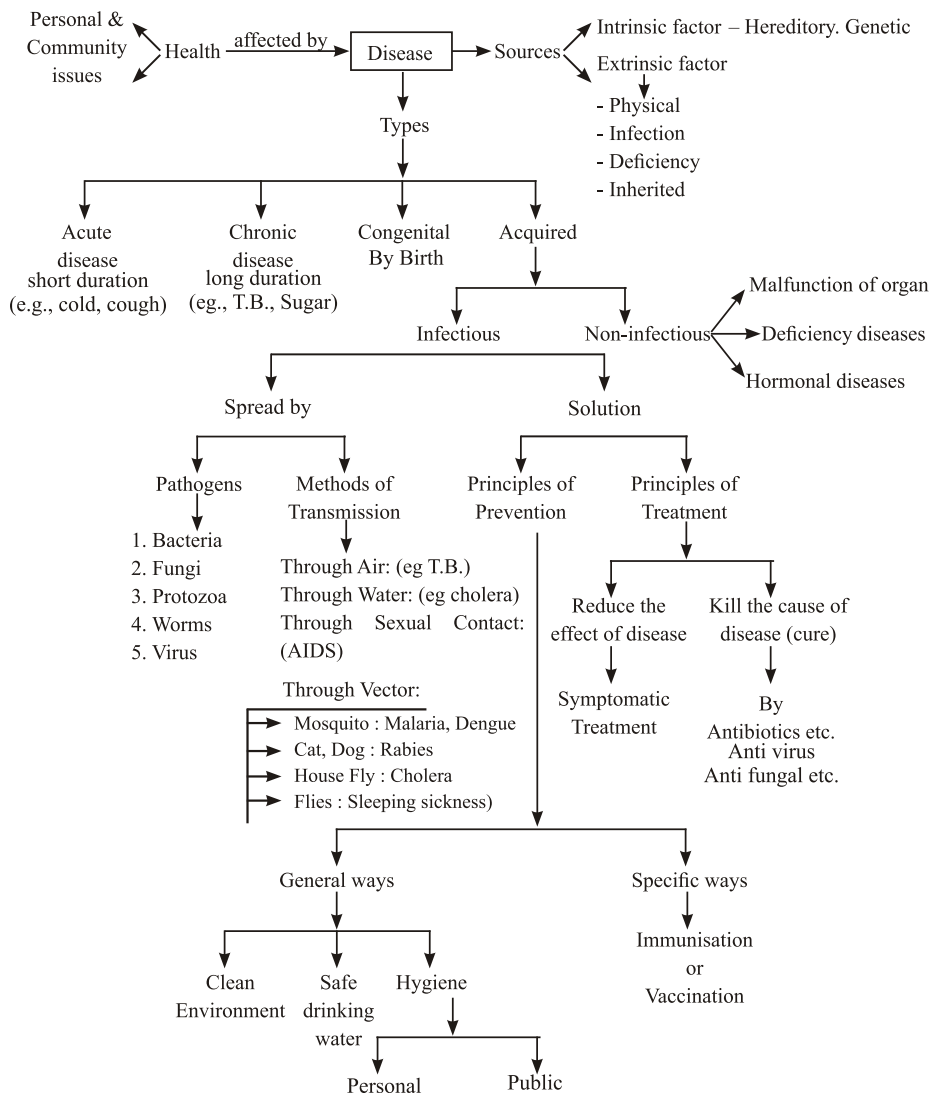


Chapter - 13

Why Do We Fall Ill ?

CONCEPT MAPPING



Health is a general condition of a person's mind and body. According to WHO (World Health Organisation) health is a "state of physical, mental and social well-being of a person".

To make people aware and conscious of keeping healthy and disease-free we celebrate WORLD HEALTH DAY on 7th April every year.

- 'Health' is a state of being well enough to function well physically, mentally and socially.
- The diseases/infections can be prevented by life style (exercise, proper sleep, enough relaxation) modification, taking balanced diet, good personal health and hygiene and also maintaining a clean and healthy surrounding.
- Treatment involves killing of the microbes/pathogens.

