Manage Nutritional Problems in Mothers and Children

NTQF Level III

Learning Guide # 3

Unit of Competence	**Manage Nutritional Problems in Mothers and Children**
Module Title:	**Managing Nutritional Problems in Mothers and Children**
LG Code:	**HLT MDW3 M09 LO02-02**
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LO 3: Manage clients with nutritional problems

Instruction Sheet	Learning Guide # 3

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics:

- Advice clients with nutritional problems
  - ✓ Nutritional assessment
  - ✓ Common nutritional problems
  - ✓ Importance of seeking early treatment
  - ✓ Compliance to treatment
- Essential Nutrition Action (ENA)
- Managing Low risk conditions
- Referring High risk conditions
- Managing emergency nutrition problems
- Practical preparation and Education of balanced diet
- Adolescent and young child feeding

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, **upon completion of this Learning Guide, you will be able to**:

- Advice on nutritional problem for clients, such as symptom of nutritional problems, the importance of early treatment seeking and compliance of treatment based on national nutritional guideline of FMOH.
- Undertake Essential Nutrition Action (ENA).
- Manage low risk conditions according to the nutrition protocol
- Refer high risk conditions to the next higher health facility
- Manage emergency conditions of nutrition according to the standard nutritional guideline
- Demonstrate Practical preparation and education of balanced diet and therapeutic feeding at health facility, household, school.

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 6.
3. Read the information written in the information “Sheet 1 sheet 2, sheet 3, sheet 4, sheet 5, Sheet 6 and Sheet.
4. Accomplish the “Self-check 1, Self-check 2, Self-check 3, Self-check 4, Self-check 5, Self-check 6 and Self-check **in page 16, 23, 34, 437, 51, 56 and 67 respectively**.

Information sheet 1	Advice clients with nutritional problems

1.1. Protein Energy Malnutrition(PEM)

PEM is a clinical syndrome mainly due to deficiency of macronutrients (protein and energy) and micronutrients. PEM is frequently observed in children between 6 months and 5 years of age. Marasmus peaks in the first year and Kwashiorkor between 1 and 3 years of age. Stunting is most common between 2.5 and 3 years of age. PEM is more common during the weaning period and the rainy season.

The causes are classified as the follows:

1. **Immediate causes:** inadequate dietary intake (lack of food) and disease.
2. **Underlying causes:** insufficient food available to families (household food insecurity), inadequate care of women and children, insufficient health care, and an unhealthy environment.
3. **Basic causes:** inadequacies in educational, political, and economic systems and problems with the availability and control of resources.eg. war and drought

Protein and calorie deficiency

Marasmus is due to both calorie and protein deficiency, predominantly calorie. Kwashiorkor is due to more marked protein deficiency than calorie which leads to edema.

Classification

There are four possible classifications for malnutrition caused by macronutrient deficiency and these are set out below.

1. **Severe complicated malnutrition**

A child will be classified as having severe complicated malnutrition in the following cases:

If the child's age is below six months and the child has

- Visible severe wasting, or
- Oedema of both feet

OR

If the child's age is six months or above and the child has

- A MUAC less than 11 cm, or
- Oedema of both feet and
- Any medical complication.

2. Severe uncomplicated malnutrition

A child will be classified as having severe uncomplicated malnutrition in the following cases:

If a child's age is six months or above and the child has

- A MUAC less than 11 cm, or
- Oedema of both feet and
  - ✓ No medical complications and
  - ✓ Passes the appetite test.

3. Moderate acute malnutrition

A child will be classified as having moderate acute malnutrition in the following cases:

If a child's age is six months or above and the child has

- A MUAC of 11 cm to less than 12 cm and
- No oedema of both feet.

4. No acute malnutrition

A child will be classified as having no acute malnutrition in the following cases:

- No visible severe wasting and
- No pitting oedema of both feet and
- Has a MUAC greater than 12 cm.

Clinical features of Marasmus

The clinical features of marasmus include

- Marked loss of weight, almost no subcutaneous tissue and atrophic muscles.
- The child will have the face of an old man, distended abdomen.
- The child will usually have a good appetite

Clinical features of Kwashiorkor

Kwashiorkor is an acute illness.

- Bilateral edema is a sin for diagnosis. Bilateral edema is pitting and starts in the lower legs and later involves the upper limbs and face. Large ascites is uncommon so consider other causes.
- The hair is red or brown, straight, sparse, lusterless, easily and painlessly pluck able.
- The face appears moon-shaped and puffy (jowls).
- The skin is hyperpigmented at first and become dry and peels off leaving hypopigmented and sometimes ulcerated areas (flaky paint dermatosis): the skin appears like old paint flaking off the surface of the wood.
- The lesions frequently occur on pressure areas like the buttocks, flexure areas, behind the ears and legs.

Complications

- Impaired immunity increase susceptibility to infection
- Hypoglycemia
- Hypothermia
- Dehydration
- Death

Figure 11: A 5 year old child with kwashiorkor

Treatment of PEM

All patients with severe PEM (Wt/Ht< 70%, or bilateral edema or MUAC <11cm) should be referred to hospital for therapeutic feeding programme (TFP) or stabilization center (SC) using F75, F100 and ready to use feeding (RUTF).

1.2. Vitamin A deficiency

Untreated Clinical vitamin A deficiency can lead to childhood blindness and it is likely that vitamin A deficiency is one of the major contributing factors to the high under-five mortality rate of Ethiopia 67/1000 EDHS 2016.

Rationale for action against vitamin A deficiency

Action against vitamin A deficiency is important, because improving a child's vitamin A status:

- Increases their chance of survival
- Reduces the severity of the childhood illness
- Prevents night blindness/blindness and may reduce birth defects
- Is very cost-effective.

Causes of vitamin A

Vitamin A deficiency (VAD) results when body stores are used up either because too little vitamin A is present in the foods, or there is insufficient absorption of vitamin A from foods. For example, if a diet is lacking in oils or fats, vitamin A is not well absorbed and utilized. VAD can also result from rapid utilization of vitamin A during illnesses

(particularly measles, diarrhea and fevers), pregnancy and lactation, and during phases of rapid growth in young children. If the vitamin A status in the body is very low:

- The immune systems become weak and illness is more common and more severe, increasing under-five death rates
- The eye could be damaged with appearance of lesions, and when severe, blindness can occur
- There is an increased risk of a woman dying during pregnancy or during the first three months after delivery.

Population at risk of vitamin A deficiency

- Infants and children under five and pregnant and lactating women

Strategies to control vitamin A deficiency

The main strategies which have been adapted globally to control and eliminate vitamin A deficiency are explained below:

1. **Promote and support exclusive breastfeeding up to six months of age** breast milk protects infants in their first six months against infectious diseases that can deplete vitamin A stores and interfere with vitamin A absorption.
2. **Vitamin A supplementation (VAS)**

Supplementation is a low-cost and highly effective means of improving vitamin A status, and the quickest intervention that can be implemented on a national scale.

- Vitamin A capsules given twice yearly at six months intervals to children 6 to 59 months is protective, and sufficient for a child's requirement
- Vitamin A capsules given to postpartum mothers within 45 days after delivery increases the amount of the vitamin A in the breast milk and therefore the infant's intake of vitamin A.
- Dietary approaches are also important and include:
  - ✓ Fortification which is the process of adding vitamin A to foods commonly consumed by vulnerable population. It is an effective and sustainable strategy to combat vitamin A deficiency

Doses and schedules for vitamin A supplements

Vitamin A supplementation should be given to those at risk using the amounts given in the table below.

Age	Dose	Frequency
Children 6-11 months	100,000 IU (one capsule of 100,000 IU)	Once
Children 12-59 months	200,000 IU (two capsules of 100,000 IU)	Once every four to six months
Postpartum women	200,000 IU (three capsules of 100,000 IU)	Within 45 days of delivery

Do not give a vitamin A capsule if the child has already received a dose within the last month.

Do not give A large dose of vitamin A supplements to pregnant women it may cause teratogenicity effect on the fetus.

Dietary diversification and modification for Vitamin A

Encourage family members to grow and consume vitamin A rich foods at all times. Examples of food sources rich in vitamin A are;

Animal sources of Vitamin A

- The best food sources are animal foods such as egg yolks, organ meats such as liver, whole milk and milk products, fish and butter.
- The best source of vitamin A for infants is breast milk. The mother's secretion of vitamin A into breast milk is related to her own vitamin A status.

Plant Sources of Vitamin A

- The best plant sources of vitamin A are dark orange or dark yellow fruits and vegetables such as papayas, mangos, pumpkins, carrots and yellow or orange sweet potatoes, and dark green vegetables such as spinach and kale

Figure: Foods rich in Vitamin A

1.3. Iodine Deficiency

Globally, 30% of the world's population is affected with iodine deficiency disorder (IDD). In Ethiopia, one out of every 1000 people is affected and about 50,000 prenatal deaths occur yearly due to iodine deficiency disorder. Goiter is caused by iodine deficiency due to marked decrease in the amount of iodized salt being consumed in households. Babies born from mothers with IDD suffer from some degree of learning disability.

Causes of iodine deficiency

Iodine is found naturally in topsoil, but in most areas Ethiopia and especially the highlands, top soil has been lost due to deforestation, erosion and flooding, and thus food crops lack iodine resulting in dietary iodine deficiency.

Rationale for action against iodine deficiency

- Universal salt iodization (USI) can lead to an increase of the average intelligence of the entire school age population by as much as 13 points
- Salt iodization will improve the physical and mental development of millions of people
- The intellectual and cognitive development of whole generations of Ethiopian children will be reduced by around 10% unless adequate iodine is provided.

Population at risk of iodine deficiency.

- People of all ages and sexes are vulnerable

- More at risk are the fetus, young children, pregnant women, and lactating mothers

Strategies to control iodine deficiency

The main strategies to control and eliminate iodine deficiency are the following:

- Universal iodization of salt for human and animal consumption

Iodine deficiency disorder can be eliminated by the daily consumption of iodized salt which is both a preventive and corrective measure for iodine deficiency and the most effective, low-cost, long-term solution to a major public health problem. The daily requirement of iodine for adults is 150 micrograms.

- Supplementation of iodine capsules to populations in areas where iodine deficiency in very common

As a short-term strategy in highly endemic areas, iodized oil capsules should be distributed on a one-time basis to individuals.

1.4. Iron Deficiency

Anemia is a widespread health problem affecting more than two billion people worldwide — one third of the world's population. More than half (57%) of Ethiopian children age 6-59 months and 24 % of Ethiopian women aged 15-49 are anemic (mainly due to low blood iron status). The consequences of anemia are multiple. Iron deficiency can delay muscular and nervous system development and mental performance, especially in preschool age children. In adults, anemia reduces work capacity, mental performance and reduces tolerance to infections. Iron deficiency anemia can also cause increased maternal mortality due to bleeding problems. Maternal anaemia can lead to prenatal infant loss, low birth weight, and pre-term births.

