

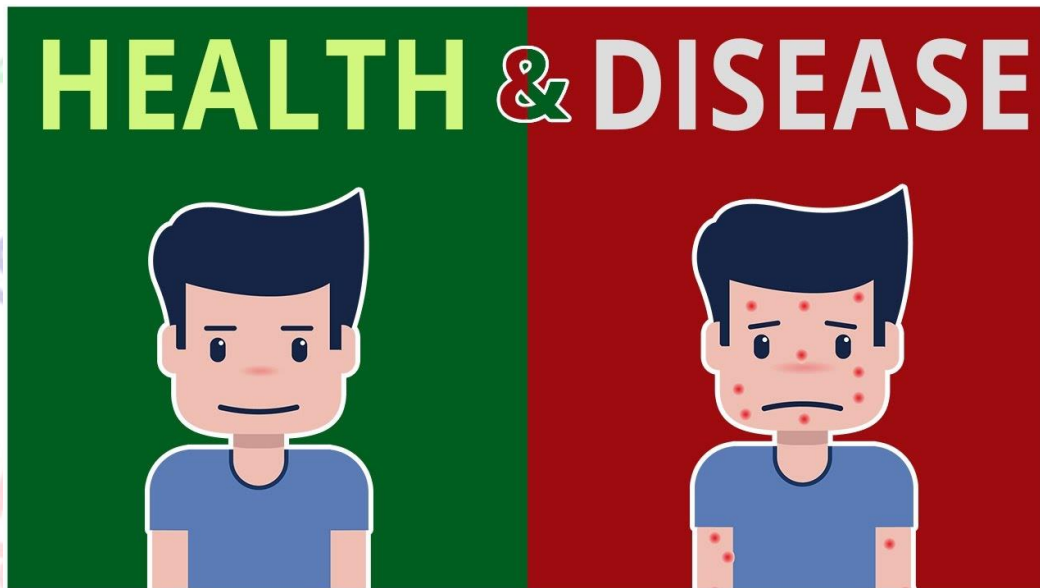
BIOLOGY

Chapter 13: Why Do We Fall Ill?



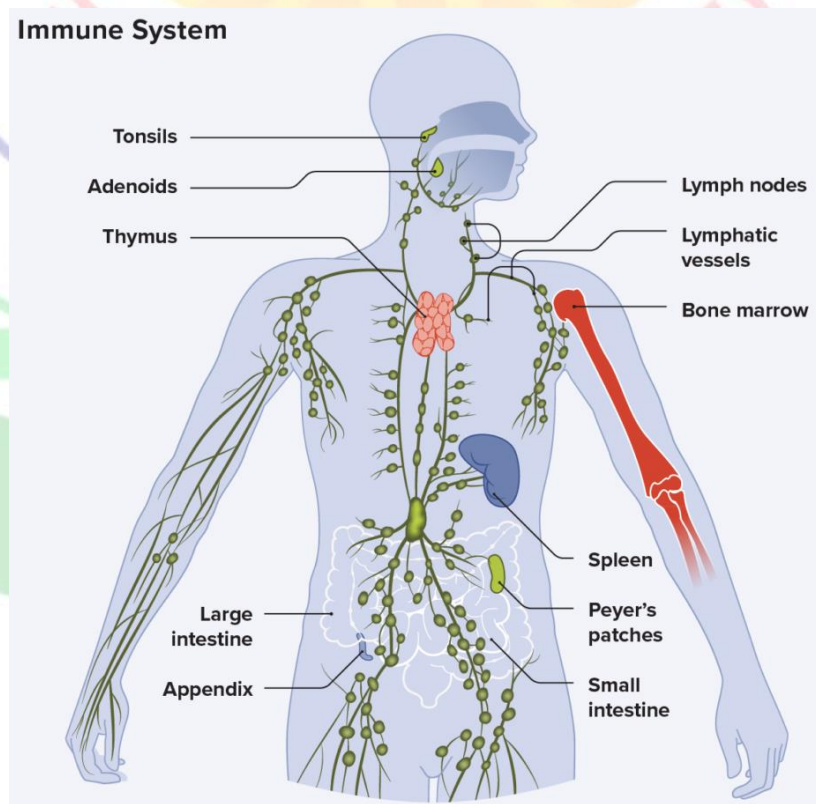
Why Do We Fall ill?

Health and Disease



- **Health** is defined as the state of complete physical, mental and social well-being.
- The health of an individual is affected by changing internal and external factors including personal, economic, environmental and social factors.
- **Disease** is the departure from normal health through a structural or functional disorder of the body.

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.

Yes, this is due to the immune system.

Children, both infants and toddlers tend to fall ill more often and are more prone to infections as they do not have a fully developed immune system, compared to adults. Likewise, as people grow old, their immune system weakens and makes things worse.

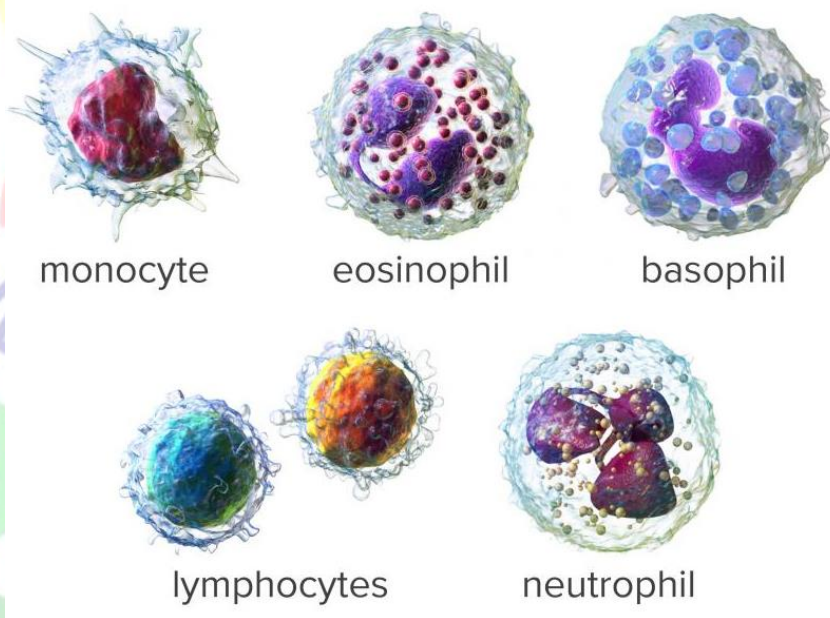
Everyone's immune system is different and it varies with age, lifestyle and there are many factors which affect the immune system.

Here, in this article let us learn in detail about the human immune system, different parts, types and other facts related to it.

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.

