

REPUBLIC OF KENYA



MINISTRY OF MEDICAL SERVICES
NATIONAL AIDS/STI CONTROL PROGRAMME

REFERENCE CHARTS FOR NUTRITION DIAGNOSIS AND PROTOCOL FOR FOOD BY PRESCRIPTION



USAID | **NHP**
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KEMRI/WRP HIV PROGRAM
SRV PEPFAR PROGRAM

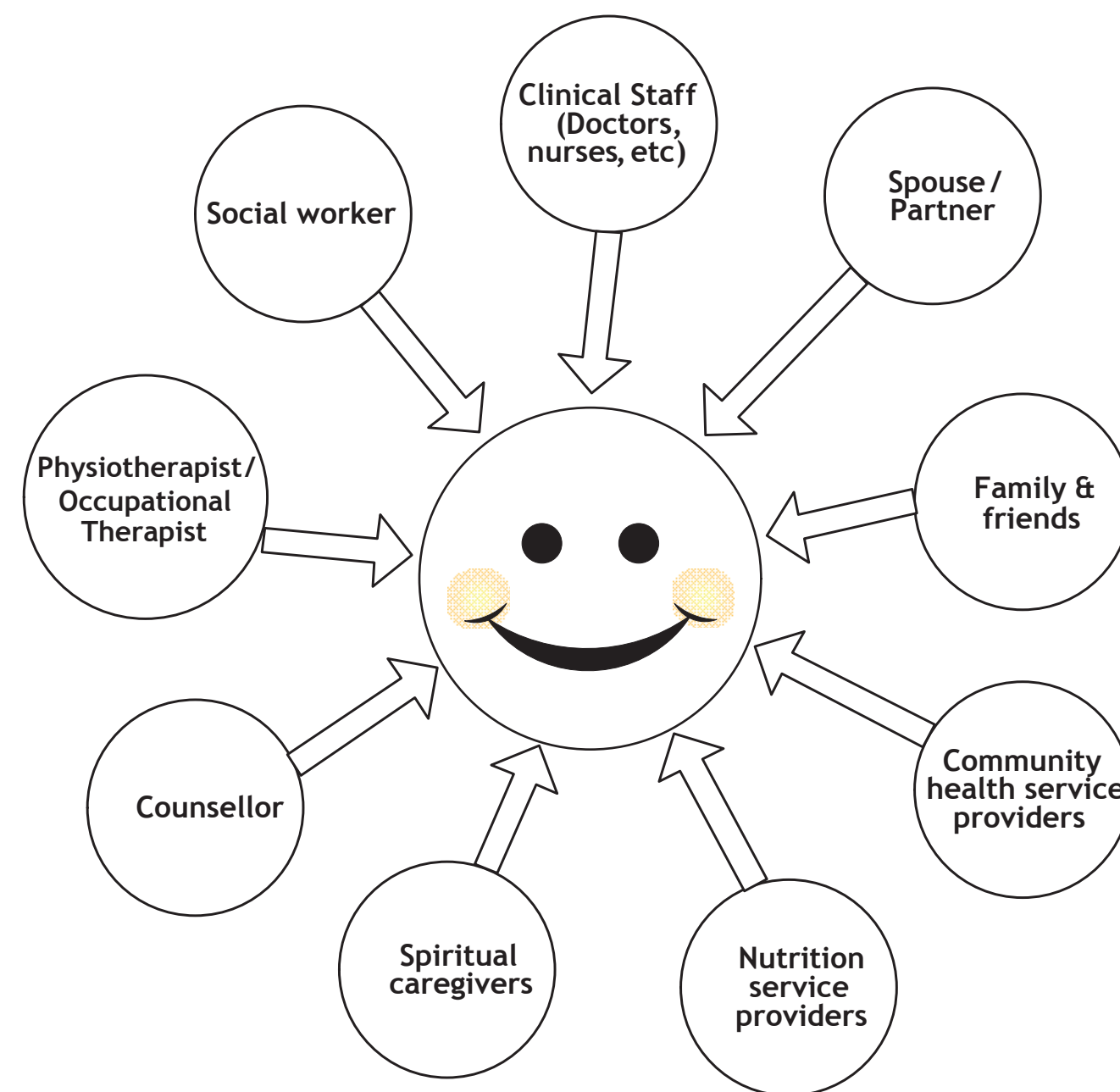
REVISED

NUTRITION CARE AND TREATMENT

Nutrition Care Process

Nutrition Care Process	Components	Key Information
Nutritional Screening and Assessment	Medical, nutrition and social history	Information about current/recent illnesses and medications, past medical and surgical interventions and dietary intakes in last 1 month. Probe for recent unexplained weight loss (3 months), food insecurity² and barriers to food intake such as illnesses of the digestive system and psychosocial factors, and food allergies.
	Anthropometric and functional impairment assessment	Accurately measure the client's weight in kg (use a regularly calibrated scale) and height in cm. Mid-upper circumference measurement is used for screening those at risk in community settings and in assessment of maternal nutrition in pregnant women. Waist and hip measurements are also necessary in assessing changes in body shape and over nutrition. Muscle strength using the grip strength tester and level of functional impairment eg Hand grip test, Karnofsky Performance status scale ³ .
	Laboratory assessment	Laboratory based testing target s biochemical markers and haematology. Anaemia, vitamins and minerals correlate with nutrition status and disease progression ⁴ (deficiency, normal, overload).
Nutritional Diagnosis¹	Protein-energy malnutrition (Under-nutrition/wasting)	Severe-acute malnutrition (SAM) and moderate acute malnutrition (MAM) with medical complications and or not able to feed orally, refer for inpatient care ⁵ . Severe-acute-malnutrition and moderate acute malnutrition without medical complications. (Other forms include stunting and underweight in children ⁵)
	Over - nutrition	Over weight and obese.
	Micronutrient deficiency diseases & disorders	Vitamin and mineral deficiency diseases and disorders e.g. nutritional anaemia, goitre, rickets, pellagra, osteoporosis, beriberi and scurvy.
	Micronutrient overloads and toxicity	Acute overloads leading to vitamin or mineral poisoning and chronic over accumulation of vitamins and minerals leading to overload disorders e.g. acute iron overload in the liver, heart and immune cells.
Nutrition Intervention (see note on therapeutic and supplemental nutritional formulations)	Counselling & education	Counselling for change and motivation to respond to recommended treatment, and optimum dietary practices. Education on safe use of micronutrients and critical nutrition practices. Referral to organizations providing food aid (wrap around food) and livelihood security support.
	Oral therapeutic foods (RUTF)	-Severe acute and moderate acute under nutrition (wasted) patients who are not able to feed orally are admitted for inpatient management (as per Phase I protocol) -Stable inpatients with Severe under nutrition (wasted) are managed with RUTF and continued as out patients. Stable outpatients with severe wasting are managed as outpatients following outpatient therapeutic program (OTP) and using food by prescription (FBP) protocol.
	Oral supplemental foods	Used for stable patients with moderate and mild acute under nutrition in out patients and inpatients.
	Single or multiple micronutrients	Therapeutic/pharmacological doses for replacement in severe deficiencies. Supplemental doses for preventive and maintainance for those at risk.
	Resistance exercise/Physical activity	Muscle function and muscle regeneration.
	Micronutrient overloads and toxicity	Refer both acute and chronic overloads for clinical management (including withdrawal, gastric suction, use of activated charcoal sorbent and chelators among others).
	Nutrition Monitoring & Evaluation	Patient focused plan

Integrating Nutrition Interventions in Care and Treatment: The roles of the Comprehensive Care Team



The Comprehensive care team plays an important role in the management of patients. This is through medical treatment, counselling for nutrition and healthcare, psychosocial support, adherence counselling, referral and linkages to livelihood support. Family members also ensure that the patient is well taken care of at home and follows all treatment instructions.

¹ Dietary intake, physical functional status, psychosocial factors including stigma and social-cultural factors along with illnesses (related diseases), presence of oedema and physiological status should be considered in the diagnostic statement.

² Refers to household hunger score (HHS) criteria (See last page on HHS).

³ Rating on the ability for self care: Level 1 – Requires special care and assistance (unable to care for self); Level 2 – Able to care for some or most self care needs but unable carry out active work (requires assistance); and Level 3 – Able to carry normal activities with some signs and symptoms or without complaints.

A hand grip test assesses muscle function by measuring grip strength and endurance. Measurements are expressed as a percentage of a standard for men and women: Men: 48.8±7.0 kg; women 34.4± 4.7 kg.

⁴ Inflammatory markers (C - reactive protein and alpha - 1 - acid glycoprotein) are required for correct interpretation of nutrition bio markers.

⁵ National Guidelines for Intergrated Management of Acute Malnutrition, 2009 and Kenya National Clinical Nutrition and Dietetics Reference Manual, 2010.

Weight for Height Reference Chart for Infants and Children 6 - 60 months old

6 - 60 Months:
Length 45 - 80 cm

Boys' weight for height Z scores					Length/Height (cm)	Girls' weight for height Z scores				
-4 SD	-3 SD	-2 SD	-1 SD	Median		Median	-1 SD	-2 SD	-3 SD	-4 SD
Severe		Moderate	Mild	Normal		Normal	Mild	Moderate	Severe	
Weight (kg)						Weight (kg)				
1.7	1.9	2.0	2.2	2.4	45.0	2.5	2.3	2.1	1.9	1.7
1.8	2.0	2.2	2.4	2.6	46.0	2.6	2.4	2.2	2.0	1.9
2.0	2.1	2.3	2.5	2.8	47.0	2.8	2.6	2.4	2.2	2.0
2.1	2.3	2.5	2.7	2.9	48.0	3.0	2.7	2.5	2.3	2.1
2.2	2.4	2.6	2.9	3.1	49.0	3.2	2.9	2.6	2.4	2.2
2.4	2.6	2.8	3.0	3.3	50.0	3.4	3.1	2.8	2.6	2.4
2.5	2.7	3.0	3.2	3.5	51.0	3.6	3.3	3.0	2.8	2.5
2.7	2.9	3.2	3.5	3.8	52.0	3.8	3.5	3.2	2.9	2.7
2.9	3.1	3.4	3.7	4.0	53.0	4.0	3.7	3.4	3.1	2.8
3.1	3.3	3.6	3.9	4.3	54.0	4.3	3.9	3.6	3.3	3.0
3.3	3.6	3.8	4.2	4.5	55.0	4.5	4.2	3.8	3.5	3.2
3.5	3.8	4.1	4.4	4.8	56.0	4.8	4.4	4.0	3.7	3.4
3.7	4.0	4.3	4.7	5.1	57.0	5.1	4.6	4.3	3.9	3.6
3.9	4.3	4.6	5.0	5.4	58.0	5.4	4.9	4.5	4.1	3.8
4.1	4.5	4.8	5.3	5.7	59.0	5.6	5.1	4.7	4.3	3.9
4.3	4.7	5.1	5.5	6.0	60.0	5.9	5.4	4.9	4.5	4.1
4.5	4.9	5.3	5.8	6.3	61.0	6.1	5.6	5.1	4.7	4.3
4.7	5.1	5.6	6.0	6.5	62.0	6.4	5.8	5.3	4.9	4.5
4.9	5.3	5.8	6.2	6.8	63.0	6.6	6.0	5.5	5.1	4.7
5.1	5.5	6.0	6.5	7.0	64.0	6.9	6.3	5.7	5.3	4.8
5.3	5.7	6.2	6.7	7.3	65.0	7.1	6.5	5.9	5.5	5.0
5.5	5.9	6.4	6.9	7.5	66.0	7.3	6.7	6.1	5.6	5.1
5.6	6.1	6.6	7.1	7.7	67.0	7.5	6.9	6.3	5.8	5.3
5.8	6.3	6.8	7.3	8.0	68.0	7.7	7.1	6.5	6.0	5.5
6.0	6.5	7.0	7.6	8.2	69.0	8.0	7.3	6.7	6.1	5.6
6.1	6.6	7.2	7.8	8.4	70.0	8.2	7.5	6.9	6.3	5.8
6.3	6.8	7.4	8.0	8.6	71.0	8.4	7.7	7.0	6.5	5.9
6.4	7.0	7.6	8.2	8.9	72.0	8.6	7.8	7.2	6.6	6.0
6.6	7.2	7.7	8.4	9.1	73.0	8.8	8.0	7.4	6.8	6.2
6.7	7.3	7.9	8.6	9.3	74.0	9.0	8.2	7.5	6.9	6.3
6.9	7.5	8.1	8.8	9.5	75.0	9.1	8.4	7.7	7.1	6.5
7.0	7.6	8.3	8.9	9.7	76.0	9.3	8.5	7.8	7.2	6.6
7.2	7.8	8.4	9.1	9.9	77.0	9.5	8.7	8.0	7.4	6.7
7.3	7.9	8.6	9.3	10.1	78.0	9.7	8.9	8.2	7.5	6.9
7.4	8.1	8.7	9.5	10.3	79.0	9.9	9.1	8.3	7.7	7.0
7.6	8.2	8.9	9.6	10.4	80.0	10.1	9.2	8.5	7.8	7.1