Rationale for action against iron deficiency anemia

Control of anemia will:

- Decrease maternal mortality
- Decrease premature birth, inter-uterine retardation and low birth weight
- Decrease infant mortality (due to low birth weight)

- Increase capacity to learn
- Increase productivity in all individuals.

Causes of iron deficiency

Anemia has multiple causes. Its direct causes can be broadly categorized as poor, insufficient or abnormal red blood cell production, excessive red blood cell destruction, and excessive red blood cell loss. Contributing causes include poor nutrition related to dietary intake and dietary quality (iron deficiency in particular), infectious and parasitic diseases; inadequate sanitation and health behaviors; lack of access to health services; and poverty. The two major direct causes of anemia, with excessive red cell destruction, are malaria and worm infections.

Population at risk of iron deficiencies.

- Low birth weight infants
- Children aged six-24 months
- Adolescent girls
- Pregnant and lactating women
- Children between six and 11 years of age
- People living with HIV and AIDS

Strategies to control iron deficiency

The main strategies are the following:

- Supplementation of iron and folic acid for pregnant and lactating women

Table. Sets out the correct dosage and duration for iron and folic acid for pregnant and lactating women.

Iron-folic acid doses	**Duration**
Iron: 60 mg/day Folic acid: 400 mcg/day	• Six months during pregnancy where anemia prevalence is less than 40% • Six months during pregnancy and three months postpartum where anemia prevalence is equal to or

	more than 40%

- Supplementation for children and adolescents

Many children from six to 24 months of age need more iron than is available in breast milk and common complementary foods. Infants with low birth weight have fewer iron stores, and are thus at a higher risk for deficiency after two months of age. In areas where iron fortified complementary foods are not available for regular consumption, children should routinely receive supplements in the first year of life. In areas where anemia prevalence in young children is 40% or more, delivery of iron supplements should continue through the second year of life, and also be given to adolescent girls. The dos of Iron and Folic acid for children should be 2 mg/kg body weight/day

Folic acid: 50 mcg/ day respectively.

Treatment of severe anemia

If anemia is diagnosed by clinical examination (extreme pallor of the palms of the hands) or by laboratory tests at health center, treatment is as set out in the table below.

Group	**Iron-folic acid dose**	**Duration**
Children under two years old	Iron: 25 mg/day Folic acid: 100-400 mcg/ day	Three months
Children two-12 years old	Iron: 60 mg/day Folic acid: 400 mcg/day	Three months
Adolescents and adults, including pregnant women	Iron: 120 mg/day Folic acid: 400 mcg/day	Three months

Dietary diversification

Food diversification is an important strategy for prevention of iron deficiency. Populations should be encouraged to produce and consume iron-rich foods at all times. The best source of iron for infants is breast milk.

Animal sources of iron

Animal products (meat, organs and blood) provide the best food sources of dietary iron. If these are available, children six to 24 months of age and pregnant women should have priority to include small amounts in their diet.

Animal products provide iron that is absorbed easily. Animal products are also the only source of vitamin B12, an important micronutrient for preventing anemia.

Plant sources of iron

The best plant sources of iron include dark green leafy vegetables and legumes. Legumes are also excellent sources of folic acid. Consumption of foods which are rich in vitamin A will also prevent anemia. Food processing techniques such as cooking, germinating, fermenting and soaking of grains should be encouraged as they reduce factors that inhibit iron absorption.

Figure. Foods rich in Iron and Folic acid

Control of malaria and worms

To control non-iron deficiency anemia it is also critical to coordinate action with the malaria control and worms control programmes. Pregnant and lactating women and children should sleep under insecticide-treated bed nets. Children between one and five years of age should receive de-worming drugs. Children under one year old are not treated, as they are not exposed to infection

Table. Recommended drugs for de-worming pre-school children (one to five years).

Drug	Dose for each age group

	0-1 year	1-2 year	2-5 year
Albendazole	No treatment	½ tablet	1 tablet
Mebendazole 500 mg tablet	No treatment	1 tablet	1 tablet

1.5. Vitamin D deficiency (Rickets)

Vitamin D deficiency leads to rickets which is a bone problem associated with disability.

Sources of vitamin D

Vitamin D is a fat soluble vitamin and its two main sources are:

1. Dietary

Fish liver oil -very rich, others eggs, butter, fish, Fortified oils, fats and cereals

2. Sunlight

Causes of Vitamin D Deficiency

Causes of Vitamin D Deficiency include:

- Inadequate exposure to sunlight – the commonest cause in Ethiopia.
- Inadequate dietary intake
- Others: -
  - ✓ Chronic GIT disorders which leads to malabsorption.
  - ✓ Liver and renal disorders
  - ✓ Anticonvulsants (phenytoin, phenobarbitone)

Children at high risk for rickets include:

- Low birth weight, preterms, twins.
- Breast fed and inadequately exposed to sunlight.
- Infants born from mothers with osteomalacia.

Clinical features

The peak age is 6 months to 2 years.

The early signs of vitamin D deficiency include:

- Craniotabes - ping pong feeling on pressing the skull.
- Rachitic rosary- palpable enlargment of costochondral junction.
- Enlarged ends of long bones of arm and legs (wide wrist)

The late/advanced signs signs of vitamin D deficiency include:

- Frontal bossing, pigeon chest, bow legs/knocked knees, hypotonia, caput quadratum (box like head), Harrison's groove, fractures, etc.
- Wide fontanel /delayed closure and delayed teeth eruption.

Diagnosis

Diagnosis is mainly clinical and involves:

- Wrist X-ray – shows decreased bone density and irregular and cuped ends of bones.
- Normal/low serum calcium, low phosphorus,elevated alkaline phosphatase

Complications

Complications include the following:

- Pneumonia – Atelectasis
- Hypokalemic tetanic
- Fracture
- disability

Treatment

There are two forms of treatment:

- Vitamin D3 (cholecalciferol) is the best treatment
  - ✓ Dose - 600,000, i.m stat.
  - ✓ Heeling occurs after 2-4 wks which can be proved with a wrist X-ray.
- Sunlight exposure is useful if no vitamin D3 is available.

Self-check 1	**Written test**

Part I. Say "True" if the statement is Correct or "False" if the Statement is Incorrect (each 2 point 2X2=4% incorrect

1. The best source of iron for infants is breast milk.
2. To prevent Vitamin A deficiency among pregnant mother a large dose of vitamin A supplements should be given.

Part II. Choose the Correct Answer for the Following Multiple Choose Questions (each 2 point 2x2= 4%)

1. Control of malaria and worms is used to prevent primary ___
   A. Vitamin A deficiency
   B. Iron deficiency
   C. Iodine deficiency
   D. Calcium deficiency
2. Rickets is caused by deficiency of _____
   A. Vitamin A
   B. Iodine
   C. Iron
   D. Vitamin D

Note: **Satisfactory rating - 4 points** **Unsatisfactory - below 4 points**

Answer sheet True or False

1. _____ 2. _____

Answer Sheet Multiple choose Questions

1. _____
2. _____

Score = _____

Rating = _____

Name _____ Date _____

Information sheet 2	Essential Nutrition action (ENA)

2.1. Introduction

In 1997, the USAID-funded Basic Support for Institutionalizing Child Survival (BASICS) Project developed a “Minimum Package for Nutrition” that was adopted by the World Health Organization (WHO) and UNICEF in 1999 as “Nutrition Essentials” and later renamed the Essential Nutrition Actions (ENA). Organized by a life-cycle approach, the ENA were affordable and effective interventions to improve the nutritional status of women and children and a framework for program actions to deliver nutrition services.

ENA is an action oriented approach to nutrition, if we use ENA approach to nutrition, estimated decrease of child mortality is 25%. Major emphasis is given to essential nutrition actions (ENA) in all national nutrition-related policies, strategies, programmes and guidelines including the National Nutrition Strategy (NNS), the National Nutrition Programme (NNP) and the National guidelines for control and prevention of micronutrient deficiencies.

2.2. The seven essential nutrition actions (ENA) and key messages.

1. **Exclusive breastfeeding for 6 months**
    - Initiate breast feeding within one hour after delivery
    - Exclusively breast feeding for the first six months
    - The mother breast feeding frequently, day and night
    - Mother allows infant to breast feed on demand (as often as the infant wants) every two to three hours (8-12 times per 24 hour)
    - Mother breast more frequently (or expresses her milk if the infant cannot breast feed)
    - The mother positions and attaches infant correctly at the breast
    - The mother offers second breast after infant releases the first
    - The mother should eat more than usual (one additional meal)
2. **Adequate complementary feeding starting at 6 months with continued breastfeeding for 2 years**
    - At six months, mother or care giver introduces soft, appropriate foods and continues breast feeding on demand
    - The mother or caregiver increases the frequency of feedings and the amount of food, as the child gets older.
    - Increase food thickness (density) and variety as the child gets older
    - Increase the amount of food as the child gets older
    - Good hygiene and safe food preparation
    - Active/responsive feeding

3. **Appropriate nutrition care of sick and malnourished children**
    - Breast more frequently (or express her milk if the infant cannot breastfeed)
    - ***Baby older than six months:*** the mother should also offer the baby bland food (even the baby is not hungry) and increase the frequency of feeding
4. **Maternal nutrition during pregnancy**
    - Iron and folic acid supplementation
    - Treatment and prevention of malaria
    - Increase food intake
    - One extra meal each day during pregnancy
    - De-worming during the third trimester of pregnancy
    - Vitamin A capsule within 45 days of delivery
5. **Adequate intake of vitamin A for women and children**
    - Breast feeding
    - Vitamin A supplementation a single dose to lactating mothers with in six weeks after delivery
    - Consumption of vitamin A rich foods (dark green leafy vegetables, yellow and orange fruits and vegetables)
    - Vitamin A supplementation a single dose every six months for all children six to 59 months and when comes with sever acute malnutrition (SAM), measles, acute respiratory infections, diarrhea or vitamin A deficiency
6. **Adequate intake of iron for women and children**
    - De-worming of children aged two to 59 months every six months and prevent women in the third trimester
    - Using bed nets
    - Diversifying diet consumption of foods from the six groups according the food guide pyramid
    - Cooking in iron pots (the iron from pots will get in to the food and supply the consumer with iron)
    - Iron supplementation to pregnant women and children

7. **Adequate intake of iodine by all household members**
    - Consumption of iodized salt by the family

2.3. Integrating the seven ENAs into the six health contacts

Mothers and children have six health contacts therefor nutrition behaviour change communication and promoting the seven essential nutrition actions will be an important element within these six health contacts. The six health contacts and the key nutrition action messages you need to communicate at each contact are identified below.

