

Chapter 4

General Care and Nutritional Care and Support of PLWHA

4.0 Introduction

A key objective of nutritional care and support for PLWHA is to prevent weight loss and to maintain normal nutritional status. Another important objective is to restore the nutritional status for severely malnourished PLWHA, to optimize their health and also reduce stigma against them. Also, nutritional support will assist those who are overweight to reduce their weight and its associated health risks.

Summary of Critical Nutrition Interventions for PLWHA

- Advise the client to have **periodic nutritional status assessments**, especially of their weight, every 2nd month for symptomatic clients and every 4th month for asymptomatic clients.
- Educate and counsel PLWHA of the **increased energy needs** for their disease stage, and the need to consume a balanced diet. Clients with severe malnutrition should be supported with therapeutic supplementary foods.
- Educate and support clients to **maintain high levels of sanitation**, food hygiene, and water safety at all times. They should be de-wormed bi-annually with an appropriate broad-spectrum anti-helminthic drug, like Albendazole™ or Mebendazole™.
- They must **practice positive living behaviours**, including practicing safer sex, avoiding or moderating use of alcohol, cigarettes and non-prescription drugs.
- Counsel PLWHA to seek **prompt treatment for all opportunistic infections** and symptoms, and especially those that may interfere with food intake.
- Clients should carry out **physical activity or exercises** to strengthen or build muscles, increase appetite and health.
- Those on medicine, including ARVs, should be informed about managing the **drug-food interactions and side-effects** that can be managed by food and nutrition interventions.

4.1 Periodic Nutritional Assessment

Nutritional assessment is a process that determines a client's nutritional status and the causes of any nutritional problems. The major purpose of a nutritional assessment is to determine the severity of nutritional impairment and probable causes. A nutritional assessment will focus on information about dietary and anthropometric factors, clinical status, biochemical status, psychosocial factors, and the living environment of the PLWHA.

The following are the main goals of a nutritional assessment:

- To confirm an adequate nutrient intake, improve eating habits, and help build and maintain stores of essential nutrients.

- To confirm correct weight status, and maintain a healthy weight by preventing overall weight loss particularly of muscle mass (lean body mass, LBM) or development of obesity.
- To confirm absence of illnesses that aggravate nutritional wasting, and assist the patient in assessing treatment for illnesses that reduce food intake.
- To adjust meals and meal plans for other chronic illnesses associated with HIV.
- To facilitate provision of therapeutic nutritional care and support during advanced stages of HIV/AIDS.

Observations of these components help the service provider design nutrition interventions for care and support of PLWHA.

4.1.1 Anthropometric Assessment

Anthropometric screening is carried out through serial measurements of weight, height, mid upper arm circumference (MUAC) and skin fold thickness (SFT). The values obtained are used to show changes in body mass and dimensions as follows:

Clients who have lost 10% or more of weight within 2 to 3 months should be referred for assessment for ARVs and started on ART as appropriate.

Weight: A client's absolute weight and the degree of weight change over time assists the service provider to understand the baseline and stability of nutritional status, impact of illness, and response to interventions. Changes can be expressed as a percentage of weight loss or gain. Rapid weight loss—losing more than 5% of usual body weight over a 2 to 3 month period—is highly associated with OIs and hospitalization. This symptom warrants a carefully executed diagnostic evaluation to determine any correctable or treatable confounding conditions. More than a 10% decrease in body weight over 2 to 3 months is a criterion of wasting syndrome. However, loss of body weight may also be a side effect of HAART (or 'Highly Active Anti-Retroviral Therapy' see Chapter 7.)

Take and record the weight of PLWHA at each visit. Body weight assessment is required to:

- Identify those whose growth patterns are outside the normal values, indicating either over-nutrition or under-nutrition.
- Identify individuals at risk of malnutrition with repeated measurement (screening) over time.
- Monitor effects of nutrition interventions on various anthropometric measurements.

For a client with oedema, net weight gain should be assessed after oedema has disappeared to ensure accuracy of the measurements obtained (i.e. that the weight is not a reflection of excess fluid retained by the body).

Body mass index (BMI): In adults, BMI is obtained from weight in kilograms divided by the square of the height in metres. Adults with a BMI less than 18.5 kg/m² indicates

under-nutrition and a high risk of illness; a BMI greater than 25 kg/m² indicates risk of overweight; and a BMI greater than 30 kg/m² indicates obesity with a high risk of diabetes and heart disease. BMI is not applicable for pregnant women—Middle Upper Arm Circumference (MUAC) is the preferred measure.

HIV-infected individuals with a BMI of less than 18.5 kg/m² and children with weight-for-height (wt/ht) of less than -2 Z scores (see Annex 4.1) should be supported with therapeutic food supplement for the purpose of improving their nutritional status to BMI above 18.5 kg/m² and wt/ht of > -2 Z score.

