

HUMAN DISEASE

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➤ HEALTH

It is a state of being well enough to function well physically mentally & socially.

◆ **Personal & Community issues both matter for health**

Our social environment is an important factor in our individual health. Humans begin to live in societies in villages, towns or cities. In such places, even our physical environment is decided by our social environment.

- **Public health services** : These services ensure (i) proper removal and disposal of garbage, (ii) proper drainage of sewage, (iii) clean drinking water and unadulterated food items, (iv) vector and pest control, (v) proper vaccination and other health care services etc. If public health services are inadequate, the health of individual citizens is bound to be affected despite taking best personal hygiene and consuming the balanced diet.
- **Economic conditions**: Food is earned by doing job. Proper earning is necessary to provide adequate and nutritious food to everyone in the family.

- **Social equality and harmony** : Similarly, social equality and harmony are necessary for individual health. It involves participation in one another's joys and sorrow, helping others and receiving help at the time of need etc.
- **Personal hygiene** : It involves individual's cleanliness. It can be achieved by washing of soiled hand, regular cleaning of teeth, care of eyes, taking bath, wearing clean clothes, timely vaccination against dangerous diseases etc.

◆ **Differences between 'healthy' and 'disease free'**

Healthy	Disease-free
1. It is a state of physical, mental and social well being.	1. It is a state of absence of any discomfort or derangement of the functioning of the body.
2. It refers not only to the individual but also its social and community environment.	2. It refers to the individual.
3. A 'healthy' individual is one who is able to perform normal under given situation.	3. A 'disease-free' individual may have good health or poor health

Symptoms : These are the manifestations or evidences of the presence of disease(s). Symptoms indicate that there is some abnormality in the body. For instance, we have headache or cough or loose motions or wound with pus, all these are symptoms of some disease(s).

On the basis of the symptoms, the physicians do the following :

- They look for the signs of a particular disease.
- They get laboratory tests done on the patients to further confirm the disease.

Signs: These provide information about the presence of particular disease. These are distinct for different diseases.

Differences between symptoms and signs of diseases

Symptoms	Signs
1. Symptoms indicate the presence of disease	1. Signs provide information about the presence of particular disease.
2. These are the manifestations or evidences of the presence of disease(s) of various body parts	2. These are distinct for different diseases.

◆ Sources (causes) of Disease :

- Generally, factors affecting health may be divided into following groups -
 - (a) Intrinsic factors and
 - (b) Extrinsic factors

(A) Intrinsic or Internal Factors :

- The disease causing factors which exist with in the human body are called intrinsic factors.
- The important intrinsic factors which affect human health are the following -
 - ☐ Malfunctioning or improper functioning of various body parts.
 - ☐ Genetic disorders
 - ☐ Hormonal imbalances
 - ☐ Malfunctioning of immune system
- The diseases caused by intrinsic sources or factors are called **organic** or **metabolic** diseases.
- Some of the diseases caused by intrinsic sources are -
 - ☐ Cardiac failure
 - ☐ Kidney failure
 - ☐ Osteoporosis (Pore in bones)
 - ☐ Myopia or short sightedness
 - ☐ Sickle cell anaemia etc.

(B) Extrinsic or External Factor :

- The factors causing diseases and existing outside the human body are called extrinsic or external factors.
- The important extrinsic factors which upset human health are the following -

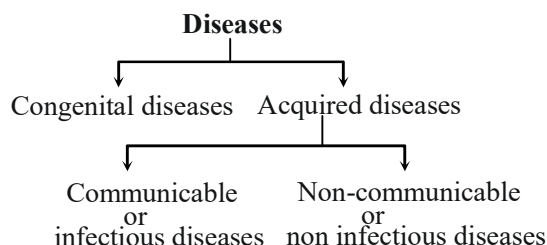
- ☐ Unbalanced diet
- ☐ Diseases causing micro-organism such as viruses, bacteria, fungi etc.
- ☐ Environmental pollutants.
- ☐ Tobacco, alcohol and narcotic drugs.

- Extrinsic factors affect the health of our body by interfering with normal functioning of the body system.

- Some of diseases caused by extrinsic factors are—

- ☐ Kwashiorkor
- ☐ Marasmus
- ☐ Night blindness
- ☐ Beri Beri etc.

◆ Types of Diseases :



- Human diseases are broadly grouped into two categories -

Congenital Diseases :

- These diseases are those which are present since birth.

Acquired Diseases :

- These diseases are those which develop after birth.

Acquired Diseases :

Acquired diseases can be broadly classified into two types -

- ☐ Communicable
- ☐ Non-communicable

◆ Infectious (communicable) Diseases :

These diseases are spread from infected person to other in various ways, i.e., through air, water, food, physical contact, sexual act and insects. The causative agents of these diseases are called **pathogens** or infectious agents. These may be viruses, bacteria, fungi, protozoans (single-celled animals) and different kinds of worms (multicellular organisms). Common diseases caused by these infectious agents are mentioned in Table.

