HANDOUT 1/3

Class - IX Subject - Science

Chapter 13 – Why do we fall ill?

HEALTH AND ITS FAILURE

Health and disease in human communities are very complex issues, with many interconnected causes.

Cells are the basic units of organisms and it is a dynamic place. Something or the other is always happening inside them. All activities in our body are interconnected.

For example- if the kidneys are not filtering urine, poisonous substances will accumulate. Under such conditions, the brain will not be able to think properly.

Anything that prevents proper functioning of cells and tissues will lead to a lack of proper activity of the body.

The World Health Organisation has defined **health as a state of complete physical, mental and social well-being.**

Community health can be defined as "All the personal health along with the environmentalservices for the importance of health of community".

Some of the **health services** are given below:

(i) Establishment of health care services like primary health centres, district hospitals,community health centres, medical colleges, all Indian institutes, regional hospitals etc.

(ii) Provision of safe drinking water and proper disposal of garbage.

(iii) Prevention of harmful insect breeding sites.

(iv) Management of different types of environmental pollution by Central and State PollutionControl Boards.

(v) Preventive vaccinations against number of diseases like tuberculosis, diphtheria, whoopingcough, tetanus, measles, hepatitis, etc.

(vi) Provision of family planning advices and services.

(vii) Provision of medical care to school going children.

(viii) Prevention of food adulteration.

(ix) Health education.

CONDITIONS ESSENTIAL FOR GOOD HEALTH

There are several conditions which have to be fulfilled for good health. The important ones are

(i) Nutrition,

(ii) Proper habits, and

(iii) Exercise and relaxation.

(i) Nutrition

Nutrition can be defined as the procurement of substances necessary for growth, development, maintenance and activities of a living organism.

We obtain food from various plant and animal sources. In order to keep healthy and energetic, we need to take food. It takes care of the daily energy need also. We consume energy even while sleeping. Energy requirement depends on individual, age and special need. Growing children, pregnant women and nursing mothers need more energy.

(ii) Proper Habits

Another important aspect of good health is to observe proper dietary habits that areconsumption of balanced diet and at fixed time. Good personal and domestic hygiene is veryessential. Take full care of the following aspects.

- Your food should be fresh and kept away from dust, flies, insect and microbes to avoid any infection and spoilage.
- Utensils should be kept clean.
- You should wash your face and hands with soap before eating or handling the food.
- Food should be cooked with good feelings and cheerful state.
- Smoking, chewing tobacco, drinking alcohol, taking addictive drugs are bad habits and should be avoided.
- They can have damaging effects on our body and mind.

(iii) Exercise and Relaxation

Regular exercise is necessary to keep our body fit. These exercises vary with age, physicalcondition and nature of work of the individual. In the case of sedentary worker, exercise iseven more essential. Another aspect of health is regular sleep and relaxation. The duration ofsleep also varies with age and nature of work.

Infants sleep for long hours, which is necessaryfor them to grow. For children, an average of eight hours of sound sleep is sufficient. Foradults six hours of sleep is enough. Relaxation improves the capacity to work. Relaxation may be defined as an activity or recreation, which provides a relief or diversion from work or effort.

There are various ways of relaxation. Yoga and meditation relax the body and mind. Listening to music and reading magazines are also relaxing.

PERSONAL AND COMMUNITY ISSUES BOTH MATTER FOR HEALTH

Health is a state of physical, mental and social well-being. The conditions necessary for goodhealth are:-

i) Good physical and social environment. -

Good physical and social environment includes clean surroundings, good sanitation,proper garbage disposal and clean drinking water.

ii) Good economic conditions.-

Good economic conditions include job opportunities for all for earning to have

nutritious food and to lead a healthy life.

iii) Social equality and harmony.-

Social equality and harmony are necessary for a healthy and peaceful life.

DISEASE AND ITS CAUSES

The word is actually self- explanatory – we can think of it as 'disease' – disturbed ease. Disease, in other words, literally means being uncomfortable.

All diseases will have **immediate causes and contributory causes.** Also, most diseases will have many causes, rather than one single cause.