BMI is recommended as criterion for adults and determining PLWHA who require prescription for supplementary food support (details in Chapter 8). The use of Middle Upper Arm Circumference is recommended for adults and children (see below) who cannot stand up for weight and/or height measurements. MUAC values correlate strongly with BMI in men. In women, the cut-off point MUAC < 23.3 cm may provide a reasonable correlation with BMI.

PLWHA with BMI greater than 30 should be advised how to reduce weight without compromising their nutritional status:

- Control caloric intake by increasing intake of low calorie foods such as vegetables and high fibre diets such as oatmeal.
- Restrict intake of polyunsaturated fats and avoid saturated and trans fats and oils.
- Restrict sugar intake.
- Increase water intake.
- Ensure regular exercise.

Detection of growth faltering: Growth faltering in children is based on underweight, stunting, wasting and growth velocity in children. Children under 10.5 years should have an expected weight and height gain that corresponds to their age in months; the reference values are provided by the National Centre for Health Statistics (NCHS)/WHO along with variations (standard deviations).

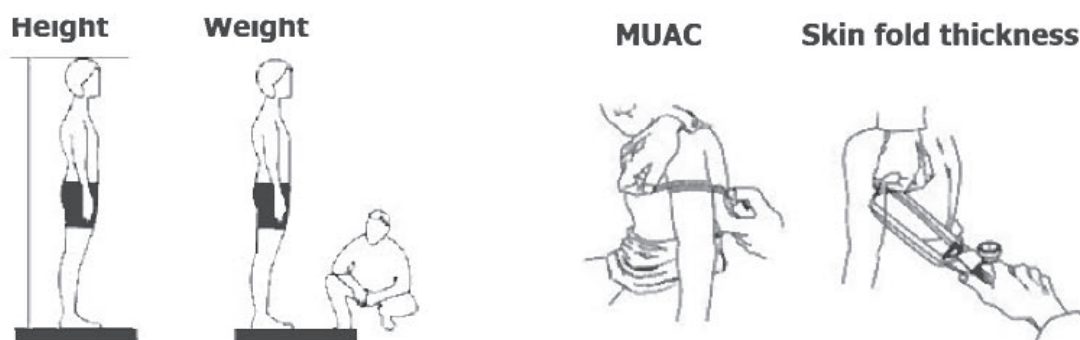


Figure 4.1 Anthropometric Measurements

Any anthropometric assessment requires relatively simple equipment:

- A calibrated Salter scale for weighing children to the nearest 100 g or a bathroom scale for adults;

- A heightometer for measuring height;
- A tape measure for measuring mid-upper arm circumference and callipers for measuring skin fold thickness (Figure 4.1).

4.1.2 Measuring Body Composition

Keeping record of the weight of a PLWHA should not be the only method to detect nutritional deficiencies. Loss of body weight in PLWHA usually signifies a change of more than one body compartment (fluids, fats, lean body mass), and sometimes a loss in one compartment is counterbalanced by a gain

It is recommended that PLWHA have their body composition (at least the fat mass, the body cell mass) taken at least every six months, and every three months after starting ART.

in another, with little change in the measured body weight. The lean body mass (LBM) (weight of the body without fat) is essential for the effectiveness of medicine and is linked to time of progression to the end stages of AIDS.

How to measure body composition

Body composition is based on fat and LBM assessment of the following:

- **Mid upper arm circumference (MUAC):** A measurement equal or lower than a cut-off point of 22 cm for women and 25 cm for men is considered risky. (A cut-off point of 23.3 cm may be applied as an average value for both men and women.) Low values are associated with under-nutrition (starvation or muscle wasting) and put a person at risk of illness. For children 1 to 5 years old, MUAC cut-off points are: 12.5 to 13.5 indicating moderate under-nutrition; and < 12.5 indicating moderate to severe malnutrition.
- **Triceps skin fold thickness:** Skin thickness below 5 mm for men and 8 mm for women indicates risk of malnutrition. Low measurements may indicate under-nutrition or changes in a person's metabolic function.
- **Waist circumference and hip circumference ratio:** In general, if the waist measurement is greater than the hip measurement, it may be associated with trunkal obesity (which indicates cardiovascular risk) or it may be a side effect of long-term ART use. A ratio above 0.8 for women and 1.0 for men suggests changes in the body shape.

Bioelectric impedance analysis (BIA)

BIA is a non-invasive tool for assessing body composition currently available in a limited number of settings in Kenya. Conventional measurement of impedance is made by placing two electrodes between the back of the wrist joints and two electrodes in front of the ankle joint on the same side of the body. The electrodes are connected with appropriate leads to a measuring device. A harmless excitation current from dry batteries is transmitted, and voltage drop measured to give the impedance.

There are computer programmes that facilitate the automatic calculation of composition indicators including the client's total body water, fat free mass, percentage of body fat, basal metabolic rates, and ideal weight taking into account his or her weight, height and gender.