1. **Pregnancy**
    - Consumption of at least one additional meal
    - Iron and folic acid supplementation
    - Iodized salt consumption by the family
    - Optimal/exclusive breast feeding
    - Infant feeding options if the mother is HIV positive
    - Use of impregnated bed nets
    - Deworming in the third trimester
    - Tetanus toxoid vaccination
    - Regular antenatal visit
2. **Delivery**
    - Safe delivery
    - Vitamin A (within six weeks after delivery)
    - Iron and folic acid supplementation
    - Optimal/exclusive breast feeding
    - Use of impregnated bed nets if the area has malaria
    - Consumption of at least two additional meals
    - Infant feeding options if the mother is HIV positive
3. **Postnatal and family planning**
    - Iron and folic acid

- Family planning
- Consumption at least two additional meals
- Infant feeding options for HIV positive mother
- Vaccination

4. **Immunization**
   - Deworming
   - Assessment and treatment of infant's anaemia
   - Use of impregnated bed nets if the area has malaria
   - Family planning
5. **Well child and growth monitoring and promotion**
   - Monitor growth
   - Counsel on infant feeding
   - Iodized salt
   - Vaccination
   - Use of impregnated bed nets if the area has malaria
6. **Sick child visit**
   - Monitor growth
   - Treat the child according to integrated maternal and newborn and child hood illness (IMNCI) guidelines.
   - Counsel on seek child feeding
   - Check immunization is complete
   - Vitamin A
   - Deworming
   - Counsel infant feeding options if the mother is HIV positive

2.4. The Critical Nutrition Actions (CAN)

Along the lines of the ENA, nutritionists developed a set of Critical Nutrition Actions (CNA), originally for people living with HIV but later applied to adults with

any infectious or chronic disease. The CNA messages (listed next) can be used in nutrition education and individual counseling.

1. **Get weighed regularly and have weight recorded.** Regular weight loss of more than 6 kg in 2 or 3 months indicates poor health or eating habits (or fast progression of HIV to AIDS in people living with HIV). Ideally, clients should be weighed on every visit. Weight should be recorded in clinic records and on cards given to clients to take home.
2. **Eat a variety of foods and increase your intake of nutritious foods.** Many diets are overbalanced in carbohydrates and do not contain enough protein and fruits and vegetables. People with limited resources may not be able to eat three meals and two snacks a day, but they can be counseled to eat locally available and affordable foods from each food group to vary the diet and increase energy consumption.
3. **Drink plenty of boiled or treated water.** Drinking water removes toxins, including those caused by infection or medicines. Drinking unsafe water can cause infections such as diarrhea. All water used to drink, swallow medicines, and prepare juices should be filtered and boiled or treated with a point-of-use water treatment product (e.g., chlorine) in the form of a solution, tablet, or powder. Drinking water should be stored in a clean, covered container with a narrow neck to prevent contamination and poured rather than ladled out.
4. **Avoid habits that can lead to poor nutrition and poor health.** Alcohol interferes with nutrient digestion, absorption, storage, and utilization; limits the effectiveness of some drugs; and may work synergistically with HIV to promote microbial translocation and immune activation. Smoking interferes with appetite, increases the risk of cancer and respiratory infections, and can reduce T-cell function, accelerating the progression of HIV to AIDS. Junk food, which has little nutritional value, can be harmful to health and is a poor use of limited income. Unsafe sex increases the risk of sexually transmitted infections.

5. **Maintain good hygiene and sanitation.** Food- or water-borne infections affect digestion and absorption of food and remove essential nutrients from the body. Proper hand washing, treatment and safe storage of drinking water, appropriate food hygiene, and sanitary disposal of feces can significantly reduce the transmission of pathogens that cause diarrhea.
6. **Get exercise whenever physically possible.** Regular physical activity—even walking, climbing stairs, or doing household chores—builds and strengthens muscles, increases appetite, helps manage stress, and improves health and alertness.
7. **Prevent and seek early treatment of infections and manage symptoms through diet.** Illness affects food intake, digestion, absorption, and utilization, and poor nutrition reduces the ability to fight infection. Some symptoms of illness can be managed through diet.
8. **Take medicines as prescribed and manage side effects and medicine-food interactions through diet.** Not taking medicines as prescribed may cause resistance. Some traditional medicines can interfere with the effectiveness of other drugs, have side effects, or be ineffective themselves (despite claims).

Self-check 2	Written test

Part I. Say "True" if the statement is Correct or "False" if the Statement is Incorrect (each 2 point 2X2=4% incorrect

1. Many diets are balanced and do contain enough carbohydrates, protein and fruits and vegetables.
2. Food- or water-borne infections affect digestion and absorption of food and remove essential nutrients from the body.

Part II. Choose the Correct Answer for the Following Multiple Choose Questions (each 2 point 2x2= 4%)

1. According to essential nutrition action approach which is NOT true the key practice of maternal nutrition during pregnancy
    A. Iron and folic acid supplementation
    B. Treatment and prevention of malaria
    C. One extra meal each day during pregnancy
    D. Vitamin A capsule during the third trimester of pregnancy
2. Which critical nutrition action message can NOT be used in nutrition education and individual counseling?
    A. Eat a variety of foods and increase your intake of nutritious foods
    B. Drink plenty of boiled or treated water
    C. Drink alcohol to facilitate and accelerate digestion after taking of diet
    D. Maintain good hygiene and sanitation

Note: Satisfactory rating – 4 point ***Unsatisfactory below 4 point***

Answer for True or False

1. _____
2. _____

Answer for Multiple choose

1. _____
2. _____

Score _____

Rating _____

Name _____ **Date** _____

Information sheet 3	Managing Low risk conditions

3.1. Anthropometric criteria for defining severe and moderate acute malnutrition

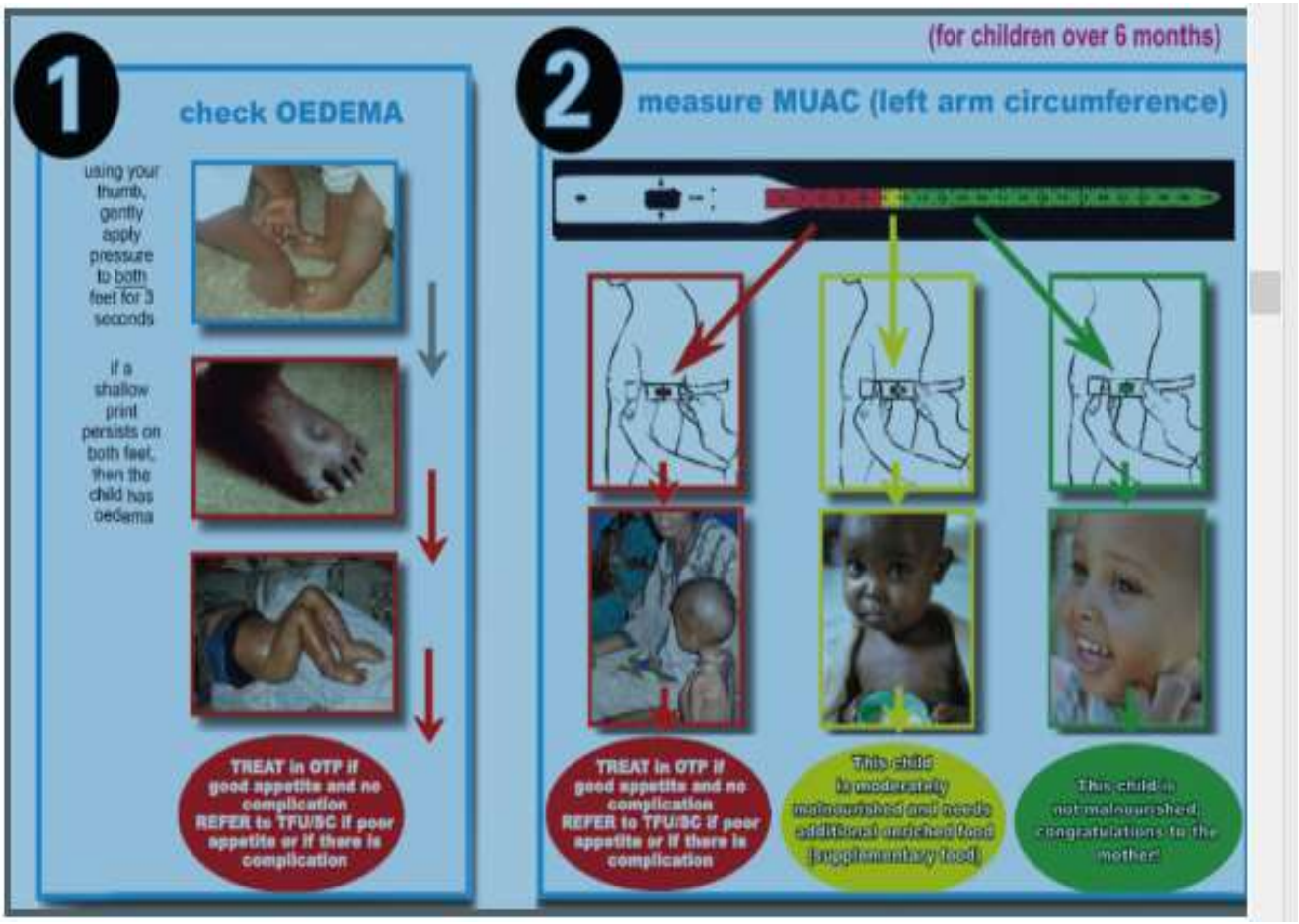
When the nutritional status of a child deteriorates in a relatively short period of time, the child can be said to have acute malnutrition. Weight-for-height, MUAC and oedema are used to decide if someone is acutely malnourished or not. Oedema in children almost always signifies the presence of severe acute malnutrition. However, when using MUAC and weight-for height you need to use 'cut-offs' in order to determine whether a child has moderate acute malnutrition, severe acute malnutrition or no acute malnutrition. Table 3.1 shows the criteria (indicators) you need to use to decide the level of acute malnutrition.

Indicator	Sever acute malnutrition	Moderate acute malnutrition	No acute malnutrition
Children (6 months up to 18 years)			
W/H (weight for height)	Less than 70% of norm	70-79.99%	More than 80%
Oedema (bilateral and pitting	Present	Absent	Absent
MUAC (cm)	Less than 11 cm	11-11.99 cm	More than 12 cm
Adults (older than 18 years)			
BMI	Less than 16	Between 16-16.99	18.5-24.99
oedema	Present	Absent	Absent
MUAC (cm)	Less than 17 cm or Less than 18 with recent weight loss or chronic illness	17-21 cm or 18-21 cm depending on presence of recent weight loss or chronic illness	No weight loss

As indicated in the table, there are different indicators for severe acute malnutrition and moderate acute malnutrition depending on whether you are measuring an adult or a

child. If you look in the column ‘severe acute malnutrition’ (SAM) you will see that if a child’s weight/height measurement is less than 70% of the normal range for his age (which can also be written as <70%), then the child has an indicator of SAM. Another criterion is when the child’s MUAC is less than 11 cm (written as <11 cm).