Infectious Agents	Diseases
I. Viruses	1. Common cold 2. Influenza 3. Dengue fever 4. Poliomyelitis 5. Hepatitis-B 6. AIDS (Acquired Immuno Deficiency Syndrom 7. Chicken pox 8. Measles 9. Mumps 10. SARS 11. Swine Flu (H ₁ N ₁)
II. Bacteria	1. Typhoid fever 2. Cholera 3. Tuberculosis 4. Anthrax 5. Tetanus 6. Food poisoning
III. Fungi	1. Many common skin infectious (<i>e.g.</i> , ring worm, athlete's foot)
IV. Protozoans	1. Malaria 2. Kala-azar 3. Amoebic dysentery 4. Sleeping sickness
V. Worms	1. Intestinal worm infections (taeniasis by tape worm and <i>ascariasis</i> by round worm). 2. Elephantiasis

◆ Non-Infectious (non-communicable) Diseases :

These diseases remain confined to the person who develops them and do not spread to other. Non-infectious diseases may occur due to :

- **Malfunctioning of some important body organs** (*e.g.*, heart diseases, epilepsy etc.);
- **Inadequate diet or deficiency of nutrients, minerals and vitamins** (*e.g.*, Kwashiorkor, marasmus, beriberi, scurvy, night blindness etc.

- **Hypo or hyper secretion of hormones** (*e.g.* diabetes, iodine-deficiency goiter, cretinism, myxedema, exophthalmic goitre etc.
- **Malfunctioning of immune system** (*e.g.*, allergy)
- **Cancer.**

➤ MEANS OF SPREAD

Infectious diseases are also called **communicable diseases** because they can spread from infected person to healthy person(s). The means of spread of these diseases are different for different pathogens.

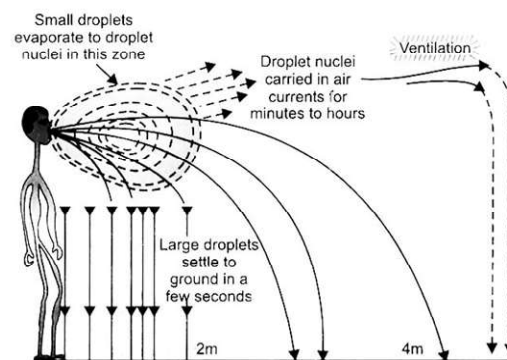
◆ Direct Transmission :

The disease causing microorganisms (pathogens) are transmitted from infected person to healthy person (s) directly in the following ways :



Spray of mucus-droplets that fills the air on sneezing

- **Physical contact with infected person** : The pathogens of diseases like chicken pox, small pox, ring worm etc. are spread through physical contact with infected person or through articles of use.
- **Sexual Contact** : Few infectious diseases such as syphilis, gonorrhoea (both caused by bacteria) and AIDS (caused by virus) are transmitted by sexual contact from one partner to the other.



Showing potential risk of getting air. transmitted diseases as we move closer to the infected person. In closed areas, the droplet nuclei recirculate and pose a risk to everybody. Thus, overcrowded and poorly ventilated housing is a major factor in the spread of airborne disease

- **Contact with soil** : Many pathogens can enter the human body from soil through injuries (*e.g.*, tetanus)
- **Animal bites** : Communicable diseases can also spread through the animal bites. For example, rabies virus enters the human body by the bite of rabid dog or monkey to cause rabies.

◆ **Indirect Transmission :**

It involves spread of pathogens of some diseases through some intermediate agents. Indirect transmission occurs in the following ways :

