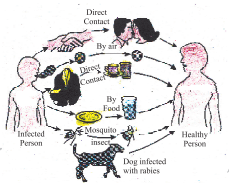
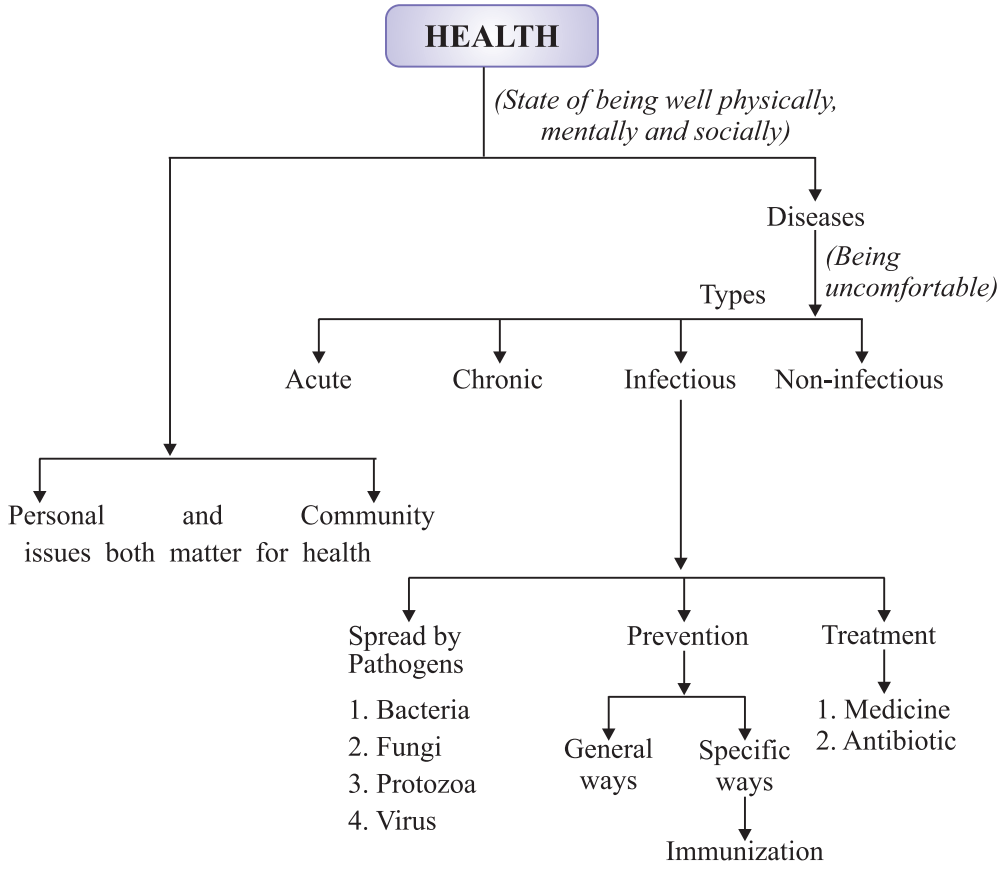


Chapter - 13

Why Do We Fall Ill ?

CHAPTER AT A GLANCE



Health is a general condition of a preson's mind and body. According to WHO (World Health Organisation) health is a "state of physical, metal and social well-being of a person".

To make people aware and conscious of keeping healthy and disease-free we celebrate WORLD HEALTH DAY on 7th April.

- 'Health' is a state of being well enough to function well physically, mentally and socially.
- Disease : Any disturbance in the structure or function of any organ or part of body.
- The various causes of diseases are pathogens (virus, bacteria), lack of nutritious diet/balanced diet and lack of public health services.
- Acute diseases occur suddenly and lasts for a short duration while chronic diseases develop slowly and lasts for long period of time.
- The diseases/infections can be prevented by life style (exercise, proper sleep, enough relaxation) modification, taking balanced diet, good personal health and hygiene and also maintaining a clean and healthy surrounding.
- Treatment involves killing of the microbes/pathogens.