The presence of one criterion is sufficient to categorize a patient as malnourished. If there is any one indicator from the severe acute malnutrition column, then the child or adult is classified as severely malnourished. If there is no indicator in the severe column, and there is at least one indicator in the moderate acute malnutrition column, then the child or adult is classified as moderately malnourished.



3.2. Treatment of severe uncomplicated malnutrition

A child will be classified as having severe uncomplicated malnutrition in the following cases:

If a child's age is six months or above and the child has

- A MUAC less than 11 cm, or
- Oedema of both feet and
  - ✓ No medical complications and
  - ✓ Passes the appetite test.

3.3. Assessing appetite

If a child aged six months or above has a MUAC less than 11 cm or pitting oedema of both feet and has no medical complications like, you should assess the child's appetite. An appetite test is not needed when the child has any one of the following:

- Medical complications that require in-patient care, pneumonia, persistent diarrhoea, watery diarrhoea, dysentery, malaria, measles, low body temperature or high fever, open skin lesions or signs of vitamin A deficiency.

Steps of the appetite test

The appetite test has a number of steps you should follow:

1. The appetite test should be conducted in a separate quiet area.
2. You should explain to the caregiver the purpose of the appetite test and how it will be carried out.
3. The caregiver, where possible, should wash their hands.
4. The caregiver should sit comfortably with the child on their lap and either offer the child ready-to-use therapeutic food (RUTF) such as Plumpy'nut® or BP-100® from the packet, or put a small amount on her finger and give it to the child.
5. The caregiver should offer the child the RUTF gently, encouraging the child all the time. If the child refuses, then the caregiver should continue to quietly encourage the child and take time over the test. The test usually takes 15-30 minutes but may take up to one hour. The child must not be forced to take the RUTF.

6. The child needs to be offered plenty of water to drink from a cup when taking the RUTF.

You interpret the result of the appetite test in the following way:

Pass: a child that takes at least the amount shown in the following table below passes the appetite test. You should:

- Explain to the caregiver the choices of treatment and decide with the caregiver whether the child should be treated as an out-patient or an in-patient (nearly all caregivers will OPT for out-patient treatment).
- Refer the child to the Out-patient Therapeutic Programme (OTP) for registration and initiation of treatment.

Fail: a child that does not take at least the amount of RUTF shown in the following table below should be referred for in-patient care. You should:

- Explain to the caregiver the reasons for recommending in-patient care; decide with the caregiver whether the child will be treated as an in-patient or an out-patient.
- Refer the child to the nearest therapeutic feeding unit (TFU) or hospital.

The appetite test should always be performed carefully. You should always offer treatment as an in-patient for children who fail their appetite tests. If there is any doubt, however, then you should refer the child for in-patient treatment until their appetite returns.

Table Appetite test table.

APPETITE TEST: This is the minimum amount that malnourished children should take to pass the appetite test			
Plumpy'nut®		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	1–1½

For children presents with severe uncomplicated malnutrition treatment includes;

- Manage the child according to the out-patient therapeutic programme
- Vitamin A (unless there is presence of oedema or they have already received vitamin A in the past six months)
- Amoxicillin for seven days
- A dose of folic acid 5 mg
- Ready-to- use therapeutic food (RUTF) such as Plumpy'nut® or BP-100®.

If the child is aged two years or above, you should also give mebendazole or albendazole, preferably at the second out-patient visit which should take place seven days after the first visit. Advise the mother that she should return for a follow-up visit within seven days, so that you can see whether the child has made progress.

The out-patient therapeutic programme (OTP)

An OTP is a programme that provides home-based treatment and rehabilitation for children with severe uncomplicated malnutrition. These children can be admitted directly into an OTP, treated with routine drugs and given ready-to-use therapeutic food (RUTF) to eat at home. The children attend the OTP every week for a medical check-up, receive additional medical treatments if required and are given a one-week supply of RUTF.

Ready-to-use food (RUTF) is therapeutic food that can be consumed easily by children straight from the packet or pot without any cooking. It is a high-energy, nutrient-dense food. It is easy to use and store. It can be kept in simple packaging for several months without refrigeration. It can be kept for several days even when opened.

BP-100® and Plumpy'nut® are the commonly known RUTF preparations. If you have both products available, you should give children under two years of age either Plumpy'nut, or crush BP-100 and make this into porridge for the child. Children above the age of two years can take the BP-100 biscuit and you may not need to make

porridge. The amount of RUTF that should be given to severely malnourished children is based on their weight as indicated in table below.

Class of weight (Kg)	PLUMPY'NUT®		BP-100®	
	sachet per day	sachet per week	sachet per day	sachet per week
3.0-3.4	1¼	9	2	14
3.5-4.9	1½	11	2½	18
5.0-6.9	2	14	4	28
7.0-9.9	3	21	5	35
10.0-14.9	4	28	7	49
15.0-19.9	5	35	9	63

Key messages for caregivers of children in OTP

- RUTF is a food and medicine for malnourished children only. It should not be shared.
- For breastfed children, breast milk should always be given before the RUTF and on demand.
- RUTF should be given before other foods. The child should have small regular meals of RUTF and be encouraged to eat often, every three to four hours.
- Plenty of clean water to drink should always be offered to the child when he or she is eating RUTF.
- The caregiver should wash their hands with soap and water before feeding the child.
- Food must be kept clean and covered.
- A sick child gets cold quickly so should be kept covered and warm.

A child with severe uncomplicated malnutrition should also receive routine drugs. These drugs are very important for the child to recover quickly. Table sets out what routine medicines should be given to severely uncomplicated malnourished children and the correct dosage according to their age and previous treatment history.

Drug	**Treatment**

Vitamin A	1 dose at admission for all children except those with oedema or those who received vitamin A in the past six months
Folic acid	1 dose at admission
Amoxicillin	1 dose at admission + give treatment for seven days to take home.
Deworming	1 dose on the second week (second visit)
Measles vaccine (from nine month old)	1 vaccine dose on the fourth week (fourth visit)

The following four tables specifically to vitamin A, folic acid and Amoxicillin and show what dose should be given to severely malnourished children and when.

Table Vitamin A

Age to months	**Vitamin A IU orally**
6-11	**One blue capsule (100,000 IU)**
12 (or 8 kg) and more	**Two blue capsules (200,000 IU)**

Table folic acid

When	**Amount**
At admission	**5 mg**

Table Amoxicillin

Weight in age	**Dosage twice per day**	**250 mg capsule/tablet**
<5 kg	125 mg	½
5-10 kg	250 mg	1
10-20 kg	500 mg	2
20-35 kg	750 mg	3
>35	1000 mg	4

Table deworming drugs

Deworming drug	**Age up to 2 years**

Albendazole 400 mg	1 tablet once
Mebendazole 100 mg	5 tablet once

Follow-up care for severe uncomplicated malnutrition

Follow-up care for a child assessed as having severe malnutrition is an important part of the OTP and the mother or caregiver should be advised to come to the health post every week for two months, using a check list.

Checklist for follow-up of a child with severe uncomplicated malnutrition

Follow-up should be done every seven days for at least two months as follows:

Ask about

- Diarrhoea, vomiting, fever or any other new complaint or problem
- Whether the child is finishing their weekly RUTF ration.

Check for

- Complications
- Temperature, respiration rate
- Weight, MUAC and oedema
- Appetite (do the appetite test).

Decide on action

Refer urgently to hospital if there is any one of the following:

- Development of any new complication
- Failed appetite test
- Increase/development of oedema
- Weight loss for two consecutive visits
- Failure to gain weight for three consecutive visits

If there is no indication for referral, give:

- De-worming and measles vaccination
- Weekly ration of Plumpy'nut® or BP-100®
- Appointment for next follow-up and record the information on the OTP card.

Discharge

A child stays in the programme until they meets the discharge criteria or have been in the programme for a maximum of two months. The discharge criteria depend on the admission criteria.

- 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 the discharge target weight. (As indicated in the chart booklet).

The child who fails to reach the discharge criteria after two months of OTP treatment, must always be referred to a hospital.

3.2. Treatment of moderate acute malnutrition

A child classified as having moderate acute malnutrition has a higher risk of severe disease. Counsel to take energy-rich food to take at home, as well as more fat and protein in the diet is mandatory. You would need to assess the child's feeding and counsel the mother about the best way to feed the baby at home. The follow up visit for a child with moderate acute malnutrition is after 30 days.

Follow-up care for moderate acute malnutrition

If a child was classified with moderate acute malnutrition and the mother has been given counselling to help her improve feeding and care of her child, she should be advised to return for a follow-up visit after 30 days. If there was a feeding problem as judged by the feeding recommendations, the mother should be advised to return with the child earlier than 30 days.

The activities of the follow up care include;

After 30 days

- Measure the child's MUAC and determine if the child still has moderate acute malnutrition
- Reassess feeding.

Treatment

- If the child no longer has moderate acute malnutrition, praise the mother and encourage her to continue her good care of the child
- If the child still has moderate acute malnutrition, counsel the mother about any feeding problems you have identified. Ask the mother to return again in one month. Continue to see the child monthly until the child is feeding well and no longer has moderate acute malnutrition.

Exception

A child for whom you do not think that feeding will improve, or whose MUAC is not improving, must always be referred to a hospital for better management.

Self-check 3	**Written test**

Part I. Say "True" if the statement is Correct or "False" if the Statement is Incorrect (each 2 point 2X2=4% incorrect

1. The presence of one criterion is sufficient to categorize a patient as malnourished.
2. The follow up visit for a child with moderate acute malnutrition is after 7 days.

Part II. Choose the Correct Answer for the Following Multiple Choose Questions (each 2 point 2x2= 4%)

1. Which is INCORRECT about Ready-to-use therapeutic food (RUTF)?
   A. RUTF is a food and medicine for malnourished children only.
   B. For breastfed children, breast milk should always be given before the RUTF.
   C. RUTF should be given before other foods.
   D. Plenty of clean water to drink should always be offered to the child when he or she is eating RUTF.

2. Among the following drugs which drug is NOT routine drug for a child with severe uncomplicated malnutrition?
   A. Amoxicillin

B. Vitamin A

C. Iron

D. Folic acid

Note: Satisfactory rating – 4 point ***Unsatisfactory below 4 point***

Answer for True or False

3. _____

4. _____

Answer for Multiple choose

3. _____

4. _____

Score _____

Rating _____

Name _____ **Date** _____

Information sheet 4	Referring High risk conditions

4.1. Definition and criteria for Sever Acute Malnutrition (SAM)

The criteria's for a child to classify as having SAM are

Age up to six months

- Visible sever wasting
- Wight to length/W/L < 70% or
- Oedema of both feet

Age six months and above and

- MUAC <11 cm or oedema of both feet or W/H <70% and one of the following
- The infant is too weak or feeble to suckle effectively or
- Fail appetite test or
- Pneumonia/sever pneumonia or
- Blood in the stool
- Fever/hypothermia

Treatment of Sever Acute Malnutrition (SAM)

Refer urgently to Therapeutic feeding Unit (TFU), also called Stabilization center (SC) for an in-patient management of the child

The aim of treatment of these patients is to return them to full exclusive breast feeding. Thus, the admission criterion is failure of effective breast feeding and the discharge criterion is gaining weight on breast milk alone (anthropometry is not used as primary admission criterion).

