

# **CHILD CARE AND HEALTH**



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# CHILD CARE AND HEALTH

## Chapter 1

### SCIENCE OF HEALTH CARE

*“Health is a state of complete physical, mental and social well being and not merely an absence of disease or infirmity”.*  
—World Health Organization

**Q.1. What is health? What should be done for its proper maintenance?**

**Ans.**

#### **What is Health?**

When we say a person is healthy, it means that the person is normally doing his activities and does not outwardly show any signs of any disease. However, for the medical man it denotes the conformity to certain standards like physical measurements, biochemical norms and rates, physiological standards, etc. These standards vary with racer-rest, exercise, food, habits, starvation, climate, altitude, latitude, etc. It has been extremely difficult to lay definite criteria for health and define the term Health in a specific manner.

There have been various systems of medicine or ‘healing arts’ evolved in different parts of the world during different civilisations. But in no system has there been a clear-cut definition of health.

According to the Oxford dictionary health means ‘*The state of being free from sickness, injury or disease, bodily conditions; something indicating good bodily condition*’. A few decades ago this meaning was conveyed in the definition of health. Having considered it necessary to give a direction towards the achievement of a robust and happy and active bodily and mental condition capable of continuous productive ability. World Health Organisation (WHO-1948) have defined health as follows: *“Health is a state of complete physical, mental and social well being and not merely an absence of disease or infirmity”.*

Even after having this definition it is difficult to conceptualise and standardise positive health with specific clear-cut attributes and criteria for measurement. A person may be enjoying mental equanimity and enthusiasm for doing anything. He may also be physically able, to do any amount of work, but he may be having some minor dysfunction or deficiency or even a mild infection causing a very minor disturbance which however does not upset his normal activities.

In these conditions the person cannot be called ‘healthy’ but for outward purpose he will appear healthy and he will also be fully active. Similarly, there are so many stresses and strains that an individual is exposed to and depending on his own mental make-up he is either able to overcome the strain or suffers from worry and depression. If he is able to function normally others may take him to be healthy, whereas the worry may normally be making him mentally unsound.

Social well-being is very much related to the mental adjustment of the individual to others around him in the family or in the community. Sometimes it may so happen that a person may find it hard to adjust with his group and may, therefore, be under a mental strain. But he may be doing his work normally from which others would judge him to be healthy. It is only if he reaches a break-point and behaves either in a withdrawn manner or becomes aggressive that his mental condition will become manifest to be seen and experienced by others.

## Positive Health

Therefore, the term health is a relative concept. In it we see a continues of freedom from sickness to better health and positive health. Positive health refers to a condition in which the body has sufficient reserve nutrition and resistant factors to prevent the invasion of the body by any micro-organism or by the deprivation of any nutritional factors causing a deficiency pathology and, therefore completely free from disease.

The normalcy of health of a person may shift towards positive health depending on the improvement of health by wholesome food, wholesome water, proper living conditions, proper work atmosphere, good personal hygiene, etc., or the deterioration of health due to faulty or inadequate food, infection through food, water or air, skin or due to external injuries, accident, etc.

## Essentials of Maintenance of Good Health

1. Adequate quantities of proper nutrition.
2. Adequate quantities of safe drinking water.
3. Proper shelter with adequate ventilation and lighting.
4. Proper clothing.
5. Proper work, exercise and rest and recreation.
6. Proper social conditions for a harmonious existence and work.
7. Proper security from fear of any kind.
8. Proper sexual behaviour.
9. Personal hygiene.
10. Provision and utilisation of health services.

### Q.2. What is disease? What are its causes? How can it be prevented?

Ans.

### What is Disease?

Disease is a little less difficult to define than Health. It denotes the condition of the human body in which something has gone wrong and has upset the normal functions of the body including the mind. As in health there is also a continuum from a .predisposition or premonition of illness which may or may not be experienced or noticed even by the individual concerned, to a definite condition of illness manifested by signs or symptoms and impairment of body functions. This continuum may further extend from mild sickness to severe sickness and death or recovery from sickness back to a debilitated condition and later to a normal condition.

### Direct Causes of Disease

1. Genetic traits,
2. Congenital deformity or malformation,
3. Traumatic,
4. Infection, inflammation, infestation,
5. Cancer,
6. Malnutrition,
7. Hormonal deficiencies,
8. Metabolic disorders,
9. Poisons.

### Epidemiology

The science of epidemiology employs various methods and approaches to explore, investigate, identify and establish the cause of disease as against maintenance of health in the individual, in the community and in a geographical area. Modern epidemiology has revealed a multiple causation theory

for most of the diseases. The direct or immediate causes may be congenital, traumatic, infection (including parasitism or cancerous growth etc. Besides these direct causes, many indirect and predisposing causes have been described.

For example, tuberculosis is caused by the *tubercule bacilli*, called myco bacterium tuberculosis. This is the direct cause.

### **The Economic Factors**

Other causes which predispose a person to the infection by tubercule bacillus may be overcrowding, poor nutrition, bad ventilation, heavy work, fatigue, etc. These causes are socio-economic. The economic factors arising out of poor means of livelihood, inadequate food, etc., are also inter-related with human and social factors like bad ways of living, customs, habits, beliefs, superstitions, etc. Taking another example, malnutrition may be due to either lack of availability of nutritious food in adequate quantities or the wrong practices of preparation of food in which nutrients may be wasted. The economic factors may be the cause for non-accessibility and the social factors may be the cause of wastage of nutrition even after the food stuffs are available or on the contrary over eating and addiction to alcohol, etc., causing metabolic disorder.

### **Human and Social Factors**

The human and social factors are predominant determinants in any society or community. In affluent countries many of the metabolic disease like obesity, heart diseases, diseases due to air pollution, etc., are on the increase due to social customs. In the poor countries a large number of communicable disease and nutritional deficiencies are due to poor sanitation, poor hygiene and low and faulty intake of food. These are again due to economic and social factors.

### **Requirements for Preventing Sickness**

For prevention of sickness or for availing of treatment facilities people have to be properly aware of why a particular condition of ill health occurs, how it can be prevented and what can be done to get it remedied, or cured. Ascertaining what and how people already know or feel about health and its importance and the different types of ailments and diseases that they are liable or prone to suffer from, is a prerequisite for any community health action. The beliefs and attitudes of people, the ways of living and the patterns of taking action for getting themselves cured or treated have to be identified before any health programme can be introduced. Such studies are K. A. P. (Knowledge, Attitude, Practice) studies. They tell us what people know about certain things, how they feel and also how they behave?

### **Requirements of Public Health**

Study of human behaviour is extremely important in public health and in any community oriented programme. The mere opening and establishment of hospitals or clinics or treatments centres by any Government or voluntary agencies does not immediately ensure that all the people will use the facilities whenever they fall sick. The following stages of human behaviour are expected to take place. For a person to seek treatment for a particular illness from a doctor or an institution—

1. The feeling of discomfort or disturbance physically and mentally and the ability to relate it to some cause;
2. A motivation arising out of a knowledge and the formation subsequently of an attitude about the facility available for treatment;
3. Getting the treatment and experiencing a benefit which acts as a reinforcement for similar action subsequently.

There may be many ideas, beliefs and sometime also prejudice about various diseases that are commonly known in the community. These beliefs and attitudes helpful or obstructive for a health programme for the prevention at all levels or the control of any of the disease. Therefore, before

introducing any public health programme, it is essential to know the minds of the people and also their behaviour pattern.