4.2 Biochemical and Microscopic Investigations

There are a number of diagnostic tests that identify infection with HIV (e.g. HIV rapid tests, ELISA and RNA-PCR) and the stage progression of the disease (e.g. viral load and CD4 counts). These are well referenced in other texts. Therefore, this section focuses on diagnostic tests that evaluate nutritional status and guide nutritional interventions for PLWHA.

Biochemical and microscopic evaluations are used to assess nutritional status, monitoring for OIs, and disease progression. The tests are advantageous because they provide information on a client's risk of nutrient deficit long before anthropometric changes can be detected. Often they complement other tests such as clinical presentations. They are also important in monitoring the effects of treatment.

Priority Laboratory Investigations

The commonly used laboratory tests in nutritional care and support of PLWHA include assessment for anaemia, white blood cell count, micronutrients status, nutrition biochemistry, and detection of infective organisms.

Anaemia: Anaemia is common in PLWHA and is a side effect of some ARVs. WHO's recommended haemoglobin cut-off points for anaemia are:

- < 11g/dL for pregnant women and six to 60 month-old children.
- < 12g/dL for non pregnant women.
- < 13g/dL for men.

With iron deficiency many red blood cells are relatively small and pale in colour.

PLWHA on **Zidovudine** or **Lamivudine** should be referred for an assessment of haemoglobin at least every 6 to 8 months. If they are anaemic, initiate low levels of iron and folic acid supplementation to the client. Clients should also be advised to eat foods rich in iron, vitamin B12 and vitamin A.

White blood cells (WBC): White cell counts in whole blood reflect the state of the immune system. A normal adult's WBC count ranges between 4,300 to 11,000 cells/mL of blood. In children, the WBC count decreases with age: less than one year is 18,000 cells/ml; 2 to 6 years is 15,000 cells/mL; and 6 to 12 years is 13,000 cells/ml.

Of special importance are the lymphocytic cells, particularly CD4 and CD8, which are used to determine the stage of HIV and in monitoring the response to ART. A CD4 cut-off point of 200×10^3 cells/ml of blood (200 cells/ μ L) and below indicates a severely compromised immune system and is currently used by most providers as a key criterion before starting ART.

Malaria: The presence of malaria parasites is confirmed most commonly by a blood film. Malarial infections are likely to be more severe in PLWHA. Confirmation by laboratory diagnosis is the first step in ensuring appropriate treatment. Confirming malaria by laboratory testing is especially important for those living in malaria endemic areas.

Intestinal and Urinary Tract Infections: Worms (helminths), bilharzias (schistosomiasis), and amoeba are common intestinal infections in places where hygiene including hand-washing, protective foot wear, and sanitation services are adequate. Infections also occur due to poor food handling and storage. These infections tend to be more severe among PLWHA. They may manifest as diarrhoea or cloudy, turbid urine. Turbid urine is suggestive of infection and/or protein loss through urine. Reagents (test kits) in the form of diagnostic strips are readily available for urine analysis. Routine microscopic methods for stool and urine are also adequate for diagnosis.

Micronutrient status: More than one test is recommended to confirm a deficiency, especially when results are marginal. This argument is based on observed fluctuations of key micronutrient indicators due to altered metabolism and distribution during acute infections. The main diagnosis criteria for key micronutrients are shown below:

Zinc deficiency (ZID)

- Low intake and poor bioavailability diets.
- Functional improvement of taste following zinc supplementation.
- Suggestive clinical signs such as delayed sexual maturation and dermatitis.
- Low plasma zinc levels: < 10.7 µmol/L.

Iodine deficiency disorders (IDD)

- Intake of non-iodized salt or poorly iodized salt.
- High intake of foods that inhibit iodine absorption and use of goitrogens (i.e. cassava leaf, kale, cabbage).
- Low urinary iodine levels (iodine intake during the preceding meals): < 50 µg/L.
- A visibly enlarged thyroid gland (goitre), which indicates a history of previous or ongoing iodine deficiency.

Vitamin A Deficiency (VAD)

- Low intake of vitamin A and pro-vitamin A rich foods for prolonged periods of time.
- In advanced cases, presence of disorders such as night blindness (reduced ability to see in dim light) and xerophthalmia.
- Low plasma or serum concentration of retinal: < 0.35 µmol/L.

Iron deficiency

Tests for assessing iron status include serum ferritin, transferrin receptor, zinc protoporphyrin and haemoglobin. With exception of haemoglobin, these tests are seldom available. A high index of suspicion for iron deficiency is based on the following:

- Low iron bioavailable diet, or marked blood loss.
- Low haemoglobin: < 11 g/dL and haematocrit: value less than about 3 times the haemoglobin value.
- Low red blood cell volume (MCV): < 72 fL.
- Low serum ferritin: < 12 ng/mL.
- Low serum transferrin receptor < 28.1 nmol/L.

- A large proportion of small red cells and generally pale red cells under the microscope.
- Large normal coloured red cells suggest deficiencies due to folate and/or vitamin B¹².
- High zinc protoporphyrin (ZnPP): > 40 µmol/mol of Heme.

