HOLT INTERNATIONAL

Uplifting children. Strengthening families.

THE CHILD NUTRITION PROGRAM

Community Resource Manual

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CHAPTER 1

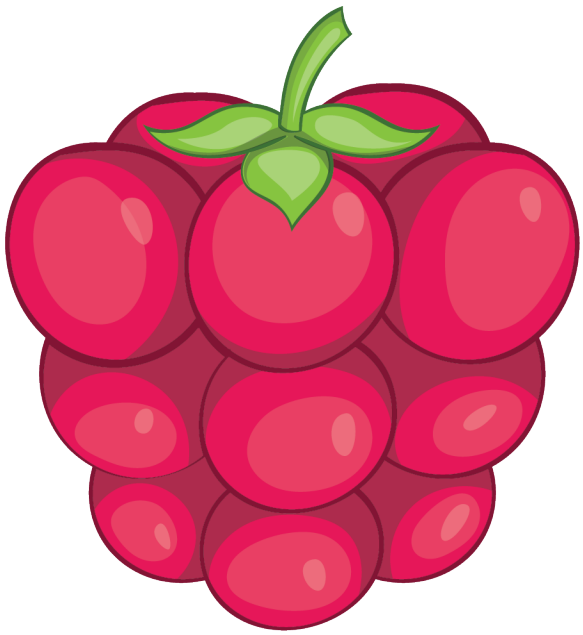
NUTRITION BASICS

INTRODUCTION TO NUTRITION

FOOD GROUPS

MACRONUTRIENTS

MICRONUTRIENTS



INTRODUCTION TO NUTRITION

NUTRITION refers to consuming and using food in order to grow, repair and maintain the body's tissues and functions. It plays a critical role in health, growth and brain development throughout a person's lifespan.

Foods are classified into FOOD GROUPS based on what they have in common, such as nutrient content or where they come from (e.g. plants). There are five commonly recognized food groups:

- Cereal grains, pasta, rice, bread and potatoes
- Fruits
- Vegetables
- Milk, dairy and calcium-rich foods
- Meats, beans and legumes

DIET OPTIMIZATION means getting the greatest possible nutrition and health benefits from the daily diet. One way to do this is to eat a balanced diet that contains a variety of food from each food group.

WATER is essential to every cell, tissue and organ in the body because it:

- Carries nutrients throughout the body
- Helps regulate the body's temperature
- Cushions joints and protects sensitive tissues
- Cleanses the body of waste through sweat, urine and the bowels

Water is an ESSENTIAL NUTRIENT, which means it must be obtained through the diet. Water can be obtained through consuming foods, such as fruits and vegetables, and fluids such as milk or yogurt drink, meat, bone broth and fresh juice. Most daily water needs can be met by drinking clean water and other beverages. Water needs vary depending on age, diet, activity level and climate.

It is important that children drink plenty of water every day to prevent DEHYDRATION, which is when the body does not have as much water as it needs. When severe, dehydration can be life threatening, especially for children.

People have additional fluid needs when:

- Living in a hot climate
- Experiencing diarrhea or vomiting
- Running a fever
- Physically active

NUTRIENTS are substances in food that are essential to the body's growth, structure and regular functioning. Nutrients fall into two categories — MACRONUTRIENTS and MICRONUTRIENTS.

PRACTICAL NUTRITION:

In general, it's recommended that children consume 1.5 liters (4-6 cups) of clean, safe drinking water or other beverages such as fresh fruit juice, fresh vegetable juice or yogurt drink daily.

MACRONUTRIENTS are substances our body needs in large amounts. These include:

- Carbohydrates
- Proteins
- Fats

MICRONUTRIENTS are substances our body needs in small amounts. These include:

- Minerals
- Vitamins

Without sufficient amounts of nutrients, the body may develop a NUTRIENT DEFICIENCY. Deficiencies in different nutrients have differing symptoms, but ultimately it affects an individual's overall health. Some nutrient deficiencies, if very severe, can even lead to death.

PRACTICAL NUTRITION

Young children between 1 and 5 years old should receive six servings of cereal grains, pasta, rice, bread or potatoes daily.

1 Serving=

- 1 slice of whole wheat bread
- 1 piece of chapatti
- 1 cup (227 grams) of ready-to-eat cereal
- ½ cup (113 grams) of cooked rice or millet
- ½ cup (113 grams) of cooked cereal, such as ragi

FOOD GROUPS

The following FOODS GROUPS are considered to be a part of a healthy, balanced diet:

- Cereal grains, pasta, rice, bread and potatoes
- Fruits
- Vegetables
- Milk, dairy and calcium-rich foods
- Meats, beans and legumes

Foods that are high in sugar, fats and oils should be limited in a young child's diet. Too much of foods such as cakes, candies, butter, oils and sugary drinks can negatively impact a child's health and development.

CEREAL GRAINS, PASTA, RICE, BREADS AND POTATOES are grouped together because they come from plants and are high in nutrients such as carbohydrates, folate and iron.

Grain-based foods, such as cereals, pasta, rice and bread fall into two categories:

- Refined grains
- Whole grains

REFINED GRAINS refer to foods containing grains that have been processed to remove parts of the grain kernel, giving the grains a finer texture. During the refining process, most vitamins and dietary fiber are removed from the grains. However, refined grains can be enriched — a process that adds vitamins and minerals back into the grain.

Examples of refined grain foods include:

- White flour
- White rice
- Biscuits or cookies
- White bread
- Pasta

WHOLE GRAINS refer to foods that contain the entire grain kernel. Because whole grains contain the whole grain kernel, they are high in nutrients*. Examples of whole grain foods include:

- Whole wheat flour
- Whole wheat bread or chapatti
- Brown rice
- Bulgur wheat
- Buckwheat
- Millet
- Teff
- Oats and oatmeal

*Even though whole grains are high in nutrients doesn't necessarily mean the body can use them efficiently. This means the bioavailability of nutrients such as iron and zinc is low in whole grains.

FRUITS and VEGETABLES are important food groups because all foods in these two groups come from plants. Fruits and vegetables are an important part of a child's diet because they contain nutrients such as dietary fiber, potassium, folate, vitamin C and vitamin A.

FRUITS include fresh, frozen, canned or dried fruit and 100 percent fruit juices, such as banana, pineapple, papaya, apple, mango, melon, orange, lemon and lime.

VEGETABLES include fresh, frozen, canned or dehydrated vegetables and 100 percent vegetable juices, such as spinach and other leafy vegetables, squash, pumpkin, carrot, peppers, sweet potato, broccoli, cauliflower, cucumber, moringa and tomatoes.

It is generally recommended to serve one fruit or vegetable high in VITAMIN C every day, such as orange, grapefruit, mango, guava, spinach, cabbage, pepper or tomato. Additionally, serve one food high in VITAMIN A three times each week, such as carrot, pumpkin, winter squash, sweet potato, spinach, papaya or mango.

PRACTICAL NUTRITION

Young children between 1 and 5 years old should receive two servings of fruits and three servings of vegetables each day.

1 Serving =

- ¾ cup (170 grams) of chopped fruit
- 1 piece of fruit (1 small apple, 1 large banana or 1 large orange)
- ¼ cup (57 grams) of dried fruit
- ½ cup (113 grams) of cooked vegetables (chopped or mashed)
- 1 cup (227 grams) of raw leafy greens
- ¾ cup (177 ml) of 100% fruit or vegetable juice

THE MILK, DAIRY AND CALCIUM-RICH FOODS group includes foods that come from animal sources. These foods contain nutrients such as protein, calcium and, when fortified, vitamin D. Milk and dairy foods include animal milks (e.g. cow, goat, sheep, buffalo) and the products derived from milk, such as buttermilk, yogurt, pudding, cheese, sour cream and ice cream.

It is important not to give animal milk to children younger than 1-year-old. After one year, some children may need to omit dairy products from their diet for various reasons. As an alternative, calcium may be obtained from a variety of other foods, such as:

- Calcium-fortified soy milk, almond milk or rice milk
- Soy beans and tofu
- Leafy greens: kale, turnip greens, bok choy

PRACTICAL NUTRITION

Young children between 1 and 5 years old need two servings of milk daily.

1 Serving=

- 237 ml of milk or buttermilk
- 237 ml of yogurt
- 28 grams of curd cheese
- 113 grams of pudding
- 113 grams of ice cream

MEAT refers to food that comes from animal tissue, and BEANS AND legumes are protein-rich, plant-based foods. What these foods have in common is that they contain the nutrients protein, iron, and zinc. Meats, beans and legumes include animal and plant foods, such as beef, lamb, mutton, chicken, fish, eggs, soya, beans, lentils, nuts and nut butters.

The general recommendation is to serve one food high in IRON EVERY DAY.

- Very good sources of iron include mutton, chicken and fish
- Other sources of iron include soya, cooked dried beans and cooked lentils

It's important to remember that iron in animal meat is more bioavailable, or efficiently absorbed and used by the body, compared to iron in some protein alternatives. To improve iron absorption, serve foods high in IRON alongside foods high in VITAMIN C.

If serving a primarily vegetarian diet, the greatest nutritional benefit from beans and legumes can be obtained by:

- Offering a variety of bean and legume choices

PRACTICAL NUTRITION

Young children between 1 and 5 years old should receive two servings of meats, beans or legumes daily.

1 Serving=

- 1 ounce (28 grams) of meat, poultry or fish
- 1 egg
- ½ cup (113 grams) cooked beans or lentils
- ½ ounce (14 grams) of nuts or seeds
- 2 Tablespoons (30 grams) of nut butter
- ¼ cup (57 grams) of soya

- Soaking beans overnight before cooking
- Serving legumes, nuts or nut butters with whole grains, or legumes with nuts or seeds
- Serving beans and legumes with foods high in vitamin C

MACRONUTRIENTS

MACRONUTRIENTS are substances in food that the body needs in large amounts for energy and to function properly. These include:

- Carbohydrates
- Proteins
- Fats

The energy obtained from food comes from carbohydrates, protein and fat. Water, minerals and vitamins do not provide any energy.

CARBOHYDRATES are made up of individual sugar units. They help fuel the body for daily activities and supply energy for the body's functions. Carbohydrates are the preferred fuel of the brain, nervous system and red blood cells.

Carbohydrates are found in the following foods:

- Fruits and vegetables
- Grains, pasta, bread, rice and potatoes
- Beans and lentils
- Milk and dairy products
- Foods containing added sugar

PRACTICAL NUTRITION

About 45-65 percent of calories in a daily diet should come from carbohydrates

Carbohydrates are grouped based on their number of sugar units and how they are connected. The two main categories of carbohydrates are divided as simple and complex.

SIMPLE CARBOHYDRATES include sugars that occur naturally in foods such as fruits, vegetables and milk. Simple carbohydrates also include foods with added sugars, such as candy, cakes and soft drinks.

COMPLEX CARBOHYDRATES AND DIETARY FIBER

- STARCHES are found in foods such as potatoes, corn, corn meal, beans, peas, white rice and white bread
- DIETARY FIBER is found in foods such as fruits, vegetables, beans and lentils, nuts and seeds, brown rice, whole wheat bread and bran flakes. Dietary fibers have several health benefits for children, such as providing a feeling of fullness and preventing constipation.

If the body consumes too few carbohydrates, the body may use fat stores for energy and quickly proceed to burning protein, such as muscle, for energy.

PROTEIN is needed in every cell, tissue and organ in the body. It is essential for growth, fighting infection and transporting nutrients throughout the body. Protein is made of building blocks called amino acids.

ESSENTIAL AMINO ACIDS are amino acids that the body does not make. Without these essential nutrients, the body cannot make the proteins it needs to work, and so, the body must obtain these amino acids from foods.

COMPLETE PROTEINS are foods that contain all the essential amino acids. Protein from animal sources are considered to be higher quality protein than protein from plant sources because:

- It tends to be more easily digested
- It supplies all the essential amino acids the body needs

Complete proteins include foods such as:

- Meat
- Poultry
- Milk
- Soya
- Fish
- Eggs
- Yogurt
- Moringa

INCOMPLETE proteins are foods that are missing one or more essential amino acids, such as plant foods. Exceptions are soy, hemp and quinoa because they provide all the essential amino acids.

Incomplete proteins include foods such as:

- Dry beans
- Corn
- Nuts
- Peas
- Rice
- Grains
- Seeds
- Lentils

COMPLEMENTARY PROTEINS are two or more incomplete proteins that are consumed together to create a complete protein. For example:

- Rice and beans
- Whole grain pasta with peas
- Whole grain bread with nut butter
- Whole grain cereal with nuts and seeds

When a child does not consume enough protein from food, body proteins are broken down and cannot support the body's functions. This can lead to:

- Delayed growth
- Muscle wasting and weakness
- Increased rate of infection and decreased immunity
- Changes to skin and hair texture

PRACTICAL NUTRITION

About 15 percent of calories in a daily diet should come from protein sources.

PRACTICAL NUTRITION

When serving a primarily vegetarian diet, offering complementary proteins is the most cost-effective and readily available way to make sure children are receiving all the essential amino acids.

Protein deficiency symptoms are also observed when energy is deficient. When the body doesn't have enough carbohydrates and fat to meet its energy needs, protein is sacrificed to supply energy.

FAT is an essential part of a diet because it provides energy to the body, is important to brain development and aids in the absorption of certain vitamins. Fat comes from both animal and plant sources. It is made of building blocks called fatty acids.

There are two ESSENTIAL FATTY ACIDS that must be present in a child's diet. These fatty acids are critical for vision, brain development and the immune system. They also make another important fatty acid called DHA, which is necessary for brain development in infants and children.

Essential fatty acids are found in foods such as nuts, seeds, grains and oils (corn, safflower, sunflower, soy bean).

DHA is found primarily in fatty fish.

Other sources of fat include:

- Avocado
- Peanut oil
- Ghee
- Olive oil
- Sesame oil
- Full-fat dairy products

Because fat helps the body use certain vitamins, consuming too little fat may lead to vitamin deficiencies, such as vitamin A and vitamin D.

PRACTICAL NUTRITION

The general recommendation is that 20-35 percent of daily calories come from fats. However, because fat is so important to brain development, young children may consume closer to 30-40 percent of daily calories from fats.

MICRONUTRIENTS

MICRONUTRIENTS are substances in food that the body needs in small amounts for growth, maintenance and function of the body's cells, tissues and organs. Micronutrients fall into one of two categories:

- Vitamins
- Minerals

VITAMINS are substances in food found in either plants or animals. Essential vitamins include:

- Vitamin A
- Vitamin C
- Vitamin K
- B Vitamins, such as B_{12} and folate
- Vitamin D
- Vitamin E

Vitamins are either FAT-SOLUBLE or WATER-SOLUBLE.

FAT-SOLUBLE VITAMINS are stored in fat tissue or the liver for long periods of time. That is why it takes longer to develop a deficiency of a fat-soluble vitamin. Because these vitamins are fat-soluble, it's important to consume enough fat in the diet to help the body absorb them. Fat-soluble vitamins include:

- Vitamin A
- Vitamin D
- Vitamin E
- Vitamin K

- Of all fat-soluble vitamins, the following are highlighted because they:
  - Play very important roles in early childhood growth and development
  - Are the most common deficiencies among children without permanent families

PRACTICAL NUTRITION

Offer children foods high in vitamin A at least three times per week.

VITAMIN A is a fat-soluble group of compounds that plays a significant role in

- Vision
- Bone and teeth growth
- Immunity
- Skin health

Vitamin A, in its active form, is found only in animal foods such as:

- Eggs
- Milk and butter
- Liver
- Fish (herring, tuna, sardines)

However, some fruits and vegetables contain a large amount of beta-carotene, which is a compound that, when consumed, is converted into vitamin A. Examples include:

- Dark, leafy vegetables
  - Broccoli
  - Spinach
- Yellow and deep orange fruits and vegetables
  - Oranges
  - Mango
  - Sweet Potatoes
  - Carrots

A child who is deficient in vitamin A may experience the following:

- Weakened resistance to infection
- Impaired growth
- Vision problems, including night blindness
- Eye inflammation or dry eyes
- Dry skin and hair

A deficiency in vitamin A can be caused by:

- Inadequate dietary intake
- Infection
- Impaired nutrient absorption

PRACTICAL NUTRITION

Essential vitamins must be obtained from the diet because the body does not make them or does not make them in sufficient quantities to satisfy its needs.

VITAMIN D is a fat-soluble vitamin that is essential to the absorption of calcium for proper bone development and function.

The body produces vitamin D when the skin is exposed to sunlight. Some of the body's vitamin D needs are met this way. The remainder must be obtained from dietary sources such as:

- Fatty fish and their oils, like cod and cod liver oil, salmon and sardines
- Shrimp
- Beef liver
- Egg yolks
- Fortified milk and butter
- Fortified cereals

PRACTICAL NUTRITION

In addition to offering foods high in vitamin D, make sure children are exposed to the sun for at least 15 minutes a few times a week.

A child who is deficient in vitamin D may experience the following:

- Rickets
  - Bone pain
  - Skeletal deformity (bowed legs)
  - Poor linear growth (length/height)
- Dental problems
  - Slow eruption of teeth
  - Malformed or decay-prone teeth

A vitamin D deficiency can be caused by:

- Inadequate dietary intake
- Impaired nutrient absorption
- Prolonged lack of exposure to direct sunlight

WATER-SOLUBLE VITAMINS dissolve in water and are not largely stored in the body because they are easily excreted in urine. That's why these vitamins are rapidly depleted and must be consumed regularly in the diet. Because these vitamins are water-soluble, cooking and washing with water can leach these vitamins out of food.

Water-soluble vitamins include:

- B vitamins
- Vitamin C

Of all water-soluble vitamins, the following are highlighted because they:

- Play very important roles in early childhood growth and development
- Are the most common deficiencies among children without permanent families

FOLATE is a water-soluble B vitamin that is naturally present in some foods and added to others.

Folate is critical for:

- Formation and maintenance of new cells
- Periods of rapid growth and development, such as during pregnancy and infancy
- Red blood cell formation and anemia prevention

Folate naturally occurs in foods, such as:

- Beef liver
- Beans and peas
- Asparagus
- Spinach
- Brussels sprouts
- Fruit and fruit juices

It also is fortified in many foods:

- Fortified flour
- Fortified cereals
- Fortified breads
- Enriched rice and pasta

A child who is deficient in folate may experience the following:

- Anemia
- Abnormal digestive function

A deficiency in folate can be caused by:

- Inadequate intake
- Poor absorption due to certain medications or illness

Additionally, if a child's mother was deficient in folate during pregnancy, the child may exhibit neural tube defects such as spina bifida (malformation of the spinal cord).

VITAMIN B12 is a water-soluble vitamin that naturally occurs in animal foods only. Vitamin B12 plays a key role in

- Red blood cell formation
- Health of nerve cells

PRACTICAL NUTRITION

The anemia caused by folate and vitamin B_{12} deficiency is different than that caused by iron deficiency.

Foods that contain vitamin B12 include:

- Fortified cereals
- Meat
- Eggs
- Fish
- Poultry
- Milk and milk products

A child deficient in vitamin B12 may experience the following:

- Anemia
- Neurological changes and nerve damage
- Cognitive issues and delays
- Fatigue and weakness
- Failure to thrive
- Abnormal movements

This deficiency can be caused by:

- Lack of animal products in the diet (e.g. vegetarian or vegan diet)
- Poor nutrient absorption
- Folate deficiency

MINERALS are substances found in soil and water and absorbed by plants. We absorb minerals from eating plants and consuming foods from plant-fed animals. There are many essential minerals that must be obtained from the diet.

Minerals fall into one of two categories: MAJOR MINERALS or TRACE MINERALS.

MAJOR MINERALS are minerals needed by the body in large amounts. Some examples include:

- Calcium
- Potassium
- Sodium
- Magnesium

PRACTICAL NUTRITION

Most of the vitamin C in food is lost during cooking. Make sure fresh fruits and vegetables are offered alongside foods high in non-heme iron to improve absorption.

TRACE MINERALS are minerals needed by the body in very small amounts. Some examples include:

- Iron
- Zinc
- Iodine
- Selenium

Of all minerals, these particular minerals are highlighted because they:

- Play very important roles in early childhood growth and development
- Are the most common deficiencies among children without permanent families

IRON is a mineral that plays important roles in:

- Blood
  - Key component of red blood cells, called hemoglobin, which carry oxygen in the blood to all parts of the body
- Early brain development
  - Essential for healthy brain and nerve tissue development
- Immune function
- Muscle function

PRACTICAL NUTRITION

Offer children a food high in iron at least once daily.

Iron is found in two forms in food: HEME and NON-HEME.

HEME iron is found in animal sources and more easily absorbed by the body. Examples of foods containing heme iron include:

- Meat (beef, lamb, mutton)
- Poultry (chicken, turkey)
- Fish and shellfish

NON-heme iron is found mainly in plant sources and is more difficult for the body to absorb. Examples of foods containing non-heme iron include:

- Iron-fortified cereal
- Spinach and moringa
- Soybeans and tofu
- Legumes (beans, lentils)

The amount of non-heme iron the body absorbs from plant sources depends on what is consumed in the same meal.

The amount of non-heme iron the body absorbs from plant sources depends on what is consumed in the same meal. Some foods can either increase or decrease the absorption of non-heme iron.

+ FOODS THAT INCREASE ABSORPTION OF NON-HEME IRON	− FOODS THAT DECREASE ABSORPTION OF NON-HEME IRON
○ Vitamin C-containing foods, such as citrus fruits, tomatoes and broccoli ○ Meat, poultry or fish.	○ Tea ○ Legumes such as beans and lentils ○ Whole grain cereals ○ Milk

A child who is iron deficient may experience iron deficiency anemia. Symptoms of iron deficiency anemia include:

- Pale appearance
- Irritability
- Decreased resistance to infection
- Inability to pay attention
- Impaired behavior
- Fatigue and weakness
- Headache
- Lack of appetite
- Learning disorder

Iron deficiency may be caused by:

- Low iron stores at birth
- Low dietary intake of iron
- High intake of foods that impair iron absorption
- Blood loss due to parasitic infections and inflammation
- Lead exposure

IODINE is a mineral that is essential to proper functioning of the thyroid gland. The thyroid is a small gland in the neck that produces hormones that regulate growth, development and how the body uses energy and makes proteins.

Iodine is found in:

- Iodized table salt
- Saltwater fish and shellfish
- Dairy products

A child who is iodine deficient may experience the following:

- Hypothyroidism (slow activity of the thyroid)
- Goiter (enlargement of the thyroid)
- Cognitive and physical delays, especially in infants

Iodine deficiency can be caused by:

- Low intake by birth mother during pregnancy
- Inadequate dietary intake

ZINC is a mineral that plays an important role in many of the body's functions, such as:

- Growth and development
- Maturation of the reproductive system
- Wound healing
- Brain function
- Immunity
- Ability to taste, see and smell

Zinc is highest in protein-rich foods, such as:

- Meat and seafood
- Yogurt
- Nuts and seeds
- Spinach
- Eggs
- Lentils
- Whole wheat and oats

A child who is zinc deficient may experience the following:

- Poor appetite
- Slow wound healing
- Sexual immaturity
- Skin rashes
- Slow growth
- Weak immunity
- Diarrhea

Zinc deficiency can be caused by:

- Low intake of animal protein
- High intake of fiber and phytates

PRACTICAL NUTRITION

Animal foods are the best sources of zinc.

KEY DEFINITIONS

Phytates are compounds present in plant foods that strongly bind minerals such as iron and zinc and prevent their absorption in the body. Foods high in phytates include:

- Whole grains
- Legumes
- Nuts
- Potatoes

CHAPTER 2

MALNUTRITION BASICS

INTRODUCTION TO MALNUTRITION

UNDERNUTRITION

OVERNUTRITION

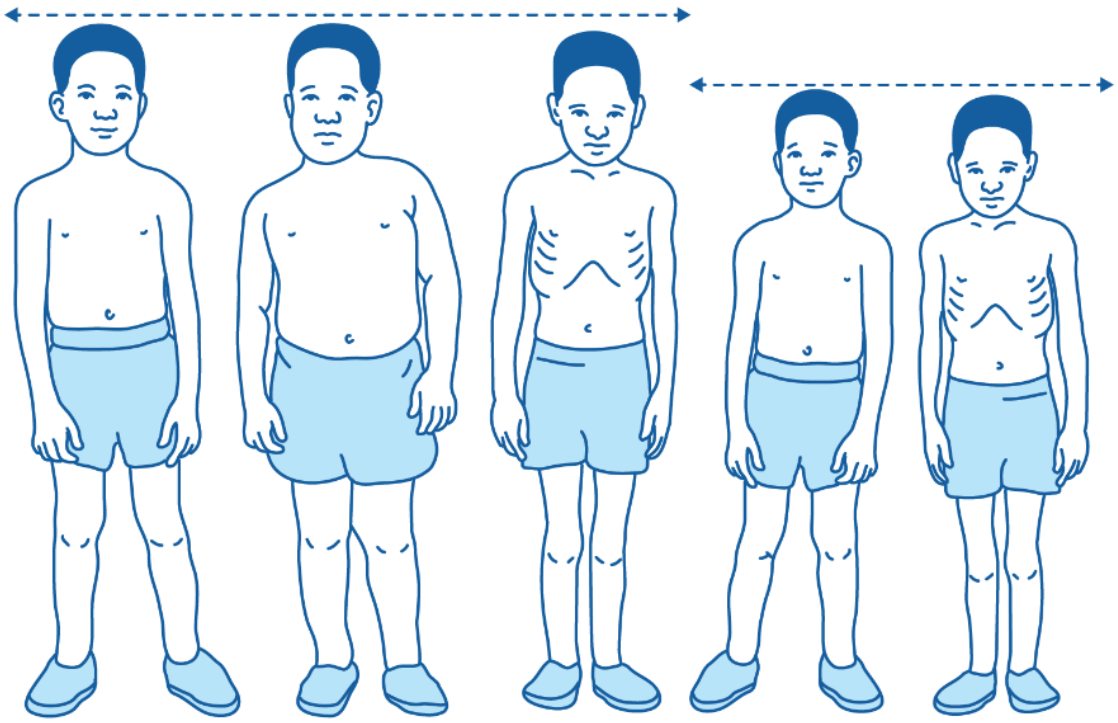
INTRODUCTION TO MALNUTRITION

MALNUTRITION is also known as poor nutrition and happens when intake of a person's basic needs of essential MACRONUTRIENTS, such as fats, carbohydrates and proteins or MICRONUTRIENTS, such as iron, folate, vitamin A, etc., is not enough (or in some cases too much) to cover their basic needs for growth, development and maintenance. A person who is malnourished is not getting the right amount of nutrients their body needs.

There are two main types of malnutrition:

- Undernutrition
- Overnutrition

Children with UNDERNUTRITION or OVERNUTRITION often have micronutrient deficiencies or parasites or illnesses which can further worsen their malnutrition, for example an overweight, stunted child who has anemia. Malnutrition during the first 1,000 days for children (conception to age 2) can result in severe and long lasting (and in some cases permanent) impacts to their health and development, although malnutrition can occur throughout a child's life.



Normal Overweight Wasted Stunted Wasted and Stunted

UNDERNUTRITION

UNDERNUTRITION is a type of malnutrition which occurs that the body is not getting enough essential nutrients from the diet to meet all of its needs. If inadequate intake of essential macronutrients or micronutrients occurs, there can be many consequences, especially if the child is young, was low birth weight or the malnutrition is severe.

Undernutrition can occur both over time and suddenly and can result in short-term and long-term impacts to growth and development, such as stunting or wasting.

Consequences of undernutrition:

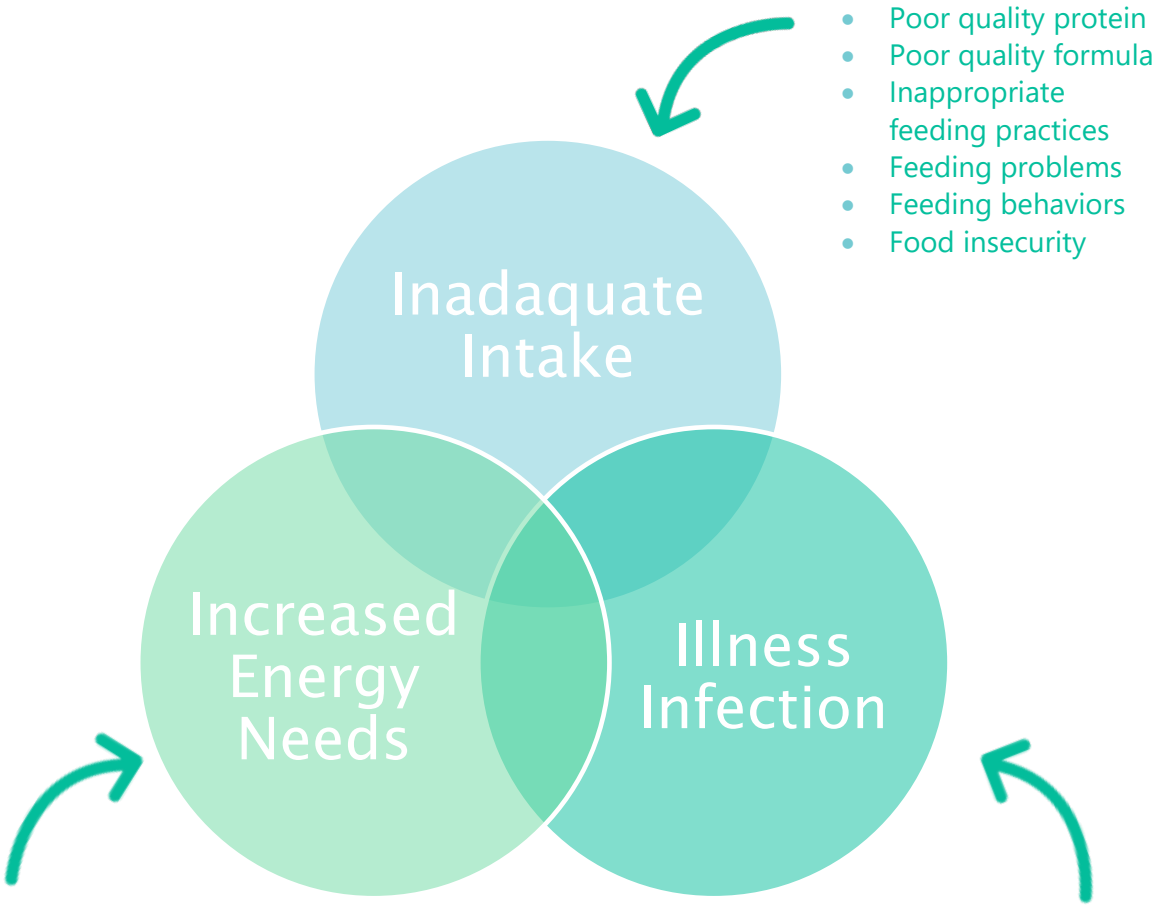
- Stunting: short stature for age and/or slow linear growth
- Wasting : low weight for length/height or mid upper arm circumference below -2 z-scores
- Death
- Weak immune system
- Increased risk of infections
- Poor brain development
- Irritability
- Slow growth
- Increased risk of non-communicable diseases such as diabetes
- Poor cognitive, social and emotional development
- Weakness
- Increased risk of obesity
- Increased risk for pregnant girls of having malnourished babies or babies with birth defects
- Poor performance in school
- Faster progression of diseases or infections such as HIV to AIDS

Undernutrition has both short-term and long-term causes, these include:

- Increased energy needs caused by:
  - rapid growth spurts
  - fever
  - infections or certain diseases
  - surgery
- Inadequate intake due to:
  - consuming meals with incomplete proteins
  - inadequate breastmilk or formula
  - feeding problems and behaviors
  - improper or unsafe feeding practices
  - unhealthy living conditions
  - insecure food situations
- Illness or infection that can coincide with:
  - poor appetite
  - diarrhea
  - vomiting

PRACTICAL NUTRITION

Screening for malnutrition involves measuring a child's growth and tracking growth patterns on charts by a trained staff member or medical professional.



If a child experiences undernutrition, they may exhibit the following:

- Weight loss
- Irritability
- Decreased activity
- Brittle hair and dry skin
- Muscle wasting: loss of muscle mass
- Severe thinness
- Stunting: short stature for age and/or slow linear growth
- Edema: Swelling due to excess fluid in the tissues outside the cells

Undernutrition can be reversed, particularly if identified and addressed early in a child's life. If left unaddressed, it can ultimately affect:

- Growth potential
- Brain development
- Immunity
- Mortality

MICRONUTRIENT DEFICIENCIES are a type of malnutrition that occurs when there is inadequate intake of essential vitamins and minerals to meet a body's needs to repair tissues, support immune function and healthy growth. Different types of micronutrient deficiencies, previously discussed in Chapter 1-Nutrition Basics include:

- Vitamin A deficiency
- Folate deficiency
- Iodine deficiency
- Iron deficiency

PARASITES AND WORMS can greatly impact nutrition status. Parasites and worms include tapeworms, roundworms, schistosomes, hookworms and others that can be spread in water, food, soil, human-to-human contact, urine and feces. School age children are most at risk of infections due to biological and environmental factors. Worms and parasites can live for many years which can cause an infection to become a chronic issue and result in malnutrition. Multiple worms and parasites can be present in the same individual and have an adverse effect on the immune system.

How worms and parasites impact health:

- Blocks absorption of nutrients in the intestines, bowel and gut
- Consume blood or cause internal bleeding resulting in anemia
- Cause lymphatic issues
- Eye damage and blindness
- Cause malnutrition
- Impact growth, strength and ability to do well in school

Ways to prevent worms and parasite infections:

- Always wash hands before preparing or eating food
- Wear shoes
- Avoid swimming in fresh water which contains snails
- Use toilets for both urination and defecation
- Thoroughly cook food, especially meat
- Wash produce in clean, purified water
- Sleep under an insecticide treated bed net and use other ways to prevent mosquitos such as covering all standing water sources and wearing protective clothing
- Use screens, trim shrubbery, cover food and wear protective clothing to prevent against blackflies spread illness

Depending on country rates of infection, WHO recommends all children are given treatment one to two times per year. Children with infections or anemia caused by worms or parasites should be treated and given a diet high in iron, micronutrients and protein.

TREATMENT

Most common treatments for parasitic infections and worms include;

- Albendazole: 400mg single dose, one to two times a year
- Mebendazole: single dose of 500mg or 100mg two times a day for three days
- Praziquantel: Single dose of 40-60mg per kg body weight to ages 4 and older (can be given at same time as albendazole)
- Ivermectin: 150mcg per kg body weight annually

OVERNUTRITION

OVERNUTRITION is a type of malnutrition that is caused by excess consumption of energy, resulting in overweight and obesity and frequently develops slowly over many years. Overnutrition is generally a result of environmental risk factors such as diet and lifestyle, although age and genetics can play a role.

Balanced Weight

Consuming more energy than a person's needs can result in increased risk for non-communicable diseases including:

- Cardiovascular disease
- Type 2 diabetes
- Hypertension
- Some types of cancers

Overnutrition if left unaddressed can have serious consequences:

- Disability
- Death
- Reduced ability to work
- Increased risk of accidents, such as falling
- Psychological problems

PRACTICAL NUTRITION

Even though a person may be consuming adequate amounts of calories, they can still be at risk of micronutrient deficiencies such as iron deficiency.

Overnutrition can frequently occur when traditional diets and lifestyles change toward more fast food or "Western diets" and more sedentary work and lower daily activity levels. Often calorically dense foods are cheaper but lack essential nutrients that children need for adequate growth.

Traditional Meals vs. Fast Food:

Fresh Foods

- Meat in sauce
- Vegetables
- Legumes
- Rice
- Banana
- Glass of water

VS

Processed foods

- Burger or breaded chicken strips
- Fries
- Ice Cream
- Soda

Ways to prevent overnutrition:

- Encourage a diverse healthy diet high in vegetables, fruits, whole grains, legumes, fish and unsaturated vegetable oils
- Consume small amounts of processed foods, animal fats, processed meats, salt, fast food, sweetened beverages and foods with added sugar
- Daily physical activity
- Discuss risks about obesity and non-communicable diseases such as hypertension or diabetes during pregnancy
- Limit excess alcohol, tobacco and convenience foods or fast food

CHAPTER 3

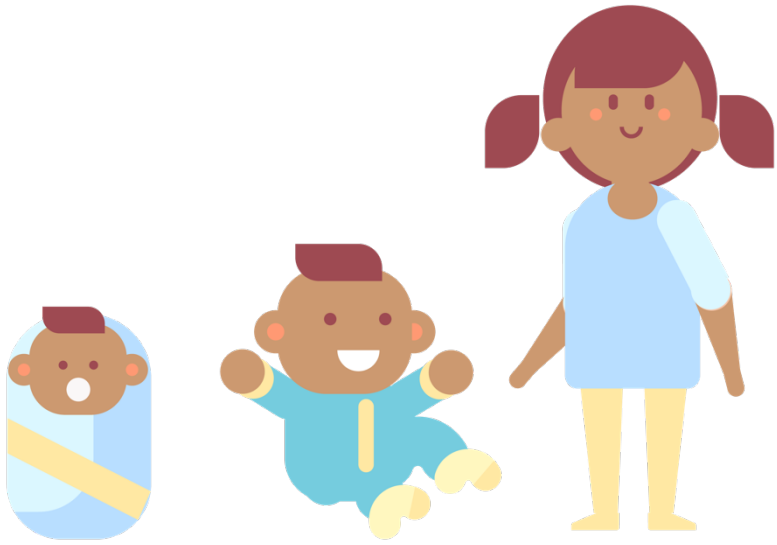
NUTRITION BY AGE

NUTRITION FOR INFANTS BIRTH TO 6 MONTHS

NUTRITION FOR INFANTS 6 TO 12 MONTHS

TRACKING INFANT FEEDS

NUTRITION FOR CHILDREN 12 MONTHS AND OLDER



NUTRITION FOR INFANTS FROM BIRTH TO 6 MONTHS OLD

Infants from birth to 6 months old are fully dependent on mothers and caregivers to provide adequate nutrition to meet their growth and development needs.

