INTEGRATED MANAGEMENT OF ACUTE MALNUTRITION (IMAM)

info@humanitarianglobal.com
+254 796 665 105 / +254 758 360 298
Humanitarian Global Institute,
P.o Box 76826 - 00620 Nairobi, Kenya.
Presented by ***Annette Mambo***

Content

1. Introduction; definition of malnutrition, categories of malnutrition, causes of malnutrition
2. Integrated Management of Acute Malnutrition (IMAM): purpose, component and principles of IMAM
3. Assessment for acute malnutrition; MUAC, oedema, appetite, medical complications, physical assessment
4. Types of therapeutic and supplementary foods used in nutrition care
5. Treatment of malnutrition in therapeutic care units: OTC, ITC
6. Discharge criteria from outpatient therapeutic care

Expected Learning Outcomes

By the end of the session the learner is expected to:

1. **Explain and categorize malnutrition**
2. **Explain the causes of malnutrition using UNICEF's conceptual framework**
3. **Explain what is the integrated Management of Acute malnutrition**
4. **Assess and diagnose malnutrition in children under five**
5. **Describe common types of therapeutic and supplementary foods used in nutrition care**
6. **Administer nutrition therapeutic care to treat the different categories of acute malnutrition in children under five using IMAM protocols**
7. **Describe the discharge criteria/outcomes of OTC**

Meaning of Malnutrition

Malnutrition refers to ***deficiencies, excesses, or imbalances*** in a person's intake of energy and/or nutrients.

The term malnutrition addresses 3 broad ***forms***:

- **Undernutrition**, which includes wasting (low weight-for-height), stunting (low height-for-age) and underweight (low weight-for-age);
- **Micronutrient-related malnutrition**, which includes deficiencies or excessive vitamins and minerals
- **Over-nutrition** which includes overweight and obesity

In other words; malnutrition is when the body does not have enough of the required nutrients (***under-nutrition***) or has excess of the required nutrients (***over-nutrition***).

Under-nutrition

Over-nutrition

Categories of Malnutrition

There are two categories of malnutrition:

a. Acute Malnutrition

b. Chronic Malnutrition

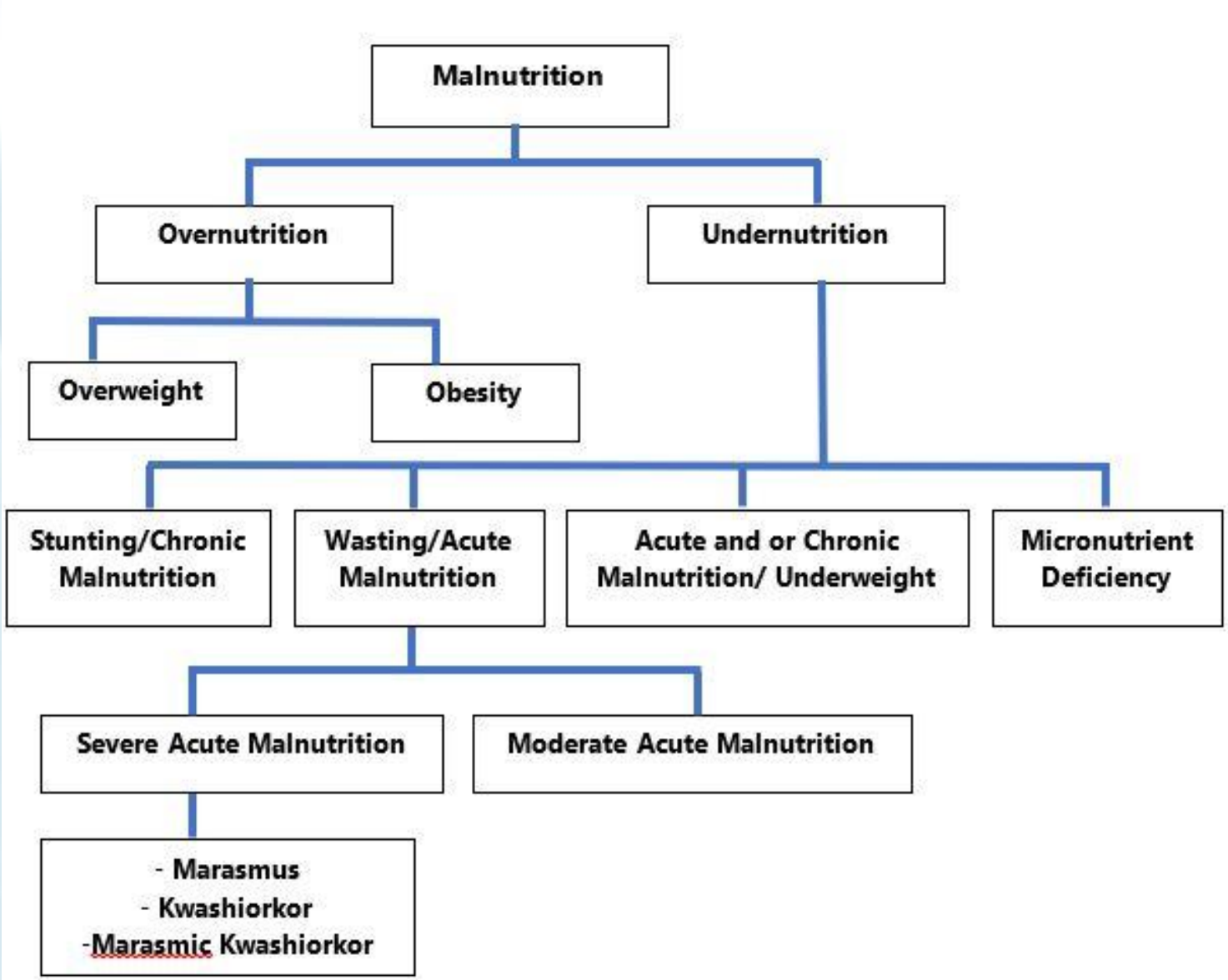
Children can have a combination of both acute and chronic malnutrition