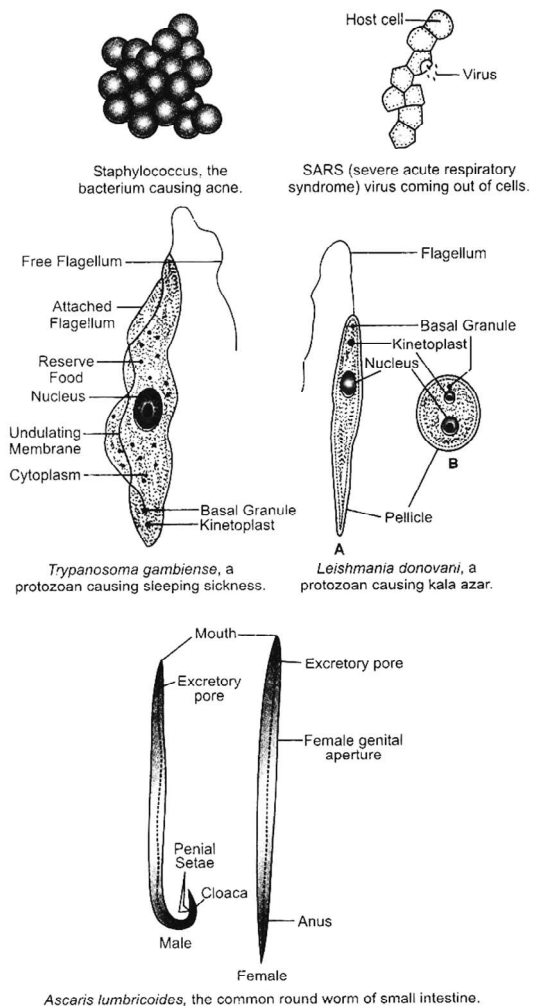
- **Through air** : Infectious microbes that cause common cold, tuberculosis, pneumonia etc. can spread through air from infected person.
- **Through contaminated food/water** : Many infectious diseases can also spread through intake of contaminated food/water. For instance, cholera-causing microbes enter new host through the water they drink and cause disease in them.
- **Through vectors** : Many animals living with us carry the infecting agents from an infected person to other potential host. These animals act as intermediate and are termed **vectors**. The vectors are, therefore the carriers of the disease-causing pathogens. The most common vectors are the **insects**.
 - Houseflies carry the causative organisms of cholera, typhoid, dysentery and tuberculosis on the legs and mouth parts from faeces and sputum to the food and drinks. The latter, if taken, cause infection in others.:

◆ **Orgns-specific and tissue-specific manifestations :**

Compared to any type of pathogenic microbe, our body is quite large. Thus, there are many possible regions, tissues or organs, where a pathogenic microbe can go and stay. Different species of disease-causing microbes have evolved to move and reach to various parts of the body. In parts, this selection is connected to their point of entry into the body. Few cases are cited below :

- If disease-causing microbes enter with air via the nose, they are likely to go to the lungs, *e.g.*, bacteria which cause tuberculosis of lungs.

- If the pathogenic microorganisms enter via mouth, they are likely to stay in the lining of the gut (*e.g.*, typhoid-causing bacteria) or these pathogens can also go to the liver, *e.g.*, the viruses that cause jaundice.



Some disease causing organisms

- Virus that causes HIV infection, enters the body through sexual organs during sexual contact and then tends to spread to lymph nodes throughout the body.
- Malaria-causing microbes are transmitted through mosquito bite, and move to the liver and then to the red blood cells (R.B.Cs).
- Similarly, virus that causes, Japanese encephalitis (brain fever) enters the body through mosquito bite, However, it will go to reside and infect the brain.

➤ PRINCIPLES OF TREATMENT

There are two ways to treat an infectious (communicable) disease. These are -

- **To reduce the effects of the disease :** It can be done by providing symptomatic treatment. We can provide treatment that will reduce the symptoms which are usually because of inflammation.
- **To kill the cause of the disease, i.e., pathogens.** The most common method to kill disease-causing microbes is to use medicines that kill microbes. We have to choose a specific drug that is effective against a particular group of microbes. This is what is achieved by **antibiotics**.

➤ PRINCIPLES OF PREVENTION

◆ Ways of Prevention of Infectious Diseases :

There are **two** ways of prevention of infectious diseases :

- General ways
- Specific ways
- **General ways of prevention of infectious diseases :**
These include
 - ❑ **Sanitation :** Public hygiene is one basic key to the prevention of infectious (communicable) diseases.
 - ❑ **Eradication of vectors :** Vector-borne infections can be prevented by providing clean environments. The breeding places of vectors should be destroyed and adult vectors killed by suitable methods.
 - ❑ **Sterilization :** Patients's surroundings and articles of use should be sterilized. Soap, phenyl, dettol, and antiseptic lotion may be used wherever necessary.
 - ❑ **Isolation :** A person suffering from an infectious disease should be kept in isolation so that others do not catch infection from him.

- ❑ **Education :** People should be educated about the infectious disease so that they may protect themselves against such infections.
- ❑ **Proper and sufficient food :** Availability of proper (nutritious) and sufficient food to everyone will make people healthy to resist infections.
- ❑ Proper immunization against diseases.
- **Specific ways of prevention of infectious diseases :** Specific ways of prevention of infectious diseases relate to a peculiar property of the immune system that usually fights off microbial infections. **This is the basis of the principle of immunisation.**