Age (months)	Breastmilk or Infant Formula	Complementary Foods
0-6	100 percent daily needs	
6-12	60 percent daily needs	40 percent daily needs (~200-300 calories)
12-24	40 percent daily needs	60 percent daily needs (~550 calories)

Infants may gradually progress from a liquid diet of breastmilk (or iron-fortified formula if breastmilk is unavailable) to solid foods based on their developmental milestones.

An infant's diet should consist solely of breastmilk or iron-fortified infant formula from birth to 6 months of age. Certain foods should not be given to infants, these foods include:

- Cow or animal milk
- Fruit juice
- Solid foods
- Sugar or juice mixed with formula in the bottle

Introducing complementary foods too early may lead to the following problems:

- Not drinking enough formula/breastmilk
- A digestive system that's not ready to digest solid foods
- Increased risk of anemia (low iron)
- Increased risk of eczema (skin disorder)
- Increased risk of developing food allergies
- Disrupted sleep

Some families may want to provide rice cereal as a complementary food to breastmilk or formula between 4-6 months of age. Do not introduce rice cereal unless an infant is able to sit up with minimal support and shows interest.

The following are recommendations by age of daily feedings and formula amounts for infants with normal birth weight. Infants who are breastfed will have more feedings than formula fed infants because breast milk digests quicker.

Age (months)	Daily Feedings Breastmilk	Daily Feedings Formula	Formula per Feeding (ml)	Total Daily Formula (ml)
0-1	10-12	6-10	60-120	550-700
1-2	8-12	6-10	60-120	650-850
2-3	7-10	6-10	60-120	700-950
4-6	6-9	6-7	150-180	750-1350

NUTRITION FOR INFANTS 6 TO 12 MONTHS OLD

Infants 6-12 months old have specific nutritional needs based in part on the fact that they are more active.

Starting at 6 months old, infants require more nutrients than what can be provided by breastmilk or formula alone and can begin receiving foods other than breastmilk or formula COMPLEMENTARY FOODS refer to nutrient-rich solid foods that can be offered a few times a day as a supplement to breastfeeding or formula.

The following are recommendations by age of daily feedings of complementary foods and formula amounts for typically developing infants:

Age (months)	Daily Feedings Breastmilk or Formula	Formula per Feeding (ml)	Complementary Food Feeds Per Day
6-8	4-5	700-950	2-3
9-12	3-5	500-950	3-4

It is recommended that iron-fortified rice cereal be the first complementary food to be introduced to an infant. Other appropriate “first foods” include soft, easy-to-digest foods, such as:

- Unsweetened full-fat yogurt
- Cooked, pureed fruits
- Cooked cereal grains
- Cooked, pureed vegetables

COMPLEMENTARY FOODS can be made from some of the foods families eat, just mashed, pureed or thinned with liquid. This is an exciting time for a child to learn about textures, flavors and foods. Meals can be a great time to engage and interact with children and can start a lifetime of healthy habits

Tips for introducing foods:

- Play and sing with the child during the mealtime
- Role model by eating with the child
- Put the child's food in their own bowl or plate to know how much they are eating
- Allow child to practice feeding themselves with hands and utensils
- Provide appropriate textures
- Offer a variety of colors and types of foods
- Allow children to play with food for sensory experience
- Continue to offer foods, even if the child did not initially like it

MAKE SURE TO NOTE

Introduce one new complementary food at a time. Wait at least five days until you try another new food to give the child time to adjust. That way if the child has a reaction, you will know which food caused the reaction.

Infants between 6 and 12 months old may receive 60 to 120 milliliters of clean, fresh water twice daily in addition to breastmilk or formula. However, infants 6 to 12 months old should not receive:

- Cow or animal milk
- Fruit juice in a bottle
- Nuts or nut butters
- Sugary drinks, such as soda
- Rice cereal added to formula in the bottle
- Sweeteners, such as honey

TRACKING INFANT FEEDS

FREQUENCY OF BREASTFEEDING

It is important to document the number of times and length of time a child breastfeeds. Although harder to measure than from a bottle, tracking the number of feedings and length will help to ensure that a child is getting enough:

- Record the starting time
- Write down if one breast is finished and/or if another one is started
- Record ending time and subtract the start time to determine length of feeding

ACTUAL AMOUNT OF FORMULA CONSUMED

It is important to document the actual amount of formula consumed, not just the amount prepared, for each feeding. To track the actual amount of formula consumed in each feeding:

- Record the starting amount (e.g. 120ml)
- Record the amount left unfinished (e.g. 30ml)
- Subtract the final amount from the starting amount (e.g. 120ml – 30ml)
- The difference is equal to the actual amount consumed during the feeding (e.g. 90ml)

SPIT UPS

Spitting up is common in breastfed and formula-fed, healthy infants and is normal during the infants early months until around the time they can eat solid foods (6 months to 12 months old). Spitting up may occur if they:

- Burp
- Swallow too much air while feeding
- Have lactose intolerance or milk allergy
- Eat too much
- Have a formula intolerance

As long as an infant is feeding well and gaining weight, there is little cause for concern. However, frequent or abnormal spit ups may be a sign of an underlying problem. Therefore, when a child spits up, it is important to track:

- The amount (more than 1-2 tablespoons is considered abnormal)
- The color (green or brown color is considered abnormal)
- Discomfort before or after spitting up (coughing, choking, crying or fussing before or after spitting up is considered abnormal)

NUMBER OF WET DIAPERS

Number of wet diapers indicates whether or not a child is sufficiently hydrated. Infants should have between six and seven wet diapers daily. If there is concern about hydration status, track the number of wet diapers per day.

NUTRITION FOR CHILDREN 12 MONTHS AND OLDER

Although young children 12 months and older are greatly self-sufficient during mealtimes and able to receive the same foods as adults, they are still learning how to eat a balanced diet. The ultimate goal of feeding young children is to provide enough calories for growth and encourage eating without conflict.

WEANING is the discontinuation of bottle-feeding by replacing breastfeeding or infant formula with food. Weaning is a gradual process that is complete when the child is consuming the calories they need from foods and beverages instead of breastmilk or formula. Typically developing children are ready to be weaned from breastfeeding or bottles when they:

- Can sit up by themselves
- Can eat from a spoon
- Start showing interest in solid foods

Between 12 and 18 months old children can be completely weaned off bottles of formula or breastmilk. However, breastfeeding is encouraged until a child is 2 years old.

If children use bottles for too long, they:

- Can suffer from tooth decay
- May have improper tooth development
- Can have delayed development or miss key milestones surrounding eating, drinking and speaking

If weaned from a bottle too early, a child who is incapable of drinking from a cup may:

- Not consume enough calories
- Fail to gain weight

To wean a child from breastfeeding or bottle feeding:

- Let a child practice holding an empty cup as early as 6 months old
- At 8-10 months old, begin replacing a bottle with a cup or lidded cup with a spout (if available) during one feeding daily
- Each week, gradually increase the number of feedings using a cup
- Assist a child in holding and tipping an open cup to deliver liquid into the mouth

WEANING TIPS

- Be consistent with the child's feeding schedule. Once a cup is introduced at a mealtime, use a cup at that same mealtime every day and do not go back to using a bottle at that mealtime.
- Be attentive to the child during feeding time.
- Be a role model and let the child watch you drink from an open cup. Young children mimic adults.

Once weaning is complete, the average young child should have three meals per day with additional snacks offered 2-3 times per day.

SERVING SIZES for young children are much smaller than adult serving sizes — about one-fourth of what an adult eats. A rule of thumb for serving sizes for young children is 15 grams or milliliters (1 tablespoon) of food per year of age. For example, a portion size for a 2-year-old would be about 30 grams (2 tablespoons). Adults often overestimate how much food a young child needs to eat, so start with a smaller portion size and provide more if a child asks for it.

MAKE SURE TO NOTE

In general, a healthy, balanced diet for children 1 to 5 years old includes a variety of foods and food textures. Children this age should receive the following:

- Cereals, pasta, rice, potatoes, bread: 2-3 servings per day
  (1 serving = 1 piece of bread; 113 grams of cooked rice or cereal)
- Fruits and vegetables: 5 servings per day or approximately 230-470 grams (1-2 cups)
- Cow or animal milk (full fat), dairy or calcium-rich foods: 2 servings or approximately 470 milliliters (2 cups) per day
- Meats, beans and legumes: 2-4 servings per day
  (1 serving = 1 egg, 113 grams of cooked lentils or beans, 57 grams soya, 28 grams mutton, chicken or fish)

HYDRATION IS an important part of children's growth and development. Review Chapter 1: Nutrition Basics for the benefits of water.

Age (years)	Daily recommended amount of water from beverages
1-5	4-5 cups / 1.3 – 1.5 liters
4-8	5-6 cups / 1.7 - 1.8 liters
9-13	7–8 cups / 2.1- 2.4 liters
14-18	8–11 cups / 2.3- 3.3 liters

CHAPTER 4

HYGIENE AND SANITATION

- IMPORTANCE OF HYGIENE AND SANITATION
- DIARRHEA TRANSMISSION AND PREVENTION
- FOOD CONTAMINATION AND FOOD BOURNE ILLNESS
- CLEAN EQUIPMENT AND SURFACES
- HAND WASHING
- IMPROVED SANITATION FACILITIES

THE IMPORTANCE OF HYGIENE AND SANITATION

HYGIENE is considered a group of practices that people can use for good health. SANITATION are a group of methods used to manage environmental factors such as preventing human contact with waste products and other forms of microorganisms that cause infections or disease.

Poor HYGIENE and SANITATION can have a huge impact on the nutritional status of children. Proper handwashing with soap could prevent about one out of every three instances of young children getting sick with diarrhea, and almost one out of five instances of young children getting respiratory infections such as pneumonia. One of the most simple and cost effective ways to prevent illness and improve the health is to practice good hygiene and sanitation.

KEY AREAS OF HYGIENE AND SANITATION

- Access to clean, safe drinking water
- Safe food and food preparation
- Handwashing with soap
- Access to sanitary toilets

DIARRHEA TRANSMISSION AND PREVENTION

DIARRHEA refers to the passage of THREE OR MORE loose or liquid stools per day (or more frequent passage than what is normal for the individual). It is commonly a symptom of an intestinal infection caused by a bacteria, virus or parasite.

A PATHOGEN, or a GERM, refers to any disease-causing organism that cannot be seen without the help of a microscope, such as a bacteria, virus or parasite.

Diarrhea is spread through:

- Contaminated food
- Contaminated water
- Person-to-person contact

Improving sanitation and food preparation practices can reduce the risk of diarrhea and diarrhea-related malnutrition. Three key strategies to preventing diarrhea include:

- Safe drinking water
- Safe food preparation and handling
- Personal hygiene

SAFE FOOD PRACTICES:

Boiling water does not remove toxic substances from water. If water is a known source of toxic substances, it should not be used.

SAFE DRINKING WATER

Water can be unsafe to drink due to:

- Water-borne pathogens such as bacteria, viruses, parasites.
- Toxic substances such as chemical pollutants.

Compared to toxic substances, diarrhea-causing pathogens in water is a more common threat to the health.

Water can be purified from pathogens by:

- Chemical agents such as chlorine
- Filtration systems
- Boiling

STERILIZING WATER BY BOILING

- Bring cold tap water to a rolling boil
- Boil for one minute (three minutes at higher altitudes)
- Cool the water to room temperature
- Store water in sterile containers with tight-fitting lids

Water filter purification systems are effective for removing most water-borne pathogens and chemical pollutants. However, these systems can be expensive to buy and maintain.

If purified water is not available, water should be boiled to make it safe to use for drinking, food preparation and hand washing. Boiling is the most reliable and cost-effective way to make water safe to drink because it kills disease-causing pathogens.

To keep drinking water safe from contamination:

- Make sure the storage container has been thoroughly washed and sanitized.
- Keep the container's lid secured.
- Do not touch the drinking water in the container with unwashed hands. Keep in mind that when using a cup or bottle to scoop water from a larger container, hands are likely to touch the water.
- Do not use a communal drinking cup to scoop water from the container.
  - Use a clean ladle to distribute water into drinking cups.
  - Use a container with a spout or spigot to deliver drinking water.

FOOD CONTAMINATION AND FOOD BOURNE ILLNESSES

People can often contaminate food without realizing it. To keep food safe, pay attention to what you touch with your hands and wash them often.

Remember to avoid doing the following while preparing food:

- Scratching your scalp and touching hair
- Wiping or touching your nose
- Rubbing or touching your ears
- Touching an infected wound or pimple
- Coughing or sneezing uncovered or into the hands
- Wearing dirty clothes
- Spitting

WHEN IT IS UNSAFE TO WORK IN THE KITCHEN

When preparing and serving food, it is important to be careful not to spread illness through food preparation, serving or storage. If a caregiver experiences the following illnesses, they should avoid preparing food if possible. If not possible, they should use increased sanitation steps and wash their hands more often to reduce contamination.

- Sore throat
- Vomiting
- Diarrhea
- Jaundice
- Hepatitis A
- Influenza or flu-like symptoms
- Food poisoning

SAFE FOOD PRACTICES

Caregivers should avoid preparing food when sick until they are free of symptoms for at least 24 hours. All caregivers should wash and sanitize hands frequently, especially when preparing food.

SAFE FOOD PREPARATION AND HANDLING

When preparing food, it is critical that foods are handled in a way that limits the risk of foodborne illness. This includes washing, preparation and storage. Diarrhea-causing bacteria and other pathogens can live on the surface of many foods, and so they must be handled, stored, and prepared safely.

In order to keep food safe, it is important that it be stored properly. The three ways food is most commonly stored are:

- Dry storage
- Refrigeration
- Freezer Storage

DRY STORAGE

Foods such as some produce, dry goods and canned foods can be stored unrefrigerated without spoiling. However, these foods may spoil if exposed to moisture or extreme heat.

When storing food:

- Protect from extreme heat and moisture
- Protect from pest infestation, such as insects or rodents
- Avoid chemical contamination

Dry storage tips:

- Store food in a cool, dry place no more than 27° C (80° F).
- Transfer bagged foods into airtight plastic, glass or metal storage containers.
- Store food at least 15 centimeters (6 inches) off the ground.
- Check dry stored foods often for pests or spoilage.
- Throw away foods that show signs of pest infestation, mold or spoilage.
- Store food separately from chemicals (separate shelves, closets, etc.).

REFRIGERATION

Bacteria can multiply on perishable foods, such as meat and dairy products, if they are left at room temperature for over two hours. In hot climates, bacteria grow even more rapidly — after just one hour. Refrigerating food in a timely manner can help prevent illness.

Refrigerators should be kept between 0° C and 5° C. The following foods should be kept refrigerated to prevent spoilage:

- Breastmilk and mixed infant formula, if not served immediately (See Chapter 6 Women and Infants: Before, During and After Pregnancy for more information about safe handling and storage of breastmilk and infant formula)
- Meat, poultry and eggs
- Dairy products
- Cut and peeled fruits and vegetables
- Leftover food from previously prepared meals

Even with refrigeration, many foods can still spoil. Check foods regularly for signs of mold or spoilage. Label foods with dates when putting into refrigerator. Discard prepared foods after three days.

SAFE FOOD PRACTICES

Handling fresh produce

- Wash hands before and after handling fresh produce
- Sanitize food preparation surfaces, cutting boards, knives and other utensils before and after preparing fresh produce
- Wash produce in clean water with a scrub brush to dislodge dirt; do not use soap or detergent
- Remove outer layers of leafy vegetables and cut away portions of produce that are bruised or damaged
- Refrigerate fruits and vegetables within two hours of cutting and peeling
- Discard peeled and cut produce that has been at room temperature for over two hours

FREEZER STORAGE

Keeping the freezer organized and routinely cleaned is important for food safety. Freezers should be kept at -18 degrees C (0 degrees F). To avoid cross-contamination follow these tips:

- Store meats on the lowest shelves.
- If possible, leave space between items to help with airflow circulation.
- Make sure to regularly rotate food in and out.
- Label everything with the item name and date it was frozen.

Here is a table of the length of time food is safe to be in the freezer before it needs to be refrigerated.

ORGANIZING FOOD TO PREVENT CROSS-CONTAMINATION

FIRST-IN, FIRST-OUT RULE

Rotate food regularly so that the food that has been in the fridge or storage area the longest is the first to be used.

REFRIGERATED STORAGE

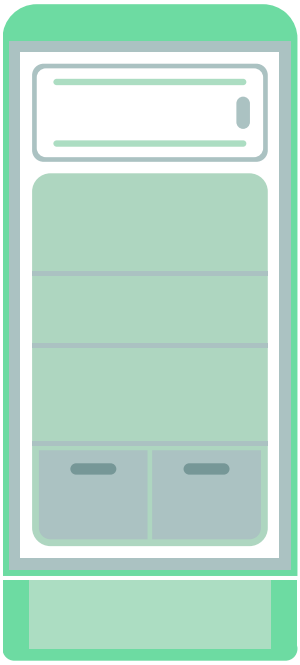
Store foods in a way that prevents cross-contamination. Never put uncovered food in the refrigerator. Always make sure food is wrapped or covered. Prepared food should be labeled with the date of preparation. Raw and ready to eat food should be stored in a way that prevents contamination. Here is a guide on how to organize the refrigerator.

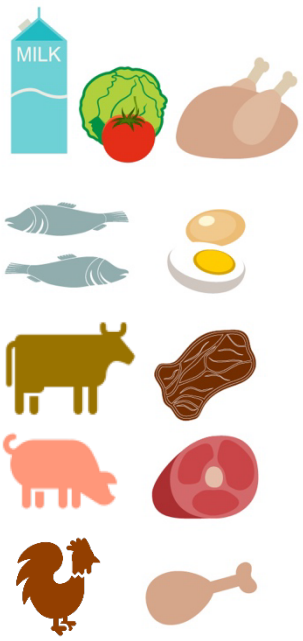
SAFE STORAGE

(1) Cooked and ready-to eat-foods
(2) Seafood, eggs
(3) Beef
(4) Pork, ground meats
(5) Poultry

Item	Months
Casseroles	2 to 3
Gravy, meat or poultry	2 to 3
Ham, Hotdogs and Lunchmeats	1 to 2
Meat, uncooked roasts, steaks	4 to 12
Meat, uncooked ground	3 to 4
Meat, cooked	2 to 3
Poultry, uncooked whole	12
Poultry, uncooked parts	9
Poultry, cooked	4
Soups and Stews	2 to 3
Wild game, uncooked	8 to 12

This arrangement will ensure that meat does not contaminate ready-to-eat foods.





Ready-to-Eat and Fully Cooked Foods

Raw Seafood, Fish, Eggs

Raw Steak and Beef

Raw Pork and Meats

Raw Poultry (chicken, duck, turkey)

STORAGE FOR WHEN YOU DON'T HAVE A FREEZER OR REFRIGERATOR

If a freezer or refrigerator is not available for food storage, use the following tips to help limit food waste:

- Buy food daily, especially meat and dairy.
- If possible, leave space between items to help with airflow circulation.
- Make sure to regularly rotate dry food in and out.
- Store food in a cool places out of direct sunlight.
- Prepare smaller meals to avoid having leftovers.
- Condiments such as jelly, jam, peanut butter, pickled foods and ketchup can stay unrefrigerated for a few months.
- Purchase fresh eggs that have not been refrigerated or washed. Fresh eggs have a natural protectant and can last unrefrigerated for a week.
- Some fruits and vegetables can last 1-2 weeks in dry places out of sunlight.
- Place vegetables and fruits such as oranges, squash, potatoes, onions, apples and carrots in dark cool areas for and they may last 1-2 months.
- Canned or dry foods have increased shelf life.
- Quickly discard any spoiled food.

CLEAN EQUIPMENT AND SURFACES

CLEAN FOOD PREPARATION EQUIPMENT, including pots, pans, bottles, dishes and utensils, is important for food safety.

Bottles, bottle components, dishes and utensils should be washed and sterilized between uses to prevent bacteria from growing on the surfaces and reduce the risk of transmitting illness from person to person.

To wash bottles:

- Separate all bottle components (nipples, rings and caps).
- Submerge bottle and components in hot water (with mild dish detergent, if available).
- Wash components with a clean cloth; use a bottle brush to dislodge any formula or milk from the bottle.
- Rinse bottle and components in hot water.
- Sterilize bottle and components.
- Dry thoroughly before putting bottles back together.

SAFE FOOD PRACTICES

Excessive use of chlorine can be toxic. It is not recommended that bottles be sterilized with bleach-water solutions.

To wash pots, pans, dishes and utensils:

- Wash dishes and utensils with a clean cloth; use a scrub brush to dislodge any food particles
- Rinse dishes and utensils in hot water
- Sterilize dishes and utensils
- Dry thoroughly before storing

Because hot water and dish soap are not always available for washing bottles and food preparation equipment, it is critical that all equipment be sterilized either chemically or with boiling water to eliminate bacteria from the surfaces.

To sterilize pots, pans, dishes and utensils using chemicals:

- Combine 8 milliliters of chlorine bleach with 4 liters of water
- Let bleach-water solution sit for 30 minutes before use
- After washing, dip or spray dishes in the bleach-water solution
- Allow dishes and utensils to air dry

BLEACH-WATER SANITIZER SOLUTION

15 milliliters of chlorine bleach to 4 liters of water. Let solution sit for 30 minutes before use. Make solution daily. Date and label bottles.

To sterilize using boiling water:

- Submerge items in a large pot of water
- Heat water until it boils
- Boil items in water for at least five minutes to sterilize
- Carefully remove items from boiling water using tongs or a slotted spoon

Boiling water is the safest and most cost-effective way to sterilize pots, pans, bottles, dishes and utensils.

Maintaining CLEAN FOOD PREPARATION SURFACES, or other surfaces that food touches in a kitchen, is one way to limit the spread of foodborne bacteria.

To clean surfaces:

- Wipe up spills on kitchen surfaces immediately using a paper towel or clean cloth.
- Wash countertops with hot, soapy water after preparing each food item and before moving onto the next.
- Wash tabletops with hot, soapy water before and after each mealtime.
- Sanitize countertops and tabletops with a bleach-water solution daily, or more frequently if children are ill.
- Allow surface to air-dry.
- Toys or other surfaces that children may come into contact with should be frequently sanitized. Wait 3 minutes after spraying for the solution to dry before offering a toy to a child.

SAFE FOOD PRACTICES

All cloths, towels and cleaning supplies should be kept clean and changed daily. Use separate cloths and towels for cleaning and cooking to avoid contamination.

Because raw meat, poultry, seafood and eggs can carry potentially harmful bacteria, it is critical to limit the spread of foodborne bacteria by cross-contamination from these to other foods.

SAFE STORAGE OF CLEANING SUPPLIES AND CHEMICALS

Cleaners and chemicals can contaminate food if not properly kept. Chemical cross-contamination can be very dangerous and even deadly. Ensure cleaners and chemicals are:

- Clearly labeled
- Kept in tightly closed containers to prevent spillage
- Are stored away from food and other items such as cookware and dishes that may touch food
- If stored in the same area as food, ensure that chemicals and cleaners are kept on their own shelf and below any food products, including dry food storage.

Tips for preventing cross-contamination:

- Use separate cutting boards for raw fruits and vegetables and for raw meat, poultry, seafood and eggs.
- Use separate plates and utensils for cooked and raw food.
- Before using again, thoroughly wash cutting boards, plates and utensils that previously had contact with raw meat, poultry, seafood and eggs.
- Wash your hands between tasks.
- Store ready-to-eat foods above raw meats, fish and poultry to avoid cross-contamination in the refrigerator.
- Store meat, poultry, seafood and eggs separately from other foods in a refrigerator.
- Avoid handling ready-to-eat foods with bare hands until meal time (if eating with hands is a common practice).
- Store cleaners and chemicals away from food and dishes.
- Spray surfaces with bleach spray frequently

HAND WASHING

During regular daily activities, hands come in contact with hundreds of surfaces — from opening doors to cooking food, from money exchanges to shaking hands. On each surface live thousands of microscopic organisms, some of which can cause serious illness.

Regular HAND WASHING is:

- Significantly reduces the risk of diarrhea and respiratory infection
- The simplest and most cost-effective way to prevent disease
- Critical to the health of children

STEPS FOR PROPER HAND WASHING

1. WET Wet hands thoroughly with clean water.		**4. RINSE** Rinse hands of the soap lather thoroughly with clean water.	
2. SOAP Use a bar of soap or apply liquid soap to the palm of the hands.		**5. DRY** Dry hands with a clean paper or cloth towel, or let them air dry.	
3. LATHER Using the soap, rub hands together vigorously for 20 seconds so the soap produces a thick lather. Scrub between the fingers and under the fingernails.			

Each step of hand washing plays an important role in reducing harmful pathogens that may be on the hands. In a hurry, hands are often simply rinsed with water. However:

- Washing with water alone is not effective in dissolving organic substances, such as dirt, where pathogens may be found.
- Lathering is critical to dislodging dirt and pathogens from the tiny crevasses in the skin.

SAFE FOOD PRACTICES

Hand sanitizer is not recommended as an alternative to hand washing during food handling.

If soap and clean water aren't available, an alcohol-based hand sanitizer can be used instead. The hand sanitizer should contain at least 60 percent alcohol.

There are two main steps for using hand sanitizer:

(1) APPLY an adequate amount of hand sanitizer to the palm of the hands.
(2) RUB hand sanitizer over all surfaces of the hands, including the backs of the hands, between the fingers and under the nails. Rub until hands are dry.

Hands should be washed:

- Before and during food preparation
- Before and after preparing infant formula
- Before and after feeding a child
- Before and after eating
- Before and after changing a diaper
- After using the bathroom
- After coughing, sneezing or blowing the nose
- After caring for a sick child
- After handling garbage
- After touching cleaners and toxic chemicals
- After touching livestock or pets

PORTABLE HANDWASHING STATIONS

Often, it can be difficult to maintain proper handwashing practices due to lack of immediate access to a handwashing station. One feasible solution is a handwashing station.

Portable handwashing stations are simple and cost effective. Portable handwashing stations should be utilized when:

- The kitchen or bathroom areas do not have a sink available
- The water available is not safe to use for handwashing
- The water is turned off to the available sink

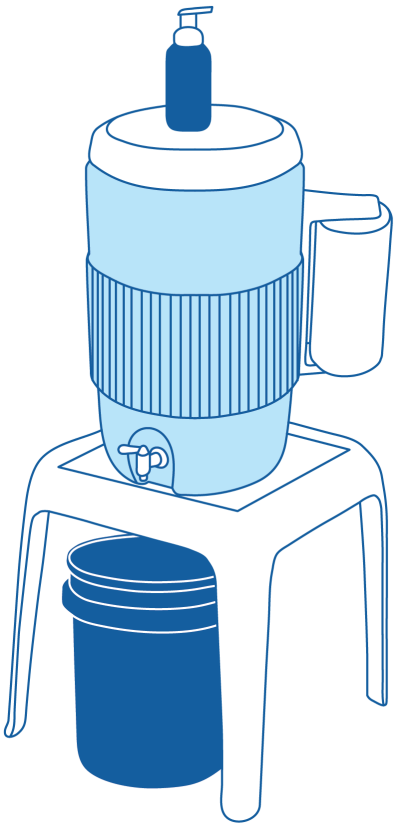
SAFE FOOD PRACTICES

- Water jug should be covered
- Handwashing station equipment should be cleaned regularly
- Keep safe and easily accessible location

There are many ways to make a portable handwashing station and different models may be made depending on functional need. The basic equipment needed:

- A covered container with a spout to hold potable water
- A bucket or container to catch water
- Soap (or ash if soap is not available)
- Paper towels

This is an example of one possible type of handwashing station. Ensure the handwashing station water is clean and changed regularly. The water caught in the bucket below can be used to water a kitchen garden or other plants.



IMPROVED SANITATION FACILITIES

IMPROVED SANITATION

An improved sanitation facility is defined as one that hygienically separates human excreta from human contact.

- Flush toilet
- Connection to a piped sewer system
- Connection to a septic system
- Flush / pour-flush to a pit latrine
- Pit latrine with slab
- Ventilated improved pit latrine (abbreviated as VIP latrine)
- Composting toilet

UNIMPROVED SANITATION

Sanitation facilities that are not considered "improved" or may put people in contact with wastes.

- Public or shared latrine (meaning a toilet that is used by more than one household)
- Flush/pour flush to elsewhere (not into a pit, septic tank or sewer)
- Pit latrine without slab

- Bucket latrines
- Hanging toilet / latrine
- No facilities / bush / field (open defecation)

PIT LATRINES

There are many reasons why using an improved latrine can be beneficial to the health of a family.

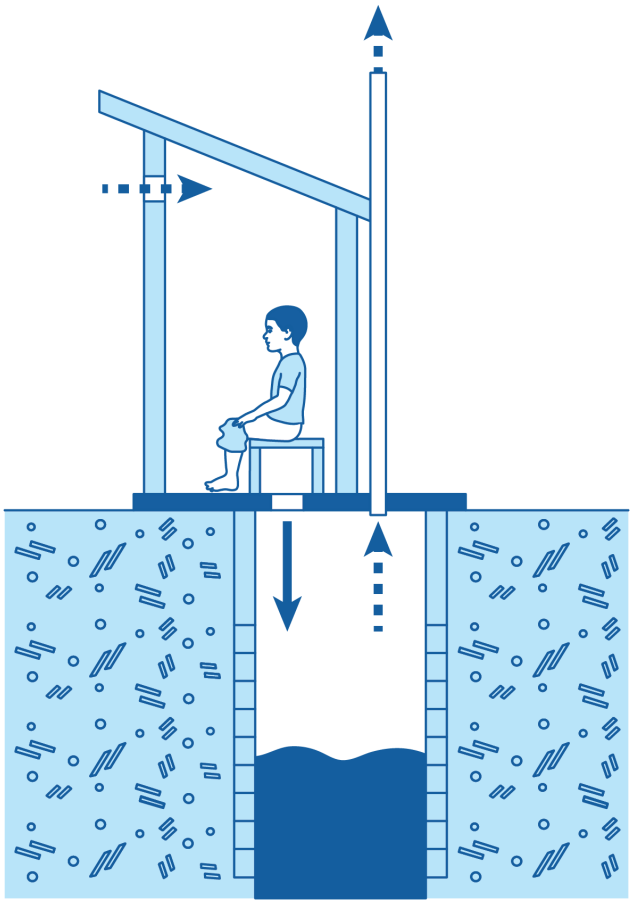
- Toilets are covered in a latrine and/or waste is flushed away, thereby limiting the opportunity for flies to land on feces or be spread by human contamination (from unwashed hands or shoes) to food or other people.
- Reduces soil contamination and contaminated food.
- Reduced illness and risk of malnutrition, stunting and wasting by reducing exposure to infections, parasites and viruses. Reducing exposure helps to reduce the incidence of diarrhea.

SAFE HYGIENE PRACTICES

It is very important to have a handwashing station is near a latrine. Handwashing stations at toilets can help to reduce the spread of illness.

Guidelines for improved pit latrines:

- Locate the latrine away from water sources and places where it floods.
- Avoid rocky areas or unstable locations.
- Check water table depth in the area through wells and avoid building latrines in shallow water table areas.
- Choose a high elevation location for the latrine, such as the top of a hill or incline to ensure that rain water does not flood the latrine
- Pits should be dug deeper for larger families or higher use areas, 3 meter depth and a 1-1.2 meter diameter is typical for a family of 5 for 3-5 years.
- If the latrine has no flushing water, ensure that the lid is covered to guard from flies.
- Latrines should have roofs, ventilation and stable floors or slabs covering the latrine.
- Ash or sawdust can be put in latrines to neutralize smell and insects.
- Once a latrine is full, it can either be filled and covered with a tree planted on top or the sewage can be removed by professionals using specific safety measures.



CHAPTER 5
DAILY ACTIVITY AND EXERCISE

IMPORTANCE OF DAILY ACTIVITY AND EXERCISE

ACTIVITY GOALS BY AGE

THE IMPORTANCE OF DAILY ACTIVITY AND EXERCISE

DAILY ACTIVITY AND EXERCISE is considered an important part of a lifestyle to maintain good health. Staying active and exercising is important for all age groups, including children with disabilities.

Daily activity and exercise has many benefits including:

- Building strong muscles, joints and bones
- Supports healthy brain development
- Maintaining a healthy weight
- Supports heart and lungs
- Helps improve coordination skills and control of movement
- Supports self-confidence and mental health

It is important to be physically active every day through play, chores, sports, exercise, transportation or games. Caregivers play an important role in modeling healthy behaviors and supporting active families.

ACTIVITY GOALS BY AGE

CHILDREN 0-12 MONTHS

Children from birth to 12 months old are in an especially important time for their brain development. During this time they are learning about the world around them and their bodies. When appropriate, floor based play and tummy time activities should occur daily with supervision.

- Tummy time and playtime on floor
- Age appropriate toys and shapes
- Activities that encourage infants to reach, grasp, pull or push
- Movement and play during diaper changes and baths
- Engagement activities with adults
- Activities that strengthen movements for rolling over and crawling

CHILDREN 1-5

Children from 1 to 5 years old should spend much of their day playing, which is a very important part of their development. Children have natural tendencies to play and this should be encouraged whenever possible.

Children 1-5 years old should have limited sedentary time (i.e. watching television) and should aim for being active and engaged for at least 3 HOURS a day. Activity time can be broken up throughout the day and can include playtime outside or indoors, with structured activities or free play.

- Playing with balls
- Going for walks
- Playtime outside
- Age appropriate toys
- Games with other children and adults

CHILDREN 6-18

Children and adolescents between 5-18 years old should aim for at least 60 MINUTES of moderate to vigorous-intensity physical activity every day. This physical activity can be broken up throughout the day and more than 60 minutes of activity will provide additional benefits.

Exercises and activities that strengthen bones should be done at least three times per week such as:

- Walking
- Bicycling
- Running
- Skipping and jumping
- Dancing
- Exercises such as pushups and sit ups
- Sports such as football, basketball or netball
- Gardening
- Chores

ACTIVITIES AND PLAY

Caregivers can support children to be active through modeling desired behaviors and playing with children. Make chores or gardening fun family activities by demonstrating and allowing children to participate.

CHAPTER 6

WOMEN AND INFANTS: BEFORE, DURING AND AFTER PREGNANCY

BEFORE PREGNANCY

DURING PREGNANCY

AFTER PREGNANCY

FAMILY PLANNING AND NUTRITION

BEFORE PREGNANCY

BEFORE PREGNANCY is an important time to focus on good nutrition, especially for adolescents and young women between 10-20 years old. During this time, adolescents' bodies are still developing and preparing their bodies for adulthood and potential future pregnancies. There are many things women can do to be healthy in adulthood and have healthy pregnancies.

- Wait until age 20 before becoming pregnant to allow for your body to fully develop.
- Eat at least three meals a day with one meal containing a protein rich food such as eggs, fish, tofu or meat.
- Focus on eating a variety of foods, especially foods that contain vitamin A, iron and protein.
- Take an iron and folic acid supplement as prescribed by a health center or doctor.
- Consume vitamin C-rich foods with iron foods or iron supplements to improve iron absorption.
- Take deworming medicines twice yearly or as prescribed.
- Do daily physical activity or exercise of at least 60 minutes per day.
- Aim for drinking 2.7 liters or 9 cups of water per day

HEALTHY FOODS FOR BEFORE AND DURING PREGNANCY

- Vitamin A Rich Foods: Carrots, squash, orange sweet potatoes, papaya, mangoes
- Iron Rich Foods: Meats, soy, spinach, legumes
- Folate Rich Foods: Spinach, fortified grains, legumes
- Protein Rich Foods: Legumes, nuts, tofu/ soy, eggs, whole grains, yogurt, and fish

DURING PREGNANCY

Nutrition DURING PREGNANCY is another essential time to focus on both a mother and infants health. If a mother is malnourished during her pregnancy, her baby can also be malnourished.

During pregnancy there are many things a woman can to ensure she stays healthy and she supports her baby's development.

- Eat one extra meal per day.
- Eat a diverse diet of colorful foods, such as fruits and vegetables, which are full of essential vitamins and minerals.
- Try to eat an iron and folate rich foods daily such as legumes, green leafy vegetables, whole grains and meats.
- Consume vitamin C- rich foods with iron foods and iron supplements to improve absorption.
- Consume iodized salt.
- Rest more frequently.
- Drink plenty of clean safe water, pregnant women need extra fluids. Pregnant women should aim for 3 liters of water or 10 cups of water a day.
- Take iron and folic acid supplementation throughout pregnancy.
- Take deworming medication or vitamin A supplements as recommended by doctor

- Go to routine well-baby checkups as scheduled by your local health worker.
- If living in an area with malaria, sleep under an insecticide-treated mosquito net and consult doctors about malaria treatment during pregnancy.

AFTER PREGNANCY

After pregnancy, when a woman begins to breastfeed and recover from giving birth, it is important the mother receives enough good nutrition. Ensuring mothers are well-nourished during breastfeeding and lactation helps to ensure that the baby is getting all of the essential nutrients they need from breastmilk. Breastfeeding requires a lot of calories and nutrients from the mother, so to make sure that they are getting enough for their health, and to ensure growth of the baby, there are a few things that a mother can do.

- While breastfeeding, women should aim to drink 3.8 liters or 13 cups of clean safe water.
- Take time to rest and get at least 8 hours of sleep
- Consume a minimum of 4-6 meals per day
- Eat a diverse diet full of colorful foods, such as fruits and vegetables
- Eat protein-rich foods such as fish, eggs, legumes, nuts and meats
- Increase intake of iron-rich foods to help replenish iron stores lost from blood during delivery and through breastfeeding.
- Consider continued iron and folic acid supplementation for three months after delivery.
- Consume vitamin C- rich foods with iron foods and iron supplements to improve absorption of iron
- If living in an area with malaria, both mother and child should sleep under an insecticide-treated mosquito net.

BREASTFEEDING

Breastfeeding is the best choice for children and their mothers. Breast milk meets the exact needs of an infant better than any other available food. Breastfeeding should start immediately after delivery until the child is 2 years old.

