



UNIT 5

Diseases and First-aid

Learning Objectives

- ◆ Communicable and non-communicable diseases
- ◆ Causes of communicable diseases
- ◆ Preventive measures for communicable diseases
- ◆ Basic idea of first-aid

TRANSMISSION OF DISEASES

The malfunctioning of the body is called a **disease**. Diseases are caused by either microorganisms or due to deficiency of certain nutrients in our diet. Microorganisms enter our body through food, water or by contact with an infected person. Diseases can be broadly classified into following two categories.

DO YOU KNOW?

When we cough, sneeze or spit, the germs spread to about 20 feet around us.

1. Communicable Diseases

These diseases are caused by the entry of disease producing organisms called **pathogen** in the body. These diseases spread very rapidly from person to person through personal contact or through air, water and the food we eat.

Depending upon the causative agent, communicable diseases are of five types :

- (i) Bacterial diseases e.g. diphtheria, tetanus, typhoid, tuberculosis, cholera, etc.
- (ii) Viral diseases e.g. mumps, measles, polio, smallpox, chickenpox, rabies etc.
- (iii) Protozoan diseases e.g. malaria, amoebiasis, kala azar, sleeping sickness, etc.
- (iv) Helminth diseases e.g. taeniasis, ascariasis, filariasis, etc.
- (v) Fungal diseases e.g. ringworm, athlete's foot, etc.

Spread of Communicable Diseases

These diseases spread in four ways—through contact, through air, through insects and by having infected food and water.

Diseases spread through contact

Diseases like common cold, chickenpox, smallpox, measles, whooping cough and ringworm are spread through contact. They can spread by sharing the same soap, towel, comb, clothes, bedding, utensils, etc. which have been used by a person suffering from these diseases.



Fig. 5.1 Diseases can spread by sharing things used by an infected person

Droplet infection through air

These diseases are caused when a healthy person breathes air which has germs of diseases like common cold, cough, flu, chickenpox, scarlet fever, diphtheria, etc. When the infected person coughs, sneezes, spits or laughs, the germs of these diseases go into the air. Diseases spread directly on exposure to sprays of droplets of saliva during sneezing or coughing. When other people breathe this air, they get infected.

Diseases spread through insects

Malaria, dengue, plague, yellow fever, sleeping sickness and kala azar are diseases caused by the bite of insects like sandflies, fleas, bugs and mosquitoes which carry the germs. When they bite a healthy person, they pass on the germs.

DO YOU KNOW?

Malaria is caused by the female anophele mosquito which carries the germ from the blood of a sick person to a healthy person.



Malaria is transmitted by the bite of an infected *anophele* mosquito. During the bite, it inoculates the germs into the body of a healthy person. Dengue is transmitted by a mosquito called *Aedes aegypti*. Houseflies carry germs of typhoid and cholera. When flies sit on sputum or garbage, they pick up the germs from the source and leave them on the exposed food or the other articles that a person handles and uses. The insect which transmits the disease is called a vector.

Diseases spread through infected food and water

Cholera, diarrhoea, food poisoning, jaundice, typhoid, tuberculosis and dysentery are all caused by having contaminated food and water. These diseases mostly affect the digestive system. The carriers of these germs are mostly houseflies. They carry the germs from garbage and sewers and deposit them on uncovered food and other things. Therefore

we should eat food which is covered and prepared with clean hands, in clean utensils and under hygienic conditions.



Fig. 5.2 Flies deposit germs on uncovered food

Diseases spread through healthy people

There are some diseases that spread through healthy persons who carry the germs that cause cholera, typhoid, measles, mumps and dysentery. These people are called carriers. They carry the germs and transfer them to other people though they themselves do not suffer from these diseases.

Basic Rules to Prevent Infection

- (i) Proper sanitation
- (ii) Disposal of garbage in covered bins
- (iii) Do not allow stagnant water near your house as it is the breeding ground for mosquitoes.
- (iv) Drink clean and boiled water.
- (v) Follow rules for personal cleanliness
- (vi) Avoid eating exposed items.
- (vii) Use your own comb, towel and handkerchief.
- (viii) Wash your hands with a soap, before eating meals/food.

