

Syllabus

- 2.1 Meaning of Communicable Diseases and Mode of Transmission
- 2.2 Essential conditions for Communicable Diseases
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- 2.4 Common alert signals indicating on set of Communicable Diseases
- 2.5 Modes of transmission, common symptoms and prevention of spread of AIDS, Rabies, Tetanus, Malaria, Hepatitis 'B' and 'C', Tuberculosis

INTRODUCTION

In ancient times, people were not well aware regarding diseases. Hippocrates was the first physician of Greece who described the symptoms of diseases in detail. Due to this fact, he is called 'the Father of Medicine'. After a long gap, Robert Koch, a German scientist, studied the various causes of diseases. He concluded that diseases spreads through germs. Since then medical scientists are engaged in research work about diseases but still we are usually attacked by new diseases.

As a matter of fact, the environment in which we live has a vital influence on us in spite of many scientific achievements. Today, we live in a highly competitive world where struggle for survival is acute. Our internal environment is persistently under the influence of external forces of nature.

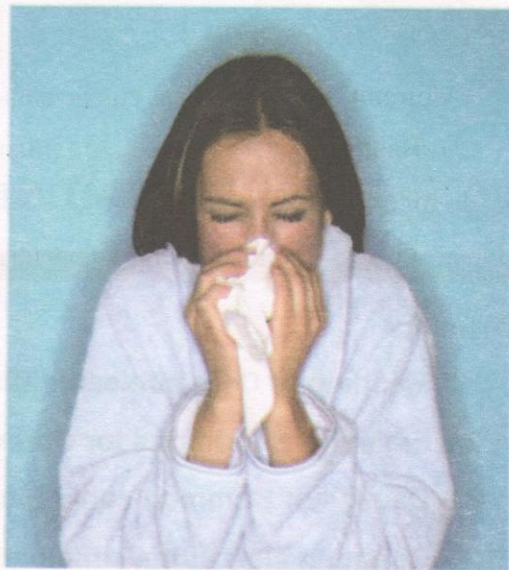
2.1 MEANING OF COMMUNICABLE DISEASES AND MODE OF TRANSMISSION**Communicable Diseases**

Communicable Diseases are the disease that are caused by germs or worms or parasites. Usually, these diseases are infectious and spread from a person suffering from the disease to a healthy person. Tuberculosis, malaria, smallpox, cholera, measles, etc. are Communicable Diseases.

Modes of Transmission of Communicable Diseases

There are various modes of transmission of Communicable Diseases. These are described below :

1. Through Air. Air is a very vital carrier of Communicable Diseases. When an individual breathes out, coughs or sneezes, he/she sprays out certain infected droplet in air. These infected droplets enter the body of a healthy person, when he breathes in fresh air, so he is also infected. Sometimes, while breathing, we inhale some dust particles that are infected. Influenza, cough, cold, tuberculosis, smallpox and measles, etc., are such communicable diseases which are usually spread through air.

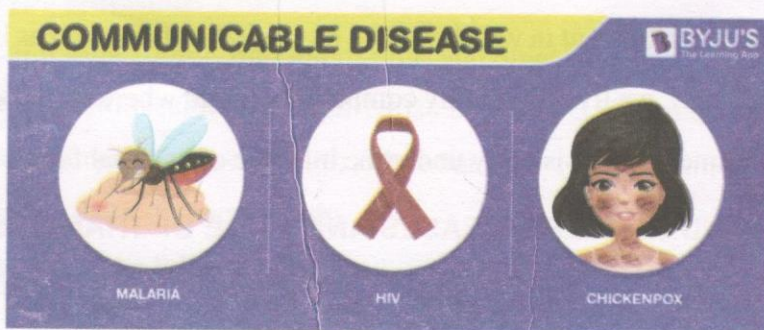


2. Through Direct Contact. Direct contact is also an important mode of transmission of communicable diseases. Kissing, body contact and shaking hands, etc. are included under the direct contact category. Sexually transmitted diseases (STDs), syphilis and scabies, etc., are such diseases that are usually spread through direct contact.