a. Acute Malnutrition

- Acute malnutrition is a form of under-nutrition caused by a ***decrease in food consumption and/or illness*** that results in ***sudden*** weight loss or oedema (fluid retention).
- Acute malnutrition can be ***moderate (MAM) or severe (SAM)***
- **MAM** and **SAM** are determined by the patient's degree of wasting and presence of bi-lateral oedema.
- **SAM** is further classified into: Marasmus and Kwashiorkor. Patients may present with a combination, known as Marasmic Kwashiorkor

b. Chronic Malnutrition

- Refers to **prolonged** malnutrition that may begin in the prenatal period and continue over the lifetime of a child. This can lead to significant developmental and cognitive deficits and significantly increases the risk of death
- Chronic undernutrition is manifested as ***stunting and underweight***
- Chronic malnutrition is determined by a patient's expected ***height for a given age***


Malnutrition
Overnutrition
Undernutrition
Overweight
Obesity
Stunting/Chronic Malnutrition
Wasting/Acute Malnutrition
Acute and or Chronic Malnutrition/ Underweight
Micronutrient Deficiency
Severe Acute Malnutrition
Moderate Acute Malnutrition
- Marasmus
- Kwashiorkor
-Marasmic Kwashiorkor

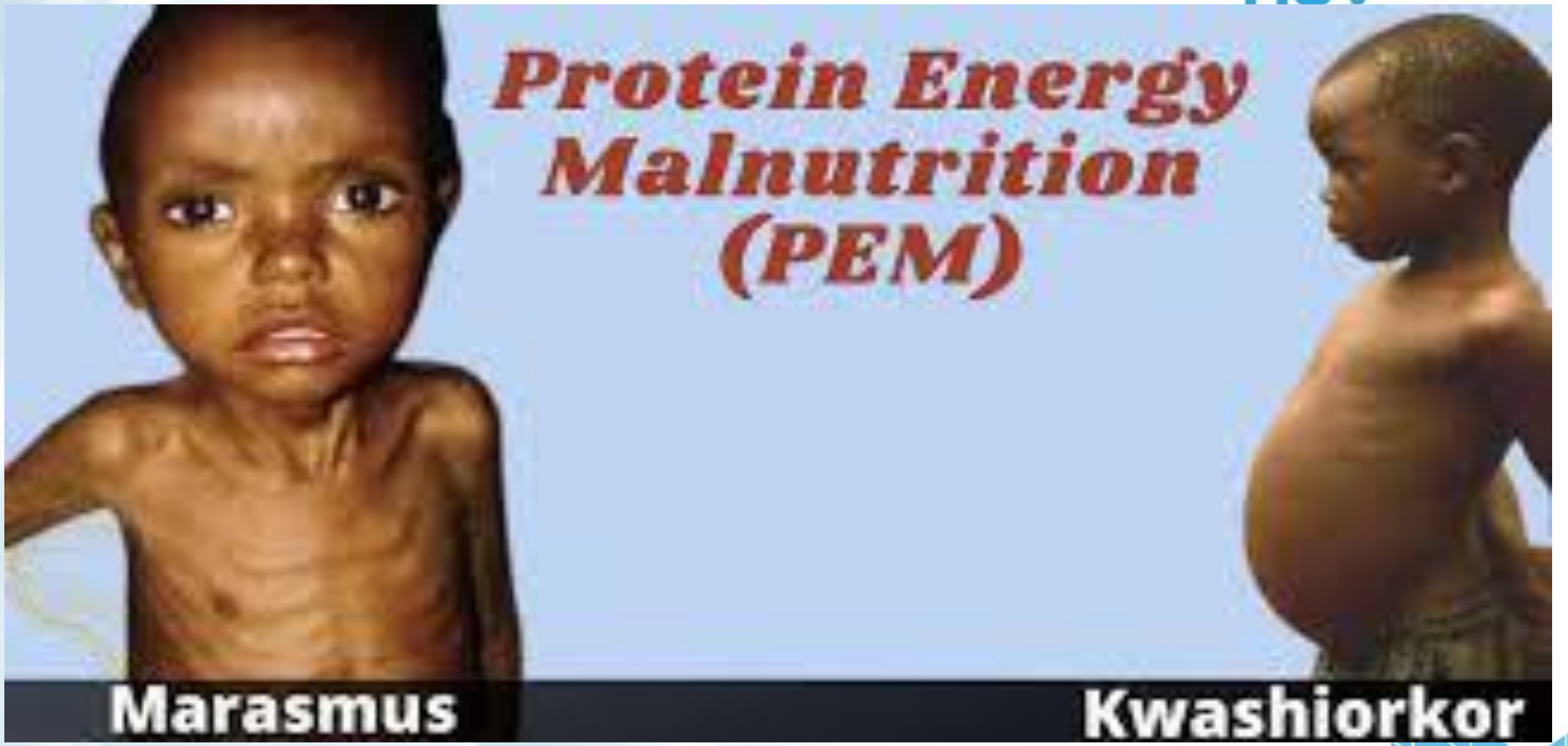


Illustration of stunted growth

Causes of Malnutrition

- Undernutrition results from the complex interplay of a range factors, as illustrated by the United Nations Children's Fund's (UNICEF) conceptual framework for undernutrition (UNICEF 2013) as shown below
- The framework defines ***basic, underlying, and immediate*** causes of undernutrition and demonstrates how these causes are interconnected.

