

# Biology

## Why do we fall ill?

### Health

Health is described as the state of complete physical, mental and social well being. Thus, being healthy means that one feels good physically, has a positive outlook and is able to cope with the social and mental pressures without much difficulty.

Difference Between Healthy and Disease Free	
Healthy	Disease Free
A state of complete physical, mental and social well being	State of the absence of discomfort in any part of the body
It depends upon the individual as well as on social and environmental factors	It depends on the individual only
A healthy person will be disease-free	A disease-free person may or may not be healthy
A healthy person is energetic and is able to perform as per the requirement	The performance of a disease-free person depends upon the environment and personal attitude

### The conditions essential for good health are:

- Steps to ensure sanitation, i.e., clean surroundings by providing good sewage and rainwater disposal systems and proper garbage disposals.
- Availability of clean drinking water.
- Availability of adequate, nutritious food.
- Social equality and harmony.

### Causes of diseases

1. environmental factors (as malnutrition, industrial hazards or climate)
2. specific infective agents (as worms, protozoans, fungi, bacteria or viruses)
3. inherent defects of the organism (as genetic anomalies)
4. combination of these factors

### Metabolic diseases

The diseases caused by intrinsic sources are called organic or metabolic diseases.

Examples:

- |                                   |                        |                              |
|-----------------------------------|------------------------|------------------------------|
| 1. Cardiac failure (Heart attack) | 6. Sickle cell anaemia | 11. Diabetes;                |
| 2. Kidney failure;                | 7. Haemophilia;        | 12. Allergies (e.g., asthma) |
| 3. Osteoporosis                   | 8. Dwarfism;           | 13. Arthritis;               |
| 4. Myopia                         | 9. Gigantism;          | 14. Cancer                   |
| 5. Cataract                       | 10. Cretinism          |                              |

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### **Symptoms and signs of Diseases**

When the body gets diseased, it shows certain symptoms and signs of illness. These symptoms and signs help in the identification and diagnosis of the disease. A symptom is felt by the affected person while signs can be detected by another person. A symptom is thus, subjective and a sign is objective.

### **Acute Diseases**

A few diseases occur suddenly and last for a few days. These are known as acute diseases. This condition can be treated with medical treatment or on its own. Many times, acute diseases turn chronic if they continue to persist.

Example :- Common cold

### **Chronic Diseases**

Chronic diseases are those which last for a long time. They take a lot of time to heal, even as much as a lifetime and can be caused by any external or internal factor.

Example:- Cancer , Elephantiasis.

### **Congenital diseases**

These diseases are present since birth. They are caused due to genetic abnormalities or due to metabolic disorders or malfunctioning of any organ. They are permanent, generally not easily curable and may be passed on to the children.

### **Acquired diseases.**

These diseases are those which develop after birth. Acquired diseases can be broadly classified into two types :

- (a) communicable or infectious diseases;
- (b) non-communicable or non-infectious diseases.

### **Infectious diseases**

These diseases are caused by some biological agents or pathogens such as viruses, bacteria, protozoans, helminthes, nematodes and fungi. Infectious diseases can rapidly spread from one person to another by various means such as by physical contact, water, air, food, and insects (vectors). Since these diseases are communicated from diseased person to healthy person they are known as infectious diseases.

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### Non-infectious diseases

These include the above described organic or metabolic diseases. The non-infectious diseases are restricted only to those persons who are suffering from them. These are not spread from an infected person to a healthy person. Non-infectious diseases may be caused by:

- (1) the lack of certain essential substances in our diet, e.g., proteins, vitamins, minerals (deficiency diseases);
- (2) general wearing out or degeneration of tissues as in old age (degenerative diseases);
- (3) uncontrolled growth of tissues in any part of the body (cancer);
- (4) defects in the metabolic reactions (metabolic disorders);
- (5) injury and damage to any part of the body by accidents.

### Pathogens

Pathogens are external agents that cause diseases in other organisms. This pathogen includes harmful microbes or microorganism such as bacteria, virus, fungi or protozoa.

### Vector

Vectors are those organisms that carry a pathogen from the host to a recipient. Mosquito, rats and mice are some of the common vectors that carry infectious diseases.

### Bacteria

Bacteria are microorganisms that are seen in almost all environmental condition. Not all bacteria are harmful to pathogens. Some bacteria are also beneficial to human beings. Bacteria are beneficial for, digestion, extracting antibiotics from them, nitrogen fixation, etc.

### Virus

A virus is a microorganism that is always pathogenic in nature. They do not have to replicate machinery. Therefore, they enter the host cell and replicate and in the process destroy the host cell. A few of the common diseases spread by the viruses are cold, influenza, dengue fever AIDS, etc.

### Fungi

Fungi are a group of organisms which are eukaryotic in nature and saprophytic in nutrition. They could be either unicellular or multicellular organism. Many common skin infections such as ringworm, nail infection, etc are examples of Fungal diseases

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### Parasites

A parasite is an organism that lives in another organism, called the host, and often harms it. It is dependent on its host for survival – it has to be in the host to live, grow and multiply.

### AIDS

AIDS stands for Acquired Immunodeficiency Syndrome. It is caused by the Human Immunodeficiency Virus. AIDS systematically destroys the immune system of the patient, leaving them vulnerable to the easiest of the diseases.

### Antibiotics

Antibiotics are antimicrobial drugs produced from other organisms, such as fungus and some bacteria, which are used for treating against the harmful infections caused by pathogens or harmful microorganisms. These antibiotics functions by:

1. Alteration of Cell Membranes.
2. Inhibition Antimetabolite Activity.
3. Inhibition of Nucleic Acid Synthesis.
4. Inhibiting of Cell Wall Synthesis (a most common mechanism).
5. Inhibition of Protein Synthesis (Translation) (second largest class).

### Preventive Measures

The preventive measures can be taken to avoid infection of various diseases. The most common measure is the maintenance of hygienic condition.

### Immunization

Immunization is the process whereby a person is made immune or resistant to an infectious disease. Vaccines are the common means to immunize people.

### The Immune System

An immune system is the part of the body that provides protection against infection from pathogens, invading foreign substances and other toxins.

### Skin and Mucous Membranes

Skin and Mucous membranes act as the layer of defence. While skin protects the body externally, mucous membrane protects the insides of the body.

### WBC

WBC- White blood cells are called Leucocytes or Leukocytes. They are the important components of our immune system and are present in the blood and lymph. They function by attacking and kill the pathogens and protect our body free from pathogens and infections. There are of different types of and are classified based on the location as well. The different types of White blood cells found in the blood are neutrophils, lymphocytes, monocytes, basophils, ad eosinophils. These blood cells have specialized functions.