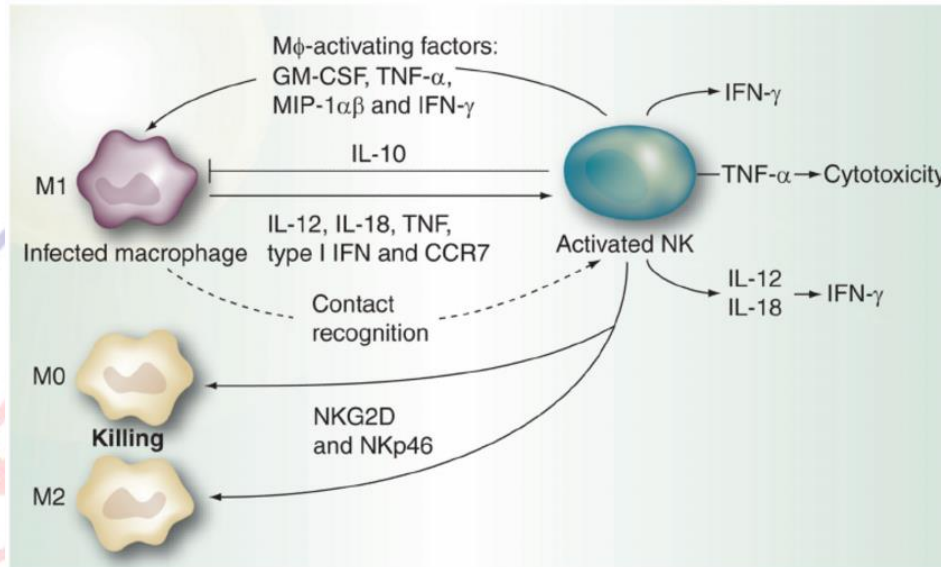
WBC

White Blood Cells



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.

Macrophages and NK Cells

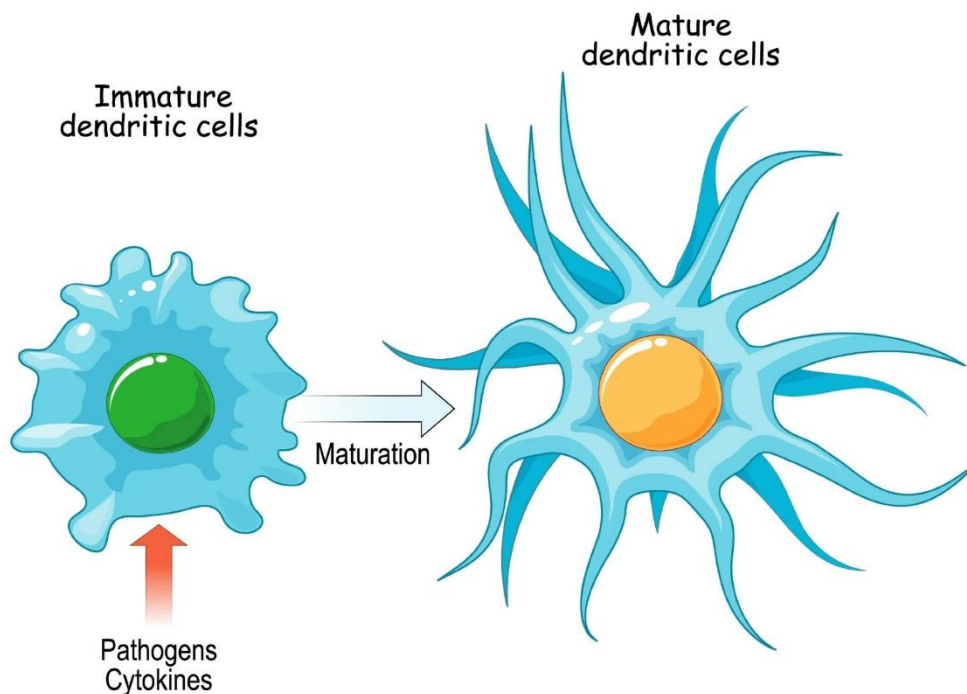


Macrophages are large and specialized cells of the immune system. These cells are produced in response to infections or due to the development of damaged or dead cells. They attack cancer cells through destruction and ingestion. Natural Killer Cells bind to the enemy cell and they dissolve the membrane so the cell can't function.

Dendritic Cells

Dendritic cells create the memory and carry information about the pathogens to the liver, spleen, lymph nodes.

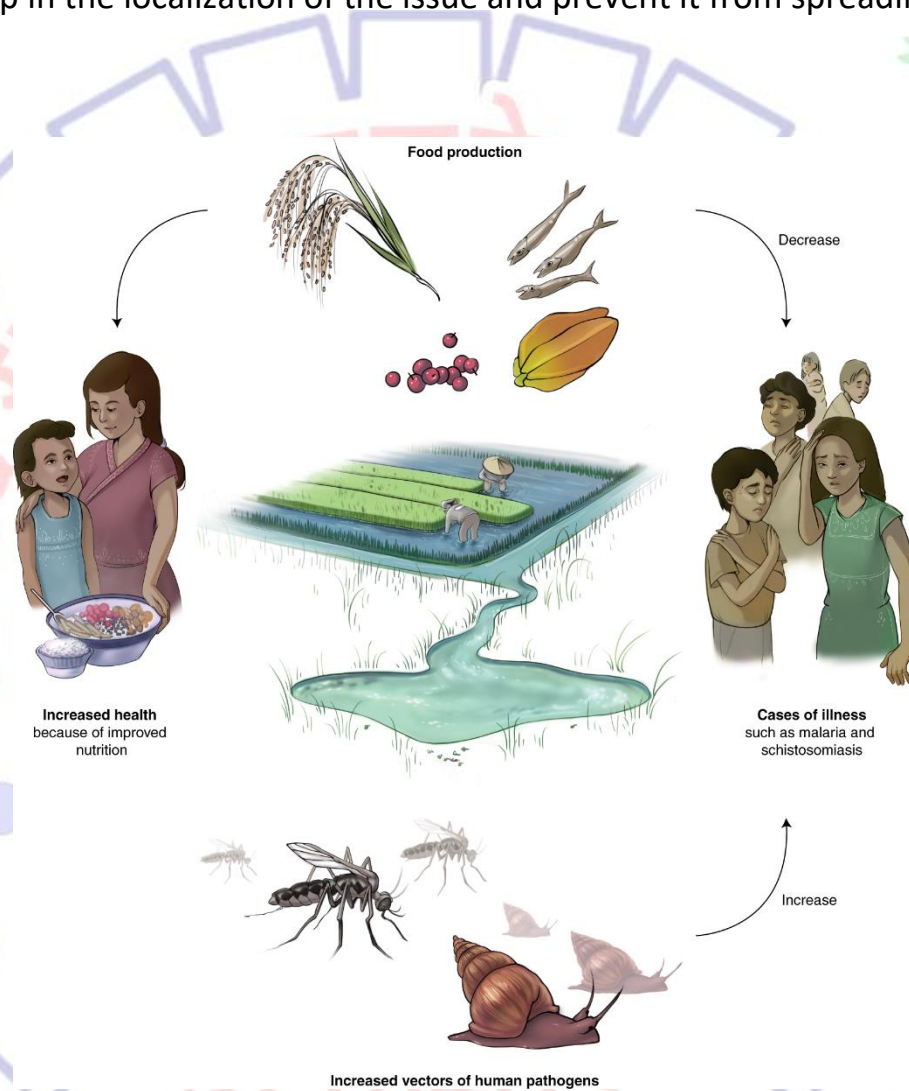
Dendritic cells



Inflammatory Response

An inflammatory response is seen in the body when it gets injured or infected by a pathogen. Inflammations help in the localization of the issue and prevent it from spreading.