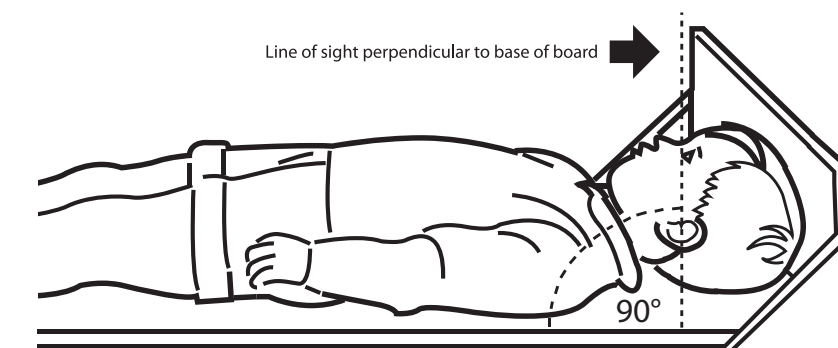
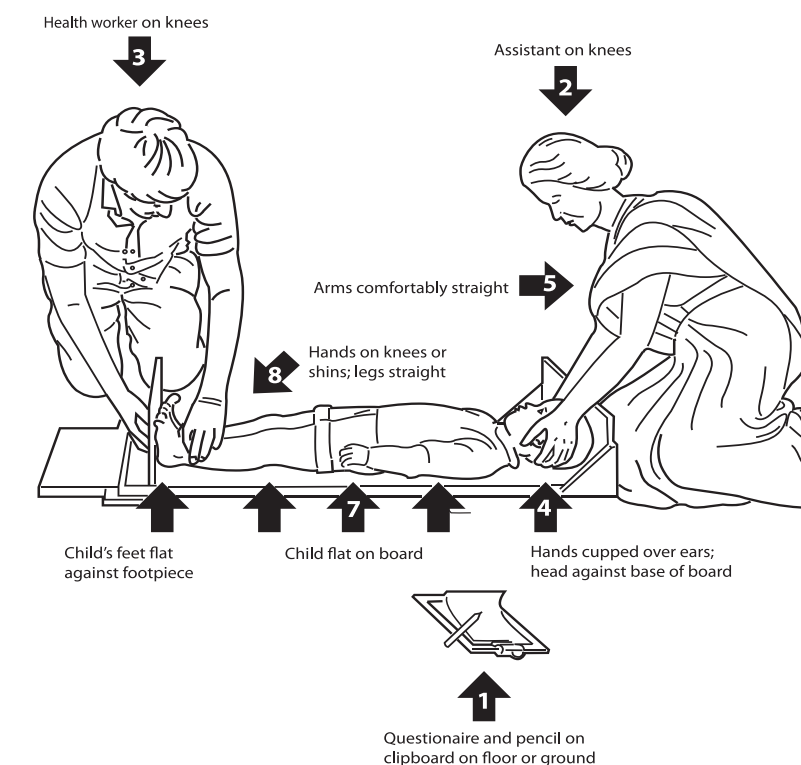
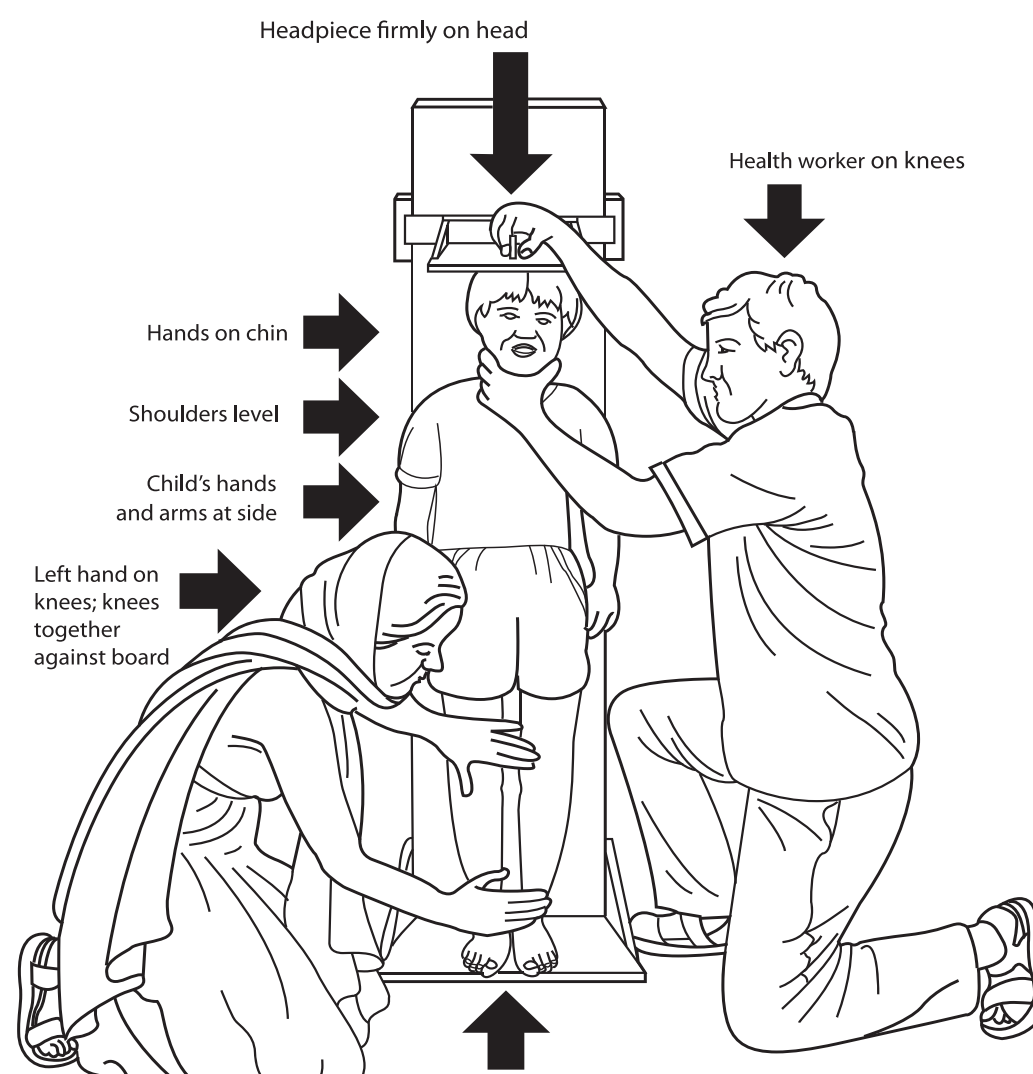
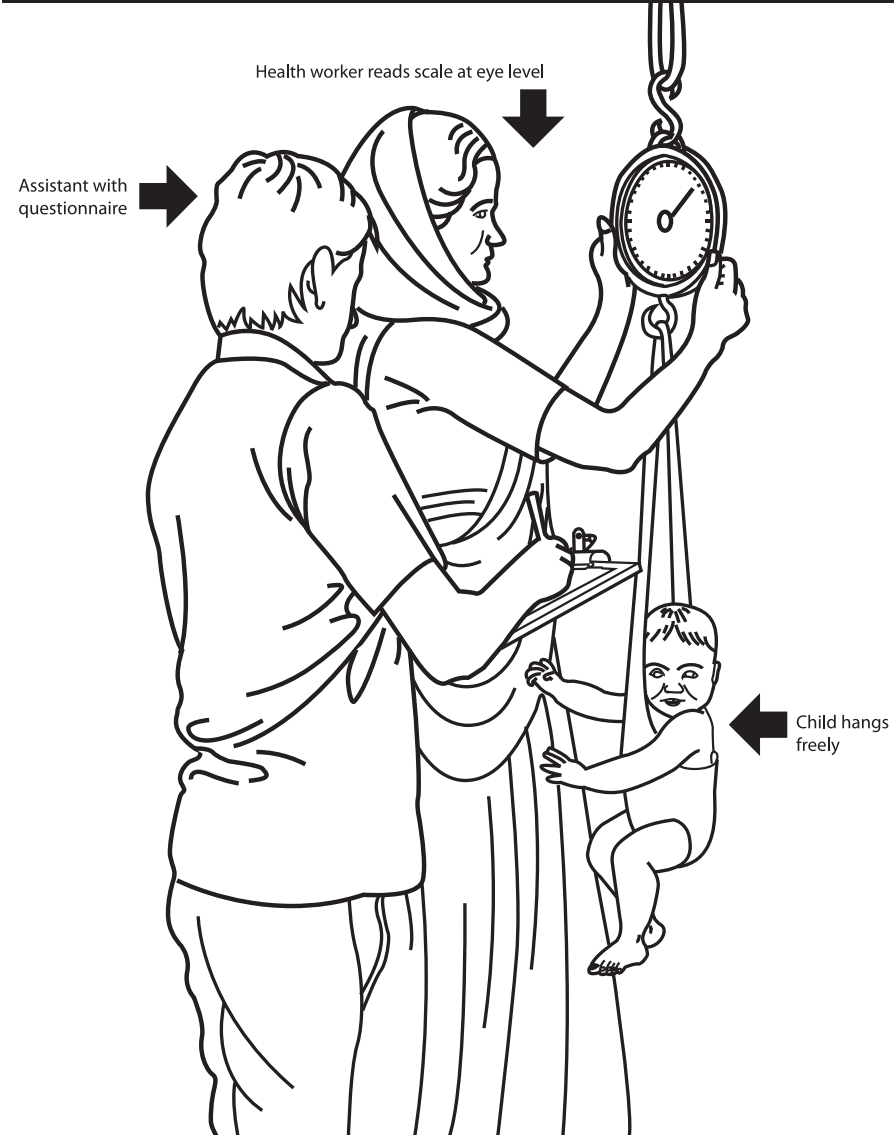
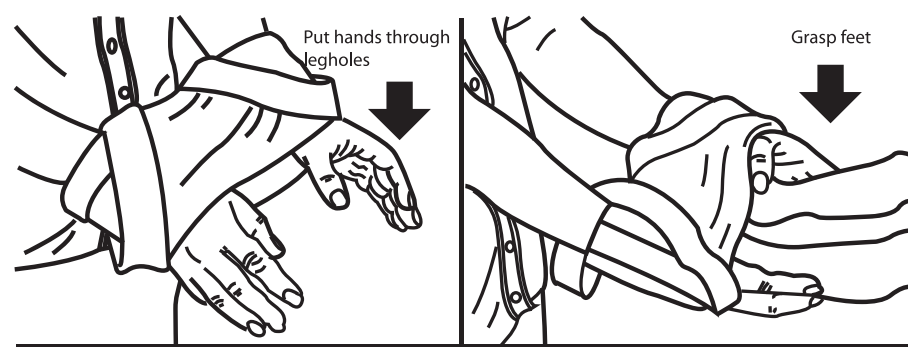
WEIGHT AND HEIGHT MEASUREMENT IN YOUNG CHILDREN

Weight measurement in children

- Ensure that the scale is with appropriate weights and well calibrated
- Place the scale on a flat surface or hang the scale on a firm place
- All heavy clothing and shoes should be removed
- Children should be undressed fully and weighed in a warm room
- Ensure the machine reads zero before and after weighing
- Record all the measurements immediately
- Calibrate the machine with standard weights regularly.

Height measurement in children

- Ensure the height meter is accurate and the numbers are legible
- The client should remove shoes and jackets/ sweaters
- The client should stand straight and look straight ahead
- The head, shoulders, hips, knees and heel must be in contact with the board or against the wall.
- Take the reading from the front and record it immediately
- For children who cannot stand, length measurements are taken as illustrated below



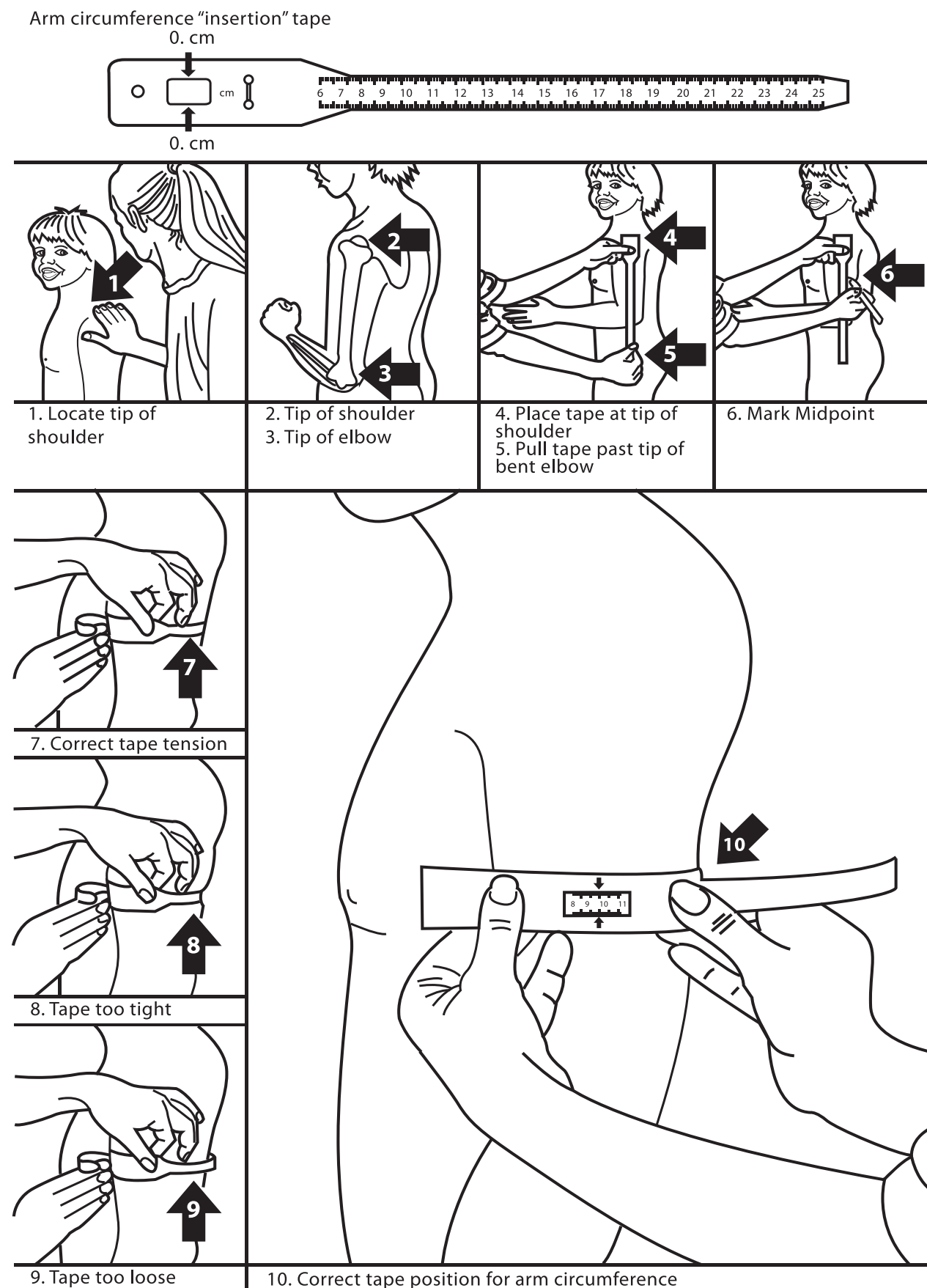
¹ National Guidelines for Integrated Management of Acute malnutrition, 2009.