The management includes three phases of treatment

Phase I

- Prevent and RX. Complications
- Start to feed
- Give routine medications
- Monitor the patient

Transition phase

- Continue to feed
- Continue the medication started in the phase I

Phase 2

- Feed
- Start to give iron supplements
- provide psychosocial support
- Monitor the response
- Teach the mother about feeding

Self-check 4	Written test

Choose the Correct Answer for the Following Multiple Choose Questions (each 2 point 2x2= 4%)

1. Which is NOT the criteria to classify as sever acute malnutrition for a child up to six months of age?
   A. Visible sever wasting
   B. Wight to length/W/L < 70%
   C. Oedema of both feet
   D. MUAC <11
2. A child with sever acute malnutrition should start outpatient therapeutic programme instead of referring to therapeutic feeding unit for an in-patient management.
   A. True
   B. False

Note: Satisfactory rating – 2 point ***Unsatisfactory below 2 point***

Answer

1. _____ 2. _____

Score _____

Rating _____

Name _____ Date _____

Information sheet 6	Managing emergency nutrition problems

6.1. Criteria for therapeutic feeding center (TFP)/Stabilization Center (SC)

Therapeutic feeding programmes (TFPs) provide a rehabilitative diet together with medical treatment for diseases and complications associated with the presence of severe acute malnutrition. This is a unit in a hospital where severely malnourished children with complications or poor appetite are referred and managed. The criteria for admission to in-patient or outpatient care;

Factor	Inpatient care	Outpatient care
Anthropometry	6 months to 18 yrs: • W/H or W/L <70% OR • MUAC <110mm with length >65cm Adults: • MUAC <180mm with recent weight loss or underlying chronic illness OR MUAC<170mm OR • BMI <16	
Bilateral pitting edema	Bilateral pitting edema grade 3(+++) Marasmic – kwashiorkor	Bilateral pitting edema Grade 1 to 2 (+ and++)
Appetite	Poor Appetite	Good Appetite
Medical complications	• severe/intractable vomiting • hypothermia: axillary T° <35°C OR rectal <35.5°C • fever>39°C • fast breathing based on age • extensive skin lesions • very weak, lethargic, unconscious • Fitting/convulsions • Severe dehydration based on history & physical examination • Any condition that requires an infusion or NG – tube feeding.	Alert with no medical complications

	• Very pale (severe anaemia), jaundice, bleeding tendencies	

6.2. Treatment Phases

Treatment Objective

- Treat life-threatening complications
- Rehabilitate with nutrition
- Achieve catch-up growth

Phase I (Inpatient facility)

- Treat poor appetite and/or major medical complications.
- Formula used during this phase is F75.
- Weight gain at this stage is dangerous.

Transition phase

- Avoid a sudden change to large amount of diet before physiological function is restored.
- Patients start to gain weight as F100 is introduced
- The quantity of F100 given is equal to the quantity of F75 given in phase I.

Phase II

- Good appetite
- No major medical complications
- Can occur at inpatient or outpatient setting
- F100 (inpatient only) or ready to use therapeutic feeding (RUTF).

6.2.1. Phase I

Non pharmacologic Treatment of complications

Dehydration

- “Therapeutic window” is narrow in a patient with severe acute malnutrition –
- Quickly go from having depleted circulation to over – hydration with fluid overload and cardiac failure

- IV infusions should be avoided whenever possible.
- The standard protocol for the well-nourished dehydrated child should not be used.
- A supply of modified ORS or Rehydration salt for malnutrition (ReSoMal) should never be freely available for the caretakers to give to the child whenever there is a loose stool.
- Ongoing loss replacement should not be given when there is no dehydration.

a. Marasmic patient

- The usual signs of dehydration are not reliable.
- History is more important than physical examination.
  - ✓ A definite history of significant recent fluid loss – usually diarrhoea which is clearly like water (not just soft or mucus) and frequent with sudden onset within the past few hours or days.
  - ✓ History of a recent change in the child's appearance.
  - ✓ If the eyes are sunken then the mother must say that the eyes have changed to become sunken since the diarrhoea has started.
  - ✓ The child must not have any edema.
  - ✓ Shock may be diagnosed when there is definite dehydration plus a weak or absent radial or femoral pulse, and cold hands and feet, and decrease in level of consciousness.

Treatment

- Rehydration should be oral whenever possible.
- IV infusions should be avoided except when there is shock or loss of consciousness from confirmed dehydration.
- Weight is the best measurement of fluid balance.
- Before starting any rehydration treatment, weigh the child; mark the edge of the liver and the skin with indelible pen and record respiratory rate.
- Start with 5ml/kg of Rehydration salt for malnourished (ReSoMal), every 30 minutes for the first 2 hours orally or by NG – tube and then adjust according to the weight

change observed. If continued weight loss, increase the rate of administration of ReSoMal by 10ml/kg/hr.

- Weigh the child every hour and assess liver size, respiration rate, and pulse rate and pulse volume.

Table 69-Composition of ReSoMal, Standard WHO_ORS and reduced Osmolarity ORS

Composition	ReSoMal (mmol/L)	Standard ORS (mmol/L)	Reduced osmolarity ORS
Glucose	125	111	75
Sodium	45	90	75
Potassium	40	20	20
Chloride	70	80	65
Citrate	7	10	10
Magnesium	3	..	..
Zinc	0.3	..	..
Copper	0.045	..	..
Osmolarity (mOsm/L)	300	311	245

To make ReSoMal (45 mmol Na/L) from the new 75 mmol Na/L WHO-ORS, add 1.7 L of cooled boiled water to each 1-litre sachet of WHO-ORS, add 33ml electrolyte mineral solution and 40g sugar.

Routine medication

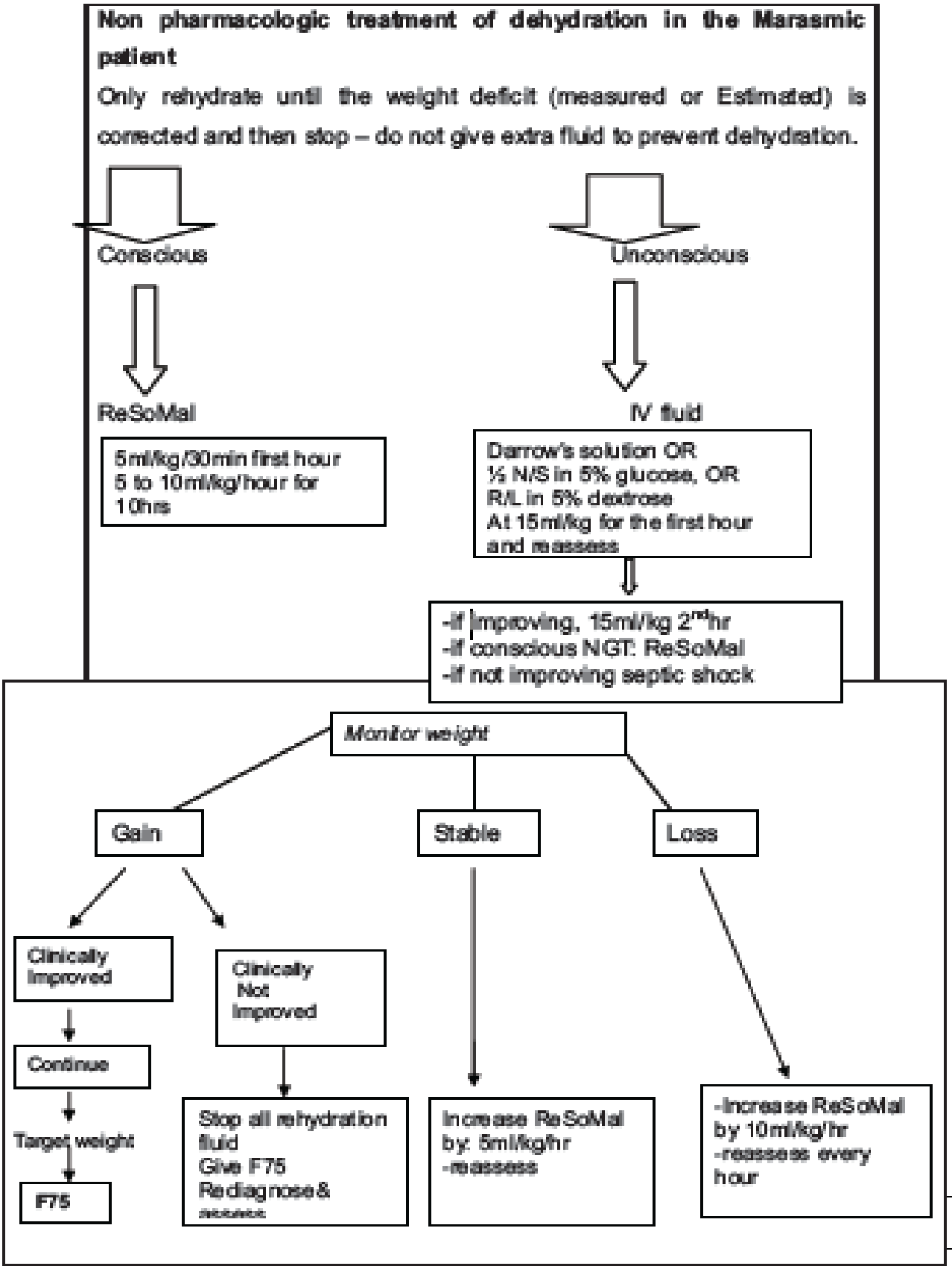
Routine medication includes:

- Vitamin A given on day 1, 2, and 14. For children 6-11 months of age give 100,000 iu and for children of 12 months or older (more than 8 Kg in weight) give 200,000 iu
- Folic acid given as a 5 mg single dose
- Antibiotics: During the phase, the first line antibiotics are amoxicillin or cotrimoxazole and the second line antibiotics are gentamicin or chloramphenicol
  - ✓ Treat orally as much as possible.

- ✓ If there are no apparent signs of infection and complication, give oral cotrimoxazole or amoxicillin
- ✓ If there are signs of infection or complication, give ampicillin and gentamicin or penicillin with gentamicin.