Diseases are caused by :-

i) Pathogens like virus, bacteria, fungi, protozoans or worms.

ii) Poor health and under nourishment.

iii) Malfunctioning of body parts.

iv) Environmental pollution.

v) Genetic disorders.

DISTINCTIONS BETWEEN 'HEALTHY' AND 'DISEASE-FREE'

Healthy	Disease free
It is a state of physical, mental and	It is a state of absence from diseases.
It refers to the individual, physical	It refers only to the individual.
The individual has good health.	The individual may have good health or poor

ACUTE AND CHRONIC DISEASES

When a person is affected by a disease either the normal functioning or the appearance of one or more systems of the body changes for the worse. These changes give rise to signs of the disease called **symptoms.**

On the basis of the symptoms the physicians look for the **signs** of a particular disease and conduct tests to confirm the disease.

Types of diseases :- Diseases are of different types.

i) Acute diseases :- are diseases which last only for a short period of time and does not have long term effect on health.

Eg:- cold, cough, typhoid, cholera etc.

ii) Chronic disease :- are diseases which lasts for a long time and has long term drastic effect on health.

Eg :- diabetes, tuberculosis, elephantiasis, arthritis, cancer etc.

CHRONIC DISEASES AND POOR HEALTH

If we get infected with a chronic disease such as tuberculosis of the lungs, thenbeing ill over the years does make us lose weight and feel tired all the time.

We may not go to school/office for a few days if we have an acute disease. But a chronicdisease will make it difficult for us to follow what is being taught in school and reduce ourability to learn.

In other words, we are likely to have prolonged general poor health if we have a chronic disease. Chronic diseases therefore, have very drastic long-term effects on people's health as compared to acute diseases.

Acute Disease	Chronic Disease
They are short duration disease.	They are long lasting disease.
Patient recovers completely after the cure.	Patient does not recover completely.
There is no loss of weight or feeling of tiredness afterward	There is often loss of weight of feeling of tiredness.
There is short duration loss of work and efficiency.	There is a prolonged loss of work and efficiency.

INFECTIOUS AND NON-INFECTIOUS CAUSES

Infectious diseases (Communicable diseases) :- are diseases which spread from an infectedperson to a healthy person through air, water, food, vectors, physical contact or sexual contact.

Eg :- common cold, chicken pox, mumps, measles, typhoid, cholera, tuberculosis, malaria,AIDS etc.

Non-infectious diseases (Non-communicable diseases) :- are diseases which are not spreadfrom an infected person to a healthy person. Eg :- beriberi, rickets, scurvy, night blindness,diabetes, cancer, high blood pressure etc.

Causes of diseases :-

Diseases are caused by :-

i) Pathogens like virus, bacteria, fungi, protozoans or worms.

ii) Poor health and under nourishment.

iii) Malfunctioning of body parts.

iv) Environmental pollution.

v) Genetic disorders.

INFECTIOUS AGENTS

Infectious diseases are caused by microorganisms such as viruses, bacteria, fungi or parasitesand can spread between individuals.

Microorganisms that cause disease are collectively called pathogens.

Vector

Vectors are those organisms that carry a pathogen from the host to a recipient. Mosquito, rats and mice are some of the common vectors that carry infectious diseases.

Pathogens cause disease either by disrupting the bodies normal processes and/or stimulatingthe immune system to produce a defensive response, resulting in high fever, inflammation and other symptoms.

Infectious diseases can be spread from one person to another, for example through contact with bodily fluids, by aerosols (through coughing and sneezing), or via a vector, for example a mosquito.

Infectious diseases can be caused by:

Bacteria. These one-cell organisms are responsible for illnesses such as strep throat,urinary tract infections and tuberculosis.

Viruses. Even smaller than bacteria, viruses cause a multitude of diseases — rangingfrom the common cold to AIDS.

Fungi. Many skin diseases, such as ringworm and athlete's foot, are caused by fungi.