Diseases



“A disease is a condition that deteriorates the normal functioning of the cells, tissues, and organs.”

Diseases are often thought of as medical conditions that are characterized by their signs and symptoms.

The disease can also be defined as:

“Any dangerous divergence from a functional or normal state of an entity.”

When a person is inflicted with a disease, he exhibits a few symptoms and signs that range from normal to severe depending upon the medical condition. Hence, in order to identify different diseases, the normalcy of an entity needs to be studied and understood as a clear demarcation between disease and disease-free is not always apparent.

The diseases are usually caused by many factors rather than a single cause. When we have a

disease, we eventually show some signs, such as headaches, cough, cold, weakness. These signs are referred to as “symptoms.” In almost all diseases, symptoms are shown immediately after having been struck by the disease. However, it varies depending upon the seriousness of the disease.

A disease is a discomfort the body experiences physically or mentally. A disease could be caused due to external or internal factor. The two types of disease are:

Acute diseases are those which last for a very short time. These diseases can be fatal and are usually caused by an external agent.

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

Symptoms and signs of Diseases

When the body gets diseased, it shows certain symptoms and signs of illness. These symptoms and signs help in 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 an objective.

Causes of Diseases

Different types of Causes of Disease

Diseases can be caused due to pathogens such as virus or bacteria. Some diseases can also be due to internal factors such as genetic mutation.

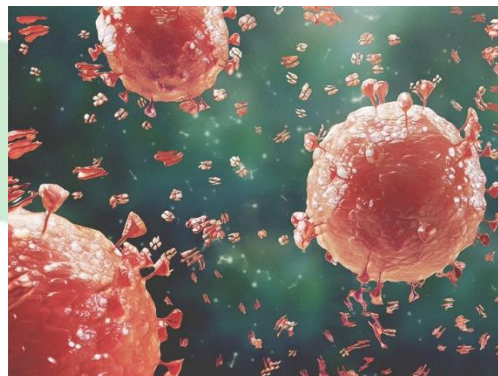
Infectious Diseases

Diseases that are caused by pathogens and can spread to other individuals in the populations are called infectious diseases.

Non-infectious diseases

Diseases that cannot spread from one individual to another are called non-infectious diseases. Usually, these diseases are not caused by a pathogen.

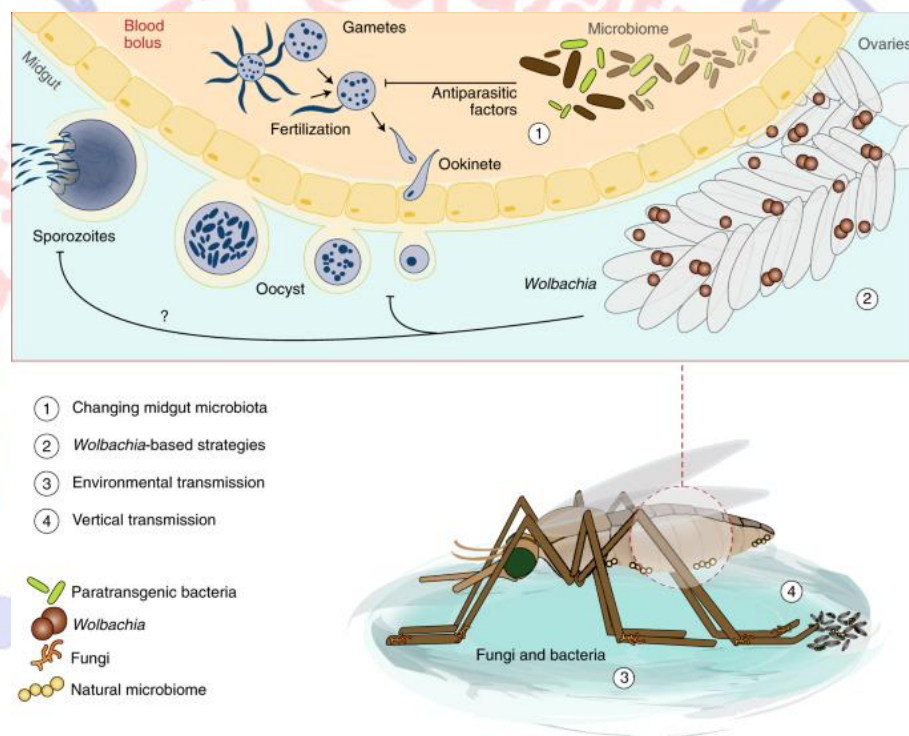
Pathogens



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

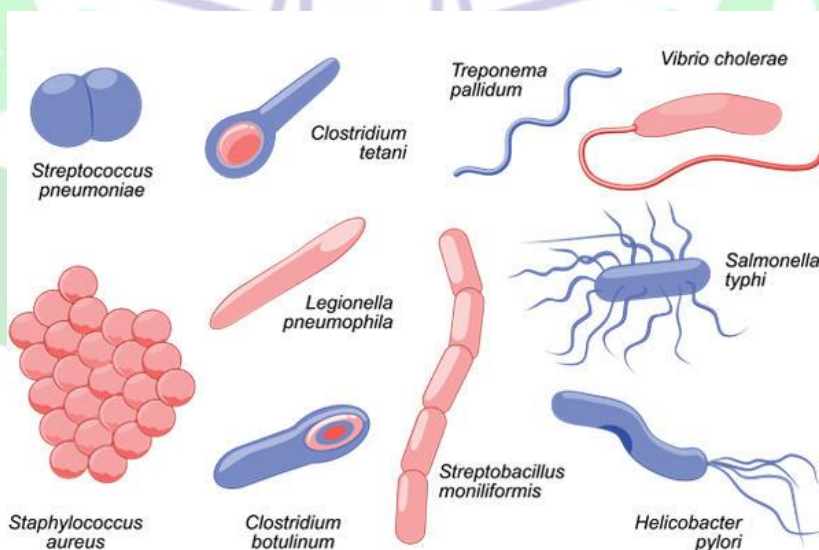
Vector

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.