Selenium deficiency

- Low intake and poor bioavailability diets.
- Low plasma or serum concentration of selenium: < 0.58 µmol/L.

Albumin

- Serum albumin testing indicates the adequacy of protein intake and can be included in routine nutritional assessments of PLWHA who are free from acute infections.
- Low plasma or serum concentration of albumin < 3.5 g/dL.

Cholesterol and triglycerides

- Fasting lipid profile (i.e. serum cholesterol and triglycerides) is a useful marker of nutritional status of PLWHA. Changes in lipid profiles may result from use of Efavirenz and other protease inhibitor ARVs.
- The desirable upper limit for total cholesterol and triglycerides is 5.2 mmol/L and 1.7 mmol/L respectively. The upper limit for low density lipoprotein is 3.4 mmol/L while the desirable lower limit for high density lipoprotein (HDL cholesterol) is 0.9 mmol/L.

4.3 Clinical Assessment

Clinical assessment, consisting of current and past medical history and related clinical examination, is vital in gauging nutritional risk. Of importance are the following:

- Illnesses and deficiencies that may be aggravated by HIV infection or its consequences. For example, oral and pharyngeal infections that reduce food intake, and chronic diarrhoea caused by gastrointestinal OIs (like *Mycobacterium avium* complex, bacterial pathogens such as *Salmonella*, *Cryptosporidium*, microsporidia, *Isospora*, *Giardia*, *Entamoeba*, *Clostridium difficile*) that induce malabsorption of nutrients and destabilize nutritional status.
- Drugs and/or traditional therapies that the client is taking for long-term treatment may have side effects that have a negative impact on nutritional status.
- Clinical staging of the disease.

Malabsorption can be evaluated by conducting specific laboratory tests, including 3-day faecal fat measurements and/or D-xylose absorption assessments. A common feature of malabsorption is steatorrhea (loose stool). A client generally reports several daily episodes of diarrhoea and may have associated vitamin B¹² deficiency. Diarrhoea is defined as passing watery stool more than three times a day.

Assessment for Fat Redistribution Syndromes

The common and prominent signs of lipodystrophy (redistribution of fat stores) include facial and limb fat wasting, central and/or localized fat deposits, and visceral fat accumulation. Localized fat accumulation may include enlarged breast in both men and women (see Chapter 7) and elevated blood triglycerides and total cholesterol. Lipoatrophy syndrome is the predominant loss of subcutaneous fat and leads to a loss in total body weight, also a side effect of HAART.

4.4 Dietary Assessment

Dietary assessment is a proxy indicator of a client's nutrient intake and risk of energy and nutrient deficiency.

- Assessment of a client's food intake is based on 24-hour recall, or by having a client record food consumed over three consecutive days. The aim is to assess the amount and frequency of foods consumed that are rich in key nutrients (e.g. animal proteins, fortified foods, vegetables, fruits, water intake), and also to assess intake of foods that may be harmful to the body (e.g. alcohol, strong teas and coffee, soda).

A PLWHA whose weight has unintentionally declined in two or more consecutively months (or has lost more than 5% of their usual weight in two to three months) should have a dietary assessment conducted by a qualified dietician/nutritionist, with a related assessment of the causes of any reduced food intake.

- If a deficit dietary intake is determined, identify the underlying factors. The causes may be poor appetite, pain from sickness, co-existent gastrointestinal disease; and/or psychiatric disorders including depression, use of non-prescriptive drugs and alcohol; or dietary restrictions mandated by HAART. Food attitude, food insecurity, availability of water and fuel, and strength required to prepare food are other factors that could affect food intake among PLWHA.
- Food intolerance: Many PLWHA are unable to properly digest nutrients because of damage to the gut. They may be intolerant to lactose, for example (the sugar primarily found in milk and milk products). Lactose intolerance can cause a variety of digestive symptoms including stomach pain, bloating and diarrhoea. Lactose intolerance is diagnosed solely on symptoms and relief of those symptoms when dairy products are avoided. Soy milk and commercial lactase enzyme replacement (lactaid) added to dairy products should be recommended. Consumption of small amounts of milk or dairy products taken with meals may be better tolerated.

Interventions to Support Adequate Dietary Intake

- Educate clients on food, diet, nutrition and healthy eating so they can make the best choices from their available options. Explain the reasons for taking 10% or 20% to 30% extra energy; balanced and adequate protein; and micronutrients in the diet (see Chapter 3).

- Assist clients on how to make decisions to meet their nutritional requirements and build their capacity to implement their decisions (see Chapter 3).
- A client with clinical manifestations of deficiency of any nutrient should be given nutritional advice, supplements where appropriate, and/or referred to a clinician for further examination.
- In case of deficit key nutrients, recommend the following approaches:
 - Balanced dietary regimens.
 - A wholesome highly bioavailable multiple-micronutrient formulation of 1 Recommended Daily Allowance. On average, therapeutic supplementation for three months may adequately address a deficiency. This should continue for about three more months as preventive supplementation, or longer depending on the adequacy of dietary intake.
 - Always keep detailed records of observations and actions for each client. Refer to these records every time you review the client.