Boys' weight for height Z scores					Length/Height (cm)	Girls' weight for height Z scores				
-4 SD	-3 SD	-2 SD	-1 SD	Median		Median	-1 SD	-2 SD	-3 SD	-4 SD
Severe		Moderate	Mild	Normal		Normal	Mild	Moderate	Severe	
Weight (kg)						Weight (kg)				
7.7	8.4	9.1	9.8	10.6	81.0	10.3	9.4	8.7	8.0	7.3
7.9	8.5	9.2	10.0	10.8	82.0	10.5	9.6	8.8	8.1	7.5
8.0	8.7	9.4	10.2	11.0	83.0	10.7	9.8	9.0	8.3	7.6
8.2	8.9	9.6	10.4	11.3	84.0	11.0	10.1	9.2	8.5	7.8
8.4	9.1	9.8	10.6	11.5	85.0	11.2	10.3	9.4	8.7	8.0
8.6	9.3	10.0	10.8	11.7	86.0	11.5	10.5	9.7	8.9	8.1
8.9	9.6	10.4	11.2	12.2	87.0	11.9	10.9	10.0	9.2	8.4
9.1	9.8	10.6	11.5	12.4	88.0	12.1	11.1	10.2	9.4	8.6
9.3	10.0	10.8	11.7	12.6	89.0	12.4	11.4	10.4	9.6	8.8
9.4	10.2	11.0	11.9	12.9	90.0	12.6	11.6	10.6	9.8	9.0
9.6	10.4	11.2	12.1	13.1	91.0	12.9	11.8	10.9	10.0	9.1
9.8	10.6	11.4	12.3	13.4	92.0	13.1	12.0	11.1	10.2	9.3
9.9	10.8	11.6	12.6	13.6	93.0	13.4	12.3	11.3	10.4	9.5
10.1	11.0	11.8	12.8	13.8	94.0	13.6	12.5	11.5	10.6	9.7
10.3	11.1	12.0	13.0	14.1	95.0	13.9	12.7	11.7	10.8	9.8
10.4	11.3	12.2	13.2	14.3	96.0	14.1	12.9	11.9	10.9	10.0
10.6	11.5	12.4	13.4	14.6	97.0	14.4	13.2	12.1	11.1	10.2
10.8	11.7	12.6	13.7	14.8	98.0	14.7	13.4	12.3	11.3	10.4
11.0	11.9	12.9	13.9	15.1	99.0	14.9	13.7	12.5	11.5	10.5
11.2	12.1	13.1	14.2	15.4	100.0	15.2	13.9	12.8	11.7	10.7
11.3	12.3	13.3	14.4	15.6	101.0	15.5	14.2	13.0	12.0	10.9
11.5	12.5	13.6	14.7	15.9	102.0	15.8	14.5	13.3	12.2	11.1
11.7	12.8	13.8	14.9	16.2	103.0	16.1	14.7	13.5	12.4	11.3
11.9	13.0	14.0	15.2	16.5	104.0	16.4	15.0	13.8	12.6	11.5
12.1	13.2	14.3	15.5	16.8	105.0	16.8	15.3	14.0	12.9	11.8
12.3	13.4	14.5	15.8	17.2	106.0	17.1	15.6	14.3	13.1	12.0
12.5	13.7	14.8	16.1	17.5	107.0	17.5	15.9	14.6	13.4	12.2
12.7	13.9	15.1	16.4	17.8	108.0	17.8	16.3	14.9	13.7	12.4
12.9	14.1	15.3	16.7	18.2	109.0	18.2	16.6	15.2	13.9	12.7
13.2	14.4	15.6	17.0	18.5	110.0	18.6	17.0	15.5	14.2	12.9
13.4	14.6	15.9	17.3	18.9	111.0	19.0	17.3	15.8	14.5	13.2
13.6	14.9	16.2	17.6	19.2	112.0	19.4	17.7	16.2	14.8	13.5
13.8	15.2	16.5	18.0	19.6	113.0	19.8	18.0	16.5	15.1	13.7
14.1	15.4	16.8	18.3	20.0	114.0	20.2	18.4	16.8	15.4	14.0
14.3	15.7	17.1	18.6	20.4	115.0	20.7	18.8	17.2	15.7	14.3
14.6	16.0	17.4	19.0	20.8	116.0	21.1	19.2	17.5	16.0	14.5
14.8	16.2	17.7	19.3	21.2	117.0	21.5	19.6	17.8	16.3	14.8
15.0	16.5	18.0	19.7	21.6	118.0	22.0	19.9	18.2	16.6	15.1
15.3	16.8	18.3	20.0	22.0	119.0	22.4	20.3	18.5	16.9	15.4
15.5	17.1	18.6	20.4	22.4	120.0	22.8	20.7	18.9	17.3	15.6

6 - 60 Months:
Length 81 - 120 cm

MEASURING THE MID-UPPER ARM CIRCUMFERENCE (MUAC) IN CHILDREN 1 - 5 YEARS OLD

MUAC is a measure used for screening. There are different cut-off points to help classify malnutrition based on age of the child¹



¹ Ministry of Medical Services and Ministry of Public Health and Sanitation; National Guidelines for Integrated Management of Acute malnutrition (IMAM), 2009

Instructions

Step 1: Measurement

- ☑ First determine the age of the child in "years" and "months".
- ☑ Infants and children less than 2 years or if under 87cm, measure the length in "cm" while lying down (supine). Children over 2 years or above 87 cm, measure height in "cm" while standing. Measure the weight in "kg". Record all measurement in your work book or patient's notes.
- ☑ Remember the child must be less than 5 years.

Step 2: Read the chart

- ☑ Identify the length/height column at the centre of the chart.
- ☑ Find where the measured length/height of the child is on the chart, and place your index finger on this cell.
If the child is a boy read the left side of the chart and if the child is a girl read the right side.

Step 3: Identification

- ☑ Identify the cell with weight that is equal to or less than the actual recorded weight by moving along the row where the height was identified.

Step 4: Classification

- ☑ From the diagnostic rows at the top of the chart classify and report the child's weight for height Z score corresponding to the identified weight.
- ☑ Remember that only children with a weight for height less than - 2 SD (Moderately undernourished) are eligible for Food By Prescription as index cases.
At risk siblings are eligible only as linked cases.

Example (use the insert figure below)

Bob's date of birth is 30 June, 2005. Therefore, he is 3 years 9 months old. His height and weight are measured and found to be 60 cm and 4.5 kg. Using the weight for height reference chart for 6 – 60 months, his weight for height is assessed as follows;

- ☑ Reading from the length/height column at the middle of the chart, find the height nearest or equal to 60cm and place your index finger on this cell and row.

Bob is a boy, so read the left section of the chart.

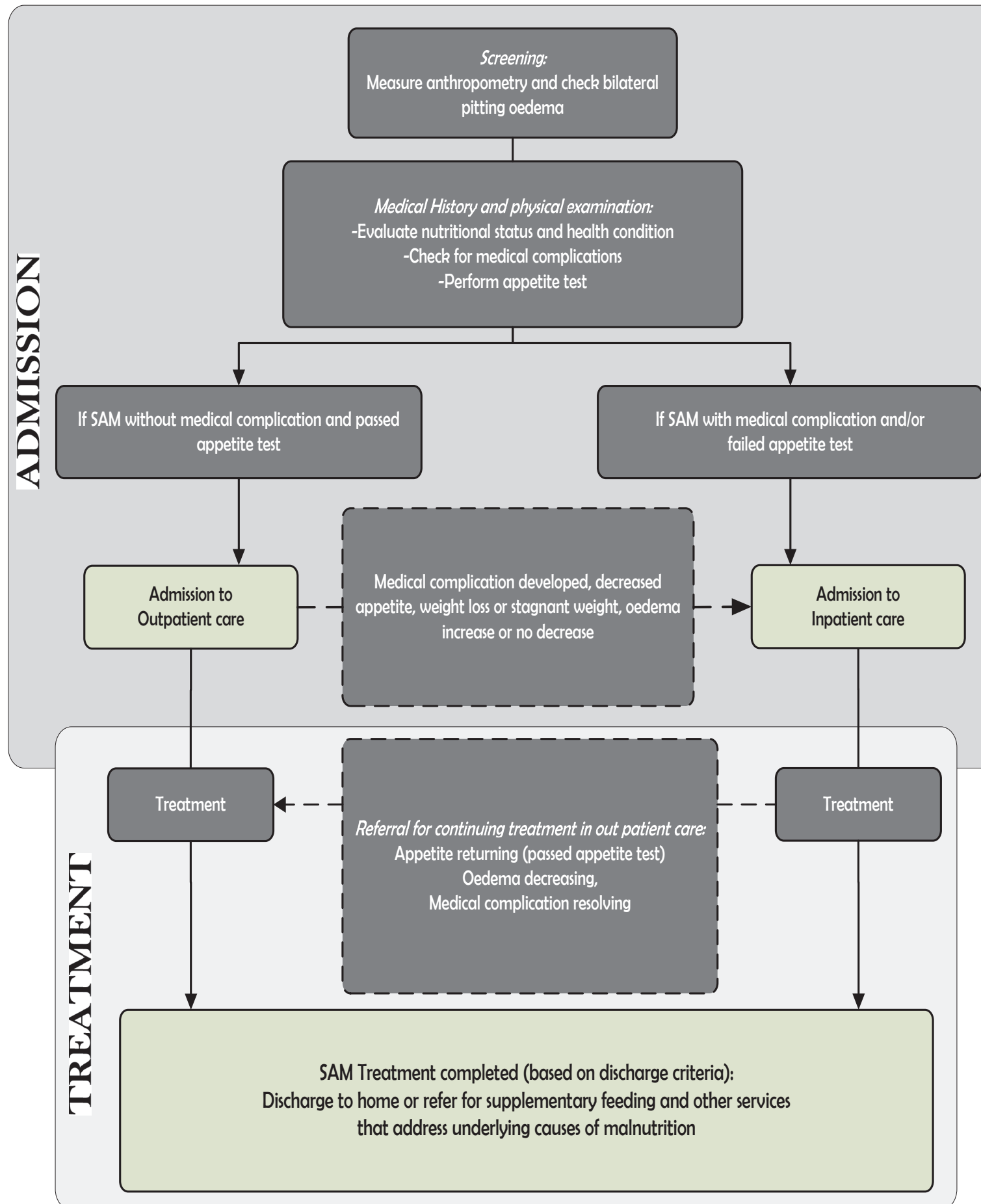
- ☑ Identify on this row that Bob's weight of 4.5 kg is less than 4.7 kg but greater than 4.3 kg.

- ☑ From the diagnostic rows at the top of the chart, classify and report Bob as severely undernourished because his height and weight correspond to - 3SD.

		Boys' height for weight Z scores					Girls' height for weight Z scores					
Diagnostic rows		-4 SD	-3SD	-2SD	-1SD	Median	Length/Height (cm)	Median	-1SD	-2SD	-3SD	-4SD
		Severe	Moderate	Mild	Normal		Normal	Mild	Moderate	Severe		
Measurements		Weight (kg)					Weight (kg)					
		4.3	4.7	5.1	5.5	6.0	60.0	5.9	5.4	4.9	4.5	4.1
		2. Identify										
		3. Classify					1. Read					

ALGORITHM FOR MANAGEMENT OF SEVERE ACUTE MALNUTRITION

TREATMENT FLOW CHART FOR SEVERE ACUTE MALNUTRITION



Other medical complications that necessitate hospitalization

In addition to severe bilateral pitting oedema (+++), marasmic kwashiorkor and poor appetite, the following complications necessitate inpatient care:

- ✓ Intractable vomiting
- ✓ Convulsions
- ✓ Lethargy, not alert
- ✓ Unconsciousness
- ✓ Lower respiratory tract infection
- ✓ High fever
- ✓ Severe dehydration
- ✓ Severe anaemia
- ✓ Hypoglycaemia
- ✓ Hypothermia
- ✓ Eye signs of vitamin A deficiency
- ✓ Skin lesions

The following complications require referral of patient for further medical evaluation:

- ✓ No appetite (failed appetite test)
- ✓ IMCI danger signs
- ✓ Increase in or newly developed bilateral pitting oedema
- ✓ Weight loss because of diarrhoea (re-feeding or other origin)
- ✓ Weight loss for three consecutive weeks
- ✓ Static weight (no weight gain) for five consecutive weeks
- ✓ Other signs of failure to respond to treatment

BMI for Age Reference Chart for Children 5 - 17 yrs

BOYS						AGE Year: Month	GIRLS					
-3 SD		-2 SD		-1 SD			-1 SD		-2 SD		-3 SD	
Severe		Moderate		Mild			Mild		Moderate		Severe	
Height(cm)	Weight(kg)	Height(cm)	Weight(kg)	Height(cm)	Weight(kg)		Height(cm)	Weight(kg)	Height(cm)	Weight(kg)	Height(cm)	Weight(kg)
96.5	11.27	101.1	13.29	105.7	15.75	5: 1	104.8	15.27	100.1	12.73	95.3	10.72
96.9	11.36	101.6	13.42	106.2	15.90	5: 2	105.3	15.41	100.5	12.83	95.7	10.81
97.4	11.48	102	13.53	106.7	16.05	5: 3	105.8	15.56	101	12.96	96.1	10.90
97.8	11.57	102.5	13.66	107.2	16.20	5: 4	106.3	15.71	101.4	13.06	96.5	10.99
98.2	11.67	103	13.79	107.7	16.35	5: 5	106.8	15.85	101.9	13.19	97	11.01
98.7	11.79	103.4	13.90	108.2	16.51	5: 6	107.2	15.97	102.3	13.29	97.4	11.10
99.1	11.88	103.9	14.03	108.7	16.66	5: 7	107.7	16.12	102.7	13.40	97.8	11.19
99.5	11.98	104.3	14.14	109.1	16.78	5: 8	108.2	16.27	103.2	13.53	98.2	11.28
99.9	12.08	104.8	14.28	109.6	16.94	5: 9	108.6	16.39	103.6	13.63	98.6	11.37
100.4	12.20	105.2	14.39	110.1	17.09	5: 10	109.1	16.54	104	13.74	99	11.47
100.8	12.29	105.7	14.52	110.6	17.25	5: 11	109.6	16.70	104.5	13.87	99.4	11.56
101.2	12.39	106.1	14.63	111	17.37	6: 0	110	16.82	104.9	13.98	99.8	11.65
101.6	12.49	106.5	14.74	111.5	17.53	6: 1	110.5	16.97	105.3	14.08	100.2	11.75
102	12.69	107	15.00	111.9	17.66	6: 2	110.9	17.10	105.7	14.19	100.5	11.82
102.4	12.79	107.4	15.11	112.4	17.81	6: 3	111.3	17.22	106.1	14.30	100.9	11.91
102.8	12.89	107.8	15.22	112.9	17.97	6: 4	111.8	17.37	106.6	14.43	101.3	12.01
103.2	12.99	108.2	15.34	113.3	18.10	6: 5	112.2	17.50	107	14.54	101.7	12.10
103.6	13.09	108.7	15.48	113.8	18.26	6: 6	112.7	17.65	107.4	14.65	102.1	12.20
103.9	13.17	109.1	15.59	114.2	18.39	6: 7	113.1	17.78	107.8	14.76	102.5	12.29
104.3	13.27	109.5	15.71	114.7	18.68	6: 8	113.6	17.94	108.2	14.87	102.9	12.39
104.7	13.37	109.9	15.82	115.1	18.81	6: 9	114	18.06	108.6	14.98	103.2	12.46
105.1	13.48	110.3	15.94	115.6	18.98	6: 10	114.5	18.22	109	15.09	103.6	12.56
105.5	13.58	110.8	16.08	116	19.11	6: 11	114.9	18.35	109.5	15.23	104	12.65