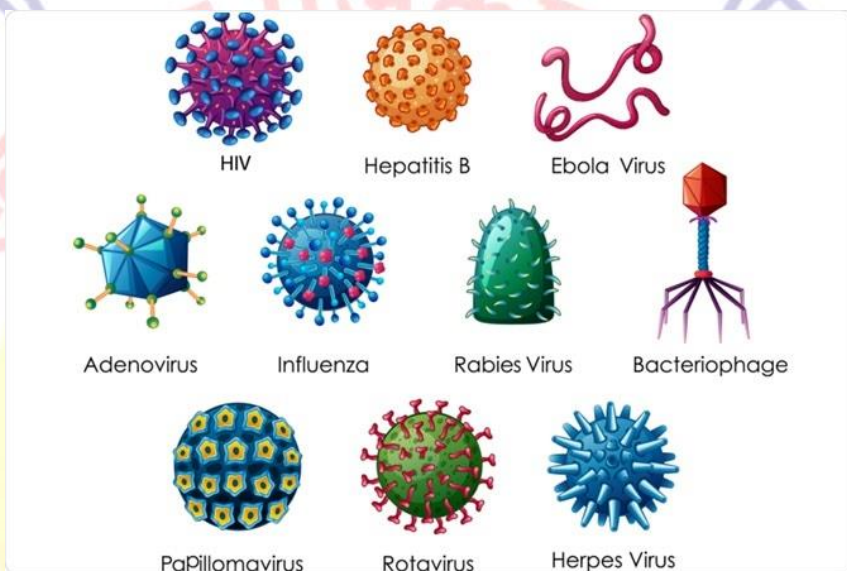
Bacteria

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 molecular machinery to replicate without a host. 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



Nail Infection



Ringworm

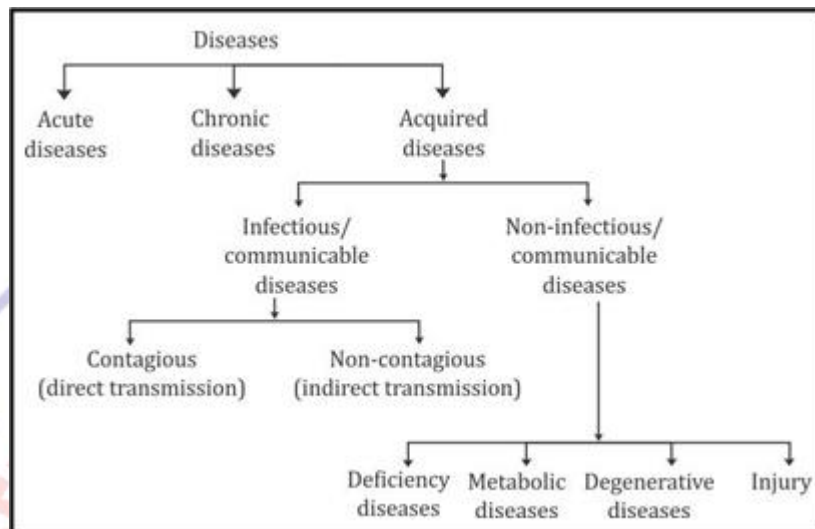
Parasites

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.



Intrinsic/Internal Factors	<ul style="list-style-type: none"> • These are disease-causing factors which exist within the human body. • Genetic disorders. Example: Haemophilia
Extrinsic/External Factors	<ul style="list-style-type: none"> • These are disease-causing factors which enter the human body from outside and cause a disease. • Disease-causing microorganisms. Example: Malaria
Levels of Immediate Causes	<ul style="list-style-type: none"> • <u>First-level cause:</u> Primary cause/causative agent: Bacteria, virus • <u>Second-level cause:</u> Secondary cause: Lack of good nourishment • <u>Third-level cause:</u> Tertiary cause: Poverty

Types of Diseases



- Diseases in which the symptoms are quickly visible in the body and last for a shorter duration are called **acute** diseases. Examples: Common cold, malaria
- Diseases which are long-term, with their symptoms lasting for months or years, are called **chronic** diseases. Examples: Elephantiasis, tuberculosis
- Diseases which develop after birth are called **acquired** diseases.
- Diseases caused by infectious agents or pathogens are called communicable or infectious diseases. Examples: Tuberculosis, chickenpox, measles
- Diseases which do not spread from one person to another are called non-communicable or **non-infectious** diseases. Examples: Beriberi, scurvy, arthritis

Differences between Infectious and Non-infectious Diseases

INFECTIOUS DISEASES	NON-INFECTIOUS DISEASES
1. Caused by attack of pathogens	1. Caused by factors other than pathogens
2. Caused by extrinsic factors	2. Caused by intrinsic factors
3. Transmitted from one person to another	3. Do not get transmitted from one person to another
4. Transmission of diseases occurs through direct contact or some medium	4. Transmission in hereditary diseases is from parent to offspring

5. Examples: Cholera, malaria

5. Examples: Diabetes, goitre

Infectious Diseases

Viruses	•AIDS, chickenpox, influenza, poliomyelitis
Bacteria	•Typhoid, cholera, tuberculosis, tetanus
Fungi	•Skin infections, dandruff, ringworm
Protozoa	•Malaria, amoebic dysentery, Kala-azar
Metazoa	•Elephantiasis, ascariasis
Mites	•Scabies

