



## MSF Nutrition Training Package

### Module 1 Session 2 Interpretation

**Duration:** 45 min

**Recommended Prerequisite Sessions:**

M1-S1

**Other Recommended Preparation:**

Nutrition Guidelines, 2014: Introduction to malnutrition (pages 19 - 21).

#### General Objective:

To be able to categorise acute malnutrition using anthropometric variables and clinical indicators

#### Target Profiles:

Must attend Supervisors, Nurses, Nutrition Assistants, CHWs, Doctors

Should attend -

Could attend -

#### Key Learning Objectives

At the end of this session participants will be able to: 1. Interpret WHZ index, MUAC cut-offs and severity of bilateral oedema; 2: Define and classify the types of malnutrition according to WHZ, MUAC and/or oedema.

#### Methodology Overview:

This is a 45-minute session where participants can practice the classification of acute malnutrition through the example of cases and receive immediate feedback from the facilitator.

1. Facilitator asks introductory questions to the participants
2. Facilitator explains the types of malnutrition, how to use the WHZ table, how to interpret the MUAC cut-offs and grades of oedema with practical examples
3. Participants practice themselves with some case studies of children
4. The facilitator provides feedback and provides quick tips to takeaway

Time	Activities	Description of Learning Activities	Method	Materials
5'	Activity 1: Introduction	Explanation of the learning objectives and introduction of the session with two questions.	Whole Group /groups of 2-3 people	None
15'	Activity 2: Determine nutrition status	The facilitators explain the different index and indicators used to classify malnutrition. Practical examples are used and participants use the WHZ table handout.	Whole group	Computer and Projector Ppt: NP_M1_S2_Interpretation NP_M1_S2_WHZ WHO 2006 tables Flipchart/markers MUAC tape
18'	Activity 3: Skills Practice	Participants first play the memory game to find their pair and then work on the classification of malnutrition with the case studies.	In pairs	Memory game: Case Study Cards NP_M1_S2_Case Study Cards NP_M1_S2_CaseStudyCards_Answers
7'	Activity 4: Wrap up	-Facilitator provides answers/feedback -Facilitator presents key contents for participants to take away. *If there is time remaining the facilitator can ask participants to turn over the key contents sheet and see how many tips they can name without looking.	Whole group	Takeaway: NP_M1_S1_Takeaway_KeyMessages NP_M1_S2_Takeaway_Interpretation  -handout/email PDF



## Materials

- Projector
- Computer
- Flipchart and markers
- MUAC Tape
- (Ppt) NP\_M1\_S2\_ Interpretation
- (PDF)NP\_M1\_S2\_WHZ WHO 2006 Tables
  - **Print:** one per participant
- (PDF) NP\_M1\_S2\_Case Study Cards):
  - **Print:** 2 copies (laminated if possible)
  - PPT: NP\_M1\_S2\_CaseStudyCards\_Answers
- **To be printed or emailed:** Takeaways
  - NP\_M1\_S2\_Takeaway\_ Interpretation
  - NP\_M1\_S1\_Takeaway\_KeyMessages



## Activities Development



### Activity 1: Introduction

(In group first and then in pairs, 5 minutes)

- The facilitator will introduce the objectives of the module, topics to deal with and methodology,
- The facilitator asks 2 questions that the participants will work on in pairs:
  1. What variables do you need to classify acute malnutrition?
  2. Have you ever seen a child with bilateral oedema, how did you recognise it, where were they?
- The facilitator will not provide the answer. The answer will be give through the theoretic content in Activity 2. The objective of asking these questions is to get the participants to start reflecting on the topics that will be explained and discussed during the session.