- Measles vaccination if the child is older than 6 months and not vaccinated
- Treat for malaria according to the national guideline

Figure 6-Rehydration monitoring



b. Kwash patient

- All children with edema have an increased total body water and sodium – they are over – hydrated.
- Edematous patients cannot be dehydrated although they are frequently Hypovolemic.
- If a child with kwashiorkor has definite watery diarrhoea and the child is deteriorating clinically (excessive weight loss, more than 2% of the body weight per day), then the fluid lost can be replaced on the basis of 30ml of ReSoMal per day.

c. Septic shock

- A fast weak pulse with cold extremities
- Disturbed consciousness
- Give broad – spectrum antibiotics
- Keep warm to prevent or treat hypothermia
- Give sugar – water by mouth or nasogastric tube as soon as the diagnosis is made.
- Full blown septic shock – treat as in the Marasmic patient.
- Treat hypothermia, severe anaemia, severe pneumonia and any major medical complications

Diet

- F-75 (130ml=100kcal) should be used at this phase (see table for amounts).
- Use NG – tube for feeding if the child is taking <75% of prescribed diet per 24hrs or has pneumonia with a rapid respiratory rate or consciousness is disturbed.

Nasogastric tube is indicated in the following cases:

- Pneumonia with rapid breathing
- Painful oral lesions
- Disturbances of consciousness
- The Patient is taking less than 75% of the daily milk

Table 70-Amounts of F75 to give during Phase 1

Class of Weight (Kg)	8 feeds per day ml for each feed	6 feeds per day Ml for each feed	5 feeds per day Ml for each feed
2.0 to 2.1 Kg	40 ml per feed	50 ml per feed	65 ml per feed
2.2 – 2.4	45	60	70
2.5 – 2.7	50	65	75
2.8 – 2.9	55	70	80
3.0 – 3.4	60	75	85
3.5 – 3.9	65	80	95
4.0 – 4.4	70	85	110
4.5 – 4.9	80	95	120
5.0 – 5.4	90	110	130
5.5 – 5.9	100	120	150
6 – 6.9	110	140	175
7 – 7.9	125	160	200
8 – 8.9	140	180	225
9 – 9.9	155	190	250
10 – 10.9	170	200	275
11 – 11.9	190	230	275
12 – 12.9	205	250	300
13 – 13.9	230	275	350
14 – 14.9	250	290	375
15 – 19.9	260	300	400
20 – 24.9	290	320	450
25 – 29.9	300	350	450
30 – 39.9	320	370	500
40– 60	350	400	500

Pharmacologic

Table 71-Routine medications

	Direct admission to in-patient (phase I)	Direct admission to out patient (phase II)
Vitamin A*	One dose at admission One dose on discharge	One dose on the 4th week
Folic acid	One dose at admission if signs of anaemia	One dose at admission if signs of anaemia
Amoxicillin	Every day in phase I + 4 more days in Transition	One dose at admission + give Treatment for 7 days at home
Malaria	According to the national protocol	According to national protocol
Measles (in Those above 9 months Old	One vaccine at dmission if no card One vaccine at discharge	One vaccine on the 4th week
Iron	Add to F100 in phase 2	No. iron is already in all RUTF
Deworming	One dose at the start of phase 2	One dose on the 2nd week

*Do not give Vitamin A to edematous children (wait till edema disappears).

6.2.2. Transition phase

Progress to from phase I to transitions phase when

- Appetite has improved
- Begins to loose edema and weight
- No IV line or NGT.
- The only change made to the treatment in phase I, is a change in the diet that is given from F75 to F100 or RUTF.
- The number of feeds, their timing and the volume of the diet given remains exactly the same as in phase I.

Table 72-Transition Phase: Amounts of RUTF to give

Class of Weight	Beza	Plumpy Nut	BP 100	Total
	Gram/day	Sachets/day	Bars/day	Kcal
3 – 3.4	90	1.00	1.5	500
3.5 – 3.9	100	1.00	1.5	550
4 – 4.9	110	1.25	2.0	600
5 – 5.9	130	1.50	2.5	700
6 – 6.9	150	1.75	3.0	800
7 – 7.9	180	2.00	3.5	1000
8 – 8.9	200	2.00	3.5	1100
9 – 9.9	220	2.50	4.0	1200
10 – 11.9	250	3.00	4.5	1350
12 – 14.9	300	3.50	6.0	1600
15 – 19.9	370	4.00	7.0	2000
20-24.9 missing				
25 – 39	450	5.00	8.0	2500
40 – 60	500	6.00	10.0	2700

The amounts given in the table are for the full 24 hour period. The amounts represent an average increase in energy intake of about one third over the amount given during Phase I. However, this varies between an increment of 10% and 50% depending upon the actual weight and the product used. Each of the RUTF products is nutritionally equivalent to F 100, with the exception that they have an appropriate amount of iron added during manufacture for children in Phase 2 (i.e. children who pass the appetite test). If both F100 and RUTF are being given they can be substituted on the basis that about 100 ml of F100 = 20g of RUTF.

Table transition Phase: amount of F100 to give

Class of Weight (Kg)	8 feeds per day	6 feeds per day	5 feeds per day
Less than 3Kg F100 full strength should not be given – Only F100 diluted should be given			

3.0 to 3.4 Kg	60 ml per feed	75 ml per feed	85 per feed
3.5 – 3.9	65	80	95
4.0 – 4.4	70	85	110
4.5 – 4.9	80	95	120
5.0 – 5.4	90	110	130
5.5 – 5.9	100	120	150
6 – 6.9	110	140	175
7 – 7.9	125	160	200
8 – 8.9	140	180	225
9 – 9.9	155	190	250
10 – 10.9	170	200	275
11 – 11.9	190	230	275
12 – 12.9	205	250	300
13 – 13.9	230	275	350
14 – 14.9	250	290	375
15 – 19.9	260	300	400
20 – 24.9	290	320	450
25 – 29.9	300	350	450
30 – 39.9	320	370	500
40 – 60	350	400	500

The table gives the amount of F100 (full strength) that should be offered to patients in Transition Phase. They should normally be taking 6 feeds during the day and none at night. The table below gives the amount of RUTF to give per feed if some of the feeds are being given as F100 and others as RUTF. A common variation is to give 5 or 6 feeds of F100 during the day and then 3 or 2 feeds of RUTF during the night – this gives 8 feeds in total during the day. The volume of F100 is then read off from the previous table and the grams of RUTF from the next table, both using the 8 meals per day column and the appropriate class of weight.

Criteria to move back from transition phase to phase I

- Increasing edema.
- If a child who did not have edema develops edema.
- Rapid increase in the size of the liver.
- Any other sign of fluid overload.
- Tense abdominal distension.
- Significant refeeding diarrhoea with weight loss.
- Develops medical complications.
- If NG tube is needed.
- If patient takes <75% of the feeds in transition phase even after interchange between RUTF and F100.

6.2.3. Phase II

Progress to Phase II from transition phase when:

- Good appetite is restored (at least 90% of the RUTF or F100 prescribed in transition phase)
- No or minimal edema (+).

Table - Phase 2 amounts of F100 and RUTF to give at each feed for 5 or 6 feeds per day

Class of weight (Kg)	6 feeds/day		5 feeds/day	
	F100	RUTF	F100	RUTF
	ml/feed	g/feed	ml/feed	g/feed
< 3kg	Full strength F100 and RUTF are not given below 3 kg			
3.0 to 3.4	110	20	130	25
3.5 – 3.9	120	22	150	30
4.0 – 4.9	150	28	180	35
5.0 – 5.9	180	35	200	35
6.0 – 6.9	210	40	250	45
7.0 – 7.9	240	45	300	55
8.0 – 8.9	270	50	330	60
9.0 – 9.9	300	55	360	65
10.0 – 11.9	350	65	420	75
12.0 – 14.9	450	80	520	95
15.0 – 19.9	550	100	650	120
20.0 – 24.9	650	120	780	140
25.0 – 29.9	650	140	900	160
30.0 – 39.9	850	160	1000	180
40.0 – 60.0	1000	180	1200	220

Table - Phase 2 (out-patients): amounts of RUTF to give

Class of weight (Kg)	RUTF Paste		PLUMPY'NUT ®		BP100 ®	
	Grams per Day	Grams per Week	Sachet per Day	Sachet per week	Bars per Day	bar per week
3.0 – 3.4	105	750	1 1/4	8	2	14
3.5 – 4.9	130	900	1 1/2	10	2 1/2	17 1/2
5.0 – 6.9	200	1400	2	15	4	28
7.0 – 9.9	260	1800	3	20	5	35
10.0 – 14.9	400	2800	4	30	7	49
15.0 – 19.9	450	3200	5	35	9	63
20.0 – 29.9	500	3500	6	40	10	70
30.0 – 39.9	650	4500	7	50	12	84
40.0 – 60.0	700	5000	8	55	14	98

Self-check	**Written test**

Choose the Correct Answer for the Following Multiple Choose Questions (each 2 point 2x2= 4%)

1. Which is NOT the criteria to move back from transition phase to phase I
   A. Rapid increase in the size of the liver.
   B. No or minimal edema (+).
   C. Tense abdominal distension.
   D. Develops medical complications.
2. Which is NOT the indication to insert nasogastric tube for a child with sever acute malnutrition?
   A. Pneumonia with rapid breathing
   B. Painful oral lesions

C. If the child is conscious

D. The Patient is taking less than 75% of the daily milk

N***ote: Satisfactory rating – 2 point*** ***Unsatisfactory below 2 point***

Answer

3. _____
4. _____

Score _____

Rating _____

Name _____ **Date** _____

Information sheet 6	Practical preparation and education of balanced diet

6.3. Definition and benefits a balanced diet

Eating a balanced diet means choosing a wide variety of foods and drinks from all the food groups. It also means eating certain things in small amounts, namely saturated fat, cholesterol, simple sugar and salt. The goal is to take in all of the nutrients you need for health at the recommended levels and perhaps restrict those things that are not good for the body. To know if the diet is balanced and to plan a balanced diet you have to think about two things: the mixture of foods and the amount of food a person eats.

6.4. Helping families to have good balanced diet

The best way to help individuals to prepare a balanced diet is to learn which foods people use, the amount of different foods available, and how they prepare their meals. Then you can decide if people need help or further support or information to improve the balance of things they eat.

Figure shows a food pyramid. It helps to identify the food groups people should combine in order to make a balanced diet. The food groups at the top of the pyramid should be eaten in moderation (small amount) but food groups at the bottom of the pyramid should be eaten in larger amounts.