Infectious Agents

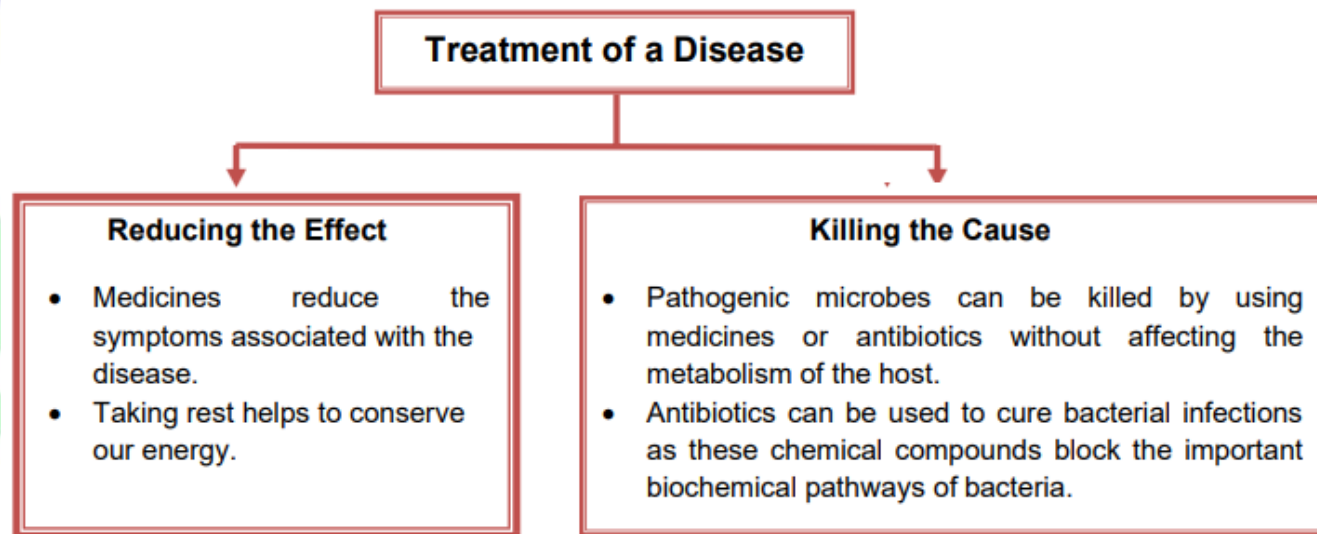
Means of Spread of Infectious Diseases

Air-borne diseases	Spread through air when droplets of pathogens are expelled into the air because of coughing, sneezing or talking. Examples: Influenza, meningitis
Water-borne diseases	Caused by consumption of contaminated water. Examples: Typhoid fever, cholera, hepatitis A
Food-borne diseases	Caused by consumption of food contaminated with chemical toxins or pathogens. Examples: Taeniasis, trichinosis
Vector-borne diseases	Caused by pathogens transmitted by vectors such as insects and ticks. Examples: Malaria, elephantiasis
Sexually transmitted diseases	Caused by pathogens transmitted by sexual contact. Examples: AIDS, syphilis
Fomite-borne diseases	Caused by pathogens present on inanimate objects such as clothing and bedding used by infected people. Examples: Scabies, ringworm

Organ-specific and Tissue-specific Manifestations of Diseases

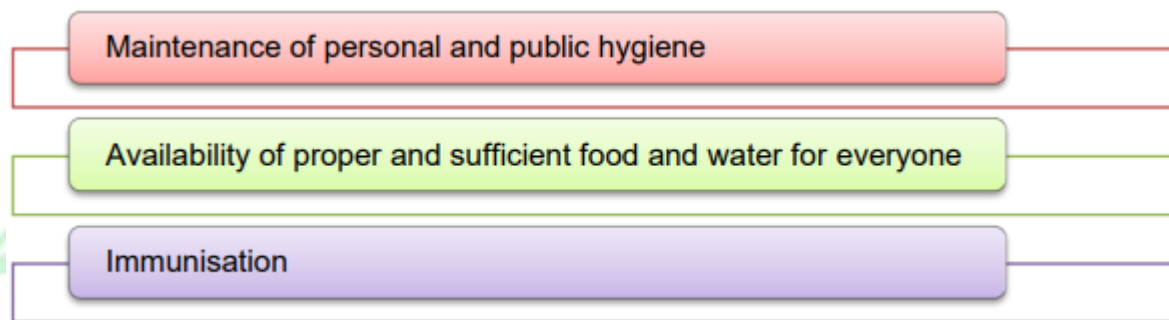
- The **signs** and **symptoms** of a disease depend on the tissue or organ which the microbe targets.
- The severity of **disease manifestation** depends on the number of microbes within the body.
- During infection, the immune system gets activated. It sends many soldier cells to the affected tissue to kill the microbes. This causes inflammation.
- **Inflammation** is due to the escape of some chemicals which cause allergic reactions in our body. They attract blood supply because of which the amount of blood and the temperature of the surrounding area increase. The consequent swelling of the area is called **oedema**.
- **Plasma** and **white blood cells** (WBCs) of the immune system of the body are discharged at the affected site. Plasma contains products such as **antibodies** and **macrophages** which kill or inhibit the growth of pathogens.
- Doctors carry out **confirmatory tests** such as laboratory tests of blood, urine and stool or even perform an X-ray to confirm the presence of a disease.

Principles of Treatment of Diseases



Principles of Prevention of Diseases

- Prevention of diseases follows three basic principles:



General Ways of Prevention of Infectious Diseases

- We can prevent exposure to **air-borne microbes** by providing living conditions which are not overcrowded.
- We can prevent exposure to **water-borne microbes** by providing safe, filtered and boiled drinking water.
- We can provide clean environments to prevent exposure to **vector-borne microbes**. This would not allow their multiplication.

Specific Ways of Prevention of Infectious Diseases

- **Immunisation** is the process by which an individual's immune system is equipped to fight off infectious agents.
- **Vaccination** provides active immunity.
- Vaccines against some common diseases such as BCG vaccine, DPT vaccine, polio vaccine, vaccines for tetanus, diphtheria, whooping cough, measles and many others have been administered in India.

Vaccination



When the immune system first sees an infectious microbe, it responds against it and then remembers it specifically. So the next time that particular microbe, or its close relative enter the body, the immune system responds with even greater vigor. This eliminates the infection even more quickly than the first time around. This is the basis of principle of immunization.

We fool the immune system of human body into developing a memory for particular infection by putting something that mimics the microbes we want to vaccinate against, into the body. This does not actually cause the disease but this would prevent any subsequent

Jaundice or hepatitis is a disease of liver. It is caused by viral infection.

There is a vaccine for hepatitis A available in market.

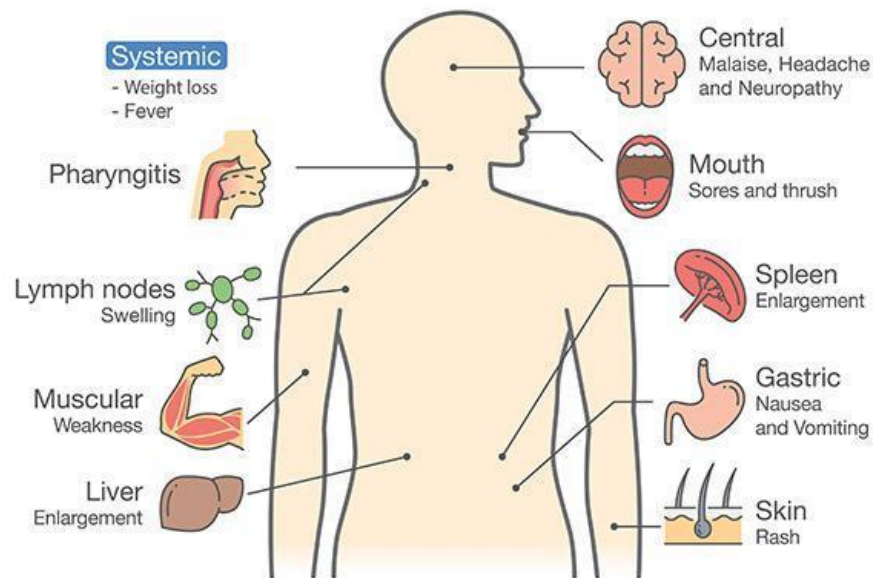
Rabies-It is spread by the bite of infected dog and other animal. It is a viral disease caused by a rabies virus which is present in saliva of infected animals.