Common causes of reduced food intake and actions to take are detailed in Table 4.1.

If the cause of reduced intake is:	Then take this action:
Diseases and/or inability to eat.	<ul style="list-style-type: none"> • If OIs, refer the client for appropriate treatment of the infections. • For psychological disorders including depression, refer to counseling; provide reassurance and hope. • For medical toxicity in patients on HAART, counsel the patient. • Counsel if taking non-prescribed substances or too much alcohol. • Refer persistent cases for medical care.
Poor attitude on food intake or taboos that affect food intake in sickness.	<ul style="list-style-type: none"> • Provide nutrition counselling to both the client and care-givers to change attitude and any eating taboos.
Complex medical regimens (for treatment of OI or ARVs, renal disease, pancreatitis).	<ul style="list-style-type: none"> • Assist clients in making a plan for daily intake of foods that are locally available and meet nutritional needs. • Advise caregivers of PLWHA to regularly supervise their meals to ensure adequate food consumption.
Unavailability of food in the household, or not able to prepare food due to illness	<ul style="list-style-type: none"> • Refer "food insecure" client for supplementary food support or programs. • Refer or provide client with ready to use therapeutic food.
Voluntary intake is not possible due to disease.	<ul style="list-style-type: none"> • Enteral or parenteral feeding routes can be used by health staff to stabilize and improve nutrition status of the subject.
All PLWHA	<ul style="list-style-type: none"> • Advise PLWHA to drink at least eight glasses of clean and safe water every day. • Provide them with user-friendly, up-to-date pamphlets and literature on nutritional care. • Refer them to providers who address the comprehensive 'holistic' needs of PLWHA.

Table 4.1: Management of Common HIV-Related Problems

4.5 Assessing Living Environment

The environmental and psychosocial assessment will identify factors that might be supporting or weakening the resolve of PLWHA. Assessment of a client's living environment should accompany the nutritional management of PLWHA.

Educate and counsel PLWHA to change unfavourable lifestyle habits that may affect food intake and nutrient absorption and utilization, and to adopt a healthy living lifestyle.

4.5.1 Interventions to Support Good Sanitation

Assessment of:	Interventions
Personal hygiene, sanitation, housing environment, and food handling practices that affect susceptibility to infection.	<ul style="list-style-type: none"> • Always wash and rinse fresh fruits and vegetables in clean water or clean with mild disinfectants, and thoroughly rinse with clean water. ⁱ • Practice good hygiene, especially hand washing with soap and thoroughly rinsing before preparing and consuming meals and after visiting the toilet. • Store food appropriately to prevent contamination of food by bacteria and moulds. • Avoid eating any food that may seem spoilt, e.g. mouldy foods or stale left overs, even if they are reheated. • Avoid spending long hours in crowded rooms, poorly ventilated rooms, or interacting with TB infected persons.

Table 4.2: Interventions to Improve Sanitation and Hygiene

4.5.2 Interventions to Support Positive Living

Assessment of:	Interventions
Self-esteem, social support, stigma and isolation that affect appetite and access to food.	<ul style="list-style-type: none"> • Provide nutrition counselling to the client and care-givers and educate the general public to change attitudes towards PLWHA.
Access to health care amenities that stabilize health and address concerns of PLWHA.	<ul style="list-style-type: none"> • Refer to community based support groups and/or home-based care initiatives.
Poor habits such as smoking, alcohol consumption and drug abuse that may affect food and nutrient intake; increase oxidative stress; and decrease the efficacy of some medications and immunity.	<ul style="list-style-type: none"> • Counsel PLWHA to stop consuming alcohol, smoking or chewing tobacco and using illicit drugs and substances. Smoking increases the risk of heart disease and high blood pressure. • Recommend moderation in the consumption of tea, coffee, sodas or other related drinks that may interfere with food intake, absorption and utilization.
Risky sexual behaviour of the client and partners, as this can cause re-infection with different HIV strains.	<ul style="list-style-type: none"> • Practice safer sex (use condoms) in order to avoid infecting others and to avoid infection with new strains of HIV.

Table 4.3: Interventions to Improve Positive Living

ⁱ - Effective cleaning of fruits and vegetables is achieved by soaking them in bleach preparation such as Water Guard™ (2 parts per million chlorine) for 15 minutes. Rinse them thoroughly in clean and safe water.

4.6 Physical Activity and Quality of Life

Physical activity is a fundamental way to improve physical and mental health. It improves physical fitness, lessens depression, improves appetite, relieves constipation, improves intestinal absorption, improves muscle tone and eliminates excess fat. Progressively resistant exercises reduce fat levels in blood, hence decreasing the risk of heart disease and diabetes, and improving lean body mass (LBM). Therefore the impact of physical activity leads to a better quality of life. It is recommended that service providers assess a client's level of physical activity and encourage appropriate forms of physical activity.