5 - 17 yrs:
Age 5:1 - 7:2

BOYS						AGE Year: Month	GIRLS					
-3 SD		-2 SD		-1 SD			-1 SD		-2 SD		-3 SD	
Severe		Moderate		Mild			Mild		Moderate		Severe	
Height(cm)	Weight(kg)	Height(cm)	Weight(kg)	Height(cm)	Weight(kg)		Height(cm)	Weight(kg)	Height(cm)	Weight(kg)	Height(cm)	Weight(kg)
105.9	13.79	111.2	16.20	116.4	19.24	7: 0	115.3	18.48	109.9	15.34	104.4	12.86
106.3	13.90	111.6	16.44	116.9	19.41	7: 1	115.8	18.64	110.3	15.45	104.8	12.96
106.6	13.98	112	16.56	117.3	19.54	7: 2	116.2	18.90	110.7	15.69	105.2	13.06
107	14.08	112.4	16.68	117.8	19.84	7: 3	116.7	19.07	111.1	15.80	105.6	13.16
107.4	14.19	112.8	16.80	118.2	19.98	7: 4	117.1	19.20	111.6	15.94	106	13.26
107.8	14.29	113.2	16.91	118.6	20.11	7: 5	117.6	19.36	112	16.06	106.4	13.36
108.1	14.37	113.6	17.03	119.1	20.28	7: 6	118	19.49	112.4	16.17	106.8	13.46
108.5	14.48	114	17.15	119.5	20.42	7: 7	118.5	19.66	112.8	16.29	107.2	13.56
108.9	14.59	114.4	17.28	119.9	20.56	7: 8	118.9	19.79	113.2	16.40	107.6	13.66
109.2	14.79	114.8	17.53	120.4	20.73	7: 9	119.4	20.10	113.7	16.55	108	13.76
109.6	14.90	115.2	17.65	120.8	21.01	7: 10	119.8	20.24	114.1	16.79	108.4	13.98
110	15.00	115.6	17.77	121.2	21.15	7: 11	120.3	20.41	114.5	16.91	108.8	14.09
110.3	15.09	116	17.90	121.6	21.29	8: 0	120.8	20.58	115	17.06	109.2	14.19
110.7	15.20	116.4	18.02	122	21.43	8: 1	121.2	20.71	115.4	17.18	109.6	14.29
111	15.28	116.7	18.11	122.5	21.61	8: 2	121.7	21.03	115.8	17.30	110	14.40
111.4	15.39	117.1	18.24	122.9	21.75	8: 3	122.1	21.17	116.3	17.45	110.4	14.50
111.7	15.47	117.5	18.50	123.3	22.04	8: 4	122.6	21.34	116.7	17.70	110.8	14.61
112.1	15.71	117.9	18.63	123.7	22.19	8: 5	123.1	21.52	117.1	17.83	111.2	14.84
112.4	15.79	118.3	18.75	124.1	22.33	8: 6	123.5	21.81	117.6	17.98	111.6	14.95
112.8	15.90	118.7	18.88	124.5	22.48	8: 7	124	21.99	118	18.10	112	15.05
113.1	15.99	119	18.98	124.9	22.62	8: 8	124.5	22.17	118.5	18.25	112.5	15.19
113.5	16.10	119.4	19.10	125.3	22.92	8: 9	125	22.34	118.9	18.52	112.9	15.30
113.8	16.19	119.8	19.38	125.7	23.07	8: 10	125.4	22.64	119.4	18.68	113.3	15.53
114.2	16.30	120.2	19.50	126.1	23.22	8: 11	125.9	22.83	119.8	18.80	113.7	15.64
114.5	16.52	120.5	19.60	126.6	23.40	9: 0	126.4	23.01	120.3	18.96	114.2	15.78
114.9	16.63	120.9	19.73	127	23.55	9: 1	126.9	23.35	120.7	19.23	114.6	15.89
115.2	16.72	121.3	19.86	127.4	23.86	9: 2	127.3	23.50	121.2	19.39	115	16.00
115.6	16.84	121.7	19.99	127.8	24.01	9: 3	127.8	23.68	121.6	19.52	115.5	16.28

5 - 17 yrs:
Age 7:3 - 9:11

BOYS						AGE Year: Month	GIRLS					
-3 SD		-2 SD		-1 SD			-1 SD		-2 SD		-3 SD	
Severe		Moderate		Mild			Mild		Moderate		Severe	
Height(cm)	Weight(kg)	Height(cm)	Weight(kg)	Height(cm)	Weight(kg)		Height(cm)	Weight(kg)	Height(cm)	Weight(kg)	Height(cm)	Weight(kg)
115.9	16.93	122	20.24	128.2	24.16	9: 4	128.3	24.03	122.1	19.68	115.9	16.39
116.3	17.04	122.4	20.38	128.6	24.31	9: 5	128.8	24.22	122.6	19.99	116.3	16.50
116.6	17.27	122.8	20.51	129	24.63	9: 6	129.3	24.41	123	20.12	116.8	16.64
116.9	17.36	123.2	20.64	129.4	24.78	9: 7	129.8	24.77	123.5	20.29	117.2	16.90
117.3	17.47	123.5	20.74	129.8	24.94	9: 8	130.3	24.96	124	20.60	117.7	17.04
117.6	17.56	123.9	21.03	130.2	25.09	9: 9	130.8	25.15	124.4	20.74	118.1	17.16
118	17.68	124.3	21.17	130.6	25.41	9: 10	131.2	25.48	124.9	20.90	118.5	17.27
118.3	17.91	124.7	21.30	131	25.57	9: 11	131.7	25.67	125.4	21.07	119	17.56
118.7	18.03	125	21.41	131.4	25.73	10: 0	132.2	25.87	125.8	21.36	119.4	17.68
119	18.13	125.4	21.70	131.8	26.06	10: 1	132.7	26.24	126.3	21.53	119.9	17.83
119.3	18.22	125.8	21.84	132.2	26.22	10: 2	133.2	26.44	126.8	21.71	120.4	17.98
119.7	18.34	126.2	21.98	132.6	26.37	10: 3	133.7	26.81	127.3	22.04	120.8	18.24
120	18.58	126.5	22.08	133	26.53	10: 4	134.2	27.01	127.8	22.21	121.3	18.39
120.4	18.70	126.9	22.38	133.4	26.87	10: 5	134.8	27.26	128.2	22.35	121.7	18.51
120.7	18.79	127.3	22.53	133.8	27.03	10: 6	135.3	27.64	128.7	22.69	122.2	18.67
121.1	18.92	127.7	22.67	134.3	27.24	10: 7	135.8	27.85	129.2	22.87	122.7	18.97
121.4	19.16	128.1	22.81	134.7	27.58	10: 8	136.3	28.24	129.7	23.05	123.2	19.12
121.8	19.29	128.5	23.12	135.1	27.74	10: 9	136.8	28.45	130.2	23.39	123.6	19.25
122.2	19.41	128.8	23.23	135.5	27.91	10: 10	137.3	28.84	130.7	23.57	124.1	19.56
122.5	19.51	129.2	23.37	135.9	28.26	10: 11	137.8	29.05	131.2	23.75	124.6	19.72
122.9	19.79	129.7	23.72	136.4	28.47	11: 0	138.3	29.26	131.7	24.11	125.1	19.88
123.3	19.92	130.1	23.87	136.8	28.63	11: 1	138.9	29.71	132.2	24.29	125.5	20.16
123.7	20.05	130.5	24.01	137.3	29.03	11: 2	139.4	29.93	132.7	24.65	126	20.32
124.1	20.18	130.9	24.16	137.7	29.20	11: 3	139.9	30.34	133.2	24.84	126.5	20.48
124.5	20.46	131.3	24.48	138.2	29.60	11: 4	140.4	30.55	133.7	25.03	127	20.81
124.9	20.59	131.7	24.63	138.6	29.78	11: 5	140.9	30.97	134.2	25.39	127.4	20.94
125.3	20.72	132.2	24.82	139.1	29.99	11: 6	141.4	31.19	134.7	25.58	127.9	21.10
125.7	20.86	132.6	25.14	139.6	30.40	11: 7	141.9	31.61	135.2	25.96	128.4	21.43

HEIGHT AND WEIGHT MEASUREMENT IN OLDER CHILDREN AND ADULTS



Height measurement

- Ensure the height meter is accurate and the numbers are legible
- The client should remove shoes and jackets/ sweaters
- The client should stand straight and look straight ahead
- The head, shoulders, hips, knees and heel must be in contact with the board or against the wall.
- If the health worker is shorter than the client, he/she should stand on an elevated surface in front of the client
- If the client has a high fixed hairstyle, the reading is taken from the highest point of the forehead
- Take the reading from the front and record it immediately

Weight measurement

- Ensure that the scale is functional and well calibrated
- Place the scale on a flat surface or hang the scale on a firm place
- All heavy clothing and shoes should be removed
- Children should be undressed fully and weighed in a warm room
- Ensure the machine reads zero before and after weighing
- Record all the measurements immediately
- Calibrate the machine with standard weights regularly

BOYS						AGE Year: Month	GIRLS					
-3 SD		-2 SD		-1 SD			-1 SD		-2 SD		-3 SD	
Severe		Moderate		Mild			Mild		Moderate		Severe	
Height(cm)	Weight(kg)	Height(cm)	Weight(kg)	Height(cm)	Weight(kg)		Height(cm)	Weight(kg)	Height(cm)	Weight(kg)	Height(cm)	Weight(kg)
126.1	21.15	133.1	25.33	140	30.58	11: 8	142.4	31.84	135.7	26.15	128.9	21.60
126.5	21.28	133.5	25.49	140.5	30.99	11: 9	142.9	32.26	136.1	26.49	129.3	21.73
126.9	21.42	134	25.86	141	31.21	11: 10	143.4	32.49	136.6	26.68	129.8	22.07
127.4	21.75	134.4	26.01	141.5	31.43	11: 11	143.9	32.92	137.1	26.88	130.3	22.24
127.8	21.89	134.9	26.39	142	31.86	12: 0	144.4	33.36	137.6	27.26	130.7	22.55
128.3	22.06	135.4	26.58	142.5	32.08	12: 1	144.9	33.59	138	27.42	131.2	22.72
128.7	22.36	135.9	26.78	143	32.51	12: 2	145.3	33.99	138.5	27.81	131.6	22.86
129.2	22.54	136.4	27.16	143.6	32.79	12: 3	145.8	34.22	138.9	27.98	132	23.17
129.7	22.71	136.9	27.36	144.1	33.22	12: 4	146.2	34.63	139.3	28.33	132.5	23.35
130.2	23.05	137.4	27.56	144.6	33.45	12: 5	146.7	34.86	139.8	28.53	132.9	23.49
130.7	23.23	137.9	27.95	145.2	33.94	12: 6	147.1	35.27	140.2	28.89	133.3	23.81
131.2	23.41	138.5	28.20	145.7	34.18	12: 7	147.5	35.46	140.6	29.06	133.7	23.95
131.7	23.76	139	28.60	146.3	34.67	12: 8	147.9	35.87	141	29.42	134.1	24.28
132.2	23.94	139.5	28.80	146.9	34.96	12: 9	148.3	36.07	141.4	29.59	134.5	24.42
132.7	24.12	140.1	29.05	147.5	35.46	12: 10	148.7	36.48	141.8	29.76	134.8	24.53
133.2	24.48	140.6	29.45	148	35.70	12: 11	149.1	36.90	142.1	30.09	135.2	24.86
133.8	24.71	141.2	29.71	148.6	36.21	13: 0	149.4	37.05	142.5	30.26	135.6	25.01
134.3	24.89	141.7	30.12	149.2	36.51	13: 1	149.8	37.47	142.8	30.59	135.9	25.12
134.8	25.26	142.3	30.37	149.8	37.03	13: 2	150.1	37.63	143.2	30.76	136.2	25.41
135.4	25.48	142.9	30.83	150.4	37.32	13: 3	150.4	38.00	143.5	31.09	136.5	25.53
135.9	25.86	143.4	31.05	151	37.85	13: 4	150.8	38.20	143.8	31.22	136.9	25.86
136.4	26.05	144	31.52	151.5	38.10	13: 5	151.1	38.58	144.1	31.56	137.2	25.98
137	26.28	144.5	31.74	152.1	38.63	13: 6	151.3	38.69	144.4	31.69	137.4	26.05
137.5	26.66	145.1	32.00	152.7	38.94	13: 7	151.6	39.07	144.7	31.83	137.7	26.36
138	26.85	145.7	32.48	153.3	39.48	13: 8	151.9	39.23	144.9	32.12	138	26.47
138.6	27.09	146.2	32.70	153.8	39.74	13: 9	152.1	39.56	145.2	32.26	138.2	26.55
139.1	27.48	146.7	33.14	154.4	40.29	13: 10	152.4	39.72	145.4	32.56	138.5	26.86
139.6	27.67	147.3	33.41	154.9	40.79	13: 11	152.6	40.05	145.7	32.69	138.7	26.93

BOYS						AGE Year: Month	GIRLS					
-3 SD		-2 SD		-1 SD			-1 SD		-2 SD		-3 SD	
Severe		Moderate		Mild			Mild		Moderate		Severe	
Weight(kg)	Height(cm)	Weight(kg)	Height(cm)	Weight(kg)	Height(cm)		Weight(kg)	Height(cm)	Weight(kg)	Height(cm)	Weight(kg)	Height(cm)
140.1	28.07	147.8	33.86	155.5	41.11	14: 0	152.8	40.16	145.9	32.78	139	27.05
140.6	28.27	148.3	34.09	156	41.61	14: 1	153.1	40.55	146.1	33.09	139.2	27.32
141.1	28.47	148.8	34.54	156.5	41.88	14: 2	153.3	40.66	146.3	33.18	139.4	27.40
141.6	28.87	149.3	34.77	157.1	42.45	14: 3	153.5	41.00	146.5	33.48	139.6	27.48
142.1	29.08	149.8	35.23	157.6	42.72	14: 4	153.6	41.05	146.7	33.57	139.8	27.56
142.5	29.44	150.3	35.47	158.1	43.24	14: 5	153.8	41.40	146.9	33.66	140	27.83
143	29.65	150.8	35.70	158.5	43.46	14: 6	154	41.50	147.1	33.97	140.1	27.87
143.4	29.82	151.2	36.12	159	43.99	14: 7	154.1	41.79	147.2	34.02	140.3	27.95
143.9	30.23	151.7	36.36	159.5	44.27	14: 8	154.3	41.90	147.4	34.11	140.5	28.23
144.3	30.40	152.1	36.78	159.9	44.74	14: 9	154.4	41.96	147.5	34.37	140.6	28.27
144.7	30.57	152.5	36.98	160.3	44.97	14: 10	154.5	42.25	147.7	34.47	140.8	28.35
145.1	30.95	152.9	37.41	160.7	45.45	14: 11	154.7	42.36	147.8	34.51	140.9	28.39
145.5	31.12	153.4	37.65	161.2	45.73	15: 0	154.8	42.65	147.9	34.78	141	28.63
145.9	31.29	153.7	38.03	161.5	46.17	15: 1	154.9	42.71	148	34.83	141.2	28.71
146.3	31.68	154.1	38.23	161.9	46.66	15: 2	155	42.76	148.1	34.87	141.3	28.75
146.7	31.85	154.5	38.43	162.3	46.89	15: 3	155.1	43.06	148.2	35.14	141.4	28.79
147.1	32.02	154.9	38.87	162.7	47.38	15: 4	155.2	43.12	148.3	35.19	141.5	29.03
147.4	32.37	155.2	39.02	163	47.56	15: 5	155.3	43.17	148.4	35.24	141.6	29.07
147.7	32.50	155.5	39.41	163.3	48.00	15: 6	155.4	43.47	148.5	35.28	141.7	29.11
148.1	32.90	155.9	39.62	163.7	48.24	15: 7	155.4	43.47	148.6	35.55	141.8	29.16
148.4	33.03	156.2	39.77	164	48.68	15: 8	155.5	43.52	148.7	35.60	141.9	29.20
148.7	33.17	156.5	40.17	164.3	48.86	15: 9	155.6	43.82	148.7	35.60	141.9	29.20
149	33.30	156.8	40.32	164.6	49.31	15: 10	155.6	43.82	148.8	35.65	142	29.44
149.3	33.66	157.1	40.72	164.9	49.49	15: 11	155.7	43.88	148.9	35.92	142.1	29.48
149.6	33.79	157.4	40.88	165.1	49.61	16: 0	155.7	44.12	148.9	35.92	142.2	29.52
149.9	33.93	157.6	40.98	165.4	50.06	16: 1	155.8	44.18	149	35.97	142.2	29.52
150.1	34.25	157.9	41.39	165.6	50.18	16: 2	155.8	44.18	149.1	36.01	142.3	29.56
150.4	34.38	158.1	41.49	165.9	50.64	16: 3	155.9	44.23	149.1	36.01	142.3	29.56