5 Anti-rabies vaccines are available.



AIDS-Acquired imuno deficiency syndrome virus.

Main symptoms of HIV infection



It is caused by a retrovirus called HIV.

It attacks white blood cells of human beings and weakens the human body's immune system. It reduces the natural immunity of the human body. Patients suffering from AIDS die from other infections.

OPV=Oral Polio Vaccine

PPTP=Pulse polio immunization program

BCG vaccine (Bacillus Calmette Guerin): It is for the prevention of tuberculosis.

Principles of Treatment

There are 2 ways to treat infectious diseases

1. Reduce the effect of the disease
2. Kill the cause of disease

To reduce the effect of disease: we provide treatment that will reduce the symptoms. The symptoms are because of inflammation.

We can take medicines that bring down fever, reduce pain or loose motion, take bed rest.

Such a kind of symptom- directed treatment is inadequate. Since it will not make the pathogen go away. For that we have to kill the microbe itself

One way To kill microbes is to use medicines. Microbes can be classified into different categories.

Infections

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.

Prevention of Disease

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:

- Alteration of Cell Membranes.
- Inhibition Antimetabolite Activity.
- Inhibition of Nucleic Acid Synthesis.
- Inhibiting of Cell Wall Synthesis (a most common mechanism).
- 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.

While treating an infection or a disease, three limitations are generally faced. These three limitations are as follows:

- Someone had a disease which completely damaged his body functions to an extent that it can't be recovered.
- A person suffering from some ailment might be bedridden for some time because it takes time to cure any disease.
- A person suffering from some disease might spread the infection to other people as well.

Therefore, it is necessary to prevent certain diseases beforehand.

How Can Disease Be Prevented?

There are two ways of preventing a particular disease.

General Ways

- Hygienic conditions should be maintained in the surroundings we live in. There should be limited exposure to airborne microbes by providing not so crowded living conditions.
- Safe drinking water should be provided to prevent water-borne diseases.
- Provide a clean environment which prevents the breeding of mosquitoes. This prevents the spread of vector-borne diseases.

Specific Ways

The immune system normally fights off microbes. The cells of the immune system are specialized in killing infectious microbes. That is why we don't always fall sick on coming in contact with an infectious person. As soon as an antigen enters the body, these cells come into play.

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.

Difference Between Vaccination And Immunization

The major difference between Vaccination and Immunization is that a vaccine is administered to people to create immunity from that disease. For example, before the polio vaccine is administered, the infant does not have immunity to the disease and has a high risk of contracting that disease. Therefore, a vaccination builds up resistance (immunity) to a disease.



VACCINATION

VACCINATION IS THE ADMINISTRATION OF ANTIGENIC MATERIAL (A VACCINE) TO STIMULATE AN INDIVIDUAL'S IMMUNE SYSTEM TO DEVELOP ADAPTIVE IMMUNITY TO A PATHOGEN.

IMMUNIZATION

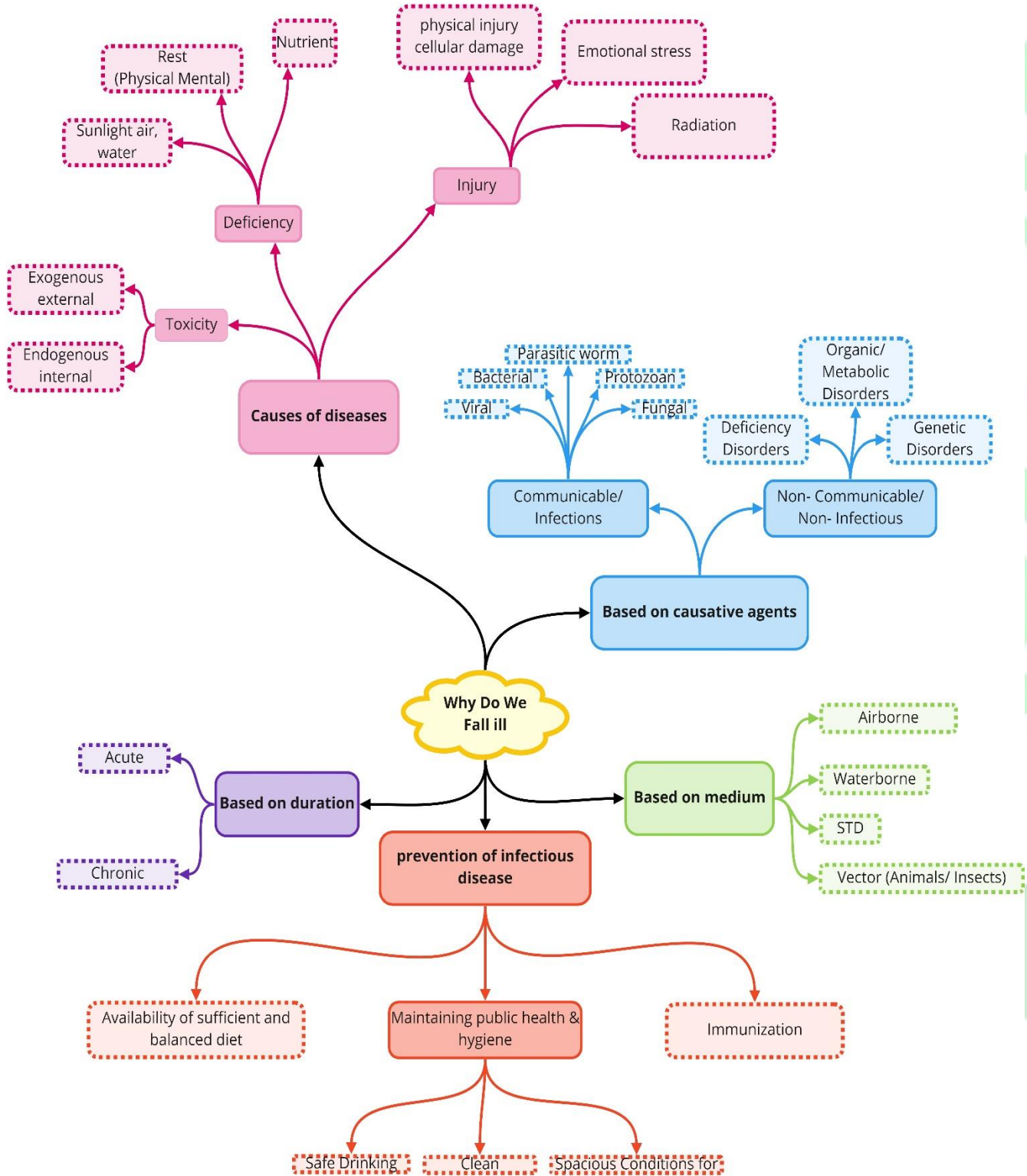
IMMUNIZATION IS THE PROCESS WHEREBY A PERSON IS MADE IMMUNE OR RESISTANT TO AN INFECTIOUS DISEASE, TYPICALLY BY THE ADMINISTRATION OF A VACCINE.

