



Government of Malawi  
Ministry of Health

# NUTRITION CARE, SUPPORT, AND TREATMENT (NCST) FOR ADOLESCENTS AND ADULTS

Training for Facility-Based  
Service Providers

## **PARTICIPANT'S MANUAL** **Module 2: Nutrition** **Assessment and Classification**



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## ABBREVIATIONS AND ACRONYMS

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>	greater than
≥	greater than or equal to
<	less than
AIDS	Acquired Immunodeficiency Syndrome
ANC	antenatal care
ART	antiretroviral therapy
ARV	antiretroviral drug
BMI	body mass index
BUN	blood urea nitrogen
cm	centimetre(s)
CMV	combined mineral and vitamin mix
CNA	Critical Nutrition Actions
CMAM	community-based management of acute malnutrition
CSB	corn-soya blend
dL	decilitre(s)
ES/L/FS	economic strengthening/livelihood/food security
FANTA	Food and Nutrition Technical Assistance III Project
FAO	Food and Agriculture Organization of the United Nations
g	gram(s)
Hb	haemoglobin
HIV	human immunodeficiency virus
HTS	HIV Testing Services
IU	international unit(s)
kcal	kilocalorie(s)
kg	kilogram(s)
L	litre(s)
µg	microgram(s)
mL	microlitre(s)
mg	milligram(s)
ml	millilitre(s)
mm	millimetre(s)
MOH	Ministry of Health
MUAC	mid-upper arm circumference
NCST	nutrition care, support, and treatment
OPD	outpatient department
PDSA	plan-do-study-act
PLHIV	person or people living with HIV
PMTCT	prevention of mother-to-child transmission of HIV
QA	quality assurance
QI	quality improvement
RDA	recommended daily allowance
RUTF	ready-to-use therapeutic food
TB	tuberculosis

## MODULE 2

# Contents and Duration



The **Nutrition Assessment and Classification** module takes about **4 hours** to complete.

#	Description	Duration
<b>2.0</b>	<b>Module Introduction</b> Review of Module 1 (20 minutes) Module Objectives (5 minutes)	<b>25 minutes</b>
<b>2.1</b>	<b>Nutrition Assessment Methods</b>	<b>20 minutes</b>
<b>2.2</b>	<b>Anthropometric Measurements</b>	<b>3 hours</b>
<b>2.3</b>	<b>Biochemical Assessment</b>	<b>20 minutes</b>
<b>2.4</b>	<b>Clinical Assessment</b> Clinical Assessment for Clients without SAM (25 minutes) Clinical Assessment for Clients with SAM (20 minutes)	<b>45 minutes</b>
<b>2.5</b>	<b>Dietary Assessment</b>	<b>30 minutes</b>
<b>2.6</b>	<b>Classifying Nutritional Status</b>	<b>30 minutes</b>
<b>2.7</b>	<b>Discussion and Evaluation of the Module</b>	<b>10 minutes</b>

### Learning objectives

By the end of this module, participants will be able to:

1. Take and interpret anthropometric measurements accurately
2. Conduct clinical, biochemical, and dietary assessments
3. Classify nutritional status correctly based on nutrition assessment

## Reference 2.0: NCST Competencies and Standards for Nutrition Assessment and Classification

Competence can be defined as the ability to apply knowledge and skills to produce a required nutrition outcome.

Competency standards are the range of skills that are needed to achieve a desired nutrition outcome.

Competency	Minimum Standards
Use anthropometric methods to assess and classify nutritional status	Measure weight
	Measure height
	Calculate BMI
	Look up BMI using reference tables or BMI wheel
	Look up BMI-for-age of an adolescent using reference tables or BMI wheel
	Measure MUAC
Use biochemical methods to assess and classify nutritional status	Interpret blood haemoglobin results
	Take the needed action based on results
Use clinical methods to assess and classify nutritional status	Identify medical conditions and complications that can affect nutritional status
	Conduct RUTF appetite test for a client who is severely undernourished
	Identify physical signs of wasting
	Assess and classify bilateral pitting oedema
Use dietary methods to assess food intake and respond to nutritional status	Use a 24-hour recall to assess a client's food intake
	Use findings of the dietary assessment to address nutrition-related problems

## Reference 2.1: How to Weigh Adolescents and Adults Using an Electronic Scale

Accurate weight measurement is important because errors can lead to classifying a client's nutritional status incorrectly and, ultimately, providing the wrong care. Scales should be standardised for accuracy at least once per week by weighing an object of known weight.

1. Ensure that you have a functioning weighing scale that measures weight in kilograms (kg) to the nearest 100 grams (g).