5 - 17 yrs:
Age 14:11 - 17:3

BOYS						AGE Year: Month	GIRLS					
-3 SD		-2 SD		-1 SD			-1 SD		-2 SD		-3 SD	
Severe		Moderate		Mild			Mild		Moderate		Severe	
Height(cm)	Weight(kg)	Height(cm)	Weight(kg)	Height(cm)	Weight(kg)		Height(cm)	Weight(kg)	Height(cm)	Weight(kg)	Height(cm)	Weight(kg)
150.6	34.47	158.4	41.90	166.1	50.76	16: 4	155.9	44.48	149.2	36.06	142.4	29.61
150.9	34.84	158.6	42.01	166.3	51.16	16: 5	155.9	44.48	149.2	36.28	142.4	29.61
151.1	34.93	158.8	42.11	166.5	51.29	16: 6	156	44.53	149.2	36.28	142.5	29.85
151.3	35.02	159	42.47	166.7	51.69	16: 7	156	44.53	149.3	36.33	142.5	29.85
151.5	35.12	159.2	42.58	166.9	51.81	16: 8	156	44.53	149.3	36.33	142.6	29.89
151.7	35.44	159.4	42.69	167.1	52.21	16: 9	156.1	44.84	149.4	36.38	142.6	29.89
151.9	35.53	159.6	43.05	167.2	52.28	16: 10	156.1	44.84	149.4	36.38	142.7	29.93
152.1	35.63	159.7	43.10	167.4	52.40	16: 11	156.1	44.84	149.4	36.38	142.7	29.93
152.2	35.67	159.9	43.21	167.5	52.75	17: 0	156.2	44.89	149.5	36.65	142.8	29.98
152.4	36.00	160	43.52	167.7	52.87	17: 1	156.2	44.89	149.5	36.65	142.8	29.98
152.5	36.05	160.2	43.63	167.8	53.22	17: 2	156.2	44.89	149.5	36.65	142.9	30.02
152.7	36.14	160.3	43.68	167.9	53.28	17: 3	156.2	45.14	149.6	36.70	142.9	30.02
152.8	36.19	160.4	44.00	168	53.34	17: 4	156.3	45.19	149.6	36.70	142.9	30.02
153	36.52	160.5	44.05	168.1	53.69	17: 5	156.3	45.19	149.6	36.70	143	30.06
153.1	36.57	160.6	44.10	168.2	53.75	17: 6	156.3	45.19	149.7	36.75	143	30.06
153.2	36.61	160.8	44.21	168.3	54.10	17: 7	156.3	45.19	149.7	36.75	143.1	30.10
153.3	36.66	160.9	44.53	168.4	54.16	17: 8	156.4	45.25	149.7	36.75	143.1	30.10
153.4	36.71	160.9	44.53	168.5	54.23	17: 9	156.4	45.25	149.8	36.80	143.1	30.10
153.5	36.99	161	44.58	168.5	54.51	17: 10	156.4	45.25	149.8	36.80	143.2	30.14
153.6	37.04	161.1	44.90	168.6	54.58	17: 11	156.4	45.50	149.8	36.80	143.2	30.14

Instructions

Step 1: Measurement

- Confirm that the age of the child in “years” and “months” is between 5 -17 yrs.
- Measure the child’s height in “cm” and weight in “kg” and record on a piece of paper.

Step 2: Read the chart

- Go to the BMI for age 5 – 17 yrs reference chart and identify the column marked AGE at the centre of the chart.
- Find the age of the child on the chart, and place your index finger on this row. If the child is boy read the cells on the left side, if the child is a girl, read the cells on the right side. Choose the cell that is nearest to the actual height you have measured.

Step 3: Identification

- ☑ Identify the cell with weight that is equal to or just less than the actual recorded weight along the age row. Identify the cell with height that is equal to or just less than the actual recorded height.

Step 4: Classification

- ☑ Classify and report the child's nutrition status as mildly undernourished if -1SD, moderately undernourished if -2SD or severely undernourished if -3SD by reading the BMI for Age Z score in the top row (Diagnostic rows) of the column where the actual height and weight falls.
- ☑ Note that if the height or weight fall in a different nutrition status category, then record and manage for the worse off nutrition status.
- ☑ Note that only children with a BMI for age less than - 2 SD and - 3SD are eligible for Food By Prescription or FBP. (For eligibility criteria of OVC, please refer to FBP protocol)

Example (use the figure shown below)

- ☑ Joan's date of birth is 30 August, 2000. Therefore, she is 8 years 7 months. Her height and weight are measured and found to be 115 cm and 17 kg respectively. Using the BMI for age 5 – 17 yrs reference chart, her BMI for age is obtained as follows;
- ☑ Reading from the AGE column of the chart, find the age 8 years 7 months and place your left index finger at this point. Since, Joan is a girl, move and read the right section of the chart.
- ☑ Establish that Joan's height of 115cm is less than 118cm but greater than 112cm, shown on the chart. Similarly, her weight is less than 18.1 kg but greater than 15.05 kg.
- ☑ From the diagnostic rows, classify and report Joan as moderately undernourished because her height and weight correspond to a BMI for age Z score of -2 SD in the top of the row.

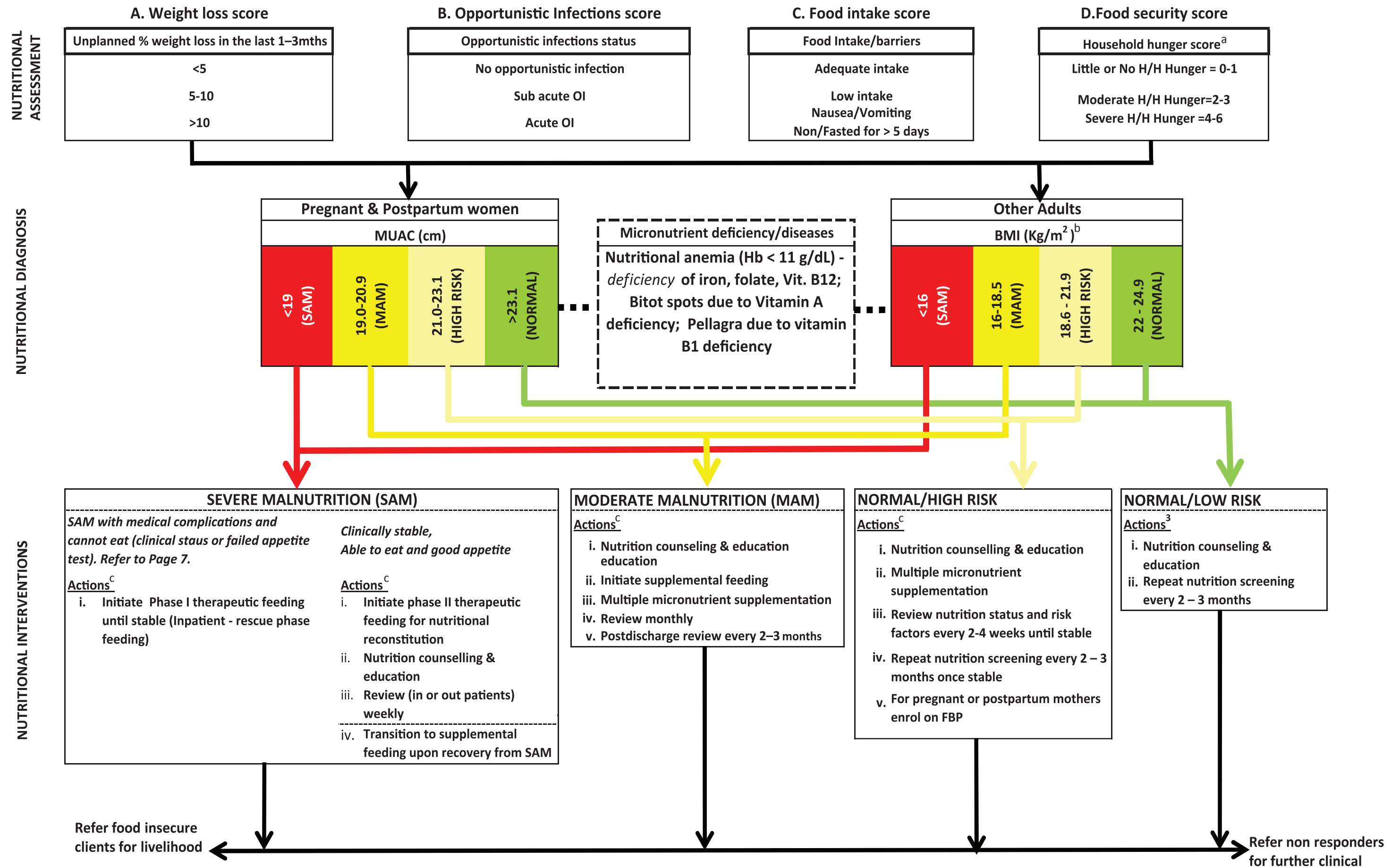
Diagnostic rows		BOYS				AGE Year: month	GIRLS				
		-3 SD		-2 SD			-1 SD		-2 SD		-3 SD
		Severe		Moderate		Mild		Moderate		Severe	
Measurements		Height (cm)	Weight (kg)	Height (cm)	Weight (kg)	Height (cm)	Weight (kg)	Height (cm)	Weight (kg)	Height (cm)	Weight (kg)
		112.1	15.71	117.9	18.63	123.7	22.19	117.1	17.83	111.2	14.84

1. Read (points to AGE column)

2. Identify (points to 8:5 in AGE column)

3. Classify (points to -2 SD in GIRLS section)

Figure 9.2: Diagnosis and management of malnutrition in HIV infected adult patients



^a Refer to household food security assessment tool

^b For overweight and obese, refer for counselling

^c Implement local clinical policy and protocol

Adult BMI Reference Chart

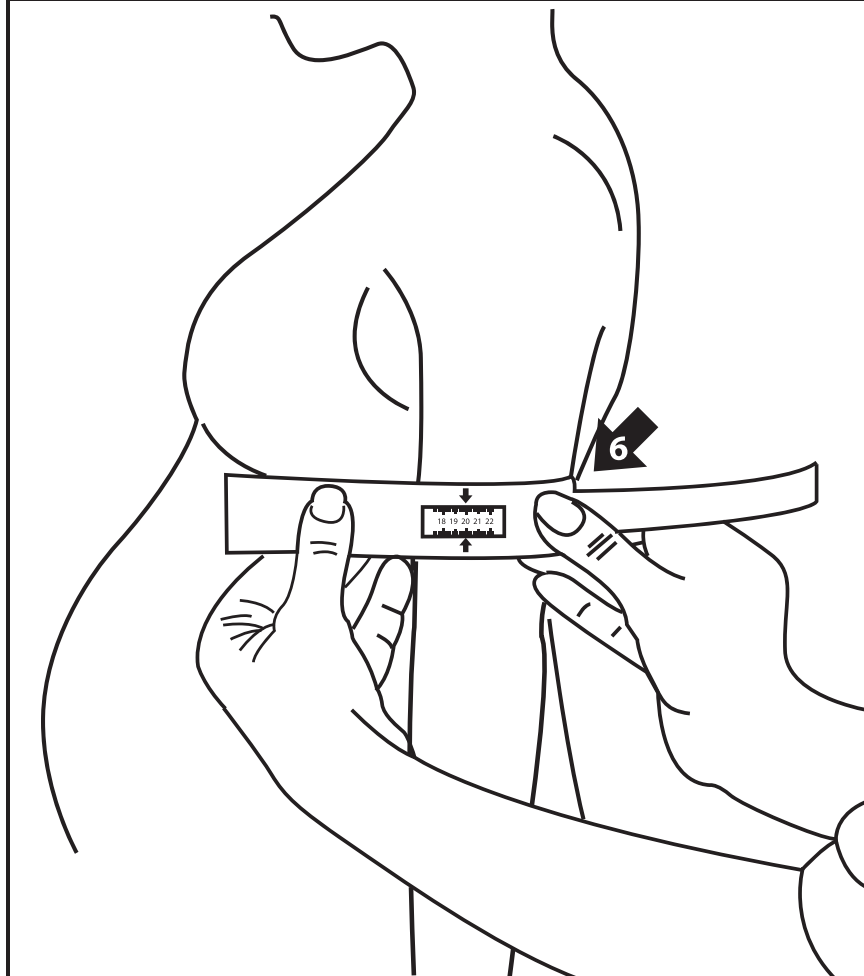
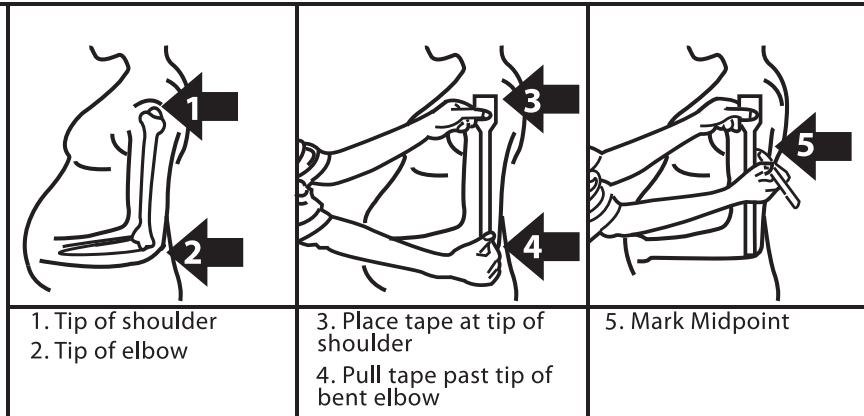
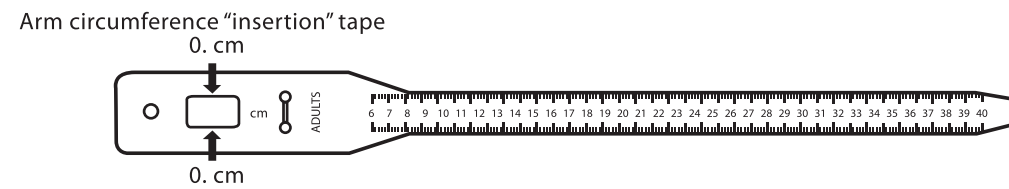
BMI Values corresponding to height (cm) and weight (kg)