In essence, vaccination and immunization go hand in hand. Immunity to a disease can occur naturally or be induced by artificial means. For instance, once you contract Chicken Pox, it is very rare for the same person to contract the disease again because they build up immunity to the

disease. Creating immunity artificially involves exposure to very weak or deactivated disease causing microbes. The major difference between Vaccination And Immunization are summarized as follows:

Difference Between Vaccination And Immunization	
Vaccination	Immunization
The process involves introducing a weakened / deactivated disease causing microbes into a person	The process starts after the person is exposed to the vaccine and the body starts building resistance to that disease
It is usually injected or administered orally	It is not administered in any way. Tthe body develops resistance from vaccines.
Imovax Rabies is the trade name for rabies vaccine	The body builds up immunity through this vaccine for the disease rabies.
Vaccination does not guarantee complete resistance to a disease	Complete immunity occurs when the person fully recovers from the disease.
Usually, if mutation happens to microbes, it might render the vaccine ineffective (this is the reason why common cold has no vaccine)	Similarly, variations of a disease impact the body's ability to generate an immune response.

Class : 9th Science
Chapter- 13: Why Do We Fall ill



Important Question

➤ Multiple Choice Questions:

1. Which one of the following is not a viral disease?
 - (a) Dengue
 - (b) AIDS
 - (c) Typhoid
 - (d) Influenza
2. Which one of the following is not a bacterial disease?
 - (a) Cholera
 - (b) Tuberculosis
 - (c) Anthrax
 - (d) Influenza
3. Which one of the following causes Kala-azar?
 - (a) Ascaris
 - (b) Trypanosoma
 - (c) Leishmania
 - (d) Bacteria
4. AIDS cannot be transmitted by:
 - (a) sexual contact
 - (b) hugs
 - (c) breastfeeding
 - (d) blood transfusion
5. Which one of the following diseases is not caused by bacteria?
 - (a) Typhoid
 - (b) Anthrax
 - (c) Tuberculosis
 - (d) Malaria
6. Viruses, which causes hepatitis are transmitted through:
 - (a) air
 - (b) water

- (c) food
 (d) personal contact
7. The name of bacterial disease is
 (a) Ringworm
 (b) Measles
 (c) Typhoid
 (d) Malaria

8. T.B. (Tuberculosis) is caused by:

- (a) Vibrio Cholerae
 (b) Mycobacterium tuberculosis
 (c) HIV virus
 (d) Salmonella typhi (bacteria)

➤ Very Short Question:

- What are infectious or communicable diseases?
- What are congenital diseases?
- Give one local and one general effect of the inflammation process.
- Name the organism causing the following diseases:
 - Kala-azar
 - Sleeping sickness
- It was diagnosed that a patient has lost the power of fighting any infection.
 - Name the disease the patient is suffering from.
 - Name the pathogen responsible for the disease.
- What is immunity?
- The diseases which can be prevented by using vaccines.
- What are principles of treatment of a disease?
- How do children in many parts of India get immune to hepatitis-A by the time they are five year old?
- Name the causative organisms of tuberculosis and cholera.

➤ Short Questions:

- What are the differences between acute and chronic diseases?

2. What is a pandemic disease? Give one example.
3. Mention the symptoms because of which you will visit a doctor and why?
4. Why is DPT called triple antigen?
5. What are the symptoms shown by a person if the
 - (i) lungs get infected?
 - (ii) stomach is infected?
6. "In our country majority of children are already immune to hepatitis A without giving its vaccine to them." Justify this statement giving reasons.
7. List any four factors that must be taken care of by an individual for keeping good health.
8. Why are antibiotics effective against bacteria?

➤ Long Questions:

1. Write a note on plant tissues.
2. Show the types of animal tissues using flow chart.
3. What is connective tissue? Explain its types.

➤ Assertion Reason Questions:

1. For two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below:
 - a. Both Assertion and Reason are correct, and reason is the correct explanation for assertion.
 - b. Both Assertion and Reason are correct, and Reason is not the correct explanation for Assertion.
 - c. Assertion is true but Reason is false.
 - d. Both Assertion and Reason are false.

Assertion: Cell plays vital role in the body.

Reason: Cell is the basic unit of body structure.

2. For two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below:
 - a. Both Assertion and Reason are correct, and reason is the correct explanation for assertion.

- b. Both Assertion and Reason are correct, and Reason is not the correct explanation for Assertion.
- c. Assertion is true but Reason is false.
- d. Both Assertion and Reason are false.

Assertion: cell plays vital role in the body.

Reason: cell is the basic unit of wall making.

➤ Case Study Questions:

1. There are many tissues in the body. These tissues make up physiological systems or organ systems that carry out body functions. Each of the organ systems has specific organs as its parts, and it has particular functions. So, the digestive system has the stomach and intestines, and it helps to digest food taken in from outside the body. The musculoskeletal system, which is made up of bones and muscles, holds the body parts together and helps the body move. When there is a disease, either the functioning of one or more systems of the body will change for the worse. These changes give rise to symptoms and signs of disease. Symptoms of disease are the things we feel as being 'wrong'. Such as headache, cough, loose motions, a wound with pus these are all symptoms. These indicate that there may be a disease, but they don't indicate what the disease is. For example, a headache may just stress or very rarely it may mean meningitis, or any one of a dozen different diseases.

The manifestations of disease will be different depending on a number of factors. Some diseases last for only very short periods of time, and these are called acute diseases. We all know from experience that the common cold lasts only a few days. Other ailments can last for a long time, even as much as a lifetime, and are called chronic diseases. An example is the infection causing elephantiasis, which is very common in some parts of India.

(i) Which of the following is the function of musculoskeletal system?

- (a) Digest food taken in from outside the body
- (b) Holds the body parts together
- (c) Helps the body move
- (d) Both b & c

(ii) Which of the following is the function of Digestive system?

- (a) Digestion of food
- (b) Holds the body parts together
- (c) Helps the body move
- (d) Both b & c

(iii) Diseases that last for only very short periods of time are termed as:

- (a) Chronic Diseases
- (b) Symptoms
- (c) Acute Diseases

(iv) Define Acute Diseases.

(v) Define Chronic Diseases.

2. Acute and chronic diseases have different effects on our health. Any disease that causes poor functioning of some part of the body will affect our health. This is because all functions of the body are necessary for being healthy. But an acute disease, which is over very soon, will not have time to cause major effects on general health, while a chronic disease will do so.

For example, cough and cold, which all of us have from time to time. Most of us get better and become well within a week or so. And there are no lasting effects on our health.