2. Place the scale on a flat surface. To turn on the scale, cover the solar panel for a second (can be covered using your foot or hand). When the number 0.0 appears, the scale is ready.



3. Ask the client to remove shoes, hats, and scarves and to empty pockets.
4. Ask the client to stand unassisted on the centre of the scale.

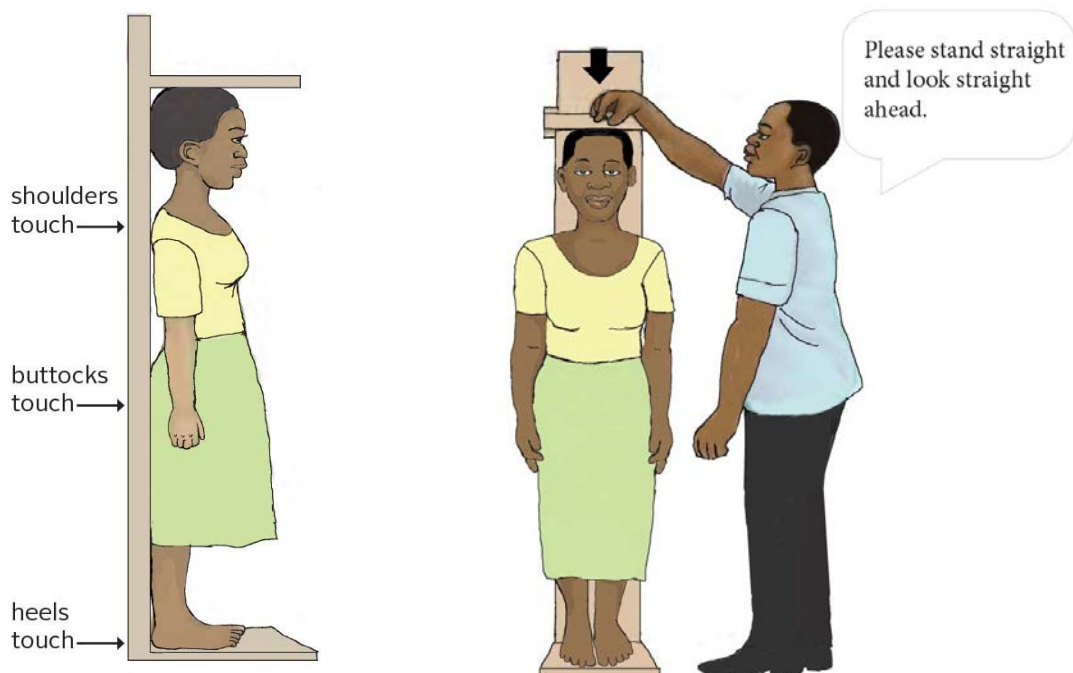
5. Read and record the weight to the nearest 100 g (0.1 kg) (for example, 62.3 kg).

## Reference 2.2: How to Measure Height for Adolescents and Adults

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Measuring the height of an adolescent or adult requires a height board or a measuring tape securely fastened to the wall and accurately marked in centimetres (cm).

1. Use a height board or fasten a non-stretchable tape measure securely to a wall.
2. Place the height board vertically against a flat surface.
3. Ask the client to remove shoes and headwear.
4. Ask the client to stand straight and look straight ahead. The client's head does not need to touch the board (or the wall if using a measuring tape).
5. Bring the moveable head piece to rest firmly on the top of the client's head.
6. Record the measurement to the nearest 0.1 cm.





## Exercise 2.1: Weight, Height, and BMI

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Name	Sex (M/F)	Pregnant (Y/N)	Weight (kg) to nearest 100 g	Height (cm)	BMI	Nutritional status
1.						
2.						

1. Did you find differences in the weight or height measurements taken by different people?
2. If so, what are the reasons for the differences?
3. What could have been done to eliminate these differences?

## Reference 2.3: Calculating Body Mass Index (BMI)

Body mass index (BMI) is a reliable indicator of body fatness and an inexpensive and simple way to measure malnutrition in **adults 19 years and above**. It does not measure body fat directly, but it correlates with direct measures of body fat. BMI below the World Health Organisation (WHO) cutoffs for normal nutritional status indicates a need for nutrition interventions to promote weight gain. A BMI above the normal cutoffs indicates the need for dietary interventions to halt or reverse weight gain.

BMI is not an accurate indicator of nutritional status in pregnant women or in adults with oedema, whose weight gain is not linked to their nutritional status. Use mid-upper arm circumference (MUAC) for these groups.

BMI is calculated as weight in kg divided by the height in square metres (m<sup>2</sup>).