When mothers start breastfeeding immediately after an infant is born, it helps the body to expel the placenta and reduce the likelihood of bleeding and swollen breasts.

BENEFITS FOR BABIES

Breast milk is ideal for babies over formula or other alternatives because it is:

- Easy to digest and safe for babies
- Contains protective immune factors
- Always at a safe temperature
- Skin-to-skin contact created when breastfeeding helps to keep infants warm and create a mother and child bond.
- Decreases risk of death
- Contains the perfect amount of water and nutrients the baby needs for development

- Contains protective antibodies to decrease the risk of illness
- Helps to prevent stunting and wasting
- Engagement with mother during breastfeeding supports infant's social, emotional and physical development

BENEFITS FOR MOTHERS

- Supports the bond between mother and baby
- Helps with expelling the placenta
- Exclusive breastfeeding is an effective contraceptive method during the first six months due to increased levels of some hormones released during milk production.
- Helps to prevent engorgement of the nipples, which can be painful
- Reduced risk of illnesses for child and mother
- Reduced time and money that would be required to prepare formula with safe water
- Reduces risk of some cancers

In addition to not containing protective immune factors, use of formula or artificial feedings for infants can increase risk of:

- Allergies or asthma
- Mortality and diseases
- Infections
- Diarrhea
- Becoming overweight or obese
- Non-communicable diseases such as cardiovascular disease or diabetes
- Impact to cognitive development and ability to do well in school

EARLY INITIATION OF BREASTFEEDING AND COLOSTRUM

EARLY INITIATION OF BREASTFEEDING is very important. Mothers should initiate breastfeeding immediately after delivery, within the first hour and prior to weighing baby or bathing. Mothers who start breast feeding right after delivery are shown to breastfeed longer and bond quicker with their babies.

COLOSTRUM, or the first milk produced is very important for an infant's development. Colostrum is often yellowish in color and very dense in nutrients and essential antibodies which help to protect the infant and support immune function. It provides many benefits to newborn babies including:

- Strengthening infants and providing the needed nutrients for early cognitive development
- Reduces risk of illnesses and infections
- Cleans infant's stomach and digestive system and helps them to pass their first stool

BREASTFEEDING DO'S AND DON'TS

Do's

- Breastfeed on demand
- Start breastfeeding immediately after birth

Don'ts

- Feed the infant anything other than breast milk.
- Don't mix feed breast milk and formula, especially if the mother is HIV positive

BREASTFEEDING BASICS

During birth to 6 months, exclusive breastfeeding is recommended to support optimal growth and development of infants. From birth to 6 months old:

- Babies will feed breast feed 6-12 TIMES in a 24-hour period, reducing frequency as they age.
- Breast milk is stimulated by suckling, if a mother is worried about producing enough breastmilk, she should practice feeding on demand.
- Breast milk has enough fluid in it to keep an infant hydrated. If a mother is worried about an infant being thirsty, she should drink more water and offer the infant more breast milk.
- When an infant becomes sick, breastfeeding should occur more frequently.
- It is important to empty one breast prior to starting feeding from the other breast because breast milk at the beginning and end has varying amounts of nutrients and water to meet an infant's needs.
- Around 3 months old, babies will go through a growth spurt and will want to breastfeed more frequently and for longer durations.

BREASTFED INFANT FEEDING

- Exclusive breastfeeding for the first 6 months of life.
- Continued breastfeeding up to 2 years of age or beyond.
- Introduction of nutritionally-adequate and safe complementary (solid) foods at 6 months together with breastfeeding.

BREAST MILK: STORING AND HANDLING

It is better to give an infant breast milk from the breast than from a bottle or cup because of increased risk of diarrhea or illness. If breast milk is expressed, follow these steps for safe handling:

- Wash hands with soap and water or use an alcohol-based hand sanitizer that contains at least 60% alcohol.
- Express breastmilk by hand or with a manual or electric pump.
- If using a pump, inspect the pump kit and tubing to ensure it is clean. Discard and replace moldy tubing.
- Use breast milk storage bags or clean food-grade containers with tight fitting lids made of glass or plastic to store expressed breast milk.
- Never store breast milk in disposable bottle liners or plastic bags that are not intended for storing breast milk.
- Clearly label the breastmilk with the date it was expressed.
- If bottles are used, ensure they are boiled for at least 5 minutes to sterilize before adding breast milk. Breast milk can also be expressed into a small clean cup and the infant supported to sip from the cup.
- If freshly expressed breast milk won't be used within 4 days, freeze immediately to protect the quality.

BREAST MILK PRACTICES

- Breast milk does not need to be warmed. It can be served room temperature or cold.
- Never thaw or heat breast milk in a microwave or stovetop. Microwaving can destroy nutrients in breast milk and create hot spots, which can burn a baby's mouth.

- Freeze breast milk in small amounts of 2 to 4 ounces or the amount that will be offered at one feeding to avoid wasting breast milk.
- When freezing breast milk, leave about an inch of space at the top of the container because breast milk expands as it freezes.
- Always thaw the oldest breast milk first. Remember first in, first out.

Types of Breast Milk	Storage Location and Temperatures		
	Room Temperature 77°F (25°C) or colder	Refrigerator 40°F (4°C)	Freezer 0°F (-18°C) or colder
Freshly Pumped or Expressed	Up to 4-6 Hours	Up to 4 days	Use within 12 months
Thawed, Previously Frozen	Use within 1-2 hours	Use within 24 hours	Do not refreeze thawed breastmilk
Leftover from feeding (infant did not finish)	Finish using within 2 hours		

WAYS TO THAW BREAST MILK

- In a refrigerator overnight. Use breast milk within 24 hours of thawing in the refrigerator (this means from the time it is no longer frozen or completely thawed, not from the time it came out of the freezer).
- Set in a container of warm or lukewarm water.
- Warm breast milk by placing the container of breast milk into a separate container or pot of warm water for a few minutes or by running warm (not hot) tap water over the container for a few minutes.

INFANT FORMULA

If breastfeeding is not possible, infant formula is the next best choice. Proper preparation of POWDERED INFANT FORMULA is important to make sure an infant is receiving the recommended amounts of calories and nutrients in each feed. Infants who are formula fed tend to have fewer feedings than breastfed infants because breastmilk is digested more quickly.

SAFE FORMULA PREPARATION

The two primary components of safe formula preparation are safe water and correct water-to-formula ratios.

Safe preparation of infant formula begins with safe water. Safe water sources include:

- Purified tap water (filtered)
- Reliable bottled water
- Boiled water

SAFE FORMULA PRACTICES

Remember, to prepare safe water by boiling:

- Bring cold tap water to a rolling boil
- Boil for 1 minute (3 minutes at higher altitudes)
- Cool the water to room temperature before mixing with formula
- Store water in sterile containers with tight-fitting lids

TOO LITTLE WATER can:

- Hurt an infant's kidneys
- Cause digestive system problems
- Lead to diarrhea and dehydration

TOO MUCH WATER thins the formula, which:

- May lead to water toxicity
- May lead to consuming too few calories and nutrients, placing an infant at risk for:
  - Malnutrition
  - Developmental delays
  - Infection

Infant formula can be prepared in single bottle or large batches.

SAFE FORMULA PRACTICES

For accurate water-to-formula ratios, always follow manufacturer's instructions. The general ratio is:

- Powdered Formula:
  1 level scoop
- Clean Water
  60ml

SINGLE BOTTLE FORMULA PREPARATION

It is best to prepare infant formula one bottle at a time, since it is easier to ensure proper proportions of powdered formula to water.

Single bottle preparation supplies:

- Bottles (including nipples, rings, caps)

- Clean water
- Powdered infant formula with 9-gram scoop

SINGLE BOTTLE FORMULA-TO-WATER RATIO

9 grams of powder (1 level scoop) for every 60 milliliters (2 oz.) of water

TO PREPARE A SINGLE BOTTLE OF POWDERED INFANT FORMULA:

(1) Wash bottle and bottle parts (nipple, ring, cap) with soap and water.

(2) Sterilize bottle and bottle parts in boiling water for five minutes.

(3) Prepare sterile water (bottled or water that has been boiled).

(4) Thoroughly wash hands with soap and water.

(5) Measure sterile water into clean bottle as described on the infant formula product label.

(6) Using the scoop, measure the amount of powdered formula into the bottle as described on the product label.

(7) Secure nipple, ring and cap to the bottle.

(8) Gently shake bottle until formula is well mixed. Do not shake bottle too much; excessive foaming may cause you to feed air to the infant. Excessive air bubbles may result in more spit up and burps or may affect an infant's sensitive digestive tract resulting in gas, pain and fussiness.

(9) Use immediately or cover bottle with cap, label bottle with the date and refrigerate until use.

INFANT FORMULA: STORING AND HANDLING

Proper handling and storage of powdered and mixed formula is vital for making formula safe for feeding.

STORING POWDERED FORMULA

Powdered formula can spoil or be exposed to toxic substances and pests if improperly stored.

Follow these best practices for storing powdered formula:

- Store unopened canisters at room temperature (12 °C to 24 °C), away from direct sunlight. Avoid exposure to extreme heat or cold.
- Always keep open powdered formula canisters tightly covered in a cool, dry area.
  Never store powdered formula in a refrigerator.
- Open canisters only when needed.

SAFE FORMULA PRACTICES

After feeding an infant, discard any unused formula. Leftover formula should be discarded within one hour of feeding an infant because bacteria can grow in room-temperature formula.

- Label open canisters with the date opened.
- Use powdered formula within one month of opening.
- Do not use powdered formula past the EXPIRATION DATE printed on the canister.
- Discard expired formula and empty canisters.

SAFE FORMULA PRACTICES

It is best if formula is prepared on an as-needed basis.

STORING PREPARED FORMULA

Prepared formula should be used immediately or stored in a refrigerator to prevent bacteria from growing.

After preparing formula, store bottles using the following practices:

- Cover and label with the date before refrigerating
- Refrigerate between 2 and 4 °C (35 – 40 °F)
- Refrigerate no longer than 24 hours. Unused, mixed formula should be discarded if it is more than 24 hours old.
- Do not use prepared formula if it is unrefrigerated for more than a total of two hours.

SAFE FORMULA PRACTICES

Do not offer leftover formula to another infant. Illness can spread from infant-to-infant if bottles are shared.

HANDLING PREPARED FORMULA

When handling formula in either powdered or prepared form, always make sure hands are washed thoroughly with soap and water.

Bottles of prepared formula can be served cold, at room temperature, or warmed if desired. When warming bottles of prepared formula, consider the following:

- Bottles can be warmed by holding with cap on under warm, flowing tap water.
- Bottles can be warmed by placing in a container of water no warmer than 48 °C.
- Do not warm bottles in a pan of water over direct heat.
- Do not leave bottles in a pot of hot water for over five minutes to avoid overheating.
- Dry the outside of the bottle thoroughly before feeding.
- Do not microwave bottles, since this can create hot spots and cause serious burns.
- Always check the temperature of warmed formula before feeding to an infant. To do so, shake the bottle thoroughly, then place a few drops of formula on your inner wrist. If the formula is too warm, allow it to cool longer.

After 6 months, other foods can start to be introduced to complement breastfeeding. Please refer to Chapter 3 Nutrition by Age chapter for more information about frequency of breastfeeding, formula feeding and complementary feeding.

FAMILY PLANNING AND NUTRITION

Family planning and nutrition are closely connected. Contraceptives and family planning methods can be a significant way to help families meet their needs and their children's needs. Supporting families to space births and plan for future pregnancies is a very important part of food security, financial security and healthy families.

Consequences of closely spaced pregnancies:

- Premature births
- Low birth weight infants
- Mother's nutrient stores have not fully replenished for her to be strong again
- Difficult pregnancies and increased risk of mortality
- Malnourished babies
- Reduced length of breastfeeding for currently breastfeeding infants
- Malnutrition among children, especially those currently breastfeeding
- Can increase risk of transmitting HIV to fetus if mother if HIV positive

Benefits of family planning:

- Healthier mothers, unborn babies, children and families
- Full-term babies
- Strong families
- Economic and food security
- Reduces stunting and mortality
- Ability to afford having more children attend school and become well educated
- Safer pregnancies
- Reduced risk of transmitting HIV to the unborn baby if mother is HIV positive

FAMILY PLANNING RECOMMENDATIONS

- Space pregnancies 3 years apart, youngest child should be 2 years old before becoming pregnant again
- Access family planning methods from local health center to match your family's needs
- Plan for new children to match available family resources

Often family planning methods are free or low cost at local health centers and clinics. Talk with your family and health care provider about what birth control method matches your family's needs and plans.

TYPES OF FAMILY PLANNING

	Type	Effectiveness
Anytime Post Delivery	Breastfeeding up to 6 months	98 percent
	Barrier methods such as condoms	85 percent (STD Protection)
	Intrauterine devices	99 percent
	Sterilization	99 percent
	Natural family planning	76-88 percent
	Withdrawal	78 percent
	Abstinence or outercourse	100 percent (STD Protection)
6 Weeks Post Delivery	Mini pills (progesterone only)	91 percent
	Progesterone-only injectable Implants	94 percent
6 Months Post Delivery	Combined oral contraceptives ("The Pill", contains progesterone and estrogen)	91 percent
	Combined injectable (contains progestin and estrogen)	94 percent

CHAPTER 7

GROWTH AND PHYSICAL SCREENING

- DEFINITION
- HOW TO MEASURE WEIGHT
- HOW TO MEASURE LENGTH
- HOW TO MEASURE HEIGHT
- HOW TO MEASURE HEAD CIRCUMFERENCE
- HOW TO MEASURE MID-UPPER ARM CIRCUMFERENCE
- PHYSICAL NUTRITION ASSESSMENT
- HOW TO MEASURE BILATERAL PITTING EDEMA
- HOW TO CALCULATE BODY MASS INDEX
- GROWTH SCREENING SCHEDULE
- HOW TO USE GROWTH CHARTS

- DECISION TREE NO. 16: GROWTH SCREENING
- DECISION TREE NO. 20: BILATERAL PITTING EDEMA

DEFINITION

Growth screening involves taking accurate measurements of weight, length or height and head circumference, and plotting them on age and sex-appropriate growth charts. Growth screening enables staff to determine if a child is growing normally, has a growth problem or is at risk for a growth problem.

GENERAL GUIDELINES WHEN MEASURING CHILDREN:

- Describe procedure to older children and explain what you are doing during the procedure.
- If an infant or a young child is crying or seems distressed, calm the child down first or measure at a different time.
- Sanitize equipment in between measurements.
- Sanitize your hands in between children.

HOW TO MEASURE WEIGHT

Age	Children younger than 2 years and small children unable to stand
You need	A baby scale
Used to	Determine a child's recent nutrition and wasting by tracking weight-for-length

(1) Place scale on a flat surface.
(2) Turn the scale on with no load on the scale.
(3) Make sure the scale reads zero and is set in kg before using.
(4) Remove child's clothing.
(5) Lay the child centered on the scale.
(6) Read weight off the display and record to the nearest 0.1 kg.

Age	Children 2 years and older who are able to stand and children who are unable to stand
You need	A standing scale
Used to	Determine a child's recent nutrition and wasting by tracking weight-for-height

(1) Place scale on a flat surface.
(2) Turn the scale on with no load on the scale.
(3) Make sure the scale reads zero and is set in kg before using.
(4) Remove child's clothing.

FOR CHILDREN WHO ARE ABLE TO STAND

(1) Ask child to stand still on scale.
(2) Read weight off the display and record to the nearest 0.1 kg.

FOR CHILDREN WHO ARE UNABLE TO STAND

(1) Ask an adult to stand centered on the scale
(2) Measure the weight
(3) Ask the adult on the scale to hold the child
(4) Measure the weight

(5) To find the child's weight, subtract the adult's weight alone from the weight of the adult with the child:

CHILD'S WEIGHT = WEIGHT OF ADULT WITH CHILD – WEIGHT OF ADULT

(1) Record the child's weight to the nearest 0.1 kg.

TIPS FOR MEASURING WEIGHT

Most digital scales have a "tare" function. When pressed, the "tare" function zeros the scale. To find the weight of a child, press the "tare" function with adult on the scale. Then, weigh the adult holding the child. The weight you see on the display is the child's weight.

WEIGHT-FOR-AGE

is sometimes used to monitor a child's weight gain or loss over time. A child with a weight-for-age below a -2 Z-score is considered underweight. A child who is severely underweight (below -3 Z-score) is in need of special medical care.

TIPS FOR MEASURING WEIGHT

- Always zero scale before use
- Weigh children with little or no clothing
- Do not touch the child while weighing
- Make sure child is not touching anything around him
- For infants, do not take weight right after feeding

HOW TO MEASURE LENGTH

Age	Children younger than 2 years and small children unable to stand
You need	A length mat or board
Used to	• Track a child's skeletal growth using length-for-age • Determine a child's current nutrition and wasting by tracking weight-for-length

(1) Place length mat or board on a flat surface (floor or a steady table).

(2) Remove child's shoes, hats and hair accessories.
(3) Ask the help of an assistant when possible.
(4) Lay child flat and centered on the length mat or board.
(5) Align the top of the head against the fixed headpiece (assistant).
(6) Position the head so line of sight is perpendicular to base of mat (assistant).
(7) Straighten the child's legs by placing your hand on the child's shin or knees and pressing them firmly against the mat or board.
(8) Adjust foot piece so that the child's feet are flat against it.
(9) Read and record length to the nearest 0.1 centimeter.

TIPS FOR MEASURING LENGTH

- The head and the foot pieces should press firmly against the child's head and feet.
- The assistant should stand behind the headpiece. The assistant's head should be straight over the child's head, so that he/she is looking directly into the child's eyes.
- The measurer should stand to the right side of the child and hold the foot piece with the right hand and the child's shins or knees with the left hand.
- Do not measure length using a measuring tape or ruler taped to a baby scale pan or floor.

HOW TO MEASURE HEIGHT

Age	Children 2 years and older who are able to stand
You need	A height rod or stadiometer
Used to	• Track a child's skeletal growth using height-for-age • Determine a child's current nutrition and wasting by tracking weight-for-height

(1) Remove child's shoes, hat and hair accessories.
(2) Ask the help of an assistant when possible.
(3) Ask the child to stand in the center and against the base of rod or wall.
(4) Make sure legs are straight while the heels and calves are against board or wall (assistant).
(5) Place your hand under the child's chin and gently close your hand. Do not cover the child's mouth or ears.
(6) Ask child to look straight ahead until line of sight is level with the ground.
(1) Make sure the child's shoulders are level, the hands are at their sides and the head, shoulder blades and buttocks are against the board or wall.

(2) Slide the headpiece downward through the child's hair.
(3) Read and record height to the nearest 0.1 centimeter.

TIPS FOR MEASURING HEIGHT

- The headpiece should press firmly against the child's head, pushing through the hair.
- The assistant should kneel to the right side of the child and hold the child's knees with the left hand and the shins with the right hand.
- The measurer should kneel to the left side of the child and hold the headpiece with the right hand and the child's chin with the left hand.
- Do not measure height using a measuring tape or ruler attached to a wall.

HOW TO MEASURE HEAD CIRCUMFERENCE

Age	Children younger than 5 years
You need	A non-elastic measuring tape
Used to	Determine if a child's brain is growing normally by tracking HEAD CIRCUMFERENCE-FOR-AGE

HEAD CIRCUMFERENCE-FOR-AGE

(1) Ask the child to sit on a chair. For infants and young children, ask the help of an assistant when possible.
(2) Wrap the tape snugly around the widest possible circumference of the head.
(3) Secure the tape using both hands.
(4) Read head circumference and record to the nearest 0.1 centimeter.

TIPS FOR MEASURING HEAD CIRCUMFERENCE

- The measurement should be taken with a device that cannot be stretched.
- The widest possible circumference of a child's head is the circumference from the most prominent part of the forehead (often 1-2 fingers above the eyebrow) around to the widest part of the back of the head.
- When trying to find the widest possible circumference of the head, feel for a bump in the back of the head and include in the measurement.

✓ Proper positioning

Widest circumference
Avoid ears

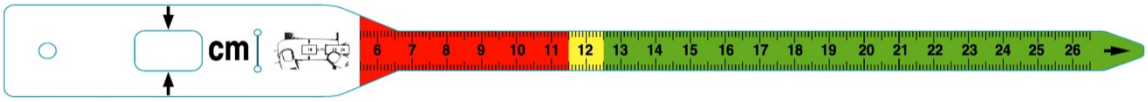
✗ Improper positioning

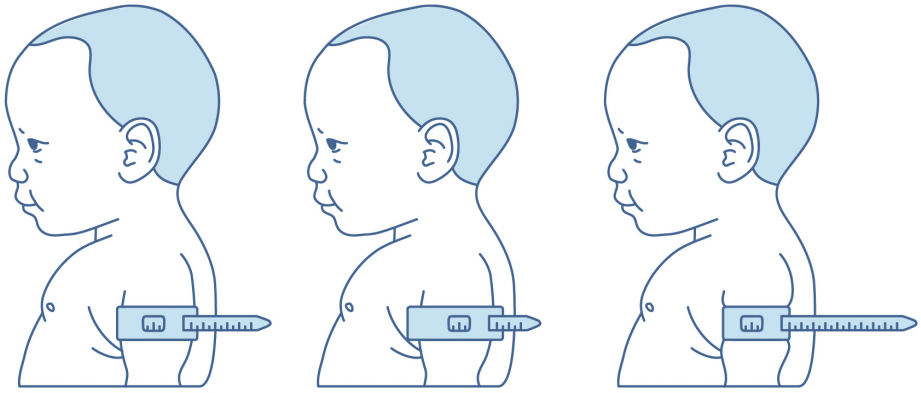
Too low, over ears
Too high, over hairline

HOW TO MEASURE MID-UPPER ARM CIRCUMFERENCE (MUAC)

Age	Children 6+ months
You need	A non-elastic MUAC measuring tape
Used to	• Determine if a child is healthy or suffering from acute malnutrition • (Note: Although not corresponding to a growth chart, this tool can be used as an additional screening method to track the maintenance, loss or gain of fat and muscle in older children including those with disabilities by comparing the measurement monthly or referring to the reference ranges.)

- Ask the child to sit on a chair. For infants and young children, ask the help of an assistant when possible.
- Ask child to relax left arm and loosely hold. Wrap the tape snugly around the midpoint between the shoulder and elbow on the left arm.
- Feed the end of tape through the slot and secure the tape using both hands.
- Read arm circumference in the small window and record to the nearest 0.1 centimeter
- Repeat to check accuracy.
- Record number.





Proper positioning

- Midpoint between shoulder and elbow
- Tape is snug around arm

Improper positioning

- Too loose, not at middle
- Too-tight, or child is not relaxed or is flexing

Group	Severe Acute Malnutrition	Moderate Acute Malnutrition	Moderate Malnutrition	Normal Nutrition Status
6-59 months	<11.5cm	≥11.5 to < 12.5cm		≥ 12.5cm
5-9 years	<13.5cm		≥ 13.5 to < 14.5cm	≥ 14.5cm
10-14 years	<16.0cm		≥ 16.0 to < 18.5cm	≥ 18.5cm
15-27 years	<19.0cm		≥ 19.0 to <22.0cm	≥ 22.0cm

*Note cutoff levels are agreed internationally only for 6-to-59-month age group.

PHYSICAL NUTRITION ASSESSMENT

Age	All children
You need	Regular screenings to observe and look for physical changes in children
Used to	Identify possible indicators of malnutrition — micronutrient deficiencies or macronutrient deficiencies

A basic physical nutrition assessment should be a regular part of nutrition screening. Often, skin infections or changes in hair can be a sign of a vitamin, mineral or macronutrient deficiency (fats, proteins, carbohydrates).

(1) While completing child weight and height measurements, look the child over for any changes in physical conditions or signs of infections.
(2) Record and monitor areas of concern and follow up with them at next screening to see if they have resolved or worsened.

Body Part	Assessment	Considerations
Hair	Thin, dull, sparse, pluckable, dry	Protein deficiency, vitamin C deficiency
Eyes	Pale, dry, poor vision	Vitamin A, riboflavin, zinc deficiency
Lips	Swollen, red, dry, cracked	Riboflavin, pyridoxine, niacin deficiencies, dehydration
Tongue	Smooth, slick, purple, white coating	Vitamin and/or iron deficiencies
Gums	Sore, red, swollen, bleeding	Vitamin C deficiency
Teeth	Missing, loose, loss of enamel	Calcium deficiency, poor intake
Skin	Pale, dry, scaly	Iron, folic acid, zinc deficiency
Nails	Brittle, thin, spoon-shaped	Iron or protein deficiency

Additional areas to observe and monitor:

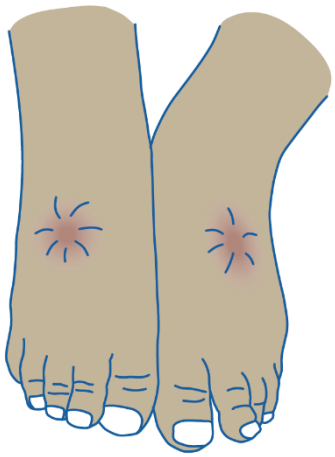
- Mental changes
- Changes in appetite
- Distention of stomach
- Apathy and/or reduced energy
- Increased irritability

HOW TO MEASURE BILATERAL PITTING EDEMA

Age	All children
You need	To do a pitting test
Used to	Identify nutrition-related edema, which helps determine acute protein-energy malnutrition

For the edema to be determined bilateral pitting edema due to malnutrition, pitting edema must be found in both feet. Any pitting edema is considered serious malnutrition and child needs immediate referral to health center.

TO TEST FOR BILATERAL PITTING EDEMA



(1) First the child should be held or presented with their legs and feet forward.
(2) The measurer should place their non-dominant hand behind the lower calf or ankle to stabilize the child's lower leg and foot.
(3) Measurer should use their dominant hand to check for excess fluid on the top of both of the child's feet by pressing the pad of the thumb for three seconds.
(4) If a pit remains for more than two seconds, edema is present. Check both feet.
(5) If both feet present with edema, test both hands by pressing the tops of the child's hands for three seconds. If edema is present in the hands, move to test the face.
(6) Test the child's face for edema by pressing into the forehead for three seconds.

Grades	Bilateral Pitting Edema	Malnutrition Level
0	Absent	Acute malnutrition is not evident; may still be wasted
+1	Bilateral pitting edema present in both feet	Mild
+2	Bilateral pitting edema present in both feet and both hands	Moderate
+3	Bilateral pitting edema present in both feet, both hands and forehead	Severe

HOW TO CALCULATE BODY MASS INDEX

Age	Children 5 years and older
You need	Weight and height
Used to	Monitor a child's weight gain or loss by tracking BMI-FOR-AGE over time

Body mass index is a value that associates a child's weight with his or her height. A unit commonly added to BMI is kg/m^2.

(1) Measure weight in kilograms
(2) Measure height in centimeters
(3) Convert height from cm to meters (1 meter = 0.1 centimeter)
(4) Calculate BMI as follows: BMI = WEIGHT IN KILOGRAMS ÷ (HEIGHT IN METERS X HEIGHT IN METERS)
Note: If measurements are done in pounds and inches then BMI = [Weight in pounds ÷ (height in inches x height in inches)] x 703
(5) Round BMI to one decimal place and record

GROWTH SCREENING SCHEDULE

Keeping to a regular measurement schedule helps establish growth patterns to be used in capturing past and present life conditions, including food intake and health status. Some children may have special conditions in which they need to be measured more frequently, as recommended by a health care professional.

GROWTH SCREENING SCHEDULE

Nutrition Risk	< 2 years	≥ 2 - ≤ 5 years	> 5 Years
No risk	Every 1 month	Every 3 months	Every 6 months
Low risk	Every 1 month	Every 3 months	Every 6 months
High risk	Every 1 month or per doctor's orders	Every 3 months or per doctor's orders	Every 6 months or per doctor's orders

HOW TO USE GROWTH CHARTS

WHAT IS THE PURPOSE OF A GROWTH CHART?

- A growth chart is a tool used to record measurements (such as weight and height) and track growth trends.
- Growth charts are an important part of assessing a child's nutritional needs and determining if intervention is needed.

WHAT ARE WHO GROWTH CHARTS?

- The World Health Organization's growth charts are the most commonly used growth charts worldwide.
- Country-specific growth charts exist; however, the WHO growth charts are considered the standard for the world.
- The WHO growth curves were developed by studying the growth and development of 8,500 infants and young children from several countries around the world.

WHAT ARE THE MAIN COMPONENTS OF A GROWTH CHART?

X-AXIS

- Horizontal line at the bottom of the graph
- Values increase left to right

Y-AXIS

- Vertical line on the left of the graph
- Values increase bottom to top

MEDIAN LINE

- Middle line labeled by a 0
- Represents the average growth pattern

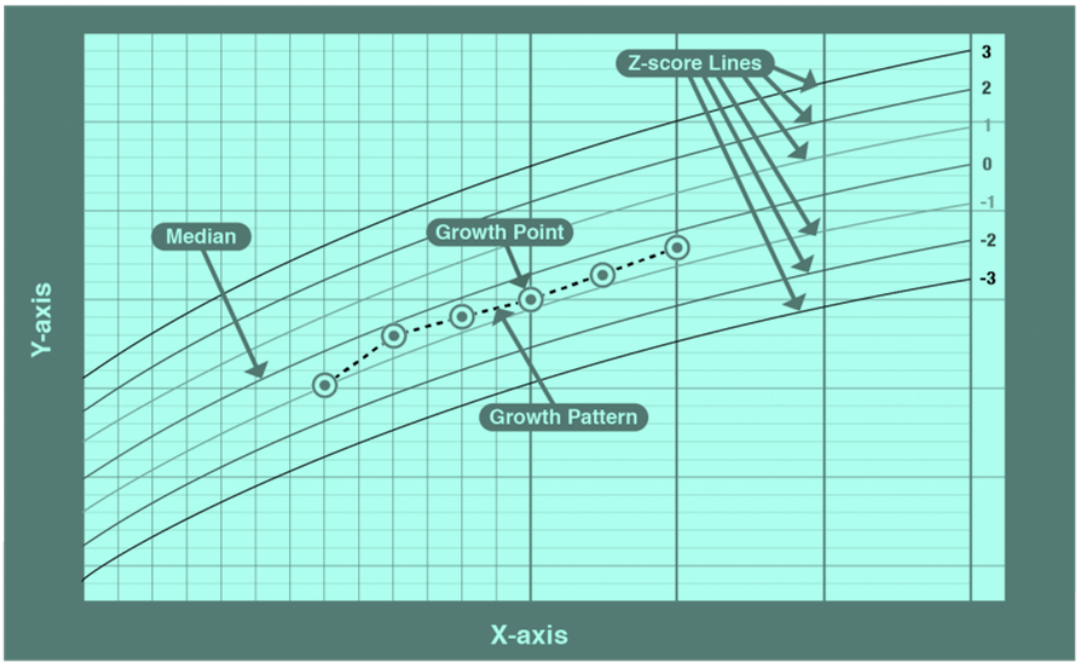
Z-SCORE LINES

- Represent the distance from the median
- Lines ABOVE the median are numbered positively (+3, +2, +1)
- Lines BELOW the median are numbered negatively (−1, −2, −3)

- X-axis can represent age (weeks, months, year) or length/height (cm)
- Y-axis can represent weight (kg), length/height (cm), BMI (kg/m2) or head circumference (cm)

The curved lines on a growth chart will help you interpret a child's growth status.

A GROWTH CHART LOOKS LIKE THIS



WHAT ARE THE MOST COMMONLY USED GROWTH CHARTS FOR CHILDREN?

THE MOST COMMONLY USED GROWTH CHARTS FOR INFANTS AND YOUNG CHILDREN ARE:

Length-for-age	Weight-for-length/height
Height-for-age	Head circumference-for-age
Weight-for-age	Mid upper arm circumference-for-age

STUNTING refers to the failure to reach one's genetic potential for height. It is the result of a slow, cumulative process often involving one or a combination of the following:

- Chronic malnutrition
- Illness or infection
- Inappropriate child care practices

Generally, stunted children younger than 2 years may regain some lost growth potential (catch-up growth) when placed in environments where they become well-fed and healthy or have recovered from a chronic illness. After a child turns 2 years old, it is difficult to reverse stunting that has occurred earlier. However, while they remain shorter than average, their growth rate becomes fairly normal with proper nutrition and care.

From birth to 3 months old, age is plotted in completed weeks; from 3 to 12 months old, age is plotted in completed months; past 12 months old, age is plotted as completed years and months.

LENGTH-FOR-AGE (< 2 YEARS) OR HEIGHT-FOR-AGE (≥ 2 YEARS)

You need

- Age in months (X-axis)
- Length or height in centimeters (Y-axis)

- Length-for-age and height-for-age growth curves tell us if a child is experiencing linear growth appropriate for age.
- Points that fall between +2 and −2 are considered to be within normal range.
- Children with length-for-age or height-for-age below −2 are considered STUNTED.

WASTING is a major indicator of malnutrition. It increases the risk for illness and infections. It is the result of rapid weight loss or failure to gain weight often involving one or a combination of the following:

- Acute starvation
- Illness or infection
- Poor food quality
- Chronic food shortage

Children who are severely wasted require immediate medical care. Wasting can be reversed if conditions improve, such as:

- Treating infections
- Improving food quality
- Increasing access to food

WASTING can be determined by weight-for-length or weight-for-height and mid-upper arm circumference-for-age. Underweight can be determined by weight-for-age charts and BMI.

WEIGHT-FOR-LENGTH (< 2 YEARS) OR WEIGHT-FOR-HEIGHT (≥ 2 YEARS AND < 5 YEARS)

You need

- Length or height in centimeters (X-axis)
- Weight in kilograms (Y-axis)

- Weight-for-length and weight-for-height tell us if a child is gaining muscle and fat mass appropriate to their length or height.
- Points that fall between +2 and −2 are considered to be within normal range.
- Points higher than +2 and lower than −2 are of concern.
  - Children above +2 are considered OVERWEIGHT and may be at risk for childhood obesity.
  - Children below −2 are considered WASTED.

Girls and boys are measured on different growth charts because they grow in different patterns and at different rates. So, it is important to select the sex-appropriate chart when tracking a child's growth.

MID-UPPER ARM CIRCUMFERENCE-FOR-AGE (6 MONTHS - < 5 YEARS)

You need

- Age in months (X-axis)
- Mid-upper arm circumference in centimeters (Y-axis)

- Mid-upper arm circumference growth chart is a tool used to determine if a child (6-59 months) is suffering from acute malnutrition or WASTING.
- Points that fall above −2 are considered to be within normal range.
- Points below −2 are of concern.
  - Children between -2 and -3 are considered moderately WASTED or to have moderate acute malnutrition
  - Children -3 and below are considered to be severely WASTED or have severe acute malnutrition.

BMI-FOR-AGE (> 5 YEARS)

You need

- Age in months (X-axis)
- BMI (Y-axis)

- BMI-for-age growth curves tell us if a child is gaining weight along a normal trajectory.

- Points that fall between +1 and −2 are considered to be within normal range.
- Points higher than +1 or lower than −2 are of concern.
  - Children above +1 are considered OVERWEIGHT and may be at risk for childhood obesity.
  - Children below −2 are considered UNDERWEIGHT.

HEAD CIRCUMFERENCE-FOR-AGE (< 5 YEARS)

You need

- Age in months (X-axis)
- Head circumference in centimeters (Y-axis)

- Head circumference-for-age curves indirectly indicate if a child's brain is growing normally.
- Points that fall between +2 and −2 are considered to be within normal range.
- Points higher than +2 and lower than −2 are of concern.
  - Children above +2 are considered to have MACROCEPHALY.
  - Children under −2 are considered to have MICROCEPHALY.

HOW DO YOU USE GROWTH CHARTS?

- Obtain and record the measurements you want to plot on a growth chart.
- Choose the age and sex-appropriate growth chart.
- Plot the measurements on the chart with a pen or pencil.
  - Find the mark representing the measurement on the X-axis on the bottom of the chart.
  - Follow the X-axis mark line upward.
  - Find the mark representing the measurement on the Y-axis on the left side of the chart.
  - Follow the y-axis mark line across until it intersects with the x-axis mark line.
  - At this intersection, draw a visible mark with pen or pencil. This is a GROWTH POINT.
  - Double check your work.

THE BUILDING BLOCKS OF GROWTH CHARTS ARE:

Age	Sex
Length or height	Weight
Head circumference	BMI
Mid-upper arm circumference	

Repeat measurements and growth chart records following recommended schedule to obtain a GROWTH PATTERN

HOW DO YOU INTERPRET GROWTH POINTS AND PATTERNS?

GROWTH POINT

- A plotted point that is far from the median in either direction may represent a growth problem.
- Generally, values below the –2 Z-score lines are of concern. These children need immediate attention from a health care professional.
- Consider the growth pattern and health condition of the child when interpreting a plotted point.

GROWTH PATTERN

- Growth patterns are important because they can help us:
  - See a child's growth over time
  - Make inferences about nutrition intake and overall health status
  - Determine if an intervention is needed
- A normal pattern in growth is, in general, parallel to the median and Z-score lines.
- Patterns that indicate a problem or a risk:
- Growth line crosses a Z-score line
  - Sharp inclined or decline in growth line
  - Growth line remains flat
- Consider the child's health condition when interpreting growth patterns.

A GROWTH POINT

is the mark on the growth chart representing a single measurement from a given day. When multiple values from different time points are plotted on a growth chart, the points can then be connected using a straight edge. The line created is called a growth pattern.

In certain countries where the general population is of shorter stature, infants and children will regularly fall below the median on the length-for-age growth chart. If a child's growth pattern is parallel to the median line, they are growing along a normal curve despite their low length/height.

WHAT DO Z-SCORES MEAN?

