

## 9<sup>th</sup> - Why Do We Fall Ill - I



**Health:** Even a couple of centuries ago, people looked upon ill-health or disease as a part of the life death cycle that had to be borne. In the middle of the 19th century that man realized that his way of living and the environment around him had an effect on his health. He realized that a lot of diseases could be prevented by simple things—safe drinking water, good sewage system and personal hygiene. We should know that these things affect our health.

**What is Good Health:** Good health may mean different things to different people. In general, a person is said to be in good health if he is free from any disease—physical or mental—and can function effectively. The World Health Organization (WHO) defines health as follows: “Health is a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity”. The body of a healthy person can adapt easily to changes in living conditions, weather, etc. It also takes stress well. A healthy person can enjoy life to the fullest.

**Basic Conditions for Good Health:** The health of an individual and that of the community are closely linked. And for good health, the actions of an individual are as important as those of the other members of his community, the civic services, the industries around him, etc.

**1. Balanced diet:** A balanced diet is the first condition necessary for good health. A balanced diet is one that provides all the nutrients required by the body in correct proportions. The nutrients required by our body are proteins, carbohydrates, fats, vitamins and minerals. For example, if our diet lacks the mineral iron, we may get a disease called anaemia.

**2. Personal hygiene:** Personal hygiene is extremely important for good health. We should bathe regularly and wear clean clothes. Bad odour associated with dirty clothes and unwashed body are caused by microorganisms acting on perspiration. Not brushing our teeth regularly and after meals can cause pyrrhoea, a disease in which pus forms in the gums. Clipping nails and keeping them clean, washing our hands with soap before meals.

**3. Clean surroundings. Food and water:** Our health depends on the cleanliness of our surroundings. Flies and mosquitoes carry germs that cause diseases. Flies breed in rotting garbage and mosquitoes breed in pools of stagnant. Fruits and vegetables should be thoroughly washed before cooking or eating. Cooked food should be kept in clean, covered utensils. We should treat water to make it safe for drinking.

**4. Clean air:** Clean air is a basic requirement for good health. Breathing polluted air causes respiratory diseases such as asthma and bronchitis. Although it is the government’s job to ensure that industries do not pollute the air, we can also take certain steps to ensure that the air we breathe is clean and fresh. Our homes should be well ventilated.

**5. Exercise and relaxation:** Exercise keeps body weight under control. It promotes digestion and is helpful for a good night’s sleep. One can choose between walking, jogging, bicycling, yoga, aerobics or sports according to one’s age, health and personal preference. Relaxation and sleep are equally important for physical and mental health. They also reduce stress.

**6. No addictions:** Generally, when we talk about addiction, we mean the habit of smoking, drinking or taking drugs. An addiction causes health problems. Drinking alcohol reduces mental and physical alertness. And excessive use of alcohol may affect the nervous system and damage the liver. Smoking causes respiratory, heart diseases, and cancer. Chewing tobacco can cause oral cancer and



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dental problems. Drugs like heroin, cocaine and hashish affect the nervous system.

**7. Good economic conditions:** People who are poor cannot afford many of the things required for good health. Many of them live in overcrowded, unhygienic areas. They may also not have access to clean drinking water. It has been found that areas and countries where the economic conditions are good, people do not usually suffer from certain diseases like malaria and cholera.

**Diseases:** A disease is an abnormal condition of the body which does not let the body function properly. For example, arthritis is a disease of the joints which affects the elderly. People with arthritis may find it difficult to move their fingers or bend their legs. Influenza (flu), typhoid, common cold and malaria are some other diseases. For example, a person with a fractured bone in the leg will not be able to move it. But a fracture is not a disease.

**Maintenance of Community Health:** The various measures which should be taken in order to maintain community health are:

1. **Public cleanliness** it includes: Proper sanitation, sewage drainage and garbage disposal, Availability of safe drinking water and unadulterated nutritive food articles, which do not contain any contamination. Strict rules and norms against pollution.

2. **Preventive control** It includes pest control, vaccination against diseases, control of diseases and infections.

3. **Health education:** It is the best way to make the population aware about the consequences related to health. Health education regarding diseases, alcoholism, drug addictions and safe sex should be provided to masses for educating the young as well as adults.