BMI	16 kg/m ²	17 kg/m ²	< 18.5 kg/m ²	19 kg/m ²	20 kg/m ²	21 kg/m ²	22 kg/m ²	23 kg/m ²	24 kg/m ²	25 kg/m ²	26 kg/m ²	27 kg/m ²	28 kg/m ²	29 kg/m ²	+30 kg/m ²
Nutrition status*	Severe	Moderate	Mild	Normal						Mild			Moderate		Severe
Height (cm)	Weight (kg)														
140	31.4	33.3	36.3	37.2	39.2	41.2	43.1	45.1	47.0	49.0	51.0	52.9	54.9	56.8	58.8
141	31.8	33.8	36.8	37.8	39.8	41.8	43.7	45.7	47.7	49.7	51.7	53.7	55.7	57.7	59.6
142	32.3	34.3	37.3	38.3	40.3	42.3	44.4	46.4	48.4	50.4	52.4	54.4	56.5	58.5	60.5
143	32.7	34.8	37.8	38.9	40.9	42.9	45.0	47.0	49.1	51.1	53.2	55.2	57.3	59.3	61.3
144	33.2	35.3	38.4	39.4	41.5	43.5	45.6	47.7	49.8	51.8	53.9	56.0	58.1	60.1	62.2
145	33.6	35.7	38.9	39.9	42.1	44.2	46.3	48.4	50.5	52.6	54.7	56.8	58.9	61.0	63.1
146	34.1	36.2	39.4	40.5	42.6	44.8	46.9	49.0	51.2	53.3	55.4	57.6	59.7	61.8	63.9
147	34.6	36.7	40.0	41.1	43.2	45.4	47.5	49.7	51.9	54.0	56.2	58.3	60.5	62.7	64.8
148	35.0	37.2	40.5	41.6	43.8	46.0	48.2	50.4	52.6	54.8	57.0	59.1	61.3	63.5	65.7
149	35.5	37.7	41.1	42.2	44.4	46.6	48.8	51.1	53.3	55.5	57.7	59.9	62.2	64.4	66.6
150	36.0	38.3	41.6	42.8	45.0	47.3	49.5	51.8	54.0	56.3	58.5	60.8	63.0	65.3	67.5
151	36.5	38.8	42.2	43.3	45.6	47.9	50.2	52.4	54.7	57.0	59.3	61.6	63.8	66.1	68.4
152	37.0	39.3	42.7	43.9	46.2	48.5	50.8	53.1	55.4	57.8	60.1	62.4	64.7	67.0	69.3
153	37.5	39.8	43.3	44.5	46.8	49.2	51.5	53.8	56.2	58.5	60.9	63.2	65.5	67.9	70.2
154	37.9	40.3	43.9	45.1	47.4	49.8	52.2	54.5	56.9	59.3	61.7	64.0	66.4	68.8	71.1
155	38.4	40.8	44.4	45.6	48.1	50.5	52.9	55.3	57.7	60.1	62.5	64.9	67.3	69.7	72.1
156	38.9	41.4	45.0	46.2	48.7	51.1	53.5	56.0	58.4	60.8	63.3	65.7	68.1	70.6	73.0
157	39.4	41.9	45.6	46.8	49.3	51.8	54.2	56.7	59.2	61.6	64.1	66.6	69.0	71.5	73.9
158	39.9	42.4	46.2	47.4	49.9	52.4	54.9	57.4	59.9	62.4	64.9	67.4	69.9	72.4	74.9
159	40.4	43.0	46.8	48.0	50.6	53.1	55.6	58.1	60.7	63.2	65.7	68.3	70.8	73.3	75.8
160	41.0	43.5	47.4	48.6	51.2	53.8	56.3	58.9	61.4	64.0	66.6	69.1	71.7	74.2	76.8
161	41.5	44.1	48.0	49.2	51.8	54.4	57.0	59.6	62.2	64.8	67.4	70.0	72.6	75.2	77.8
162	42.0	44.6	48.6	49.9	52.5	55.1	57.7	60.4	63.0	65.6	68.2	70.9	73.5	76.1	78.7
163	42.5	45.2	49.2	50.5	53.1	55.8	58.5	61.1	63.8	66.4	69.1	71.7	74.4	77.1	79.7
164	43.0	45.7	49.8	51.1	53.8	56.5	59.2	61.9	64.6	67.2	69.9	72.6	75.3	78.0	80.7
165	43.6	46.3	50.4	51.7	54.5	57.2	59.9	62.6	65.3	68.1	70.8	73.5	76.2	79.0	81.7
166	44.1	46.8	51.0	52.4	55.1	57.9	60.6	63.4	66.1	68.9	71.6	74.4	77.2	79.9	82.7
167	44.6	47.4	51.6	53.0	55.8	58.6	61.4	64.1	66.9	69.7	72.5	75.3	78.1	80.9	83.7
168	45.2	48.0	52.2	53.6	56.4	59.3	62.1	64.9	67.7	70.6	73.4	76.2	79.0	81.8	84.7
169	45.7	48.6	52.8	54.3	57.1	60.0	62.8	65.7	68.5	71.4	74.3	77.1	80.0	82.8	85.7
170	46.2	49.1	53.5	54.9	57.8	60.7	63.6	66.5	69.4	72.3	75.1	78.0	80.9	83.8	86.7
171	46.8	49.7	54.1	55.6	58.5	61.4	64.3	67.3	70.2	73.1	76.0	79.0	81.9	84.8	87.7
172	47.3	50.3	54.7	56.2	59.2	62.1	65.1	68.0	71.0	74.0	76.9	79.9	82.8	85.8	88.8
173	47.9	50.9	55.4	56.9	59.9	62.9	65.8	68.8	71.8	74.8	77.8	80.8	83.8	86.8	89.8
174	48.4	51.5	56.0	57.5	60.6	63.6	66.6	69.6	72.7	75.7	78.7	81.7	84.8	87.8	90.8

Adult: Height 140 - 174cm

MEASURING THE MID-UPPER ARM CIRCUMFERENCE (MUAC) IN ADULTS

MUAC is used to assess nutrition status of the pregnant women and post partum mothers past 6 weeks.
It is also used for assessing nutrition status of bed ridden patients.



6. Correct tape position and tension for arm circumference

BMI Values corresponding to height (cm) and weight (kg)															
BMI	16 kg/m ²	17 kg/m ²	< 18.5 kg/m ²	19 kg/m ²	20 kg/m ²	21 kg/m ²	22 kg/m ²	23 kg/m ²	24 kg/m ²	25 kg/m ²	26 kg/m ²	27 kg/m ²	28 kg/m ²	29 kg/m ²	+30 kg/m ²
Nutrition status*	Severe	Moderate	Mild	Normal						Mild			Moderate		Severe
Height (cm)	Weight (kg)														
175	49.0	52.1	56.7	58.2	61.3	64.3	67.4	70.4	73.5	76.6	79.6	82.7	85.8	88.8	91.9
176	49.6	52.7	57.3	58.9	62.0	65.0	68.1	71.2	74.3	77.4	80.5	83.6	86.7	89.8	92.9
177	50.1	53.3	58.0	59.5	62.7	65.8	68.9	72.1	75.2	78.3	81.5	84.6	87.7	90.9	94.0
178	50.7	53.9	58.6	60.2	63.4	66.5	69.7	72.9	76.0	79.2	82.4	85.5	88.7	91.9	95.1
179	51.3	54.5	59.3	60.9	64.1	67.3	70.5	73.7	76.9	80.1	83.3	86.5	89.7	92.9	96.1
180	51.8	55.1	59.9	61.6	64.8	68.0	71.3	74.5	77.8	81.0	84.2	87.5	90.7	94.0	97.2
181	52.4	55.7	60.6	62.2	65.5	68.8	72.1	75.4	78.6	81.9	85.2	88.5	91.7	95.0	98.3
182	53.0	56.3	61.3	62.9	66.2	69.6	72.9	76.2	79.5	82.8	86.1	89.4	92.7	96.1	99.4
183	53.6	56.9	62.0	63.6	67.0	70.3	73.7	77.0	80.4	83.7	87.1	90.4	93.8	97.1	100.5
184	54.2	57.6	62.6	64.3	67.7	71.1	74.5	77.9	81.3	84.6	88.0	91.4	94.8	98.2	101.6
185	54.8	58.2	63.3	65.0	68.5	71.9	75.3	78.7	82.1	85.6	89.0	92.4	95.8	99.3	102.7
186	55.4	58.8	64.0	65.7	69.2	72.7	76.1	79.6	83.0	86.5	89.9	93.4	96.9	100.3	103.8
187	56.0	59.4	64.7	66.4	69.9	73.4	76.9	80.4	83.9	87.4	90.9	94.4	97.9	101.4	104.9
188	56.6	60.1	65.4	67.2	70.7	74.2	77.8	81.3	84.8	88.4	91.9	95.4	99.0	102.5	106.0
189	57.2	60.7	66.1	67.9	71.4	75.0	78.6	82.2	85.7	89.3	92.9	96.4	100.0	103.6	107.2
190	57.8	61.4	66.8	68.6	72.2	75.8	79.4	83.0	86.6	90.3	93.9	97.5	101.1	104.7	108.3
191	58.4	62.0	67.5	69.3	73.0	76.6	80.3	83.9	87.6	91.2	94.9	98.5	102.1	105.8	109.4
192	59.0	62.7	68.2	70.0	73.7	77.4	81.1	84.8	88.5	92.2	95.8	99.5	103.2	106.9	110.6
193	59.6	63.3	68.9	70.8	74.5	78.2	81.9	85.7	89.4	93.1	96.8	100.6	104.3	108.0	111.7
194	60.2	64.0	69.6	71.5	75.3	79.0	82.8	86.6	90.3	94.1	97.9	101.6	105.4	109.1	112.9
195	60.8	64.6	70.3	72.2	76.1	79.9	83.7	87.5	91.3	95.1	98.9	102.7	106.5	110.3	114.1
196	61.5	65.3	71.1	73.0	76.8	80.7	84.5	88.4	92.2	96.0	99.9	103.7	107.6	111.4	115.2
197	62.1	66.0	71.8	73.7	77.6	81.5	85.4	89.3	93.1	97.0	100.9	104.8	108.7	112.5	116.4
198	62.7	66.6	72.5	74.5	78.4	82.3	86.2	90.2	94.1	98.0	101.9	105.9	109.8	113.7	117.6
199	63.4	67.3	73.3	75.2	79.2	83.2	87.1	91.1	95.0	99.0	103.0	106.9	110.9	114.8	118.8
200	64.0	68.0	74.0	76.0	80.0	84.0	88.0	92.0	96.0	100.0	104.0	108.0	112.0	116.0	120.0
201	64.6	68.7	74.7	76.8	80.8	84.8	88.9	92.9	97.0	101.0	105.0	109.1	113.1	117.2	121.2
202	65.3	69.4	75.5	77.5	81.6	85.7	89.8	93.8	97.9	102.0	106.1	110.2	114.3	118.3	122.4
203	65.9	70.1	76.2	78.3	82.4	86.5	90.7	94.8	98.9	103.0	107.1	111.3	115.4	119.5	123.6
204	66.6	70.7	77.0	79.1	83.2	87.4	91.6	95.7	99.9	104.0	108.2	112.4	116.5	120.7	124.8
205	67.2	71.4	77.7	79.8	84.1	88.3	92.5	96.7	100.9	105.1	109.3	113.5	117.7	121.9	126.1
206	67.9	72.1	78.5	80.6	84.9	89.1	93.4	97.6	101.8	106.1	110.3	114.6	118.8	123.1	127.3
207	68.6	72.8	79.3	81.4	85.7	90.0	94.3	98.6	102.8	107.1	111.4	115.7	120.0	124.3	128.5
208	69.2	73.5	80.0	82.2	86.5	90.9	95.2	99.5	103.8	108.2	112.5	116.8	121.1	125.5	129.8
209	69.9	74.3	80.8	83.0	87.4	91.7	96.1	100.5	104.8	109.2	113.6	117.9	122.3	126.7	131.0
210	70.6	75.0	81.6	83.8	88.2	92.6	97.0	101.4	105.8	110.3	114.7	119.1	123.5	127.9	132.3

Adult: Height 175 - 210cm

Instructions

Step 1: Measurement

- ☑ Measure the client's height in "cm" and weight in "kg" and record measurements on a piece of paper.

Step 2: Read the chart

- ☑ Go to the BMI adult reference chart and identify the column marked "height" on the left hand side of the chart. Find the height on the chart that is nearest to the actual height you have recorded. Place your index finger on this row.

Step 3: Identification

- ☑ Move your index finger along the height row to the cell with weight (kg) that is equal to or just less than the recorded weight.

Step 4: Classification of nutrition status*

- ☑ Classify the client as follows, if the BMI is:

16 kg/m² = Severely undernourished

17 kg/m² = Moderately undernourished

< 18.5 kg/m² = Mildly undernourished

Between 18.5 and 24 kg/m² = Normal

Between 25 and 29 kg/m² = Over weight

Over 30 kg/m² = Obese

- ☑ Note that only clients with a BMI less than 18.5 kg/m² are eligible for Food By Prescription (FBP).

- ☑ Note that this chart is not suitable for use as reference for pregnant or postpartum mothers.

- ☑ Note in HIV +ve individuals BMI 18.5 – 21 kg/m² is considered to be at high risk of malnutrition (see page 21)

Example (use the figure shown below)

John 23 yrs old, his height and weight are measured and found to be 155 cm and 37kg respectively.

- ☑ Using the BMI adult reference chart, read the height column and find the height of 155 cm.