### **KAP Study**

A Knowledge, Attitude, Practice (K.A.P.) study will help in knowing whether the people are aware of the disease, its causation and transmission, etc., and about the existing practices with their reasoning. It will help in providing the required type of health education to the people and enlisting their cooperation in adopting the hygienic practices necessary for the control of infection. After instituting specific control measures, it will again be helpful in finding out how much the people have improved in their knowledge about the disease and whether and how much they have changed their behaviour for the better.

Essential requirements for proper maintenance of health and for prevention of illness include the basic human needs and also a number of practices which govern proper nutrition, proper hygiene and proper environmental health.

Certain practices are common in the entire group or community because of long-standing customs arising out of cultural beliefs and norms. It is necessary in a system of health programme to understand human psychology and sociology in sufficient depth pertaining to each disease condition taken up for action; also for prevention of illness and preservation of good health. If people do not take the right type of food or necessary quantity of food the economic and social factors have to be understood before the remedial action can be suggested to the individual or to the group. Similarly, if people have to enjoy the best health by means of proper exercise, proper rest and wholesome food and water, etc, the psychological and sociological factors of individuals and groups are essentially to be understood.



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## Chapter 2

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### MEANING AND DEFINITION OF HEALTH EDUCATION

*“Health education, like general education is concerned with changes in knowledge, feelings and behaviour of people. In its most usual forms it concentrates on developing such health practices as are believed to bring about the best possible state of well being”.* —WHO

**Q.1. What is the meaning of health education? Give its definition.**

**Ans. Historical Background**

In pre-historic times, human beings lived very much like animals. Everything was left to nature. Man knew very little about how diseases occur and how to overcome them? With the march of time and scientific advancement man has learnt to ward off sickness and strived to live as long a life as possible.

Through the ages knowledge has been accumulating about the body in health and disease. Various specialised sciences have been developing concerning not only man but all other forms of life. Beginning from the ancient systems of medicine invented by Greeks, Romans, Arabs, Egyptians, Indians and Chinese there has been rapid and sustained expansion of the healing arts. Medical science of modern day has unravelled many mysteries about the normal and abnormal mechanisms taking place in the human body and the remedial and corrective measures.

In the medieval period and closely following the industrial revolution in Europe a number of discoveries were made which helped in the determination of the causation of many of the infective disease. Further experimental work has sharpened the epidemiological tools to determine the multiple causes of various diseases affecting mankind. Serious wide-spreading epidemic scourges like plague (Black death) and cholera were wiped out in the European countries in the early part of the century by applying the knowledge gained. From the latter half of the 19th century there has been increasing emphasis on prevention of disease. These days importance is given to ‘promotive health’.

#### Meaning of Health Education

Suitable education is required for people to be made to understand and practise proper ways of living for the maintenance of health and avoidance of illness to ensure behaviour consisting of proper health practice. People have to realise what are the correct things to do and what are the wrong things to be given up or avoided if proper health has to be maintained. Health education is the art and science of engaging people in a process of learning for the desired behaviour for the preservation of health.

#### Definition of Health Education

Health education has been defined in many ways by different authors and experts. In a WHO Technical Report (No. 89 of 1954) it was defined as follows—

*“Health education, like general education is concerned with changes in knowledge, feelings and behaviour of people. In its most usual forms it concentrates on developing such health practices as are believed to bring about the best possible state of well being”.*

By health education we mean *“The process by which one enables any individual or group of individuals to realise the health needs and match them with necessary health related behaviour for the*



*attainment of positive health*". Thus health education involves people individually/collectively in the adoption and practice of patterns of behaviour necessary for the preservation and enjoyment of normal and sound health.

Therefore health education has to do with knowing the health needs and the action for fulfilment of those needs. It is a process in which the people are helped to learn what is good for themselves and their health and to adopt patterns of behaviour which will ensure normal health. This process implies that people should be able to do and follow healthful ways of living voluntarily after having understood the need for such behaviour.

Thus health education is education for health or education about health. In health education we refer the attainment of positive health through adopting primary, secondary and tertiary levels of prevention as applicable to any disease.

### **Health Promotion and Specific Protection**

Primary prevention in 'epidemiology' refers to health promotion and specific protection—

**1. Health promotion**—It means all practices and measures to be observed for maintaining normal health—eating the proper type of food in proper quantities, optimum amount of exercise, rest, sleep, good clothing, shelter, personal hygiene, drinking wholesome water, breathing fresh and unpolluted air and such other observances.

**2. Specific protection**—It is given by specific immunisation for specific diseases, prophylactic drugs, protective appliances like mosquito nets, fly proof, etc.

### **Levels of Prevention**

1. Primary level of prevention is applied before occurrence of any disease. In other words, it is to prevent the occurrence of any disease.
2. Secondary level of prevention refers to curative care or treatment given after the occurrence of any disease. It includes early diagnosis which is necessary for mitigating the effects of sickness.
3. Tertiary level of prevention refers to the disability limitation prevention of complication and deformity and rehabilitation if any handicap has already occurred. ●

### **Q.2. Describe the need of health education.**

**Ans.**

#### **Need of Health Education**

**1. Health related behaviour**—Health education is a process that aids people to find out their health needs and activate them for suitable behaviour. The behaviour necessary for health in any situation is referred to as 'health related behaviour'. The education given for identifying the health need and matching it with suitable behaviour has been termed as health education.

**2. Lack of knowledge**—The behaviour of people shows that many things concerned with health are not properly known. Even after falling sick many people do not seek treatment promptly. The advice given by doctors or nurses or other health personnel is not correctly followed. Even at the time of sickness the health need is not fully appreciated or realised by people. A health need has to be created in the minds of the people to make people understand why they fall sick and what they should do to prevent falling sick or to remedy a sick condition.

After knowing what can be done and should be done, the individual or the people have to adopt the course of action that is available and practically feasible.

**3. Lack of practice**—Health education is the entire process of involving people in learning about health and disease and aiding them to act suitably for overcoming illness and preserving a positive health. Therefore, Health Education is not a onetime affair. It is not meant for 'X' or 'Y' only. It is required for almost everyone in society and is required off and on, in a continuous manner. It is not required only for illiterates or people with a low level of general education. Even people with a high



general education may not know sufficiently on health matters and even if they know, their behaviour may not be fully conducive to good health. For example, the evils of over eating, smoking and excessive consumption of alcohol may be well known to a well educated person but he may not be observing enough to care for moderation in his daily life.

**4. Universal need**—Health education is needed for all ages, both sexes, all classes of community (rich or poor), literate or illiterate and in all parts of the world. Even in advanced countries health education becomes important with changing conditions of life. Science helps to find out many new aspects about diseases and health and therefore, health education has to be a never-ending process..

**5. Health behaviour**—Unless proper health behaviour is ensured education cannot be complete. At the same time the knowledge or understanding the reasoning behind a particular behaviour and the formation of a favourable attitude for behaviour are also equally important.

**6. Learning and doing**—Health education should be an active process of learning and doing by one's self. The individual has to assimilate and internalise the information and ideas and adopt behaviour necessary for health. The health education process must result in a permanent change or sustained behaviour.

Sometimes people may observe certain hygienic or healthful practices without knowing why they are doing so. They may be imitating some others without releasing the purpose of their own behaviour. Health education helps in giving them necessary meaning behind their own proper and useful actions. Health education will stabilise the good pattern of behaviour by providing necessary information and creating a positive attitude for the behaviour that has been already formed.