4. **Establishment of healthcare services:** Services like hospitals, community healthcare centres, maternity and childcare centres, etc., are necessary for medical care of the population.

**Signs and Symptoms of a Disease:** When we suffer from a disease, we feel unwell because some part of the body is not working normally. This is an indication of a disease and is called a symptom. A symptom is a change in normal functioning of the body which is felt by a patient, but which cannot be observed by the doctor. For example, stomach ache, sore throat and nausea are symptoms. A patient has to tell the doctor about these because the doctor cannot see or feel them. Symptoms only indicate that a patient is suffering from a disease, but they do not indicate what disease. For example, a patient complaining of body ache could be suffering from any one of a number of diseases like influenza or malaria. Apart from what he hears from a patient, a doctor looks for signs of a disease. A sign of a disease is a change in the bodily function or structure that can be observed. Rashes, swelling of glands, change in colour of the skin, etc., are signs which give doctors a good idea about a disease. For example, a sticky red eye indicates a common eye infection called conjunctivitis. Yellow skin and eyes can be due to a disease called hepatitis. Signs and symptoms help in the diagnosis of a disease.

Healthy	Disease-Free
It is a state of complete physical, mental and social well-being.	It is a state of absence of discomfort or dearrangement of body parts and their function.
It depends upon the individual as well as on the physical and social environmental factors (societies and communities).	It is related to the individual only.
A healthy person will be disease-free.	A disease-free person can be healthy or unhealthy.
Healthy person is energetic and able to perform as per requirement.	Performance of a disease-free person depends upon environment and personal attitude.



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Diagnosis means the process of identifying a disease. Apart from signs and symptoms, a doctor may measure the temperature, blood pressure and weight of the patient to diagnose a disease. In many cases, the doctor also needs the help of laboratory tests of blood, urine, stool, etc., and diagnostic images like X-rays to diagnose a disease.

**Types of Diseases:** The diseases can be broadly grouped into congenital and acquired diseases. Anatomical or physiological abnormalities when present from birth cause congenital diseases (e.g. haemophilia, colour blindness) whereas, the diseases developing after birth are called acquired diseases (e.g. malaria, cancer, etc.). Depending on the duration of infection, diseases may be of following two types:

1. **Acute Diseases:** These are the diseases that last only for very short periods of time. Thus, they do not cause long-term harmful effects on human health. In these diseases, patients recover completely after the cure, e.g. common cold, cough, etc.

2. **Chronic Diseases:** These are the diseases, which last for a long time, even as much as a lifetime and cause drastic long-term effects on human health, e.g. elephantiasis (an infection caused by filarial worm), cancer, AIDS, etc. In these diseases, patient does not recover completely.

**Chronic Diseases and Poor Health:** Acute and chronic diseases have different effects on our health. Any disease that causes poor functioning of one part of the body affects our general health because for general health, all body parts should work properly. Acute diseases do not have time to cause major effects on general health, while a chronic disease will cause major effects. As chronic diseases are long-term diseases, therefore they can cause serious distress to health as compared to acute diseases.

**Causes of Diseases:** Most of the diseases will have many causes, rather than one single cause. These causes of diseases are classified into two types:

1. **Immediate causes:** These are the real or primary causes; also called first level of causes. Various microorganisms like bacteria, virus, fungi, protozoans, etc., that can cause infectious diseases are included in this category.

2. **Contributory causes:** These are also called intrinsic or internal factors, and do not lead to a disease themselves. These can be of following types:

- **Poor health due to inadequate diet:** It occurs due to deficiency of one or more nutrients, making the person unhealthy or susceptible to diseases, e.g. kwashiorkor, a nutritional deficiency disease occurring due to low protein diet. So, lack of good nourishment becomes second level of cause of disease.

- **Genetic disorders:** These are present since birth; pass down from parents to offsprings, e.g. haemophilia.

- **Various pollutants present in environment:** Pollutants in air, water and soil also contribute in causing diseases, e.g. intensive use of nitrate fertiliser causes methaemoglobinaemia.

- **Improper functioning of any body organ:** Non-communicable diseases (i.e. non-spreadable diseases) like diabetes, blood pressure and heart diseases are due to the malfunctioning of body organs.