- Convert cm to m (100 cm = 1 m).
- Calculate BMI using the formula below.

$$\frac{\text{Weight in kg}}{\text{Height in m}^2}$$

### Classifying Nutritional Status According to BMI (Adults)

BMI	Nutritional Status
Less than 16.0	Severe underweight
16.0 to 18.4	Moderate underweight
18.5 to 24.9	Normal
25.0 to 29.9	Overweight
30.0 or higher	Obese

Source: WHO. 1995. *Physical Status: The Use and Interpretation of Anthropometry: Report of a WHO Expert Committee*. WHO Technical Report Series 854. Geneva: WHO.

### How to use the BMI look-up tables

1. Find height in cm in the left-hand column (y axis).
2. Find weight in kg in the bottom row (x axis).
3. Find the point where the two lines meet. This is the BMI.
4. If the client's height or weight falls between values on the table, round it to the nearest kg and cm. For example, if the client weighs 28.5 kilos, round up to 29. If the client's height is 155.2 cm, round down to 155 cm.

## How to use the BMI wheel

BMI for adults is found on the front side of the BMI wheel, where the word 'Instructions' appears. The inner/smaller disc shows height. The outer/larger disc shows weight. Use the following steps to find BMI:

1. Turn the inner/smaller disc until the client's height is aligned with the client's weight.
2. Read the number that the arrow labelled 'BMI' is pointing to on the outer disc. The BMI values are coloured turquoise.
3. Look at the box at the bottom of the wheel labelled 'Nutritional status for adults 19 years and older'. Find the range that contains the client's BMI and classify the client's nutritional status.

## Exercise 2.2: Determining BMI for Adults Using Look-Up Tables

Use the **BMI reference tables** find the BMI for the clients in the table below. Write it in the BMI column.

ID	Sex	Height (cm)	Weight (kg)	BMI	Nutritional status
1	F	184	52		
2	F	148	40		
3	F	178	52		
4	M	190	68		
5	M	176	48		
6	F	156	77		
7	M	160	42		
8	M	174	84		
9	F	180	74		
10	M	164	66		

Now use the cutoffs below to add the nutritional status of each client in the last column.

### Nutritional Status According to BMI

BMI	Nutritional Status
< 16.0	Severe underweight
16.0 to 18.4	Moderate underweight
18.5 to 24.9	Normal
25.0 to 29.9	Overweight
≥ 30.0	Obese

Source: WHO. 1995. *Physical Status: The Use and Interpretation of Anthropometry. Report of a WHO Expert Committee.* Technical Report Series No. 854. Geneva: WHO.

## Reference 2.4: BMI-for-Age

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BMI-for-age is the preferred nutrition indicator for adolescents 12–18 years. Because adolescent boys and girls grow at different rates, age and sex are considered when assessing their nutritional status.

The first step in finding BMI-for-age is to calculate BMI using the standard formula, look-up tables, or BMI wheel.

### How to use the look-up tables to determine BMI-for-age

1. Find the BMI using the formula or BMI look-up tables.
2. On the BMI-for-age reference tables, find the row corresponding to the client's age. Then find the range in which the client's BMI falls.
3. Record the BMI-for-age z-score, based on the range in which the BMI falls.
4. Determine the adolescent client's nutritional status using the BMI-for-age z-score cutoffs in the table below:

#### Nutritional Status According to BMI-for-Age

BMI-for-Age Z-Score	Nutritional Status
<-3	Severe underweight
≥ 3 to < -2	Moderate underweight
≥ -2 to < +1	Normal
≥ +1 to < +2	Overweight
≥ +2	Obese

Source: WHO. 2007. *Growth Reference Data for 5–19 Years*. Available at <http://www.who.int/growthref/en/>.

### How to use the BMI wheel to determine BMI-for-age

1. Use the front side of the wheel to find the client's BMI.
2. Flip the wheel over. Turn the inner disc until the arrow labelled 'age' points to the age closest to the child's age. You may have to round up or down. For example, if a child is age 15 years and 5 months, point the arrow to 15. If the child is 17 years and 6 months, point the arrow to 18.
3. You will see two boxes on the back side of the wheel, one labelled 'Girls' and one labelled 'Boys'. Select the box based on the child's sex.
4. With the wheel still pointing to the child's age, find the number range in the 'Girls' or 'Boys' box that contains the child's BMI. Classify the child's nutritional status based on the range in which the child's BMI falls.

## Exercise 2.3: Classifying BMI-for-Age Using Look-Up Tables

Use the **Body Mass Index (BMI) reference tables** and the **BMI-for-Age reference tables for boys and girls** to find the BMI and BMI-for-age z-score for the adolescent clients in the table below. Fill in the blank columns with the answers.