Sometimes people may know sufficiently about certain health needs and their related behaviour also but they may not be practising or manifesting the required behaviour. For example, very often people may be aware of what they are suffering from and also about the scope and possibilities of treatments but still they may be neglecting without going for treatment. In such cases health education is necessary to make them understand the seriousness of their condition, the possibilities of treatment and the need for relief symptoms and sickness. Health education would have played its part by involving them in the learning process about their own condition or the correction of it by treatment.

**7. Change of attitude**—Health education may be necessary to change the attitude. The patient's attitude towards treatment or towards doctors should be essentially favourable. The doctor's attitude towards the patient has necessarily to be kind and sympathetic. The attitude is as important as acquiring the knowledge or information for preventive actions like immunisation, sanitary precautions, hygienic practice, medical check up, etc. Mere acquisition of knowledge will not help unless there is a desire or tendency to do something for the maintenance of health.



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## Chapter 3

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### PHYSICAL HEALTH CARE

*“The process by which one enables any individual or group of individuals to realise the health needs and match them with necessary health related behaviour for the attainment of positive health”.*

**Q.1. Describe physical health care of various human organs.**

**Ans.**

#### Physical Health Care

##### Care of the Teeth

When we eat food we chew it to break and grind it to smaller particles. Some of these particles stick in between the teeth. If they stay there for a long time they start to putrefy. Germs grow on these food particles which are putrefying, and damage the substance of the tooth. Thus the tooth starts decaying. This gives rise to pain and formation of pus or abscesses in the roots of the teeth. In order to avoid or minimise any damage to our teeth we must clean our teeth not only in the morning but also before going to bed and after every meal. Cleaning of teeth is best done with a tooth brush which is neither too hard nor too soft. A medium hard tooth brush with a good tooth paste or a very fine tooth powder helps in keeping the teeth clean and sparkling white. Even when we take liquids like tea, coffee and soft drinks we must rinse our mouth thoroughly with clean fresh water. The tooth brush must be washed clean after every use and kept covered in a glass jar. This protects it from insects crawling over it. Repeated use of a toothbrush damages its bristles hence it should also be changed from time to time. After brushing our teeth we must also massage our gums with the help of a finger. Regular massaging leads to strong healthy gums. Moreover the grip of the gums on teeth also remains firm.

Besides cleaning and care a balanced diet rich in calcium and vitamin C, is good for the growth and good health of our teeth. Starchy or sweet food sticks to our teeth and cause decay faster, while fresh acidic fruits and salads are good for the teeth. Eating extremely hot and cold foods and cracking of hard nuts etc. also damage the enamel of our teeth.

##### Care of the Skin

Bathing is the best way to keep the skin clean. The soap used should be of good quality and should not irritate the skin. Depending on the season, the water should be warm or tepid. Such a water has the best cleaning effect on the skin. It also helps to increase the blood supply to the skin and activates the sweat glands. We must take at least one bath in a day, preferably in the morning and before our meals. A very hot bath, even in winter, is harmful as there is danger of exposure to cold. Cold bath may be taken by the young persons but it should be very short and quick. Such baths have a stimulating effect on the skin. In case the skin is dry or rough we may take an oil massage before the bath. The massage helps in promoting the blood circulation to the skin making it soft and smooth.

After the bath the skin should be rubbed dry vigorously with a clean dry towel. This is very beneficial, as it dries and massages the skin. This improves the blood circulation to the skin and makes it glow.

##### Care of the Hair

The hair should also be kept clean, properly combed and dressed. Dirty hair leads to breeding of lice, falling of the hair and many skin diseases.

Oily hair needs frequent washing and cleaning as dust and dirt stick easily to the oil. Dry hair can be kept soft and glossy with an oil massage to the scalp before, the head bath.

We should wash our hair at least once a week with a good soft shampoo of vegetable cleaners like amla berries and soap-nut (*i.e.* reetha nut). We should brush our hair daily, for at least five minutes, twice a day. This keeps the hair clean and look glossy. The brushing stimulates the blood circulation to the scalp which strengthens the hair roots. Brushes and combs should not be shared and must be kept clean by washing and cleaning them once every week. Besides a balanced diet, proper sleep and protection from strong sunshine are also essential for healthy and glossy hair.

## Care of Hands

Care of our hands is important because we do many things with them. For this reason our hands get dirty easily. Eating with dirty hands means taking in the dirt with the food. Hands must be specially cleaned with soap and clean water before preparing, cooking, serving or eating food. Otherwise the germs of infectious diseases like cholera, typhoid and dysentery are likely to contaminate the food which we cook, serve or eat.

The nails should be kept clean, trimmed short. Long dirty nails harbour disease causing germs of various intestinal parasites like hook worms, thread worms and round worms. Our nails should be cleaned with a nail-brush, soap and clean water.

## Care of Eyes

Dirty eyes can lead to eye infections which if not checked can spread to other people and can result in affecting the vision. Therefore all cases of sore eyes must be attended immediately. When we wash our face we must also clean our eyes and use clean cloth or towel to wipe our face and eyes.

While working we should be careful that the light is good. Working in poor light strains the eye, causes defects in vision and accidents. The light should be bright but not excessive or cause glare. It should fall on our work and come from behind. Excessive light from front causes dazzling effect which is harmful. If there are any defects in the vision we should see a doctor. He will help us to correct the defects.

## Clothing

Man unlike animals does not have any natural covering to protect himself from extreme cold, heat or variations of the atmosphere. Therefore he has to use clothes. Clothes protect us against the effects of wind, weather and injuries. They also make us look smart and beautiful. Clothes should be clean and should not irritate the skin. They should be loose enough to allow free circulation of blood and free body movements. They should also be porous, light and preferably made of cotton, so that there is free flow of air over the skin, and the sweat evaporates quickly. During the cold weather we should wear woollen clothes which help us to retain our body warmth.

It is very important to keep our clothes clean by washing. Dirty clothes can cause irritation to the skin and skin infections.

Besides cotton and bad wool, clothes are made of many other materials like silk, flax, rubber, leather and nylon or synthetics. Clothes made of nylon or synthetic material are very easy to wash and dry. These can be stored in a very small space. But they do not absorb moisture, can cause skin problems in certain people and can very easily catch fire. Therefore, we should wear clothes which are not only clean but also suit our skin and protect us from climate variations.

## Eating Habits

We must eat a balanced diet which contains all the necessary nutrients for our body. We must eat at regular meal times and in a happy environment. Our food must be prepared, served and eaten with clean hands and in clean utensils. It should be protected from dust and flies. We must chew our food

slowly and properly. This helps in proper digestion. We must not eat food which is impure, dirty or bought from unhygienic restaurants, hotels or vendors. It should be freshly cooked and not be stale or spoiled. Eating food under unhygienic conditions can result in stomach upsets, indigestion and diseases like dysentery, typhoid and cholera.