Health

- Health is a state of physical, mental and social well-being.
- The conditions necessary for good health are :
  (i) Good physical and social environment.
  (ii) Good economic conditions.
- Good physical and social environment includes clean surroundings, good sanitation, proper garbage disposal and clean drinking water.
- Good economic conditions includes job opportunities for earning to have nutritious food and to lead a healthy life.

Personal and Community Issues Both Matter for Health

Community Health :

- All those activities which people do both individually and in groups for the development of their society, constitute the community health.
- Personal and community health are supplementary to each other.
- We protect ourselves by keeping our body clean.
- For this, we also require a good and healthy environment in our surroundings.
- We can have this only by the means of community health and

development.

- So, both personal and community health are inter-related.

Differences between Being Healthy and Disease-free

Being Healthy	Being Disease-free
1. It is a state of being well enough to function well physically, mentally and socially.	1. It is a state of absence from diseases.
2. It refers to the individual, physical and social environment.	2. It refers only to the individual.
3. The individual has good health.	3. The individual may have good health or poor health.

Disease and Its Causes

What does disease look like ?

- When a person is affected by a disease either the functioning or the appearance of one or more systems of the body will change for the worse.
- These changes give rise to symptoms and signs of disease.
- On the basis of the symptoms the physicians look for the signs of a particular disease and conduct tests to confirm the disease.

Types of Diseases

(i) Acute Diseases : Acute diseases which last for only very short period of time and affect body suddenly and quickly. *E.g.,* Cold, cough, typhoid etc.

(ii) Chronic Diseases : The diseases which last for a long time, even as much as a life time, are called chronic diseases. *E.g.,* Diabetes, tuberculosis, elephantiasis etc.

Causes of Diseases

Diseases are caused by :

- Pathogens like virus, bacteria, fungi, protozoans or worms.
- Poor health and under nourishment.
- Hereditary and genetic disorder.

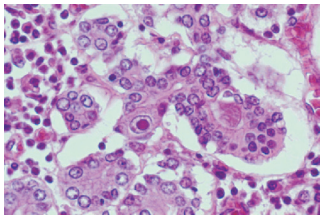
- Lack of proper treatment of immunization.
- Environmental pollution (air, water etc.)

Infectious and Non-infectious Diseases

(i) Infectious Diseases : The diseases which spread due to infection by micro-organisms are called infectious diseases. It is communicated from diseased person to healthy person, caused by some biological agents/pathogens like viruses, bacteria, fungi, protozoans, fungi worms.

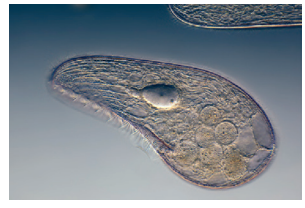
(ii) Non-infectious Diseases : The disease which does not spread by contact between infected and healthy person through air and water, is called non-infectious disease. *E.g.,* Arthritis, heart disease.

Pictures of Different Micro-organisms



(i) The picture shows SARS viruses coming out of the surface of an infected cell (see the arrows for example).

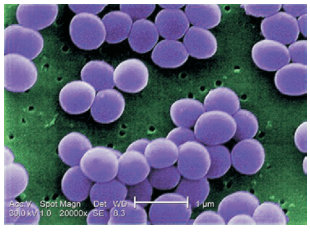
(ii) 500 nanometer = 0.5 micrometer = 0.001 millimeter.



(i) The picture shows Trypanosoma, a protozoan organism.

(ii) It causes sleeping sickness.

(iii) The saucer-shaped substance lying next to the protozoa, is a red blood cell.



(i) The picture shows *Staphylococcus* bacteria.

(ii) The *Staphylococcus* bacteria causes acne.

(iii) The scale is indicated at the line at the top left of the picture. It is 5 micrometers long.

(i) The given picture shows an adult roundworm from the small intestine.