ID	Sex	Age	Height (cm)	Weight (kg)	BMI	BMI-for-age z-score	Nutritional status
1	M	15 years 9 months	143	37			
2	F	15 years 9 months	152	36			
3	M	16 years 2 months	135	28.5			
4	F	15 years 1 month	147	27			

Now use the cutoffs below to add the nutritional status of each client in the last column.

### Nutritional Status According to BMI-for-Age Z-Score

BMI-for-Age Z-Score	Nutritional Status
< -3	Severe underweight
≥ -3 to < -2	Moderate underweight
≥ -2 to < +1	Normal
≥ +1 to < +2	Overweight
≥ +2	Obese

Source: WHO. 2007. *Growth Reference Data for 5–19 Years*. <http://www.who.int/growthref/en/>

## Exercise 2.4: Finding BMI and BMI-for-Age Using a BMI Wheel

Practice using the wheel to determine the BMI and nutritional status of the clients listed in the table below.

### BMI

Height (cm)	Weight (kg)	BMI	Nutritional status
184	52		
148	40		
178	50		
190	68		
176	48		
172	94		

Practice using the wheel to determine the BMI and nutritional status of the adolescents listed in the table below.

### BMI-for-Age

Sex	Age (years and months)	Height (cm)	Weight (kg)	BMI	Nutritional status
F	16 yrs., 2 mo.	150	43		
M	17 yrs., 3 mo.	160	43.2		
F	15 yrs., 7 mo.	145	38		
M	18 yrs., 4 mo.	155	36		
M	15 yrs., 1 mo.	148	35.5		
F	17 yrs., 6 mo.	146	55		
M	16 yrs., 2 mo.	147	45		
F	17 yrs., 7 mo.	176	45		

## Reference 2.5: Calculating Weight Loss

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Unintentional weight loss is a sign of a medical or dietary complications and can be an independent indicator of malnutrition. Clients who unintentionally lose 5–10% of their weight are classified as ‘moderately undernourished’, and clients who unintentionally lose more than 10% of their weight are considered to be ‘severely malnourished’.

A client’s weight should be taken at every visit. If the client has lost weight unintentionally, use the formula below to determine how much weight the client has lost.

**Formula for Calculating Percentage of Weight Lost**  
(Previous Weight – Current Weight)  
----- X 100  
Previous Weight

Example  
**Step 1:** 80-74 = 6  
**Step 2:** 6 ÷ 80 = 0.075  
**Step 3:** 0.075 x 100 = 7.5%  
**Answer:** 7.5%

## Exercise 2.5: Calculating Weight Loss

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Use the formula in **Reference 2.5** to calculate the percentage of weight lost by the five clients in the table.

Client #	Weight at First Visit (kg)	Weight at Second Visit kg)	% Weight Lost
1	62	57	
2	50	45	
3	79	75	
4	81	73	
5	56	50	



## Reference 2.6: Measuring Mid-Upper Arm Circumference

Mid-upper arm circumference (MUAC) is the circumference of the left upper arm measured at the midpoint between the tip of the shoulder and the tip of the elbow, using a measuring or MUAC tape.

Use MUAC to measure:

- Pregnant and post-partum women
- Adolescent or adult clients who are unable to stand up to have weight and height measured or clients who have bilateral pitting oedema.

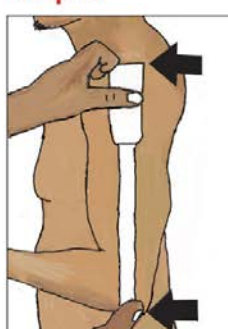
### 1. Find midpoint of upper arm

Step 1a



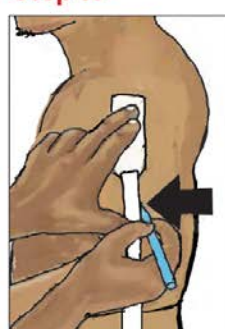
Always use left arm. Bend arm to a 90 degree angle. Find arm endpoints at the tip of the shoulder and tip of the elbow.

Step 1b



Use thumbs to place tape at endpoints.

Step 1c



Make a mark on the arm's midpoint

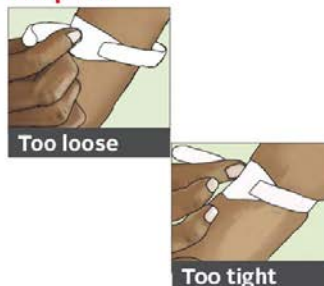
### 2. Measure circumference

Step 2a



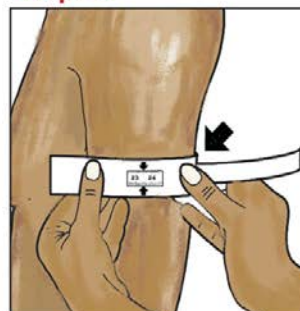
Straighten the arm. Wrap the tape around the mid-point and thread it through the window.