Interventions to Improve Physical Activity

More activity may be required for weight reduction among the overweight. However, physical activity and exercise should always be within sufficient energy intake, otherwise it may cause unwanted weight loss. Service providers should assess a client's strength, and recommend suitable and various physical activities. For example, a hand grip will assess muscle strength and this measure correlates well with muscle endurance (glycogen levels) and hydration.



Figure 4.2: Physical Activities and Exercises for PLWHA

Weak, bed-ridden and hospitalized individuals should be encouraged or assisted to carry out light exercises to strengthen their muscles and prevent bedsores. These exercises include the following:

- Leg stretch exercises: repeat bending and stretching the legs 5 to 10 times.
- Arm stretch exercises: repeatedly raise the arms over the head, then lower sideways parallel to the trunk until they meet.
- Curl ups: repeatedly bend the knees while lifting the head and shoulders forward with stretched hands. To improve the exercise efficiency, retain that position for between 5 to 10 seconds.
- Abdominal exercises: lie on back with body and legs straight to permit repeated deep breathing to expand the chest and pull the abdominal muscles.

4.7 Prompt Treatment of OIs and Management of Diet-related Symptoms

Management of Diet-related Symptoms

- Nutritional practices can help PLWHA manage symptoms of OIs such as diarrhoea, oral thrush, and fever. Nutritional practices can also help manage side effects of ARVs and other medicine used to treat nausea, vomiting, anorexia, etc. Service providers should advise PLWHA who are experiencing symptoms or side effects about nutritional practices that can help, and assist PLWHA to find feasible nutritional practices they can follow. Table 4.4 provides information about nutritional management of specific symptoms.
- Advise PLWHA to report any symptoms and side effects to a clinician, especially when severe or persistent, so the underlying infection can be treated as well as the symptoms. Nutritional management is not a substitute for medical treatment, but can supplement treatment and help to reduce the severity of symptoms and improve functioning.
- Inform PLWHA on how to manage symptoms and side effects through dietary and nutritional actions. In cases where symptoms prevent adequate food intake, nutritional practices can help manage the symptoms and improve intake. Table 4.4 below offers medical and nutritional actions to address such symptoms.

For all PLWHA with unintentional declining weight or malnutrition (BMI < 18.5 kg/m²), accompanied with chronic diarrhea (including ARV-induced diarrhea), the clinician should suspect malabsorption of essential nutrients. Actions to take include: a) treat the gastrointestinal OIs and b) supplement the patient with an energy-dense therapeutic food and provide multiple micronutrient supplements, especially and at least vitamins A and B12, zinc and calcium.

- For persistent diarrhoea induced by HAART that does not subside after several weeks, the clinician may consider a change in therapy if a suitable alternative is available. In most cases the clinician should consider supplementing the patient with calcium and fibre supplements.
- Altered metabolism may induce weight loss, because of ineffective or excessive use of energy and other nutrients, and should be suspected in the event of acute weight loss.

The clinician must always carry out a comprehensive medical evaluation for a PLWHA presenting rapid, unintentional **weight loss ≥10%** of usual body weight within weeks to two months; for example, a 55 kg person who has lost more than 5.5 kg over a two month period. Such weight loss is commonly associated with a life-threatening opportunistic infection or neoplasm.

Problem	Potential Causes	Interventions
Anaemia (pale hands and fingernails)	<ul style="list-style-type: none"> • Lack of adequate iron (or blood) in the body • Malabsorption of B12 • Illness like malaria, worm infestation • Side-effects of some ARVs (zidovudine or lamivudine) 	<ul style="list-style-type: none"> • Ensure they are treated for malaria and were dewormed in the last 4 to 6 months. • If taking Zidovudine or Lamivudine, you should recommend haemoglobin assessment at least once a year. <p>Recommend:</p> <ul style="list-style-type: none"> • Increased consumption of: <ul style="list-style-type: none"> ◦ animal protein (red meat) ◦ dark green vegetables, especially ◦ traditional vegetables ◦ fruits rich in vitamin c, e.g. citrus ◦ fruits, mangoes • Reduced consumption of tea, coffee after meals. • Iron/folate and B12 supplementation.
Anorexia (loss of Appetite)	<ul style="list-style-type: none"> • Side effects of medication • Chronic infections (e.g. OIs of the oral cavity, upper gastrointestinal tract, endocrine or central nervous system, especially if CD4<200) • Active substance abuse • Monotonous meals • Stress, anxiety, depression • Noxious smells 	<ul style="list-style-type: none"> • Recommend: <ul style="list-style-type: none"> ◦ Small frequent meals. ◦ Energy and nutrient-dense foods ◦ Eat favourite foods ◦ Nutritious snacks between meals and plenty of fluids ◦ Avoid smoking and alcohol. ◦ Eating in the company of friends or relatives • Advise simple exercise, if possible. Provide or prescribe multivitamins (e.g. vitamin B) • Prescribe appetite stimulants/drugs (Megesterol acetate and Dronabinol) for short term use and under the supervision of a qualified clinician. • If related to depression or another psychological condition, refer to a counselor or psychiatrist.
Constipation (irregular passage of stool, or passing too small and hard stool)	<ul style="list-style-type: none"> • Side effects of medication. Eating highly processed, refined foods with little fibre and fluids 	<p>Recommend:</p> <ul style="list-style-type: none"> • Maintain a regular eating schedule and don't skip meals. • Drink plenty of fluids (about 8 glasses/day), especially if on diuretics. • Eat foods high in fibre e.g. whole meal bread, vegetables and fruits, oats, nuts and avoid highly refined foods. • Exercise as much as possible. • Avoid laxatives as they cause loss of fluids from the body • <i>If dietary fibre does not resolve the problem you may prescribe fibre supplementation (e.g. methylcellulose or psyllium).</i>