1. **Immediate Causes of Malnutrition:** *which include*

   Lack of food Intake and disease. *These* create a vicious cycle in which disease and malnutrition exacerbate each other. It is known as the Malnutrition-infection Complex. Thus, lack of food intake and disease must both be addressed to support recovery from malnutrition

2. **Underlying Causes of Malnutrition:** Three major underlying causes of malnutrition include:

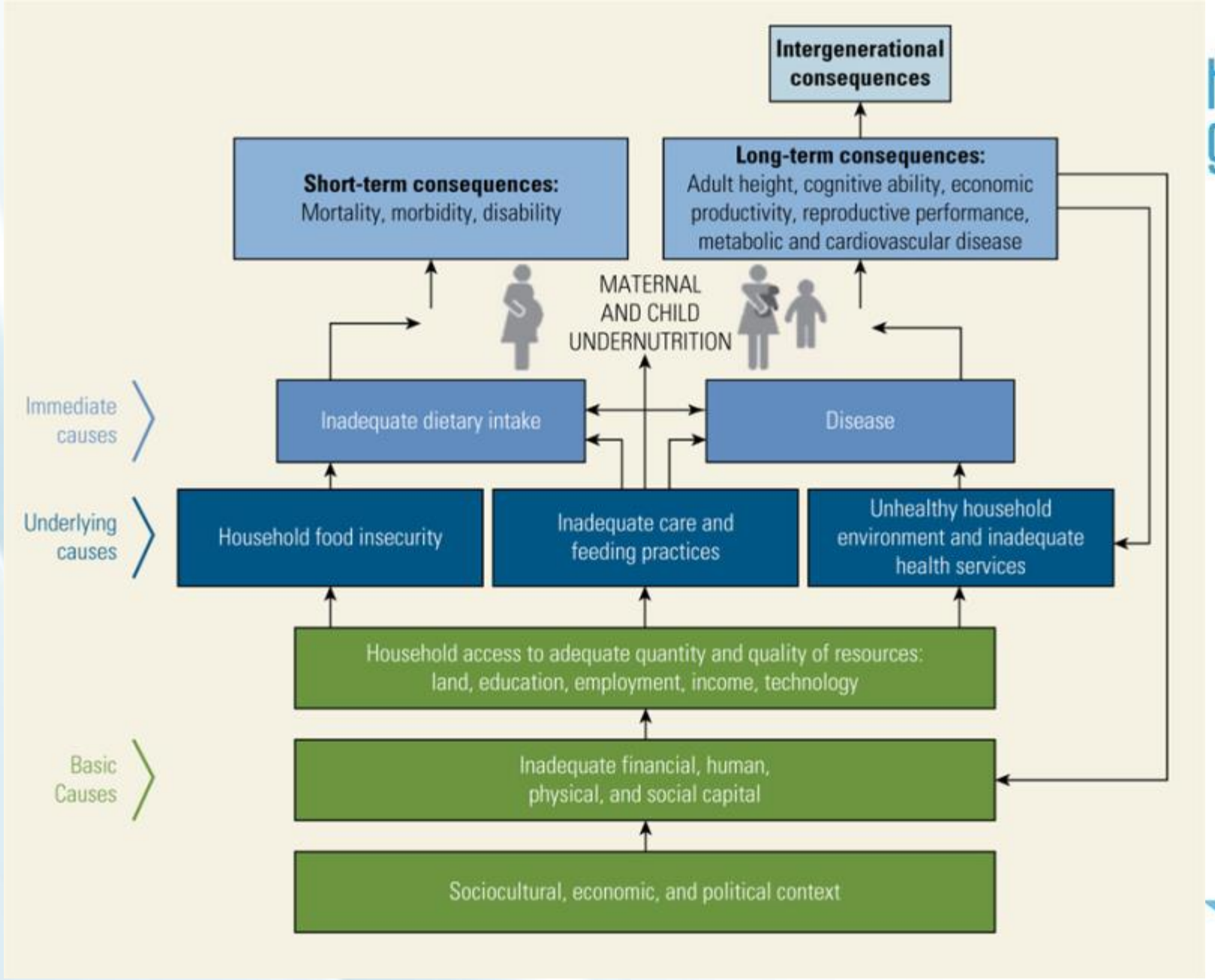
   .

a. ***Inadequate household food security*** (limited access or availability of food).