2.2 ESSENTIAL CONDITIONS FOR COMMUNICABLE DISEASES TO OCCUR AND DISEASES PROCESS

These diseases spread depends on the specific disease or infectious agent. Some ways in which communicable diseases spread are by:

Physical contact with an infected person, such as through touch (staphylococcus), sexual intercourse (gonorrhea, HIV), fecal/oral transmission (hepatitis A), or droplets (influenza, TB) contact



with a contaminated surface or object (Norwalk virus), food (salmonella, E. coli), blood (HIV, hepatitis B), or water (cholera); bites from insects or animals capable of transmitting the disease (mosquito: malaria and yellow fever; flea: plague); and travel through the air, such as tuberculosis or measles.

2.3 CAUSES OF COMMUNICABLE DISEASES

Communicable diseases can be caused by :

1. Bacteria. These one-cell organisms are responsible for illnesses such as strep throat, urinary tract infections and tuberculosis.
2. Viruses. Even smaller than bacteria, viruses cause a multitude of diseases — ranging from the common cold to AIDS.
3. Fungi. Many skin diseases, such as ringworm and athlete's foot, are caused by fungi. Other types of fungi can infect your lungs or nervous system.
4. Parasites. Malaria is caused by a tiny parasite that is transmitted by a mosquito bite. Other parasites may be transmitted to humans from animal feces.
5. Direct contact

An easy way to catch most infectious diseases is by coming in contact with a person or animal who has the infection. Three ways infectious diseases can be spread through direct contact are:

6. Person to person. A common way for infectious diseases to spread is through the direct transfer of bacteria, viruses or other germs from one person to another. This can occur when an individual with the bacterium or virus touches, kisses, or coughs or sneezes on someone who isn't infected.

These germs can also spread through the exchange of body fluids from sexual contact. The person who passes the germ may have no symptoms of the disease, but may simply be a carrier.

7. Animal to person. Being bitten or scratched by an infected animal — even a pet — can make you sick and, in extreme circumstances, can be fatal. Handling animal waste can be hazardous, too. For example, you can acquire a toxoplasmosis infection by scooping your cat's litter box.

8. Mother to unborn child. A pregnant woman may pass germs that cause infectious diseases to her unborn baby. Some germs can pass through the placenta. Germs in the vagina can be transmitted to the baby during birth.

9. Indirect contact

Disease-causing organisms also can be passed by indirect contact. Many germs can linger on an inanimate object, such as a tabletop, doorknob or faucet handle.

When you touch a doorknob handled by someone ill with the flu or a cold, for example, you can pick up the germs he or she left behind. If you then touch your eyes, mouth or nose before washing your hands, you may become infected.

10. Insect-bites :

Some germs rely on insect carriers-such as mosquitoes, fleas, lice or ticks to move from host to host. These carriers are known as vectors. Mosquitoes can carry the malaria parasite or West Nile virus, and deer ticks may carry the bacterium that causes Lyme disease.

11. Food contamination

Another way disease-causing germs can infect you is through contaminated food and water. This mechanism of transmission allows germs to be spread to many people through a single source.

2.4 COMMON ALERT SIGNALS INDICATING ON SET OF COMMUNICABLE DISEASES

These alert signals should be integrated into routine surveillance and alert systems. When the following conditions arise, a possible deliberate event is indicated,

- (i) Overt terrorism threats
- (ii) All rumours and reports of smallpox-like illness or cases with test results confirming a potential bioterrorism-related agent (e.g., pulmonary anthrax, tularaemia, or plague)
- (iii) Previously well persons presenting with, or dying from, severe unexplained diseases or syndromes
- (iv) Higher morbidity or mortality than expected for a common disease or syndrome
- (v) Cases of known aetiology occurring in an unusual setting, population or season, or with an atypical clinical presentation, or with unusual or atypical strain
- (vi) Indistinguishable molecular and genetic characteristics of agents detected in temporally or spatially distinct sources
- (vii) Presence of a large epidemic or multiple simultaneous outbreaks in discrete populations
- (viii) Deaths or illness among animals with the potential for zoonotic disease transmission to humans.
- (ix) Illness affecting a key sector of the community (e.g. political, financial) or a mass gathering event.
- (x) Failure of a common disease to respond to usual therapy/prophylaxis
- (xi) Unusually short median/mean incubation period for a known disease
- (xii) Higher rates of person-to-person transmission than previously observed
- (xiii) Higher attack and case fatality rates than previously observed
- (xiv) Differential attack rates or clustering likely to indicate potential unusual exposures
- (xv) An unusual increase in the number of people seeking health care, especially if presenting with fever, respiratory, neurological or gastrointestinal syndromes

(xvi) Confirmed atypical, genetically engineered, or antiquated strain of an agent

(xvii) Laboratory-confirmed case/cluster of specific bioterrorism agent (in a case/cases with no known risk factors for a natural infection).