EXERCISE # 1

A. Single Choice Type Questions

- Q.1** Jaundice is disease of -
(A) Kidney (B) Liver
(C) Pancreas (D) Duodenum
- Q.2** Immuno-deficiency syndrome could develop due to -
(A) Defective liver
(B) Defective thymus
(C) AIDS Virus
(D) Weak immune system.
- Q.3** Lack of Iodine causes -
(A) Goitre (B) Fluorosis
(C) Anaemia (D) Osteomalacia
- Q.4** AIDS virus cannot be transmitted to another person by -
(A) Blood transfusion (B) Shaking hands
(C) Sexual contact (D) Infected needles
- Q.5** T.B. is cured by -
(A) Streptomycin (B) Ubiquinone
(C) Griseofulvin (D) Encitol
- Q.6** Which of the following is a bacterial diseases -
(A) Sickle-cell anaemia (B) Cholera
(C) Cancer (D) Goitre
- Q.7** Among the following a communicable disease is -
(A) Diabetes (B) Diphtheria
(C) Hypertension (D) Kwashiorkor.
- Q.8** One stands the risk of dehydration in -
(A) Jaundice (B) Pneumonia
(C) Malaria (D) Diarrhoea
- Q.9** Which of the following is not a sexually transmitted disease -
(A) Tuberculosis (B) Syphilis
(C) Gonorrhoea (D) AIDS
- Q.10** The study of resistance to disease is called -
(A) Pathology (B) Cytology
(C) Immunology (D) None of these.
- Q.11** Oral vaccine prevents the attack of -
(A) Typhoid (B) Polio
(C) Tetanus (D) Cholera
- Q.12** Which of the following is a bacterial disease-
(A) Poliomyelitis (B) Filariasis
(C) Tetanus (D) Malaria

B. Multiple Choice Type Questions

- Q.13** Haemophilia is a -
(A) chronic disease (B) congenital disease
(C) acute disease (D) deficiency disease
- Q.14** Goitre is caused due to deficiency of -
(A) Vitamin A (B) Fluorine
(C) Iodine (D) Vitamin C
- Q.15** Sleeping sickness disease is caused by -
(A) house fly (B) mosquito
(C) sand fly (D) tsetse fly
- Q.16** Female *Anopheles* mosquito is carrier of a pathogen that causes -
(A) malaria (B) dengue
(C) yellow fever (D) filariasis
- Q.17** Microbes that generally enter the body through nose are likely to affect -
(A) gut (B) lungs
(C) liver (D) lymph nodes
- Q.18** Which of the following is a mismatch ?
(A) AIDS – Bacterial infection
(B) Polio – Viral infection
(C) Malaria – Protozoan infection
(D) Elephantiasis – Helminth infection
- Q.19** An animal that transmits a disease from infected person or its stools etc. to other potential host is called -
(A) primary host (B) secondary host
(C) parasite (D) vector
- Q.20** The type of disease which begins abruptly, affects patient's normal functioning but lasts for a short duration is termed as -
(A) chronic disease (B) acute disease
(C) hormonal disease (D) deficiency disease
- Q.21** Peptic ulcers are caused by -
(A) Bacterium, *Helicobacter pylori*
(B) virus
(C) Protozoan, *Plasmodium vivax*
(D) the deficiency of hormone
- Q.22** Many skin infections occur by -
(A) viruses (B) fungi
(C) worms (D) protozoans

EXERCISE # 2

A. Very Short Answer Types Questions

- Q.1** Name the causative organism and vector of malaria.
- Q.2** Name any one general way of prevention of infectious diseases.
- Q.3** Name the most common insect that carries causative organisms of cholera, typhoid, dysentery and tuberculosis.
- Q.4** What are congenital diseases ? Give one example.
- Q.5** What are pathogens ? Give examples.
- Q.6** Give the name known antibiotic ?
- Q.7** What is meant by 'symptoms' of a disease ? What do they indicate ?
- Q.8** What do the physician do on the basis of symptoms ?
- Q.9** What are first-level causes of the disease ?

B. Short Answer Types Questions

- Q.10** Differentiate between
(i) Acute and chronic diseases
(ii) Congenital and acquired diseases
(iii) Infectious and non-infectious diseases
- Q.11** Write notes on -
(a) Vaccination
(b) Causes of diseases
(c) Signs and symptoms
(d) Means of spread of infectious diseases
- Q.12** List various external (extrinsic) factors responsible for causing diseases.
- Q.13** (a) Name one disease caused by *Anopheles*, *Culex* and *Aedes* spp. of mosquitoes.
(b) Name the organism that transmits the following diseases :
(i) Diarrhoea (ii) Rabies

- Q.14** (i) AIDS is a viral disease that spreads by sexual contact. Is there any other way in which this disease can spread ?
(ii) Can you name two diseases which spread by sexual contact but are caused by bacteria instead of virus ?
- Q.15** A viral disease which generally affects children and causes paralysis of limbs. It is about to be eradicated from the world. Name this disease.

C. Long Answer Types Questions

- Q.16** Write about various preventive measures to cure infectious diseases.
- Q.17** List various causes and signs and symptoms of diseases.
- Q.18** Highlight the ways through which infectious diseases generally spread in human communities ?
- Q.19** Write an account about acute and chronic disease .
- Q.20** Explain in detail general ways of prevention of infectious diseases.