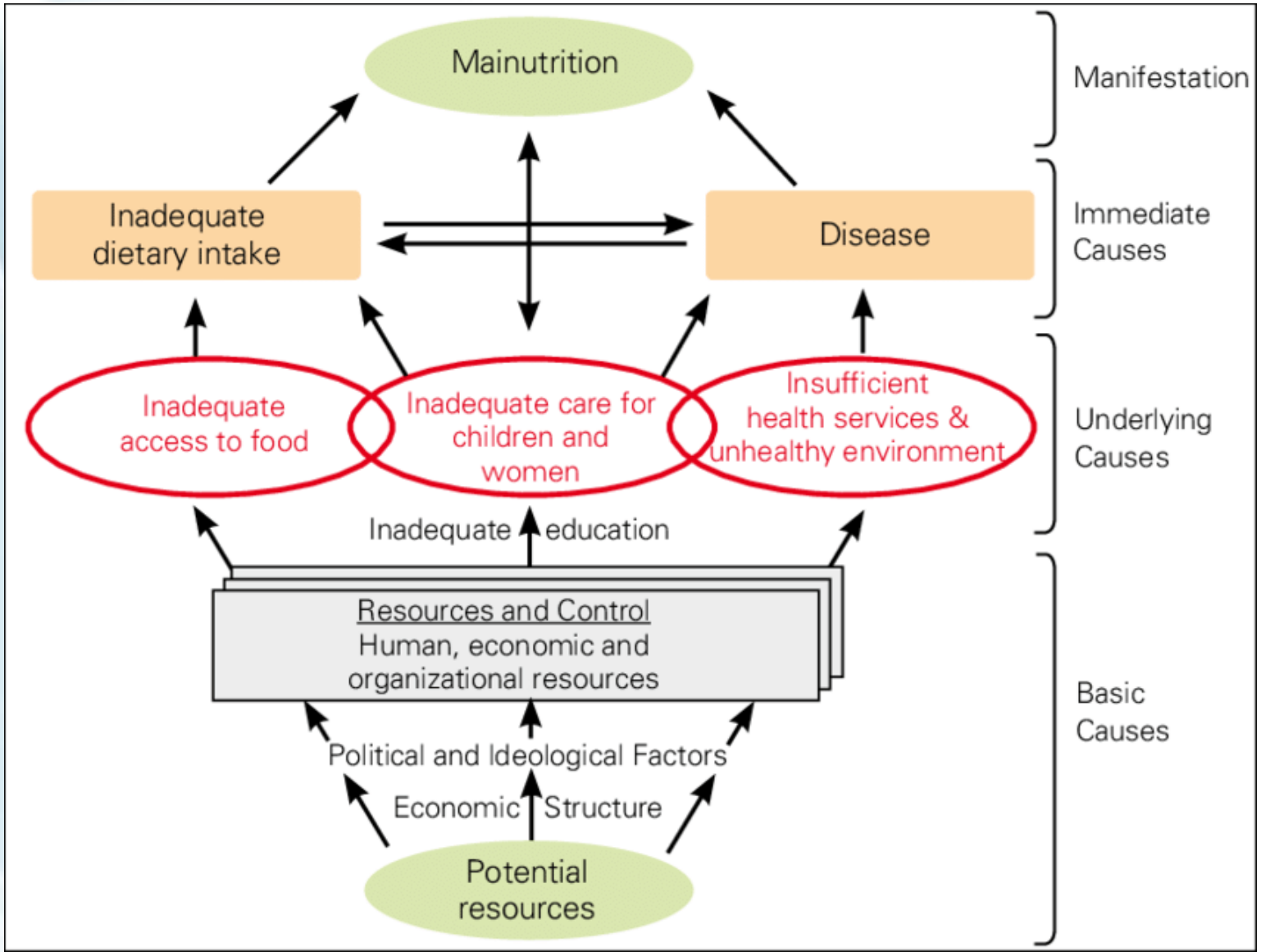
b. ***Health***: Limited access to adequate health services and/or inadequate environmental health conditions.

c. ***Care***: Inadequate social support and care in the household and local community, especially with regard to women and children

3. **Basic causes of malnutrition** in a community originate at the regional and national level, where strategies and policies that affect the allocation of resources (human, economic, political and cultural) influence what happens at community level.



Causes of Malnutrition: The *UNICEF's conceptual framework*, below, summarizes the causes of malnutrition



Why focus on undernutrition? Why focus on children?

- Malnutrition is an ***important public health*** issue particularly ***for children under five years old*** who have a significantly higher risk of ***mortality and morbidity*** than well nourished children.
- Globally, around 45% of deaths among children under 5 years of age are linked to undernutrition. (WHO, 2021
- Acutely malnourished children lack growth nutrients that are required to build new tissues. These nutrients aid weight gain after illness, repair damaged tissues and help replace the rapid turn-over of cells (intestine and immune cells).

INTEGRATED MANAGEMENT OF ACUTE MALNUTRITION (IMAM)

- **I**ntegrated **M**anagement of **A**cute **M**alnutrition (IMAM) is an integrated program to fight back against acute malnutrition.
- It is a comprehensive strategy that **links *inpatient treatment*** of SAM patients (with complications) with ***outpatient care*** of SAM (without complications), management of children with moderate acute malnutrition (MAM) and comprehensive ***community mobilisation*** and involvement
- It is a nutritional program designed for management of malnutrition ***especially*** for children of 6-59 months of age

- The Guidelines for Integrated Management of Acute Malnutrition (**IMAM**) have been developed by the collaboration of many technical experts and bodies.
- The IMAM guidelines are based ***on current evidence as well as best practices*** in the management and treatment of acute malnutrition.
- The **IMAM** tool continues to be very useful and many counties worldwide have made local adaptation of the tool.
- The **IMAM** guidelines have provided a comprehensive strategy for management of acute malnutrition

Purpose of the IMAM guidelines

Some of the purposes of the **IMAM guidelines** include:

1. The IMAM guidelines specifically deal with the **identification and management** of acute malnutrition. The guidelines seek to improve the management of acute malnutrition in children, adolescents and adults through the treatment of SAM and MAM cases that have medical complications in ITC and those without complications in OTC.