- **Lack of public services or poor economic conditions.** It also contributes to the cause of disease. These causes become the third level cause of disease.

**Note:** The diseases, which are caused when organ and tissues degenerate and do

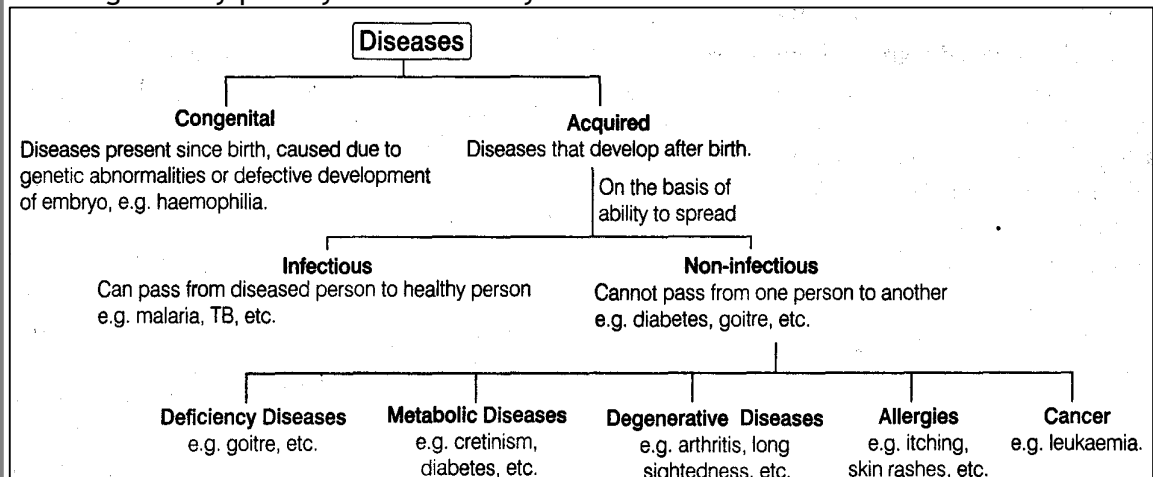


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not work well with increasing age are called degenerative diseases. Arthritis, disturbed sight and hearing defects are all degenerative diseases.

**Infectious and Non-infectious Causes:** Immediate causes of diseases belong to two distinct types. One of the group of diseases is caused by infectious agents mainly microorganisms. As the microbe can spread in the community, so the disease caused by it also spreads. Hence, these diseases are known as **infectious diseases**, e.g. typhoid caused by bacterial infection. The second group of diseases is not caused by infectious agents. These diseases are restricted only to the persons, who are suffering from them. As they do not spread from infected person to a healthy person, these are called **non-infectious diseases** or **non-communicable diseases**, e.g. some cancers are caused by genetic abnormalities or by exposure to certain carcinogenic chemicals and radiations; high blood pressure is caused by excessive weight and lack of exercise, etc. Non-communicable diseases are mainly caused due to:

- Lack of essential nutrients/substances in our diet, e.g. proteins, vitamins, minerals, etc.
- Uncontrolled growth of tissues in any part of body.
- Damage to any part by accident or by other means.



**Infectious diseases:** Infectious diseases are caused by some biological agents (pathogens) such as viruses, bacteria, fungi and single-celled animal protozoans, etc. The presence of an infectious agent may affect the normal body function of the individual, leading to a disease. These can rapidly spread from one person to another by various means such as water, air, food, insects (vectors) or by physical contact. Some infectious diseases that develop and spread rapidly to many people are called epidemic diseases.

**Infectious Agents:** The unicellular or multicellular organisms that cause infection are called infectious agents. These disease causing organisms are also called pathogens and they are classified into a wide range of categories. Some of them are viruses, bacteria, fungi, protozoans, etc.

**Communicable disease:** An infectious disease that can be spread from one infected individual to another is called a communicable disease. An infectious disease can be spread from an infected person to a healthy person in many ways such as through food, water, air, direct contact, through a disease carrier like a mosquito, etc.