### Activity 2: Determining Nutritional Status

(In group, 15 minutes)

The facilitator will present the content theory through the PPT: NP\_M1\_S2\_ Interpretation

#### 1. Malnutrition Index

- To classify malnutrition, we need different variables: anthropometric measurements (weight, height or length, and MUAC), the clinical sign of bilateral pitting oedema, and the sex and age variables.
- These variables in isolation do not provide information on the nutritional status of a person. Measurements such as weight and height have to be seen in relation to each other or in relation to age for interpretation or calculation of indices, which are combinations of measures. In this sense, we use the following indices to classify malnutrition:

- Weight/height Z-score (WHZ): To determine acute malnutrition or wasting
- Height/age Z-score (HAZ): To determine chronic malnutrition or stunting
- Weight/age Z-score (WAZ): To determine underweight (more general nutritional status)
- The indices are compared with a reference values (standard cut-off points) to determine if the individual is malnourished and to determine the severity: Moderate or severely malnourished.

## 2. Acute malnutrition classification

- In this training, we will focus on acute malnutrition (WHZ). Acute malnutrition has the following types:
  - Moderate acute malnutrition (MAM) = moderate wasting.
  - Severe acute malnutrition (SAM) = severe wasting and/or bilateral oedema (can also be both).
  - Global acute malnutrition refers to both *moderate* acute malnutrition (MAM) and *severe* acute malnutrition (SAM).
- There are two types of SAM:
  - Marasmus:
    - Excessive thinness, also known as “**wasting**”.
    - Low weight compared to height/length (WHZ index criteria) or low MUAC
    - Resulting from a recent and rapid loss of weight, or incapacity to gain weight
  - Kwashiorkor:
    - Presence of bilateral pitting oedema
    - Hair depigmentation, skin desquamation, hepatomegaly
    - Often following weaning, 18 months to 2.5 years.
    - Causes remain uncertain
  - Note: There are children where both conditions are present: Marasmus (low weight compared to their height/length or low MUAC) + Kwashiorkor (oedema). Often called Marasmic-kwashiorkor or ‘mixed’
- After measuring each child’s weight, height, length, MUAC and oedema, it is necessary to **identify the child’s nutritional status** by:
  1. Grading their oedema:
  2. Comparing their weight/height index to WHO Z-score tables
  3. Compare their MUAC to the cut-off criteria

### 1. Grading the severity of oedema:

- When bilateral pitting oedema is present: This means that the child has **severe acute malnutrition**, regardless of their other measurements. This type of malnutrition is called Kwashiorkor
- 4. When measuring oedema, it is important to interpret the grading of bilateral pitting oedema to properly classify its severity. If oedema is present in the feet = +; feet and legs = ++; feet, legs and other parts of the body = +++.

Then, the facilitator will explain without using the PPT: NP\_M1\_S2\_Interpretation the following steps to identify a child's nutritional status:

## 2. Comparing their weight/height to WHO Z-score tables:

- The facilitator will show and explain the WHZ MSF tables (give one table to each participant):
  - i. Show that there is one side for boys and the other for girls.
  - ii. Show that in the middle there are all the heights/lengths. Show that they go from 45 cm to 120 cm. There is a 0.5 cm precision. If a child has a height or length between the 0.5 cm precision, round up or round down to the nearest height/length (e.g. 45.3=45.5 cm)
  - iii. Show that for boys and girls there are different columns. Each column corresponds to a standard deviation (Z-score): -3, -2, -1 and median
- The facilitator will explain the Z-score Interpretation of Measurements. The facilitator writes this criteria on the flipchart:

Table 1: Z-score interpretation of measurement

Criteria	Normal	Moderate	Severe
Z-score	$\geq -2$	$\geq -3$ and $< -2$	$< -3$

- The facilitator explains that SAM defined by WHZ  $< -3$  (without oedema) is called marasmus
- The facilitator will give examples to interpret the WHZ table. He/she writes down each example in the flipchart. They do the exercises all together in plenary. Note: there are 4 examples; this can be reduced if there is not enough time.

Example 1: A boy with a height of 63 cm and weighing 8.0 kg

- *Look for the height of 63 cm in the first column of the table.*
- *Take a ruler, place it under the figure 63, and LOOK LEFT along the line for the figure corresponding to the weight of the child. When you find this figure (i.e. 8.0), go to the top of the column and you will see that this corresponds to 2 SD. This child is therefore considered as having a normal weight for his height.*

Example 2: A girl with a height of 78 cm and weighing 8.0 kg.

