

HYGIENE — [A KEY TO HEALTHY LIFE]

Syllabus : A brief introduction to maintaining good health.

General idea of personal hygiene, public hygiene and sanitation.

Modes of transmission : air borne, water borne, vectors (housefly, mosquito, cockroach).

15.1 SIMPLE PERSONAL HYGIENE

Hygiene is defined as **the science and practice of maintaining good health**. It requires caring of one's own body (**personal hygiene**) and taking proper care of surroundings (**social hygiene**). The major aspects of personal hygiene are as follows :

1. Cleanliness
2. Physical exercise
3. Rest and sleep
4. Healthy habits

1. **Cleanliness.** Personal cleanliness is most essential.

(i) **Hands and skin** must be cleaned regularly. We are continually handling a variety of things—furniture, books, coins, currency notes, seats and supporting rods in buses, pets and other domestic animals, tools and machinery in workshops, and so on. All these objects may carry germs which may be picked up by our fingers and transferred over other parts of the body or into the mouth through food.

- The practice of washing hands with soap after using toilets is very important.

- A daily bath regularly keeps the skin clean and free of germs, the body odours given out in perspiration are removed and keeps the sweat pores open. Particular attention must be paid to the cleansing and drying of the various clefts and folds of the skin, *for example*, of arms, legs and toes.

- **Undergarments** and **handkerchiefs** must be washed daily.

(ii) **Hair** should be kept clean by frequent washing and regular combing. This keeps it healthy and free of parasites (like head-lice).

Two dirty habits :

Turning book pages or counting currency notes by saliva wetted finger tip.

(iii) **Teeth** should be cleaned at least twice a day—before going to bed at night and after getting up in the morning.

- Mouth should be washed after every meal.
- Too much eating of sweets and chocolates spoils the teeth causing caries and gum infections.

(iv) **Breathe by Nose.** One must always **breathe by the nose** and never by the mouth. One should **blow the nose into a handkerchief** and should hold a handkerchief in front of the mouth and nose while sneezing.

(v) **Eyes** must be cleaned and washed with clear water two or three times everyday. Trachoma and conjunctivitis are two common diseases of the eye caused through dust and through contamination by hands and towels. For preventing eye infections :

- One must **never share towels** with others, even in the same family.
- The Indian custom of applying “kajal” (soot) may sometimes lead to infections of the eyes through the shared applying sticks, so never share such sticks.

(vi) **Ears** should be kept clean.

- The wax inside may be cleaned by soft moist swab.
- One should never put any sharp pointed object into the ear, it may injure the eardrum.

2. **Physical exercise.** Some physical exercise is necessary for all age groups, especially children, adolescents and young people. Long gentle walks are enough for the old. Physical exercise should be systematic and regular. It **improves blood circulation**.

3. **Rest and sleep.** All organs of the body including the brain (mind) need rest. In general, the body obtains adequate rest by means of sleep. The

amount of sleep required varies with age. The very young infants sleep for most of the day. For adults 6-7 hours continuous undisturbed sleep is sufficient.

4. **Healthy habits.** One should develop good healthy habits such as going to bed at night at regular time, taking food at regular hours, *etc.*

- In general, **going to bed** at late hours or immediately after taking dinner are not good habits.
- **Bowels** should be cleared everyday preferably in the mornings.
- **Tobacco** should be avoided—it is injurious to health and may even lead to cancer.
- Taking **stimulants** and **sedatives** are unnecessary and spoil habits.
- Drinking **alcoholic beverages** is definitely harmful to one's own body as well as to society.

The **living rooms** should be **well ventilated** for fresh air and sunlight. Fresh air brings oxygen and sunlight kills germs.

15.2 SOCIAL HYGIENE AND SANITATION

All public places such as schools, office buildings, bathrooms, lavatories, cinema halls, *etc.*, should be kept clean.

The eating places such as hotels, restaurants, roadside *dhabas* and their surroundings must be kept clean and free of flies. All eatables must be covered. All utensils, cups, glass-tumblers and spoons, *etc.*, must be thoroughly washed preferably with soap and hot water.

All public drains and garbage must be covered and some disinfectants such as bleaching powder, lime, *etc.*, must be frequently sprinkled.

The civic bodies (municipalities, *etc.*) must ensure the supply of clean **germ-free drinking water and an efficient sewage disposal.**

Control of Disease-carriers (Vectors).