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We shall learn about these ways shortly. Some infectious diseases are not communicable. For example, tetanus is an infectious disease which affects the nerves and muscles of the patient. It is caused by a bacterium which enters the body when a wound comes in contact with contaminated soil or animal wastes. But tetanus cannot be spread from person to person. So, it is not a communicable disease.

**How Communicable Diseases Spread:** A communicable disease can spread, or get transmitted, in many ways. It is important to know how they spread because it can help in controlling these diseases.

**Through air:** Some diseases that are caused by bacteria or virus can be spread through air. Such diseases are called airborne diseases. When an infected person sneezes or coughs, tiny droplets of liquid containing bacteria or viruses come out from the mouth and nose. When a healthy person breathes in the droplet-containing air, these organisms enter his/her body. In this way the disease spreads. This method of transmission of a disease by droplets is called droplet infection. Common cold, influenza, measles and tuberculosis are some diseases that spread in this way. The chances of droplet infection increase when a healthy person is near an infected person. So, such diseases spread very quickly in crowded areas.

**Through food and water:** Infectious diseases of the intestines and stomach can spread through contaminated food and water. The organisms that cause these diseases are present in the excreta of a patient. These organisms can get into water bodies when rainwater carries excreta into them, or when sewage flows into them. Food can get contaminated by these organisms when a patient who does not have clean habits handles food, or when flies that feed on sewage sit on the food. Cholera, typhoid and hepatitis are some diseases spread by contaminated food and water.

**Through contact:** Many diseases are spread when our skin comes in contact with an infected person, especially if our skin is broken due to a wound, scratch, etc. Diseases like scabies, herpes, ringworm (a fungal infection) and some types of anthrax can be spread in this way. Diseases can also be spread by touching things like the clothes, bed sheets, or other objects used or touched by an infected person. For example, when a man with conjunctivitis rubs his eyes while washing, the infectious agent gets on his hand. From there it gets on to the tap. His daughter can get infected if she touches the tap and then rubs her eyes. Some diseases like AIDS and syphilis are spread by sexual contact.

Types of Pathogens	Description	Diseases
<b>Bacteria,</b> e.g. <i>Salmonella typhi</i>	Single-celled organisms without a well-defined nucleus.	Typhoid, fever, cholera, anthrax, tuberculosis, tetanus, pneumonia and syphilis.
<b>Viruses,</b> e.g. <i>Herpes simplex</i>	Non-living particles that reproduce by taking over living machinery of the host cells.	Common cold, influenza, dengue fever, flu and functional disorders like measles, AIDS, chickenpox and smallpox.
<b>Fungi</b> e.g. death cap mushroom	Simple organisms, including mushrooms and yeasts, that grow as single cells or thread-like filaments.	Ringworm, athlete's foot.
<b>Protozoan</b> e.g. <i>Giardia lamblia</i>	Single-celled organisms with a nucleus.	Malaria, kala-azar, amoebiasis, giardiasis, trypanosomiasis (sleeping sickness).
<b>Worms,</b> e.g. <i>Ascaris</i>	Multicellular, mostly parasitic.	Ascariasis, filariasis, cysticercosis.



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**Through body fluids:** Some diseases can be spread through blood, semen or mother's milk. AIDS and hepatitis B can be spread by these body fluids. For example, they can be spread by sharing injection needles or by the transfusion of infected blood.

**Through vectors:** Animals like mosquitoes, flies, cockroaches and rats spread many diseases. An animal that spreads a disease is called a vector. Mosquitoes of different species are vectors for diseases like malaria, dengue, yellow fever and filariasis. Mosquitoes feed on blood to be able to lay mature eggs. When a mosquito bites an infected person, the infectious agent enters its stomach. After this when it bites a healthy person, the infectious agent passes into his/her bloodstream. In this way the disease gets transmitted. Vectors can spread diseases in other ways too. For example, infectious agents can stick to the body of a fly. Apart from this, infectious agents can be transmitted through the faeces and saliva of the fly. The housefly spreads diseases like typhoid and cholera. Shadflies and tse-tse flies spread kala-azar and sleeping sickness respectively. Cockroaches can spread diseases like polio and typhoid, while rats spread diseases like plague.