When we get infected with a chronic disease such as tuberculosis of the lungs, then being ill over the years does make us lose weight and feel tired all the time. We are likely to have prolonged general poor health if we have a chronic disease. Chronic diseases have very drastic long-term effects on people's health as compared to acute diseases.

(i) Which of the following is the example of chronic disease?

- (a) Cold
- (b) Cough
- (c) Tuberculosis
- (d) All of the above

(ii) Identify correct statement given below,

Statement 1 – Chronic diseases have very drastic long-term effects on health.

Statement 2 – Acute diseases does not cause major effects on general health.

Statement 3 – Chronic diseases last for only very short periods of time.

Statement 4 – Acute diseases last for very long periods of time.

- (a) Both 1 & 2
- (b) Only 1
- (c) Both 3 & 4
- (d) All of the above

(iii) Which of the following is the example of acute disease?

- (a) Cold & Cough
- (b) Tuberculosis

- (c) Both a & b
- (d) None of the above

(iv) What is the distinguishing feature of Acute Diseases?

(v) What is the distinguishing feature of Chronic Diseases?

✓ Answer Key-

➤ Multiple Choice Answers:

1. (c) Typhoid
2. (d) Influenza
3. (c) Leishmania
4. (b) hugs
5. (d) Malaria
6. (b) water
7. (c) Typhoid
8. (b) Mycobacterium tuberculosis

➤ Very Short Answers:

1. Answer: The diseases which are caused by infectious agents are called as infectious diseases as they can spread from one person to another through some medium or by direct contact.
Example: Pneumonia, common cold, tuberculosis, etc.
2. Answer: The diseases which are present in a person since birth are called congenital diseases.
Example: colour blindness.
3. Answer: Swelling or pain is a local effect. Fever or headache is a general effect.
4. Answer:
 - (a) Kala-azar is caused by Leishmania
 - (b) Sleeping sickness is caused by Trypanosoma.
5. Answer:
 - (i) AIDS.
 - (iii) HIV is the causative organism of AIDS. [HIV-Human immunodeficiency virus]
6. Answer: The ability of the body of a person to fight against the disease causing organisms is called immunity. Name any disease that can be prevented by using

vaccines.

7. Answer: The diseases which can be prevented by using vaccines are polio, small pox, diphtheria, tetanus, measles, etc.

8. Answer:

- The principles of treatment are:
- reducing the effects of the disease.
- to kill the cause of the disease.

9. Answer: The children become immune to hepatitis A virus as they are exposed to hepatitis A virus present in the water they drink.

10. Answer:

- Tuberculosis: Caused by bacterium called as Mycobacterium tuberculosis.
- Cholera is caused by a bacterium called as Vibrio cholera

➤ Short Answer:

1. Answer:

Acute disease: The disease which lasts for only very short periods of time is called acute disease.

They get over soon and do not get much time to affect the health more adversely.

Example: Common cold

Chronic disease: The disease which can last for a long time, even as much as a lifetime is called chronic disease.

They have a long-term effect on the health of a person. Example: Elephantiasis

2. Answer: The disease which affects the health of human population all over the world is called a pandemic disease. For example, AIDS.

3. Answer: High fever, headache, tiredness, loose motion, cough and cold, loss of appetite and body weight are some of the symptoms for which we will visit a doctor because the doctor would be able to ascertain the disease caused on the basis of the symptoms produced and give medication accordingly.

4. Answer: DPT is called as triple antigen as it affects three antigens to produce the antibodies against them. The diseases are: Diphtheria, Pertussis and Tetanus.

5. Answer:

(i) Cough, breathlessness, tiredness are the symptoms produced if the lungs of a person get affected by a disease.

(ii) Loose motion, vomiting and stomach-ache are the symptoms produced when the

stomach of a person gets affected by a disease.

6. Answer: Majority of the children are already exposed to the hepatitis A virus by the time they are five years old because the water which the children generally drink contains the hepatitis A virus. The immune system thus helps to develop immunity against the virus.
7. Answer: The four factors which must be taken care by an individual for keeping good health are:
 - Proper nourishing balanced diet
 - Clean and hygienic environment
 - Good social environment
 - Proper sanitation and cleanliness
8. Answer: Antibiotics block the biochemical pathways of the bacteria which inhibit their growth and kill them. For example: Penicillin blocks the pathway involved in the synthesis of cell wall which protects the bacteria. This inhibits their growth and kills them.

➤ Long Answer:

1. Answer:
 - (a) 'Health' is defined as a state of physical, emotional, mental and social well being of a person.
 - (b) The four factors whose non availability or absence can cause disease are:
 - (i) Proper nourishing food: If the person does not get proper nourishing food and a balanced diet, then disease may affect the person.
 - (ii) Proper hygienic conditions and cleanliness: If the surroundings are not hygienic and the public cleanliness is ignored in a society, then the individuals living there become more prone to diseases.
 - (iii) Good social conditions: The society in which the person lives should cater towards a healthy mind set of the members of the society. A bad social environment makes the individuals of the society develop an unhealthy attitude.
 - (iv) Good economic conditions: Poverty is a major cause of diseases and poor economic conditions increase the chances of spread of diseases in the society due to inadequate food and unhygienic conditions.
2. Answer:
 - (a) AIDS can spread by four ways: Sexual contact, Transfusion of AIDS infected blood, use of infected syringe and from an infected mother to her baby during pregnancy or through breast feeding.

(b) Antibiotics block the biochemical pathways of the microorganism in order to inhibit their growth and kill them. But, the viruses do not employ such biochemical pathways of their own. They utilize the host machinery to multiply themselves. So, antibiotics cannot be used for the treatment of the viral diseases like AIDS.

3. Answer:

(a) Mode of transmission of Jaundice: Contaminated water Organ affected by Jaundice: Liver

(b) Access to pure drinking water can prevent jaundice.

(c) Most of the children of India are already exposed to the hepatitis A virus through the drinking water and their immune system helps to develop immunity against the disease by the time they are five years old. So, it is not necessary to give them the hepatitis A vaccine.

➤ Assertion Reason Answer:

1. (b) Both Assertion and Reason are correct, and reason is not the correct explanation for assertion.
2. (c) Assertion is true but Reason is false.

➤ Case Study Answers:

1.

(i) (d) Both b & c

(ii) (a) Digestion of food

(iii) (c) Acute Diseases

(iv) Diseases that last for only very short periods of time are called as Acute Diseases

(v) Diseases that last for long period of time, even as much as a lifetime are called as Chronic Diseases.

2.

(i) (c) Tuberculosis

(ii) (a) Both 1 & 2

(iii) (a) Cold & Cough

(iv) Distinguishing feature of Acute Diseases :

- Acute diseases last for very short period of time.
- Acute diseases does not cause major effects on general health.
- Example – Cold and cough.

(v) Distinguishing feature of Chronic Diseases :

- Chronic diseases last for very long periods of time.
- Chronic diseases does cause major effects on health.
- Example – Tuberculosis.