Step 2b



Adjust the tension of the tape so that it is not too tight or too loose.

Step 2c



Record the measurement in mm where the arrows point inward.

### 3. Classify

Group	Severe underweight	Moderate underweight	Normal nutritional status
Adolescents 15–18 years	< 185 mm (< 18.5 cm)	185 to 219 mm (18.5 to 21.9 cm)	≥ 220 mm (≥ 22.0 cm)
Adults*	< 190 mm (< 19.0 cm)	190 to 219 mm (19.0 to 21.9 cm)	≥ 220 mm (≥ 22.0 cm)

\* includes pregnant and lactating women

## Exercise 2.6: Measuring MUAC

Measure and record the MUAC of each group member. Record all measurements of each person taken by the group. Afterward, compare the measurements and discuss any differences.

Name of person being measured	Measurement 1	Measurement 2	Measurement 3	Measurement 4

## Reference 2.7: Pregnancy Weight Gain

Inadequate weight gain during pregnancy is associated with low birth weight, preterm delivery, and intrauterine growth retardation. Women who gain too much weight during pregnancy are also at increased risk for complications during delivery and adverse outcomes. While MUAC takes time to respond to changes in nutritional status, tracking weight changes between visits allows the health worker to easily identify pregnant women who are at risk of malnutrition and who have a higher risk of delivering a preterm or low-birth-weight baby.

At the first antenatal care visit, weight gain targets should be set for each woman based on her MUAC. Pregnant and lactating women should be weighed at every visit, and their average weight gain per month should be determined.

Pre-pregnancy MUAC or MUAC during the first trimester	Recommended total weight gain
< 220 mm	13–18 kg
≥ 220 mm to 299 mm	11–16 kg
≥ 300 mm	7–11 kg

- Healthy women (MUAC ≥ 220 mm–299 mm) should gain about 11–16 kg during pregnancy. Women who gain less than 1 kg per month should be referred for additional assessment and intervention.
- Undernourished women (MUAC < 220 mm) who gain less than 2 kg per month should be referred for additional assessment and intervention.

## Reference 2.8: Laboratory Tests for Nutrition

Test	Normal results	Low number	High number
<b>Metabolic tests</b>			
Glucose	70–99 mg/dL	Hypoglycaemia, liver disease, adrenal insufficiency, excess insulin	Hyperglycaemia, certain types of diabetes, pre-diabetes, pancreatitis, hyperthyroidism
Blood urea nitrogen (BUN)	7–20 mg/dL	Undernutrition	Liver or kidney disease, heart failure
Creatinine	0.8–1.4 mg/dL	Low muscle mass, undernutrition	Chronic or temporary decrease in kidney function
BUN/creatinine ratio	10:1 to 20:1	Undernutrition	Blood in bowels, kidney obstruction, dehydration
Calcium	8.5–10.9 mg/dL	Calcium, magnesium, or vitamin D deficiency; undernutrition; pancreatitis; neurological disorders	Excess vitamin D intake, kidney disease, cancer, hyperthyroidism
Protein	6.3–7.9 g/dL	Liver or kidney disease, undernutrition	Dehydration, liver or kidney disease, multiple myeloma
Albumin	3.9–5.0 g/dL	Liver or kidney disease, undernutrition	Dehydration
Alkaline phosphatase	44–147 IU/L	Undernutrition	Paget’s disease or certain cancers that spread to bone, bile duct obstruction, liver cancer
Alanine amino-transferase	8–37 IU/L	Generally not a concern	Certain toxins such as excess acetaminophen or alcohol, hepatitis
<b>Blood tests</b>			
White blood cell count	4,500–10,000 cells/mcL	Autoimmune illness, bone marrow failure, viral infections	Infection, inflammation, cancer, stress, intense exercise
Red blood cell count	Male: 4.7–6.1 Mill/mcL Female: 4.2–5.4 Mill/mcL	Iron, vitamin B12, or folate deficiency; bone marrow damage	Dehydration, renal problems, pulmonary or congenital heart disease
Haemoglobin (Hb)	Male: 13.0–17.2 g/dL Female: 12.0–15.1 g/dL Pregnancy: ≥11.0	Iron, vitamin B12, or folate deficiency; bone marrow damage	Dehydration, renal problems, pulmonary or congenital heart disease
Haematocrit	Male: 40.7%–50.3% Female: 36.1%–44.3%	Iron, vitamin B12, or folate deficiency; bone marrow damage	Dehydration, renal problems, pulmonary or congenital heart disease
Mean corpuscular volume	80–95 femtolitres	Iron deficiency	Vitamin B12 or folate deficiency
Mean corpuscular Hb	27–31 picograms	Iron deficiency	Vitamin B12 or folate deficiency
Platelet count	150,000–400,000/mcL	Viral infections, lupus, pernicious anaemia (due to vitamin B12 deficiency)	Leukaemia, inflammatory conditions
Note: Reference numbers are not standardised, and numbers may vary from lab to lab.			
<b>Stool sample analysis</b>			
Helminth (hookworm and ascaris) infection			Anaemia

