Ratna Sagar

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Education, Our Mission

As per the latest ICSE syllabus

Rama Sagar
Education, Our Mission!

Revised and Updated

LIVING SCIENCE BIOLOGY

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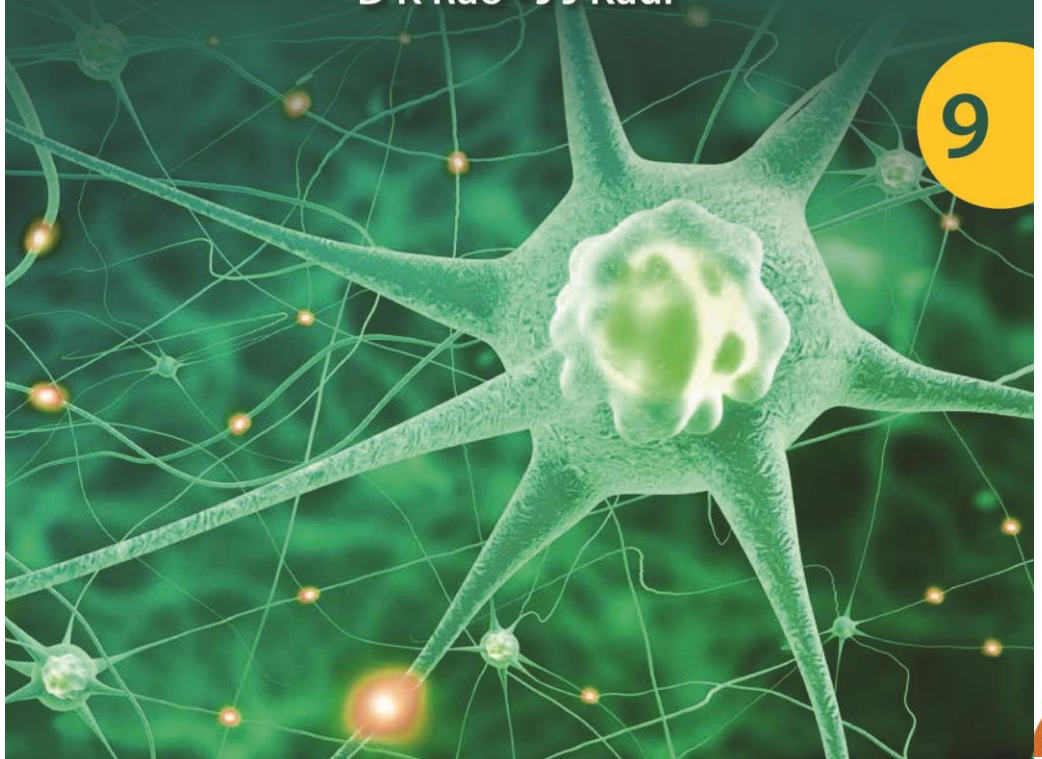

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ICSE
Living Science
Biology

Class 9

Chapter 15 Health and Hygiene

LEARNING OBJECTIVES

Hygiene

- ❖Personal hygiene
- ❖Public sanitation and hygiene
- ❖ Environmental hygiene

Classification of diseases

- ❖ Non-communicable diseases
- ❖ Communicable or infectious diseases

Patterns of occurrence of Disease

- ❖ How do pathogens cause disease?

Mode of Spread of infectious diseases

- ❖ Direct transmission
- ❖ Indirect transmission

Vectors or disease carriers

- ❖ Houseflies
- ❖ Mosquitoes
- ❖ Cockroaches

What is health and what are the characteristics of good health?

The World Health Organization (WHO) defines health as ‘a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity’. Good health has the following characteristics–

- ❖ Absence of disease in the body.
- ❖ Proper working of all internal as well as external body organs.
- ❖ Absence of any mental disease.
- ❖ Absence of social and psychological tensions.

Hygiene

The science and practices of **maintaining good health** is **called hygiene**. Thus, health and hygiene are interrelated. Hygiene includes both personal and community hygiene.

Personal hygiene

Taking care of oneself to remain healthy and free from diseases is personal hygiene. Personal hygiene includes:

- **Eating a balanced diet**
- **Cleanliness and healthy habits**

Public sanitation and hygiene

Activities undertaken at the government or local organizational level to maintain health of the people (for controlling diseases) is known as public or community hygiene.

Local or government organizations may take steps to control spreading of a disease, by creating awareness and ensuring adequate supplies of medicines. This can be done by:

- **Maintaining proper cleanliness of surroundings** by disposing off the sewage from colonies.
- **Providing safe and germ free drinking water.**

❖ **Running various immunization (vaccination) and other health awareness programmes** wherever there is danger of spread of a disease.
❖ **Maintaining food standards** by regular inspection at food stores, meat and milk outlets.

Environmental hygiene

To keep the environment healthy, we should be careful about the following while maintaining domestic hygiene.
❖ **House should be kept clean** and free from dirt, flies and germs.
❖ **Cooking utensils**, plates, and other utensils should be kept clean.
❖ **Garbage should be thrown inside the dustbins.** Throwing household garbage on the roadside makes street dirty and allows flies, mosquitoes and other animals to breed.

