by the in-charge, one sent to the HSD and one to the district.
- 2. HMIS 106A (Health Unit Quarterly Report) reports quarterly attendance at HIV/ART, nutrition, and TB services. Three copies are filled by the health unit in-charge. One is kept at the health unit, one sent to the district, and one sent to the HSD.

# Nutrition Indicators Reported in the HMIS 105 (Monthly Form)

No.	Indicator		Nu	mber			
			М	F			
1	No. of clients who received nutrition assessment on each clinic visit using colour-coded MUAC tapes This information is found in the assessment forms' booklet. Add all clients who are assess found to be normal or have SAM or MAM. Disaggregate by sex.	sed and are					
2	No. of clients who received nutritional assessment and have malnutrition This also is from the assessment forms' booklet. Count all clients assessed who have	SAM					
	SAM and all clients assessed who have MAM. Disaggregate by sex.	MAM					
3	No. of newly identified malnourished clients who received nutrition counselling This is in the OTC register under the 'enrolment and revisits' column. Count all the clients in the row for counselling who received individual counselling.						
4	No. of HIV-positive pregnant mothers in care who are assessed for malnutrition <i>This information is in the ART register.</i>						
5	No. of HIV-positive pregnant mothers in care who are assessed for malnutrition and found with acute malnutrition	SAM					
	This is also obtained from the ART register and then categorised as SAM or MAM.	MAM					
6	No. of HIV-exposed infants reported to be exclusively breastfed for the first 6 completed months during the reporting period						
	This is obtained from the exposed-infant register. Count all the exposed infants who have attended at 6 months of age and who were reported to be exclusively breastfed.						
7	No. of malnourished clients referred from the community This is in the OTC register under the 'referrals from the community' column.						

# Nutrition Indicators Reported in the HMIS 106A (Quarterly Form)

No.	Indicator		Nur	nber		
			М	F		
1	No. of all acutely malnourished clients who received treatment according to recommended protocol and who improved <i>This is obtained from the OTC register under the 'exit outcome' column. Count a the sub-column 'cured'.</i>	Ill the clients under				
2	No. of HIV-positive children in care who were assessed for malnutrition at least once in 3 months	Under 2 years				
	This information is in the ART and pre-ART registers and is disaggregated by	2 to under 5 years				
	uye group.	5 to under 15 years				
3	No. of HIV-positive adults in care who were assessed for malnutrition at least once in 3 months <i>This information is in the ART and pre-ART registers.</i>					
4	No. of HIV-positive clients in care assessed for malnutrition within the past 3 months and found with acute malnutrition					
	<i>This Information is in the ART and pre-ART registers. Count all the clients with SAM and MAM, then disaggregate by sex.</i>					
5	No. of HIV-positive acutely malnourished clients in care who received treatmen recommended protocol and who improved	t according to				
	This Information is in the OTC register. Count all the clients reported to be on AF the OTC and compare with those who were discharged as cured under the 'exit	RT and pre-ART in outcome'.				

## **Other Related Indicators (Tracked at the National Level)**

- Proportion of HIV-exposed infants reported to be exclusively breastfed for the first 6 completed months during the reporting period. This is tracked annually; as noted, the information comes from the exposed-infant register.
- Proportion of HIV-exposed infants who reportedly breastfed for up to 12 months. This also is tracked annually; the information comes from the exposed-infant register.
- Proportion of health facilities providing therapeutic foods as part of essential medicines. The national programme will develop an inventory to track the number of facilities providing therapeutic foods. This will also provide a reference for scale-up, supervision, forecasting of supplies needed, and planning for the programme.
- Percentage of infants born to HIV-positive women in PMTCT programmes who are alive at 12 months of age and HIV positive. This information will be obtained through special studies.

#### **Case scenarios**

**Scenario 1:** On 7 January 2013, Jane Namali, age 32, attended Ntara health centre IV (HC IV). She is from Kayembe cell, Kagazi Parish, Kecheche sub-county in Kamwenge District. Her telephone number is 0749448910. She has two children and is currently pregnant. She was referred to the ART clinic from the outpatient department (OPD) for further HIV counselling after testing positive. She was immediately enrolled in care (pre-ART) and assigned a number, 0057/13. A nurse took her weight and height, which were 49 kg and 179 cm, respectively. Her MUAC colour was red. She was started on ARVs and was referred to the OTC for nutritional rehabilitation.