Vector is any agent that acts as an intermediate carrier of the pathogen. Many insects and other animals spread diseases. Steps should be taken to control or to eradicate them. Control of houseflies mosquitoes and cockroaches should be given maximum priority. These three are considered the worst public enemies.



PROGRESS CHECK

1. Fill in the blanks
 - (i) Cleanliness, rest and sleep, and physical exercise are a part of _____ hygiene
 - (ii) One must always breathe by the _____ and never by the _____.
 - (iii) Fresh air brings _____ into the living rooms.
 - (iv) One must never put a sharp pointed object into the _____, it may rupture the _____.
 - (v) For adults 6-7 hours of continuous undisturbed _____ is sufficient
 - (vi) The municipal bodies must ensure the supply of clean germ-free _____ and an efficient _____ disposal.
2. List any three advantages of a daily bath.
 - (i) _____
 - (ii) _____
 - (iii) _____

Economic Importance of Housefly. The housefly is a kind of **natural scavenger** cleaning and consuming the left-overs of the food, *etc.* But the dangers which the housefly poses to human life are so serious, that it is often designated as **Public Enemy No. 1.** It spreads numerous diseases including **dysentery, cholera, typhoid, etc.**

The manner in which the housefly spreads diseases :

1. **Hairy body and legs pick up filth :** The body and specially the legs are hairy or spiny. They easily pick up filth containing germs from dirty places. Such a fly **contaminates our food by sitting on it.** A resting housefly always keeps on rubbing its legs against themselves and over the body, thus dropping particles of filth.
2. **Pouring out saliva :** Food is also contaminated with germs when the housefly **moistens the foodstuffs by pouring out its saliva** on it, or when it vomits (regurgitates) food which it has swallowed from dirty places.
3. **Excreta :** It **deposits its excreta while it feeds,** and thus contaminates human food.
4. **Direct transmission of germs :** Sometimes it **directly conveys the infection.** For example, germs of trachoma (a disease of the eyes) are

directly transferred when a fly which once settled on the infected eyes of a patient, next time sits on the eyes of a healthy person.

Control of the housefly. There are several methods to control houseflies.

1. **Elimination of breeding places.** All refuse from houses, and all animal and human excreta should be removed at regular and frequent intervals and disposed off in such a way that the flies cannot breed in it. If the refuse be covered by a layer of earth, enough heat is produced in it by decomposition, which is sufficient to kill the maggots, if any.
2. **Spraying.** Houses and breeding places should be sprayed with DDT and other insecticides.
3. **Avoidance.** Food should be kept well protected and covered. Flies should not be allowed to sit on the body. Sleeping babies should be protected by baby umbrellas.

15.3 MOSQUITOES AND DISEASES

1. *Anopheles* mosquito spreads **malaria** in man, monkeys and birds, etc. The malaria germ is a protozoan *Plasmodium*.
2. *Culex* mosquito spreads **elephantiasis** (filariasis), caused by a nematode worm *Wuchereria*.
3. A third mosquito, *Aedes* spreads **yellow fever** and **dengue**, both caused by their respective viruses.

The germs of these diseases are spread when the mosquitoes bite to suck blood. With this blood, the mosquitoes receive germs of the particular disease, which grow and multiply within their body. When such infected mosquitoes bite a healthy person, these germs are introduced into his body through the saliva. Before sucking blood the mosquito first injects its saliva into the skin, which contains a substance that prevents clotting of blood to facilitate suction.

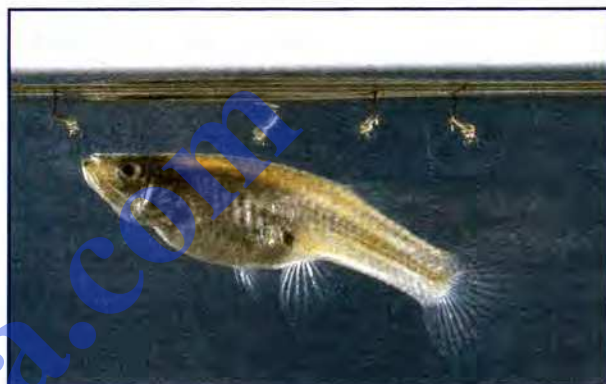
CONTROL OF MOSQUITOES

Several steps are recommended to destroy mosquitoes in different stages :

1. **Spraying.** Adult mosquitoes should be destroyed by spraying DDT and other insecticides in

dwelling places. Spraying on ponds and marshy places kills the life-history stages.