Significance of Health

Good health has following advantages:

- (i) It increases our working efficiency & helps us to perform various activity at our best.
 - (ii) It helps us to cope up with the social & mental pressure without much difficulty.
 - (iii) It makes our life joyful.
- The conditions necessary for good health are :
 - (i) Good physical and social environment.
 - (ii) Good economic conditions.
 - (iii) Active life style
 - Good physical and social environment includes clean surroundings, good sanitation, proper garbage disposal and clean drinking water.
 - Good economic conditions includes job opportunities for earning to have nutritious food and to lead a healthy life.
 - Active life style includes regular exercise and health conscious attitude.

Personal and Community Issues Both Matter for Health

Community Health :

It refers to maintenance, protection and improvement of whole community in which an individual lives.

- Personal and community health are supplementary to each other.
 - We protect ourselves by keeping our body clean.
 - For this, we also require a good and healthy environment in our surroundings.
 - We can have this only by the means of community health and development.
 - So, both personal and community health are inter-related.

Differences between Being Healthy and Disease-free

Being Healthy	Being Disease-free
1. It is a state of being well enough to function well physically, mentally and socially.	1. It is a state of absence from diseases.
2. It refers to the individual, physical and social environment.	2. It refers only to the individual.
3. The individual has good health Energetic	3. The individual may have good health or poor health.

Disease and Its Causes

Diseases : It refers to any condition that disturbs or modifies the normal functioning of the living organisms.

What does disease look like ?

- When a person is affected by a disease either the functioning or the appearance of one or more systems of the body will change for the worse.
- These changes give rise to symptoms and signs of disease.
- On the basis of the symptoms the physicians look for the signs of a particular disease and conduct tests to confirm the disease.

Sign : It gives more definite indications of the presence of a particular disease it include laboratory test, ultrasound etc.

Symptoms : Symptoms of diseases are the indications that we feel as being wrong , such as cold, headache, loose motion etc.

Causes of Diseases

Diseases are caused by :

- Pathogens like virus, bacteria, fungi, protozoans or worms.
- Poor health and under nourishment.
- Hereditary and genetic disorder.
- Lack of proper treatment immunization.
- Environmental pollution (air, water etc.)

Types of Diseases

- Acute Diseases** : Acute diseases which last for only very short period of time and affect body suddenly and quickly. E.g., Cold, cough, typhoid etc.
- Chronic Diseases** : The diseases which last for a long time, even as much as a life time, are called chronic diseases. E.g., Diabetes, tuberculosis, elephantiasis etc.
- Infectious Disease Communicable** : The diseases which spread due to infection by micro-organisms are called infectious diseases. It is communicated from diseased person to healthy person, caused by some biological agents/pathogens like viruses, bacteria, fungi, protozoans, worms. e.g. corona, T.B etc
- Non-infectious Diseases – Non Communicable** : The diseases which does not spread by contact between infected and healthy person through air and water, is called non-infectious disease. *E.g.*, Arthritis, heart diseases, Diabetes, Hyper Thyroids etc.
 - Deficiency diseases – caused due to deficiency of nutrient. eg. goitre etc.
 - Degenerative diseases – ex. arthritis.
 - Allergies
 - Cancer – Leukemia
- Congenital diseases** : The diseases present since birth, caused due to genetic abnormalities or defective development of embryo. e.g., haemophilic.

Difference between Infectious & Non-infectious disease

Infectious/Communicable	Non-infectious/Non-Communicable
1. These disease spread from one person to another.	1. These do not spread from one person to another.
2. These are caused due to pathogens like viruses, bacteria	2. These could be caused due deficiency, cancer, degeneration, injury or metabolic disorders
3. May be chronic & acute	3. Primary by chronic nature
4. for eg., common cold, T.B. etc	4. for e.g.: Kwashiorkar, cancer etc.

Pathogens : The disease causing organisms are called pathogens. These can also be known as infections agents.

Categories of infectious agents are :-

- Bacteria (e.g., Salmonella typhi, Micobacterium tuberculi, Staphylococcus etc.
- Fungi : Posinous mushrooms,
- Protozoan - Amoeba, Trypanosoma, Plasmodium, Leishmania)
- Worm - Ascaris etc.