### **Bowel Care**

After the process of digestion and absorption is over the residue of the undigested food material in the large intestine is waste and has to be thrown out of our body. This waste, if not removed from the body regularly, can cause harmful effects like headache, drowsiness, lack of appetite and indigestion. When this waste residue after digestion of food is not removed regularly we call it constipation. Constipation may be due to not going to the toilet regularly, intake of less water, lack of roughage or indigestible fibres in our food, deficiency of vitamin B and weakness of abdominal and intestinal muscles. We can remedy this by going to the toilet at the regular time everyday. Drinking several glasses of water a day, especially a glass early in the morning after waking up and one glass at bed time before sleeping, helps proper bowel movement. Besides, eating the diet which has plenty of fruits, vegetables and vitamins, regular physical exercise and never ignoring the call of nature etc. all help in regulating the bowels and avoiding constipation.

### **Posture and Exercise**

In order that all parts of the body work properly without getting strained or tired we must be aware of our body posture while working. Bad posture can result in early fatigue, deformations of the body and defective vision. While working our shoulders should be up and spine erect. Stooping or bending over our work will cause cramping of the lungs, deformation of the spine and defects of the vision.

While standing, walking or running not only should the spine be erect but the body weight should be resting on the balls of feet and not on the heels. Sleeping in curled up posture interferes with circulation, breathing and causes strain to the muscles. High pillows are bad for the neck, chin, spine and for circulation of blood to the head and the face.

Regular exercise, done preferably in the morning and before meals, keeps our body strong, fit and in good working condition. It has a special effect on the respiratory, circulatory, muscular and nervous systems. We remain active, alert and relaxed in mind. We do not tire easily while doing work. Taking part in regular sports and outdoor games helps us to relax, make friends, cooperate and share things with others. Exercises which are strenuous and done irregularly are harmful and should be avoided.

### **Sleep**

Sleep is very important to give rest to our body and its various systems. It is only during sleep the body can relax, repair the worn and torn tissues and remove the waste products from the body. People who cannot sleep properly remain tired, unhappy and sick. The amount of sleep needed varies with age and occupation. Infants, small children and the sick need longer hours of sleep as compared with the adults who need only six to eight hours of sleep a day. Children need 10-12 hours. People who live in hot climate should take a mid- day nap. It helps in refreshing them.

We should sleep on a clean firm flat bed, placed in a properly ventilated room and away from disturbing noises.

### **Rest and Relaxation**

After a long spell of work specially physical, and hard labour we start feeling tired. This tiredness or fatigue is due to the collection of carbon-di-oxide and waste products produced due to muscular activity which the circulatory system cannot remove quickly. Resting enables the circulatory system to remove these waste materials by throwing it out of our body through our nose. Once this is done we are

once again refreshed to do more work. Warm bath, light massage and sleeping for sometime also helps us to get rid of our fatigue.

When we do the same type of work day in and day out we start getting bored and our mind starts getting dull. In order to avoid boredom and fatigue we must do some activity which is different from our daily routine and gives us pleasure and relaxation. Some examples of such activities are listening to music, singing, painting, reading, playing games and going for a walk, etc. ●

**Q.2. Write a short note on—Prevention of Bad Habits.**

**Ans. Prevention of Bad Habits**

Good habits are valuable for maintaining good health. These start developing from early childhood and remain with us forever. Bad habits also develop during this period and persist forever. One must be very careful not to develop habits which may be harmful to him and to those who live around us. Some of the habits which have to be prevented from being formed are described—

**1. Smoking**—It causes irritation to the throat and wind pipe and results in cough. Inhalation of cigarette or bidi smoke for long leads to insufficient working of lungs, heart, digestive system and nervous system. It is very easy to develop diseases like pulmonary tuberculosis, or cancer of the throat or lungs and heart trouble.

When we smoke cigarettes or bidis the smoke that we blow out is inhaled by the people around us. This also causes irritation to their respiratory tract. This means that even if people do not smoke themselves they become susceptible to the same diseases as those who smoke.

**2. Alcohol**—The effect of alcohol on the human body is harmful and therefore its intake should be avoided. It is a narcotic and brings about sleepiness and insensitivity of the nervous system. When we are under the effect of alcohol our body does not work properly, and we are slow in reacting to the dangers around us. We cannot think properly and judge what is right and wrong. At times under the effect of alcohol we may even do wrong things. Since alcohol has fuel or energy value, doctors use it under strict conditions for medical treatment.

The taking of opium and certain drugs is as dangerous and harmful as alcohol hence these too should be avoided.

**3. The use of paan**—Chewing paan or betel leaf is a common practice in India. It contains calcium and is said to have digestive properties. But it has more harmful effects than benefits. It causes discoloration of the teeth, dead taste buds and thickening of the tongue. The betel nut and tobacco used in it can lead to ulcers in the mouth which can later become cancerous. People who continuously use paan spit frequently and dirty the place around them.

**4. Spitting**—Thoughtless spitting on the road or streets is a bad habit. It not only spreads dirt but also disease specially when the sputum is infected with the germs. The sputum from the patient of *Pulmonary Tuberculosis* can dry and mix with the air. It can then settle on our food or be inhaled by a healthy person. The disease can also affect us when flies and insects sit on the sputum and then on our food. In order that we have a germ free atmosphere we should not spit any where we like but only in the spittoons provided.





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## Chapter 4

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### MATERNAL AND INFANT-MORTALITY

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*“Death is the permanent disappearance of all evidence of life at any time after birth has taken place (post natal) cessation of vital functions without capacity of resuscitation”.* —WHO

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**Q.1. What is mortality? Explain its sources with particular reference to India.**

**Ans.**

#### **What is Mortality?**

Population change has been defined in terms of mortality, fertility and migration. According to United Nations mortality is the percentage of death in the population. Death has been defined by the **World Health Organisation (WHO)** as follows : *“Death is the permanent disappearance of all evidence of life at any time after birth has taken place (pos-natal) cessation of vital functions without capacity of resuscitation”*. This definition however, postulates that death can occur only after live birth. Therefore, mortality is closely linked with live birth. The **United Nations** has defined live birth as follows : *“Live birth is the complete expulsion from its mother of a product of conception, irrespective of the duration of pregnancy, which, after such separation breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached; each product of such a birth is considered live-born. Death prior to a live birth is not included in mortality. It is known as still birth”*.

#### **Sources of Data**

The above explanation of the concept of mortality implies sources of data about it. An important source of data is the registration of vital event. This however, is very inadequate in developing countries except in some major cities. It is only rarely that mortality data are gathered through census. On the world level *The Demographic Year Book* of the United Nations provides data on mortality including number of deaths, death rates, death by age and sex, infant deaths, infant mortality rates, causes of death, etc. Statistical report of the World Health Organisation also provides information on mortality. The following explanation of the sources of mortality data in India will help in understanding the sources, in developing countries—

**1. Vital Registration**—In India the history of collecting vital data dates back to 1886. Vital Registration has been the function of The Registrar General of India. The same source provides data for under registration of deaths in different states of India. Thus there is a serious handicap for gathering mortality data in India.

**2. National Sample Survey**—Another source of mortality data in India is the National Sample Survey (NSS). It collects information on a variety of topics. It was established in 1949. It is gathering mortality data since Oct. 1953. Its estimates are better than those of Registrar General of India. But it also suffers from certain limitations like recall lapse and mis-statements of evens due to the mixing of the reference period.