❖ **Keeping dustbins covered:** To prevent the entry of insects and other animals inside the house, dustbins should be kept covered. The bins should also be cleaned after emptying the garbage

Diseases

The state of the body when any of its normal functions are disturbed or when the structures are altered is called disease.

Classification of diseases

On the basis of their communicability within a population, diseases are categorized into two major types.

- **Non-communicable or non-infectious diseases**
- **Communicable or infectious diseases**

Non-communicable diseases

Non-communicable or non-infectious diseases are diseases which do not spread from one person to another. These diseases are either connected to our lifestyle or genetic make-up. They cannot be transmitted from one person to another. For example,diabetes, beriberi, scurvy, heart attack, etc.

Types of non-communicable diseases

- **Lifestyle or social diseases** are those which result from the conditions in which we live. For example, heart disease.
- **Metabolic diseases are caused by improper functioning of a tissue or an organ.** For example, diabetes mellitus and coronary heart disease.
- **Allergies** such as asthma are caused by hypersensitivity or overreaction of the body to the presence of a normally harmless substance called an **allergen**.
- **Mental illness** includes disorders like dementia, schizophrenia and depression.

❖ **Deficiency diseases are caused due to absence of certain nutrients in the diet**, such as proteins causing kwashiorkor and marasmus.

❖ **Cancer is uncontrolled division of cells in any part of the body to form a mass of cells called tumour**.

❖ **Genetic disorders are caused due to inheritance of defective or abnormally-functioning genes from the parents**. As these disorders are passed from parents to the offsprings they are known as **hereditary disorders**.

❖ **Degenerative diseases: A gradual decline in the efficiency of any organ or system in the body brought about by age is called a degenerative disease**. For example, weakening of eye muscles causes long sightedness, opaqueness of eye lens causes cataract,

Allergy produces rashes on skin

A child suffering from kwashiorkor

Arthritis is a degenerative disease

Patterns of occurrence of Disease

The extent of occurrence of a disease in a population decides the pattern of the disease.

1. **Endemic**: A disease occurring in a specific area attacking only a smaller number of people is called an endemic disease.
2. **Epidemic**: An epidemic is an outbreak of disease which spreads rapidly from one place to another affecting a large population.
3. **Pandemic**: If a disease occurs on a global scale, that is, it spreads across the world, it is called pandemic.
4. **Sporadic**: When there are scattered individual cases of a disease, it is called as sporadic disease.

How do pathogens cause disease?

Body tissues and systems can be damaged by pathogens in the following ways:

- **True infections:** The pathogen enters the body and develops a mechanism by which it is not damaged by the white blood cells. It then adheres to the cells in the body of host and harms these cells.
- **Releasing toxins:** Some pathogens release certain chemicals called **toxins** as soon as they enter the host's body. These toxins cause disease symptoms such as fever, vomiting, headache, etc.

❖ **Secondary infections:** Certain parasitic worms bore through the host tissues causing wounds. These wounds may then become infected with germs. This is called secondary infection.

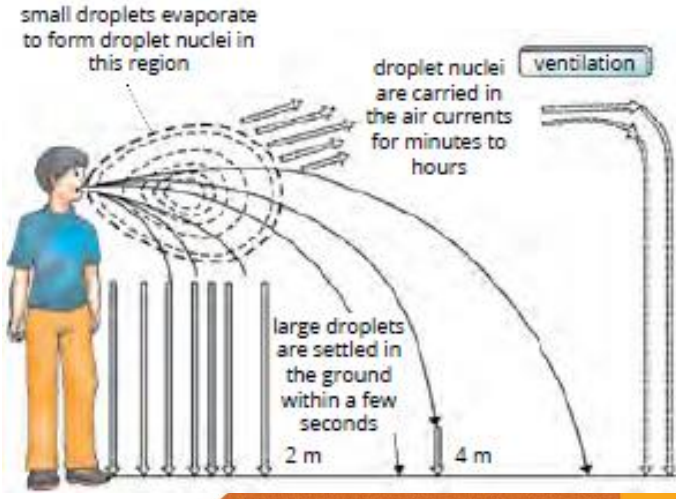
Mode of spread of infectious diseases

Infectious (communicable) diseases spread from an infected person to a healthy person in two ways – direct transmission and indirect transmission.

Direct transmission

❖ **Direct contact between the infected person and the healthy person:** Diseases like **smallpox, chickenpox, syphilis and gonorrhoea spread through direct contact**. Sexual act is one such direct contact through which syphilis and AIDS are transmitted.

❖ **Droplet infection:** Droplets are airborne. The infected person throws out tiny droplets of mucus by coughing, sneezing, spitting or even talking. These droplets may contain pathogens. By inhaling the air containing the droplets, a healthy person may get the infection. Diseases like common cold, pneumonia, influenza, measles, mumps and tuberculosis spread by droplet infection.