- (ix) Cover your mouth and nose with a tissue or handkerchief while sneezing/coughing.
- (x) Isolate the patient in case of a contagious disease like chickenpox.
- (xi) Vaccination and immunization: We should protect ourselves and our family members against common diseases like typhoid, cholera, pox,

whooping cough and tuberculosis, etc. This can be done by taking vaccination against the disease.

DO YOU KNOW?

The disease **phenylketonuria** if untreated can cause problems with brain development, leading to progressive mental retardation, brain damage and seizures.

TABLE 5.1
Diseases Caused due to Deficiency of Vitamins

Vitamin	Deficiency Causes	Available from
A (Retinol)	Poor vision, bad eyes, nightblindness	Spinach, carrots, butter, mangoes
B ₁ (Thiamine)	Extreme weakness, beri-beri	eggs, meat, yeast
B ₂ (Riboflavin)	Retarded growth, bad skin	green leafy vegetables, beans, peas, milk
B ₁₂ (Cyanocobalamin)	Anaemia	non-vegetarian food like meat
D (Calciferol)	Rickets, brittle bones which break or bend easily in children	milk, fish, liver oil
C (Ascorbic acid)	Scurvy, swollen gums and loose teeth	lime, lemon, oranges
K (Phylloquinone)	Excessive bleeding due to injury	green leafy vegetables

2. Non-communicable Diseases

These diseases cannot be transmitted from an infected person to a healthy person. These diseases affect only the person who is suffering from it.

Non-communicable diseases can be categorised into five types:

- (i) Deficiency diseases e.g. beri-beri, scurvy, nightblindness, goitre, etc.
- (ii) Degenerative diseases e.g. heart attack, arthritis, diabetes, etc.
- (iii) Allergies e.g. eczema, asthma, bronchitis, etc.
- (iv) Social diseases like alcoholism, drug addiction, etc.

TABLE 5.2

Diseases Caused due to Deficiency of Minerals

Name of minerals	Symptoms	Available from
Calcium	Brittle bones, excessive bleeding, bad muscular movement.	milk, green leafy vegetables.
Phosphorus	Bad teeth and bones.	pulses, cereals, milk.
Iron	Anaemia, lack of red blood cells.	green vegetables, pulses, meat.
Iodine	Goitre, enlarged thyroid gland.	fish, salt from sea water.
Copper	Low appetite, retarded growth.	pulses and leafy vegetables.
Cobalt, Zinc, Sodium & Potassium	General weakness.	cereals, pulses, vegetables.

(v) Inherited diseases like albinism, phenylketonuria, etc.

DO YOU KNOW?

Albinism is a congenital disorder characterised by the complete or partial absence of pigment in the skin, hair and eyes.

Protein-Carbohydrate Deficiency Disease

Marasmus

Our body requires proteins for growth and carbohydrates for supplying energy. A diet with poor carbohydrate and protein content leads to marasmus.

Marasmus affects children below the age of 1 year. The mental and physical growth of the baby is stunted and the body becomes weak.