**3. Sample Registration Scheme**—This scheme was launched by the Registrar General of India in 1964. It is also known as Sample Registration System. It aims at obtaining more reliable mortality data. It involves continuous enumeration by a part time local resident enumerator, along with a six monthly cross check survey by a superior, manual matching of two sets of records, verification of

discrepancies of the field, preparation of a final list of verified events and calculation of birth and death rates based on them. The present level of IMR (33 infant deaths per thousand live births, for the year 2017) is about one-fourth as compared to 1971 (129 infant deaths per thousand live births). In the last ten years, IMR has witnessed a decline of about 36.7% in rural areas and about 36% in urban areas. The fig. 1 states that IMR at all India level has declined from 53 to 33 in last decade. The corresponding decline in rural area is 58 to 37 and for urban areas it is from 36 to 23.

Despite the decline in IMR over the last decades, one in every 30 infants die at the National level (irrespective of rural-urban), one in every 27 infants in rural areas and one in every 43 infants in urban areas still die within one year of life. Among the States/Union Territories, the IMR ranges from 7 in Nagaland to 47 in Madhya Pradesh for 2017.

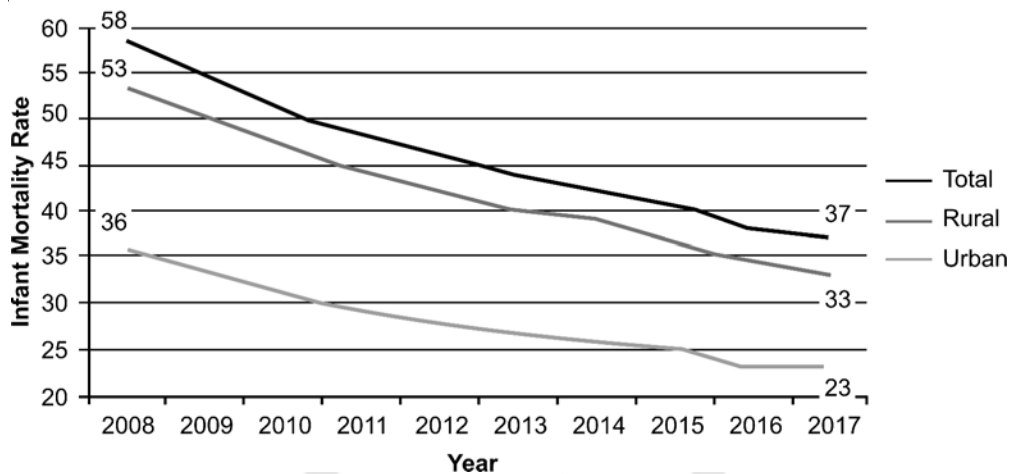


Fig. 1 : Infant Mortality Rate, 2008-2017

**4. Indirect Methods**—Besides the above mentioned direct methods of obtaining death rates, demographers also use the following indirect method of estimation of mortality. Firstly, age data of two consecutive censuses are used and the death rates are obtained through the application of ‘differencing method’, ‘reverse survival method’ in combination with the differencing method, ‘stable’ and ‘quasi-stable’ population methods, etc.

**Q.2. Explain important basic measures for the understanding of mortality.**

**Ans.**

### Measures of Mortality

The following are most important basic measures for the general understanding of the process of mortality.

**1. Crude Death Rate**—This is the most simple, the most commonly used and the most quickly calculated and understood measure of mortality. Crude death rate is a ratio of the total registered deaths of a specified year to the total mid-year population, multiplied by 1000. It is computed as follows—

$$\frac{D}{P} \times K$$

Where, D is the total number of deaths registered during a calendar year (January 1 to December 31);

P is the total population at the middle of the year (July 1); K is 1000. For example—the crude death rates for Greater Mumbai in 2017 have been computed as follows—

Total number of **deaths** 2017

(January 1 to December 31) = 61,931



Total population at the middle of the year, (i.e., mid-year population July 1, 2017) = 65,51,000  
Therefore, the crude death rate for,

$$\text{Greater Mumbai for 2017 } \frac{61,931}{65,51,000} \times 1000 = 9.45$$

The crude death rate expresses the frequency of deaths in total population as a single number. For example if it is said that in 2017 the crude death rate in Greater Mumbai was 9.45, it means that 9.45 deaths occurred per 1000 population. The crude death rate provides the basis for computing the rate of natural increase in population by comparison with the crude birth rate. It is the most widely available index of mortality. It may be compared with similar data from other countries to know the trend in mortality. However, it is a refined measure. It suffers from severe limitations, the most glaring of which are the following—

- (i) Its coverage of death statistics is inadequate.
- (ii) It hides the experience of population group with varying mortality.
- (iii) It gives a greater weightage to the mortality experience of large group in the population.
- (iv) It does not take cognisance of the differences in the age sex structures of different populations.

To overcome the above mentioned limitations are used age specific death rates.

**2. Average Life Expectancy**—This is average expectation of life at birth. It is a useful measure of mortality because it is not influenced by the age structure. It is derived from the life table which is constructed to summarise the mortality experience, of a single hypothetical generation. Average life expectancy means the average-number of years of life which cohort of new born babies may be expected to live. This measure is rather complicated to calculate. However, it is most easily understood by the common man. Therefore, it is widely used in different countries.

**3. Infant Mortality Rate**—According to **George W. Barclay**, “*Infants are defined in demography as an exact age group namely, age zero, or those children in the first year of life who have not yet reached age one*”. The infant mortality rate is a measure of the risk of death between the birth of the baby and its first birthday. It is computed as follows—

where,

$d_0$  is the number of deaths below age one, registered during calendar year

B is the number of live births, registered during the same year

K is 1,000.

For example, infant mortality rate for Greater Mumbai for 2017 was computed as follows—

Total number of registered deaths among infants during 2017 = 7,023

Total number of registered live births during 2017 = 81,642

$$\begin{aligned} \text{Therefore, infant mortality rate for Greater Mumbai for 2017} &= \frac{7,023}{81,642} \times 1,000 \\ &= 86.02 \end{aligned}$$

The above mentioned mortality state shows that in 2017, 86.02 infants per 1,000 live born babies died during the first year of their life in Greater Mumbai. These measures of mortality will be discussed in more details in sequence. ●

**Q.3. What is infant mortality? Discuss factors determining infant mortality.**

**Ans.**

### **Infant Mortality**

Yet another important index of mortality is infant mortality. It is particularly important due to the fact that in almost all the countries it is invariably high during the first year of life. It varies

tremendously from country to country. While it was 131.0 in 1971 in India, it was only 9.9 in 1973 in Sweden. Again, while it was 116 in Egypt in 1972 it was 11.3 in 1973 in Japan. However, it has been noted that in spite of the fact that Sweden has the lowest infant mortality rate in the world. Eastern European countries show higher even in comparison to some developing countries, such as Hong Kong (16.4 in 1973), Singapore (19.7 in 1970) and Trinidad and Tobago (23.5 in 1972). In 1971 Chile, a more developed country, had an infant mortality rate of 78.8. Some 150 years back infant mortality rates in industrialised countries were around 200. In 1870 they ranged from 100 in Norway the three hundred in Germany in Europe. In late 1950 and 1960 it was 200 in Africa. Even in the beginning of the 20th century it was more than 150 in Austria, Bulgaria, Hungary, Japan, Spain, and Portugal. The fall of infant mortality had been spectacular in 20th century. In USSR it was 269 in 1913 and only 29 in 1964. In Japan it was 110.4 in 1935-39 and only 20.4 in 1964. This is also true of developing countries. In Singapore the infant mortality rate was 152 in 1935-39 and it was only 20 in 1973. Similar decline of almost 60% has been recorded in Sri Lanka, West Malaysia, Mauritius, etc. Thus the infant mortality rate is declining everywhere. In India according to The Sample Registration System, the infant mortality rate in the years 1968, 1969, 1970 and 1971 was 137, 140, 133 and 131 respectively. This was in the rural areas. In the urban areas however it was a bit lower, 86 during 1970 and 81 in 1971. The total infantile mortality rate in India was, 125 in 1970 and 122 in 1971.