2.5 MODES OF TRANSMISION, COMMON SYMPTOMS AND PREVENTION OF SPREAD OF AIDS, RABIES, TETANUS, MALARIA, HEPATITIS 'B' AND 'C', TUBERCULOSIS

(1) AIDS :

Acquired immunodeficiency syndrome (AIDS) is a chronic, potentially life threatening condition caused by the human immunodeficiency virus (HIV). By damaging your immune system, HIV interferes with your body's ability to fight the organisms that cause disease.

HIV is a sexually transmitted infection (STI). It can also be spread by contact with infected blood or from mother to child during pregnancy, childbirth or breast-feeding. Without medication, it may take



Mode of Transmission :

To become infected with HIV, infected blood, semen or vaginal secretions must enter your body. This can happen in several ways:

(i) By having sex. You may become infected if you have vaginal, anal or oral sex with an infected partner whose blood, semen or vaginal secretions enter your body. The virus can enter your body through mouth sores or small tears that sometimes develop in the rectum or vagina during sexual activity.

(ii) From blood transfusions. In some cases, the virus may be transmitted through blood transfusions. American hospitals and blood banks now screen the blood supply for HIV antibodies, so this risk is very small.

(iii) By sharing needles. Sharing contaminated intravenous drug paraphernalia (needles and syringes) puts you at high risk of HIV and other infectious diseases, such as hepatitis.

(iv) During pregnancy or delivery or through breast-feeding. Infected mothers can pass the virus on to their babies. HIV-positive mothers who get treatment for the infection during pregnancy can significantly lower the risk to their babies.

You can't become infected with HIV through ordinary contact. That means you can't catch HIV or AIDS by hugging, kissing, dancing or shaking hands with someone who has the infection.

HIV isn't spread through the air, water or insect bites.

Symptoms :

- (i) Soaking night sweats
- (ii) Recurring fever
- (iii) Chronic diarrhea
- (iv) Persistent white spots or unusual lesions on your tongue or in your mouth
- (v) Persistent, unexplained fatigue
- (vi) Weight loss
- (vii) Skin rashes or bumps

Prevention :

Using a condom every time you have vaginal, anal or oral sex in some countries PrEP is available. This is a course of HIV drugs which if taken consistently as advised by your healthcare professional prevents HIV infection through sex avoiding sharing needles, syringes and other injecting equipment taking HIV treatment if you are a new or expectant mother living with HIV, as this will dramatically reduce the risk of passing HIV to your baby during pregnancy, childbirth and breastfeeding asking your healthcare professional if the blood product you are receiving (blood transfusion, organ or tissue transplant) has been tested for HIV taking precautions if you are a healthcare worker, such as wearing protection (like gloves and goggles), washing hands after contact with blood and other bodily fluids, and safely disposing of sharp equipment

(2) Rabies :

Rabies or hydrophobia is a fatal disease because death of the patient is certain in such cases. It is caused by a virus. Maximum cases of human rabies result from dog bite.



The virus rhobdo infects the nerveous tissue and salivary glands. This virus develops within a duration of 4-6 weeks after the bite by a rabid animal. This disease is fairly common in India.

Symptoms

1. Fever
2. Pain at the site of the bite
3. Headache
4. Difficulty in swallowing water/food
5. Fear of water
6. The patient cannot drink water although he is thirsty
7. Spasm of respiratory muscles
8. Patient shows illusion

Prevention :

1. In case of animal bite, notify immediately to the health department.
2. Vaccination schedule of anti-rabies should be performed immediately.
3. Pet dogs must be immunized against rabies.
4. Avoid playing with stray dogs.
5. Any animal suspected of having rabies, municipality should be notified.
6. The wound should be washed with running water immediately.