2. **Elimination of breeding places.** Breeding places should be destroyed. Small ponds and puddles should be filled up.
3. **Spraying on stagnant water.** Kerosene or some other greasy oil should be poured over the water to make a thin film on the surface. The oil kills the larvae and pupae when they come to breathe on the surface.
4. **Biological control.** Certain fishes such as *Gambusia* should be introduced in the ponds. They selectively devour mosquito larvae.



15.4 COCKROACHES

These are very common household insects breeding mostly in the connecting manholes and sewers. They extend their activities to kitchens, cupboards and wardrobes. They eat and spoil food, paper and clothes. They are also suspected to be carriers of certain viral diseases, including possibly a cancer-causing virus. Spraying DDT and other insecticides in their breeding places is an effective method of control.

15.5 RATS

Rats are serious domestic pests. Besides eating grain and other foods they also spread germs of certain diseases. Rat-flea is a parasite which lives on rat's skin. It may carry germs of plague. Plague had spread as a serious epidemic during the earlier part of twentieth century in many parts of the world killing a number of people. Rats should be trapped and disposed off or be killed by suitable rat poisons (raticides).



PROGRESS CHECK

1. Tick-mark the correctly matched pairs of certain animals and the related diseases/habits.
 - (i) Culex _____ yellow fever
 - (ii) Aedes _____ filaria
 - (iii) Anopheles _____ malaria
 - (iv) Gambusia _____ eat up mosquito larvae
 - (v) Rat flea _____ diarrhoea
 - (vi) Cockroaches _____ Breed in man-holes

15.6 CONTAMINATION OF WATER AND WATER-BORNE DISEASES

Contamination means unwanted entry of disease germs into drinking water or edible foods.

Clean and germ-free drinking water is very essential for personal and public health.

Contamination of potable (drinking) water can occur in several ways such as :

- **Sewage** if improperly disposed of, leaks into sub soil and may contaminate water supplies.
- People **defecating** or **urinating** near lakes, rivers or ponds may contribute to contamination of water.
- **Animal wastes** and washings from dairies, poultries, etc. may also be drained into water bodies.

Besides the above principal sources of contamination, there can be a variety of **industrial** and agriculture **wastes** that may contain poisonous chemicals and can be harmful to human health. *For example :*

- Industrial wastes containing mercury cause abnormalities in the nervous system.
- Tannery wastes contain the pathogen **anthrax** bacilli and are the most serious water pollutants.
- Pesticides especially DDT are most serious water pollutants, pesticide concentration in humans cause hormonal imbalance, leading to cancer.
- Presence of fluorides in drinking water causes tooth disorders, bone disorder and in higher concentration it causes neuro – muscular disorders and may be fatal to life.

15.7 THE THREE COMMON WATER BORNE DISEASES

In case the water supply agencies are not very cautious in purifying water, the residents of the area may suffer from three common diseases, **cholera**, **typhoid** and **dysentery** which may take the form of severe epidemics.

1. Cholera

You have already read a little about cholera under “Diseases caused by Bacteria”. The main points are as follows :

- Infection of intestinal tract is by a bacillus ***Vibrio cholerae***.
- It appears as sudden onset with sickness and severe diarrhoea and vomiting
- No urination due to shortage of water in the body, urea accumulates in the blood, which is highly poisonous and causes death.

Infection of cholera occurs through contaminated water and also by dust and flies that sit on excreta and may transfer germs to exposed foods. Food handlers with dirty hands can also transmit the germs.

2. Dysentery

There are *two* forms of dysentery — **bacillary** and **amoebic**.

- (i) **Bacillary dysentery.** The causative agent is a bacterium (*Shigella*). It occurs frequently among children. The disease is marked by loose motions (diarrhoea), intestinal pain and mild fever. Patients are treated with antibiotics. Prevention includes drinking safe (boiled) water and avoiding flies from contaminating food.
- (ii) **Amoebic dysentery.** The causative agent is a protozoan ***Entamoeba histolytica***.

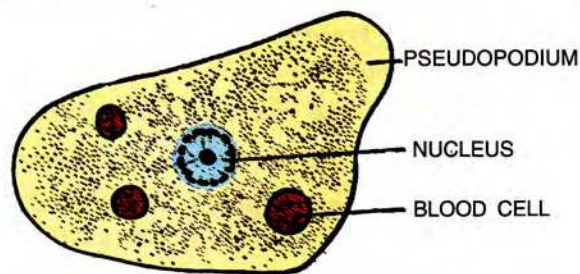


Fig. 18.4 *Entamoeba histolytica*

- This organism enters our body through contaminated water and food. It establishes in the lining of large intestine where it feeds by engulfing red blood cells of the patient's intestine. This amoeba has no contractile vacuole and bears one large blunt pseudopodium.
- When fully mature it forms cysts which pass out through faeces. The cysts remain active for a long time. On reaching a new host through contaminated water and food they split off to infect a new individual.