2. The IMAM guidelines are aimed at contributing to improved ***standardized treatment, monitoring and reporting***

Components of IMAM Program

Integrated management of acute malnutrition (IMAM) has **four** components:

1. **Outpatient Therapeutic Care (OTC)):** provides ***home-based*** treatment and rehabilitation

1. **Inpatient Therapeutic Care (ITC):** may take place in ***hospitals or Stabilisation*** Centres (SC).

Components of IMAM Program.....continued

3. **Supplementary Feeding Program (SFP**), to boost dietary intake of the vulnerable individuals/communities. It commonly used in difficult circumstances

4. **Community linkage (**Community Outreach/mobilization) for early identification, referral, and follow-up of acutely malnourished cases

Principles of IMAM:

1. **Maximum coverage and access**; aims to achieve the greatest possible coverage by making services available to the highest possible population
2. **Timeliness**; aims to begin case-finding and treatment before the prevalence of malnutrition escalates.
3. **Appropriate medical care and nutritional rehabilitation**; provision of simple, effective outpatient care for patients who can be treated at home and clinical care for those who need in-patient treatment
4. **Care for as long as it is needed**; ensuring clients can stay in the programme as long as they need to.

Target group of IMAM program

- 6-59 months age children
- Children above 59 months (for special cases of HIV/AIDS, Severe acute malnutrition and oedema)

Screening or Assessment for Acute Malnutrition

Acute Malnutrition in a child can be assessed/identified by:

- Measuring Mid Upper Arm Circumference (MUAC) using MUAC tape
- Measuring height and weight of the child and determining Z-score
- Checking bilateral pitting oedema
- Appetite test
- Physical assessment
- Clinical assessment for medical complications

Diagnosis of Severe Acute Malnutrition

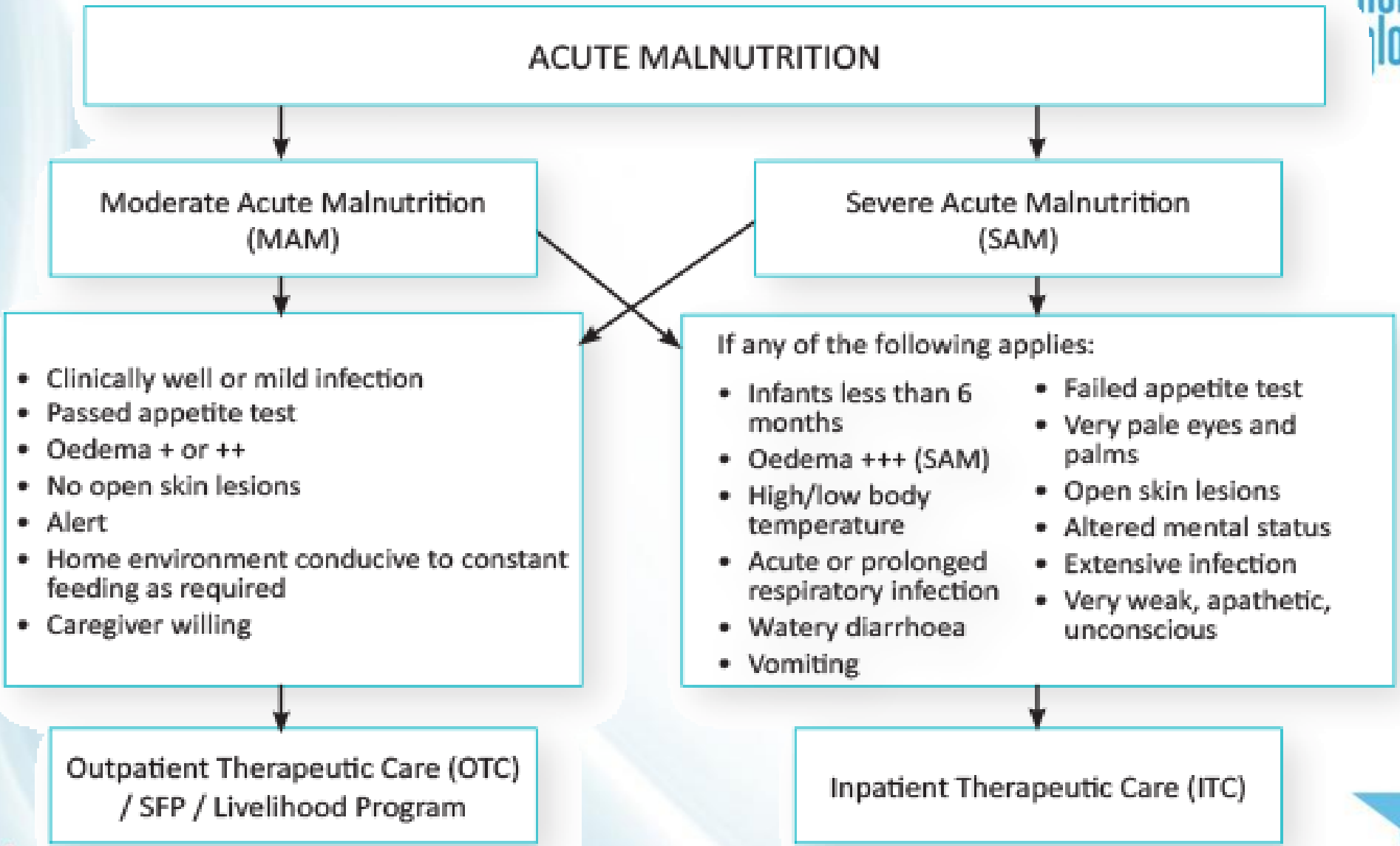
A child has **MAM if** he/she meet any of the following criteria