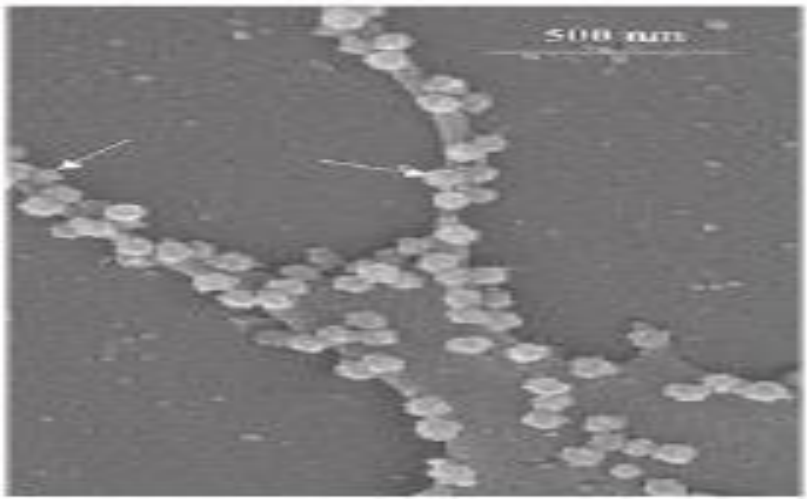
Other types of fungi can infect your lungs or nervous system.

Parasites. Malaria is caused by a tiny parasite that is transmitted by a mosquito bite.

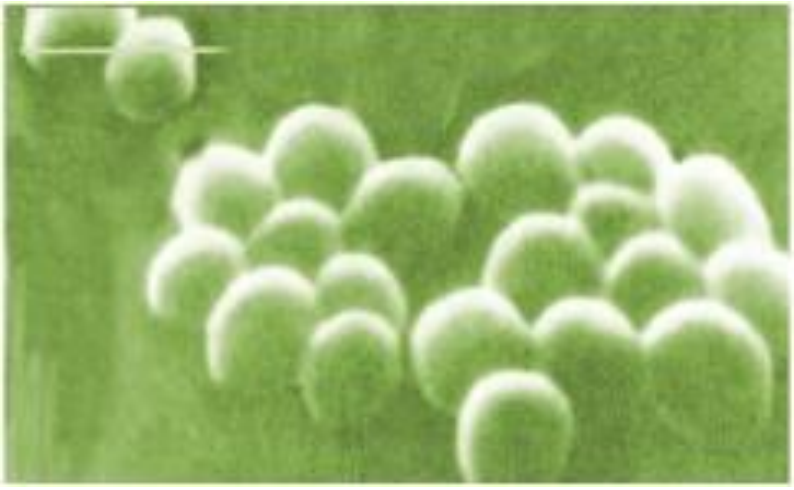
Other parasites may be transmitted to humans from animal faeces.

These animals are thus the intermediaries and are called vectors. The commonest vectors we all know are mosquitoes. In many species of mosquitoes, the females need highly nutritious food in the form of blood in order to be able to lay mature eggs. Mosquitoes feed on many warm-blooded animals, including us. In this way, they can transfer diseases from person to person

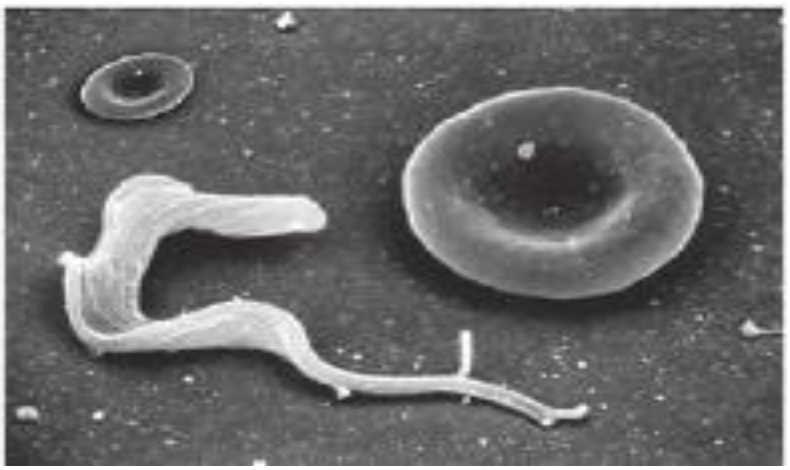
S. No.	Infectious Agents		Diseases
1.	Viruses	SAS HIV-AIDS	Dengul, Arallpox, Poho, flu, fauch Common cold, influenza, measles, chicken pox, AIDS, Hepatitis-B etc.
2.	Bacteria	Salmonella Typhi, Staphylococcus.	Cholera, Pneumania, typhoid, TB, tetanus, anthrax, food poisoning, Syphilise etc.
3.	Fungi	Poisinous Mushroom	Skin infections, Ringworm, athletes goot
4.	Protozoan	Amoeba, Trypnosoma Plasmodium etc.	Malaria, kala-azar, (Leishmama) amoebic dysentery, sleeping sickness (Trypoanasoma)
5.	Worms	Ascaris	Intestinal worm infections, elephantiasis