- ☑ Identify the cell with 37 kg (or closest weight) in the adjacent height rows. In this case, it is less than the weight of 38.4 kg.

- ☑ From the diagnostic rows, John's nutrition status is classified as severely undernourished because his weight is less than 38.4 kg and corresponds to a BMI of less than 16 kg/m².

3. Classify

		BMI values corresponding to Height and Weight				
Diagnostic rows		16 (kg/m ²)	17 (kg/m ²)	18.5 (kg/m ²)	19 (kg/m ²)	20 (kg/m ²)
		Severe	Moderate	Mild	Normal	
Measurements		Height(cm)		Weight (kg)		
1. Read	154	37.9	40.3	43.9	45.1	47.4
	155	38.4	40.8	44.4	45.6	48.1
	156	38.9	41.4	45.0	46.2	48.7

2. Identify

ORAL NUTRITIONAL THERAPIES FOR STABLE PATIENTS

Oral Nutritional Therapies

Therapeutic food formulations

They are energy and nutrient dense food formulations designed for treatment of severe malnutrition (weight loss and wasting). Therapeutic formulations deliver energy¹ and nutrients as well as pharmacological levels of vitamins and minerals to meet daily requirements and support nutritional reconstitution (rehabilitation phase). Commonly available formulations include, lipid based peanut-milk powder paste (Plumpy nut[®], Imunut[®], Insta RUTF) and cereal-milk powder & plant protein based solid bars (BP-100[®]) among others. Typical energy values are 500 kcal/92g sachet (550 kcal/100g) for the paste presentation and 300 kcal/57 g bar (526 kcal/100g) in the bar presentation.

Supplemental food formulations

These foods are designed to facilitate faster recovery of moderate and mild malnutrition. Supplemental food formulations are nutrient dense fortified blended foods (FBF) or composites of staple foods. They contain recommended daily allowances for selected vitamins and minerals (RDAs) levels and may be used concurrently with RUTF in treatment of severe malnutrition. Brands available in the market include Nutrimix[®], Foundation Plus[®], First Food[®], Advantage[®], and Plumpy soy[®] among others. Typical energy values are 410-550 kcal/100g. Guidelines for FBF are provided by Kenya Bureau of Standards Composite Flour Specification; KS 1808:2010

Rationale for prescription of therapeutic and supplemental formulations

Therapeutic prescription

The aim is to provide close to 100% of recommended energy, proteins and lipids. The pharmacological levels of micronutrients are intended to facilitate recovery and storage requirements of severely malnourished patients. Treatment should transition from therapeutic intervention to supplemental intervention after the patient nutrition status improves to moderate/mild malnutrition status.

Treatment of stable severe malnutrition² in children below 10 years is based on a fixed dose prescription 170-220 kcal/kg/day³. The feed should be gradually increased to the fixed dose level to permit physiological stabilization.

Treatment of stable severe malnutrition² in children above 10 years and adults a fixed dose prescription of approximately 40 kcal/kg/day is recommended until the patients is physiologically stable and recovery is evident. Thereafter, the energy intake is gradually escalated to 85 kcal/kg/day⁴ until patient is cured and transitioned to maintenance diet.

Supplementation prescription

The aim is to provide about 50% of energy, over 70% of whole protein and essential fatty acids along with about 1 RDA of key micronutrients. The supplementation protocol is designed with the intention of drawing the remaining energy and nutrient requirements from consumption of home foods to raise the caloric intake by 2 - 2.5 times. This should facilitate transition to home food upon recovery from malnutrition.

In rehabilitation of moderately undernourished children a fixed dose prescription of 435 kcal/day or 100 g FBF/day for 6-23 months old and 870 kcal/day or 200g FBF/day for 2 to 9 years old children are recommended. A fixed dose prescription of 1350 kcal day or 300 g FBF/day is recommended for rehabilitation of moderately undernourished children above 10 years and all adults. Nutrient deficits of the prescribed therapeutic or supplemental nutritional products should be met using home diets.

¹ - The total daily energy requirement (kcal/day) consists of resting (basal) energy expenditure (BEE) to maintain life, energy of activity (type of work – sedentary, light, moderate or heavy) and energy expended in digestion, transportation and processing of food (diet-induced). The BEE is dependent on age, size (weight and height), gender and environment. Clinical estimation of BEE is based on Harris and Benedict equations. These equations are based on age (A) in years, height (H) in cm and adjusted weight (W) in kg.

$$\text{BEE (males)} = (13.8 \times W) + (5.0 \times H) - (6.8 \times A) + 66.5 \text{ (kcal/d)}$$

$$\text{BEE (females)} = (9.6 \times W) + (1.8 \times H) - (4.7 \times A) + 655.0 \text{ (kcal/d)}$$

A set of adjustment factors that account for different clinical status are used to estimate TEE values from BEE. For example, the following factors are used to estimate TEE; during total bed rest BEE x 1.2; patient with multiple fractures BEE x 1.2 to 1.4; HIV positive/AIDS patients BEE x 1.5 to 1.8 and a maximum of 2 in patients with major burns.

² – Assumes that patients have successfully completed the Phase 1 stabilization and the transition phase. In case of new stable patients particularly those with SAM, who have eaten little or nothing during the previous 5 days or more, gentle re-awakening of the metabolic functions and ensuring nutrition-electrolyte balance is necessary. Sudden loading with therapeutic foods could precipitate life threatening fluid electrolyte imbalance also known as re-feeding syndrome. Patients aged above 10 years should be initiated on 100 mg Thiamine (vitamin B1) and complete multiple micronutrient formulation immediately before feeding and continue daily for the first 10 days. For patients aged below 10 years, 50 mg Thiamine and multiple micronutrient formulation should be considered after consulting the doctor. Phosphate, potassium and magnesium supplements may be provided if plasma levels are low and the therapeutic nutritional formulation does not provide adequate amounts.

³ - Management of severe malnutrition: a manual for physicians and other senior health workers. World Health Organization, Geneva, Switzerland, 1999.

⁴ - Collins S, Myatt M, and Golden B. Dietary treatment of severe malnutrition in adults Am. J. Clin. Nutr. 1998;68:193-9.

Management of uncomplicated under nutrition (wasting) using Food by Prescription (FBP)

Client category	Diagnosis	Eligibility criteria ¹		Intervention package ²	FBP exit criteria ³ & Actions
		Primary	Secondary		
Orphaned and Vulnerable Children: 6 – 23 months	Severe undernutrition	<ul style="list-style-type: none"> – WHZ < - 3.0 Z score Or – MUAC < 11.5 cm – Appetite test ✓ 	<ul style="list-style-type: none"> – Visible wasting – Bilateral pitting edema +/- 	<ul style="list-style-type: none"> – Infant and young child nutrition counseling – Therapeutic food: 37g/kg body weight/per day of RUTF, ie 21 – 28 sachets per wk  – One bottle per month of safe water solution (SWS) e.g. WaterGuard® 	<ul style="list-style-type: none"> – WHZ = or > - 1.0 Z score – No oedema on 2 consecutive visits – Exit client from FBP & monitor progress
	Moderate undernutrition	<ul style="list-style-type: none"> – WFH < - 2.0 Z score Or MUAC between 11.5 - 12 cm 	<ul style="list-style-type: none"> – Linked OVC  	<ul style="list-style-type: none"> – Infant and young child nutrition counseling – Supplemental food eg 100gms FBF (First Food®) per day i.e. 1 bag (3kg) per month – One bottle per month of safe water solution (SWS) e.g. Water Guard® 	<ul style="list-style-type: none"> – Graduate when: WHZ = or > - 1.0 Z Score – Exit client from FBP & monitor progress
Orphaned and Vulnerable Children: 24– 59 months	Severe undernutrition	<ul style="list-style-type: none"> – WHZ < - 3.0 Z score Or – MUAC < 11.5 cm – Appetite test ✓ 	<ul style="list-style-type: none"> – Visible wasting – Bilateral pitting edema +/- 	<ul style="list-style-type: none"> – Young child nutrition counseling – Therapeutic food: 37g /kg body weight/per day of RUTF ie 21 – 35 sachets per wk – One bottle per month of safe water solution (SWS) e.g. WaterGuard® 	<ul style="list-style-type: none"> – WHZ = or > - 1.0 Z score – No oedema on 2 consecutive visits – Exit client from FBP & monitor progress
	Moderate undernutrition	<ul style="list-style-type: none"> – WHZ < -2.0 Z score – MUAC between 11.5 – 13.5 cm 	<ul style="list-style-type: none"> – Linked OVC 	<ul style="list-style-type: none"> – Young child nutrition counseling – Supplemental food eg 200gms FBF (First Food®) per day i.e. 2 bags (6 kg) per month – One bottle per month of safe water solution (SWS) e.g. Water Guard® 	<ul style="list-style-type: none"> – Graduate when WHZ = or > - 1.0 Z score – Exit client from FBP & monitor progress
Orphaned and Vulnerable Children: 5 – 9 years	Severe undernutrition	<ul style="list-style-type: none"> – BMI for Age < - 3.0 Z score Or – MUAC < 13.5 cm – Appetite test ✓ 	<ul style="list-style-type: none"> – Visible wasting – Bilateral pitting edema +/- 	<ul style="list-style-type: none"> – Nutrition counseling – 276gms per day of RUTF ie 21 sachets per wk – Supplemental food eg 100gms FBF (First Food®) per day i.e. 1 bag (3kg) per month – One bottle per month of safe water solution (SWS) e.g. waterGuard® 	<ul style="list-style-type: none"> – BMI for Age = or > - 3.0 Z score – No oedema on 2 consecutive visits – Switch to FBF prescriptions only
	Moderate undernutrition	<ul style="list-style-type: none"> – BMI for Age < -2.0 Z score – MUAC between 13.5 – 14.5 cm 	<ul style="list-style-type: none"> – Linked OVC 	<ul style="list-style-type: none"> – Nutrition counseling – Supplemental food eg 200gms FBF (First Food®) per day i.e. 2 bags (6 kg) per month – One bottle per month of safe water solution (SWS) e.g. Water Guard® 	<ul style="list-style-type: none"> – Graduate when BMI for Age = or > - 1.0 Z score – Exit client from FBP & monitor progress
Orphaned and Vulnerable Children: 10 - 15 years	Severe undernutrition	<ul style="list-style-type: none"> – BMI for Age < - 3.0 Z score Or – MUAC < 14.5 cm – Appetite test ✓ 	<ul style="list-style-type: none"> – Visible wasting – Bilateral pitting edema +/- 	<ul style="list-style-type: none"> – Nutrition counseling – Therapeutic food eg 276gms per day of RUTF ie 21 sachets per wk – Supplemental food eg 300gms per day FBF (Foundation Plus®) i.e. 1bag (4.5kg) per month – One bottle per month of safe water solution (SWS) e.g. WaterGuard® 	<ul style="list-style-type: none"> – BMI for Age = or > - 3.0 Z score – No oedema on 2 consecutive visits – Switch to FBF prescriptions only
	Moderate undernutrition	<ul style="list-style-type: none"> – BMI for Age < -2.0 Z score Or – MUAC between 14.5 – 18.5 cm 	<ul style="list-style-type: none"> – Linked OVC 	<ul style="list-style-type: none"> – Nutrition counseling – Supplemental food eg 300gms per day FBF (Foundation Plus®) i.e. 2 bags (9 kg) per month – One bottle per month of safe water solution (SWS) eg Water Guard® 	<ul style="list-style-type: none"> – Graduate when BMI for Age = or > - 1.0 Z score – Exit client from FBP & monitor progress

Oral Nutritional Therapies

Nutritional Composition Therapeutic Food Formulations

Nutrients	Lipid based Peanut Paste ¹		Wheat/Oat Flour based BP-100 Bar ²
	Content (Range)	Typical content per 92 g sachet	Content per 57 g bar
Energy	520-550 kcal/100 g	500 kcal	300 kcal /bar
Proteins	10 to 12% total energy	12.5 g	8.2 g
Lipids	45 to 60% total energy	32.86 g	17.6 g
Sodium	290 mg/100 g maximum	<276 mg	<164 mg
Potassium	1100 to 1400 mg/100 g	1022 mg	488 mg
Calcium	300 to 600 mg/100 g	276 g	266 mg
Phosphorus (excluding phytate)	300 to 600 mg/100 g	276 g	266 mg
Magnesium	80 to 140 mg/100 g	84.6 mg	62 mg
Iron	10 to 14 mg/100 g	10.6 mg	5.7 mg
Zinc	11 to 14 mg/100 g	12.9 mg	6.8 mg
Copper	1.4 to 1.8 mg/100 g	1.6 mg	0.9 mg
Selenium	20 to 40 µg	27.6 µg	14.2 µg
Iodine	70 to 140 µg/100 g	92 µg	28.4 µg
Vitamin A	0.8 to 1.1 mg/100 g	840 µg	0.5 mg
Vitamin D	15 to 20 µg/100 g	15 µg	10.2 µg
Vitamin E	20 mg/100 g minimum	18.4 mg	15.3 mg
Vitamin C	50 mg/100 g minimum	49 mg	30.6 mg
Vitamin K	15 to 30 µg/100 g	19.3 µg	11.9 µg
Vitamin B1 (Thiamine)	0.5 mg/100 g minimum	0.55 mg	0.3 mg
Vitamin B2 (Riboflavin)	1.6 mg/100 g minimum	1.66 mg	1.0 mg
Vitamin B3 (Niacin)	5 mg/100 g minimum	4.88 mg	3.3 mg
Vitamin B6 (Pyridoxine)	0.6 mg/100 g minimum	0.55 mg	0.4 mg
Vitamin B12 (Cobolamine)	1.6 µg/100 g minimum	1.7 µg	0.9 mg
Folic acid	200 mcg/100 g minimum	193 µg	128 µg
Pantothenic acid	3 mg/100 g minimum	2.85 mg	1.7mg
Biotin	60 µg/100 g minimum	60 µg	40 µg
n-6 fatty acids	3 to 10% of total energy		
n-3 fatty acids	0.3 to 2.5% of total energy		

Maximum moisture content is 2.5%

¹ Source: World Health Organization/World Food Programme/United Nations System Standing Committee on Nutrition/The United Nations Children's Fund, 2007

² Source: Manufacturer - Compact AS, Norway

Special Precautions

- In pregnant women the number of sachets and the period of treatment with RUTF should be carefully monitored to avoid high loading with vitamin A.
- In patients with diabetes, caution is required and careful adjustment of the treatment protocol is required because RUTF contains large amounts of sugar.
- The risk of micronutrient overload with iron, zinc and selenium along with fat soluble vitamin A and D could significantly increase if large amounts of RUTF are consumed over a prolonged period.
- Administration of mega dose vitamin A in management of SAM in children and initiation of RUTF treatment should be carefully evaluated to avoid Vitamin A overload.
- Risk of hyperlipidemia is increased patients who are adequately nourished and or from prolonged use of RUTF.