- A mid-upper arm circumference (MUAC) between 11 cm and 12.5 cm or
- Weight-for-height between -3 and -2 z-scores
- The child should have No bilateral pitting edema,
- No medical complications
- Should good appetite

Diagnosis of Severe Acute Malnutrition……..continued

A child has **SAM if** he/she meet one or more of the following criteria:

- Presence of bilateral pitting oedema or
- MUAC measurement of <115mm,or
- Weight for height Z-score of <-3 S.D of the international standard or
- Has poor/no appetite or
- Has medical complications



MUAC measurement

Bilateral pitting oedema

Classification of Nutritional Oedema

Observation	Classification
No oedema	(0)
Bilateral oedema in both feet (below the ankles)	+ (grade 1)
Bilateral oedema in both feet and legs (below the knees)	++ (grade 2
Bilateral oedema observed on both feet, legs, arms, face	+++ (grade 3)

Medical Complications

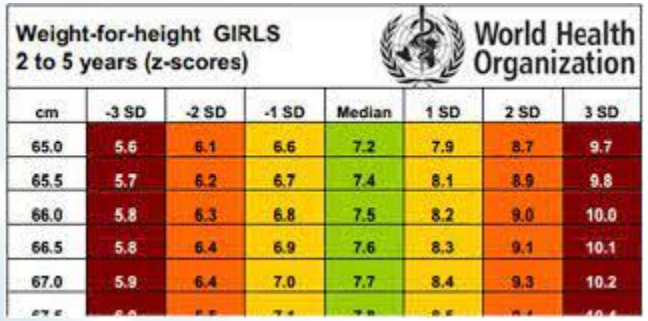
Presence of any one/more of the following condition is referred to as medical complication:

- Oedema +++
- Marasmic-Kwashiorkor
- No food appetite/fail the food appetite test
- High fever (>38.5 degree Celsius)
- Hypoglycaemia
- Hypothermia (35.5 to 36.5 degree Celsius)

Medical Complications……..continued

- Severe anaemia
- Superficial infection
- Severe dehydration
- Congestive heart failure
- Vomits everything
- Having convulsions/Loss of consciousness
- Jaundice
- Not able to drink or breastfeed and/or does not eat

Example of a simplified W/H table to determine Z-score



Weight-for-height GIRLS
2 to 5 years (z-scores)

World Health Organization

cm	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
65.0	5.6	6.1	6.6	7.2	7.9	8.7	9.7
65.5	5.7	6.2	6.7	7.4	8.1	8.9	9.8
66.0	5.8	6.3	6.8	7.5	8.2	9.0	10.0
66.5	5.8	6.4	6.9	7.6	8.3	9.1	10.1
67.0	5.9	6.4	7.0	7.7	8.4	9.3	10.2

Food Appetite Test

- Food appetite test is a process of analysing or ***testing the appetite of the child*** in order to identify the hidden complications related to malnutrition.
- This test is done for severely acute malnourished children before starting their treatment
- It is a necessary step to identify medical complication in a child
- It is done by using **Ready to Use Therapeutic Food (RUTF)**

What is Ready to Use Therapeutic Food (RUTF)?

- RUTF is an energy-dense, mineral and vitamin enriched food that requires no preparation and is specifically designed to treat severe acute malnutrition (SAM). Can be eaten directly from the packaging. E.gs below

Examples of different brands of RUTF sachets

Quantities of RUTF for Appetite Test

A child who fails the appetite test is considered to have medical complications

RUTF	
Weight of client (kg)	**Sachets**
< 4 kg	⅛ to ¼ sachet
4–6.9 kg	> ¼ sachet
7–9.9 kg	½ sachet
10–14.9 kg	½ to ¾ sachet
15–29 kg	¾ to 1 sachet
> 30 kg	> 1 sachet

Minimum amount that a malnourished child should take to pass the appetite test			
RUTF		**BP 100**	
Body weight (kg)	**Sachet**	**Body weight (kg)**	**Bars**
< 4	⅛-¼	< 5	¼-½
4 up to 10	¼-½	5 up to 10	½-¾
10 up to 15	½-¾	10 up to 15	¾-1
> 15	¾-1	> 15	1-1 ½

Therapeutic Care Actions

Once the assessment and diagnosis for acute malnutrition has been carried out, the patients can be placed in either:

a. **Outpatient Therapeutic Care (OTC) -** home-based treatment and rehabilitation, or

b. **Inpatient Therapeutic Care (ITC):** may take place in hospitals or Stabilisation Centres (SC) or

c. **Supplementary feeding programme;** home-based management

Therapeutic Care……. continued

- **OTC:** management of (***SAM without complications***) takes place at home under the ***supervision of a health worker***. **OTC** is based on availability of ***RUTF*** and functional ***community structures***
- **ITC:** management of (***SAM with medical complications***). **ITC** aims to concurrently ***treat medical*** complications while providing ***nutrition therapy.***
- **Supplementary feeding programme** is a management approach to treat **MAM** and is home based

Admission to Out-patient Therapeutic Care (OTC)

- SAM cases (MUAC <115 mm or WHZ <-3 S.D or oedema) without medical complication and with a Good appetite
- MAM cases (MUAC 11 cm to 12.5 cm Weight-for-height between -3 and -2 z-scores) without complications and with a good appetite

Additionally, these children should also be admitted to OTC:

- Children who left the treatment earlier and came back now
- Special cases (children more than 59 months age who are very thin or have oedema, children with HIV and AIDS)
- Children who have been are referred

OTC: Referrals and admission criteria

Referrals from/by:

- Wards, counselling units, immunization points
- ITC (when a client's condition improves)
- Community volunteers or other community structures (village health teams, community-based organizations, community development officers)
- Self referrals/caregivers

Admission to the In-patient Therapeutic Care(ITC)/ Stabilization centres (SC)

- **SAM** Children 6 - 59 months of age with medical complication(s)
- Children with no/poor food appetite
- Severe Nutritional Oedema +++ cases
- Marasmic - Kwashiorkor cases
- HIV positive child

Admission to the inpatient therapeutic care(ITC)/ Stabilization centres (SC).....continued

Children less than 6 months age who:

- Have Kwashiorkor and
- Are severely underweight (less than 3 kgs)
- Cannot breastfed/did not get mother milk to feed and living in a vulnerable environment

- Any other cases referral case

Therapeutic Foods for Preventing and Treating Acute Malnutrition

Some commonly used specially formulated therapeutic foods used in in-patient settings to treat SAM (over 6months) are; **F75 and F100**

1. **F-75** contains ***75 kcal and 0.9 g*** protein per 100 ml.

- Children are provided with approximately ***80–100*** kilocalories per kilogram per day (kcal/kg/d) spread over 8–12 meals per day for three to seven days.
- **F-75** is given in *the* ***stabilization phase*** of inpatient treatment and is not designed for weight gain

Therapeutic Foods for Preventing and Treating Acute Malnutrition……continued

2. **F-100** contains more calories and protein: **100 kcal and 2.9g protein per 100 ml** and provides children with approximately **100–200 kcal/kg/d** and is given for three to four weeks

- ***F-100*** is given during the ***rehabilitation phase*** of inpatient treatment of SAM, and is used as a "catch-up" formula to rebuild wasted tissues
- **Note**: Because **F75 and F100** require preparation and have high moisture content, they cannot be stored for long at room temperature for food safety reasons, and are not given to caretakers to prepare at home

Specially formulated therapeutic milk-based diets (F-75 and F-100)

Therapeutic Foods for Preventing and Treating Acute Malnutrition…….continued

3. **Ready-to-use-foods (RUFs)** are specially formulated pastes, bars or biscuits that provide varying ranges of high-quality protein, energy, and micronutrients.

- These products are more ***nutrient dense*** than available home foods and ***do not require preparation***; they typically have very ***low moisture content*** and are resistant to microbes.
- With use of each of these products, continued breastfeeding is recommended. They include;

Therapeutic Foods for Preventing and Treating Acute Malnutrition…….continued

(a) **Ready-to-use therapeutic foods (RUTFs),** such as Plumpy'Nut are designed for the treatment of uncomplicated SAM.

- **Dose of RUTF** depends on the weight of the child. It must be adjusted as the weight increases during the treatment **should be fed exclusively to the child**. i.e. no other food should be given to the child before completing the recommended dose of RUTF. However, water should be fed adequately to the child.
- RUTF is given to the SAM child admitted in Outpatient Therapeutic Care (OTC)
- RUTF uses ingredients like full fat milk, sugar, vegetable oil, mineral vitamin fix with peanut butter

Therapeutic Foods for Preventing and Treating Acute Malnutrition…….continued

b. Ready-to-use supplementary foods (RUSFs

- A food supplement intended to be used as part of a nutritional program, to treat moderate acute malnutrition (MAM) for children over 6 months, for a period of 2-3 months.. E.g Plumpy'Sup
- RUSF is given to the MAM child in outpatient care
- The **dose of RUSF** is 1 packet of RUSF (500Kcal)/day
- RUSF should be given along with other complementary and supplementary foods.
- RUSF is commonly made with heat treated oil seeds/beats/grains, sugar, milk powder, vegetable oils, nutrients, and minerals.

- Ready-to-use supplementary food (RUSF) is similar to RUTF, but is **intended to be a nutritional supplement given to vulnerable populations, or to prevent malnutrition**.
- RUSF is aimed at the prevention and treatment of moderate acute malnutrition (MAM) and RUTF for the prevention of severe acute malnutrition (SAM).
- **RUSF is a less energy-dense product compared to RUTF**, and is used during situations where MAM is likely to increase

Therapeutic Foods for Preventing and Treating Acute Malnutrition… ….continued

c. Medium-quantity **Lipid-based nutrient supplements (LNSs),** such as Plumpy'Doz, are designed as a supplement to prevent MAM.