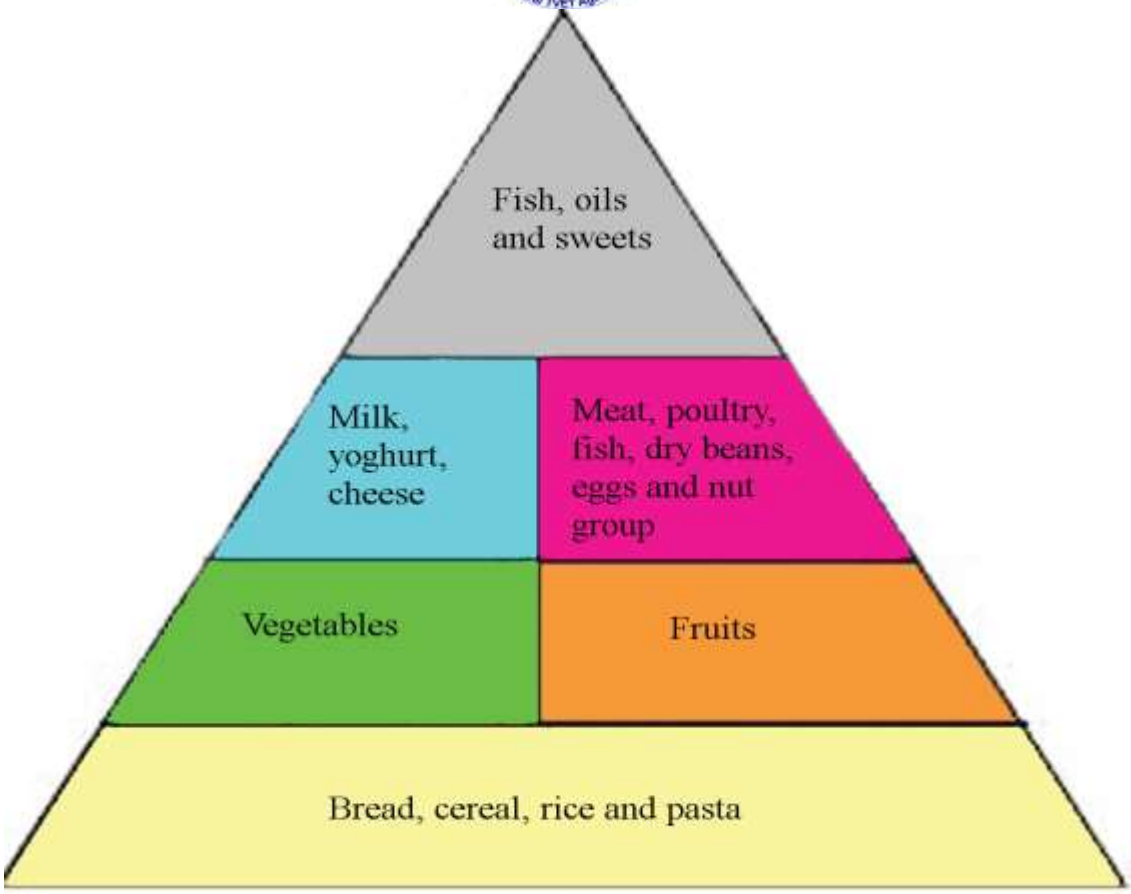


Figure. Food pyramid

6.5. The mixture of foods to use

The staple food is the common type of food that is consumed by the community. It should be part of a balanced diet because it's the main part of most meals. The staple diet may vary from region to region. For example, 'injera' is the staple diet in many sites, maize in other areas, and 'kocho' in the southern part of the country. These foods are usually cheap, and provide most of the energy, protein and fiber in a meal, as well as some vitamins.

6.6. Adding other foods to the staple food

In order to have a good balanced diet, people will need to eat other foods in addition to the staple foods. The additional foods are important because they:

- Provide nutrients that may not be available in the staple food. For example, legumes such as peas, beans and lentils add protein, iron and other minerals and fat; green and yellow vegetables and fruits add vitamins A and C, folate, and fiber.
- Make the food less bulky
- Make the diet more tasty and interesting to eat.

A diet which is composed of staples, legumes and vegetables or fruits is a good, balanced diet because this combination of foods will provide most of the nutrients that the people in need. Adding animal sources to the sample is also good because they contain plenty of protein, have high energy (due to the fats), and the iron is easily absorbed compared with the iron sourced from plants.

Therefore adding small amounts of animal products like meat, milk and eggs to staples, legumes and vegetables will improve the balanced diet. As well as protein, animal foods will also provide fat (for energy) and vitamins (especially vitamin A and folate), iron and zinc .

Self-check 6	Written test

Part I. Say "True" if the statement is Correct or "False" if the Statement is Incorrect (each 2 point 2X2=4% incorrect

1. The iron in plant source is easily absorbed compared with the iron sourced from plants.
2. The food groups at the top of the pyramid should be eaten in moderation (small amount) but food groups at the bottom of the pyramid should be eaten in larger amounts.

Note: Satisfactory rating – 2 point ***Unsatisfactory below 2 point***

Answer for True or False

1. _____ 2. _____

Score _____

Rating _____

Name _____ **Date** _____

Information sheet 7	Adolescent and young child feeding

8.1. Adolescent Feeding

World health organization defines adolescents as individuals between 10 and 19 years of age. The broader terms "youth" and “young” encompass the 15 to 24 year-old and 10 to 24 year-old age groups, respectively. Adolescents undergo a very rapid growth during their puberty (called the pubertal growth spurt). During the pubertal growth spurt, they increase rapidly both in weight and height. Therefore, they need a nutrient intake that is proportional with their rate of growth. The growth rate is very high right after birth (infancy). Then the growth rate slows down until the age of 12–14 years. At about 15–16 years (the pubertal period) there is a sharp rise in growth rate/velocity. After that, the growth rate slows down again.

Higher intakes of protein and energy for growth are recommended for adolescents. For most micronutrients, recommendations are the same as for adults. Exceptions are made for certain minerals needed for bone growth (e.g. calcium and phosphorus). Evidence is clear that bone calcium accretion increases as a result of exercise rather than from increases in calcium intake. Since weight gain often begins during adolescence and young adulthood, young people must establish healthy eating and lifestyle habits that reduce the risk for chronic disease later in life. The feeding recommendations of adolescents are:

- Increased requirements of energy, protein, calcium, phosphorus and zinc.
- Need at least two large mixed meals and some snacks each day. They can eat bulky food. Boys need a lot of calories. Girls need plenty of iron.
- Pregnant adolescent girls are still growing so they need more food than pregnant women.

8.2. Feeding Young Child

Optimal feeding of children during the first two years is critical to break the cycle of malnutrition from generation to generation. The first 24 months is recognized as being the most important window of opportunity for establishing healthy growth. Infant and

child feeding practices are major determinants of the risk of malnutrition. In Ethiopia only 58% of infants under age 6 months are exclusively breastfed, 73% of infants were breastfed within 1 hour of birth and 92% were breastfed within 1 day of birth. Eight percent of children received prelacteal feeding.

According to profiles analyses using Demographic Health Survey data, it is estimated in Ethiopia that there are about 50,000 infant deaths a year attributable to poor breastfeeding habits, that is, 18% of all infant deaths every year.

Equally important are the serious problems related to when complementary food is introduced, because a large majority of infants are given such foods too early or too late. At six to eight months of age, only one in two children is consuming solid or semisolid food. Much of the inappropriate breastfeeding and complementary feeding behaviour is actually due to lack of knowledge, rather than practical or financial constraints, and you will have plenty of opportunities in your work to give mothers the best information possible.

8.2.1. Global and national recommendations for child feeding during the first 24 months

Based on the global infant and young child feeding recommendations developed by the World Health Organization in 2002, the Ethiopian National Infant and Young Child Feeding (IYCF) Guideline was developed in 2004. The guideline stresses the following IYCF strategies during the first two years:

- **Exclusive breastfeeding** during the first six months (exclusive breastfeeding is defined as giving only breast milk and no other food or fluid including water except medication)
- Start optimal **complementary feeding** at six months with continuation of breastfeeding for the first two years or beyond (complementary feeding means giving solid or semisolid food to a child in addition to breast milk).

Key messages for optimal breastfeeding practices

The following are key messages that need to be explained to the mother.

A. The mother initiates breastfeeding within one hour of birth

Initiating breastfeeding within one hour protects the infant from disease by providing the thick, yellowish first milk (colostrum). It also helps to the uterus more contract to expel the placenta more rapidly and reduces blood loss. It also helps to stimulates further breast milk production and keeps the newborn warm through skin-to-skin contact.

B. The mother breastfeeds frequently, day and night

The mother should allow the infant to breastfeed on demand (as often as the infant wants.) This means feeding every two to three hours (8–12 times per 24 hours) or more frequently if needed, especially in the early months. The mother needs to breastfeed frequently to stimulate milk production. Breast milk is perfectly adapted to the infant's small stomach size because it is quickly and easily digested.

C. The mother gives infant only breast milk for the first six months.

Breast milk contains all the water and nutrients that an infant needs to satisfy its hunger and thirst. Exclusive breastfeeding helps to space births by delaying the return of fertility. Exclusively breasted infants are likely to have fewer diarrhoea, respiratory, and ear infections. You should encourage and support the mother to exclusively breastfeed her baby, explaining how it will help both her and her infant.

D. The mother continues breastfeeding when either she or the infant is sick

If the mother is sick with a cold, flu or diarrhoea, she can continue to breastfeed because breast milk still protects the infant against illness. If the infant is sick, mother has to breastfeed more frequently (or express her milk if the infant cannot breastfeed) so that the infant recovers faster. Breast milk replaces water and nutrients lost through frequent loose stools, and is the most easily digestible food for the sick infant.

E. The mother positions and attaches infant correctly at the breast

The mother has to position and attach the infant to the breast correctly to help prevent sore or cracked nipples, and to stimulate her milk supply. Signs that infant is properly positioned are:

- The infant's whole body is facing the mother and is close to her
- The mother holds infant's entire body, not just the neck and shoulders.

Signs that infant is properly attached include:

- The mother brings infant toward her breast, not the breast toward her infant
- The infant's mouth is open wide
- The infant's lips are turned outwards
- The infant's chin touches the mother's breast
- The mother's entire nipple and a good portion of the areola (dark skin around the nipple) are in the infant's mouth
- More areola is showing above rather than below the nipple.

F. The mother offers the second breast after the infant releases the first

The mother has to allow the infant to release the first breast before offering the second breast so that infant receives both 'fore milk' which has a high water content to quench the infant's thirst, and 'hind milk' which is rich in fat and nutrients. The mother should not give bottles and pacifiers (dummies) to her breastfed infant because they can interfere with breastfeeding and cause diarrhoea and other possibly serious infections as they are difficult to keep clean.

G. The mother should eat more than usual

As breastfeeding increases the nutritional requirements of the mother, she needs to have two additional meals (about 500 kcal) every day. Her diet should also be varied (for example by adding vegetables and fruits).

H. By the age of six months the mother or caregiver must add complementary food

The complementary food given to the child should be varied as much as possible, increasing the quantity, frequency and density of the food as the child gets older. This is in addition to the need for the mother to continue breastfeeding until the child is two years of age or older.

8.2.2. Benefits of breastfeeding for the baby

Breast milk has many advantages over cow's milk or other formula foods. Explaining the following benefits to the mothers will help you to convince them about the practice of breastfeeding.