Use age/sex appropriate growth chart	You need	Z-score	What it means
AGE: 0-23 MONTHS			
Length-for-age	Length Age	Above −2 Below −2 Below −3	Normal Moderately stunted Severely stunted
Weight-for-length	Weight Length	Above 3 Above 2 Between −2 and 2 Below −2 Below −3	Very overweight Overweight Normal Moderately wasted Severely wasted
HC-for-age	Head circumference Age	Above 2 Between −2 and 2 Below −2	Large head size Normal head size Small head size
MUAC-for-age (6+ months)	Mid-upper arm circumference Age	Above −2 Below −2 Below −3	Normal Moderate acute malnutrition Severe acute malnutrition
Weight-for-age	Weight	Above −2 Below −2 Below −3	Normal Underweight Severely Underweight
AGE: 24-59 MONTHS			
Height-for-age	Height Age	Above −2 Below −2 Below −3	Normal Moderately stunted Severely stunted
Weight-for-height	Weight Height	Above 3 Above 2 Between −2 and 2 Below −2 Below −3	Very overweight Overweight Normal Moderately wasted Severely wasted
HC-for-age	Head circumference Age	Above 2 Between −2 and 2 Below −2	Large head size Normal head size Small head size
MUAC-for-age (6+ months)	Mid-upper arm circumference Age	Above −2 Below −2 Below −3	Normal Moderate acute malnutrition Severe acute malnutrition
Weight-for-age	Weight	Above −2 Below −2 Below −3	Normal Underweight Severely underweight

AGE: 5 YEARS AND OLDER			
Height-for-age	Height Age	Above −2 Below −2 Below −3	Normal Moderately stunted Severely stunted
BMI-for-age	BMI Age	Above 2 Above 1 Between −2 and 1 Below −2 Below −3	Obese Overweight Normal Moderately underweight Severely underweight

CHAPTER 8
IRON DEFICIENCY ANEMIA

DEFINITION

CAUSES

SYMPTOMS

DIETARY CONSIDERATIONS

SCREENING FOR IRON DEFICIENCY AND ANEMIA

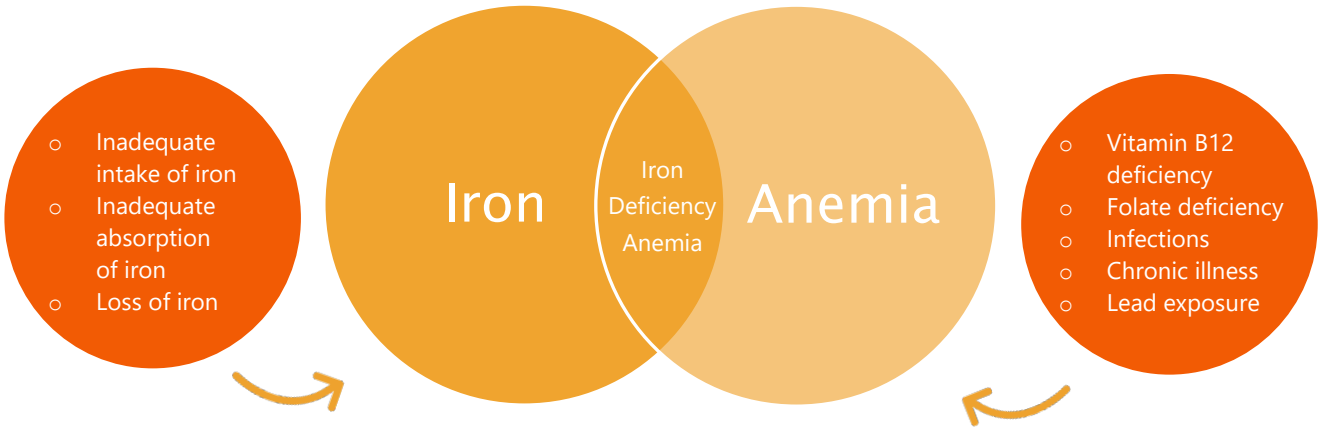
IRON SUPPLEMENTATION

USING THE HEMOCUE MACHINE

DECISION TREE NO. 8: ANEMIA

DEFINITION

Iron deficiency occurs when iron stores in the body diminish and can no longer meet the needs of the child. When iron deficiency becomes severe, anemia develops. This condition is referred to as iron deficiency anemia. However, anemia is not only caused by iron deficiency. Other causes include infections and chronic disease. Additionally, a child can have iron deficiency without having anemia.



All of these conditions have serious effects on a child's health at all stages of life, including:

- Delayed brain development
- Impaired mental function and school performance
- Fatigue, weakness and impaired behavior
- Reduced work capacity and productivity
- Delayed physical growth
- Weak immunity and resistance to infections

CAUSES

The following can put children at risk for iron deficiency or anemia:

- Poor maternal health, especially a mother with iron deficiency anemia herself
- Low birth weight
- Inability to absorb iron
- Blood loss in the stools due to intestinal parasite
- A diet low in iron
- A diet high in substances that inhibit iron absorption (whole grains, legumes, fiber, milk, tea)
- Bottle-feeding with formula not iron-fortified and drinking milk rather than formula in the first year

SYMPTOMS

Many symptoms associated with iron deficiency can easily be mistaken for behavioral problems.

Iron Deficiency	Mild to Moderate Anemia	Severe Anemia	
• Irritability • Decrease in attention span • Decrease in alertness • Decrease in learning ability • Anemia	• Irritability • Fatigue • Pale appearance • Poor appetite	• Fatigue and weakness • Noticeable irritability • Difficulty paying attention • Headache and lightheadedness • Poor appetite • Pale skin • Hair loss	• Cold hands and feet • Swollen tongue • Brittle or spoon-shaped nails • Shortness of breath • Rapid heartbeat • Unusual cravings for non-nutritive substances such as ice, dirt or pure starch (a condition known as "pica")

DIETARY CONSIDERATIONS

- Eat FOODS HIGH IN IRON EVERY DAY.
  - Good sources: Oatmeal, apricots, raisins, spinach, kale, greens and prunes.
  - Better Sources: Eggs, meat, fish, chicken, turkey, soybeans, dried beans, peanuts, peas and lentils.
- Maximize IRON ABSORPTION.
  - Meat, fish, chicken and vitamin C INCREASE absorption.
  - Whole grains, beans, lentils, legumes, fiber, tea and cow's milk DECREASE absorption.
- Offer whole grains, beans, lentils and legumes with foods high in vitamin C. Examples: orange, lemon, peppers, dark leafy greens.
- Use iron cooking utensils.
- Soak beans, lentils and legumes in water before cooking.
- For children 6-12 months:
  - Give iron-fortified cereal if available.

- Include foods high in iron every day.

- For children younger than 1 year:
  - Do not give cow or other animal milk whenever possible.
  - Give iron-fortified formula if available.

SCREENING FOR IRON DEFICIENCY AND ANEMIA

There are several laboratory tests to determine if a child has iron deficiency:

- Serum ferritin
- Serum iron
- Transferrin saturation

However, these tests are expensive and require laboratory testing.

Even though there may be many causes of anemia, dietary iron deficiency is usually either the main or a major contributing factor. A common practice to assess whether or not anemia is caused by iron deficiency is to monitor the response of hemoglobin levels after one month of supplementation with iron. AN INCREASE OF AROUND 1 G/DL IN HEMOGLOBIN IS INDICATIVE OF IRON DEFICIENCY.

Measuring hemoglobin using the portable HemoCue machine is a simple and affordable way to screen for iron deficiency anemia.

ANEMIA SCREENING SCHEDULE

Hemoglobin should be measured following the schedule below or as directed by a doctor.

SCHEDULE FOR HEMOGLOBIN SCREENING

No Anemia	Any Anemia	Infection, Diarrhea, Illness
0-≤5 years: Every 3 months	• One month after treatment begins • At end of treatment • Every 3 months thereafter	Every 3 months or as recommended by pediatrician
5+ years: Every 6 months	• One month after treatment begins • At end of treatment • Every 6 months thereafter	Every 6 months or as recommended by a pediatrician

CUT-OFF VALUES FOR HEMOGLOBIN

Normal hemoglobin levels in children vary by age. To determine whether a child is anemic, select the appropriate cut-off value.

DEFINITION OF ANEMIA BASED ON HEMOGLOBIN VALUE IN G/DL

Age	No Anemia	Anemia		
		Mild	Moderate	Severe
< 5 years	11.0 or higher	10.0 – 10.9	7.0 – 9.9	Lower than 7.0
5 – 11 years	11.5 or higher	11.0 – 11.4	8.0 – 10.9	Lower than 8.0
12 – 14 years	12.0 or higher	11.0 – 11.9	8.0 – 10.9	Lower than 8.0
Female 14+	12.0 or higher	11.0 – 11.9	8.0 – 10.9	Lower than 8.0
Male 14+	13.0 or higher	11.0 – 12.9	8.0 – 10.9	Lower than 8.0

IRON SUPPLEMENTATION

TO PREVENT IRON DEFICIENCY ANEMIA

To PREVENT iron deficiency anemia, give a multivitamin for children that contains iron (follow recommendations on package) or an iron supplement following the dosage recommendations below.

If universal supplementation (prevention of anemia) is practiced, treatment of an anemic child begins when the dosage of iron supplements increases to TREATMENT DOSAGE (3-4 mg per kg). Treatment ends when the dosage is lowered back to PREVENTION DOSAGE (2 mg per kg).

GENERAL RULE FOR IRON SUPPLEMENTATION DOSAGE

- For prevention of anemia, give 2 mg per kg body weight
- For treatment of anemia, give 3-4 mg per kg body weight

IRON SUPPLEMENT DOSAGE TO PREVENT IRON DEFICIENCY ANEMIA

Age	Dosage*	
	Iron	Folic Acid
2 – 24 months (Low birth weight)	~12.5 mg/day	50 µg/day
6 – 24 months (Normal birth weight)	~12.5 mg/day	50 µg/day
2 – 5 years	20-30 mg/day	-
6 – 11 years	30-60 mg/day	-
12+ years	60 mg/day	400 µg/day

* Iron dosage based on 2 mg per kg body weight

PREVENTION OF IRON DEFICIENCY ANEMIA IS RECOMMENDED IF:

- The child is a picky eater.
- The child has poor appetite.
- The child is younger than 1 year and is:
  - not receiving iron-fortified cereal.
  - not receiving iron-fortified formula.
  - is receiving cow or other animal milk.
- The child is older than 6 months and is receiving a diet that is:
  - high in grains, beans, legumes.
  - low in animal foods.
- If infections with intestinal parasites are common.
  - If this is the case, combine iron supplementation with routine deworming.
  - Children should receive a single-dose treatment at least annually or 1-2 times a year depending on how common infections are.
  - The recommended single-dose treatment is 400 mg Albendazole.

Do not give a multivitamin that contains iron and an iron supplement at the same time without consulting with a doctor.

TO TREAT IRON DEFICIENCY ANEMIA

Use the treatment recommendations for iron deficiency anemia when anemia is confirmed by a hemoglobin screening. To treat iron deficiency anemia, follow the age-appropriate iron dosage schedule below.

IRON SUPPLEMENT DOSAGE TO TREAT IRON DEFICIENCY ANEMIA

Age	Indication	Dosage*		Duration
		Iron	Folic Acid	
< 2 years	Hb < 11.0 g/dl	~25 mg/day	100-400 µg/day	3 months
2 – 5 years	Hb < 11.0 g/dl	~60 mg/day	400 µg/day	3 months
6 – 11 years	Hb < 11.5 g/dl	~60 mg/day	400 µg/day	3 months
12 – 14 years	Hb < 12.0 g/dl	~120 mg/day	400 µg/day	3 months
14+	Female: Hb < 12.0 g/dl Male: Hb < 13.0 g/dl	~120 mg/day	400 µg/day	3 months

* Iron dosage based on 3-4 mg per kg body weight

TIPS FOR EFFECTIVE IRON SUPPLEMENTATION

- Use age-appropriate iron drops or tablets.
- Even if hemoglobin is within normal range after the one-month follow up test, continue treatment for the entire three months to ensure all iron stores are full.
- Give iron supplement with:
  - a vitamin C supplement (follow recommendations on package)
  - foods rich in vitamin C (citrus fruits or juices such as orange, grapefruit, lemon)
  - meat, chicken, fish
- Do not give iron supplement with:
  - tea
  - milk
  - foods high in fiber
- Iron supplements could cause constipation. Increase fiber in diet and/or give a fiber supplement but not at the same time as the iron supplement.
- Iron supplements could upset stomach. Do not give iron supplement on an empty stomach.

USING THE HEMOCUE MACHINE

To use the HemoCue machine, a trained staff draws a capillary blood drop through a finger or heel prick, depending on the age of the child. The blood drop is then filled into a microcuvette. The filled

microcuvette is then inserted into the HemoCue for a hemoglobin reading. To provide accurate measurements, the HemoCue machine needs to be properly stored, cleaned and maintained.

SUPPLIES

To complete one hemoglobin measurement, you need the equipment and supplies listed in the table below.

SUPPLIES NEEDED FOR ONE HEMOGLOBIN MEASUREMENT

Item	Description	Quantity
HemoCue Hb 201+ Analyzer		1
AC adaptor	If power is available	1
AA batteries	If no power is available	4
Microcuvette	Specific to HemoCue Hb 201+; individually wrapped	1
Soap or hand sanitizer	Antibacterial	1
Paper towel	Single-use, disposable	1
Gloves	Exam gloves; powder-free; non-sterile	1
Alcohol pads	Individually wrapped; can use cotton and alcohol	1
Lancet	Disposable; sterile	1
Newborns and preemies (0-6 months)	Quickheel Infant Lancet	
Infants and young children (< 8 years)	25 G x 1.4 mm	
Older children (≥ 8 years)	21 G x 1.8 mm	
Gauze	Sterile; lint-free; 2"x2"	1-2
Bandage	Small size; 1"x3"	1
Biohazard container		1

FINGER OR HEEL PRICK

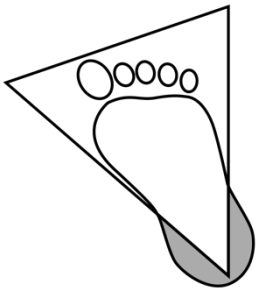
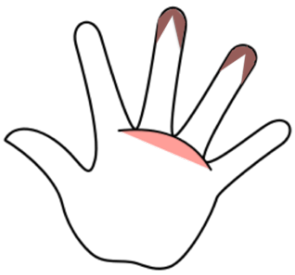
Selection of a site for capillary sampling in a child is usually based on the age and weight of the patient. If the child is walking, a finger prick is preferable because the child's feet may have calluses that hinder adequate blood flow.

The table below explains the conditions that influence the choice of heel or finger prick.

TIPS FOR OBTAINING A GOOD BLOOD SAMPLE

Keep the child warm to increase the rate of blood flow by removing as few of the child's clothes as possible and, in the case of an infant, by: swaddling in a blanket, and having the caregiver or nurse hold the infant, leaving only the extremity of the site of sampling exposed. Warm the area of puncture with warm cloths if needed to help dilate the blood vessels.

CONDITIONS INFLUENCING THE CHOICE OF HEEL OR FINGER PRICK

	Heel prick	Finger prick
Age	Birth to about 6 months	Over 6 months
Weight	From 3–10 kg, approximately	Greater than 10 kg
Placement of lancet	On the medial or lateral plantar surface 	On the side of the ball of the finger perpendicular to the lines of the fingerprint 
Recommended finger	Not applicable	Middle or ring finger. Avoid the thumb and index finger because of calluses. Avoid the little finger because the tissue is thin.

SELECTING A LANCET

In heel and finger pricks, the depth of the lancet should be selected based on the age of the child.

	Heel Prick		Finger Prick	
	Depth	Lancets	Depth	Lancets
Preemies < 6 months	< 1.2 mm	Pediatric, safety flow lancet	—	—
Infants < 6 months	< 2.4 mm	Pediatric, safety flow lancet 25 G x 1.4 mm	—	—
≥ 6 months and < 8 years	—	—	1.5 mm	25 G x 1.4 mm
≥ 8 years	—	—	2.4 mm	21 G x 1.8 mm

RECOMMENDED LANCETS AND DEPTH FOR HEEL AND FINGER PRICKS

PROCEDURE FOR MEASURING HEMOGLOBIN

The main steps for measuring hemoglobin are:

• Clean hands • Wear gloves	• Clean site • Apply lancet	• Collect blood • Measure hemoglobin

Use individually wrapped microcuvettes. If not available, immediately replace cap tightly when you remove a microcuvette from the vial, to avoid humidity damage to the remaining cuvettes. Be sure to check and track expiration dates.

(1) Wash your hands with soap and water and dry with
(2) single-use paper towel. Alternatively, sanitize your hands using hand sanitizer gel.

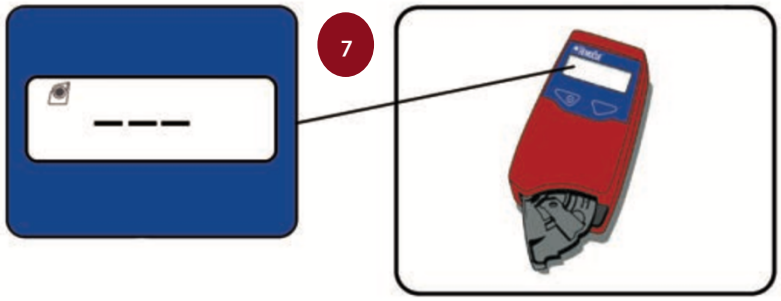
(3) Put on gloves.

(4) Assemble equipment and supplies.

(5) Immobilize the infant or child. You can use the help of the caregiver or another nurse to hold the baby while you complete the procedure.

(6) Warm the child as described in section above.

(7) Turn the photometer on using the switch in the back. The display screen should now read “Hb.”

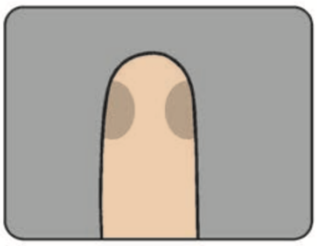


(8) Pull the black cuvette holder out to the insertion position, which will be noted by a distinct stop. After about 2 seconds the screen should read “READY” with three flashing dashes.

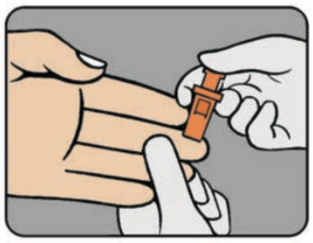
(9) Select the sampling site: heel, middle finger or ring finger.

(10) Wipe the sampling site (heel or finger) with an alcohol pad. Allow to completely air dry.

(11) Using your thumb, lightly press the finger from the top of the knuckle toward the tip. This stimulates the blood flow toward the sampling point.



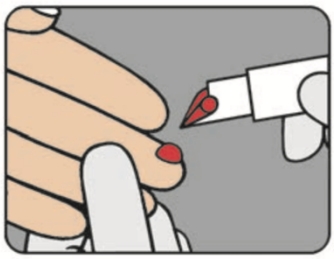
(12) For best blood flow and least pain sample at the side of the fingertip, not the center, and on the medial or lateral plantar surface of the heel.



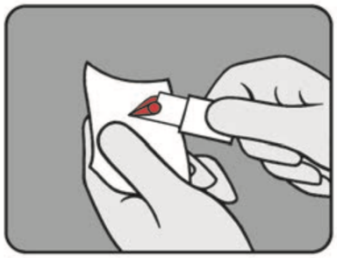
(13) While applying light pressure toward the fingertip or the heel, puncture the skin using the appropriate sterile lancet.

(14) Wipe away the first one to three drops of blood with sterile gauze.

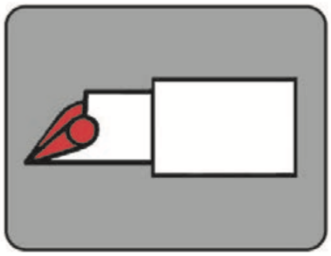
(15) Reapply light pressure toward the fingertip or heel until another drop of blood appears.



(16) Hold the microcuvette by the winged end. When the blood drop is large enough, introduce the cuvette tip into the middle of the drop of blood and fill the microcuvette completely in one continuous process.



(17) Wipe off any excess blood from the outside of the microcuvette with clean gauze. Make sure not to touch the open end of the microcuvette, which could cause blood to be drawn out of the microcuvette.



(18) Inspect filled microcuvette for air bubbles. If present, discard filled microcuvette in sharps container and fill a new microcuvette from a new drop of blood.

(19) Place the filled microcuvette in the cuvette holder.

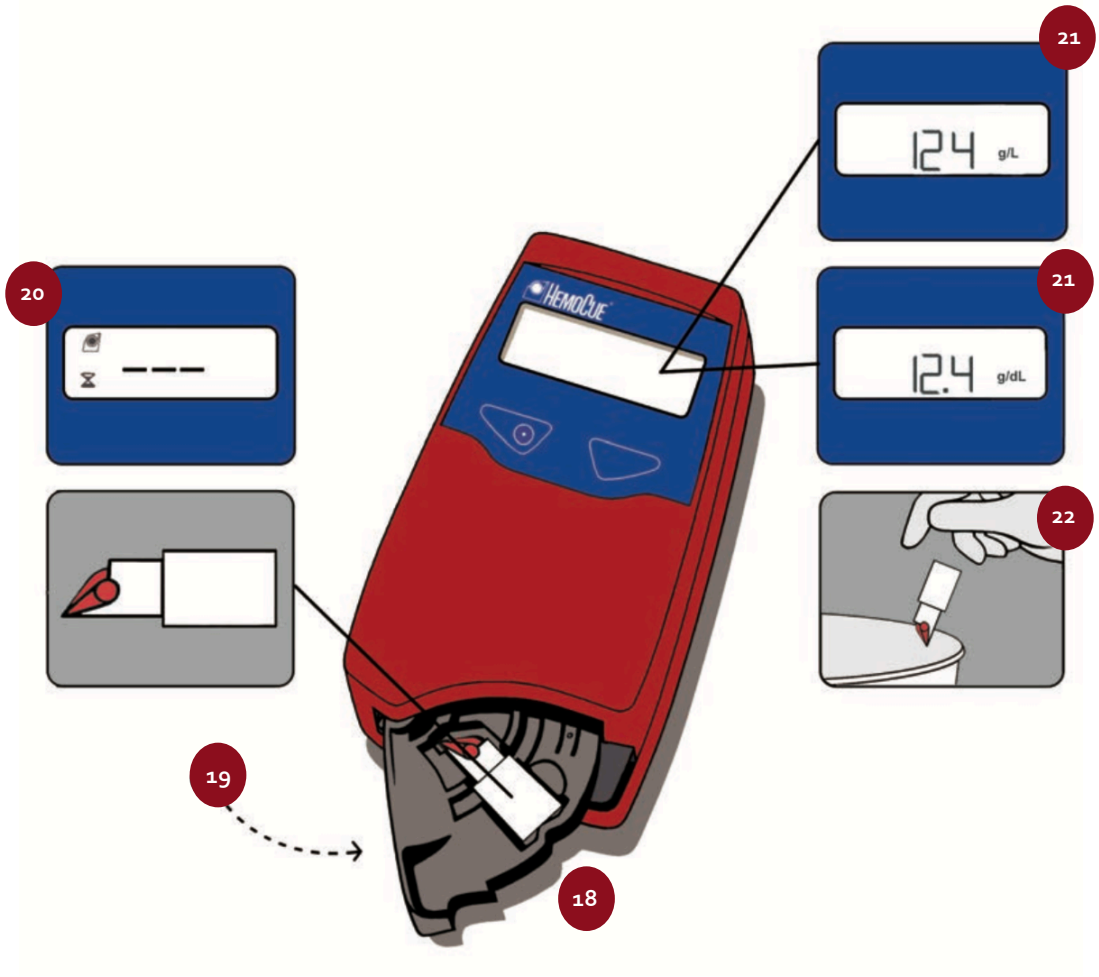
(20) Gently push the cuvette holder to the measuring position.

(21) The display shows an image of a sand timer plus three fixed dashes. The HemoCue is measuring.

(22) After 15 - 60 seconds, the hemoglobin value is displayed. The value will remain on the display as long as the cuvette holder is in the measuring position. While the HemoCue is measuring, apply gentle pressure to the sampling site to stop bleeding. If needed, apply a bandage.

(23) Dispose of the used supplies appropriately. Discard the filled microcuvette and the lancet in the sharps container.

(24) Take your gloves off. If you are measuring hemoglobin on another child, repeat steps 1 through 22. If you are done with measurements for the day, push the photometer power switch to "Power Off" position, clean the cuvette holder and store appropriately (see next section).



CLEANING THE HEMOCUE MACHINE

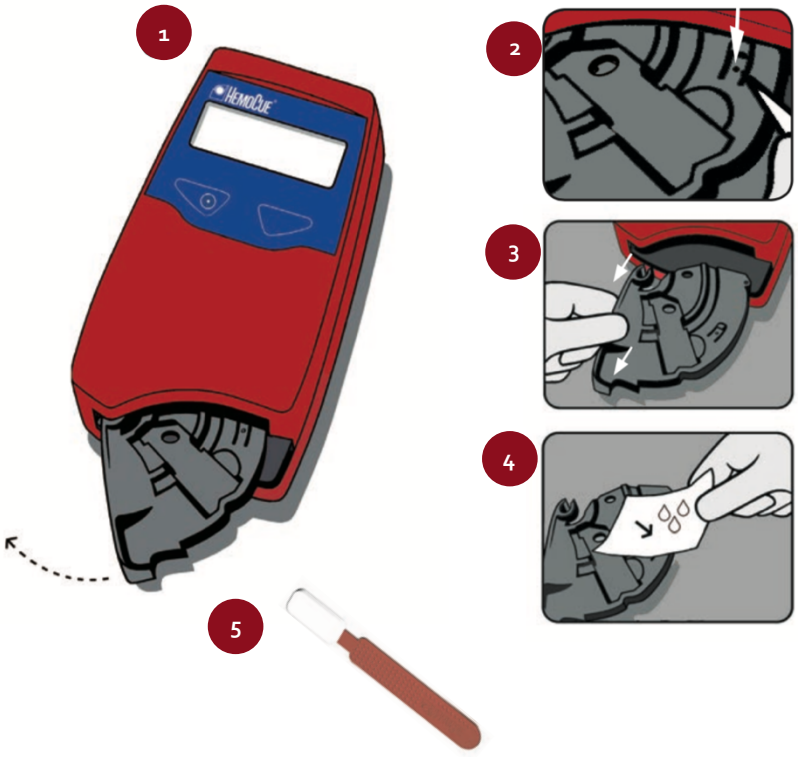
THE COVER

Clean the cover after each day of use with alcohol.

THE CUVETTE HOLDER

The cuvette holder should be cleaned after each day of use.

(1) Check that the analyzer is turned off. The display should be blank.
(2) Pull the cuvette holder out to its loading position. Carefully press the small catch located in the upper right corner of the cuvette holder.
(3) While pressing the catch, carefully rotate the cuvette holder toward the left as far as possible. Carefully pull the cuvette holder away from the analyzer.
(4) Clean the cuvette holder with alcohol. Allow cuvette holder to completely dry before replacing it.



THE OPTRONIC UNIT

The optronic unit should be cleaned in the following scenarios:

- Display shows error code E01-E05.
- Display shows error code E09-E30.
- Measurements are much higher or much lower than anticipated and you eliminated the following as causes: expired microcuvette, air bubbles or improper sampling technique.

To clean the optronic unit:

(1) Make sure the cuvette holder is removed, as explained above.
(2) Moisten a cotton tip swab with alcohol (without additives).
(3) Push the moistened swab into the opening of the cuvette holder (STEP 5 IN FIGURE ABOVE).
(4) Move from side to side 5-10 times. If the swab is stained, repeat with new swab. If the swab remains clean, no further cleaning is required (STEP 5 IN FIGURE ABOVE).
(5) Wait 15 minutes before replacing the cuvette holder and using the analyzer.

STORAGE OF HEMOCUE AND THE MICROCUVETTES

HEMOCUE ANALYZER

- Can be stored at 0-50 °C (32-122 °F).

- Operate at 15-30 °C (59-86 °F).
- Allow to reach room ambient temperature before use.
- Do not operate at high humidity.

INDIVIDUALLY PACKAGED CUVETTES

- Use these cuvettes whenever possible.
- The microcuvettes are stable until the date printed on each package.
- Use the microcuvettes prior to their expiration date.
- Do not refrigerate.
- Store at room temperature (15-30 °C, 59-86 °F).

MICROCUVETTES KEPT IN A VIAL

- Expiration date for microcuvettes in a sealed vial is printed on the vial.
- Once the seal is broken the microcuvette are stable for THREE MONTHS.
- Always keep container properly closed.
- Use the microcuvettes prior to their expiration date.
- Do not refrigerate.
- Store at room temperature (15-30 °C, 59-86 °F).

TROUBLESHOOTING

Refer to the TROUBLESHOOTING GUIDE in the HEMOCUE OPERATING MANUAL.

CHAPTER 9

DIARRHEA

DEFINITION

CAUSES

COMPLICATIONS

TREATMENT AND PREVENTION

FEEDING CONSIDERATIONS

DECISION TREE NO. 11: DIARRHEA

DECISION TREE NO. 12: DEHYDRATION

DECISION TREE NO. 13: ACUTE BLOODY DIARRHEA

DECISION TREE NO. 14: PERSISTENT DIARRHEA

DEFINITION

According to the World Health Organization, diarrhea:

- is the leading preventable cause of death in children younger than 5 years old.
- kills around 760, 000 children younger than 5 years old each year.
- is a leading cause of malnutrition in children younger than 5 years old.
- is often caused by poor water, sanitation and hygiene.
- is both preventable and treatable.

Diarrhea is defined by the passage of loose or liquid stools more frequently than normal for a child. There are different types of diarrhea:

- ACUTE: sudden onset and presence of more than three loose, watery stools within 24 hours for two days or longer.
- PERSISTENT: starts like acute diarrhea but lasts for 14 days or longer.
- CHRONIC: a diarrhea episode lasting for 28 days or longer, or multiple episodes with few weeks in between.
- BLOODY: usually acute diarrhea with presence of blood and mucus in the stools (also called dysentery).

CAUSES

Determining the cause of diarrhea can be difficult but is often done with the help of other symptoms such as fever, presence of blood in the stool or vomiting. Be sure to tell the pediatrician about all symptoms so treatment and prevention recommendations for the child can be made more easily.

COMMON CAUSES OF ACUTE DIARRHEA

- Gastrointestinal infection by bacteria, virus or parasite (may cause bloody diarrhea)
- Non-gastrointestinal infection: diarrhea associated with ear infection, pneumonia or urinary tract infection
- Medication side effects (common with antibiotics)
- Food intolerance (e.g., milk)

COMMON CAUSES OF CHRONIC DIARRHEA

- Food intolerance or food allergy (e.g., milk)
- Formula intolerance
- Improper formula preparation
- Gastrointestinal disease (e.g., short bowel syndrome, celiac disease, Crohn's disease, ulcerative colitis)
- HIV/AIDS and other immune deficiencies
- Micronutrient deficiency (e.g., zinc deficiency can be both a cause and a complication of chronic diarrhea)

PEOPLE ARE AT RISK FOR DIARRHEA BECAUSE THEY:

- may lack access to a safe water source.
- may live in a building or community with poor sanitation infrastructure.
- rely on caregivers, cooks and other adults to practice good hygiene.
- live in close quarters with other people.

COMPLICATIONS

DEHYDRATION

Dehydration is the loss of water and salt from the body, which is a common result of diarrhea. It should be treated through fluid and electrolyte replacement as soon as possible. Generally, dehydration occurs faster in infants and young children, in hot climates and when there is fever present.

SIGNS OF DEHYDRATION INCLUDE

- restlessness or irritability
- abnormally sleepy or lethargic
- sunken eyes
- lack of tears or dry mucous membranes
- lack of wet diapers in infants
- lack of urine or small amount of dark yellow urine in older children
- poor skin turgor (tension): when the skin over the abdomen is pinched and released, it goes down slowly
- drinks eagerly or drinks poorly (or not at all)
- sunken fontanel (the soft spot on the top of an infant's head)

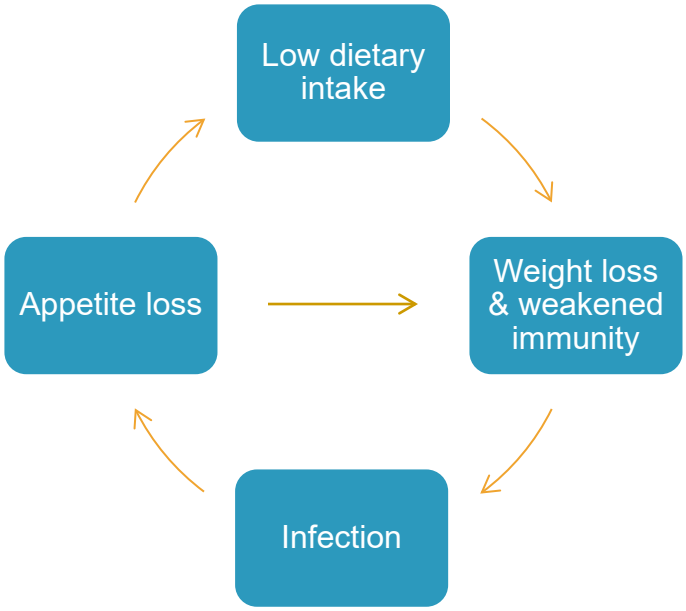
Severe dehydration may require the use of intravenous solution and can cause death if not treated. Refer the child to the hospital immediately if the child has severe dehydration.

MALNUTRITION

Diarrhea can cause malnutrition or make it worse because:

- a child with diarrhea may not be hungry.
- nutrients are lost from the body in diarrhea.
- zinc, an important mineral for the child's health and development, is lost in greater quantity during diarrhea.

Infection and malnutrition may occur as a cycle: diarrheal illness increases the risk for malnutrition and malnutrition increases the risk for illness. Diarrhea combined with malnutrition can weaken a child's immune system and put them at risk for other illnesses.



TREATMENT

In order for an appropriate treatment plan to be developed and implemented promptly, a child with diarrhea should be assessed for:

- dehydration
- bloody diarrhea
- persistent diarrhea
- malnutrition
- fever
- serious non-intestinal infections

To treat diarrhea, follow these important recommendations:

- If an infant is breastfed, offer breastfeeding more frequently.
- Prevent dehydration from occurring if possible.
- If dehydration occurs, treat quickly using appropriate fluids and/or oral rehydration solution. Appropriate fluids to give a child with diarrhea and the recommended oral rehydration solution amounts are described in the tables below.
- Give zinc supplements for 14 days to reduce the severity of the episode and to reduce the incidence of diarrhea episodes in the following 2 to 3 months.
- Continue feeding during the episode, and increase feeding after the episode.
- Use antibiotics only when appropriate, e.g. in the presence of bloody diarrhea.
- Abstain from administering anti-diarrheal drugs.

Refer to Decision-Tree No. 13 (Acute Bloody Diarrhea) and Decision-Tree No. 14 (Persistent Diarrhea) for recommended treatment.

Refer to Decision-Tree #12 (Dehydration) for appropriate treatment of dehydration.

Zinc dosage by age

- Infants younger than 6 months old,10 mg per day
- Children 6 months and older, 20 mg per day

✓ Good liquids without salt	...with salt	✗ Do not give
• Clean water • Unsalted rice water • Unsalted yogurt drink • Green coconut water • Unsweetened fresh fruit juice	• Salted soup • Salted rice water • Salted yogurt drink • Oral rehydration solution (ORS)	• Soft drinks • Sweetened tea • Sweetened fruit drinks • Coffee • Local medicinal tea

What fluids?

- If an infant is breastfed, offer breastfeeding more frequently
- If an infant is formula-fed, give ORS or clean water in addition to formula.
- If an infant is not exclusively receiving formula, give ORS and/or other good liquids.

How much?

- Age < 2 years: 50-100 ml (1/4 large cup) of fluid after each loose stool.
- Age 2-5 years: 100-200 ml (1/2-1 large cup) of fluid after each loose stool.
- Age > 5 years: As much as they want.

RECOMMENDED FLUIDS TO GIVE A CHILD WITH DIARRHEA

ORAL REHYDRATION SOLUTION OR SALTS (ORS)

Oral rehydration solution is a water, sugar and salt solution that is used to help treat and prevent dehydration, especially dehydration related to diarrhea. You can provide ORS in addition to zinc supplementation for treatment of diarrhea.

Age	< 4 months	4 – 11 months	1 – 2 years	2 – 5 years
Weight	< 6 kg	6 – 9.9 kg	10 – 11.9 kg	12 – 19 kg
Amount of ORS	200-400 ml	400-700 ml	700-900 ml	900-1400 ml

ORAL REHYDRATION SOLUTION (ORS) RECIPE

If available, it is recommended to purchase premade packets of oral rehydration solution and prepare as directed on the label. Premade packets of ORS contain additional nutrients to help during episodes of diarrhea, vomiting and dehydration. If unavailable, prepare ORS using the following recipe:

Amount of for making a 1 liter ORS solution using sugar, salt and water

(1) Clean water: 1 liter or ~4 1/4 cups (each cup about 240 ml)
(2) Sugar: 25.2 grams (6 level teaspoons)
(3) Salt: 2.1 grams (half level teaspoon)

Stir the mixture till the sugar dissolves and offer small frequent amounts to children suffering from dehydration related to vomiting or diarrhea. Make fresh ORS in each 24-hour period.

FEEDING CONSIDERATIONS

Proper nutrition is important for replacing nutrients and fluids lost during the episode of diarrhea. Some foods improve symptoms while others worsen diarrhea or prolong recovery time. If the child's symptoms get worse after eating a specific food, you should stop offering it until the child recovers.

It is important to:

- not be too restrictive in the foods you offer the child.
- offer a variety of foods that are nutrient-dense (high amount of calories and nutrients relative to volume) and easily digested.
- return to a normal diet as soon as possible.

TIPS FOR IMPROVING NUTRIENT INTAKE

Infants (exclusively breastfed):

- Offer more frequent breast feedings.

Infants (exclusively formula-fed):

- Offer more frequent bottle feedings.
- Special formulas or dilutions are not necessary.