- *Look for the height of 78 cm in the first column of the table.*
- *LOOK RIGHT along this line, until you find the weight of the child. 8.0 kg does not correspond to any figure written on the table.*
- *8.0kg is between 7.5 and 8.2 kg and therefore between -3 SD and -2 SD. Since, this child's weight is higher than the -3 SD limit, she would be considering as suffering from moderate acute malnutrition.*

Example 3: A girl with a height of 66.8 cm and weighing 5.5 kg.

- Look for the height of 66.8 cm in the first column of the table. This height does not exist on the table. Take the nearest height, i.e. 67 cm.
- LOOK RIGHT from the 67 cm point until you find the weight of the child. 5.5 kg does not correspond to any weight on the table.
- 5.5 kg is less than the last weight on the table, i.e. 5.8 kg, and therefore is less than -3 SD. This child is suffering from severe acute malnutrition.

Example 4: A girl with a height of 89.8 cm and weighing 10 kg.

- Look for the height of 89.8 cm in the first column of the table. This height does not exist on the table. Take the nearest height, i.e. 90 cm.
- Look RIGHT across from the 90 cm point until you find the weight of the child. 10 kg does not correspond to any weight on the table.
- 10 kg is between 9.8 and 10.6 kg, which correspond to -3 SD and -2 SD, respectively. In this case, since 10 kg is higher than the limit for the -3 SD, i.e. 9.8 kg, we would consider the child as moderately malnourished.

### 3. Compare MUAC to the cut-off criteria

- The facilitator will show a MUAC tape to explain the cut-offs and colours

Table 2: MUAC interpretation of measurements for children from 6 to 59 months

Criteria	Normal	Moderate	Severe
MUAC	≥125	≥115 and <125 mm	< 115 mm

- SAM defined by MUAC < 115 mm (without oedema) is called marasmus
- When measuring MUAC, red colour (MUAC < 115 mm) corresponds to SAM while orange colour (MUAC ≥115 and < 125) corresponds to MAM.

### Determining the nutritional status

- Finally, the facilitator will explain the following:
  - Each variable (MUAC and oedema) or index (WHZ) is independent from the other to classify acute malnutrition. For example: children who present bilateral oedema are diagnosed as SAM, irrespective of their WHZ or MUAC
  - Identification of acute malnutrition at community level:
    - CHW use the MUAC and oedema criteria
    - SAM and MAM cases will be identified according to MUAC and/or oedema variables

Table 3: Criteria to determine acute malnutrition

Acute malnutrition	Criteria
Global Acute Malnutrition (SAM + MAM)	<-2 WHZ (0-59 months) and/or MUAC < 125 mm (6-59 months) And/or Bilateral oedema
Moderate Acute Malnutrition	<-2 to $\geq$ -3 WHZ (0-59 months) and/or MUAC $\geq$ 115 mm to < 125 mm (6-59 months)
Severe Acute Malnutrition	< -3 WHZ (0-59 months) and/or MUAC < 115 mm (6-59 months) And/or Bilateral oedema



### Activity 3: Skills Practice

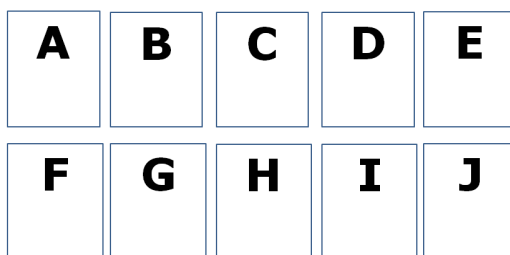
(Pairs, 18 minutes)

#### Game and Case study Analysis

The participants will work together in pairs with some case studies to classify malnutrition by WHZ (using the WHZ table), MUAC and/or oedema.

Ask participants to get into pairs, first they do the Nutrition Memory Game (5 min), and then work together on cases. When they finish they swap cards with other pairs.