(a): Picture of SARS viruses coming out of the surface of an infected cell. The white scale line represents 500 nanometres, which is half a micrometre, which is one- thousandth of a millimetre. The scale line gives us an idea of how small the things we are looking at are.

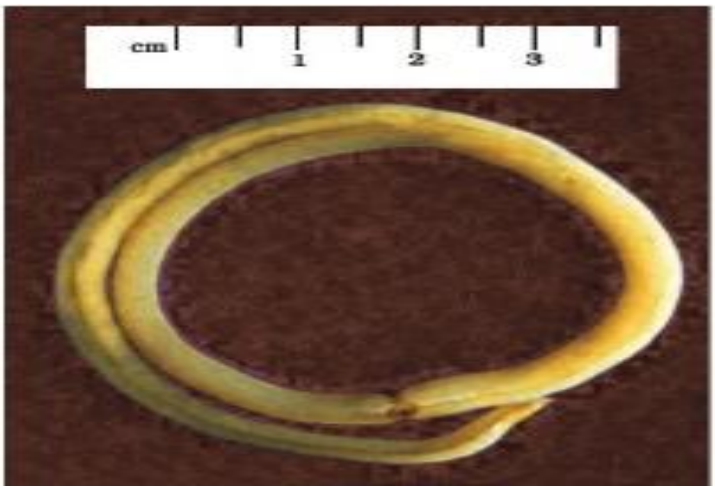


(b): Picture of staphylococci, the bacteria which can cause acne. The scale of the image is indicated by the line at top left, which is 5 micrometres long.



(c): Picture of Trypanosoma, the protozoan organism responsible for sleeping sickness. The organism is lying next to a saucer-shaped red blood cell to give an idea of the scale.

(d): Picture of Leishmania, the protozoan organism that causes kala-azar. Theorganisms are oval-shaped, and each has one long whip-like structure. Oneorganism (arrow) is dividing, while a cell of the immune system (lower right) hasgripped on the two whips of the dividing organism and is sending cell processesup to eat up the organism. The immune cell is about ten micrometres in diameter



(e): Picture of an adult roundworm (Ascaris lumbricoides) from the small intestine. The ruler next to it shows four centimetres to give us an idea of the scale.

PEPTIC ULCERS AND THE NOBEL PRIZE

For many years, everybody used to think that peptic ulcers, which cause acidity– related pain and bleeding in the stomach and duodenum, were because of lifestyle reasons. Everybody thought that a stressful life led to a lot of acid secretion in the stomach, and eventually caused peptic ulcers.

Then two Australians made a discovery that a bacterium, Helicobacter pylori, was responsible for peptic ulcers. Robin Warren (born 1937), a pathologist from Perth, Australia, saw these small curved bacteria in the lower part of the stomach in many patients. He noticed that signs of inflammation were always present around these bacteria. Barry Marshall (born 1951), a young clinical fellow, became interested in Warren's findings and succeeded in cultivating the bacteria from these sources.

In treatment studies, Marshall and Warren showed that patients could be cured of peptic ulcer only when the bacteria were killed off from the stomach. Thanks to his pioneering discovery by Marshall and Warren, peptic ulcer disease is no longer a chronic, frequently disabling condition, but a disease that can be cured by a short period of treatment with antibiotics. For this achievement, Marshall and Warren (seen in the picture) received the Nobel prize for physiology and medicine in 2005.