3. Tetanus

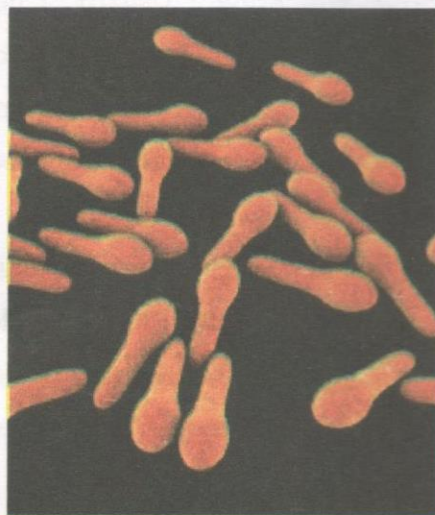
Tetanus is a dangerous disease. Mode of transmission. This disease spreads through soil because germs of tetanus are found in soil. When there is a cut on the body, germs from the soil enter the wound.

Symptoms

1. Stiffness and pain in neck
2. Locking of jaws

Prevention

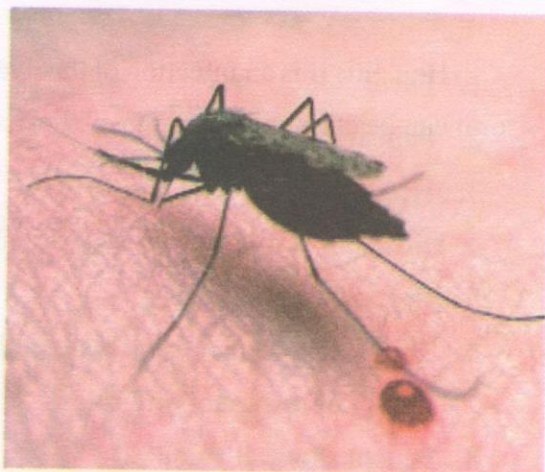
1. The wound and the skin around it should be washed with clean running water.
2. After washing the wound, some disinfectant like dettol should be applied immediately.
3. During childhood and pregnancy; vaccination is must.
4. Vaccination against tetanus is also essential after any cut on the body



4. Malaria :

Malaria is such a communicable disease, which is common in our country. Usually, it spreads in rainy season because most of the ditches are filled up with water during this season. In these ditches, mosquitoes lay their eggs. It is dreadful disease, which is caused by the bitings of female mosquitos (Anopheles).

Mode of Transmission : Malaria spreads from a sick person through anopheles, which bites the human beings at sunset or during night. It sucks the blood along with the malaria parasites, which are present in the sick perosn. These parasites multiply in the body of anopheles. When this infected anopheles bites a halthy person, it injects the malaria parasites in the blood of that healthy person. And then malaria parasites multiply in the blood of that person and in a few days, he becomes sick.



Symptoms :

1. Cold Stage : In this stage, the patient feels very cold. Even a quit or a blanket is not beneficial at cold stage. The patient complains abut headache and vomiting.

2. Hot Stage : Usually, 1 hour after cold stage. The body tempatrue rises up to 41°C approximately. This stage remain for 2–6 hrs.

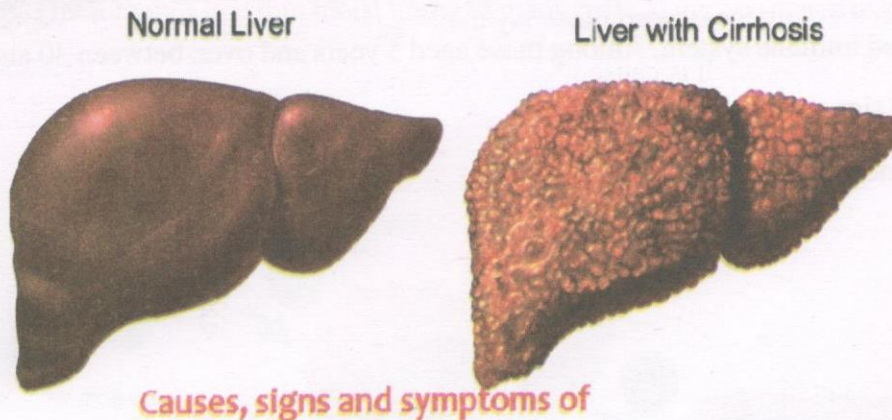
3. Sweating Stage : Sweat comes after Hot Stage. The clothes of the patient become wet. Body temperature decreases. Pulse rate becomes normal.