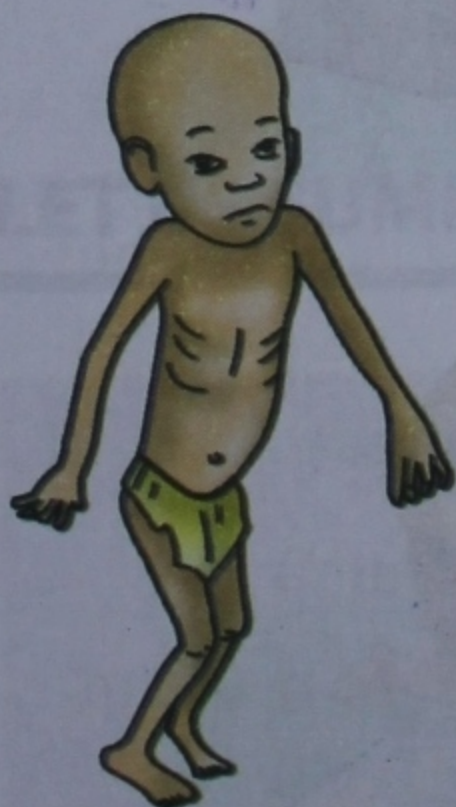


Fig. 5.3 A child suffering from marasmus

The skin gets dry and wrinkled. The baby suffers from frequent diarrhoea and stomach disorders.

A child suffering from marasmus should be fed with carbohydrate and protein rich foods like wheat, soyabean, eggs, sugar, potato, gram, fish, meat and nuts.

Kwashiorkor

Kwashiorkor is caused in children who have stopped breast feeding and do not get enough carbohydrates and proteins in their diet.



Fig. 5.4 Children suffering from kwashiorkor

A child suffering from kwashiorkor has low appetite, swollen legs and belly, enlarged liver and reduced growth.

A child suffering from kwashiorkor should be fed skimmed milk, porridge (dalia), khichri, pulses, eggs, sugar and potato.

FIRST-AID

An accident is something which happens suddenly and damages something or injures someone. Accidents can occur anywhere—on road, in the house, at school, offices and other places.

Accidents often occur because of our carelessness. Although accidents can take place even after we take all precautions, they can be minimised by being alert and by taking precautions.

In the event of an accident, sometimes we are not able to get to a doctor at once. In such cases the immediate help or treatment given to an injured person before a medical aid can arrive, gives immediate relief and sometimes even saves life. This immediate treatment is called first-aid.

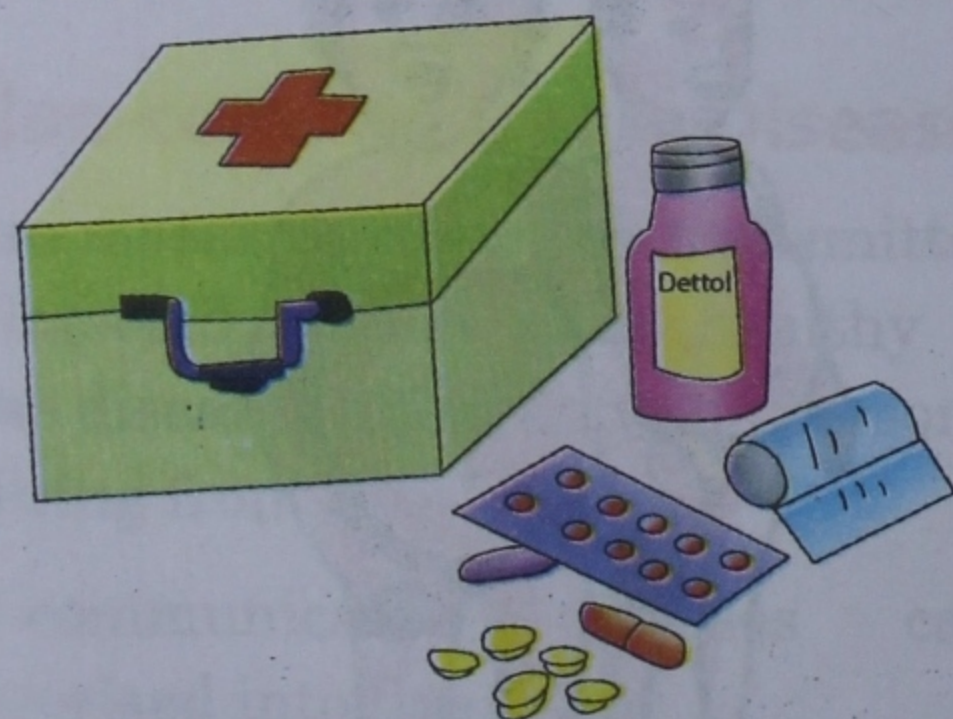


Fig. 5.5 First-aid box

FIRST-AID FOR SOME COMMON INJURIES

Bleeding from Cuts and Wounds

We get wounds and cuts from sharp objects like knives, blades, etc.