3. Hepatitis

There are three types of **hepatitis**. The name hepatitis refers to liver (*hepatos* = liver), meaning inflammation of liver. There are three types of hepatitis — Hepatitis A is the infectious hepatitis transmitted through **contaminated water**. The other two types (hepatitis B and hepatitis C) are passed through blood and other body fluids.

Symptoms :

- Body ache
- Eyes yellowish, deep yellow urine (due to bile pigments)
- Enlarged liver

Prevention :

- Hepatitis vaccine
- Proper hygiene
- Avoid taking fat rich substances



PROGRESS CHECK

Mention if the following statements are **True (T)** or **False (F)**

- Contamination means entry of germs by insect bite T/F
- Sewage is the commonest source of contamination of water in the cities T/F
- Cholera is marked by acute diarrhoea and no urination T/F
- Typhoid is caused by a type of worm T/F
- Mosquitoes are the source of dysentery germs T/F

POINTS TO REMEMBER

- *For keeping healthy we require three things : a balanced diet, proper personal hygiene, and good sanitation*
- *Personal hygiene includes cleanliness of hands, skin, teeth, eyes, ears, etc.*
- *Physical exercise improves blood circulation.*
- *Healthy habits such as keeping to regular timings in one's daily routine of taking food or going to bed, etc. keep one fit.*
- *All public places must be kept clean.*
- *Housefly breeds in cowdung, horsedung, etc. and its life-history includes egg, larva (maggot), pupa and imago (adult).*
- *Housefly spreads germs of several diseases including dysentery, typhoid, cholera, etc.*
- *Anopheles mosquito transmits malaria and Culex mosquito transmits filaria.*
- *Mosquitoes breed in water and all the stages in the life-history of Culex and Anopheles slightly differ in shapes or postures*
- *Cockroaches and rats are common household pests which spoil and damage our food and other articles.*
- *Contaminated water produces three very common diseases - cholera, dysentery, hepatitis.*
- *Hepatitis (actually hepatitis A) is a viral disease causing inflammation of liver and symptoms of eyes turning yellow, and passing deep yellow uring.*

REVIEW QUESTIONS

A. MULTIPLE CHOICE TYPE

- No urination due to shortage of water in the body is a **typical symptom** of
(a) typhoid (b) malaria
(c) dysentery (d) cholera
- Which one of the following is an **unhealthy** habit?
(a) Removing wax from inside the ears
(b) Keeping the mouth closed while breathing
(c) Sleeping for only 6-7 hours
(d) Sharing towels with others
- The protozoan that causes malaria is :
(a) *Entamoeba histolytica* (b) *Euglena*
(c) *Paramecium* (d) *Plasmodium*
- the chemical substance mainly responsible for tooth disorders is
(a) calcium (b) chloride
(c) flourides (d) iodides
- Thyphoid is caused by
(a) housefly (b) bacteria
(c) virus (d) None of the above

B. VERY SHORT ANSWER TYPE

- Match the stages of housefly in Column I with a characteristic in Column II.

Column I	Column II
(a) Eggs	(i) Sucking proboscis
(b) Adult	(ii) Barrel-shaped
(c) Pupa	(iii) White cylindrical
(d) Larva	(iv) Legless

- Describe the different ways by which the housefly contaminates our food.
- Suggest any *two* methods of controlling flies.
- List any *three* effective methods for controlling mosquitoes

C. SHORT ANSWER TYPE

- Name the **two common kinds** of mosquitoes and the diseases they transmit.
- How would you differentiate between *Culex* and *Anopheles* mosquitoes pertaining to their :
(i) eggs,
(ii) larvae and
(iii) adults

D. LONG ANSWER TYPE

- Give suitable **explanations** for the following :
(i) One should breathe by nose and never by mouth.
(ii) Hands must be washed before eating food.
(iii) Eating places must be kept free of flies.
- How are cockroaches and rats **harmful** to humans.
- Name the two types of dysentery and their causative germs and give one main **precaution** against them.