Children (≥ 1 Year)

- Offer fluids more frequently, especially breast milk if appropriate.
- Offer only water between meals. Juice, milk and other drinks should be offered with a meal or snack.
- Provide frequent, small meals throughout the day (3 meals and 2 snacks).
- Give a multivitamin or food supplement as prescribed by doctor.
- Give a probiotic supplement (live good bacteria) as prescribed by doctor.

LIST OF FOODS THAT CAN HELP OR WORSEN DIARRHEA

✓ Do give	✗ Do not give
Breast milk if child still breastfeeds or formula if formula-fed Dairy • Dairy • Soy milk • Yogurt • Powdered milk • Cheese • Buttermilk • Evaporated, skim and low-fat milk Grains • White flour • Bread, crackers • Pasta made from white flour • Cooked cereals (cold/ hot) made from white flour • White rice Fruits/vegetables • Ripe bananas • Melons • Canned soft fruits • Well-cooked vegetables, no seeds or skins • Cooked potatoes without skin • Lettuce Protein • Tender, well-cooked meat • Poultry, fish, eggs or soy foods • Smooth nut butters Fats (limited amounts) • Cooking oils and fats • Butter or margarine	Dairy (if symptoms worsen) • Whole milk • Sour cream • Ice cream Grains • Whole wheat or whole grain breads, rolls, crackers, pasta or cereals • Breads or cereals made with seeds or nuts • Brown or wild rice • Barley, oats and other whole grains Fruits and vegetables • All raw fruits and vegetables, except banana, melons and lettuce • Fried vegetables • Potato skins • Dried fruits, including prunes and raisins • Canned juice, especially with pulp • Canned fruit in heavy syrup Protein • Fried meat, poultry or fish • Fatty meats and meat with skin • Nuts • Chunky nut butters Other • Spicy food • Sugary foods and drinks

PREVENTION

Diarrhea can be prevented through:

- SAFE WATER. Use safe water for all drinking, washing and food preparation.
- HAND WASHING, sanitation and hygiene. Practice regular hand washing and employ proper sanitation and hygiene practices.
- SAFE FOOD. Ensure food is prepared and handled safely.
- VACCINES. Vaccinate infants against measles at the recommended age. Measles vaccination can substantially reduce the incidence and severity of diarrheal diseases.

Chapter 4 Hygiene and Sanitation provides additional information on ways to prevent diarrhea.

CHAPTER 10

CONSTIPATION

- DEFINITION
- CAUSES
- SIGNS AND SYMPTOMS
- TREATMENT AND PREVENTION

DEFINITION

Constipation is defined as:

- the presence of hard, dry stool (may look like small pebbles), or
- a stool frequency of less than three times per week, given that this is a change from normal.

In healthy children, the number of bowel movements changes with age and diet. Newborns may average several bowel movements a day. By the age of 4 years, a child may average one bowel movement a day.

CAUSES

Constipation in children is generally caused by:

- inadequate fluid intake
- inadequate fiber intake
- lack of routine toileting habits
- forced toilet training
- avoidance of bowel movements because of pain
- postponing going to the bathroom when the urge to have a bowel movement is felt
- stressful events

In addition, CHILDREN WITH DISABILITIES are particularly at risk for constipation. They may experience constipation because of:

- decreased activity
- abnormal anatomy of the intestines
- abnormal muscle tone
- inability to attain an upright position for toileting
- certain medications
- inability to communicate needs
- excessive fluid losses due to constant drooling, chronic vomiting or fever
- malnutrition

SIGNS AND SYMPTOMS

A child may have constipation if he or she has:

- abdominal pain
- bloating
- decreased oral intake
- irritability
- pain, cramping and/or straining with passing stools

TREATMENT AND PREVENTION

Call the pediatrician if the child has:

- constipation symptoms that last for more than two weeks
- blood in or on the stool, diarrhea, fever or vomiting
- recurrent constipation
- constipation that interferes with daily activities
- soiling of underclothes

In most cases, constipation lasts for a short time and is not serious. There are a number of ways to help a child avoid constipation.

DIETARY CONSIDERATIONS

Eat / Drink More	Avoid / Limit
• Fiber (vegetables, fruits, whole grains, beans and legumes) • Water • Clear soups • Vegetable juice and fruit juice (prune, pear and apple juice). Juice indications by age: • Age < 6 months, no juice • Age 6-12 months, limited and not before bedtime • Age 1 to 6 years, < 120-180 ml (4-6 ounces) of juice per day • Age 7 to 18 years, < 24-360 ml (8 to 12 ounces) per day	• Foods that have little or no fiber such as ice cream, cheese and meat • High-sugar foods • High-fat foods • Too much fruit juice • Processed or packaged foods • Caffeine (soft drinks)

ENCOURAGE CHILD TO BE MORE ACTIVE

- Encourage regular daily activity of at least 60 MINUTES.

CREATE A REGULAR BOWEL MOVEMENT SCHEDULE

- Set up regular times for going to the toilet (after meals, particularly breakfast or dinner).
- Allow the child enough time to have a bowel movement.
- Remind the child or ask if he or she needs to go to the bathroom during scheduled times.
- Tell the child to listen to his or her body when the urge arises to have a bowel movement.

MEDICATIONS

- The short-term use of medications, such as laxatives, may help return the child to his or her normal bowel movement pattern. Use as recommended by a doctor.

CHAPTER 11

FEVER

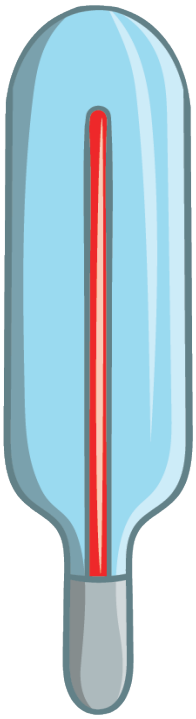
DEFINITION

CAUSES

TREATMENT

WHEN TO CALL ABOUT A FEVER

DECISION TREE NO. 9: FEVER



DEFINITION

A fever is a sign of a variety of illnesses, including infections. To determine whether fever is present, an accurate body temperature is needed. Temperature can be taken using the mouth (oral), anus (rectal), armpit (axillary) or ear (tympanic). Rectal temperature is the most accurate for checking a young child's temperature.

Temperature site	°C	°F
Rectal (in the bottom)	> 38	> 100.4
Tympanic (inside the ear)	> 38	> 100.4
Oral (in the mouth)	> 37.5	> 99.5
Axillary (under the armpit)	> 37.2	> 99

Normal temperature is usually highest in the evening. Temperature increases because of the following;

- Physical activity
- Eating
- Medications
- High humidity
- Strong emotion
- Heavy clothing
- High room temperature

CAUSES

It is normal for healthy children to have a low-grade fever:

- AFTER IMMUNIZATIONS (fever may last for 1-2 days after vaccinations)
- WHEN TEETHING (temperature is usually not higher than 37.8°C/100 °F)

A fever may signal one of the following:

- Infections
  - Pneumonia
  - Respiratory infections (bronchitis, sinus infections, mononucleosis)
  - Gastrointestinal infections
  - Meningitis
  - Appendicitis
  - Ear infections
  - Tuberculosis
  - Cold or /flu illness
- Urinary tract infections
- Autoimmune or inflammatory disorders
- Gastrointestinal disorders
- Cancer (fever is generally the first symptom)
- Some medications (antibiotics, antihistamines, seizure medicine)

Some serious infections may cause no fever or even a very low body temperature, especially in infants.

TREATMENT

Not all fevers need to be treated. A fever should be treated only if it is causing a child discomfort (vomiting, dehydration or not sleeping well). The goal is to lower, not eliminate, the fever.

If the fever is mild and no other problems exist, fluids and rest should be enough.

TO LOWER A FEVER

- DO NOT bundle up the child if they have the chills.
- Dress the child with lightweight clothing and cover with a thin blanket.
- The room should be at a comfortable temperature, not too hot or cool.
- DO NOT use cold baths, ice, or alcohol rubs. They cause chills that raise body temperature.
- DO NOT give medication to children younger than 2 years unless prescribed by their doctor.
- Make sure the child gets plenty of rest.

EATING AND DRINKING WITH FEVER

- Offer the child plenty of fluids like water and soups.
- If the child has diarrhea and/or vomiting, offer an oral rehydration solution if needed.
- Limit amount of fruit juice.
- Avoid sugary drinks.
- Do not force feed.
- Offer small frequent meals (every 3-4 hours) if appetite is low.

WHEN TO CALL ABOUT A FEVER

The temperature that should trigger a call to a doctor depends on the age of the child, the illness and whether there are other symptoms with the fever.

For older kids, take behavior and activity level into account. The illness is probably not serious if the child:

- is still interested in playing.
- is eating and drinking well.
- is alert and smiling at you.
- has a normal skin color.
- looks healthy when his or her temperature comes down.

Age	Rectal Temperature*	What to do
0-3 months	> 38 °C (100.4 °F)	Call the doctor, even if child doesn't have other symptoms
3-6 months	38-39 °C (100.4-102.2 °F)	Call doctor if child seems unusually irritable, uncomfortable or lethargic
> 3 months	> 39 °C (102.2 °F)	Call doctor
≤ 2 years	Any fever that lasts longer than 24-48 hours	Call doctor
> 2 years	Any fever that lasts longer than 48-72 hours	Call doctor
Any age	Recurrent fever for > 1 week	Call doctor

*Adjust if temperature is taken orally or under the armpit.

CALL THE DOCTOR IMMEDIATELY IF THE CHILD HAS A FEVER AND:

- other symptoms (sore throat, earache or cough).
- a chronic medical condition (heart problem, sickle cell anemia, diabetes or cystic fibrosis).
- a rash.
- pain with urination.
- persistent diarrhea.
- repeated vomiting.
- any signs of dehydration (no tears when crying, urinating less than usual, less active and less alert than usual).

REFER CHILD TO A HOSPITAL FOR EMERGENCY OR A DOCTOR IMMEDIATELY IF THE CHILD HAS A FEVER AND:

- is crying and cannot be calmed down.
- cannot be awakened easily or at all.
- seems confused.
- cannot walk.
- difficulty breathing, even after the nose is cleared.
- blue lips, tongue or nails.
- a very bad headache.
- a stiff neck.
- refuses to move an arm or leg.
- a seizure.
- abdominal pain.

CHAPTER 12

NAUSEA AND VOMITING

DEFINITION

CAUSES

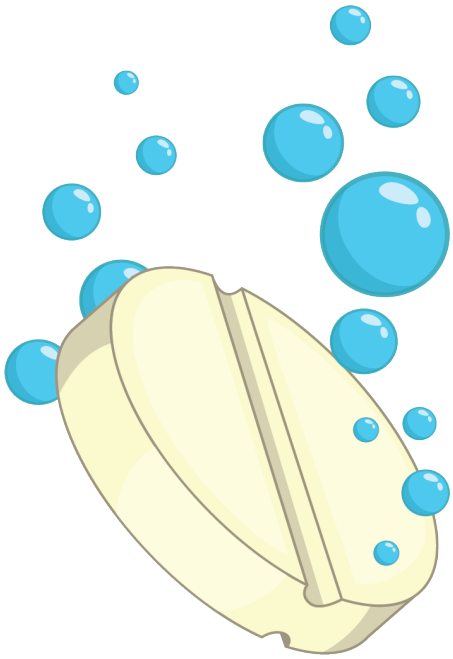
COMPLICATIONS

TREATMENT

SPITTING UP VERSUS VOMITING

DECISION TREE NO. 12: DEHYDRATION

DECISION TREE NO. 15: VOMITING



DEFINITION

- NAUSEA is an uneasy or unsettled feeling in the stomach combined with an urge to vomit.
- VOMITING, or throwing up, is the forcible voluntary or involuntary emptying of stomach contents through the mouth.

CAUSES

Nausea and vomiting are not diseases. They can be symptoms of a variety of conditions, such as:

- gastrointestinal viral infection, also called gastroenteritis or "stomach flu."
- gastrointestinal bacterial infections and parasites.
- migraine headaches.
- motion sickness.
- food poisoning.
- medications.
- cancer chemotherapy.
- head trauma or brain injury.

Gastrointestinal viral infection is the most common cause of vomiting.

Depending on the cause, vomiting may be accompanied by diarrhea and fever.

COMPLICATIONS

Infants and children are at a great risk for losing substantial amount of fluids with vomiting, especially if the vomiting lasts for more than 24 hours and is accompanied by diarrhea. This can lead to dehydration.

Dehydration can be life threatening if untreated. Refer child to the doctor or hospital immediately if the child has severe dehydration.

WATCH FOR THE FOLLOWING SIGNS OF DEHYDRATION

- Dry mouth
- Few or no tears when crying
- Fussiness, irritability
- Fewer than four wet diapers in 24 hours
- Reduced frequency of urination and amount of urine at urination
- Fatigue, drowsiness, excessive sleepiness
- Disorientation, confusion
- Deep, rapid breathing
- Rapid heartbeat

TREATMENT

Nausea and vomiting are common and are usually not serious. Because vomiting is a symptom rather than a condition, treatment depends on the underlying cause. Regardless of the underlying cause, there are a few things that can help the child recover quickly. Fluids

- Offer children suffering from vomiting plenty of fluids to replenish water loss from the body.

SOLID FOODS

- DO NOT offer the child solid food if he or she is vomiting.
- Offer frozen juice or ice chips to help soothe the child.
- If the child asks for food and has not vomited for an hour or more, give plain crackers, plain cookies or toast, or rice cereal.
- Do not re-offer solid foods until vomiting has stopped for at least six hours.
- After vomiting has stopped, gradually work back to a normal diet.

SEE A DOCTOR OR GO TO A HOSPITAL IMMEDIATELY IF YOU SUSPECT FOOD POISONING OR IF THE CHILD:

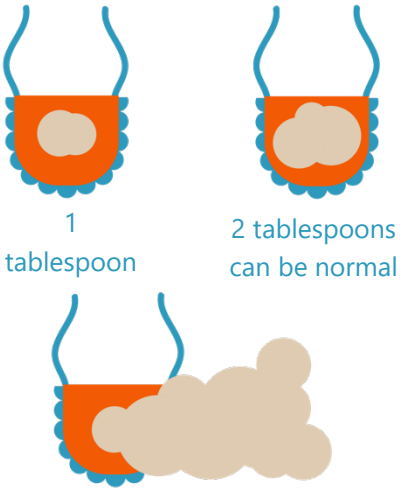
- has vomited for longer than 24 hours.
- starts vomiting again once he or she has resumed a normal diet.
- has blood in the vomit.
- vomits a substance that looks like coffee grounds or yellowish or greenish fluid.
- has severe abdominal pain.
- has a headache and stiff neck.
- has signs of severe dehydration (see above).
- develops a fever after vomiting (temperature over 38 °C or 100.4 °F).
- vomits after hurting his or her head.

Refer **to** Decision Tree No. 15 (Vomiting) and Decision Tree No. 12 (Dehydration) for appropriate treatment plan.

- Avoid giving plain water to an infant younger than 12 months. Breast milk is the best source of hydration for children of that age.
- Offer infants younger than 24 months breast milk or formula for those younger than12 months to replenish water loss. Consult a pediatrician for other possible fluids or home remedies that may be given to infants, what amounts and how often.
- Offer clear fluids such as water, gelatin (like Jell-O) or broth.
- DO NOT force the child to drink, but offer small amounts of fluids often.
- Offer fluids in very small amounts: 15 to 30 ml (1 to 2 tablespoons) every 5 to 15 minutes for 30 to 60 minutes. If the fluid is vomited, reduce the amount given each time to 5 ml (1 teaspoon).

SPITTING UP VERSUS VOMITING

Spitting up is NOT vomiting. Spitting up is normal during the infant's early months until about the time he or she can eat solid foods (usually around 6 months to 12 months). It rarely involves choking, coughing or pain. Infants usually do not notice when they spit up. In contrast, vomiting is forceful and painful. Sometimes, infants have a number of symptoms in addition to spitting up, which may indicate a problem called GASTROESOPHAGEAL REFLUX DISEASE, or just "reflux."



INFANTS SPIT UP WHEN THEY:

- burp
- drool
- have eaten too much
- have swallowed too much air while feeding
- have a formula intolerance
- have lactose intolerance or a milk allergy

CONTACT THE PEDIATRICIAN IF YOU NOTICE THE INFANT:

- has no weight gain.
- refuses feedings repeatedly.
- is spitting up a large amount of breast milk or formula (more than 15 to 30 ml (1 or 2 tablespoons)).
- is spitting up or vomiting forcefully.
- has fewer wet diapers than normal.
- is very tired or lethargic.
- has green or brown spit-up.
- has difficulty breathing or other signs of illness.

It is easy to overestimate the amount an infant has spit up based on the size of a spit-up stain. 15 to 30 milliliters is normal but may look like a lot.

Do not feed thickened formula in a bottle. Consult with doctor before thickening formula.

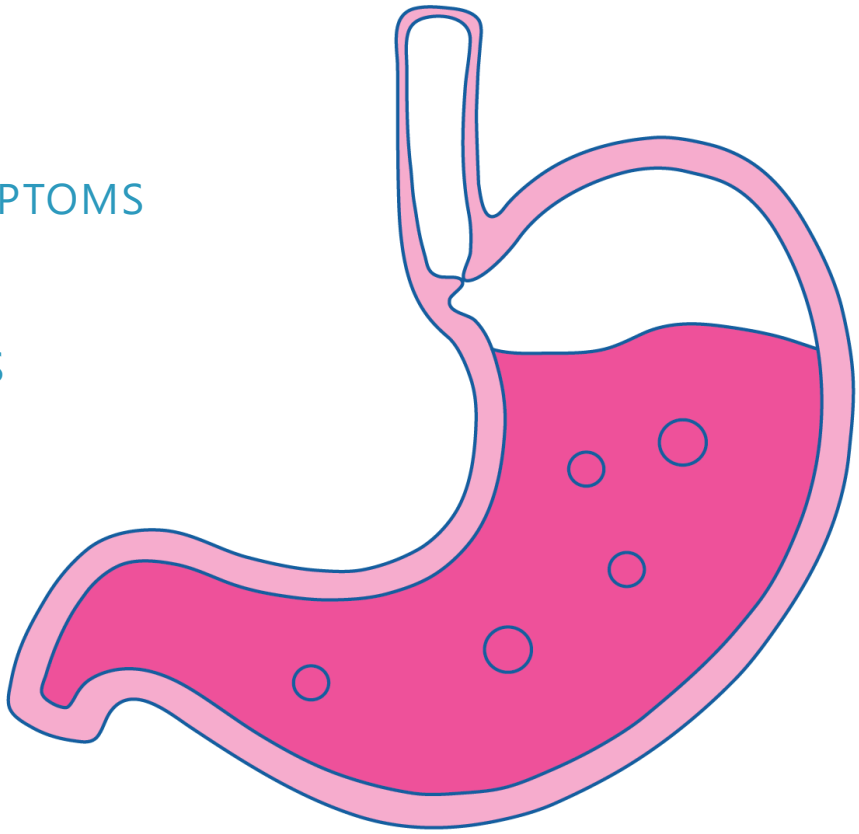
TIPS FOR REDUCING SPITTING UP

- Feed the infant in an upright position.
- Burp an infant several times during and after feeding.
- If formula feeding, make sure the hole in the nipple on the bottle is not too large, or milk will come out too fast.
- Avoid laying the infant down following a feeding or moving him around too much before the food settles in the stomach.
- Give small, frequent feedings.
- If you see no improvements, try the following:
  - change type of formula.
  - For infants 4 to 6 months and older, spoon-feed formula thickened with rice cereal (4 to 8 grams (2 to 3 teaspoons) of rice cereal to each ounce or 30 ml of formula.

CHAPTER 13

GASTROESOPHAGEAL REFLUX DISEASE

- DEFINITION
- CAUSES
- SIGNS AND SYMPTOMS
- COMPLICATIONS
- TREATMENT



DEFINITION

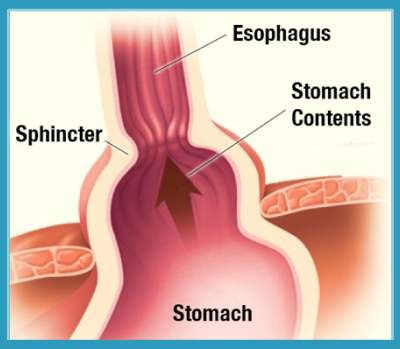
Gastroesophageal Reflux Disease (GERD) is a condition in which the contents of the stomach flow back into the esophagus and/or throat. Children typically outgrow GERD by 12 to 18 months without developing any medical complications.

Many infants regurgitate a small amount of milk occasionally, especially when burping after meals. This spitting up is normal.

CAUSES

The following can cause reflux:

- the SPHINCTER or MUSCLE RING separating the stomach and esophagus does not work properly
- low muscle tone
- inability to tolerate a normal volume in the stomach
- over-stimulating environment
- allergy to components of the diet
- receiving medication that causes nausea
- bending over
- breathing hard
- wearing tight clothes
- overeating or overfeeding
- eating spicy, fatty or acidic foods
- an immature digestive system (infants)



The muscle ring or sphincter normally opens to allow swallowing, belching and vomiting and then closes immediately. If the muscle ring stays relaxed or relaxes periodically, the food and stomach acid can escape back into the esophagus.

SIGNS AND SYMPTOMS

Inform the doctor if a child has one or more of the following symptoms:

- vomits liquid and food during or after a meal
- spits up, chokes or coughs frequently during or after meals
- has difficulty breathing during or after a meal
- cries and becomes irritable during feeding
- seems uncomfortable or distressed during feeding
- stops eating after consuming only a small amount of food
- refuses to eat
- has a history of repeated upper respiratory infections and pneumonia
- wakes up frequently at night
- makes “wet burp" or "wet hiccup" sounds

COMPLICATIONS

If poorly controlled, GERD can result in several complications:

- POOR GROWTH. A child may vomit frequently and eat an inadequate quantity of food to support weight gain.
- HEARTBURN. A burning sensation and pain in the chest.
- INFLAMMATION OF THE ESOPHAGUS. Redness, swelling and pain in the esophagus causing poor appetite. Severe inflammation can lead to bleeding and difficulty swallowing.
- RESPIRATORY ISSUES. Stomach contents may enter the nose, windpipe or lungs (aspiration) leading to recurrent breathing problems such as wheezing or pneumonia and sinus infections.
- DENTAL PROBLEMS. Stomach acid can melt tooth enamel leading to tooth decay and enamel erosion.

TREATMENT

In children, lifestyle and dietary strategies should be tried before medical treatment is used. Some suggestions are:

Do	Do Not
• Offer breastfeeding more frequently • Offer small, frequent meals • Offer foods high in protein • Thicken liquid with cereal* • Offer a diet rich in fruits and vegetables • Offer gum (for older children) or a safe, non-food item to produce saliva that helps neutralize acid in esophagus • Offer food for at least 2 hours before bedtime • Create a calm, low-stress feeding environment • Clothe the infant or child in loose clothing around the abdomen • Position child upright for at least 30 minutes after meals • Position child to sleep on left side to take pressure off the stomach • Raise the bed at an angle using blocks at the head of the bed or pillow to elevate the top half of the child's body • Exercises that strengthen the abdominal muscles**	• Overfeed • Force infants and children to eat • Offer foods that cause allergy • Offer acidic vegetables and fruits such as oranges, lemons, grapefruit, pineapple and tomatoes • Offer chocolate, soda, tea, coffee and peppermint • Offer bedtime snacks • Offer nonsteroidal anti-inflammatory drugs such as aspirin, ibuprofen (Motrin, Advil) or naproxen (Aleve) • Offer Tylenol (acetaminophen) for pain when needed* * Consult with doctor ** Consult with physical or occupational therapist

MEDICATION

Medications can be given to increase the speed in which the stomach empties after feeding and to relieve heartburn.

TUBE FEEDING

If lack of weight gain and/or eating problem is severe, alternate methods of feeding can be used. The esophagus can be bypassed and food introduced directly into the stomach. This is usually the last form of treatment.

CHAPTER 14

FOOD ALLERGY AND INTOLERANCE

DEFINITION

CAUSES

SIGNS AND SYMPTOMS

DIAGNOSIS

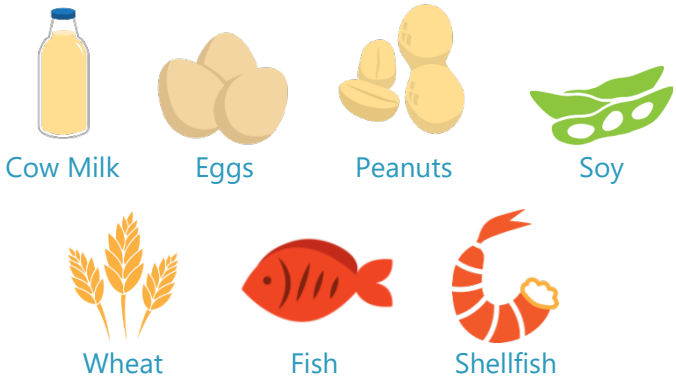
FEEDING CONSIDERATIONS

DEFINITION

A food allergy is an incorrect response by the immune system to a food that causes the body to act as though that particular food is harmful. The body's immune system creates antibodies to fight the food allergen. Allergies usually occur early in life, when the immune and digestive systems are not mature.

CAUSES

BELOW ARE THE MOST COMMON FOOD ALLERGIES IN CHILDREN



WHEAT PRODUCTS

include semolina, cracked wheat or bulgur, wheat bran, durum, many ready-to-eat cereals, pasta, roti, chapatti, most packaged baked products and some noodles.

Some children are allergic to food additives in packaged food products, such as food dye and artificial sweeteners, but these are less common.

WHO IS AFFECTED BY FOOD ALLERGIES?

The tendency to develop allergies is most commonly genetic. However, a child usually does not inherit a particular allergy, just the likelihood of having allergies. A child who is allergic to one food is likely to be allergic to others as well. Whenever possible, obtain information on the presence of food allergies or conditions such as eczema and asthma in the child's biological family. Breastfeeding can help to prevent allergies.

SIGNS AND SYMPTOMS

Allergic reactions can occur within a few minutes or up to a few hours after contact with the food. They can cause mild to severe symptoms and can affect many body systems.

SYMPTOMS OF FOOD ALLERGIES

Body System	Symptoms
Skin (Most common)	• Itchy red bumps (hives) • Eczema • Redness and swelling of the face or extremities • Itching and swelling of the lips, tongue or mouth
Gastrointestinal tract	• Abdominal pain • Nausea and/or vomiting • Diarrhea
Respiratory tract	• Runny or stuffy nose • Sneezing or coughing • Wheezing or shortness of breath • Anaphylactic shock (life-threatening)
Cardiovascular system	• Lightheadedness or fainting
Other	• Sense of uneasiness or nervousness • Headache • Feeling feverish

ANAPHYLACTIC SHOCK

is a rare, immediate and potentially life-threatening allergic reaction with widespread effects on the body. Anaphylactic shock is often accompanied by:

- swelling of the airway
- serious difficulty with breathing
- a drop in blood pressure
- loss of consciousness
- in some cases, death

FOOD ALLERGY VS. FOOD INTOLERANCE

Food allergy is completely different from food intolerance. However, there can be some overlap between food allergy and intolerance symptoms.

DIFFERENCES BETWEEN FOOD ALLERGY AND FOOD INTOLERANCE

	Food Allergy	Food Intolerance
Onset of symptoms	• Sudden	• Gradual
Symptoms triggered by	• Small amount of food	• May happen when you eat a lot of the food
Frequency of symptoms	• Every time you eat the food	• May happen if you eat the food often
Life-threatening?	• Can be	• No
Immune system involved?	• Yes	• No
Symptoms	• Rash, hives or itchy skin • Shortness of breath • Chest pain • Sudden drop in blood pressure, trouble swallowing • Nausea • Stomach pain	• Gas, cramps or bloating • Heartburn • Headaches • Irritability or nervousness • Diarrhea • Vomiting

DIAGNOSIS

If you suspect a child has a food allergy, contact a nurse or doctor. Do not diagnose an allergy yourself but note the child's symptoms, how often the reaction occurs and the time it takes between eating a particular food and the start of the first symptoms. Avoid suspected food but do not eliminate it without a confirmed diagnosis or unless recommended by the doctor. Otherwise, the child might lack nutrients needed to grow and stay healthy.

A FOOD ALLERGY CAN BE DIAGNOSED THROUGH:

- a skin-prick test
- serum specific IgE testing
- a medically supervised oral challenge

IMPORTANT!

There is no cure for food allergies. Avoiding the allergen is the only way to avoid the symptoms. Consult with a doctor about prescriptions that may be appropriate to mitigate effects of exposure to aller

FEEDING CONSIDERATIONS

INTRODUCTION OF NEW FOODS

Introduce new foods into the child's diet one at a time. Wait one week to see whether a new food causes a reaction before introducing other foods. Sudden or severe reactions to foods will be obvious,

but more subtle symptoms such as diarrhea, skin rash/eczema, vomiting, respiratory difficulties, bloating and hives may take time to present.

FEEDING A CHILD WITH FOOD ALLERGIES

Delaying giving infants certain solid foods (e.g. fish, eggs, peanuts) does not prevent food allergies.

- Avoid offering the allergenic foods.
- Read the ingredient list on packaged food labels to find out if the food has the allergen. Counsel caregivers and cooks on dietary restrictions and train them on how to identify foods that contain the allergen.
- Prepare meals on clean surfaces and with utensils that have not been exposed to allergenic foods.
- Teach older children:
  - about foods they are allergic to.
  - why it is important to avoid them.
  - how to identify them on their plate and on a food label.
  - how to ask about ingredients in a meal before eating so they can be aware of potential allergens.
  - why sharing food with other people can be risky –another person's meal may contain the allergenic food.
  - what to do if they have symptoms of an allergic reaction.
- Find out what foods can be a substitute for the allergenic food so that the child does not miss any important nutrients. Choose foods from the same food group.
- Try to create meals everyone can eat (that do not contain the allergenic food).

REINTRODUCING ALLERGENIC FOODS

If the child has a food allergy, you should only consider reintroducing those foods under a doctor's supervision. This is done through a food challenge during which an allergenic food is reintroduced into the diet and the child is closely monitored for allergy symptoms. Although children may outgrow some food allergies, this often depends on the severity of the initial reaction.

CHAPTER 15

POOR APPETITE

DEFINITION

CAUSES

FEEDING CONSIDERATIONS

DEFINITION

Poor appetite is the reduced desire to eat. It does not usually last long. If it lasts longer than several days it could indicate a more serious health concern. If the health concern is treatable, the appetite should return when the condition is cured.

It is normal for children older than 2 years to have fluctuating appetites. A good indicator of poor appetite is if a caregiver has difficulty giving food to a child.

CAUSES

Poor appetite in infants or children can occur for the following reasons:

- low iron status or anemia
- medical condition or illness
- developmental delays that cause distorted hunger perception
- oral sensory problems
- certain medications
- body or oral pain
- diarrhea or constipation
- stress
- end of a growth spurt (children eat less when they are not growing)
- snacking in between scheduled meals or lack of structured meal and snack times
- forcing the child to eat more than he wants
- associating the act of eating with an unhappy event

FEEDING CONSIDERATIONS

If poor appetite lasts long enough to affect the infant or child's weight, try some of the following feeding practices to ensure adequate intake of food.

INFANTS (< 1 YEAR)

- Offer breastfeeding more frequently.
- Place the infant in an upright position during feeding.
- Feed bottle-fed infants smaller amounts more often (every 1-3 hours).
- Limit feeding time to 30 minutes.
- If an infant is bottle-fed and tires easily during feeding, replace the nipple with a softer or smaller one (preemie nipple).
- Wake infant in the middle of night or during long naps. Do not let the infant sleep through the night without feeding until an appropriate weight is reached.
- If the infant seems irritable or distracted, try to soothe them in a quiet, dark room. Avoid places that are crowded and noisy. Wait until the infant is calm to feed.

- Discuss with the doctor changing the formula to a high-calorie, high-protein one. Do not concentrate or change formula without a doctor's recommendations.

CHILDREN (≥ 1 YEAR)

- Continue to offer breastfeeding.
- Set an eating schedule. Offer three meals and two to three snacks at about the same time each day. Limit snacking and drinking fluid besides water in between regular meal and snack times.
- Limit fluid intakes such as juice and milk as these liquids can decrease appetite and intake of solid foods. Offer drinks at the middle or end of a meal.
- Offer meals at a table in a room with little distraction.
- Provide the opportunity to eat all meals in the presence of other children because it encourages them to eat.
- Role model eating a variety of foods and engage with the child during mealtimes.
- Do not force-feed. Force-feeding may cause anxiety and resistance to eating.
- Limit meals to 30 minutes and snacks to 15 minutes.
- Offer vitamin and mineral supplements if recommended by the pediatrician.
- Encourage the child to be active before mealtimes.
- Offer a variety of foods to keep the child interested in eating.
- Fortify or enrich the diet to increase calorie and protein intake

CHILDREN (>6 MONTHS) IF WEIGHT LOSS OR POOR WEIGHT GAIN IS PRESENT AND INTAKE IS LIMITED

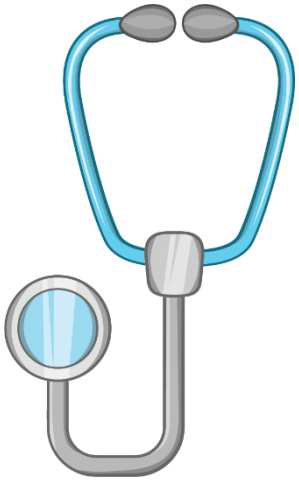
- Continue to offer breastfeeding.
- Make sure there is a protein source in each meal and all snacks.
- Add cheese to omelets, meals and/or snacks or on bread.
- Add 1 tablespoon of powdered milk or formula to dairy products or mix in to other dishes.
- Add nuts, nut butters, seeds, raisins and other dried fruits to bread, yogurt, cooked meals and as snacks.
- Add starchy vegetables (potatoes, sweet potatoes, beets, pumpkin, carrots, corn, green peas, lima beans, plantains) to soups, stews and curries.
- Offer dense, fully ripe fruits (versus watery fruits) such as papaya, avocado, banana, pear and pineapple.
- Offer energy-containing drinks, such as milk or juice, in the middle or toward the end of a meal.
- Mix vegetable oil into dishes or when preparing meats, vegetables and grains. Oils can also be added to breads.

REMEMBER

Do not offer nuts, seeds and animal milk until one year of age.

CHAPTER 16

DISABILITIES AND MEDICAL NEEDS



- CLEFT LIP AND CLEFT PALATE
- CEREBRAL PALSY
- FETAL ALCOHOL SPECTRUM DISORDER
- CONGENITAL HEART DISEASE
- DOWN SYNDROME AND GENERAL LOW TONE
- LOW BIRTH WEIGHT
- SEVERE MALNUTRITION
- ORAL-MOTOR FEEDING PROBLEMS

- Decision-Tree No. 1: Disabilities or Medical Needs
- Decision-Tree No. 2: Cleft Lip, Cleft Palate
- Decision-Tree No. 3: Cerebral Palsy
- Decision-Tree No. 4: Fetal Alcohol Spectrum Disorder
- Decision-Tree No. 5: Congenital Heart Disease
- Decision-Tree No. 6: Down Syndrome and General Low Tone
- Decision-Tree No. 7: Low Birth Weight
- Decision-Tree No. 17: Difficulty Swallowing

DISABILITIES are common, with 15% of the world's population experiencing some form of disability. Disability is defined as any continuing condition that restricts everyday activities and is a broad term that includes a range of conditions and disability types. When a child has a disability, they may need some additional support or resources as they grow and develop.

Children with MEDICAL NEEDS include those who have a chronic illness or medical condition that affects growth, development, nutrition and/or feeding.

Children with disabilities or medical needs may require health and health-related services beyond basic, routine care. Examples of conditions that may require some additional support or health care resources: Children with disabilities or medical needs require health and related services beyond basic, routine care.

Examples of types of disabilities and medical needs include:

- Cleft lip/palate
- Cerebral palsy
- Down syndrome and general low tone
- Severe malnutrition
- Premature birth
- Cancer
- Gastrointestinal disorders
- Congenital heart disease
- Fetal alcohol spectrum disorder
- Low birth weight
- Failure to thrive
- Spinal bifida
- HIV/AIDS
- Overweight/obesity

The MOST COMMON CHALLENGES for children with disabilities and medical needs are:

- abnormal growth (e.g., underweight, overweight and/or short stature or stunting)
- inadequate food intake to support growth and health
- feeding problems related to oral-motor (difficulty sucking, swallowing, chewing) and/or behavioral difficulties (easily distracted or stimulated, food refusal, aggressive behavior)
- low muscle tone
- medication-nutrient interactions
- chronic constipation or diarrhea
- need for enteral (tube) feeding

All children require good nutrition to grow and develop. However, children with disabilities or medical needs have more frequent, long-term problems that may alter their growth, diet, feeding and eating behaviors and bowel and fluid habits. When these problems are not adequately addressed, a child may become ill more often and for longer periods of time.

The nutrition and feeding problems that children with disabilities or medical needs experience can be improved or controlled, but often are not totally resolved. These children will require ongoing and periodic nutrition screening and intervention, and the participation of a team to provide interdisciplinary care.

This chapter on disabilities or medical needs is not comprehensive; it includes information on few selected medical conditions. However, a wide range of physical, behavioral, developmental and feeding,

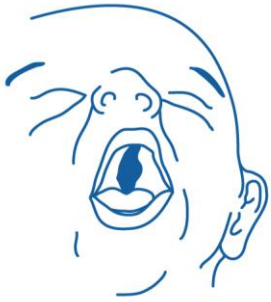
characterizes these conditions or eating complications that are shared by many other conditions not included in this chapter.

CLEFT LIP AND CLEFT PALATE

DEFINITION

Cleft lip and palate are birth defects that affect the upper lip and the roof of the mouth.

- A CLEFT LIP may be a small split in the lip or a complete split in the lip that goes all the way to the base of the nose. The cleft can be on one or both sides of the lip.
- A CLEFT PALATE causes an opening in the roof of the mouth (palate). It can be on one or both sides of the roof of the mouth. It may go the full length of the palate.
- Cleft lip and palate can occur together or separately.