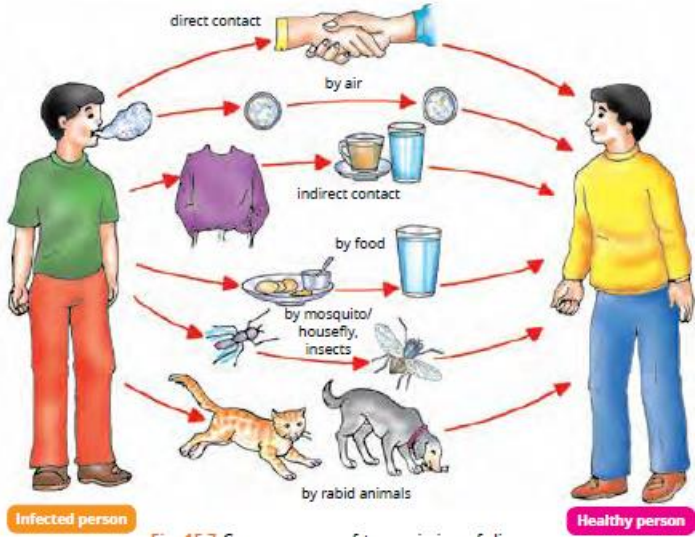
❖ **Contact with soil contaminated with disease-causing viruses, bacteria, etc.** The bacteria responsible for tetanus, *Clostridium tetani*, enters the human body from the soil.

Indirect transmission

The pathogens of certain diseases reach human body through some intermediate agents. It can take place by various means, which are as follows:

❖ **By vectors:** Houseflies, mosquitoes and cockroaches which take up the pathogen from the reservoir of infection pass it to healthy persons. These are the intermediaries and are called as **vectors**.

For example, houseflies carry the causative organisms of cholera, typhoid, dysentery and tuberculosis on their legs and mouthparts from the faeces and sputum to food and drinks, and contaminate them. When this contaminated food is taken by a healthy person, he/she gets the infection. The commonest vector is the mosquito.



❖ **By vectors:** Houseflies, mosquitoes and cockroaches which take up the pathogen from the reservoir of infection pass it to healthy persons. These are

❖ **Airborne:** The pathogens may reach the humans with air and dust. The epidemic typhus spreads by inhalation of dried faeces of infected lice. For example, tuberculosis, influenza, common cold and pneumonia.

a. Cloud of tiny droplets released during a sneeze

❖ **Waterborne:** Diseases also spread through water contaminated with microbes. For example, contaminated water may contain excreta from someone suffering from infectious gut disease, such as cholera. When this water mixes with the water used for drinking, the cholera causing microbes will enter the new hosts and cause diseases in them. Cholera, hepatitis B and diarrhoea spread through such mode.

b. Keep your mouth and nose covered while sneezing

❖ **Dirty hands and fingers** are also the sources of infection for various digestive and respiratory diseases.

Vectors or disease carriers

Organisms such as insects, ticks and mites that act as intermediate carrier to transmit pathogens to humans and animals are called vectors.

Houseflies

Houseflies do not bite but are vectors of several bacteria, protozoa, viruses and worms owing to their habits of visiting faeces and other unhygienic matter and then to food of man.

The housefly is a physical carrier of pathogens and may transmit the pathogen in various ways.

Mosquitoes

There are mainly three types of human-biting mosquitoes belonging to genera *Anopheles*, *Culex* and *Aedes*.

Only female mosquitoes bite and suck animal blood, male mosquitoes do not bite and they feed on nectar.

Cockroaches

Cockroaches are among the most common of household insects . They feed upon a great variety of materials such as cheese, water, bakery products, books, dead animals, plant material, clothing, etc.

Cockroaches feed and live in damp and unsanitary places such as sewers, garbage, disposals, kitchens and indoor storage units. They excrete and regurgitate the undigested food and spread filth over food products.

SUMMARY...

- Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.
- Health and hygiene are interrelated.
- Proper nutrition, physical exercise and cleanliness are essential parts of maintaining good health.
- Activities undertaken at the government or local organizational level to maintain the health of the people is known as community health.
- On the basis of their communicability within a population, diseases may be communicable (infectious) or non-communicable (non-infectious).
- Non-communicable diseases are either connected to our lifestyle or genetic make-up or they occur as we age as a consequence of the process of degeneration.
- Communicable diseases are caused by various pathogens such as bacteria, viruses, fungi, protozoa and worms, and are spread by air, water, food and insects.
- Diseases may be epidemic, endemic or pandemic depending upon their pattern of occurrence.
- Pathogens cause disease either by true infections, or releasing toxins or by promoting secondary infections.

- Organisms such as insects, ticks and mites that transmit pathogens to human and animals are called vectors.
- The housefly is a physical carrier of pathogens and may transmit the pathogens through its feet and body hair, mouthparts, regurgitation or vomit or deposition of faecal matter.
- Diseases spread by housefly include polio, Q fever, hepatitis, amoebic dysentery, typhoid, cholera, conjunctivitis, etc.
- There are mainly three genes of mosquito namely *Anopheles*, *Culex* and *Aedes*. They transmit a number of diseases such as malaria, filariasis, yellow fever and dengue to humans.
- Cockroaches also act as vectors of diseases.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