(ii) Its technical name is *Ascaris Lumbricoides.*

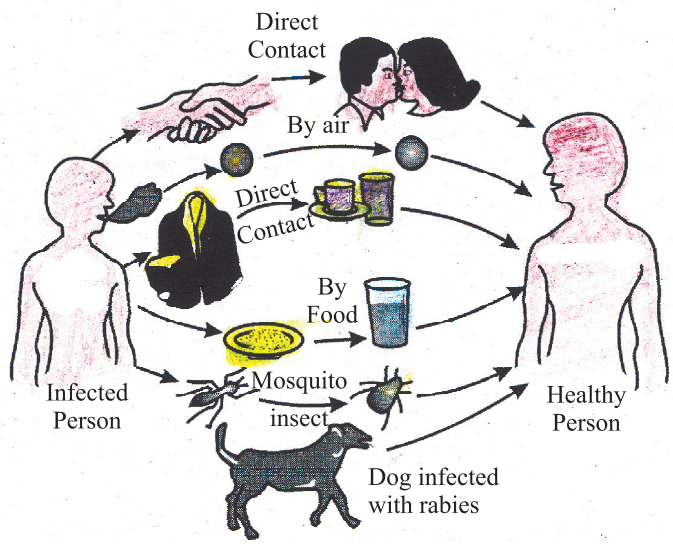
(iii) The ruler next to it shows 4 centimeter to give an idea of the scale.

Micro-organisms :

S. No.	Infectious Agents	Diseases
1.	Viruses	Common cold, influenza, measles, chicken pox, AIDS, Hepatitis-B etc.
2.	Bacteria	Cholera, typhoid, TB, tetanus, anthrax, food poisoning etc.
3.	Fungi	Skin infections
4.	Protozoan	Malaria, kala-azar, amoebic dysentery, sleeping sickness
5.	Worms	Intestinal infections, elephantiasis

Antibiotics

- Antibiotics blocks biochemical pathways important for bacteria. Hence, they are effective against them. *E.g.,* Penicillin, tetracycline.
- Many bacteria make a cell wall to protect themselves, the antibiotics (Penicillin) blocks the bacterial process that builds cell wall.
- Antibiotics works only against the **bacteria** and **not** against the **viruses.**



Common method of transmission of diseases

(Diseases spread from affected person to healthy person)

Means of Spread of Infectious Diseases

Infectious diseases spread from an infected person to a healthy person through air, water, food, vectors, physical contact and sexual contact.

- **Through air :** By sneezing and coughing, the microbes spread into air and enter into the body of a healthy person, like common cold, tuberculosis, pneumonia etc.
- **Through water :** The microbes enter into our body by drinking/eating polluted and contaminated water/food, like cholera, amoebic dysentery etc.
- **Vectors :** Some organisms like female anopheles mosquito also work as a vector of disease, like malaria, dengue, yellow fever etc.
- **Through sexual contact :** Syphilus, AIDS spread by sexual contact with infected person. AIDS virus can also spread through blood transfusion and from the mother to her child during pregnancy and through breast feeding.

AIDS (Acquired Immuno Deficiency Syndrome)

Causes :

AIDS is caused by a retro-virus called HIV (Human Immuno Deficiency Virus).

Method of transmission of AIDS :

The transmission of AIDS from an infected to a healthy person takes place :

- through sexual contact
- blood transfusion
- use of infected needle or blade etc.
- This may also get transmitted from infected mother to her foetus.

Prevention :

- Avoid transfusion of infected blood. This can be done by testing whether the blood is HIV negative or not.
- Always use disposable needle and syringe.
- Avoid sexual contact with unknown person.
- Avoid the same razor used in the salons.

ORGAN – Specific and Tissue-specific Manifestations

Disease causing microbes enter the body by different means and goes to different organs and tissues.

(i) Microbes which enter through the nose are likely to go to the lungs. (Bacteria which cause tuberculosis of lungs).

(ii) Microbes which enter through the mouth are likely to stay in the gut (bacteria which causes typhoid) or liver (bacteria which causes jaundice).

(iii) Virus which causes AIDS enter the body through sexual organs during sexual contact and spread through the lymph to all parts of the body and damages the immune system.