Prevention :

1. For prevention from malaria, mosquitoes should be killed. For this purpose DDT or Malathion can be used. The pits should be filled up before rainy season so that mosquitoes may not lay eggs at the surface or water.
2. Comoquin or Chloroquine tablets should be taken by healthy persons after consulting the doctor.
3. Mosquito net should be used or mosquito repellant should be applied on body.
4. To prevent cold, warm clothes should be given to the patient so that he may not feel cold.
5. If the temperature rises high, cold bandage should be kept on the forehead of the patient.
6. Aspirin should be given for headache.
7. Doctor should be consulted immediately for the treatment.

5. Hepatitis B

Hepatitis B is an infection of the liver by the hepatitis B virus. It can be acute and self-resolving, or it can be chronic, leading to cirrhosis and liver cancer.



Mode of Transmission :

Hepatitis B is transmitted when blood, semen, or another bodily fluid from a person infected with the virus enters the body of someone who is not infected. This may be through a puncture in the skin, a shared needle, or the exchange of body fluids.

Infection can happen :

- * As an infected mother gives birth
- * During sexual activity
- * Through sharing needles, syringes, or other drug-injection equipment
- * Through unsafe tattoo techniques
- * By sharing personal hygiene items such as razors or toothbrushes
- * Health workers can be at risk if they are exposed to unsafe medical practices, such as reusing medical equipment, not using personal protection, or incorrect disposal of sharps.
- * HBV is not spread through food or water, sharing eating utensils, breastfeeding, hugging, kissing, holding hands, coughing, sneezing, or insects that bite.

However, the virus can survive outside the body for at least 7 days. During this time, the virus can cause infection if it enters the body of a person who is not protected by the vaccine.

Symptoms :

Most infections occur during infancy or childhood. They are rarely diagnosed, as there may be few obvious symptoms.

Symptoms of a new infection may not be apparent in children under 5 years of age and adults with a suppressed immune system. Among those aged 5 years and over, between 30 and 50 percent will show initial signs and symptoms.

These include :

fever

joint pain

fatigue

nausea

vomiting

loss of appetite

abdominal pain

dark urine

clay-colored stools

jaundice, or a yellowing of the skin and whites of the eyes

Acute symptoms appear from 60 to 120 days after exposure to the virus, and they can last from several weeks to 6 months.

A person with chronic HBV infection may have ongoing episodes of abdominal pain, persistent fatigue, and aching joints.

Prevention :

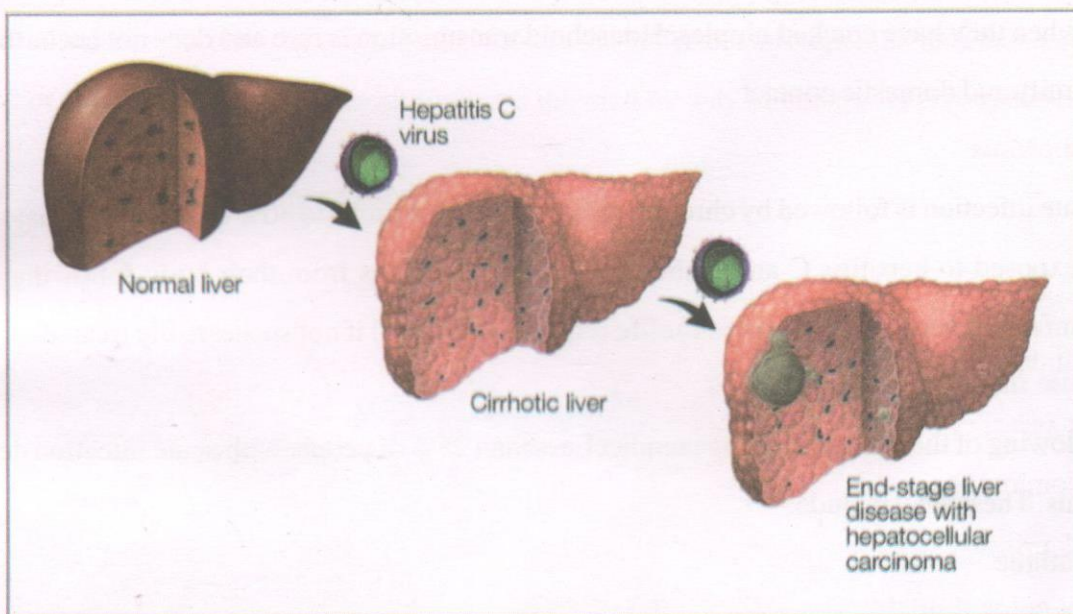
A vaccine against HBV has been available since 1982. This is a series of three injections. The first injection is given soon after birth, the second at least 1 month later, and the third dose is given at least 8 weeks after the second dose.