Table 4.4 Nutritional Management of Specific HIV/AIDS Related Symptoms

Problem	Potential Causes	Interventions
Diarrhoea	<ul style="list-style-type: none"> Bacterial, viral, or fungal infections (because of poor hygiene, waterborne OIs) Effects of HIV on the gut Side effects of medication Food poisoning Mal-absorption of nutrients e.g. lactose, fats, sugars Intolerance of nutrients e.g. lactose 	<ul style="list-style-type: none"> Advise to drink plenty of fluids (boiled water, soups, herbal teas) Provide ORT solution or if unavailable, advise how to make it (1 litre boiled water, 4 tsp. sugar, ½ tsp. salt) Assess and advise on food/water safety and personal hygiene to ensure it is not cause of diarrhoea. Advise to continue feeding during and after illness. Treat for bacterial, viral and fungal infections. Identify whether diarrhoea is an effect of drugs. <p>Recommend:</p> <ul style="list-style-type: none"> Small frequent meals, with plenty of fibre from fruits and vegetables (e.g. mangoes, pawpaw, pears, oats, carrots, pumpkins, potatoes). Foods rich in potassium, e.g. bananas. Avoiding alcohol. If there is blood in the diarrhoea or if symptoms persist, advise to immediately seek medical care. <p><i>If diarrhoea is chronic and nutrition interventions are not effective, refer for mal-absorption tests (e.g. D-Xylose Absorption test, 3 day faecal fat measurements), and lactose intolerance tests.</i></p>
Dry Mouth	<ul style="list-style-type: none"> Effect of disease or medication Eating very salty, dry foods like nyama choma; or drinking a lot of caffeinated drinks 	<ul style="list-style-type: none"> Advise to <ul style="list-style-type: none"> rinse mouth with warm salted water avoid very hot foods, sweets, caffeinated drinks like coffee, strong tea, sodas avoid alcohol
Fatigue (tired, lethargy/general body weakness)	<ul style="list-style-type: none"> HIV-infection Side-effect of medication Stress caused by the virus Depression and anxiety Malnutrition (inadequate intake of food) Anaemia Hormonal changes (e.g. testosterone and thyroid) caused by HIV-infection Loss of body muscle 	<ul style="list-style-type: none"> Discuss possible causes of fatigue. <p>Recommend:</p> <ul style="list-style-type: none"> Eat snacks between meals. Eat high energy and protein foods: bananas, nuts, yoghurt. Eat ready-to-eat foods from shops where possible. Some exercise to increase energy. Stretching. Rest, with ready-to-eat food kept in closed containers next to the bed. Drink plenty of safe water. <p><i>If symptoms persist. Recommend haemoglobin test.</i></p> <p><i>If you suspect psychological factors, refer for psychosocial care.</i></p>

Table 4.4 Nutritional Management of Specific HIV/AIDS Related Symptoms

Problem	Potential Causes	Interventions
Fever	<ul style="list-style-type: none"> • Disease (HIV, especially at high viral loads; malaria; ARIs, OIs) 	<ul style="list-style-type: none"> • Advise to seek immediate care (have malaria and other OIs promptly treated). • Advise to drink plenty of fluids (safe water). • Eat foods rich in energy, like groundnuts, millet/maize porridge. • Rest in an area that is well ventilated and with cool air.
Mouth sores/ thrush	<ul style="list-style-type: none"> • Infection • Antibiotic therapy 	<p>Recommend:</p> <ul style="list-style-type: none"> • Good oral hygiene and gargling with a pinch of salt in warm water (lemon juice can be used). • Eat garlic or drink raw garlic tea to relieve the pain. • Eat fermented foods like yoghurt. • Eat mashed, soft, smooth foods at room temperature. • Drink fluids with a straw to ease swallowing. • Avoid spicy, sugary and acidic foods and drinks. • Avoid alcohol and cigarettes. <p><i>Advise to seek medical treatment if the patient can't swallow food; if there is a burning pain in the chest; or deep pain on swallowing.</i></p>
Muscle wasting / Weight loss	<ul style="list-style-type: none"> • Effect of disease • Inadequate intake or poor quality diet • Malabsorption • Disturbance in utilization of the nutrients (due to chronic infections) • Side-effects of certain drugs (lipodystrophy) • Hormonal changes in the body (e.g. testosterone and thyroid) 	<ul style="list-style-type: none"> • Refer for ARV assessment if Body Mass Index is less than 16.5. • Advise to prevent infections and treat infections promptly. • Assess possible causes of weight loss. • If due to dietary intake, recommend: <ul style="list-style-type: none"> ◦ Eating balanced meals and increase quantity of intake ◦ Improving nutrient density of food by adding peanut butter, skimmed milk or eggs in porridge or soups ◦ Taking snacks that are nutrient rich between meals, ◦ Eating favourite foods • Advise simple exercises (walks) to improve muscle. • Weigh client at least every 2 months. <p>Refer for assessment of hormonal replacement, or use of steroids to restore body weight and body cell mass.</p>