Cleft Palate

Cleft Lip

CAUSES

There are many potential causes of cleft lip and palate such as:

- family history of cleft lip or palate.
- exposure to viruses, toxic substances and environmental pollutants.

- maternal nutritional imbalances.

COMPLICATIONS

Cleft lip and palate have NO CONNECTION TO COGNITIVE DELAYS but can complicate TALKING, FEEDING AND EATING. If you are caring for a child with cleft lip or palate, watch for the following possible problems:

- failure to gain weight
- poor growth
- feeding problems due to malformation of the face, delayed oral motor development or behavioral issues
- flow of milk through the nose during feeding
- dental problems
- repeated ear infections that may cause hearing loss
- speech difficulties

CHALLENGES BEFORE SURGERY

Cleft lip and palate will likely affect bottle-feeding and may affect breastfeeding, although often infants with a cleft can often still successfully breastfeed.

- An opening in the lip or palate interferes with the suction or vacuum needed to pull milk from the nipple.
- Milk may come out of the infant's nose during a feeding due to the opening in the lip or palate.
- The infant may swallow too much air while feeding leading to discomfort and inadequate intake.
- Longer feedings can make an infant very tired and cause them to burn too many calories.
- Though a child with a cleft has normal sucking and swallowing reflexes, they may need a special bottle to allow milk to flow without suction.

CHALLENGES AFTER SURGERY

After the palate is surgically repaired, any problems with mealtimes should resolve. Sometimes, a small hole may remain or develop in the roof the mouth at the site of the original cleft. Food or liquid may come through or get lodged in the hole. Most children adapt and clear any liquid or food particles on their own. If leaking or reflux through a fistula is fairly frequent, discuss the concern with the child's doctor.

TREATMENT

A cleft lip or palate can be successfully treated with surgery, especially if corrected soon after birth or in early childhood. Ideally, children with cleft lip and/or palate should be followed from birth through adolescence by a team who designs an individualized treatment plan.

If you are caring for a child with cleft lip and /or palate, discuss with the pediatrician and director a treatment plan for the child. The treatment plan should be based on the needs of the child and should include:

- surgery to correct malformation.
- speech and occupational therapy to address feeding issues for the infant and child and speech issues for the child.
- adaptive equipment such as specialized bottles, spoons and cups that can improve feeding.
- a dental checkup.
- an ear and hearing checkup for children with cleft palate.

CEREBRAL PALSY

DEFINITION

Cerebral palsy is a disorder that impairs body movement, muscle tone and coordination. It is caused by brain damage before or during birth, or in the first three to five years of life.

- Problems arise because of abnormalities in parts of the brain that control muscle movements, not the muscles themselves.
- CP can affect the body in different ways (right side or left side, arms or legs or both) depending on the severity of the disease.
- The brain damage that leads to CP can also lead to other health issues, including mental delays, seizures, vision, hearing and speech problems and learning disabilities.
- The condition does not worsen over time.
- There is no cure for CP, but treatment, therapy and special equipment can greatly improve a child's capabilities. The earlier treatment begins the better chance a child has of overcoming
- developmental disabilities and learning new ways to accomplish daily tasks.

CAUSES

DURING PREGNANCY

- Genetic conditions
- Limited blood or oxygen supply to the brain before or during birth
- Infections
- Bleeding in the brain
- Severe jaundice
- Premature birth, very low-birth weight, multiple births (twins, triplets)
- Maternal smoking, alcohol and/or drug use

DURING INFANCY AND EARLY CHILDHOOD

A small number of children might have brain damage that lead to CP during infancy or early childhood. Causes include:

- brain infections (bacterial meningitis)
- malnutrition
- car accident
- a fall
- child abuse
- lead poisoning

SIGNS

Cerebral palsy is usually detected before a child turns 3 years old. Signs may include:

- inability to control muscles in the body; arms and legs might move suddenly and involuntarily
- problems with balance and coordination
- stiff or tight muscles and exaggerated reflexes
- walking with one foot or leg dragging
- walking on the toes, a crouched gait or a "scissored" gait
- muscle tone that is either too stiff or too floppy

For a child with CP, poor muscle development and coordination of arms, legs, lips, tongue, jaw and throat can lead to several feeding problems and other complications. If you are caring for a child with CP, watch for the following possible problems:

Complications	Can result in
Chewing and swallowing difficulty	Lengthy feedings, aspiration
Poor posture and head control	Lengthy feedings, aspiration
Easily distracted	Lengthy feedings
Limited hunger cues	Underweight and failure to thrive
Limited food intake	Underweight and failure to thrive
Texture and other food aversions	Underweight
Gastro-esophageal reflux disease	Underweight and failure to thrive
Limited fluid intake	Constipation, dehydration
Limited mobility	Constipation, overweight
Poor dental health	Difficulty chewing
Medication-nutrient interactions	Nutrient deficiencies
Need for feeding tube	

TREATMENT

If you are caring for a child with CP, discuss with the pediatrician and director about a treatment plan for the child. The treatment plan should be based on the needs of the child and should include:

- regular follow-up by a pediatrician/neurologist/ breastfeeding counselor or feeding specialist.

- speech, occupational and/or physical therapy to help them develop skills such as walking, sitting, swallowing and using their hands; and to address feeding issues for the infant and child and speech issues for the child.
- adaptive equipment such as specialized bottles, spoons and cups that can improve feeding.
- training of nurses and caregivers on feeding an infant and child with CP, using adaptive equipment, daily exercises as recommended by doctors and therapists and growth monitoring.
- dental checkups.

FETAL ALCOHOL SPECTRUM DISORDER

DEFINITION

Fetal alcohol spectrum disorder is a birth defect that causes a pattern of physical, developmental and functional problems. There is no cure for FASD. Its associated problems must be managed throughout the lifespan. Early intervention can improve a child's growth, development and well-being.

CAUSE

FASD is caused by consumption of alcohol during pregnancy. Alcohol damages the baby's cells and impacts development.

COMPLICATIONS

Damage to the fetus can result in physical and mental complications. These problems can affect each child in different ways, and can range from mild to severe.

- Abnormal facial features
  - Smaller eye openings
  - Flattened cheekbones
  - Smooth ridge between the nose and upper lip
- Delayed growth
  - Small head circumference
  - Shorter-than-average height
  - Low birth weight
  - Underweight and failure to thrive
- Behavioral problems
  - Hyperactive or aggressive behavior
  - Difficulty paying attention, including at mealtimes
  - Social withdrawal, stubbornness, impulsiveness and anxiety

- Learning difficulties
  - Poor memory
  - Speech and language delays
  - Poor problem-solving skills and judgment skills
- Distorted hunger perception
- Vision or hearing problems
- Sleep and sucking problems as an infant
- Decreased muscle tone
- Poor coordination
- Problems with the heart, kidneys or bones

TREATMENT

If you are caring for a child with FASD, discuss with the pediatrician and director a treatment plan for the child. The treatment plan should be based on the needs of the child and should include:

- regular follow-up by a pediatrician — ask the doctor about developmental milestones you should watch for and how to encourage the development of those skills.
- speech, physical and/or occupational therapist to address feeding issues for the infant and child and speech and language issues for the child.
- training of nurses and caregivers on feeding an infant and child with FASD.

CONGENITAL HEART DISEASE

DEFINITION

CONGENITAL HEART DISEASE is a problem that is present at birth and can affect the structure of a baby's heart and the way it works. In some cases, the heart can become enlarged to make up for its limited function.

CONGESTIVE HEART FAILURE may be a result of CHD because the heart has to work harder than usual. CHF is a serious condition in which the overworked heart does not pump blood efficiently. As the heart works harder, metabolism and energy requirements increase. At the same time, blood flow decreases resulting in small stomach size and slow gut motility. In addition, the heart's inefficient pumping causes fluid to back up into the lungs, liver and other organs. Therefore, children with CHF often require fluid restriction and/or a diet low in salt. This makes it difficult to provide the child with adequate energy intake.

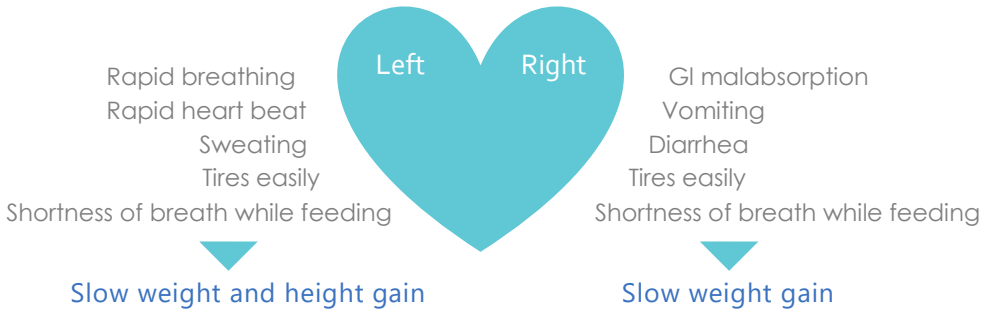
SIGNS AND SYMPTOMS

Signs and symptoms for CHD depend on the type and severity of the disease. Contact the doctor if the child:

- has bluish tinted nails, lips or tongue
- has fast or difficulty breathing
- sweats, especially during feeding
- tires easily when feeding
- is very sleepy

CHF can affect either side of the heart, the right and left. In children with CHD, right-sided CHF is the most common. The child may show different signs and symptoms based on the side affected.

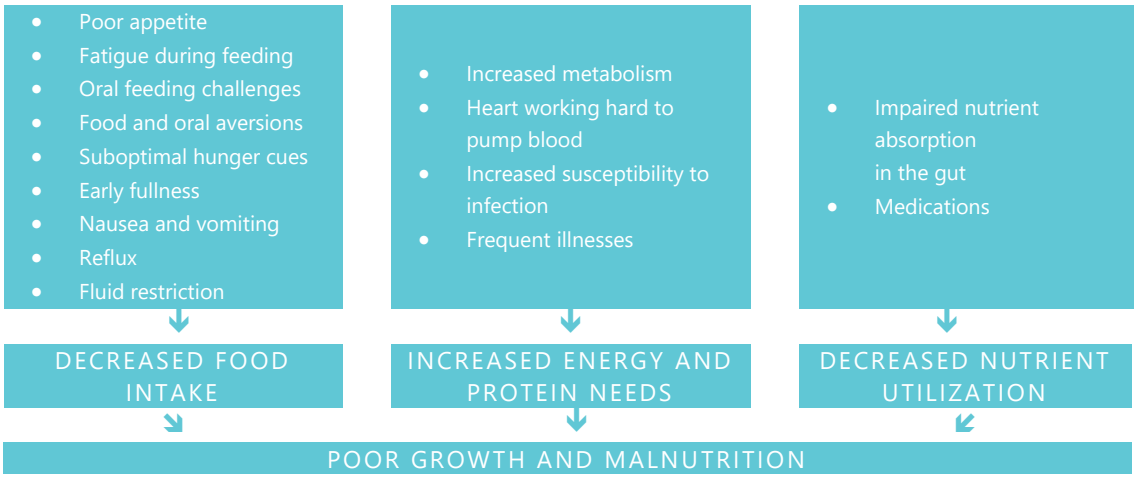
SIGNS AND SYMPTOMS OF CHF BASED ON SIDE OF HEART AFFECTED



COMPLICATIONS

Children with CHD are at nutritional risk and often demonstrate slow growth, which becomes apparent early in life. Depending on cardiac status, many factors may cause poor growth and malnutrition.

CAUSES OF POOR GROWTH AND MALNUTRITION IN CHILDREN WITH CHD



TREATMENT

Infants with CHD can receive corrective surgery in the first days to months of life. Good nutritional status is important before surgery; some infants will not be able to receive the operation until they are at a healthy weight. If you are caring for a child with CHD, discuss with the doctor a treatment plan for the child. The treatment plan should be based on the needs of the child and should include:

- regular follow-up by a pediatrician.
- follow-up by a pediatric cardiologist as needed.
- speech and/or occupational therapist or breastfeeding counselor to address feeding issues.
- training of nurses and caregivers on feeding an infant and child with CHD.
- training of nurses, caregivers and cooks on measurement of liquids and limiting salt in cooking in the case of fluid and salt restrictions.

DOWN SYNDROME AND GENERAL LOW TONE

DEFINITION

Down syndrome, also called Trisomy 21, is a condition in which extra genetic material causes delays in the way a child develops, both mentally and physically. The medical problems vary from child to child. While some children with DS need a lot of medical attention, others lead healthy lives.

CAUSE

At the time of conception, the child inherits extra genetic material that causes the physical features and developmental delays associated with DS. The exact cause of why this happens is unknown. Women who become pregnant after the age of 35 have a significantly higher risk of having a child with DS.

SIGNS AND COMPLICATIONS

COMMON PHYSICAL FEATURES INCLUDE

- Flat facial profile
- An upward slant to the eyes
- Small ears
- A protruding tongue
- Excessive drooling
- Low muscle tone (babies in particular may seem especially "floppy")

COMMON COMPLICATIONS AND MEDICAL PROBLEMS INCLUDE

- Infants:
  - slower growth rate
  - difficulty sleeping
  - sucking and feeding problems
  - constipation
  - delayed developmental milestones (sitting up, crawling and walking)
- Toddlers and older children:
  - difficulty learning
  - delays in speech
  - delays in self-care skills (feeding, dressing, use of toilet)
- Slow metabolism that may result in being overweight
- Thyroid problems
- Seizure disorders
- Respiratory problems
- Vision or hearing problems
- Problems with the heart and lungs
- Increased susceptibility to infections

TREATMENT

If you are caring for a child with DS or a condition characterized by low tone, discuss with the pediatrician and director a treatment plan for the child. The treatment plan should be based on the needs of the child and should include:

- regular follow-up by a pediatrician — ask the doctor about developmental milestones you should watch for and how to encourage the development of those skills.
- evaluation by a cardiologist, eye doctor and ear, nose and throat doctor.
- speech, physical and/or occupational therapist or breastfeeding counselor to address feeding issues for the infant and child and speech and feeding issues for the toddlers and older children.
- training of caregivers on feeding an infant and child with DS.

- Low tone can and often does improve over time.
- Most children with DS typically reach developmental milestones later than other kids.
- Children with DS can and do learn, and are capable of developing skills throughout their lives. They simply reach goals at a different pace — which is why it is important not to compare a child with DS with a child who is developing at a typical rate.

LOW-BIRTH WEIGHT

DEFINITION

Low-birth weight is defined as a birth weight of less than 2.5 kg (2,500 grams) or 5.5 pounds. It is associated with chronic diseases or disabilities later in life and higher risk for infant or childhood death.

CAUSES

Causes of LBW may include:

- congenital abnormalities
- premature birth (birth at less than 37 weeks of gestation)
- maternal factors such as:
  - small size
  - infections
  - poor nutrition
  - problems with placenta
  - exposure to drugs, alcohol, smoking

COMPLICATIONS

If you are caring for a low-birth weight child, watch for the following possible problems:

- slow weight gain and growth during infancy
- subtle and delayed hunger cues, difficult to recognize
- nutrient deficiencies (e.g., iron deficiency anemia)
- poor cognitive development.
- If premature:
  - diminished or absent gag and cough reflex
  - decreased muscle tone
  - difficulty sucking
  - constipation.

TREATMENT

If you are caring for a LBW child, discuss with the pediatrician and director a care plan for the child. The care plan should be based on the need of the child and should include:

- regular checkups by a pediatrician.
- speech therapy or a breastfeeding counselor to address feeding issues for the infant.
- adaptive equipment such as premature bottle or cup that can improve feeding.

SEVERE MALNUTRITION

DEFINITION

Severe acute malnutrition is defined by all or one of the following:

- very low weight-for-height or weight-for-length or MUAC-for-age (below -3 Z-score line on WHO growth charts)
- visible severe wasting (weight loss, decreased physical strength, appetite and mental activity)
- presence of nutritional edema (swelling caused by insufficient protein intake)

CAUSES

No matter what the cause, poor growth caused by poor nutrition is the result of not eating adequate calories, not being offered adequate calories, or not being able to retain adequate calories.

Severe malnutrition can be caused by medical problems that affect intake. These include, but are not limited to:

- premature birth
- low-birth weight
- developmental delay
- Human Immunodeficiency Virus (HIV)
- gastrointestinal diseases
- cancer

Severe malnutrition can also be the result of an environment that affects intake. For example, access to food may be low because the child is not offered adequate calories as a result of high-stress situations, such as poverty or intentional abuse.

COMPLICATIONS

Severe malnutrition may cause the following complications:

- Stunting. A child with severe malnutrition may also have stunting (low height-for-age or length-for-age). This develops over a long period of time. A child who is stunted may have the following symptoms:
  - short for age
  - appears young for his or her age
  - appears chubby (disproportionate fat mass related to height)
- increased risk for illness and infection
- slow brain growth
- delayed cognitive development

REMEMBER

Keeping a record of head circumference provides a record of brain growth. When a child is malnourished, the head circumference is usually the last measurement affected. This is the body's way of sparing brain health above weight gain and length growth. When a child's brain growth begins to lag, this can indicate chronic malnourishment.

TREATMENT

Severe malnutrition can be a life threatening condition that requires urgent treatment. If there are medical complications, the child should be treated at a hospital as aggressive attempts to promote rapid weight gain from the start of treatment can be dangerous, leading to diarrhea, vomiting, imbalances in the blood, heart arrhythmia, poor appetite, slow recovery and even death.

If a child has severe malnutrition, refer to doctor or hospital immediately.

FEEDING CONSIDERATIONS

- The goal of feeding a child with severe malnutrition is to achieve CATCH-UP GROWTH and restore the nutritional status of the child.
- Nutritional treatment for malnutrition should continue until the child achieves a normal weight-for-length or weight-for-height growth line and is able to maintain this for several months while continuing to gain weight at an appropriate rate.
- Length or height growth is slower to respond to nutritional therapy than weight. So, it is important to continue nutrition treatment even if the child begins to appear "chubby." This extra fat can help to stimulate growth hormones necessary for length or height growth.

CATCH-UP GROWTH

is a faster-than-normal rate of weight and length/height gain that requires more calories, protein, vitamins and minerals compared to a child of the same age and weight.

Consult with a pediatrician about a feeding plan for a child with severe malnutrition. A pediatrician should monitor the progress of catch-up growth.

ORAL-MOTOR FEEDING PROBLEMS

DEFINITION

Oral-motor feeding problems occur when a child has abnormal or inefficient movement and coordinating muscles involved in the process of eating, swallowing and speaking.

CAUSES

Oral-motor feeding problems can be affected by one or more of the following complications:

- MEDICAL such as congenital heart disease and gastrointestinal issues that cause pain (reflux, nausea and vomiting)
- NEUROLOGICAL/DEVELOPMENTAL such as prematurity and weak oral muscles
- PHYSICAL such as cleft lip or palate and severe dental problems
- BEHAVIORAL such as poor body positioning and difficulties in caregiver-child interaction, especially at mealtime

SYMPTOMS

Oral-motor feeding problems can take different forms such as:

INFANTS

- Difficulty sucking
- Early fatigue during feeding
- Coughing or choking during feeding
- Frequent respiratory infections
- Gagging or vomiting milk while or soon after feeding

CHILDREN

- Difficulty biting, chewing or swallowing a variety of textures
- Resistance to touch around face and mouth
- Food is refused verbally or with body language
- Difficulty drinking from a cup
- Difficulty feeding self

TREATMENT

Since most feeding problems have multiple underlying factors that contribute to the overall nutritional and feeding deficits, a team approach is the most effective method to thoroughly assess and treat the oral-motor feeding problems. If you are caring for a child with oral-motor feeding problems, discuss with the doctor a treatment plan for the child that includes a speech and a physical and/or occupational therapist.

FEEDING CONSIDERATIONS

Oral-motor delays/disorders can make it difficult for a child to eat enough to grow and develop in a healthy way. Children with disabilities or medical needs are at risk for malnutrition because of feeding difficulties. Below are general tips to make sure children with disabilities or medical needs get the proper nutrition for healthy weight gain and growth.

GENERAL GUIDELINES FOR ADDRESSING ORAL-MOTOR FEEDING PROBLEMS

- Proper positioning
- Appropriate food types and textures
- Activities to improve oral-motor skills
- Appropriate and safe feeding pace
- Adaptive feeding utensils
- Oral support
- Good oral hygiene
- Patience

FEEDING CONSIDERATIONS FOR INFANTS 0 MONTHS TO 1-YEAR-OLD

Common problems	What to do
Infant does breast feed enough or consume enough formula at each feeding; poor growth	• Offer breast milk more frequently • Offer high calorie, specialized or concentrated formulas per doctor's orders • Provide multivitamin and iron supplement per doctor's orders • Wake infant to feed at night until appropriate weight is reached • Small frequent feedings (every 1-3 hours) • Limit feeding time to 30 min
Weak suck	• Change the bottle nipple type (soft nipple, angle-necked bottle) • Use a spoon or a cup with a beak • Position the infant upright and allow them to drink the milk from a cup without pouring it into the mouth • Provide lip, cheek and jaw support • Provide oral motor stimulation • Consult with speech or occupational therapist or breastfeeding counselor
Difficulty swallowing	• Use adaptive bottle or nipple • Use a spoon or a cup with a beak • Position the infant upright (45-90 degrees) • Thicken liquids • Consult with speech or occupational therapist

Difficulty coordinating suck-swallow-rest reflex	• Use adaptive bottle, such as Haberman feeder or Pigeon nipple, to help infant pace the feed • Take frequent breaks • Consult with speech or occupational therapist
Infant is volume sensitive	• Offer small, frequent feedings • Wake infant to feed at night until appropriate weight is reached
Infant is easily overwhelmed by too much light, noise and activity	• Create a calm environment
Infant is too tired to eat or falls asleep in the middle of a feeding (due to oxygen levels becoming too low)	• Position infant upright • Provide supplemental oxygen if infants falls asleep during feeding per doctor's order • If oxygen not available, allow feeding breaks
Infant is irritable	• Help prepare the infant for feeding. Swaddling and thumb sucking is soothing for an infant. • Avoid force feeding
Infants intake is very poor, documented growth failure or difficulty meeting nutrition needs orally	• Tube feeding. Consult with doctor.

FEEDING CONSIDERATIONS FOR CHILDREN 1 YEAR AND OLDER

- Continue to offer breastfeeding.
- Offer structured, nutritionally balanced meals and snacks. Limit snacking between scheduled meal and snack times.
- Reduce mealtime interruptions and distractions.
- Limit mealtimes to 30 minutes and snack time to 15 minutes. Long mealtimes do not always mean the child is getting enough nutrition.

- Make sure the child sits in an upright position. Adapt seating to provide proper pelvic positioning and support of the body trunk to improve head control and position.
- Offer foods that can be eaten with little frustration and distress. You may need to thicken liquids or mash/grind hard or crunchy foods to facilitate swallowing. However, continue to introduce new foods and textures as tolerated.
- Give a multivitamin or food supplement if food intake is low.
- Ensure ADEQUATE FLUID INTAKE and mobility to prevent or alleviate constipation.
- Encourage DAILY ACTIVITY and core strengthening exercises.
- Encourage the child to eat with as little assistance as possible.
- SPOON FEEDING: Instead of scraping the spoon on the top of the child's mouth to get the food off, encourage the child to use and strengthen their lips by placing the bowl of the spoon on the child's tongue and applying gentle pressure until the child closes their mouth to remove the food. Use flat-bowled spoons.
- CUP DRINKING: Provide a little support to the child's jaw with your hands and let the child do the rest, instead of pouring the liquid into the child's mouth.
- Assist child with meal if the child is unable to self-feed all food within 30 minutes.
- Do not force a child to eat or restrict foods. This can lead to behavioral disturbances, food aversions and limited intake.
- Adaptive utensils can help the child self-feed more easily.

Limit meal times to 30 minutes and snack time to 15 minutes. Long mealtimes do not always mean the child is getting enough nutrition.

TUBE FEEDING

If the child is unable to consume an adequate amount of food and/or it is unsafe for the child to eat either by bottle or spoon, supplemental tube feeding should be considered. If the child receives tube feeding, he or she needs to practice eating by mouth as much as possible.

CHAPTER 17

IMPROVING HOUSEHOLD FOOD SECURITY

DEFINITION

KITCHEN GARDENS

FOOD PRESERVATION

FOOD STORAGE

PLANNING, BUYING AND PREPARING HEALTHY MEALS

DEFINITION

HOUSEHOLD FOOD SECURITY is when families have enough nutritious and safe foods to meet everyone's needs throughout the year. Affordable or available diverse foods through sustainable food systems is an important part of household food security.

To ensure a household is food secure, all household members need access to adequate food, health services, clean safe water and sanitation practices and facilities.

Sustainable food systems are one part of ensuring a household is food secure. Sustainable food systems are built on promoting healthy environments by protecting trees, soil and water sources. However, there are economic and environmental factors that sometimes can bar families from accessing sustainable food systems. Factors such as distance from markets, drought, budget issues/lack of steady income, lacking knowledge of proper methods etc.

Families can proactively work to improve their household food security through using a variety of strategies, including prioritizing and planning nutritious meals, reducing food waste, starting small gardens or raising small animals, poultry or fish.

KITCHEN GARDENS

KITCHEN GARDENS are one easy and fun way to help improve household food security. Kitchen gardens can supplement or even replace much of the household fruits and vegetables purchased at the market. Even for farmers, having a kitchen garden can help to meet your family's nutrient needs without subtracting from food produced for income.

Kitchen gardens can vary from size and shape but even little gardens are able to supplement household diets. There are many places that small gardens can be set up such as:

- small plots of land or yards
- on windowsills or indoors
- rooftops
- trellis or vertical planting
- in alleys or between trees
- garden pots or boxes on porches
- raised garden beds
- areas around water sources
- small terraces on a hillside
    - added benefit of helping to prevent erosion which can lead to landslides

WATERING YOUR KITCHEN GARDEN

Kitchen gardens can use "grey water" from daily household activities such as washing dishes or laundry or from rain collection barrels.

Grey water is water collected from household sources that are not exposed to fecal contamination. Collecting and using this water on a household kitchen garden can be a good way to improve diet diversity and supplement meals with nutritious foods.

KITCHEN GARDEN TIPS

PROTECTING YOUR GARDEN

Gardens need nurture and care for them to be successful. This includes protecting the plants from elements such as the environment and pests. There are a few things you can do to protect and strengthen your garden for increased success.

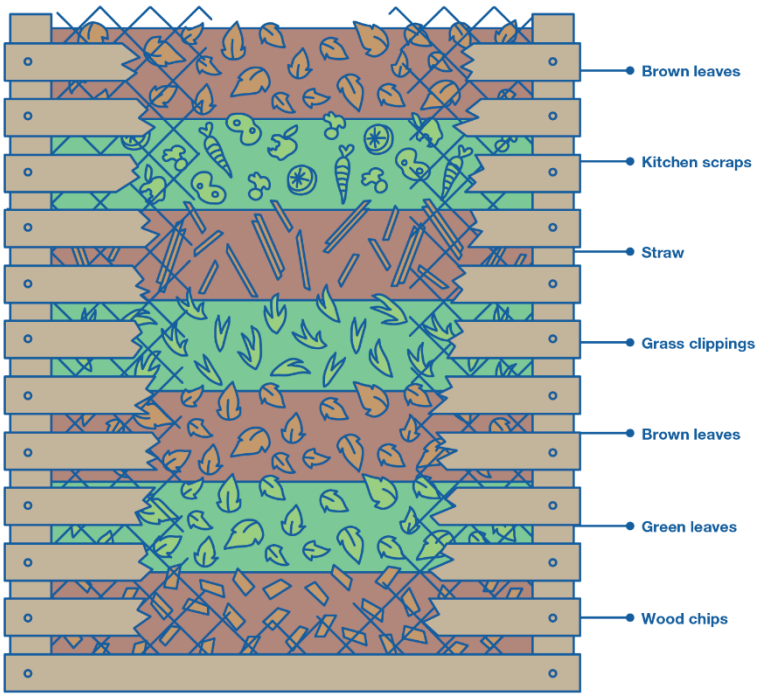
- GROW TRADITIONAL DROUGHT-RESISTANT CROPS. This will reduce the amount of water needed for the plants. Local crops also are easier to grown and usually have more success than other plants.
- Use natural insect repellent methods.
- Fence off the area to protect from animals.
- COMPANION PLANTING is when you plant multiple plants at the same time near each other. As they grow, they provide benefits to one another's development and growth. Try multilayer companion planting such as banana trees, beans, root vegetables and onions. Banana trees or corn can provide climbing space for beans and the beans will fix nitrogen into the soil to help the corn. Planting pumpkins or squash can help by providing shade to the soil and minimize weeds.
- Plant seasonal foods.
- Pull weeds, alternate planted foods and space the crops out.
- Share and take cuttings from neighbors to propagate fruit trees.
- Use mulch such as leaves, bark or compost on the garden to help reduce moisture loss.
- Make compost using leaves, garden refuse, kitchen scraps, animal manure, ash, leaves and cutting to use on your garden.

BASIC COMPOST 101

COMPOST is organic matter that has been decomposed and it is great because it is alive and full of rich nutrients which will help plants to grow. Compost has valuable microorganisms, worms and other valuable components. It is also easy to make and provides an alternative to expensive fertilizers.

✓ Compostable Items	✗ Non-Compostable Items
• Leaves	• Animal waste from cats and dogs
• Garden refuse, cuttings or grass	• Meat or fish
• Kitchen scraps such as egg shells, expired fruits and vegetables, peelings or cuttings from meal preparation, expired leftovers	• Synthetic fertilizer
• Ash	• Plastic non-compostable items or glossy paper or tape
• Animal manure from cows, sheep, chickens and goats	• Large tree branches unless cut into small wood chips
• Shredded paper or cardboard	• High-sugar processed foods

HOW TO BUILD A COMPOST PILE



(1) Choose size of the pile. The minimum size should be 1 meter x 1 meter. The larger the pile size is the longer the composting process will take.
(2) Choose a spot for the compost pile that has a good amount of shade. This will help the decomposition of the compost materials and to retain moisture.
(3) Once a spot is chosen, clear the soil of any debris such as sticks, leaves or weeds. Loosen soil with a fork or hoe this will help for water to be absorbed.
(4) Next, build the first layer of the compost pile. This pile will be larger than the rest and will require using brown materials such as maize stalks, twigs or small branches. The first layer is now complete.
(5) Add the second layer of the compost onto the pile. This layer will consist of only green material/vegetation. This can include grasses, leaves, plants and food scraps. This layer will be added on top of the first layer.
(6) Next add the third layer which will be a mixture of soil and manure or wood ash. When placing this layer on top of the second layer, place the manure or wood ash toward the center.

(7) Repeat steps 4-6. Once the pile is tall, cover with a final brown material layer, this will help reduce the smell of the decomposing materials and keep animals away from the pile.
(8) Allow the pile to rest for three weeks. After three weeks, mix everything and add some water to keep moist. After two months of managing the pile with watering when needed, the compost pile will be dark, rich soil.

NATURAL INSECT REPELLANTS

NATURAL INSECT REPELLANTS can help to ensure the growth and safety of your garden. While some insects are beneficial to your garden, others can cause extensive damage. Natural insect repellants are often easy to make, low cost and safer to use than traditional insecticides or pesticides.

Here are some tips and recipes for making homemade natural insect repellants.

- Spray 1-2 times per week.
- Spray plants in the evening to avoid potential damage from the combination of sun and repellant.
- Focus spray on affected plants as not all plants will need to be sprayed.
- Try spraying a few plants then waiting to see the plants and insects reaction to the spray.

RECIPE 1: GARLIC SPRAY

- 1 head of garlic
- 15 ml (1 tablespoon dish soap) (Note: Do not use dish soap that contains bleach.)
- 30 ml (2 tablespoons) mineral or vegetable oil
- 2 cups water
- Optional ingredients: 30 ml (2 tablespoons) cayenne pepper or a few drops peppermint oil

Peel the garlic cloves and puree the cloves along with the oil and water. Allow to sit overnight and then strain the mixture. Add the soap and mix. Pour into a spray bottle and use on pest infected plants.

RECIPE 2: BAKING SODA SPRAY

- 15 mil (1 tablespoon) vegetable oil
- 30 ml (2 tablespoons) baking soda
- 5 ml (1 teaspoon) dish soap
- 2 liters (2 quarts) of water

Combine ingredients and pour into a spray bottle. Pour into a spray bottle and use on pest infected plants.

RECIPE 3: CHILI SPRAY

- 170 grams (1/2 cup) chopped hot peppers
- 2 cups water

- 30 ml (2 tablespoons) dish soap

Mix the soap, peppers and water. Let sit overnight. Strain carefully and mix in dish soap. Pour into a spray bottle and use on pest infected plants.

PLANT REPELLANTS

Planting these plants around your house or adding them to your kitchen garden may help to deter insects from coming to your garden. Check for local plants in your area that may help for specific pests.

- Lemongrass
- Lavender
- Peppermint or lemon balm
- Rosemary
- Basil
- Garlic

SOIL EROSION

When SOIL EROSION happens, valuable top soil is lost. Top soil is the most productive part of soil for growing plants. Loss of top soil has many consequences including:

- reduced ability for soil to store nutrients and water
- higher water and nutrient losses due to runoff
- silt into water sources
- loss and reduced growth of crops

HOW TO PREVENT SOIL EROSION

- Create drainage systems for rain or flooding
- Plant trees
- Make terraces or contour ridges on slopes
- Avoid letting animals over graze land by tying them up or fencing
- Rotate crops or plants
- Allow grass to grow and cover open ground
- Cover planting soil with mulch, compost and manure to help inhibit the growth of weeds, prevention erosion, keep soil moist and replenish nutrients in the soil
- Teach others in the community about how to protect soil and care for common areas
- Grow trees or shrubs to protect the soil from wind and provide shade
- Avoid sweeping away the top levels of soil and nourishing debris such as rotting leaves
- Allow soil periods of rest between gardens or farming when possible

PLANTING MULTIPURPOSE TREES is not only a way to prevent soil erosion, but also provides a list of other benefits as well.

- Provide shade
- Support fences and keep animals out of the garden

- Produce edible leaves, nuts or fruits
- Provide wind barriers

Household food security can also be supported by raising small animals, poultry or fish.

FOOD PRESERVATION

FOOD PRESERVATION is a way to help save food and reduce food waste, extend food shelf life and increase food stores. There are many easy and effective ways to preserve food. Food preservation can have many benefits including:

- can make some nutrients more bioavailable
- some foods become easier to digest
- extract concentrated forms (such as oil from vegetables or sugar from sugar cane)
- protect it from contamination
- extend the shelf life of foods
- remove toxins (such as processing cassava to remove cyanide compound)
- make foods easier to store

FOOD PRESERVATION METHODS

DRYING: Drying food is a method of preservation that removes the water from food. Reducing the water content in food helps to slow spoilage and bacteria growth. Food can be dried in the sun, indoors or in an oven.

MILLING: Milling happens when the outer layers of dried grains, roots, legumes or cereals are removed or made into flour. When foods are dried and milled, they are often easier to prepare, eat and digest, although depending on parts removed during process it can reduce the nutritious values such as whole grain flour vs. refined grain flour.

FERMENTING AND SOURING: Fermented or soured foods are when healthy bacteria are present or added to food and change the sugar in the food. The process makes it hard for harmful bacteria to grow.

CANNING: Preserving food by processing and sealing foods in airtight containers, such as boiling food in glass canning jars to remove air and delay or stop food spoilage. Food can be previously cooked or sometimes salt, vinegar or sugar are added to increase shelf life.

FREEZING: Preserving food at very low temperatures. (Refer to Chapter 4: Hygiene and Sanitation for additional information)

REFRIGERATION: The process of chilling or keeping foods cold. (Refer to Chapter 4: Hygiene and Sanitation for additional information)

DRY STORAGE: Storage of foods that have a long shelf life and can be stored in cool, dry rooms. (Refer to Chapter 4: Hygiene and Sanitation for additional information)

STORING FOOD

How food is stored can have a huge impact on the safety of the food and how long it keeps before needing to be used. Proper food storage can also help to reduce unnecessary food loss. Refer to section Chapter 4: Hygiene and Sanitation to review safe food storage and methods.

PREVENTING TOXINS

TOXINS are harmful substances that can be found in food and water and can result in vomiting, diarrhea and other illnesses. Toxins can sometimes be found naturally in foods, or mold but can also be caused by improper use of some pesticides.

One type of commonly found and harmful toxin is aflatoxin. Aflatoxin found in mold that grows on legumes and cereals that are not dried properly. This toxin can cause cancer or illness.

Here are some ways to reduce exposure to toxins.

- Rinse and scrub all produce.
- Cooking and milling or grinding foods breaks down some cells walls, which increases digestion of some nutrients.
- Do not eat moldy foods or give them to animals.
- Soak beans.
- Remove sprouts and green skin from potatoes.
- Wash your hands with soap after using chemicals such as synthetic fertilizer.
- Do not reuse containers that contained chemicals such as pesticides or cleaning products.
- Wear gloves when cleaning or farming with toxic substances.
- Fully prepare foods such as cassava to ensure naturally occurring toxins are removed.

PLANNING, BUYING AND PREPARING HEALTHY MEALS

Buying food effectively and thoughtfully can help to meet families nutrient needs throughout the week. By prioritizing the purchase of foods that are high in nutrients but are lower cost such as legumes or vegetables, families can meet their nutrient needs at the lowest cost.

HEALTHY MEAL PLANNING

- Make meals colorful with a variety of vegetables, legumes and fruits.
- Aim for 2 servings of fruit and 3 servings of vegetables daily.
- Include two servings of legumes, beans, nuts, meats or seeds daily.
- Aim to eat at least one food high in iron daily.
- Drink water instead of sugary drinks.
- Purchase iodized salt.
- Use nutrient dense produce from gardens for household meals instead of selling.
- Limit sugar and salt consumption, including reducing use of sugar and salt during cooking.
- Include foods high in vitamin A at least 3 times per week.
- Purchase fortified foods.
- Eat vitamin C rich foods alongside iron rich foods to improve absorption.