## Factors Affecting Infant Mortality

The most important factors about infant mortality are genetic. Besides there are environment factors. The following is the explanation of the factors affecting infant mortality—

**1. Biological Factors**—Biological factors include age of the mother order of birth, time interval between births, etc. These may be classified into endogenous factors. Endogenous factors are biological factors related to the formation of the foetus in the womb. These include, besides the factors mentioned above, weight at birth and multiple births or premature births etc. It has been observed that foetal and neo-natal mortality rates are higher at the younger age of the mother (below 19), at first parity and for the first birth order. Upto the age of 29 of the mother these mortality rates decline and increase after it. The maturity of an infants is an important factor. Similar is the factor of the weight of the baby, at birth. In 1950 low birth weight was the cause of 23rds of all the neo-natal deaths in USA. Changes of survival increase with the increase of weight. Endogenous factors are also known as genetic factors.

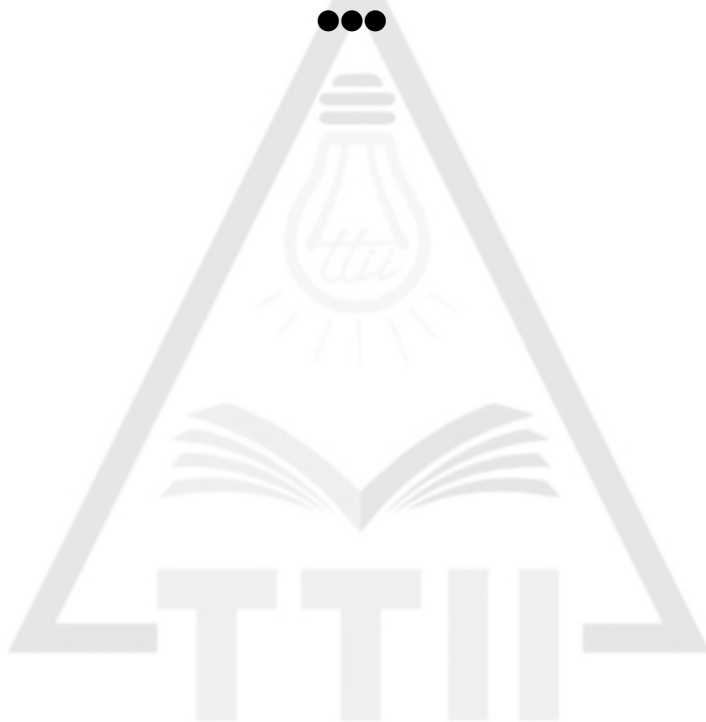
**2. Environment or Exogenous Causes**—These include social, cultural, economic and environmental factors affecting infant mortality particularly during the post-neo-natal period. One of the causes of high infant mortality in some countries is the lack of availability of medicine. Most of the post-neo-natal deaths are due to communicable diseases of digestive and respiratory system such as diarrhoea and pneumonia, etc. The adverse environmental factors including congestion, insanitation, lack of sufficient sunshine and fresh air. Among the environmental causes an important socio-cultural cause is illegitimacy. There is high rate of mortality among the illegitimate infants.

It should be remembered that biological and environmental factors interact and do not work separately. Both the factors have their roles almost everywhere. However, in developing countries the environmental factors are more important and less favourable. On the other hand, in developed countries biological factors are more important since environmental facilities are available.

India has reduced its infant mortality rate (IMR) by 42% over 11 years—from 57 per 1000 live births in 2006 to 33 in 2017, as per the latest government data released on May 30, 2019. Despite the reduction, India's IMR in 2017 remained higher than the global 29.4, a rate equivalent to that of the West African nation of Senegal and higher than most South Asian neighbours' except that of Pakistan and Myanmar. IMR is considered a rough indicator of a country's overall healthcare scenario. The

latest data come from the Sample Registration Survey (SRS), which is released by office of Registrar General and Census Commissioner, Ministry of Home Affairs. The last SRS bulletin was released in September 2017.

In 2017, India's rural areas had an IMR of 37 and urban areas 23, revealing difference in healthcare quality and access despite implementation of a national programme to bridge this gap, the National Rural Health Mission, since 2005. Among Indian states, Madhya Pradesh recorded the most number of deaths of children younger than one (IMR 47) in 2017, followed by Assam (44) and Arunachal Pradesh (42). Madhya Pradesh IMR was equivalent to that of the West African country Niger's, 80% of whose land area lies in the Sahara Desert and which ranked the very last on the United Nations' Human Development Index in 2018. As for the Indian states that performed well, Nagaland recorded the lowest IMR of 7— corresponding to that of Kuwait and Lebanon—followed by Goa (9) and Kerala (10). Close behind were Puducherry (11), Sikkim (12) and Manipur (12), all small states (with a population of less than 10 million), except Puducherry, which is a union territory (federally administered area).



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## Chapter 5

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### DIAGNOSIS AND CURE OF INFANT-DISEASES

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*“Harmful substance or micro-organisms may enter food at any stage of processing, growing, harvesting, transporting, preparing or storing both at home or the industry, consumption of such foods may than cause symptoms of food poisoning”.*

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**Q.1. Describe diagnosis and cure of minor infant diseases.**

**Ans.**

#### **Minor Infant Diseases**

Children suffer from a lot of minor ailments which, if neglected, may develop into serious, complicated, major diseases, causing great concern and alarm to the parents. The most common are colic, constipation, diarrhoea, common cold, convulsions, croup, scabies or itch, eczema and worms. These can be minimised by ensuring that the child is fed and cared for properly.

**1. Colic**—It is a disease attended with severe pain and flatulent distension of the abdomen, without diarrhoea. The symptoms are the following : fits of irritable crying, hard and distended abdomen, gas in the stomach, clenched fists and cold feet tightly drawn up against the body and kicked out. It may be due to a variety of causes such as indigestion, constipation, or infection.

**Cure**—Warmth should be applied to the abdomen as a relief measure, with a slightly heated flannel cloth. Warm water with a little bicarbonate of soda dissolved in it may be given. Hot water bags may be applied to the sides of the abdomen, or the child may be laid on his stomach over a hot water bag.

Regular habits of emptying the bowels should be encouraged as a preventive against colic.

**2. Constipation**—Breast-fed babies seldom get constipated. Even if their bowel movements are infrequent or irregular, the faeces are never hard. Babies should not be given laxatives, which at best give only temporary relief. At times children get constipated when solid foods are introduced. Water given between feeds may relieve constipation. Prune juice is suggested by many doctors for constipation in infants. In bottle-fed babies adding more sugar especially brown sugar to the milk will help to relieve constipation.

**3. Diarrhoea**—It is a disease which causes too many loose motions. The stools are frequent and watery, often with mucus. Vomiting and fever may follow severe diarrhoea.

Diarrhoea is a common disease in India, and through neglect is often the cause of infant mortality. Especially between the ages of two months and one year, children should be guarded against its dire consequences. It rarely occurs in breast-fed babies. If it does, it may be due to some infection in the mother or to some medicine which the mother may be taking.