The CDC recommends that all children receive a birth dose of HBV vaccine and complete the series by 6 to 18 months of age.

6. Hepatitis 'C'

Mode of Transmission :

Hepatitis C is spread by blood-to-blood contact through needle puncture, broken skin or a break in mucous membranes (the thin moist lining of many parts of the body such as the nose, mouth, throat and genitals).



Other ways hepatitis C can spread are :

- (i) Through non-sterile tattooing, body piercing and acupuncture
- (ii) Through non-sterile medical or dental procedures, particularly in countries where hepatitis C is more common
- (iii) From mother to infant during delivery if the mother has high levels of hepatitis C virus in her blood in occupational settings through needle stick injuries and accidental exposures to infected blood or blood products
- (iv) Through transfusion of infected blood or blood products

Hepatitis C is much more common in prisons due to multiple risk factors.

The risk of transmission (spreading of the infection) is low in the following situations:

Sexual transmission : this has been documented but appears to be rare. However, blood contact during unprotected intercourse should be avoided, for example, during menstruation, when there is

broken or inflamed skin, unprotected penetrative intercourse where bleeding is caused, or unprotected anal intercourse. Condoms provide an effective barrier in these situations. Sexual transmission is also more likely to occur when the person has a high viral load (the amount of virus measured in the blood) or also has human immunodeficiency virus (HIV) infection.

(iii) Mother-to-baby transmission - the risk of transmission in pregnancy and childbirth is low unless the mother is also infected with HIV. Women with hepatitis C are encouraged to breastfeed, except when they have cracked nipples. Household transmission is rare and does not occur through usual family and domestic contact

Symptoms

Acute infection is followed by chronic (lifelong) infection in 50 to 80% of cases. The majority of people exposed to hepatitis C are unable to eliminate the virus from their body following initial (acute) infection and remain infected for life (chronic infection) if not successfully treated.

Acute infection

Yellowing of the eyes, indicating jaundice Less than 25% of people with acute infection develop symptoms. These may include:

- (i) fatigue
- (ii) poor appetite
- (iii) upper right sided abdominal pain
- (iv) low grade fever lasting 2 to 10 days
- (v) jaundice (yellow skin and eyes)
- (vi) nausea.

Treatment

Improved antiviral therapy is available and new treatments have increased the number of people who have been able to clear the virus (are cured of hepatitis C) and avoid ongoing symptoms and liver damage.