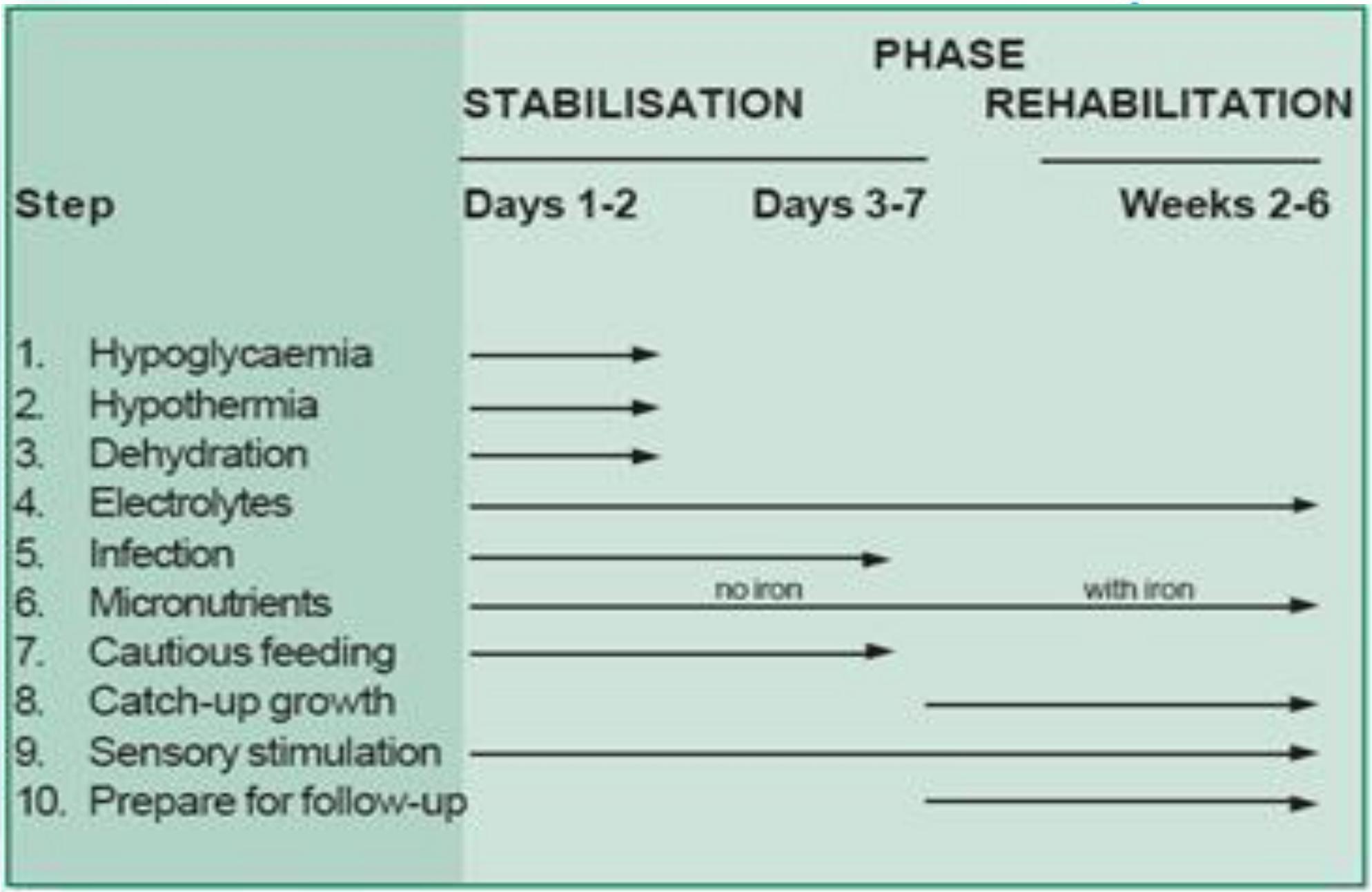
d. **Fortified blended flours (FBFs)** are an additional class of specially formulated foods. The most commonly used product is Supercereal Plus, formerly called Corn Soy Blend Plus (CSB++). FBFs require some preparation before consumption and are typically distributed in larger quantities as family rations for treating or preventing MAM

In-patient management of SAM

- Inpatient care for children ***6-59 months with SAM with medical complications or no appetite***, and nutritionally vulnerable infants ***under 6 months with medical complications***.
- In-patient management aims to concurrently treat medical complications while providing nutrition therapy Infant or child resumes outpatient care when complications are resolved
- Management provided in phases

Phase I (stabilization phase)

- Takes 2-7 days
- Medical conditions/complications managed; broad spectrum antibiotics given to treat/prevent infections
- Clinical monitoring of progress
- F-75 is prescribed and fed every 2-3 hours by mouth or through feeding tube
- Clients gradually transition from F-75 to either F-100 or RUTF


PHASE
STABILISATION
REHABILITATION
Step
Days 1-2
Days 3-7
Weeks 2-6
1. Hypoglycaemia
2. Hypothermia
3. Dehydration
4. Electrolytes
5. Infection
6. Micronutrients
no iron
with iron
7. Cautious feeding
8. Catch-up growth
9. Sensory stimulation
10. Prepare for follow-up

Below left: child on admission; Below right: child 5 weeks later

Out-patient management of moderate malnutrition (OTC)

- Outpatient care for children **6-59 months with SAM without medical complications** at decentralised health facilities and at home
- Infants under 6 months of age who are nutritionally vulnerable without medical complications can also be treated in outpatient care.

Out-patient management of moderate malnutrition (OTC)……continued

- **The MAM** affected children receive **RUSF** as supplementary food until they reach discharge criteria.
- Children aged **6-59 months** receive **one sachet of RUSF**. Each sachet of RUSF contains 500 kcal energy.
- Weekly or by weekly they attend HF and receive RUSF
- **The MAM** affected children receive RUSF as supplementary food until they reach discharge criteria.

Discharge from outpatient

You should discharge the child from OTP follow-up if the following criteria are fulfilled

- For those who were admitted based on oedema: discharge if there is no oedema for two consecutive visits (14 days)
- For those who were admitted without oedema: discharge when the child reaches discharge target weight.
- If the child fails to reach the discharge criteria after two months of OTP treatment, you should refer the child for in-patient care and undertake more detailed follow-up to investigate the cause.

Discharge from outpatient

On discharge make sure:

- Counselling is given to the mother or caregiver about child feeding and care
- Wherever the service exists, give a discharge certificate to the caregiver and make a referral to the supplementary feeding programme
- Each child is registered appropriately in the registration book on date of discharge.

Thank you

The End!

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