At the OTC, a community volunteer entered her information in the OTC register. She was sent to the counsellor after registration since this was her first enrolment. The counsellor took her through education sessions on infant feeding, positive living, and ART adherence. She was sent to the clinical officer for examination and clinical management. He measured her again and found that her weight was 50 kg, height was 179 cm, and MUAC colour was red. He prescribed six sachets of RUTF per day for 2 weeks. She was told to come back in 2 weeks, the same time she was scheduled to attend the ART clinic for follow-up.

**Scenario 2:** On 9 January 2013, Kaboto Kellenson, age 26, attended Ntara HC IV with her 8-month-old son (Baby Kellenson), who is breastfeeding. She is from Kangora cell, Kicwamba Parish, Ntara sub-county in Kamwenge district. She had been referred by health educator Ruyondo Joshua for nutrition assessment after reporting weight loss and poor appetite. She was seen at the OPD, and her weight was 41 kg, height was 172 cm, and MUAC colour was red. She declined HIV testing, saying she was not ready. But she agreed to testing for her baby, whose weight was 5 kg, length was 40 cm, and MUAC colour was red. The baby tested HIV positive using a rapid test. The mother and baby were referred to the OTC.

On 11 January, Kellenson reported to the OTC with her baby. Their weight, height, and MUAC again were measured and found to be unchanged. Nurse Vero Kabalisa counselled Kellenson on infant feeding, emphasizing complementary feeding, prevention of mother-to-child transmission of HIV, and HIV testing, which she again declined. The nurse prescribed six sachets of RUTF per day for 2 weeks for the mother.

Baby Kellenson was admitted to inpatient therapeutic care (ITC) for further treatment and referred to the early infant diagnosis care point. At the ITC, he was given 65 ml of F-75 every 8 hours for 1 week. After 1 week the dose increased to 75 ml. After 2 weeks, he gained 3 kg. He was prescribed 2.5 sachets of RUTF per day for 2 weeks and discharged to the OTC. He should return for follow-up in 2 weeks.

**Scenario 3:** On 12 January, Toma Kalenke, 3 years of age, was admitted to the same ITC after a referral from Kanara HC II. She is from Kanara cell, Kanara Parish, Nyabani sub-county. Her weight was 10 kg, height was 60 cm, and MUAC colour was red. She was put on 160 ml of F-75 for 1 week and discharged to OTC. She was prescribed 4 RUTF sachets per day for 2 weeks, when her caregiver is expected to bring her back for follow-up.

**Scenario 4:** On 14 January, Jimmyman Bakareeba, 30 years of age, attended an ART clinic in Ntara HC IV for a refill of ARVs. He is from Kibanga cell, Kiryanga Parish, Ntara sub-county. He was measured at the clinic; his weight was 52 kg, height was 190 cm, and MUAC colour was yellow. He was referred to the OTC. The nurse at the OTC noticed that this was his second time attending the OTC; he had been discharged as cured 6 months ago. The nurse prescribed 42 sachets of RUTF for 1 week and told him to come back on 21 January.

**Scenario 5.** On 7 February, Kallon Mashiyo, 45 years of age, attended the OTC. She is from Kokoyo cell, Buhanda parish, Buhanda sub-county, and does not have a contact number. She had been referred by the village health team after it was found that her weight was 42 kg, height was 175 cm, and MUAC colour was red. Her HIV status is unknown. The nurse gave her 84 sachets of RUTF for 2 weeks and told her to return on 21 February.

# **Client Information for Subsequent Visits**

	Jane Namali	Kaboto Kellenson	Baby Kellenson	Toma Kalenke	Jimmyman Bakareeba	Kallon Mashiyo
Second Visit						
Weight (kg)						
MUAC						
Therapeutic food						
Counselling						
Third Visit		` 			-	
Weight						
MUAC						
Therapeutic food						
Counselling						
Fourth Visit						
Weight						
MUAC						
Therapeutic food						
Counselling						

Counselling codes: Write '1' for optimal dietary practices for adults, including pregnant and lactating women ; '2' for use of therapeutic foods; '3' for IYCF; '4' for WASH; '5' for ARV adherence; and '6' for other.

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