- If the cut is small, wash it with plenty of water using cotton or a clean cloth.
- Wash the wound with a soap and an antiseptic lotion.
- Cover the wound with a clean bandage.
- If it is a deep wound, wrap a tourniquet above the wound and take the patient to a doctor. The patient may need stitches or a tetanus injection.

To stop bleeding, raise the wound above the level of the heart to slow the flow of blood from that area.



Fig. 5.6 First-aid for cuts and wounds

- When the bleeding stops, clean the wound and apply antiseptic cream and bandage firmly.

Bruises

- Bruises could be treated by a cold pack or ice pack.
- Covering the bruised area with an ice pack for few minutes can give relief.
- If the bruise is very large then one should consult a doctor.

Burns

- Accidents due to fire can cause serious injuries or sometimes even death.
- In case of minor burn injuries, first-aid measures can be taken at home.
- Cool the burnt area with water for 10 minutes or apply ice-cubes. It will reduce the heat or even prevent the formation of blisters.
- Apply a soothing cream or a paste of baking soda on it to reduce the pain.



Fig. 5.7 First-aid for burns

- Cover the burns with a bandage or a clean cloth to keep flies and dust away.

Causes of Fire

- Short circuit or faulty electrical wiring.
- Bursting of crackers, cylinders, etc.
- Leakage in cooking gas pipe.

Measures to be Taken when a Fire Breaks out

- Throw sand/mud on the fire to put it off.
- Put off the main switch in the house to prevent further damage.
- Remove gas cylinders immediately from the house.
- Look for an exit and rush out.
- Call a fire brigade.

LET US SUMMARISE

1. Diseases are of two kinds

- Communicable—caused by microorganisms
- Non-communicable—not caused by germs. They are not spread by contact from one person to another.

2. Spread of communicable diseases

- (i) Through food
- (ii) Through water
- (iii) Through droplets
- (iv) Direct contact
- (v) Through vectors

3. Immediate help or treatment given to an injured person is called first-aid.

EVALUATION

Subjective Evaluation

A. Answer the following questions briefly:

1. What is a vector?
2. List five ways to prevent infections.
3. What are the different ways by which communicable diseases spread?
4. What would you do in case of burns and cuts?
5. What are communicable diseases?

B. Give reasons:

1. We should wash hand before eating.
2. The drains should be covered.
3. We should isolate the patients in case of an infectious disease.

C. Answer in detail:

1. What is first-aid?
2. What are the differences between communicable and non-communicable diseases?
3. What are protein-deficiency diseases? What are the corrective measures to be taken?
4. What are the modes of transmission of communicable diseases?
5. What are the measures to be taken when a fire breaks out?

Objective Evaluation

D. Name the following:

1. An infectious disease.
2. A disease spread by bacteria.
3. A viral disease.
4. A disease caused by an insect that lays eggs in water.
5. A disease caused due to the deficiency of Vitamin D.

E. Fill in the blanks:

1. A disease which spreads from one person to another is called
2. Malaria is caused by the bite of
3. is a viral disease.
4. Cholera and tuberculosis are diseases.
5. Marasmus is caused due to the deficiency of

F. Tick (✓) the right option:

1. Scurvy is caused due to the deficiency of:
(a) vitamin A (b) vitamin B
(c) vitamin C (d) vitamin D
2. Which of the following is not a communicable disease?
(a) measles (b) ringworm
(c) goitre (d) cholera
3. Anaemia is caused due to the deficiency of:
(a) calcium (b) iron
(c) iodine (d) copper.
4. Marasmus is caused due to the deficiency of in the diet.
(a) protein (b) carbohydrate
(c) both (d) none
5. Arthritis is a disease.
(a) deficiency (b) communicable
(c) degenerative (d) social