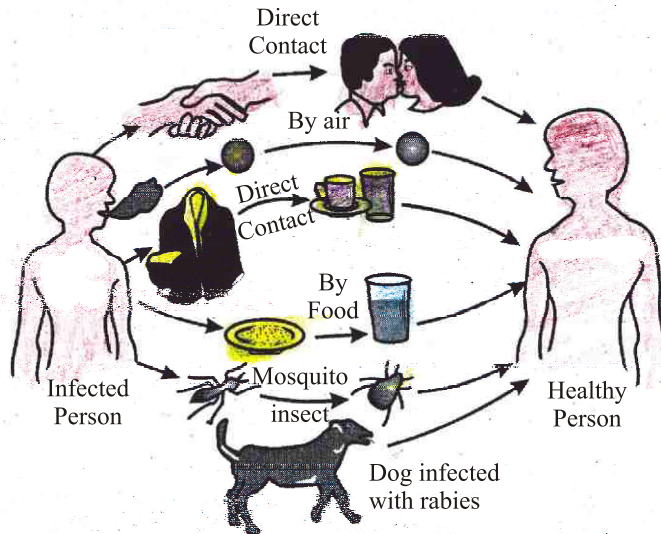
Epidemic diseases : Some infectious diseases that develop and spread rapidly to many people in a community are called epidemic diseases. e.g. corona virus.

Micro-organisms and there Discases

S. No.	Infectious Agents		Diseases
1.	Viruses	SARS HIV-AIDS	Dengue, Smallpox, Polio, flu, fauch Common cold, influenza, measles, chicken pox, AIDS, Hepatitis-B etc.
2.	Bacteria	Salmonella Typhi, Staphylococcus.	Cholera, Penumoniam , typhoid, TB, tetanus, anthrax, food poisoning, Syphilis etc.
3.	Fungi	Poisonous Mushroom	Skin infections, Ringworm, athlete's foot
4.	Protozoan	Amoeba, Trypanosoma Plasmodium etc.	Malaria, kala-azar, Leishmania amoebic dysentery, sleeping sickness (Trypanosoma)
5.	Worms	Ascaris	Intestinal worm infections, elephantiasis

Common method of transmission of diseases

(Diseases spread from affected person to healthy person)



Means of Spread of Infectious Diseases

Infectious diseases spread from an infected person to a healthy person through air, water, food, vectors, physical contact and sexual contact.

- **Through air :** By sneezing and coughing, the microbes spread into air and enter into the body of a healthy person, like common cold, tuberculosis, pneumonia etc.
- **Through water :** The microbes enter into our body by drinking/eating polluted and contaminated water/food, like cholera, amoebic dysentery etc.
- **Vectors :** Some infected organisms like Dog, Cat, Monkey & Mosquito (female anopheles mosquito) spread the diseases to a healthy person when they bite them like Rabies malaria, dengue, yellow fever etc.
- **Through sexual contact (STD) :** Syphilis, AIDS spread by sexual contact with infected person. AIDS virus can also spread through blood transfusion and from the mother to her child during pregnancy and through breast feeding.
- **Through physical contact :** Some disease spread when we use the clothes food etc. used by infected person e.g., Scabies, Fungal infection etc.

AIDS (Acquired Immuno Deficiency Syndrome)

Causes :

AIDS is caused by a retro-virus called HIV (Human Immuno Deficiency Virus).

Method of transmission of AIDS :

The transmission of AIDS from an infected to a healthy person takes place :

- through sexual contact
- blood transfusion
- use of infected needle or blade etc.
- This may also get transmitted from infected mother to her foetus.

Prevention :

- Avoid transfusion of infected blood. This can be done by testing whether the blood is HIV negative or not.
- Always use disposable needle and syringe.
- Avoid sexual contact with unknown person.
- Avoid the same razor used in the salons.

ORGAN – Specific and Tissue-specific Manifestations

Disease causing microbes enter the body by different means and goes to different organs and tissues. The signs & symptoms of a disease will depend on the tissue, organ which the Microbes Target.

- (i) Microbes which enter through the nose are likely to go to the lungs.
(Bacteria which cause tuberculosis of lungs).
- (ii) Microbes which enter through the mouth are likely to stay in the gut
(bacteria which causes typhoid) or liver (bacteria which causes jaundice).
- (iii) Virus which causes AIDS enter the body through sexual organs during sexual contact and spread through the lymph to all parts of the body and damages the immune system.
- (iv) Virus which causes Japanese encephalitis (brain fever) enters the body through mosquito bite and goes and infects the brain.