**The Effects of infectious Diseases: the part of the body that gets affected:** Infectious agents enter the body through several places. They may enter through the eyes, nose, mouth, cuts and wounds, and through the sexual organs. The part of the body that gets affected may depend on from where the infectious agent enters. For example, the infectious agents which cause conjunctivitis enter the eye and infect it. Infectious agents who enter through the nose affect the organs of the respiratory system. For example, the virus that causes common cold affects the upper respiratory tract, and the bacteria that cause tuberculosis first affects the lungs. Those infectious agents that enter through the mouth with food and water primarily affect the organs of the digestive system. For example, in cholera and typhoid the intestine is affected, and in hepatitis, the liver is affected. In some cases, the infectious agents multiply in and affect organs that are not directly related to the part of the body through which they enter. For example, the infectious agents that cause malaria and Japanese encephalitis get into human blood through mosquito bite. In the case of Japanese encephalitis, the infectious agent reaches the brain and affects it. And in the case of malaria, the infectious agent reaches the liver. After reproducing in the liver, it leaves the organ to infect the red blood cells.

**Common effects of infectious diseases:** Whenever the body is attacked by infectious agents, the immune system of the body reacts to defend it. This defensive reaction does not depend upon how the infectious agents entered the body, or where it resides inside the body. In all cases, the body's immune system sends white blood cells to the place where the infectious agents are. To fight the infectious agents, the white blood cells release some chemicals, setting off chemical reactions. The defensive reaction of the body's immune system in response to infection or injury is called inflammation. Inflammation is characterized by swelling, reddening, and pain in the affected area of the body, plus an increase in body temperature.





**Signs, symptoms and effects related to the affected organs and tissues:** Certain signs and symptoms of an infectious disease depend upon the tissues or organs that are affected. In tuberculosis, the lungs are affected. So there is coughing and breathlessness. In cholera, the intestine is affected. So the patient has stomach ache and passes loose stools. In hepatitis, the liver is affected, which causes yellowing of the skin. In encephalitis, the brain is affected, which causes headache and giddiness. Sometimes, an infectious disease might affect the body in such a way that wide-ranging effects are produced, which are not confined to any particular organ. For example, HIV (human immunodeficiency virus) which causes AIDS, attacks and affects the immune system of the body. As a result, the body's ability to fight infections gets weakened. So the patient gets different kinds of diseases like tuberculosis, pneumonia, hepatitis, certain kinds of cancer, etc. These diseases affect different parts of the body.

**Severity of the effects:** In general, the greater the number of infectious agents in the body, the more severe is the effect of the infection. Infectious agents affect the processes inside our body. As they live and multiply inside the body, they may produce substances that are harmful for us. It is obvious that the greater the number of these organisms, the greater is the ill effect on the body. Also, if the infectious agents are not too many, the immune system and medicines may overcome them easily. However, if the infectious agents are large in number, the immune system and medicines take time to overcome them.

**Treatment of Infectious Diseases:** We have so far learnt quite a bit about infectious diseases. Now let us see how these diseases can be treated. When we get an infectious disease, our doctor may prescribe different medicines. Some of them reduce the symptoms of the disease, while others kill the disease-causing organisms.

**Treatment for Reducing Symptoms:** In many diseases, doctors prescribe medicines to reduce symptoms like pain, nausea, etc. This kind of treatment does not cure the disease itself. It is done only for the comfort of the patient. For example, in some diseases, a patient suffering from pain can be given a painkiller. The medicine prescribed as a painkiller will reduce the pain, but it will not cure the disease. Similarly, a cough syrup helps to clear the respiratory tract, but it does not cure the infection that is causing the cough. In some diseases, the only option is to reduce the symptoms. Influenza, for example, does not have a cure. But a doctor may prescribe medicines to reduce the aches and fever that an influenza patient has.

**Eliminating Infectious Agents:** As you know, infectious diseases are caused by bacteria, viruses, fungi, protozoan parasites and worms. These infectious agents differ from each other in many ways. So, a drug that kills one type of infectious agent, does not work on others. However, within a type of organism like, say, bacteria, there are a number of similarities in structure and life processes. So, a drug may work against a number of species of bacteria. Therefore, in our fight against these infectious agents, it makes sense to focus on each kind of infectious agent separately. Among infectious diseases, those caused by bacteria and viruses are more common.