Infantile diarrhoea is caused by germs gaining entrance to the baby's body, through the feeds. Feeds should be carefully protected from flies and from contamination by unclean hands; and feeding utensils should be thoroughly sterilized.

As a baby's intestines are very sensitive, too much sugar in the feeds, or any other food which does not agree with the baby and which the baby is unable to digest, may cause diarrhoea. As diarrhoea drains the tissues and depletes them of water, it will lead to serious complications if allowed to continue. So a doctor should immediately be consulted if a baby has diarrhoea, however mild it may be.

**Cure**—Mild diarrhoea is improved by cutting down the sugar in the feeds and making them more dilute. The fat content in the milk feeds should also be reduced. As a short term measure, arrow root *conjee* may be given to babies suffering from diarrhoea. Semisolids and solids should be avoided.

The after-care of babies who have suffered from acute diarrhoea is very important. They should be kept to a strict diet with no fat in it. Skimmed milk and half-cream milk should be given till such time as the child is absolutely normal. Though diarrhoea may be severe in babies, it is seldom acute or prolonged in children above two years of age.

**4. Common cold**—A cold is a common and oft recurring complaint in children. It is due to an infection by a germ. It is infectious, so those suffering from a cold should not be allowed near the baby or his food and clothing. If the cold is accompanied by fever, a doctor should be consulted immediately. Infants catch cold by exposure to a chill breeze, from wet napkins not being removed and changed quickly, from staying in rooms which are too moist, or through wet clothes hung inside the room where they are cradled. Situations such as these should be avoided to prevent a child from catching cold. A running nose, sneezing and watering eyes are common symptoms of cold.

**Cure**—The child should be given heavy doses of Vitamin C to combat colds. Plenty of lukewarm boiled water should be given and no cold water. If the child lacks appetite, he should not be forced to eat. If he has a cold and fever, he should be confined to bed. Laxatives and nose drops should not be given unless order by a doctor. A neglected cold may lead to serious ear and throat infections and further develop into bronchitis or pneumonia.

**5. Convulsions**—Children get convulsions sometimes, especially when they have high fever. During convulsions or spasms, there is twitching of the muscles of the hands, feet and face, spreading to most parts of the body. Breathing becomes heavy, the body stiffens, the eyes become fixed or roll upward, there is occasionally froth in the mouth, and at times the child perspires profusely. A heavy cold combined with high fever and constipation, sore throat, infectious diseases, brain injury or brain infection may cause convulsions.

**Cure**—The most common cause for convulsions being fever, steps should be taken to bring down the fever. An ice cap should be used if available. Otherwise a cloth soaked in cold water or with a little eau-de-cologne or spirit should be put on the child's forehead. A warm bath should be given to the baby's body. After the bath the baby should be dried, wrapped in a warm towel and put to bed. During convulsions the feet will usually become cold. They should be kept warm by vigorous rubbing. A doctor should be sent for at once.

**6. Croup**—When a child suffers from croup, he has inflammation of the vocal cords. Coughing, hoarseness and difficulty in breathing are the symptoms. Croup usually troubles the child at night.

**Cure**—Croup should be treated with hot fomentations to the throat. The room should be kept warm. The child should be kept out of cold draughts, but the room should have plenty of fresh air. Wet towels, the water wrung out, should be hung around to keep the room moist. A doctor should be consulted lest croup should develop into diphtheria or a 'strep' infection.

**7. Chafed or Irritated Skin**—In the folds where moisture collects, the skin gets red and sore and later peels off. This is caused by dirty clothing and wet diapers.

**Cure**—The skin should be kept clean and washed, and dried clothes should be used. Dirty and soiled napkins should be removed immediately. After removing the wet diaper, pat the skin dry and dust it lightly with powder.

**8. Prickly Heat or Heat Rash**—If the weather is hot and the child is heavily clothed and in consequence perspires profusely, heat rashes appear on his skin.

**Cure**—He should be lightly clothed and kept in cool surroundings in hot weather. He should be sponged several times a day and powder should be liberally applied on his back and chest. Though heat rashes are not serious, they cause a lot of discomfort because of the itching sensation they excite. Application of a mild lotion may help to cure prickly heat.

**9. Heat boils**—Heat boils start as reddish pimples, accumulate pus and cause pain. These are common in India, especially in the summer months.

**Cure**—Children are given frequent oil baths to keep their body cool, which spares them the suffering and pain caused by heat boils. If boils occur in profusion, a doctor should be consulted.

**10. Scabies or Itch**—This is caused by a small insect called the itch mite. Children get it because of playing in dirty soil. It spreads from person to person either through personal contact or by contact with the infected child's clothing. It causes a scratching sensation which increases in intensity at night.

**Cure**—It is better to get the child cured of the itch by consulting a doctor in good time and thus also prevent others in the family from contracting it.

**11. Eczema**—It occurs on the face and scalp and in the folds of the elbows and knees. It begins with redness and roughness. Then damp and a crust develop. Scratching aggravates the condition.

**Cure**—Strong soaps should not be used. A doctor should be consulted, and his prescriptions followed carefully to fight the disease.

**12. Worms**—Children suffer from a variety of worm infections in India. The most common of these are roundworm, the thread-worm, the hookworm and the tapeworm.

**(i) The Roundworm**—The roundworm, an intestinal parasite, is of most frequent occurrence in children. It resembles the earthworm and is round or cylindrical and pointed at both ends. The male is about 10.2 cms. to 20.3 cms. long and the female about 17.8 cms. to 35.6 cms. The sources of infection are uncooked vegetables, contaminated food or drinking water. Infection is through the skin by the larvae, and also through the air by breathing embryonated eggs with dust. The roundworms, if present in large numbers, cause severe colic pain, irregular appetite and convulsions and other nervous symptoms in children.

**(ii) Threadworms**—As the very name indicates they are threadlike. They measure about 6.35 mms. to 12.7 mms. and are found mainly in children, in enormous numbers. They inhabit the colon, especially the caecum. They usually cause irritation around the anus. Smearing the anus with dilute ammoniated mercury ointment at night, before going to bed, will not only allay the irritation but kill the worms and their eggs.

**(ii) The Hookworm**—The hookworm is also another common parasite of the intestines. It has a conical head and a threadlike body. Infection with hookworms is mainly a rural disease. In older children going about the fields without any protection, the skin of the foot is the vulnerable spot. The symptoms vary. Indigestion, dyspepsia, lack of energy, apathy and anaemia are common symptoms in the early stages and are followed by dropsy, palpitation, shortness of breath and general debility in advanced stages of the infection.

**(iv) The Tapeworm**—These worms are long, flat and tape-like and inhabit the intestinal canal. They are usually segmented, white or yellow in colour, and lead a parasitic life by attaching themselves to the intestinal walls. The tapeworm segments break and come out in the faeces. Animals such as the pig, which eat refuse, harbour them and act as the 'intermediary host' till the eggs and larvae develop. They pass into the digestive system of human beings through such meat being eaten.