- Participants take turns in pairs to find two matching cards (with the same child).
- Preparation
  - Once printed, a letter is written down on the back side (see the example of design below)
  - The cards are laid out on a table face down with the letters facing up or stuck to the flipchart.



- Steps
  - The aim is to find two matching photos.
  - Each pair gets a turn
  - Each pair chooses two letters
  - Facilitator turns over the cards to see who is on the other side
  - If they do not find the match, the facilitator turns the card back to the letter and it is the next pair's turn.
  - When they find a match, they work together to analyse the case.
  - When they have finished analysing one case, they write down the result in their notebook and they swap the case with another pair and analyse the new case. They do this with the 5 cases (or less according to the facilitator and time available)
  - If there are more than 10 participants, other copies of the cards can be printed.



Facilitator provides answers to the correct classification of each case study and provides overall feedback.



**Fatima**

Girl 13 months  
MUAC: 122 mm  
Weight: 8.1 kg  
Length: 74.4 cm  
Oedema: ++

**Answer**

WHZ: > -2  
MUAC: MAM  
But the child has SAM because of the oedema  
CATEGORY: SAM



**Mohamed**

Boy 7 months old  
MUAC: 108 mm  
Weight: 6.1 kg  
Length: 66.3  
Oedema: 0

**Answer**

No oedema  
WHZ: between -3 and -2  
But is SAM because MUAC < 115mm  
CATEGORY: SAM



Boy 10 months old  
MUAC : 126 mm  
Weight: 5.5 kg  
Length: 63.1 cm  
Oedema= 0

**Answer**

No oedema  
MUAC > 125= not malnourished  
MAM because : Zscore between <-2 and >-3  
CATEGORY: MAM





**Ninka**

Girl 8 months old  
MUAC: 131 mm  
Weight: 5.9 kg  
Length: 62.5 cm  
oedema: 0

**Answer**

No oedema  
Zscore = -1. No malnutrition  
CATEGORY: NO MALNUTRITION



**Fabian**

Boy 30 months old  
MUAC: 120 mm  
Weight: 10 kg  
Height: 92.2 cm  
oedema: 0

**Answer**

No oedema  
Zscore < -3 SAM  
MUAC : MAM  
SAM because of WHZ < -3  
CATEGORY: SAM



**Activity 4: Wrap Up**

(Whole group, 7 minutes)

The facilitator makes sure all the key messages and key contents are mentioned:

**Key messages/contents**

- In order to classify malnutrition, the anthropometric measurements (weight, height) are combined. This is called an Index.
- In nutrition programmes, the WHZ index, MUAC and assessment of oedema are the appropriate variables (along with age and sex) to classify severe acute malnutrition (SAM). For moderate acute malnutrition (MAM), WHZ index and MUAC will only be used – this is because as soon as a child has oedema, they are SAM regardless of the other measures.
- To classify SAM or MAM by WHZ it is important to properly interpret WHZ reference tables:

- SAM: WHZ <-3
- MAM: WHZ ≥-3 and <-2
- When measuring MUAC:
  - SAM: red colour (MUAC < 115 mm)
  - MAM: orange colour (MUAC ≥115mm and < 125mm)
- Grading oedema:
  - In the feet: +
  - In the feet and legs: ++
  - In the feet, legs and other parts of the body: +++
- Each variable (MUAC and oedema) or index (WHZ) is independent from the other to diagnose acute malnutrition. For example: children who present bilateral oedema are categorised as SAM, irrespective of their WHZ



## Takeaways

Facilitator gives “quick tips” for participants to take away:

- NP\_M1\_S2\_Takeaway\_ Interpretation
- NP\_M1\_S1\_Takeaway\_KeyMessages
- Optional Game-If there is time remaining the facilitator can:
  1. Give the participants one minute to memorise as many key contents as possible
  2. Ask participants to turn over the quick tips sheet
  3. Talk to their partner and see how many tips they can name without looking.



## On the job training

When there is a real case that comes to the admission area. Nutrition assistants, nurses or doctors can come over to the registration area, gets the results of the child’s measurements and then they do the exercises themselves and deciding if this child is SAM, MAM or is healthy.