Principles of Treatment :

The treatment of infectious diseases consists of two steps. They are **to reduce the effects** of the disease (symptoms) and to kill the microbes which caused disease.

- (i) **To reduce the effects of the disease :** This can be done by taking medicines to bring down the effects of the disease like fever, pain or loose motions etc. and by taking bed rest to conserve our energy.

Some Categories of medicines for symptomatic relief are:

Anti pyretic	- For fever and pain	- ex. Paracetamol
Analgesic	- For pain & also relieve fever	- ex. Analgin, Combiflame
Antispasmodic	- For abdominal pain & spasm	
Antiemetic	- For vomiting & nausea	- ex. Domperidone, Avomine
Anti inflammatory	- For help to reduce inflammations	- ex. Combiflame etc.
Antiallergic	- For itching & other allergic response	- ex. Avil, cetirizine etc.

(ii) To kill the microbes : This can be done by taking suitable antibiotics and drugs which kills the microbes and the disease incurred.

To cure disease specific medicine are used to kill that microbes, some medicines are :

Anti bacterial / antibiotic :- These drugs are used to kill or stop the growth of bacteria in the body. These drugs are very specific means they and work only against bacterial infections. ex. Pencilline, Tetracycline, Cefixime etc.

Antibiotics acts by blocking some biochemical pathways that are important for bacterial growth like many bacteria make cell wall after division protect themselves but the Antibiotics block the pathway that is required to build cell wall and thus bacteria dies & diseases is cured.

As these biochemical pathways are different for different microbes. Thus these medicines only work against a particular categories of microbes and not on other.

Antiviral medicine – These drugs are used against viral infections.

Antifungal medicine – These drugs are used only against fungal infections.

Antiprotozoal medicine – These drugs are used only against protozoal infections

Anthelmintic medicine – These medicines can used to treat infections as caused by parastic worms

Principles of Prevention.

"Prevention is better than its cure ".

There are two ways of prevention of infectious diseases. They are general ways and specific ways.

(i) General ways of prevention : Public & Personal hygiene and Balanced Diet are most important for prevention of infectious diseases. Proper and sufficient food for everyone will make people healthy to resist the infection.

Air borne diseases can be prevented by living in conditions that are not crowded. Water borne diseases can be prevented by providing safe drinking water. Vector borne diseases can be prevented by providing clean environment.

(ii) **Specific ways of prevention :** There are disease specific measures which are used to fight them. It is done by Immunisation. This is the process of introducing a weakened pathogen inside the body of the host to fool his/her immune system to produce antibodies against that particular disease. Not only does our immune system fight the disease (feeble pathogen), but also keeps a memory of the incident by keeping those antibodies in blood. Thus, next time even if the disease will strike the host's body with full vigor, the body will be able to protect itself with the help of these antibodies. This is also the basic law followed by vaccination programmes done for infants.

3. **Vaccination :** Vaccination is the administration of a vaccine to help the immune system develop protection from a disease. Vaccines contain a microorganism in a weakened or killed non infective state.

Vaccines available against are:

Tetanus, diphtheria, whooping cough, measles, polio, BCG. [*Bacillus Calmette Guerin*) used against prevention of TB]

The small pox vaccine was invented in 1796 by Edward Jenner.

A Few Diseases

Disease	Pathogen	Vector (if any)	Symptoms
1. Malaria	Protozoa	Female anopheles mosquito	Recurrent fever, chills
2. Typhoid	Bacteria – <i>Salmonella</i>	Cockroaches etc.	High fever and intestinal infections
3. AIDS	Virus – HIV	–	Not a disease in itself, it affects our lymph glands thereby decreasing our immunity
4. Dengue	Virus	Female <i>Aedes aegypti</i>	Headache + fever

5. Worms	Worms in intestine	–	Stomach ache
6. Kala azar	Protozoa – <i>Leishmania</i>	–	Brain fever
7. Round worms	Ascaris in intestine	–	Stomach ache
8. SARS	Bacteria	–	–
9. Swine flu	Virus	Pig + human	Fever – spreads
10. Bird flu	Virus	Birds	Fever – spreads
11. Ebola	Ebola virus	Bat	Fever – spreads

QUESTIONS

VERY SHORT ANSWER QUESTIONS

1. Write the full form of WHO.
2. Name two non-infectious diseases.
3. Write two water-borne diseases.
4. Write the difference between acute and chronic disease.
5. Write the expanded form of AIDS.
6. What is the difference between 'Being healthy' and 'Disease free'?
7. Name two disease that can be prevented by using vaccine.
8. Name the methods for treatment of infectious diseases.