TIPS FOR MAKING THE MOST OF BUYING FOOD ON A BUDGET

- Limit purchasing of convenience foods which can be expensive and typically have limited nutritious value.
- Use fuel efficient cook stoves to reduce cooking time and fuel.
- Buy in season foods and produce.
- Prepare foods with the skins intact, such as orange sweet potatoes, eggplant, mangoes, apples, zucchini or carrots. Just ensure all produce is washed in clean water before serving. Skins of fruits and vegetables have important nutrients and fiber that can be eaten.
- Utilize the seeds from squash or pumpkins for snacks or garnishes for meals.
- If cheaper, purchase in bulk but note that bulk cost is not always cheaper. Keep in mind if safe, clean storage areas are available.
- Ensure budgeting for meals is done on a weekly and monthly basis. Think of items that are cheaper in bulk and how much you will need for a month.
- Plan your meals at the beginning of each week.
- Based on your budget, make a list before shopping and stick to the list.
- Save and store leftovers when possible (ensure refrigeration of cooked foods within 2 hours of meal).
- Compare prices at different stores and purchase from reliable sources for safety.
- Look at the price per kilogram or per unit, not just the price itself to know which item is the best deal.
- Avoid shopping when hungry.
- Freeze foods prior to them going bad if you are not able to use them all. Label freezer foods with dates.
- Buy locally available produce and foods. Look for foods that are bright in color, ripe or have a good smell.
- Use leftovers or scraps to season soups or to feed animals or add to your compost pile for your garden.
- Supplement meals with produce or herbs from gardens.
- Dry homegrown herbs, chilies and spices.

- Limit purchasing soda, chips, cookies, bottled drinks and candy. These foods have limited nutrition and are not essential. Especially for children, these foods can displace the healthy foods a child should eat.
- Limit buying premade complementary foods, which can be expensive. Instead, prepare food for infants and toddlers at home.
- Buy whole grains which will have fiber, fats and proteins. Whole grains promote a greater feeling of fullness compared to refined grains.
- Purchase fortified or enriched foods when available, such as fortified flour vs. plain white flour with limited nutritious value.
- Choose red meat (beef, mutton, etc.) as it is typically higher in iron.
- Prepare meatless meals. Meat can be expensive, try substituting legumes, eggs, nuts or soy in meals.
- Avoid buying street foods that might be costly and unsafely prepared.
- Shop the perimeter of stores. This is where the whole foods are typically sold, whereas convenience and processed foods are typically in the middle aisles.
- Use coupons found online or in newspapers.

FOOD PREPARATION METHODS FOR HEALTHY MEALS

Safe food preparation will ensure delicious, nutritious and safe meals for the whole family. Here are some important tips and reminders on how to ensure your meal preparation is safe.

Use clean water from covered storage or boiled tap water for washing and cooking foods. Review Chapter 4: Hygiene and Sanitation for safe water preparation and storage methods.

- Have a handwashing station or sink near food preparation area.
- Thoroughly wash hands before preparing meals.
- Ensure food is stored in covered containers to protect from pests and stored off the ground.
- Cut off mold and damaged areas of food before cooking.
- Soak beans for at least 4-8 hours to shorten cooking time and remove any contaminants.
- Frequently use bleach spray on food prep areas and utensils. Allow 3 minutes to dry before eating off of sprayed utensils.
- Eat cooked foods soon after they are prepared.
- Store leftovers in a covered container in the refrigerator within 1-2 hours of completing the meal.

Nutrition Screening Decision Trees

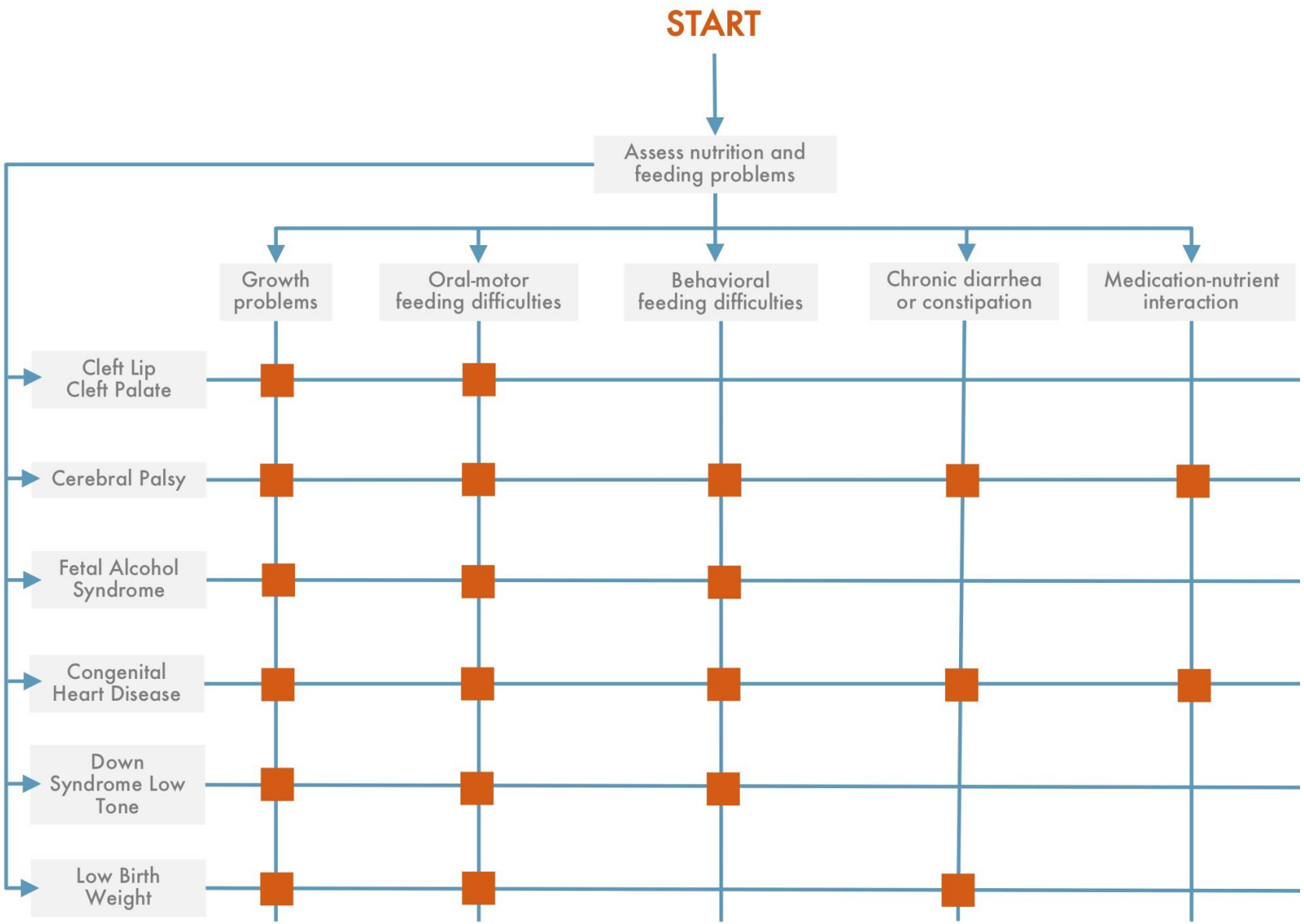
1. Disabilities and Medical Needs
2. Cleft Lip, Cleft Palate
3. Cerebral Palsy
4. Fetal Alcohol Spectrum Disorder
5. Congenital Heart Disease
6. Down Syndrome, General Low Tone
7. Low Birth Weight
8. Anemia
9. Fever
10. Constipation
11. Diarrhea
12. Dehydration
13. Acute Bloody Diarrhea
14. Persistent Diarrhea
15. Vomiting
16. Growth
17. Difficulty Swallowing
18. Reflux
19. Food Allergy and Intolerance
20. Bilateral Pitting Edema

Decision-tree color codes:

- **Red – Consult with doctor or requires hospital care (bold)**
- ***Blue** – Consult with speech or occupational therapist (italics)*
- Green – Follow a decision-tree