## Reference 2.9: Clinical Nutrition Assessment of Adolescents and Adults

Step 1. Ask about medical conditions and dietary issues		
ASK/LOOK	If YES	Implication
1. Have you noticed any weight change lately?	<p>Look for signs of severe wasting:</p> <ul style="list-style-type: none"> <li>Loss of muscle bulk around the shoulders, arms, ribs and legs. Is the outline of the ribs clearly visible? Are the hips small compared with the chest and abdomen?</li> <li>Sagging skin (sometimes looking like baggy pants)</li> </ul>	Unintended weight loss is a sign of illness.
2. How have you been feeling lately?	<p>Ask whether the client has had:</p> <ul style="list-style-type: none"> <li>Active tuberculosis (TB) (first 3 months of treatment)</li> <li>Chronic diarrhoea (for more than 7 days)</li> <li>Other chronic opportunistic infections (OIs)</li> <li>Oesophageal infections/tumours</li> </ul>	Illness may be the cause of malnutrition and may need to be treated first.
3. Have you had any uncomfortable symptoms lately?	<p>Ask whether the client has had:</p> <ul style="list-style-type: none"> <li>Nausea or vomiting</li> <li>Persistent fatigue</li> <li>Mouth sores, thrush, or difficulty swallowing</li> <li>Dental problems</li> <li>Dry or flaking skin</li> <li>Swollen gums</li> <li>Anorexia/poor appetite</li> </ul>	<p>Many of these symptoms can be managed through diet.</p> <p>Many of these symptoms are signs of or risk factors for malnutrition.</p>
4. How has your appetite been? How are you eating?	Do a dietary assessment using a 24-hour recall.	Assess whether poor food intake may be causing malnutrition.
5. Have you noticed changes in body composition or fat distribution?	Ask whether the changes include thinning limbs and face or enlargement of the face, stomach, breasts or back.	These are side effects of antiretroviral drugs (ARVs) that should be referred to a clinician.
6. Are you taking any medication?	<p>Find out what medications the client is taking.</p> <p>Find out whether the client is taking any nutrition supplements or herbal or other remedies.</p>	<p>Drug side effects may affect ability to eat, change body composition, and cause anaemia.</p> <p>Supplements and herbal remedies should be approved by medical personnel to ensure safety.</p>

## Step 2. Examine for signs of nutritional deficiencies.

(A nurse or clinician should do medical assessments and record all results in the client's record.)

ASK/LOOK	If YES	Implication
<b>1. Check for medical complications.</b>	Medical complications <ul style="list-style-type: none"> <li>• Bilateral pitting oedema</li> <li>• Severe dehydration</li> <li>• High fever (<math>\geq 38.5^{\circ}\text{C}</math>)</li> <li>• Difficult or rapid breathing or increased pulse rate</li> <li>• Convulsions</li> <li>• Severe anaemia</li> <li>• Mouth sores or thrush</li> <li>• Hypothermia (temperature <math>&lt; 35^{\circ}\text{C}</math>)</li> <li>• Hypoglycaemia</li> <li>• Extreme weakness</li> <li>• Opportunistic infections</li> <li>• Extensive skin lesions</li> </ul>	Clients with severe undernutrition, medical complications, and no appetite must be admitted for inpatient treatment of severe undernutrition.  Clients with severe undernutrition, appetite, and no medical complications can be treated for severe undernutrition as outpatients.
<b>2. Assess for bilateral pitting oedema on both legs.</b>	Rule out non-nutritional causes of oedema such as pre-eclampsia, severe proteinuria, nephritic syndrome, nephritis, acute filariasis, heart failure, and wet beriberi.  No oedema = Grade 0 Bilateral pitting oedema <ul style="list-style-type: none"> <li>• In both feet below the ankles = Grade + (mild)</li> <li>• In both feet and legs below the knees = Grade ++ (moderate)</li> <li>• In both feet, legs, arms, and face = Grade +++ (severe)</li> </ul>	Bilateral pitting oedema in adults may be a sign of severe undernutrition.
<b>3. Conduct appetite test with ready-to-use therapeutic food (RUTF) if the client is severely undernourished.</b>	Conduct RUTF appetite test for all severely undernourished clients: <ul style="list-style-type: none"> <li>• If client passes appetite test, treat for severe undernutrition in outpatient care.</li> <li>• If client fails appetite test, refer for treatment of severe undernutrition in inpatient care.</li> </ul>	Poor appetite can cause further deterioration of a client's nutritional status.