(iv) Virus which causes Japanese encephalitis (brain fever) enters the body through mosquito bite and goes and infects the brain.

Principles of Treatment :

The treatment of infectious diseases consists of two steps. They are **to reduce the effects** of the disease (symptoms) and **to kill the microbes** which caused disease.

(i) To reduce the effects of the disease : This can be done by taking medicines to bring down the effects of the disease like fever, pain or loose motions etc. and by taking bed rest to conserve our energy.

(ii) To kill the microbes : This can be done by taking suitable antibiotics and drugs which kills the microbes and the disease is cured.

Principles of Prevention

There are two ways of prevention of infectious diseases. They are general ways and specific ways.

(i) General ways of prevention : Public hygiene is most important for prevention of infectious diseases. Proper and sufficient food for everyone will make people healthy to resist the infection.

Air borne diseases can be prevented by living in conditions that are not crowded. Water borne diseases can be prevented by providing safe drinking water. Vector borne diseases can be prevented by providing clean environment.

(ii) Specific ways of prevention : There are disease specific measures which are used to fight them. It is done by **Immunisation.** This is the

process of introducing a weakened pathogen inside the body of the host to fool his/her immune system to produce antibodies against that particular disease. Not only does our immune system fight the disease (feeble pathogen), but also keeps a memory of the incident by keeping those antibodies in blood. Thus, next time even if the disease will strike the host's body with full vigor, the body will be able to protect itself with the help of these antibodies. This is also the basic law followed by vaccination programmes done for infants.

A Few Diseases

Disease	Pathogen	Vector (if any)	
1. Malaria	Protozoa	Female anopheles mosquito	Recurrent fever, chills
2. Typhoid	Bacteria – *Salmonella*	Cockroaches etc.	High fever and intestinal infections
3. AIDS	Virus – HIV	–	Not a disease in itself, it affects our lymph glands thereby decreasing our immunity
4. Dengue	Virus	Female *aedies egypte* mosquito	Headache + fever
5. Worms	Worms in intestine	–	Stomach ache
6. Kala azar	Protozoa – *Leishmania*	–	Brain fever
7. Round worms	Ascaris in intestine	–	Stomach ache
8. SARS	Bacteria	–	–
9. Swine flu	Virus	Pig + human	Fever – spreads
10. Bird flu	Virus	Birds	Fever – spreads
11. Ebola	Ebola virus	–	Fever – spreads

QUESTIONS

VERY SHORT ANSWER TYPE QUESTIONS (1 Mark)

1. Why is food necessary for us ?
2. Write the full form of WHO.
3. Name two non-infectious diseases.
4. Write two water-borne diseases.

SHORT ANSWER TYPE QUESTIONS (2 Marks)

1. Write the difference between acute and chronic disease.
2. Write the expanded form of AIDS.
3. What is the difference between 'Being healthy' and 'Disease free' ?
4. Name two methods for treatment of infectious diseases.

SHORT ANSWER TYPE QUESTIONS (3 Marks)

1. How do micro-organisms enter into our body ?
2. Name four diseases caused by protozoa, virus, bacteria, fungi.
3. What are the different means by which infectious diseases spread ?
4. What precautions can you take in your school to reduce the incidence of infectious diseases ?

LONG ANSWER TYPE QUESTIONS (5 Marks)

1. Name five diseases against which immunization vaccines are available.

OR

Name two diseases that can be prevented by using vaccine.

2. Fill in the blanks :

   (i) .....is a state of physical, mental and social well-being.

   (ii) AIDS is a.....(communicable/non-communicable) disease.

   (iii) Common cold is a.....(acute/chronic) disease.

(iv) Breathing in polluted air causes.....disease.

(v) Small pox is prevented through..... .

Hints to Long Answer Type Questions

1. Protozoa – Malaria, Virus – Polio, Bacteria – Pneumonia, TB, Fungi – Skin disease

2. (i) Health (ii) communicable (iii) acute

   (iv) respiratory (v) vaccination