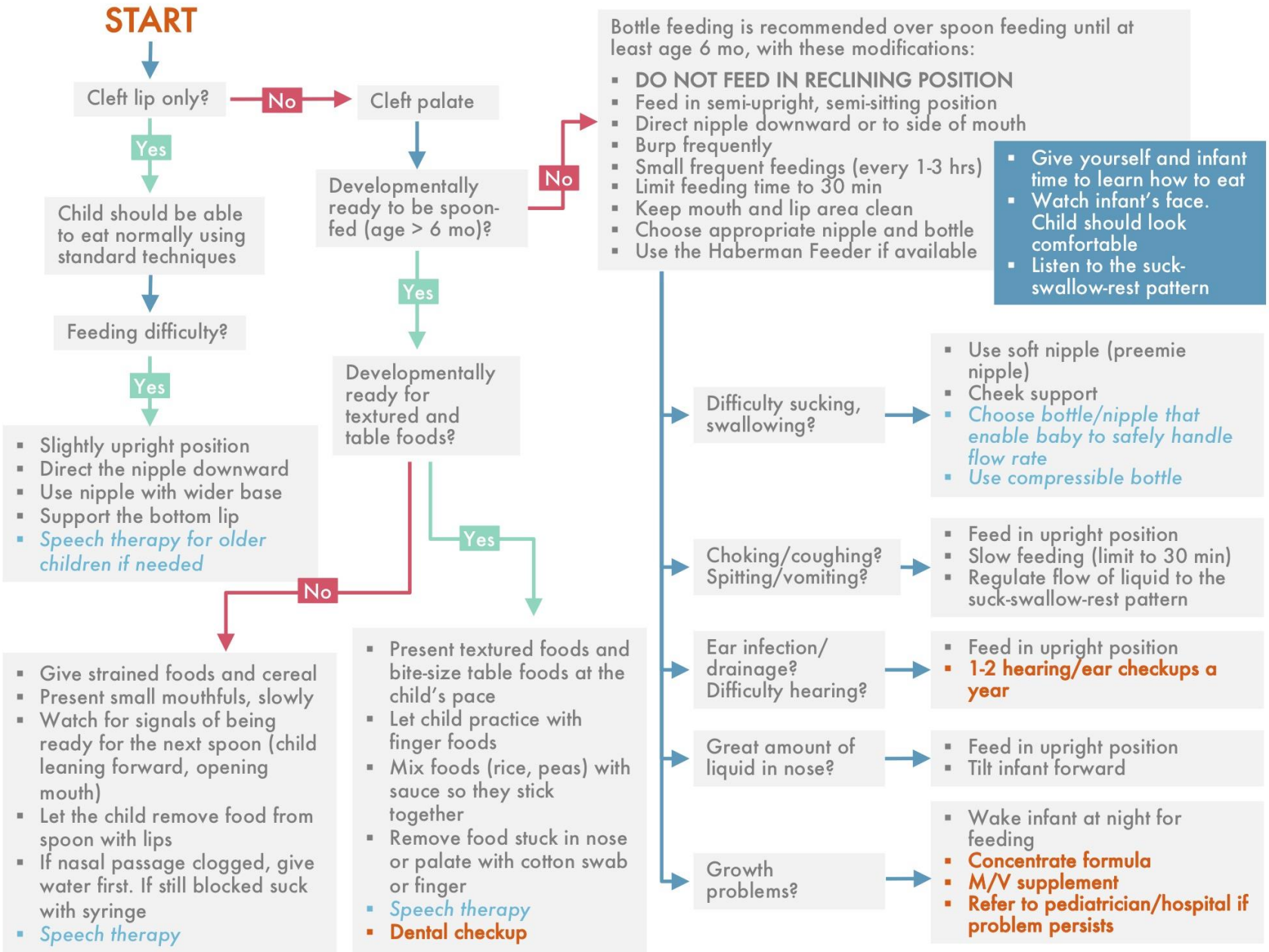
1 Disabilities and Medical Needs

Refer to Ch.16 for more information on common disabilities and medical needs



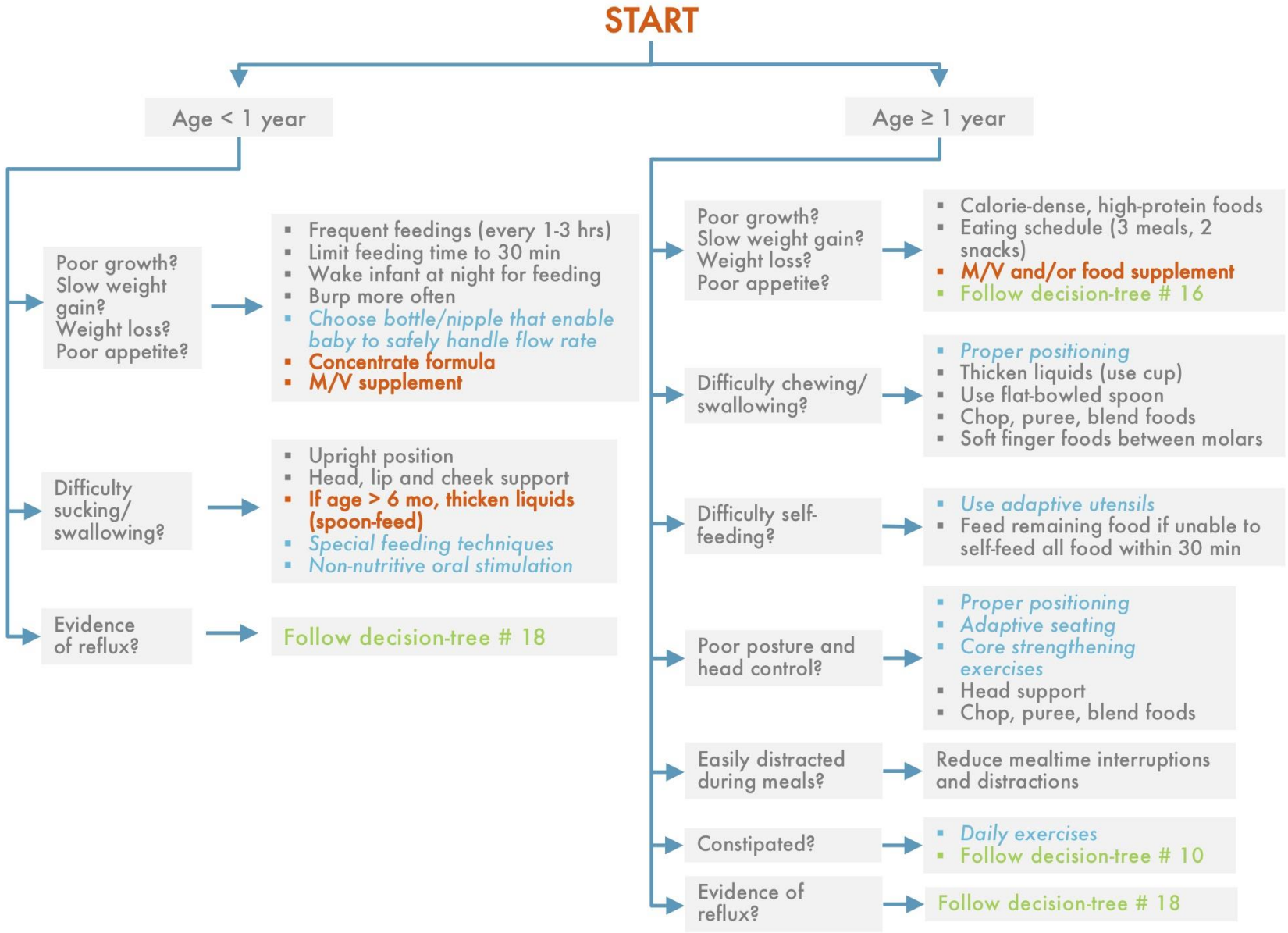
2 Cleft Lip, Cleft Palate

Refer to Ch.16 for more information on cleft lip and cleft palate



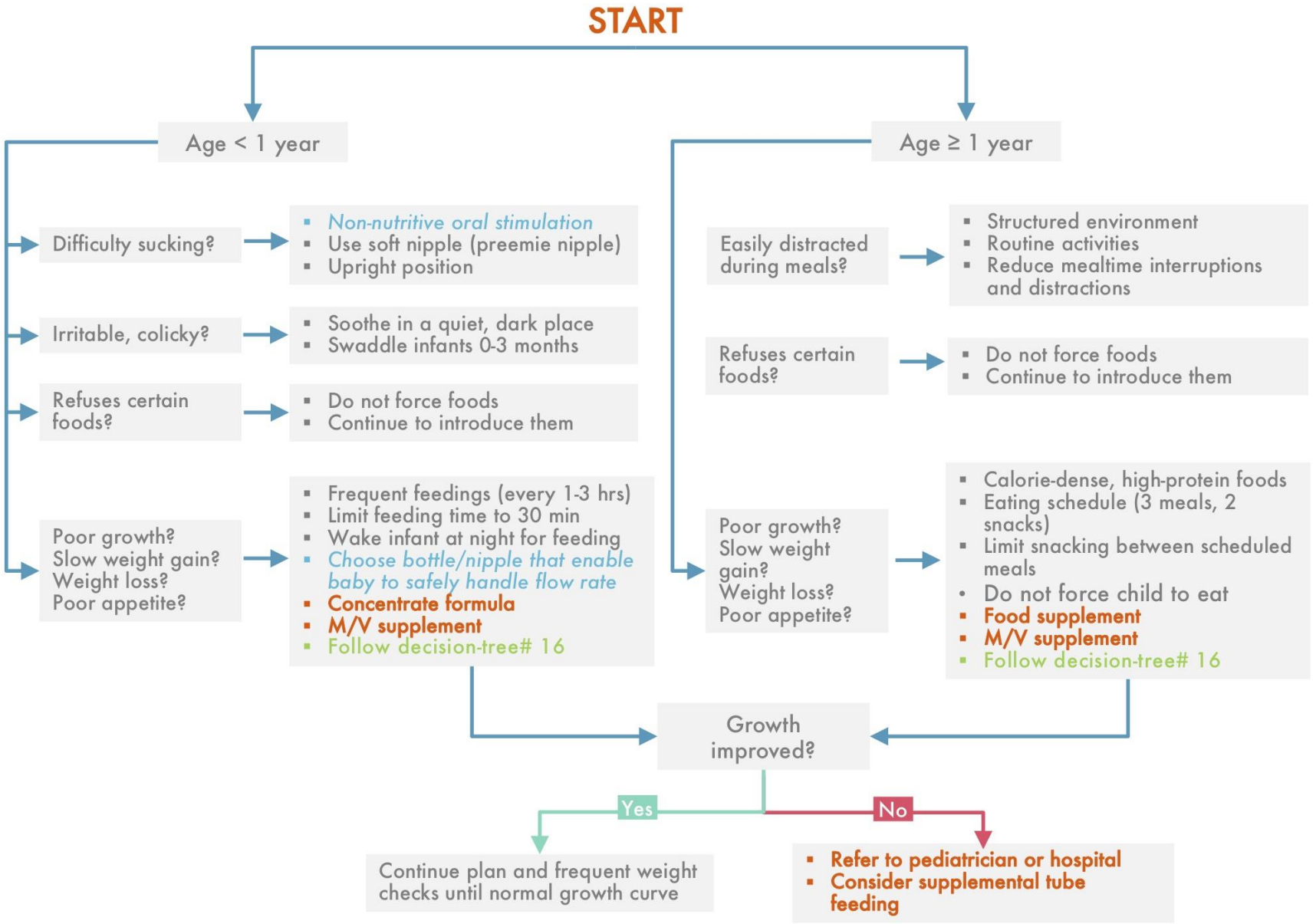
3 Cerebral Palsy

Refer to Ch.16 for more information on cerebral palsy



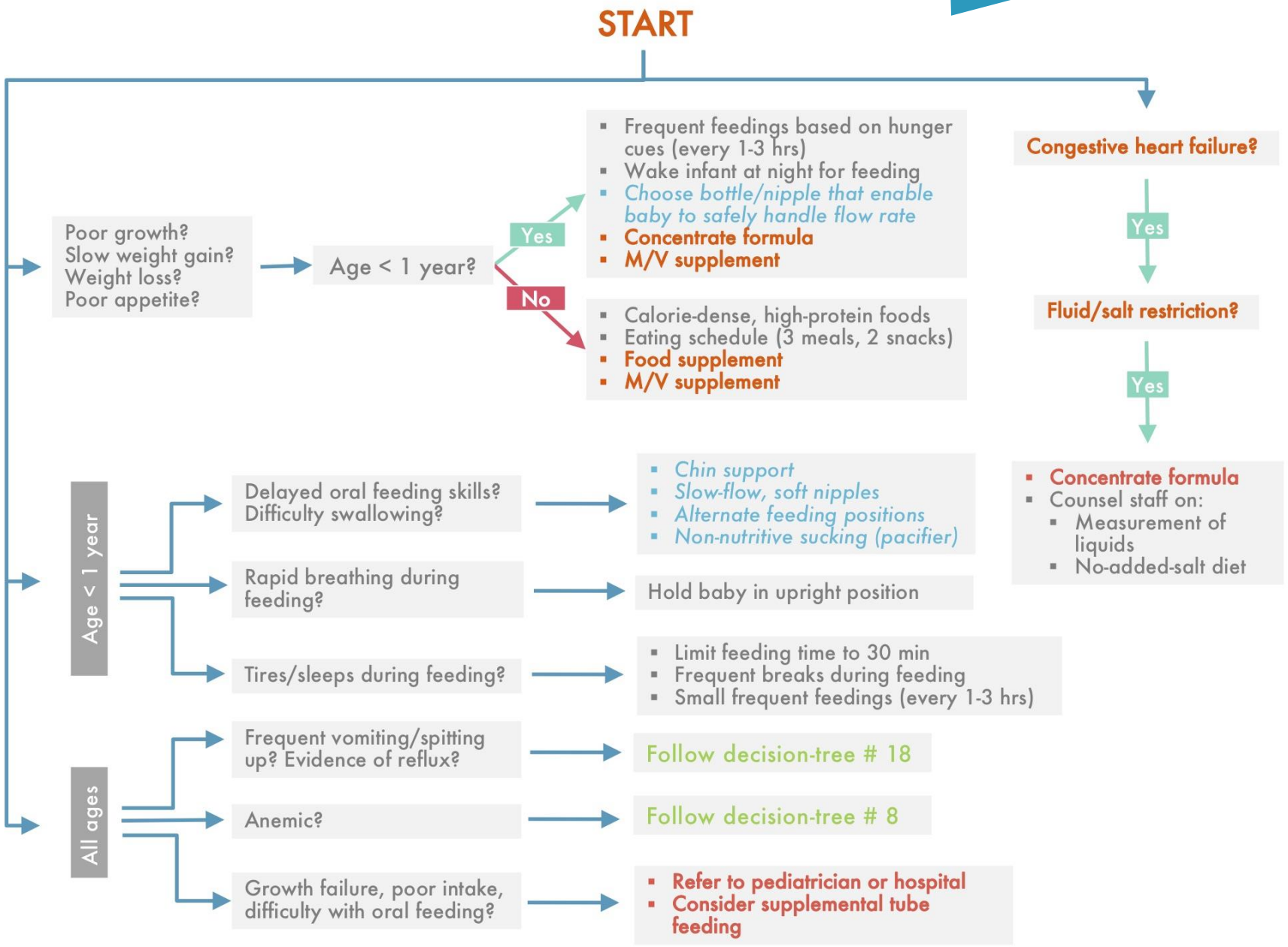
4 Fetal Alcohol Spectrum Disorder

Refer to Ch.16 for more information on fetal alcohol syndrome



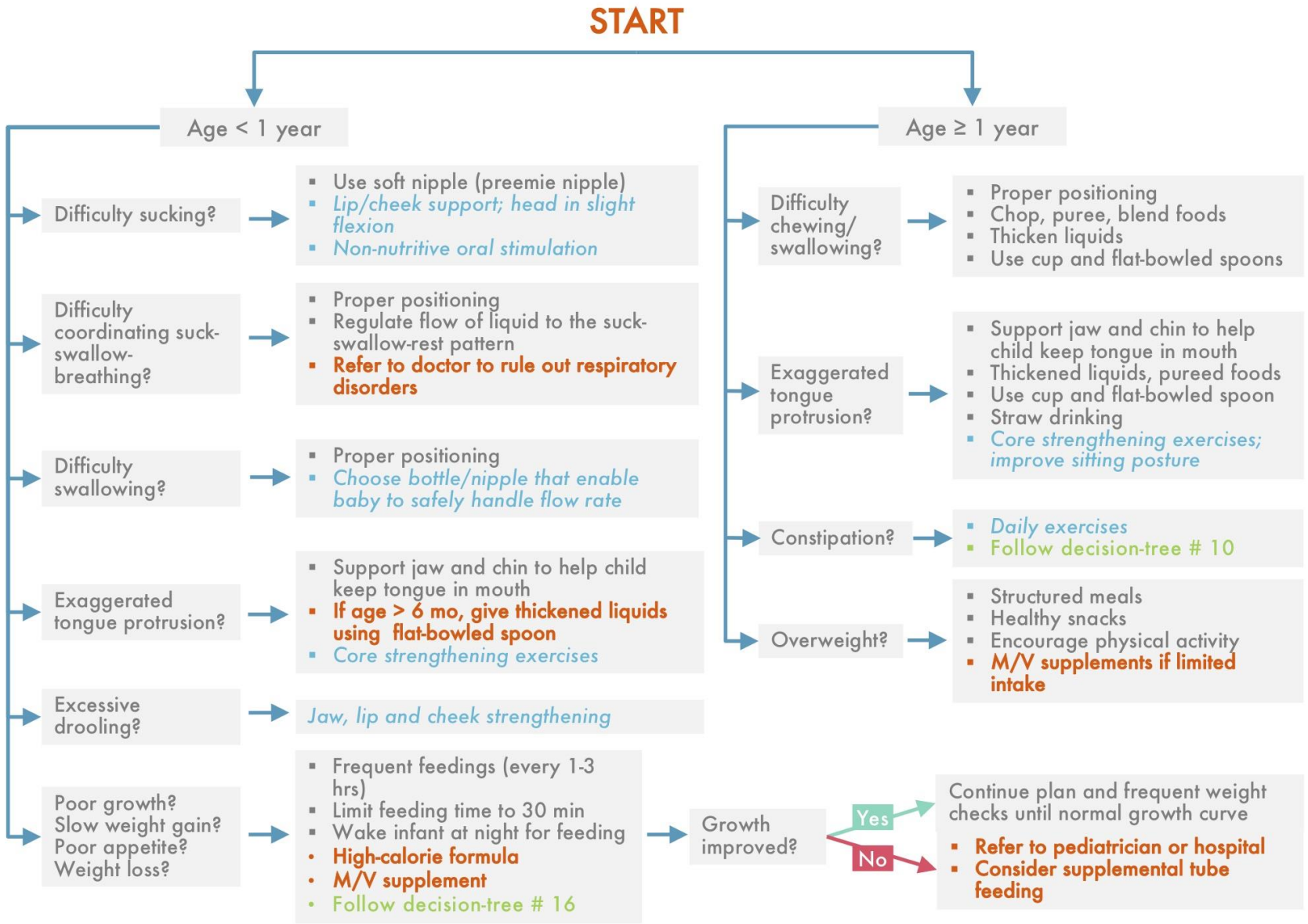
5 Congenital Heart Disease

Refer to Ch.16 for more information on congenital heart disease



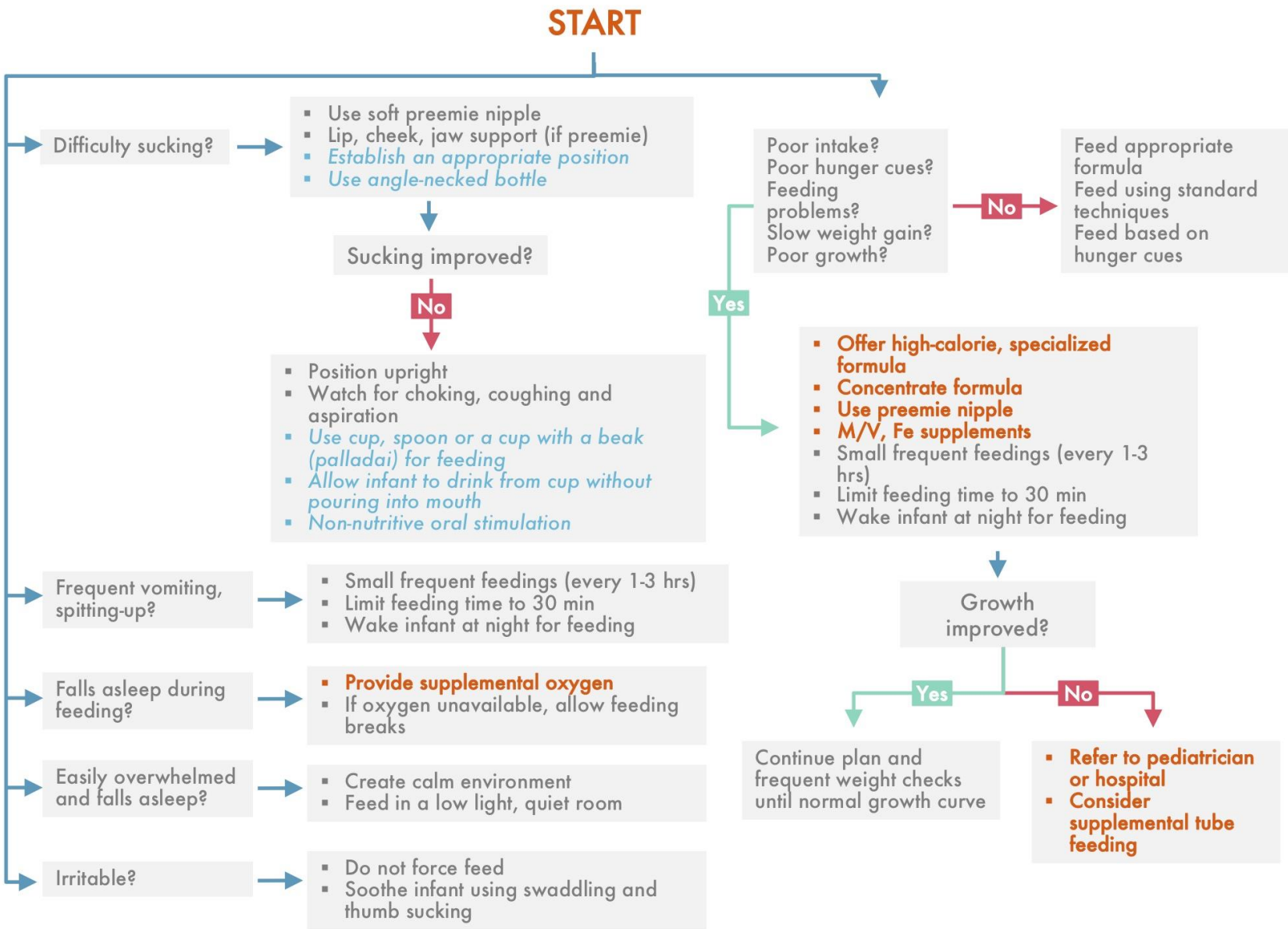
6 Down Syndrome, General Low Tone

Refer to Ch.16 for more information on Down syndrome and general low tone

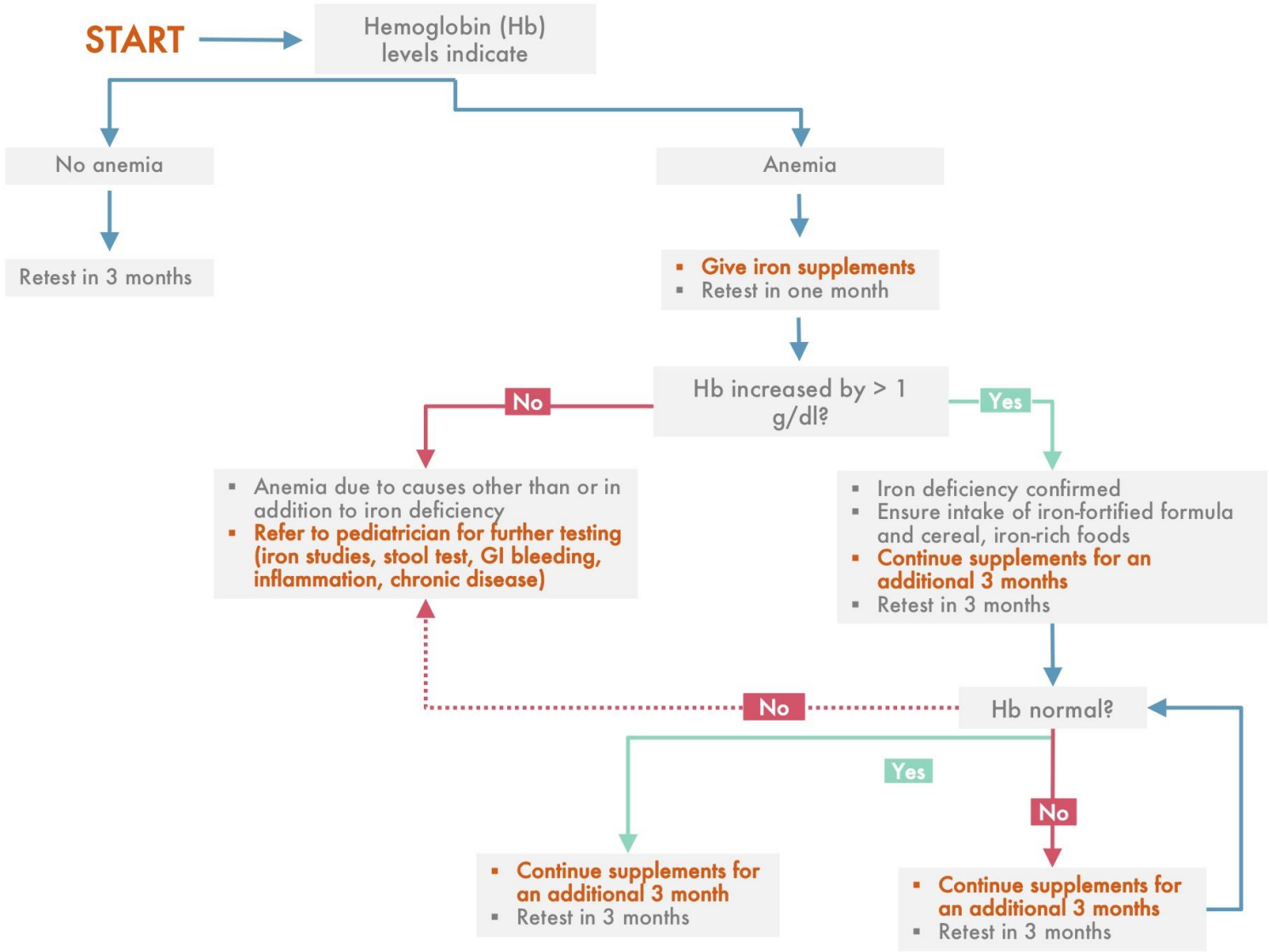


7 Low Birth Weight

Refer to Ch.16 for more information on low birth weight

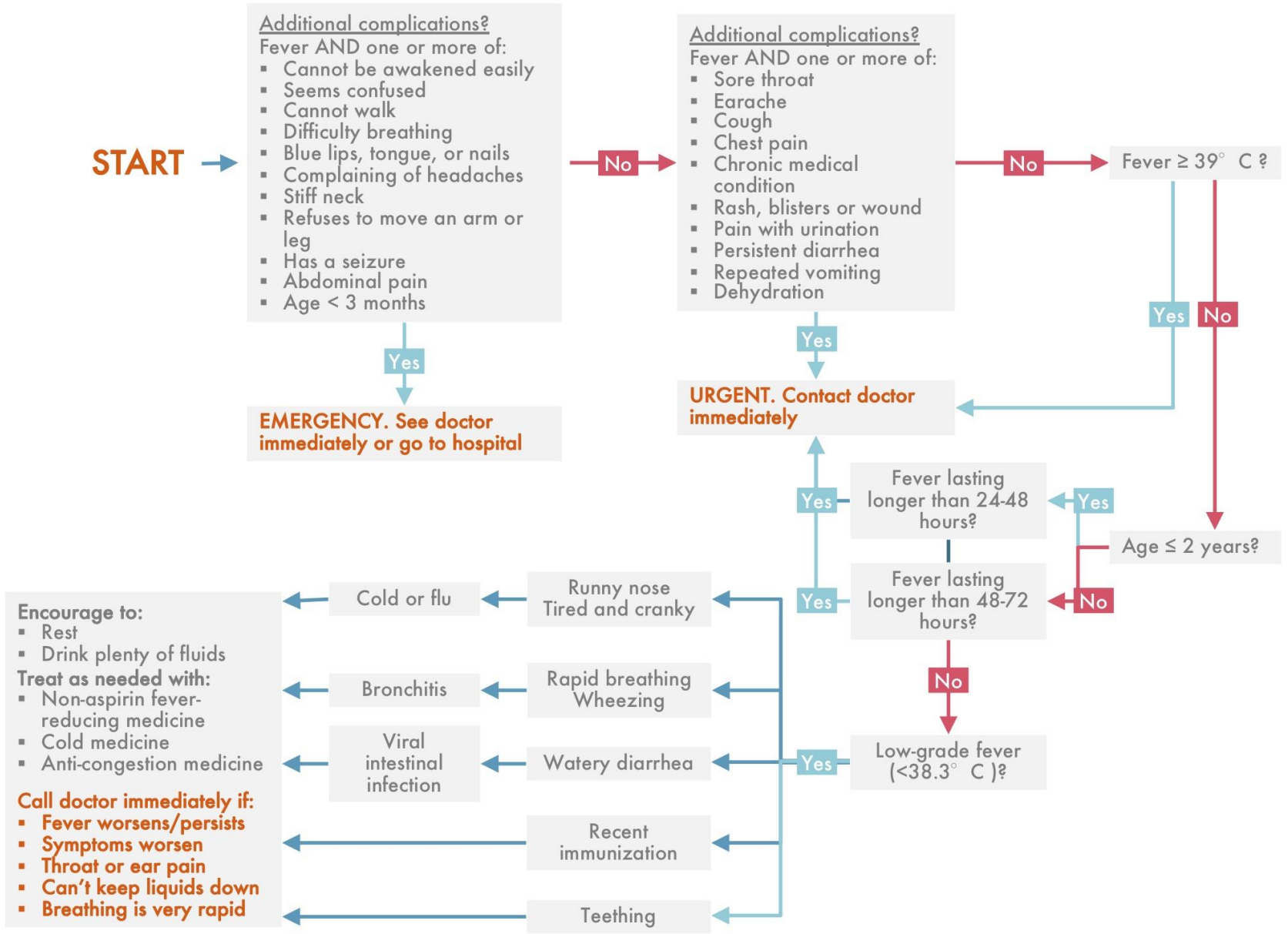


Refer to Ch. 8 for more information on anemia



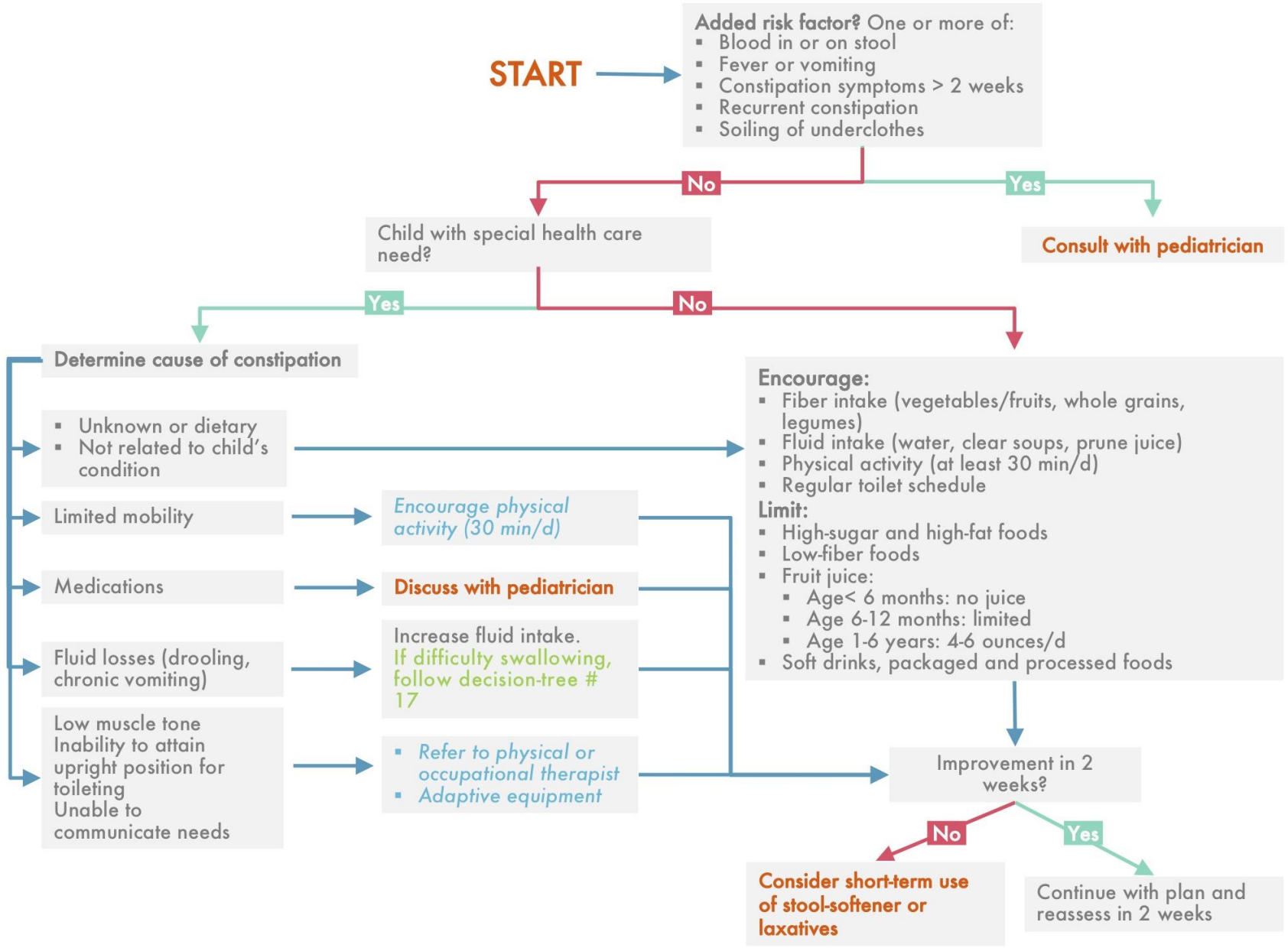
Fever

Refer to Ch. 11 for more information on fever

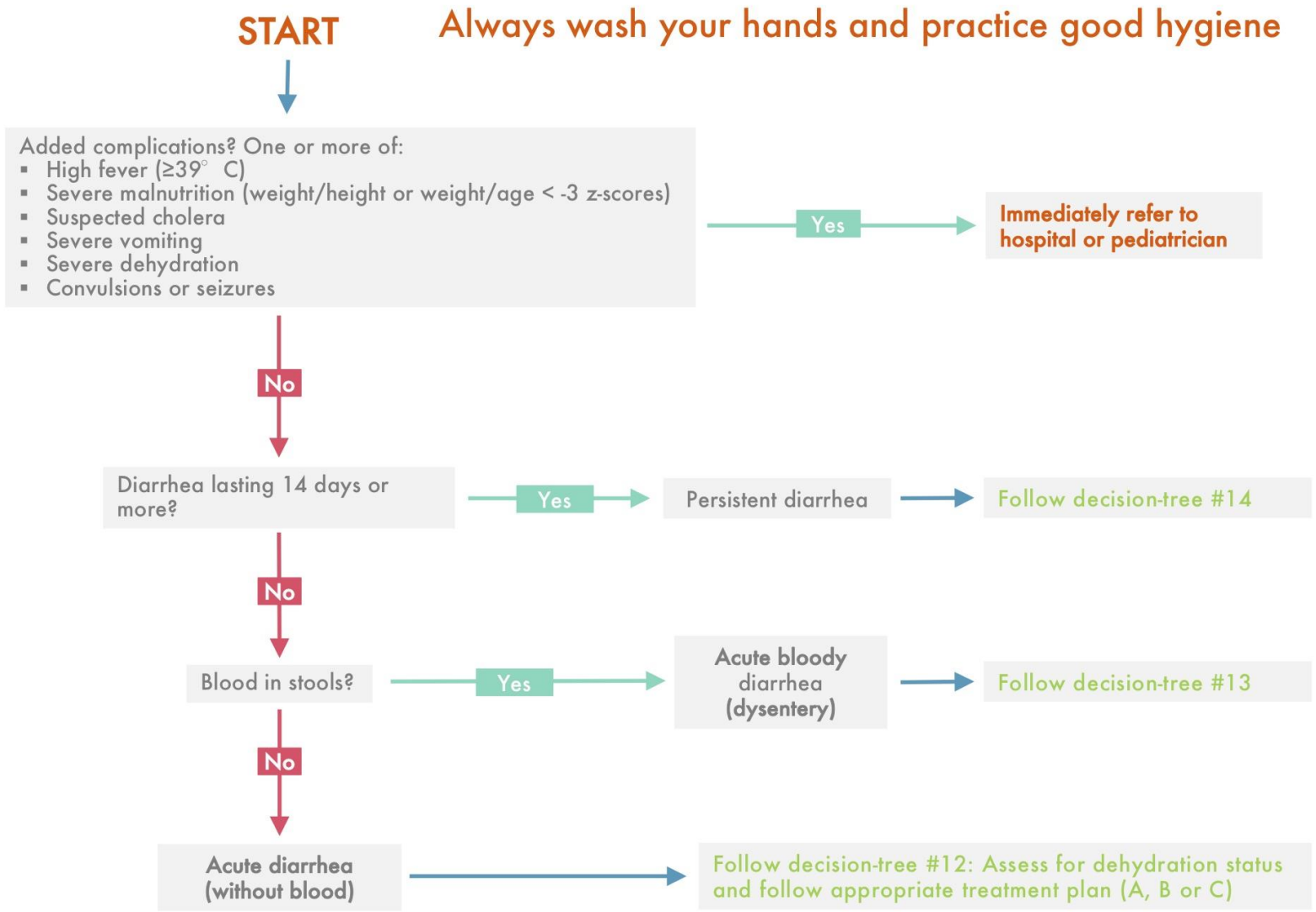


10 Constipation

Refer to Ch. 10 for more information on constipation



Refer to Ch. 9 for more information on diarrhea



Dehydration

Refer to Ch. 9 for more information on dehydration status

START

Dehydration Status

NO DEHYDRATION

- Condition: Well, alert
- Eyes: Normal
- Thirst: Drinks normally, not thirsty
- Skin pinch: Goes back quickly

TREATMENT PLAN A

- Extra fluids to prevent dehydration:
  - Age < 2 year, 50-100 ml (1/4-1/2 cup)
  - Age 2-10 years, 100-200 ml (1/2-1 cup)
  - Age > 10 years, as much as they want
- Give fluids in small, frequent amounts
- Do NOT give drinks sweetened with sugar
- **Zinc supplements as soon as diarrhea starts:**
  - Age < 6 months, 10 mg for 14 days
  - Age ≥ 6 months, 20 mg for 14 days
- Frequent small meals, every 3-4 hours
- Extra meal after diarrhea stops for 2 weeks
- **Refer to hospital or pediatrician if condition gets worse**

SOME DEHYDRATION

- Condition: Restless or irritable behavior
- Eyes: Sunken
- Thirst: Thirsty, drinks eagerly, dry mouth
- Skin pinch: Goes back slowly
- Other: Sunken fontanelle or soft spot on top of head (infants)

TREATMENT PLAN B

THE INITIAL 4-HOUR REHYDRATION PERIOD:

- **ORS in small, frequent amounts appropriate for weight and age:**
  - Amount (ml) = child's weight (kg) x 75 (ml)
- Do NOT give food or zinc during the initial 4-hour period

AFTER 4 HOURS:

- Reassess dehydration status and follow appropriate treatment plan
- **Zinc supplements as soon as child is able to eat:**
  - Age < 6 months, 10 mg for 14 days
  - Age ≥ 6 months, 20 mg for 14 days
- Frequent small meals, every 3-4 hours
- Extra meal after diarrhea stops for 2 weeks
- **Refer to hospital or pediatrician if condition gets worse**

SEVERE DEHYDRATION

- Condition: Lethargic, unconscious
- Eyes: Sunken
- Thirst: Drinks poorly or unable to drink
- Skin pinch: Goes back very slowly
- Other:
  - Lack of urine output
  - Cool, moist extremities
  - A rapid and feeble pulse
  - Low or undetectable blood pressure
  - Bluish discoloration in fingers or extremities

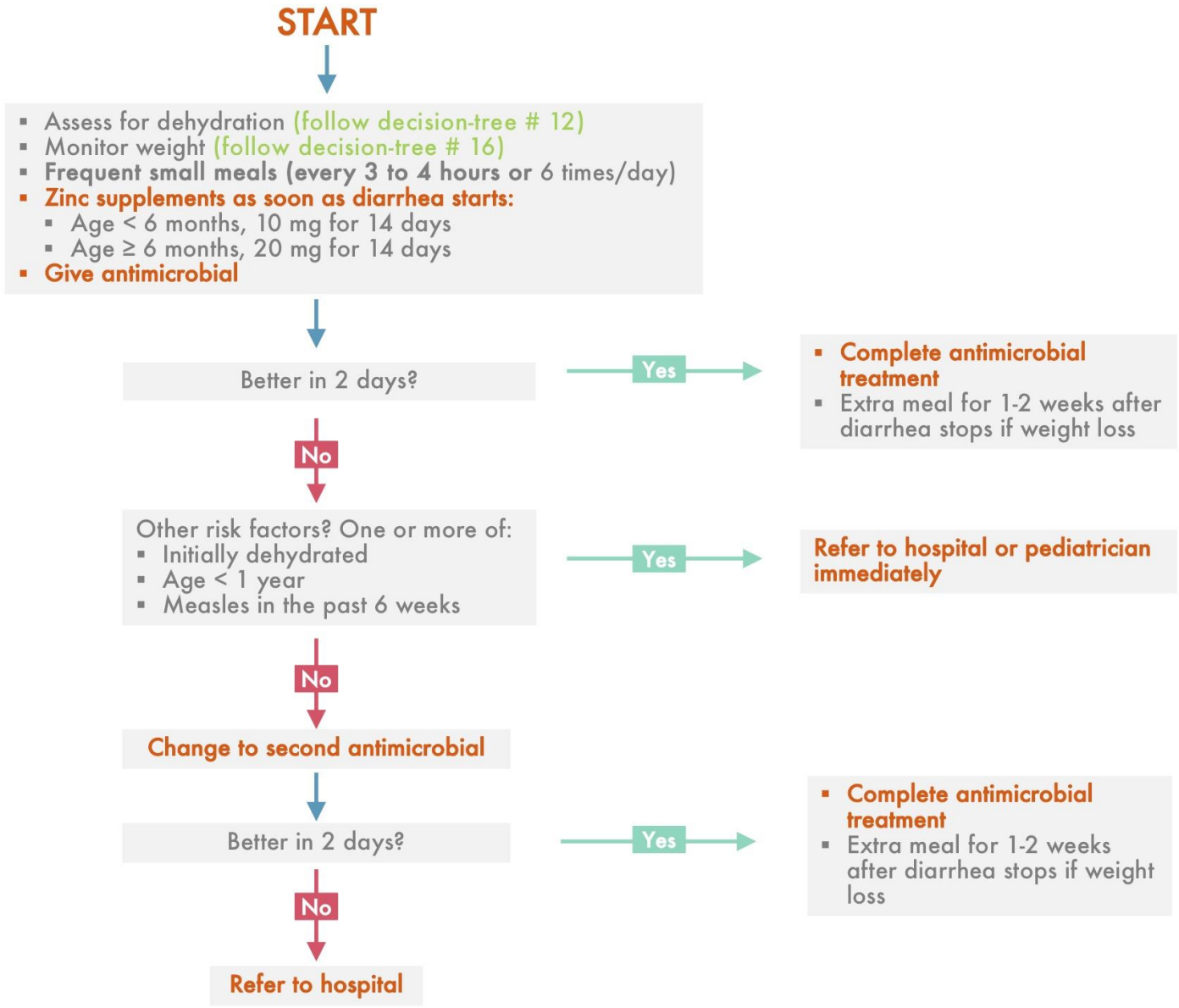
TREATMENT PLAN C

Refer to hospital or pediatrician immediately

ORS: Oral rehydration solution

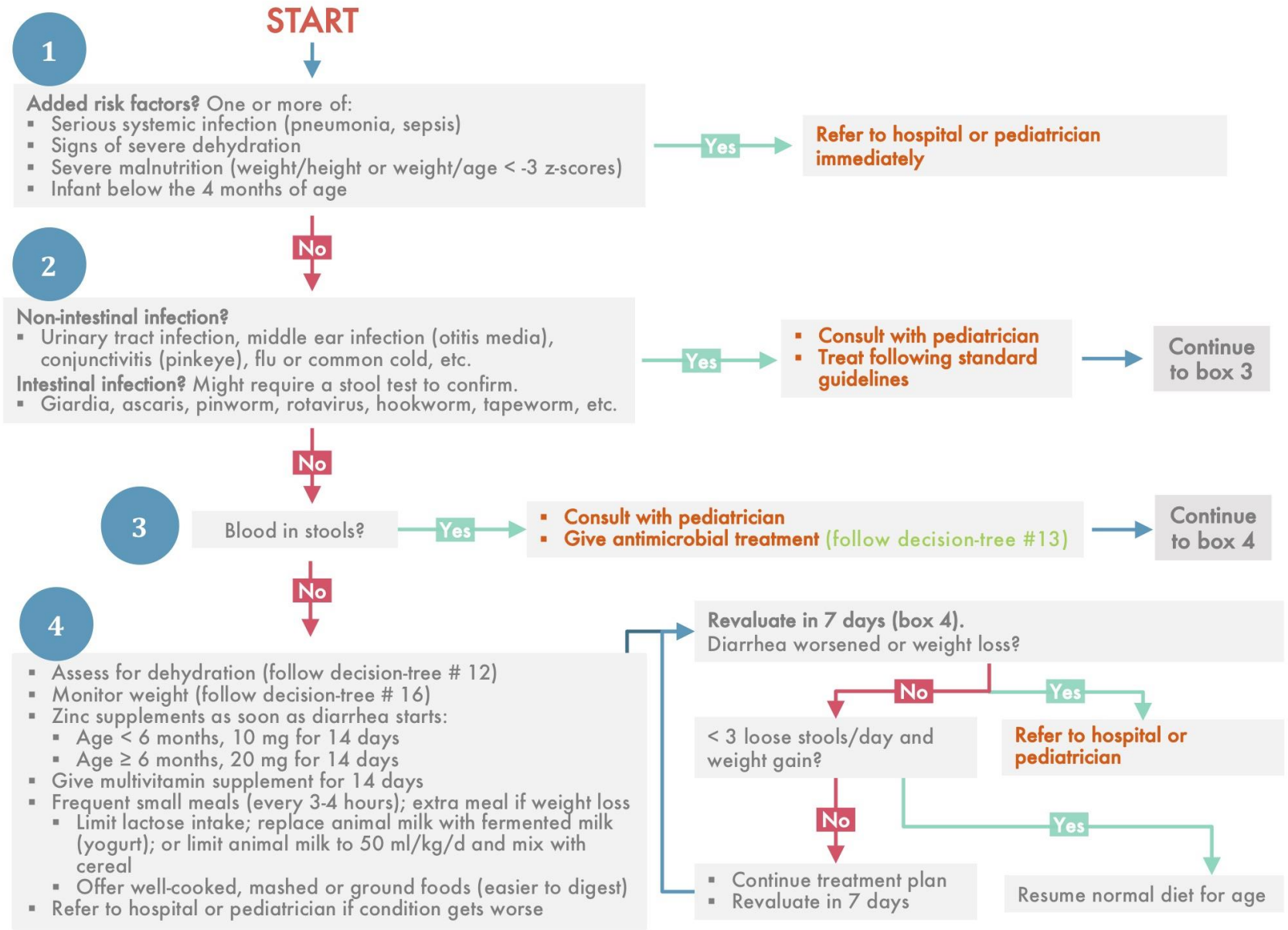
Acute Bloody Diarrhea

Refer to Ch. 9 for more information on diarrhea



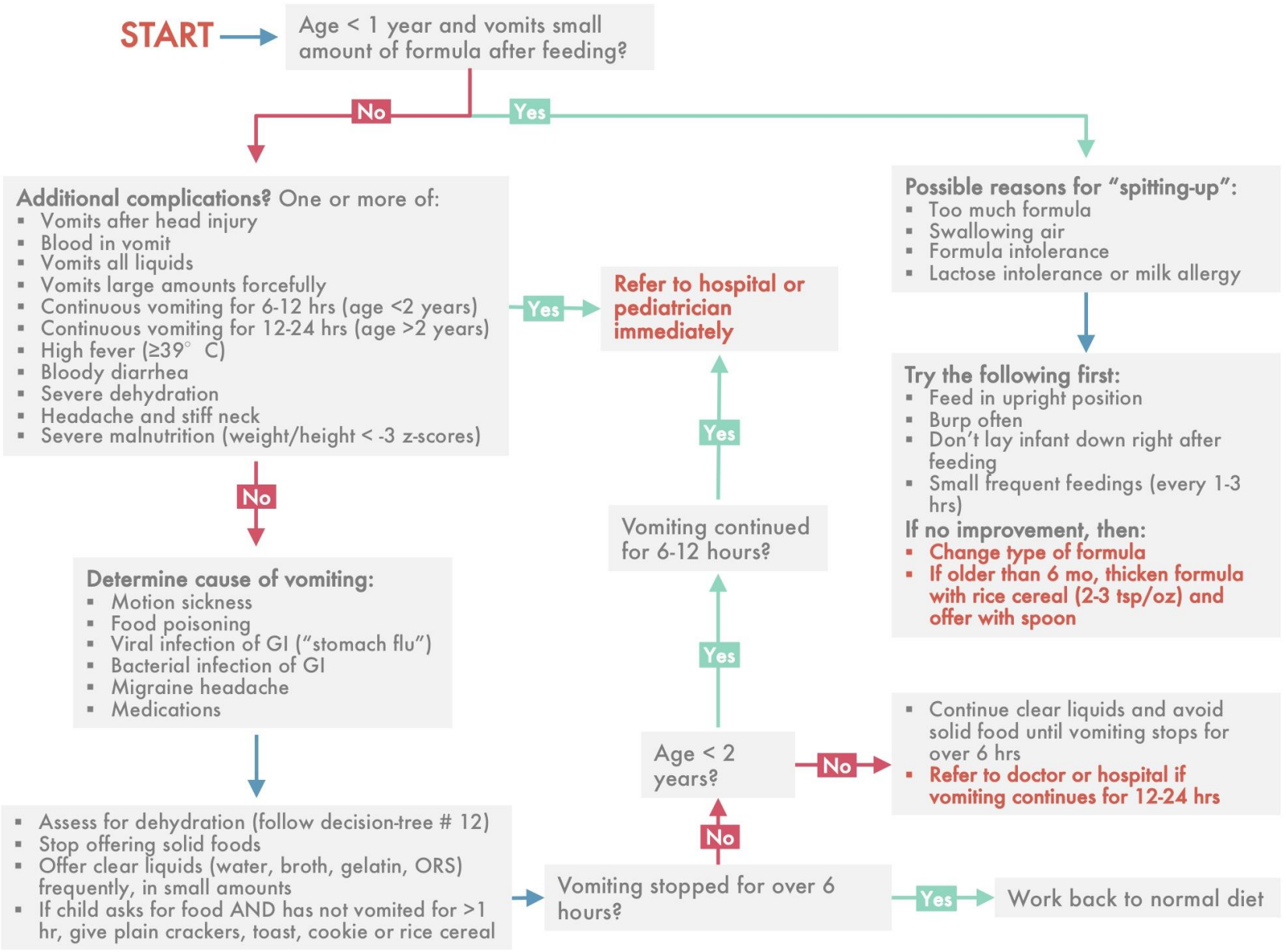
Persistent Diarrhea

Refer to Ch. 9 for more information on diarrhea

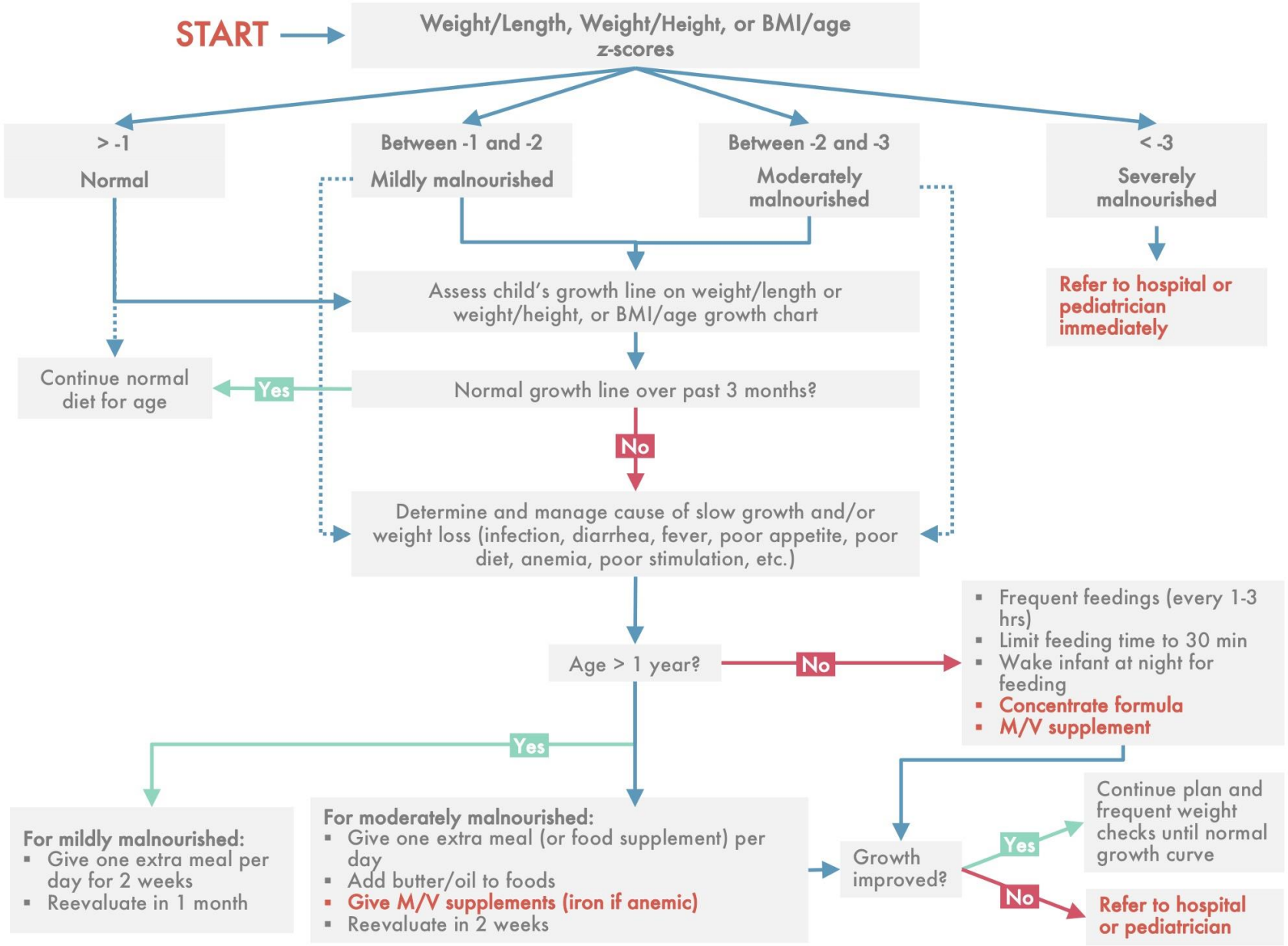


15 Vomiting

Refer to Ch.12 and Ch. 13 for more information on vomiting and spitting-up

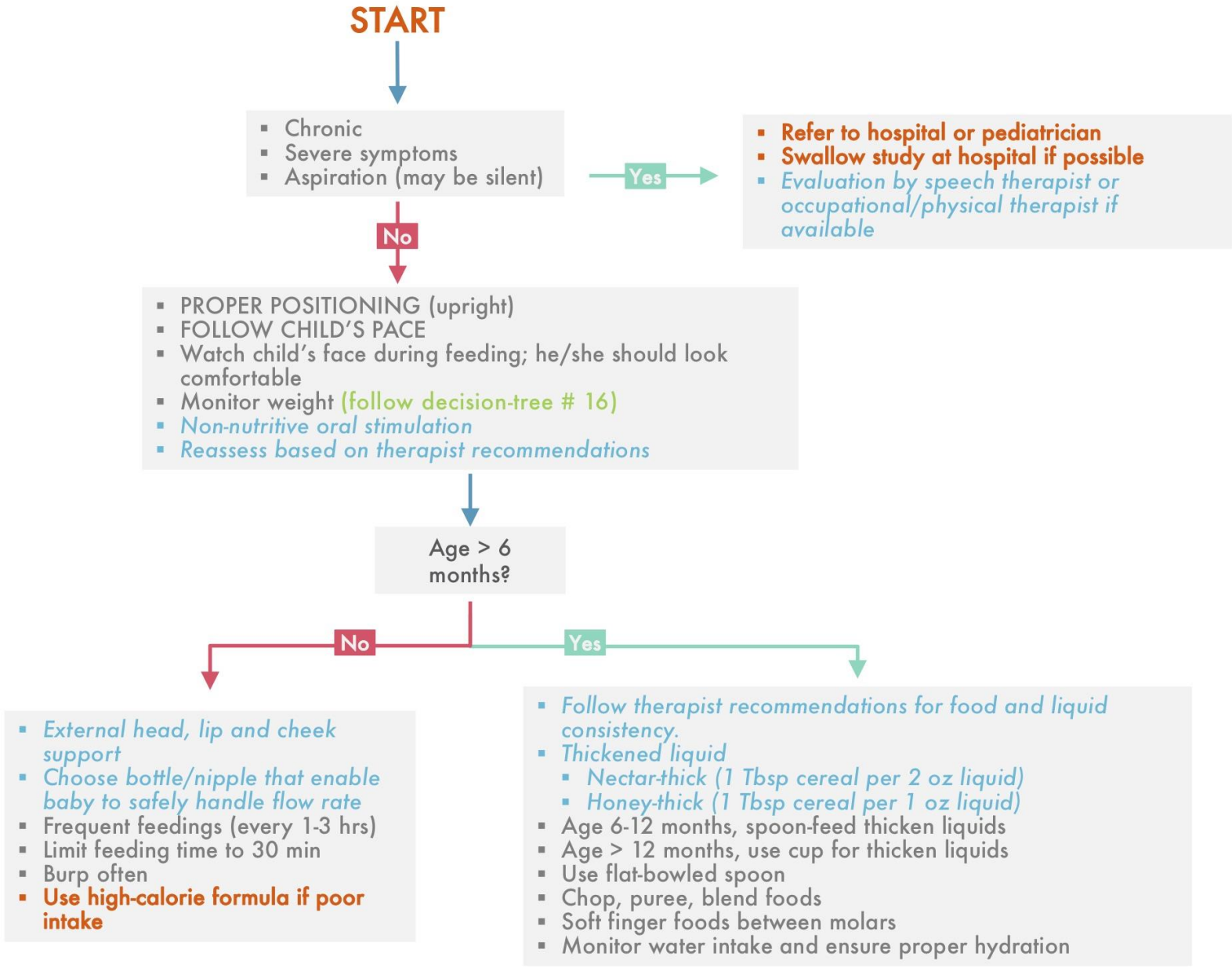


Refer to Ch. 7 for more information on growth screening



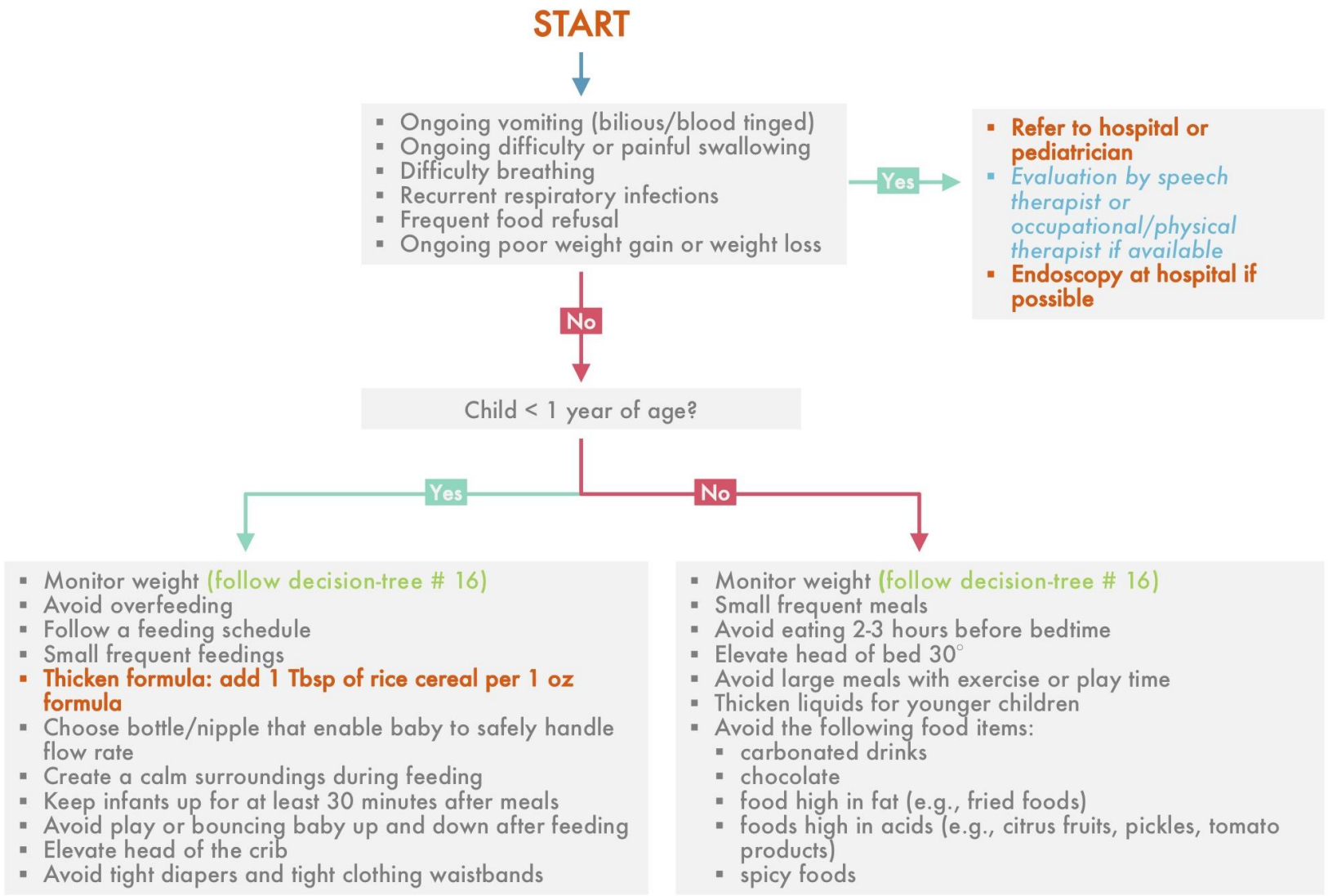
17 Difficulty Swallowing

Refer to Ch.16 for more information on difficulty swallowing and oral-motor feeding problems



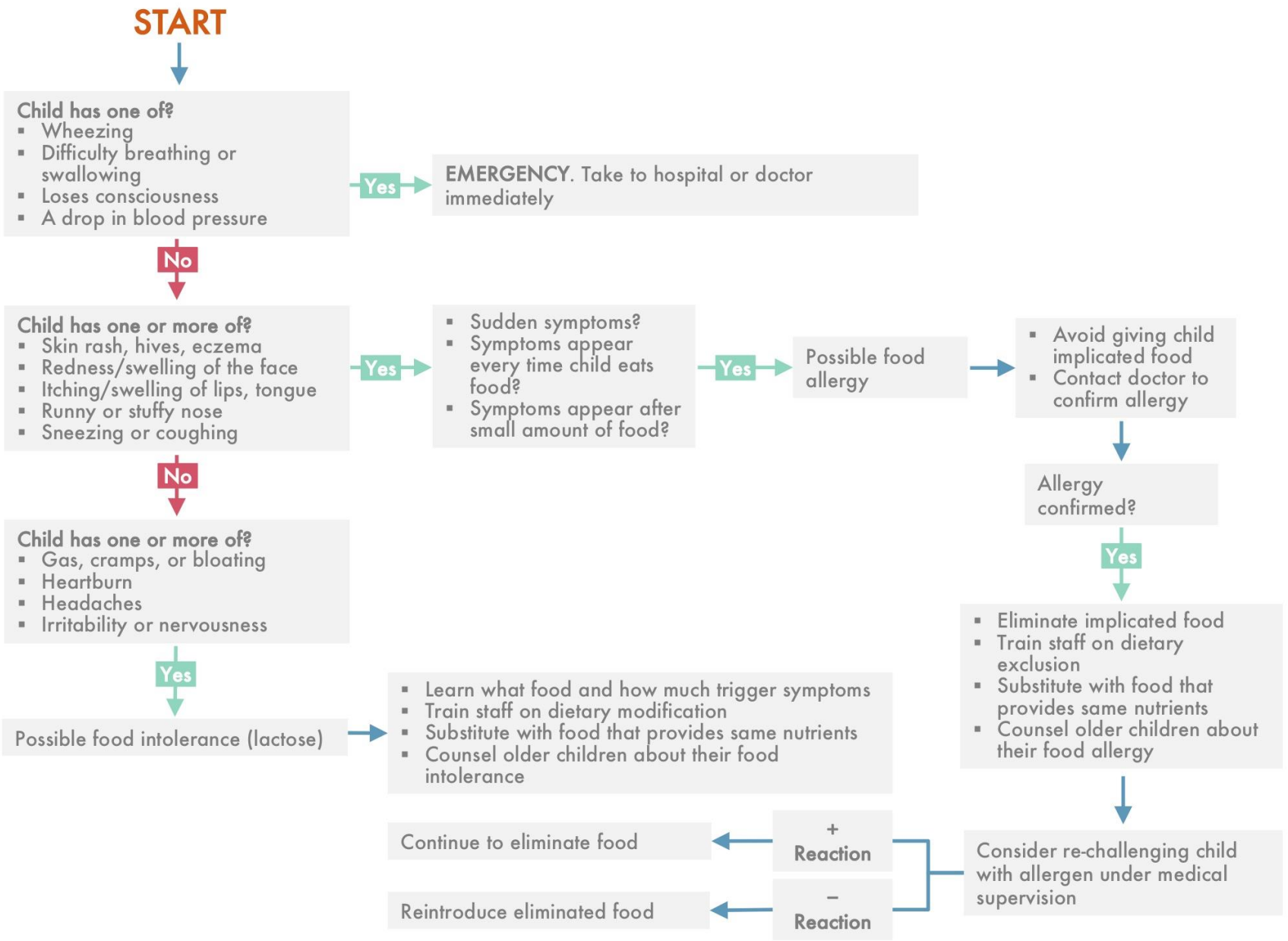
Reflux

Refer to Ch. 13 for more information on reflux



Food Allergy and Intolerance

Refer to Ch. 14 for more information on food allergy and intolerance



Bilateral Pitting Edema

Refer to Ch. 7 for more information on bilateral pitting edema