LONG ANSWER QUESTIONS

1. Why is food necessary for us?
2. Name two methods for treatment of infectious diseases.
3. How do micro-organisms enter into our body?
4. Name four diseases caused by protozoa, virus, bacteria, fungi.
5. What are the different means by which infectious diseases spread?
6. What precautions can you take in your school to reduce the incidence of infectious diseases?

7. Name five diseases against which immunization vaccines are available.
8. What is the basic principle of vaccination?
9. It has been observed that despite the availability of the vaccine for Hepatitis A in the market, It may not be necessary to be given to children by the time they are five years old. Why?
10. It is diagnosed that Seema suffers from malaria
 - (a) Which organ of Seema is affected?
 - (b) What is the symptom of this disease?
11.
 - (i) What is balanced diet?
 - (ii) What problems will you face if you do not eat a balanced diet?

OBJECTIVE TYPE QUESTIONS

A. Fill in the blanks :

- (i)is a state of physical, mental and social well-being.
- (ii) AIDS is a.....(communicable/non-communicable) disease.
- (iii) Common cold is a.....(acute/chronic) disease.
- (iv) Breathing in polluted air causes.....disease.
- (v) Small pox is prevented through.....

B. MCQ

1. Which one of the following is an infectious disease?

- | | |
|------------------|--------------|
| (a) Diphtheria | (b) Diabetes |
| (c) Hypertension | (d) Cancer |

2. Elephantiasis disease can have

- | | |
|-------------------------------------|--|
| (a) short-term affect on our health | (b) no effect on our health |
| (c) long term effect on our health | (d) sometimes bad effect on our health |

3. Ascaris worm lives in which part of human body?

- | | |
|---------------------|---------------------|
| (a) Kidneys | (b) liver |
| (c) small intestine | (d) large intestine |

4. Microbes which enter the body through nose most likely affect.

- | | |
|-----------|-----------|
| (a) liver | (b) heart |
| (c) brain | (d) lungs |

5. Which of the following is a viral infection?

- | | |
|----------------|---------------|
| (a) Diphtheria | (b) Influenza |
| (c) Cholera | (d) Typhoid |

6. HIV virus when active in body mainly attacks on

- | | |
|--------------|------------|
| (a) lungs | (b) liver |
| (c) immunity | (d) nerves |

7. An Organism which carries pathogens is termed as

- (a) host
- (b) vector
- (c) parasite
- (d) predator

8. Diseases which are always present in certain location are called

- (a) epidemic diseases
- (b) endemic diseases
- (c) acute diseases
- (d) chronic diseases

9. DPT vaccines are administered to develop immunity against

- (a) Tetanus
- (b) Diptheria
- (c) Pertussis
- (d) All of these

10. Anti-viral drugs are difficult to make because, viruses

- (a) live outside the host cells
- (b) live inside the host cells
- (c) live in consumed food particles
- (d) live in blood stream

11. BCG vaccine is used to develop immunity against

- (a) jaundice
- (b) polio
- (c) influenza
- (d) tuberculosis

C. Assertion and Reasoning Based :-

Question consists of an Assertion and a Reason. Use the following key to choose the appropriate answer

- a) If both assertion and reasoning are correct and the reason is the correct explanation of the assertion.
- b) If both assertion and reasoning are correct but reason is not the correct explanation of assertion.
- c) If assertion is correct but reason is incorrect
- d) If assertion is incorrect but reason is incorrect
- e) If both assertion and reason are incorrect

- 1. Assertion (a) : Tuberculosis is a bacterial diseases
Reason (b) : Tuberculosis is mainly transmitted by droplet infection
- 2. Assertion (a) : Making anti-viral drug is difficult
Reason (R) : Viruses are on the border line of living and non-living

Ans. 1. (b) 2. (b)