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Problem	Potential Causes	Interventions
Nausea and vomiting (feeling of vomiting when supposed to be eating)	<ul style="list-style-type: none"> • Infections (including malaria, candidiasis, etc.) • Side effects of medication • Food with strong aromas • Food intolerance • Food poisoning 	<p>Recommend:</p> <ul style="list-style-type: none"> • Take small quantities of dry, bland or lightly salted foods (bread or toast), and boiled foods at frequent intervals. • Take plenty of fluids after meals such as diluted fruit juice, or water especially with lemon. • Sucking a lemon: the sour taste reduces nausea. • Avoid greasy, fried foods and foods with strong odour. • Avoid coffee and alcohol. <p>If vomiting continues for more than a day; if there is blood in the vomit; or if there is fever, the client must seek medical care.</p>
Overweight	<ul style="list-style-type: none"> • Energy intake is more than needs • Side-effects of medication • High levels of fat in the blood, also a side-effects of certain ARVs. 	<ul style="list-style-type: none"> • Assess possible cause. • Advise exercise (or physical activity) at least three times a day. • Advise reduced portions of food. Recommend a variety of foods and limit foods high in fat, sugars and sweetened foods/fluids. <p>Recommend regular weight monitoring to detect early unhealthy weight gain.</p>
Taste Changes (changes in taste of food, food tastes too sweet or too salty)	<ul style="list-style-type: none"> • Side effects of medication • Poor nutrition • Common cold or flu • Malaria 	<p>Recommend:</p> <ul style="list-style-type: none"> • Good oral hygiene (e.g. rinsing mouth after meals) • Seasoning food for flavour and different varieties of foods. • Chew food well and move around in mouth to stimulate taste buds. • Use lemon, tonic water, vinegar or raw tomatoes to stimulate the taste buds. • Take small sips of liquid between meals

Table 4.4 Nutritional Management of Specific HIV/AIDS Related Symptoms

4.8 Nutritional Management of Acute HIV/AIDS Malnutrition

Patients with acute HIV/AIDS-related malnutrition are categorized by their inability to eat; their appetite changes; and the degree of gut impairment or inability to absorb nutrients. For these individuals, therapeutic nutrition interventions should be provided to reverse or prevent the worsening of malnutrition. The options available are voluntary oral sip feeding and non-voluntary therapeutic enteral and parenteral nutrition services. The service provider must ensure that the food contains nutrients in adequate amounts.

Sip feeding: This is suitable for severely malnourished and weak individuals who have an appetite and are able to feed. Sip feeding may also be used to supplement total nutrient intake. Foods for special medical purposes (FSMP) such as high-energy formulations (therapeutic milk – f75, f100 TM, BP100TM, NutrenTM, Plumpy nutTM, and FreseniusTM) among others may be used.

Enteral feeding: Enteral feeding is recommended for individuals who cannot take food or liquid orally. Enteral feeding is a type of nutritional support using liquid formula diets through naso-gastric tube feeding; a surgically introduced tube to the stomach (gastrostomy tube); or jejunum (jejunostomy tube). Enteral feeds may be commercial preparations indicated under sip feeds or blended mixtures prepared from regular foods. Enteral feeding can also be used as a supplement to normal oral or sip feeding.

Parenteral feeding: Parenteral feeding (intravenous feeding) is recommended when the gastrointestinal tract is non-functional for example:

- Preparation for surgery,
- Severe protein-energy malnutrition, or
- Serious restrictions of oral feeding due complications such as:
 - profound anorexia,
 - intolerance to enteral nutrition,
 - severe diarrhoea,
 - AIDS enteropathy,
 - intractable vomiting,
 - acute pancreatitis,
 - major oral-pharyngeal lesions or
 - neurological disorders.

Parenteral route may be used to stabilize and maintain nutrition and hydration status. Parenteral feeding is partial when it is used as a supplement; total parenteral nutrition is required when oral-gastric system is not practical.