## Reference 2.10: Conducting an Appetite Test

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Give all clients with severe undernutrition an appetite test to find out whether they can eat ready-to-use therapeutic food (RUTF) in outpatient care.

1. Ask the client to wash his or her hands with soap and running water.
2. Take the client to a quiet, private area.
3. Give the client a packet of RUTF and demonstrate how to open it and eat it from the packet or with a spoon.
4. Do not force the client to eat the RUTF.
5. Offer plenty of boiled or treated drinking water to the client while he or she eats the RUTF.
6. Watch to see how much the client eats in about 30 minutes.

Minimum amount of RUTF the client should eat to pass the appetite test	
Weight (kg)	Packets
15.0–29.0	$\frac{3}{4}$
$\geq 30.0$	$> 1$

7. If the client has no appetite, try giving smaller amounts every 10–15 minutes.
8. If the client does not pass appetite test, refer the client for treatment of severe undernutrition in inpatient care. If the client passes the appetite test, provide treatment for severe undernutrition in outpatient care.

## Reference 2.11: How to Assess for Bilateral Pitting Oedema

Bilateral pitting oedema is oedema in both feet in which pressure on the skin leaves a depression in the tissues. Bilateral pitting oedema, also called nutritional oedema, may be a sign of severe undernutrition. It can be used to diagnose severe undernutrition regardless of a client's BMI or MUAC if non-nutritional causes of oedema are ruled out. Any client with bilateral pitting oedema should be carefully assessed for other signs of severe undernutrition to determine if the oedema is a result of severe undernutrition. Bilateral pitting oedema is more common in young children than in adolescents or adults.

Oedema in adults may be a sign of other medical problems. Adults with oedema should be referred for a thorough medical examination to rule out causes of oedema not related to nutrition.

### To assess for bilateral pitting oedema:

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

### Grades of Bilateral Pitting Oedema

Grade	Definition
Absent or 0	No bilateral pitting oedema
Grade +	Mild (in both feet)
Grade ++	Moderate (in both feet plus lower legs, hands, and/or lower arms)
Grade +++	Severe (generalised, including both feet, legs, arms, and face)

## Reference 2.12: 24-Hour Recall Dietary Assessment Form

**Step 1: What did you eat in the last 24 hours** (*from when you woke up yesterday in the morning to when you woke up this morning*)?

Time	Food or drink*	Amount eaten or drunk	Is this unusual? Take notes in this column if unusual intake.

\* Include both foods eaten alone and foods combined in a dish (e.g., soup or stew).

Use the questions below to probe for information on foods eaten in the last 24 hours.

- What was the first thing you ate or drank when you got up in the morning?
- Do you remember anything else you ate or drank?
- Did you eat the food plain or put something else on it?
- While you were working, did you take a break to eat or drink something?
- What foods do you especially like or dislike?
- If you were sick during the 24 hours, how did that affect your eating?



**Step 2: Ask if what or how much they ate yesterday is different than what they usually eat and, if so, why.**

Changes in normal diet could be due to a holiday, a special occasion, illness, or lack of food in the house.

**Step 3: Analyse the client's overall food intake in the last 24 hours to identify problems and offer possible recommendations.**

1. Was the quantity of food or drink consumed adequate?
2. Did the client consume an appropriate amount of food from the various food groups?
3. What are the reasons for inadequate food intake: illness, poor appetite, or other?
4. Does the client have food allergies or intolerance?
5. What simple adaptations could be made to the client's usual diet to improve nutrition or reduce nutrition-related problems?

## Reference 2.13: Classifying Nutritional Status of Adolescents 15–18 Years and Adults ≥ 19 years

### Normal nutritional status

Adolescents 15–18 years (non-pregnant and non-post-partum)

**BMI-for-age z-score:**  $\geq -2$  to  $+1$

**Or MUAC:**  $\geq 220$  mm (22.0 cm)

Adults  $\geq 19$  years (non-pregnant and non-post-partum)

**BMI:** 18.5 to 24.9

**Or MUAC:**  $\geq 220$  mm (22.0 cm)

Pregnant women and lactating women up to 6 months post-partum

**MUAC:** 220 to 299 mm

Follow care plan for maintaining **normal nutritional status.**

### Moderate undernutrition

Adolescents 15–18 years (non-pregnant and non-post-partum)