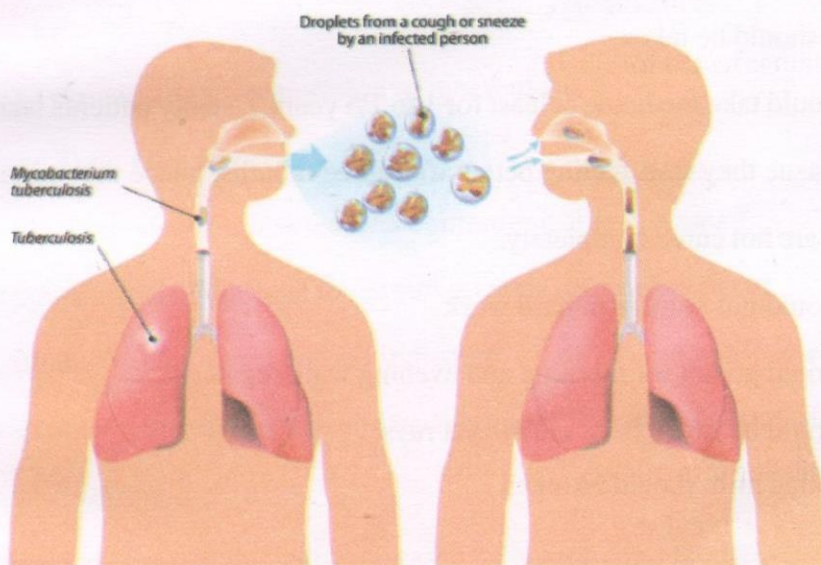
People who are infected with hepatitis C should seek advice about minimising further damage to their liver from alcohol and drug use, and preventing co-infection with blood borne viruses, including immunisation against hepatitis A and hepatitis B.

Lifelong monitoring of chronic hepatitis C infection by a general practitioner and liver specialist can assist in preventing the progression to severe liver disease including liver cancer.

7. Tuberculosis :

Tuberculosis is an infectious disease. In India, lot of people fall prey to this disease. It can be prevented and cured. This disease is common in men in comparison to women. It is caused by *Mycobacterium tuberculosis*. Robert Koch identified it in 1882. Bacillus can creep into the body through various means. Sometimes it affects the whole body. Mode of transmission bacillus spreads in two ways, *i.e.*, men to men and animals to men. This disease is caused by lack of fresh air, improper ventilation, deficiency of vitamins and food in the body, and through infected eatables and drinks, lack of rest and sleep, contact with someone infected by way of cough, sneeze, spit etc.

TUBERCULOSIS



Incubation Period : The incubation period may be a week, a month or a year.

Mode of Transmission. The infected sputum of a patient comes out and dries up then the germs of tuberculosis are scattered in the air. When a patient coughs or sneezes, the bacilli come out and mix in the air. When a healthy person inhales that air the bacilli also enter his lungs. By taking infected meat or milk, bacilli may also enter the body of a healthy person.

Symptoms :

1. Persistent cough with or without blood.
2. High fever

3. Pain in the chest and throat
4. Fast breathing and pulse rate
5. Blood with sputum in advanced case
6. Loss of appetite and loss of weight
7. Sweating at night, chills.

Prevention :

1. BCG vaccination should be given to a child from birth to six weeks.
2. The children should avoid playing in dusty areas.
3. Rooms should be hygienic and properly ventilated.
4. Balanced diet should be taken.
5. The patient should take medicine at least for 1 to 1½ years. Usually patients take incomplete treatment because they start feeling better after three months, hence they usually leave the medicine and are not cured completely.
6. The patient should not indulge in hard work.
7. The patient should go out for morning and evening walk regularly.
8. The patient should be saved from ultraviolet rays.
9. Completely boiled milk should be taken.

EXERCISE**◆◆ Very Short Answer Type Questions :**

1. What are the communicable diseases ?
2. Mention one cause of communicable diseases.
3. Give any two common alert signals indicating on let of communicable diseases.
4. Write some common symptoms of AIDS.
5. What are the modes of transmission of Tatanus ?
6. What are the common symptoms of malaria ?
7. What are the modes of transmission of tuberculosis ?

◆◆ Short Answer Type Questions :

1. What are the modes of transmission of communicable diseases ?
2. Write the essential conditions for communicable diseases to occur.
3. What are the common alert signals indicating on set of communicable diseases ?
4. What are the modes of transmission and common symptoms of malaria and tuberculosis ?

◆◆ Long Answer Type Questions :

1. What is meant by communicable diseases ? Mention their modes of transmission.
2. What are the main causes of communicable diseases ?
3. What are the modes of transmission and common symptoms of :

(i) AIDS	(ii) Rabies
(iii) Hepatitis 'B' and 'C'	(iv) Tuberculosis