Contraindications

Adverse Reactions to Foods

Food intolerance, sensitivity and allergies are commonly associated with peanuts (ground nuts), tree nuts (macadamia, walnuts etc), fish, shellfish, milk (casein), cheese, soybeans, eggs (albumin), meat and meat products and fruits. Past history of signs and symptoms following ingestion of these foods may indicate intolerance or allergy.

Client category	Diagnosis	Eligibility criteria ¹		Intervention package ²	FBP exit criteria ³ & Actions
		Primary	Secondary		
Orphaned and Vulnerable Children :15+ years Adults: 18 years and above	Severe undernutrition	<ul style="list-style-type: none"> - OVC BMI for Age < - 3.0 Z score Or - OVC MUAC < 14.5 cm - HIV + ve - BMI < 16 kg/m² Or - MUAC < 16 cm Or - MUAC 16 - 18.5 cm with WHO stages 2 or 3 criteria - Appetite test ✓ 	<ul style="list-style-type: none"> - Visible wasting - Bilateral pitting edema +/- 	<ul style="list-style-type: none"> - Nutrition counseling - Therapeutic food eg 276gms per day of RUTF ie 21 sachets per wk - Supplemental food eg 300gms per day FBF (Foundation Plus®) i.e. 1 bag (4.5kg) per month - One bottle per month of safe water solution (SWS) e.g. WaterGuard® 	<ul style="list-style-type: none"> - BMI = or > 16 kg/m² - No oedema on 2 consecutive visits - Switch to FBF prescriptions only
	Moderate/Mild undernutrition	<ul style="list-style-type: none"> - OVC BMI for Age < -2.0 Z score Or - OVC MUAC between 14.5 – 18.5 cm - HIV + ve - BMI 16 to < 18.5 kg/m² Or - MUAC between 16 – 18.5 cm 	-	<ul style="list-style-type: none"> - Nutrition counseling - Supplemental food eg 300gms per day FBF (Foundation Plus®) i.e. 2 bags (9 kg) per month - One bottle per month of safe water solution (SWS) e.g. Water Guard® 	<ul style="list-style-type: none"> - Graduate when BMI > 18.5 kg/m² on 2 consecutive months or BMI > 20 kg/m² - Exit client from FBP & monitor progress
Pregnant women	Severe undernutrition	<ul style="list-style-type: none"> - HIV +ve - MUAC < 19 cm - Appetite test ✓ 	<ul style="list-style-type: none"> - Visible wasting - Bilateral pitting edema +/- - BMI < 20 kg/m² 	<ul style="list-style-type: none"> - Maternal nutrition and infant feeding counseling - Routine ANC counseling, referral & follow up - Therapeutic food eg 276gms per day of RUTF ie 21 sachets per wk - Supplemental food eg 300gms per day FBF (Foundation Plus®) i.e. 1 bag (4.5kg) per month - One bottle per month of safe water solution (SWS)e.g. WaterGuard® 	<ul style="list-style-type: none"> - BMI = or > 20 kg/m² OR MUAC = or > 19cm and weight gain = or > 1.3 kg/month ✓ - Switch to FBF prescriptions only
	Moderate/ Mild undernutrition; Poor weight gain ✓;	<ul style="list-style-type: none"> - HIV + ve - MUAC between 19 – 23 cm And/Or <ul style="list-style-type: none"> - Low weight gain of < 1.3 kg/month (Low gestational weight gain) 	<ul style="list-style-type: none"> - BMI < 20 kg/m² - Failure to gain weight despite OI control & or ART 	<ul style="list-style-type: none"> - Maternal nutrition and infant feeding counseling - Supplemental food eg 300gms per day FBF (Foundation Plus®) i.e. 2 bags (9 kg) per month - One bottle per month of safe water solution (SWS) e.g. Water Guard® 	Graduate when: <ul style="list-style-type: none"> - BMI = or > 20 kg/m² & OR MUAC = or > 23cm - And if weight gain = or > than 1.3 kg/month - Exit client from FBP & monitor progress
Post Partum women (1 st 6 months)	Severe undernutrition	<ul style="list-style-type: none"> - HIV +ve - MUAC < 19 cm - Appetite test ✓ 	<ul style="list-style-type: none"> - Visible wasting - Bilateral pitting edema +/- - BMI < 20 kg/m² 	<ul style="list-style-type: none"> - Maternal nutrition and infant feeding counseling - Routine Post natal counseling, referral & follow up - Therapeutic food eg 276gms per day of RUTF ie 21 sachets per wk - Supplemental food eg 300gms per day FBF (Foundation Plus®) i.e. 1 bag (4.5kg) per month - One bottle per month of safe water solution (SWS)e.g. WaterGuard® 	<ul style="list-style-type: none"> - Steady weight gain after 6 wks And - MUAC = or > 19 cm Or BMI = or > 20 kg/m² - No oedema on 2 consecutive visits - Switch to FBF prescriptions only
	Moderate/ Mild undernutrition; Rapid weight loss ✓.	<ul style="list-style-type: none"> - HIV + ve - MUAC between 19 – 23 cm And/Or <ul style="list-style-type: none"> - Non intentional rapid weight loss of > 0.7 kg/month in normal & low BMI clients 	<ul style="list-style-type: none"> - BMI < 20 kg/m² - Failure to gain weight despite OI control & or ART. 	<ul style="list-style-type: none"> - Maternal nutrition and infant feeding counseling - Supplemental food eg 300gms per day FBF (Foundation Plus®) i.e. 2 bags (9 kg) per month - One bottle per month of safe water solution (SWS) e.g. Water Guard® 	Graduate when: <ul style="list-style-type: none"> - BMI = or > 20 kg/m² & Weight loss is < 0.5 kg/month for 2 consecutive months; OR - BMI = or > 20 kg/m² and steady weight gain is observed on 2 consecutive months - Exit client from FBP & monitor progress

APPETITE TEST AND FREQUENTLY ASKED QUESTIONS ON ORAL NUTRITION THERAPIES

Appetite Test

Points to Consider When Conducting an Appetite Test for children

- Conduct the appetite test in a quiet, separate area.
- Provide an explanation to the caregiver regarding the purpose of the appetite test and outline the procedures involved.
- Observe the child eating the RUTF and determine if the child passes or fails the appetite test.
- Advise the caregiver to:
 - Wash hands and or spoon used for giving the RUTF
 - Sit with the child in his/her lap and gently offer the RUTF
 - Encourage the child to eat the RUTF without force-feeding
 - Offer plenty of clean water to drink from a cup while child is eating the RUTF

Appetite Test Results

Pass Appetite Test	Fail Appetite Test
The child eats at least one third of a packet of RUTF (92 g).	The child does not eat one third of a packet of RUTF (92 g).

Notes:

1. Many children will eat the RUTF enthusiastically straight away, while others might initially refuse it. These children need to sit quietly with their caregivers in a secluded place and be given time to become accustomed to it.
2. For adults, if an appetite test must be conducted, the food given should be in the form that the patient will eventually use at home. It is essential that this test is used to establish swallowing capacity of a combined preparation of RUTF and FBF. Health workers should conduct demonstrations on food preparations for all new patients.
3. Short term pharmacological interventions with an antiemetic and an appetite stimulant should be considered for patients with severe nausea/vomiting and anorexia.

Dietetic Counselling Session – Frequently Asked Questions¹

1. Are Oral Nutritional Supplemental and Therapeutic formulations food or drugs?
2. Who is supposed to use them?
3. How often should I use them along the day?
4. What should I do when I do not manage to finish because of nausea, vomiting, loss of appetite or diarrhoea?
5. Can the therapeutic food formulations be mixed with other foods?
6. What should I avoid to drink or eat together with RUTF?
7. What are the consequences if I share my ration of RUTF with other persons?
8. Is it good for somebody who is not HIV positive to use RUTF?
9. Is it good for somebody who is not thin to use RUTF?
10. When should I stop using RUTF?
11. Will I become thin again when I stop eating RUTF?

¹ Dibari et al; A qualitative investigation of adherence to nutritional therapy in malnourished adult AIDS patients in Kenya. Public Health Nutrition 10. 101; 1-8, 2011.


Chart notes

1. Client enrollment in FBP support is based on primary eligibility criteria.

- Presence of bilateral pitting edema and MUAC values corresponding to moderate under nutrition is managed the same way as severe under nutrition until two weeks after edema has disappeared.

a: Linked OVC refers to siblings in the same household as index child but **Not** receiving care from CCC or treatment centre.

- Pregnant and post partum (first 6 months after delivery) women:

b: Normal and moderately undernourished with low weight gain < 1.3 kg/month in consecutive months during 2nd and 3rd trimesters.

c: Normal and moderately undernourished with rapid weight loss in consecutive months after 6 weeks

2. Ready to use therapeutic food (RUTF): Used alone in 6-59 months old or in combination with supplemental foods for other age groups is used in management of severe acute under nutrition (marked red).


- Reviews and RUTF prescription refills are done weekly.
- Supplemental foods e.g. fortified blended flours (FBF) alone or ready to use formulations are used in the management of moderate acute under nutrition.
- Reviews and FBF prescription refills are done monthly.

Note: In children, actual RUTF dose should be determined on the basis of current weight and age.

d: Intake of 37g /kg body weight/ day of RUTF yields 200 kcal/kg body weight /day.

- The weekly RUTF prescription for an OVC aged 6 – 23 months ranges from 21 to 28 sachets.

3. Discharge from FBP support is based on attaining appropriate anthropometric cut-off points.

- **Index OVC:** Discharge when weight-for-height equal to or greater than -1.0 (or corresponding weight gain of 15% to 20% of enrollment weight) in children.
- **Linked OVC:** Discharged at the exit point of the Index OVC.
- **Adult PLHIV:** Discharged after attaining BMI > 18.5 on 2 consecutive months or attaining BMI equal to or greater than 20, whichever comes first.
- **Pregnant and post partum women: (e****)** Consistent weight gain in pregnant women during 2nd and 3rd trimester for 2 consecutive months
- **All clients:** Discharge and refer for evaluation if clients does not gain weight or continues to loose weight in successful visit despite adequate intake or edema persists for 2 - 3 weeks or failure of appetite test (ability to consume an estimated dose of RUTF for one day). Treatment with RUTF should be limited to 90 days and FBF supplementation should **Not** exceed 6 months.

Critical Practices in Nutrition Assessment, Counselling and Support (NACS)

Critical Nutrition Practice ¹	Key message and Actions
1. Periodic nutrition assessment is critical for effective maintenance and management of malnutrition	Anthropometric measurements of height and weight (to assess % weight changes, Body Mass Index (BMI) or Z- score) and MUAC provide useful information on nutrition and health status of patient. Changes in body shape and waist to hip ratio may be observed to detect fat distribution disorders.
2. Adequate intake of a balanced diet to meet increased energy and nutrient requirement is essential for effective maintenance of optimal nutrition status and management of malnutrition	Dietary assessment of the adequacy of food consumptions from different food groups and their access (food security), and barriers to food intake that are disease related is required. This informs in selection of appropriate diet and meal plans that include nutrient dense foods. In case s of clinical nutritional deficiency disorders/diseases, prescription of supplemental or therapeutic food or micronutrients is indicated.
3. Regular drinking of adequate safe and clean water is critical for optimum nutrition and health status.	Water intake must be sufficient to meet essential functions including digestion, absorption, transport and metabolism of nutrients. Drinking plenty of water can reduce side effects from medications, and also help with dry mouth and constipation. Patients must remain adequately hydrated at all times and use safe water to take drugs. The water must be boiled or treated.
4. Maintaining good personal hygiene, food safety and environmental cleanliness is key to effective prevention of opportunistic infections.	Frequent hand washing with clean water and soap, and making it a must after using the toilet, before handling food and before eating is vital. Washing fruits and vegetables with safe clean water is also vital in prevention of opportunistic infections and malnutrition consequences.
5. Food and drugs interactions are important in effective patient management.	Side effects of drugs may impact on nutrition status of a client by altering intake, absorption and metabolism. Medications can affect taste; precipitate nausea, vomiting, loss of appetite, diarrhoea and constipation. Dietary interventions can reduce the severity of drugs related side effects. Oral drugs may also require specific dietary practices to enhance their efficacy.
6. Positive living behaviours improve the coping mechanism of the clients.	Lifestyles that increase the risk of infection with other strains of HIV and or infecting others must be discouraged. Clients must be encouraged to use condoms when having sex or abstain altogether, to stop alcohol consumption and smoking. These risk factors exacerbate disease progression and reverse all treatment gains. Clients should be given good psycho-social support to be able to seek help from family and friends and or referred to peer support groups. .
7. Adequate physical activity is key to maintenance muscle tone and regeneration following wasting.	Regular physical activity enhances muscle tone, prevents muscle wasting, stimulates regeneration, increases appetite and improves sleep patterns Encourage patients to engage in daily physical activity for at least 30 minutes.
8. Good health seeking behaviour facilitate prompt access to treatment and support	Timely and effective management of opportunistic infections helps in slowing down progression of the disease and malnutrition Effective management of opportunistic infections and appropriate nutritional interventions are vital in slowing down the progression of disease. . Encourage patients to seek help anytime they develop signs and symptoms of an opportunistic infection.

¹ Provide patient with reinforcing IEC material such as “Eat Well Stay Healthy” and “Nutrition in Management of HIV/AIDS”

Determining Household Food Security: Application of the Household Hunger Score¹ (HHS)

A: No	B: QUESTION	C: RESPONSE OPTIONS	D: CODE
1.	In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?	0 = No (skip to Question 2) 1 = Yes	... __
1.a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)	... __
2.	In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food?	0 = No (skip to Question 3) 1 = Yes	... __
2.a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)	... __
3.	In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?	0 = No (questionnaire is finished) 1 = Yes	... __
3.a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)	... __

Creating a Household Hunger Score for a household

Step1. The response for each question (column C) is recorded under column D (Code). ‘Never’ should always be coded as 0. ‘Rarely’ or ‘Sometimes’ should be coded as 1. ‘Often’ should be coded as 2.

Step 2. The responses given by a household in column D for the three questions are added to obtain the household’s aggregated HHS score.

Interpretation

Based on the HHS score, each household is categorized as follows:

HHS SCORE	CATEGORY
0-1	Little to no household hunger
2-3	Moderate household hunger
4-6	Severe household hunger

The minimum score possible is 0. This would be the HHS score for a household that responded “NO/never” to all three questions. The maximum score possible is 6. This would be the HHS score for a household that responded “YES/often” to all three questions. Households in this category merit food aid and livelihood support.

¹ Deitchler, Megan, Terri Ballard, Anne Swindale and Jennifer Coates. Validation of a Measure of Household Hunger for Cross-Cultural Use. Washington, DC: Food and Nutrition Technical Assistance II Project (FANTA-2), AED, 2010