**BMI-for-age z-score:**  $\geq -3$  to  $< -2$

**Or MUAC:** 185 to 219 mm (18.5 to 21.9 cm)

**Or** unintentional weight loss of 5%–10%

Adults  $\geq 19$  years (non-pregnant and non-post-partum)

**BMI:** 16.0 to 18.4

**Or MUAC:** 190 to 219 mm (19.0 to 21.9 cm)

**Or** unintentional weight loss of 5%–10%

Pregnant women and lactating women up to 6 months post-partum

**MUAC:** 190 to 219 mm (19.0 to 21.9 cm)

**Or weight gain:** Less than 1 kg per month since the last visit

Follow care plan for managing **moderate undernutrition.**

### Severe undernutrition

Adolescents 15–18 years (non-pregnant and non-post-partum)

**BMI-for-age z-score:**  $< -3$

**Or MUAC:**  $< 185$  mm (18.5 cm)

**Or** unintentional weight loss of more than 10%

**Or** presence of bilateral pitting oedema

Adults  $\geq 19$  years (non-pregnant and non-post-partum)

**BMI:**  $< 16.0$

**Or MUAC:**  $< 190$  mm (19.0 cm)

**Or** unintentional weight loss of more than 10%

**Or** presence of bilateral pitting oedema without other medical cause

Pregnant women and lactating women up to 6 months post-partum

**MUAC:**  $< 190$  mm (19.0 cm)

**Or** any weight loss

If **NO** severe complications or no oedema or has oedema + or ++, and passed appetite test, follow care plan for managing severe undernutrition without medical complications in outpatient care. **Conduct thorough examination to rule out other causes of oedema.**

If severe complications or oedema +++ or failed appetite test, follow care plan for managing severe undernutrition with complications in inpatient care. **Conduct thorough examination to rule out other causes of oedema.**

### Overweight and obese

Adolescents 15–18 years (non-pregnant and non-post-partum)

**BMI for-age z-score** Overweight:  $\geq +1$  to  $< +2$

Obese:  $\geq +2$

Adults  $\geq 19$  years (non-pregnant and non-post-partum)

**BMI:** Overweight: 25.0 to 29.9

Obese:  $\geq 30.0$

Pregnant women and lactating women up to 6 months post-partum

**MUAC:**  $\geq 300$  mm (30.0 cm)

Follow care plan for managing **overweight and obesity.**

## Exercise 2.7: Adolescent and Adult Nutrition Register for Kalembo Health Centre

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Use the information below on the clients seen during one day at the Kalembo Health Centre to fill in the nutrition register on the following page.

1. HIV-positive boy, age 15, height 168.0 cm, weight 54.0 kg, no weight change since the last visit, MUAC 15.0 cm, no bilateral pitting oedema or other medical complications
2. HIV-positive pregnant woman, age 27, height 166.0 cm, weight 72.4 kg, has lost 1 kg since the last visit, MUAC 21.5 cm, no bilateral pitting oedema or other medical complications
3. HIV-positive boy, age 16 years and 2 months, height 166.0 cm, weight 50.0 kg, no weight change since the last visit, MUAC 20.0 cm, no bilateral pitting oedema or other medical complications
4. Man with unknown HIV status, age 46, height 160.0 cm, weight 80.0 kg, no weight change since the last visit, MUAC 25.0 cm, no bilateral pitting oedema or other medical complications
5. HIV-positive girl, age 15, height 140.1 cm, weight 27.0 kg, has lost 2 kg since the last visit, MUAC 15.9, no bilateral pitting oedema or other medical complications
6. HIV-positive woman, age 19, height 164.0 cm, weight 50.0 kg, has gained 0.5 kg since the last visit, MUAC 22.0 cm, no bilateral pitting oedema or other medical complications
7. HIV-positive girl, age 15, height 134.0 cm, weight 26.0 kg, has lost 1.5 kg since the last visit, MUAC 15.5 cm, bilateral pitting oedema (++)
8. HIV-positive man, age 26, height 178.0 cm, weight 84.0 kg, has gained 1 kg since the last visit, MUAC 24.0 cm, no bilateral pitting oedema or other medical complications
9. Boy with unknown HIV status, age 17, height 157.0 cm, weight 38.5 kg, no weight change since the last visit, MUAC 18.3 cm, no bilateral pitting oedema or other medical complications
10. HIV-positive woman who gave birth 3 months ago and is breastfeeding, age 35, height 156.3 cm, weight 58.2 kg, has lost 2 kg since the last visit, MUAC 23.5 cm, no bilateral pitting oedema or other medical complications