1. Nutritional

Breast milk is free of contamination and does not need any preparation. It is also self-regulatory; breast milk secretion occurs based on the need of the infant, so if there is more feeding there will be more secretion. If the mother tries to introduce supplementary food such as formula milk early in the life of the baby (as early as under four months), there will be replacement of the clean, nutritious breast milk by formula or cow's milk which is more likely to be contaminated, resulting in increased risk of infection. Therefore, breast milk should be considered to be a whole food for the infant because it contains balanced proportions and a sufficient quantity of all the nutrients needed for the first six months. The nutritional benefits of breastfeeding are the following;

- Breast milk is always clean
- Breast milk is always ready and at the right temperature
- Breast milk is easy to digest
- Nutrients are easily absorbed from breast milk
- Breast milk protects against allergies
- Breast milk antibodies protect the baby's gut by preventing harmful substances from passing into the blood
- Breast milk contains enough water for the baby's needs

- Breast milk has a low protein content which makes it suitable for feeding small infants before their kidneys are fully developed. The amount of protein is adequate to promote the normal growth of the baby.
- Breast milk is low in saturated fatty acids; saturated fatty acids from cow's milk may form a hard curd when they react with hydrochloric acid in the baby's stomach and may result in the impacting of the curd in the intestine. Cow's milk is rich in these acids and also contains large amounts of protein. Breast milk is much safer

2. Builds up immunity

Breast milk has many active immune agents that protect the child from developing diseases and therefore promotes the normal growth of the child.

3. Growth factor

Breast milk is important for the normal growth of the baby.

4. Development factors

The fat in breast milk has been found to be very important for the development of the brain. Breastfed children show better intelligence as compared to bottle or formula-fed children.

- Breastfeeding helps jaw and tooth development; suckling develops facial muscles
- Frequent skin-to-skin contact during breastfeeding leads to better psychomotor, affective and social development of the infant and promotes bonding between mother and child.

5. The infant benefits from colostrum

Colostrum is the first breast milk that is produced after delivery and protects the baby from diseases. The colostrum acts as a laxative cleaning the infant's stomach. It is also the equivalent of the first immunization for the baby as it has many immunologic factors and a high concentration of vitamin A.

8.2.3. Benefits of breastfeeding for the mother

The benefits of breastfeeding for mothers are;

- Breastfeeding is more than 98% effective as a contraceptive method during the first 6 months provided breastfeeding is exclusive and **amenorrhoea** persists (menstruation has not started)
- Putting the baby to the breast immediately after birth facilitates expulsion of the placenta as the baby's suckling stimulates uterine contractions
- Breastfeeding reduces risks of bleeding after delivery
- Breastfeeding immediately after birth stimulates breast milk production
- Immediate and frequent suckling prevents engorgement of the breasts
- Breastfeeding reduces the mother's workload (no time is involved in boiling water, gathering fuel or preparing formula milk)
- Breast milk is available at anytime and anywhere, is always clean, nutritious and at the right temperature
- Breastfeeding is economical
- Breastfeeding stimulates bonding between mother and baby
- Breastfeeding reduces risks of pre-menopausal breast and ovarian cancer.

8.2.4. Benefits of breastfeeding for the family

The benefits of breastfeeding for families with infants and young children are;

- There are no expenses in buying formula, firewood or other fuel to boil water, milk, or utensils. The money saved can be used to meet the family's other needs
- There should be no medical expenses due to the sickness that formula milk might cause. The mothers and their children are healthier
- As illness episodes are reduced in number, the family encounters fewer emotional difficulties associated with the baby's illness
- Births are spaced thanks to the contraceptive effect of breastfeeding
- Time is saved as breast milk does not need preparation
- Breastfeeding the baby reduces the mother's work load because the milk is always available and ready.

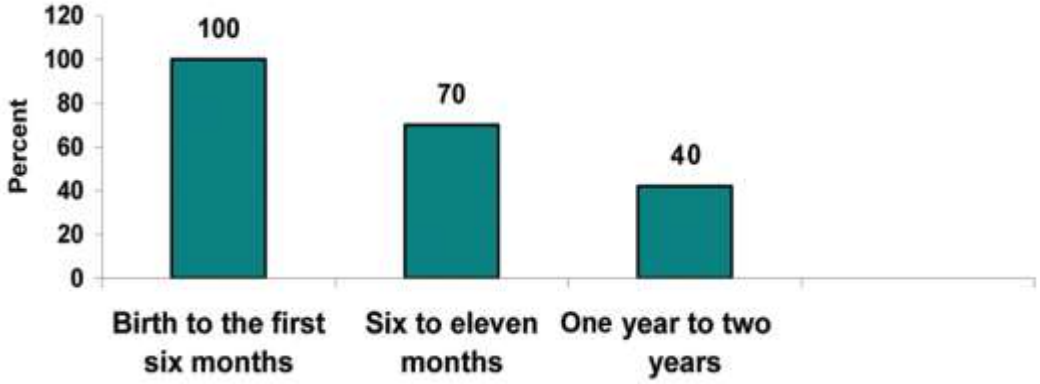
Key messages for optimal complementary feeding practices

Both the quantity and quality of complementary foods are important to ensure good health and development for the baby and young child. Infants older than six months should eat a variety of nutrient-rich foods, including animal products (e.g. eggs, beef, chicken, lamb, milk, cheese and butter), fruits, and vegetables. It is usually not possible for an infant to consume sufficient quantities of plant foods to meet their needs for iron, zinc and calcium. Therefore, the addition of animal source foods enables the different nutrients to be absorbed more easily and is essential in the preparation of complementary foods.

When you are advising mothers and caregivers about optimal complementary feeding, there are a number of key messages you can give. These are set out below.

- When the infant is six months old the mother must give the infant complementary foods in addition to breast milk to help the infant grow strong and healthy. At this age, breast milk alone cannot meet all the nutritional needs for growth and development
- The mother should continue to give breast milk as the main food throughout the infant's first year. Breast milk will continue to protect the child against illness
- The mother or caregiver should begin complementary feeding by adding available, feasible, local foods (vegetables, fruits, eggs, milk) to staple foods (cereals and legumes) and increase the amount of food as the child grows
- The mother should continue breastfeeding until child is at least two years old.

Breast milk constitutes the largest portion of young child's food during the first two years. Figure shows what percentage of breast milk should be in a child's diet from birth to two years.



Here are some additional important messages about feeding.

- **Increase frequency of feedings**
  - ✓ The mother or caregiver should increase the frequency of feedings and the amount of food as the child gets older
  - ✓ The mother or caregiver should use a separate bowl for the child and continue frequent breastfeeding
  - ✓ The mother or caregiver should give young children small feeds frequently throughout the day (both day and night) because they have very small stomachs
  - ✓ As the child grows, the mother or caregiver should give the child more food. Table summarizes the frequency of meals, and their number according to the age of the child.

Age (month)	**Meal frequency per day for breastfed baby**	**Meal frequency per day for non-breastfed baby**
6-9	2-3 times + 1-2 snacks	4-5 times + 1-2 snacks
10-23	3-4 times + 1-2 snacks	

- **Increase food thickness and variety**

At six months, the mother or caregiver can give the infant softened, mashed and semi-solid foods. She should also add protein-rich foods (animal/ plant); beans, soya, chick peas, groundnuts, eggs, liver, meat, chicken and milk. At eight months the mother or caregiver can give foods that infant can eat alone, such as cutup fruit and vegetables

(for example, mangoes, papaya, leafy greens, oranges, bananas, pumpkin, carrots and tomatoes). During complementary feeding, the aim is for the mother or caregiver to gradually accustom the child to family foods. By 12 months the child should be eating family foods.

- **Interact with the child during feeding**

The mother or caregiver should interact with the child during feeding. This is known as active or responsive feeding. The mother or caregiver should also feed the infant directly and help older children eat and experiment with food combinations, tastes and textures.

- **Practice good hygiene and safe food preparation**

In resource-poor settings, the mother or caregiver can feed liquids to the child from a small cup or bowl, as bottles are difficult to keep clean, and contaminated bottles can cause diarrhoea. Before feeding the child, the mother or caregiver should wash their hands and the child's hands with soap and water and use clean utensils and bowls or dishes to avoid introducing dirt and germs that might cause diarrhoea and other infections. Food can be contaminated as a result of poor basic hygiene, poor sanitation, and poor methods of food preparation and storage, so food should be served immediately after preparation.

Increase the amount of food provided each day

As children grow older, they need to eat more food each day.

- **Increases complementary food if the child becomes sick**

The mother should continue to breastfeed when the child is ill and should encourage the child who is older than six months to eat during and after illness. The mother should offer the child who is older than six months soft, mashed favorite foods. Breastfeeding is extremely important during illness. Children who are ill will often continue to breastfeed even if they refuse other foods.

- **The mother diversifies the complementary food**

The mother should mix foods from plant sources such as fruits, vegetables, cereals and legumes with foods of animal origin in order to diversify the complementary food. During

illness and for two weeks after illness, the mother or caregiver should increase the quantity of food and feed the child more often so that the child recovers quickly. Children are often very hungry during recovery from illness and need more food to support catch-up growth and to replace nutrient stores.

Self-check 8	**Written test**

Part I. Say "True" if the statement is Correct or "False" if the Statement is Incorrect (each 2 point 2X2=4% incorrect

3. Pregnant adolescent girls need more food than pregnant women.
4. When the infant is six months old breast milk alone cannot meet all the nutritional needs for growth and development

Part II. Choose the Correct Answer for the Following Multiple Choose Questions (each 2 point 2x2= 4%)

1. In order to receive the infant both 'fore milk' which has a high water content to quench the infant's thirst, and 'hind milk' which is rich in fat and nutrients; the mother should
   A. The mother breastfeeds frequently, day and night
   B. The mother continues breastfeeding when either she or the infant is sick
   C. The mother positions and attaches infant correctly at the breast
   D. The mother offers the second breast after the infant releases the first
2. To prevent the risk of diarrhea during complementary feeding which practice should be best?
   A. Increase frequency of feeding
   B. Increase food thickness and variety
   C. Practice good hygiene and safe food preparation
   D. Increase the amount of food provided each day

Note: Satisfactory rating – 4 point ***Unsatisfactory below 4 point***

Answer for True or False

1. _____
2. _____

Answer for Multiple choose

1. _____
2. _____

Score _____

Rating _____

Name _____ **Date** _____

Prepared By

No	Name	Educational Back grand	LEVEL	Region	College	Email	Phone Number
1	Masresha Leta	Midwifery	A	Harari	Harar HSC	masreshaleta3@gmail.com	0911947787
2	Gosaye T/haymanot Zewde	Midwifery	A	Harari	Harar HSC	Zewegosa@yahoo.com	0913227450
3	Amare Kiros	Midwifery	A	BGRS	Pawi HSC	amarekiros9@gmail.com	0920843010
4	Jalele Mosisa	Midwifery	B	oromia	Nekemte HSC	jalemosis2018@gmail.com	0939316415
5	Serkalem Fetene	Midwifery	A	oromia	Mettu HSC	serkefetene@gmail.com	0912022476
6	Balela Kadir	Midwifery	B	oromia	Nagelle HSC	balela.kedirbedu@gmail.com	0916633542
7	Sadeya Mohamed	Midwifery	A	Somali	Jigjiga HSC	yanaan261@gamil.com	0915076012

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