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## Chapter 6

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### INFECTIOUS DISEASES

*“Communicable diseases are those diseases which special from one person to another”.*

**Q.1. What are infectious diseases? What steps should be taken to prevent infectious diseases?**

**Ans. What are Infectious Diseases?**

Infectious diseases are caused by germs which are organisms that are either invisible (ultra-microscopic) or visible only under a very powerful microscope. They invade the body and multiply at a very rapid rate, the poisons, (toxins) manufactured by the germs circulate in the blood and give rise to the symptoms of particular diseases. They spread because the germs causing them are carried from one person to another. This may happen either by direct contact with the infected person's body or by his secretions and excretions. These can be carried by flies and other insects, human beings, articles used by the infected person and public conveniences.

#### **Steps for Prevention of Infectious Diseases**

**1. Notification**—The health officer of the municipal committee must be informed at once. Whenever a case of infectious disease occurs in the home, they will investigate the cause of the outbreak of the disease, tighten up health measures, and inform the public about the disease so that people may take care of themselves.

**2. Isolation**—Every individual suffering from an infectious disease and those who attend on him should see that he is completely isolated from the rest of the household and the neighbourhood, until he is free from infection. Mothers and families should develop a 'community conscience', and whenever an illness occurs in the family, they should keep their children and themselves in very strict quarantine. It is criminally selfish to let children suffering from whooping cough, measles, or chicken-pox, go about in the streets or to other houses to play with other children or to travel by train or other public vehicles. It is also wrong to suppose that diseases like small-pox are unavoidable during one's lifetime and that it is better to suffer from them in childhood and be done with them once for all. With this crude and incorrect notion, many ignorant mothers wilfully let their children mix with infected children. Many of these diseases are either fatal or may impair the child for life. Many are blinded, crippled, struck dumb, or disfigured by small-pox. Most diseases can be prevented by taking proper precautions. Serious patient should be sent to the Infectious Diseases Hospital where he can be kept completely isolated. Ambulance should be used to transfer the patient to the hospital as it minimises the spread of disease.

**3. Quarantine**—It is separation of neighbours and relatives of the patient and all those people who have come in contact with the patient for a specific length of time, equal to the incubation period of that disease.

**4. Disinfection and preventive measures**—Germs are chiefly carried through discharges from the nose, throat, mouth, eyes and ears of the sufferer and also from the excreta. Destroy the germs in these as soon as they leave the body. Lysol, potassium permanganate, carbolic acid, iodine, phenyl, sulphur dioxide, formaldehyde, etc. are some chemical disinfectants which destroy germ. Heat and sunlight are natural disinfectants.

In many diseases the only plenty of soap and water, fresh air, sunlight, a bottle of phenyl and some potassium permanganate are needed. An earthen pot containing strong permanganate lotion should



be kept for spitting into. Clean pieces of old soft cloth may be used to wipe the eyes or nose, and should be burned after use. Towels, clothes and bed-sheets must be boiled before being given to washer man. Separate vessels should be used for eating and drinking, and these should be disinfected by boiling. All excreta should be burnt and commodes and bed-pans disinfected with phenyl. Flies must be checked. Books and journals used by the patient must be disinfected or burned. In case of diseases like small pox it is safer to burn the clothes and bedding used by the patient. When the doctor declares the patient to be free from infection, he should be bathed with some disinfectant and dressed in clean clothes before joining the rest of the household. All the furniture in the sick-room must be put in the sun and thoroughly washed with phenyl and the walls white-washed, or the room may be hermetically sealed for a week, during which time it should be fumigated.

The nurse should not eat in the sick-room. She should wash her hands with soap and dip them in some antiseptic lotion every time she touches the patient. She must not mix freely with other people and must change her clothes when she leaves the sick room.

**5. Education**—One of the most important steps in arresting the spread of an infectious disease is to educate public about the disease how it is spread, how to prevent it and what steps they can take to control its spread? ●

**Q.2. Write short note on—Stages of a Disease.**

**Ans.**

### Stages of a Disease

There are three distinct stages in every disease caused by germs— (1) The Incubation Stage, (2) The Acute Stage, and (3) Convalescence.

**1. The Incubation Stage**—The germs causing disease enter the body in one of the many ways they may be breathed in, swallowed in along with food or water, enter through open wounds on the skin or be injected into the blood by insects like lice, fleas and mosquitoes. Then they multiply and produce poisonous substances called toxins, which circulate in the blood and give rise to symptoms peculiar to that disease—rash, fever or diarrhoea as the case may be. But some time elapses after the germs enter and before the symptoms really begin to appear, just as it takes a few days for the seeds which you sow to sprout. This interval of time is called the incubation period. During this period the germs increase in number and circulate their poison. The blood produces what are known as antibodies and antitoxins and also the white blood corpuscle increase in number; this is an important part of our defence mechanism. If this defence is strong the person either never gets the disease or may suffer from a mild attack.

The incubation period is fairly definite for every disease. It takes 8 to 16 days for measles, 14 to 22 days for mumps, and so on.

**2. Acute Stage**—Even if the body is not able to resist the disease and actually suffers from it, it does not give up fighting and producing antibodies and antitoxins, until it either conquers or is conquered. In this acute stage if this is passed safely, the symptoms gradually disappear leaving the person completely exhausted.

**3. Convalescence**—It takes days or even weeks, according to the severity of the attack, for the patient to recover his normal health and strength. This is the period of convalescence in which proper care in diet and rest is very important, especially in cases like typhoid where there is not only a fear of relapse, but also chances of invasion by some other disease bacteria, such as those causing broncho-pneumonia. ●

**Q.3. Write short note on—Cholera.**

**Ans.**

### Cholera

**Symptoms**—There is severe pain in the abdomen, vomiting and diarrhoea (called rice-water motion because the stools are colourless due to absence of bile), and cramps throughout the body. Since the vomiting and purging rob the blood of all its water and salts, there is a sudden collapse.

**Treatment**—The doctor should be sent for at once. Saline infusion or the introduction of sterile salt water of a certain percentage into blood stream should be given. The patient must be removed to an isolation hospital.

**Prevention**—As the vomited discharge and the stools are full of germs these must be mixed with sawdust and burned. Clothes and bedding must be disinfected and boiled. They must never be given to a dhobi who will only dip them in a public well or tank and pollute the water which may infect the whole neighbourhood. All wells and other sources of drinking water in the locality must be disinfected with potassium permanganate. The drinking water used at home must be boiled for 10 minutes. One must also protect our food from dust and flies. One must not eat food from outside specially from dirty places. One must always wash our hands before eating or drinking. One must ensure that the excreta and other waste is disposed off safely and properly as discussed earlier. Inoculation against cholera must be taken. ●

**Q.4. Describe symptoms, treatment and precaution in Small Pox.**

**Ans.**

**Small Pox**

Small Pox is known as a serious infectious disease. Not only children, even the grown ups may come under the grip of this infection. At present it has been completely eradicated from India.

Caused by a specific virus at one time virulent and dreaded. It is intensely infectious. Its germs are given off in the breath, excretions and scabs from the skin. Almost all modes of transmission of germs help in the spread of this disease. Its infection lasts at least six weeks till the skin is healed after every scab is cleared.

**Incubation**—This period is from 10 to 14 days.

**Symptoms**—Small pox begins with a heavy chill, vomiting, intense headache, backache and rise in temperature. On the third day of the illness, rashes start appearing first on the forehead and afterwards spread all over the body. The rash which is like red spots, slightly raised in the beginning, starts becoming prominent afterwards. On the 3rd day of appearance of the scabs, some clear watery fluid starts appearing in them and they look like blisters. After another three days these blisters start getting depressed and colour becomes dull yellow. After eight days fever will start diminishing and scabs also begin to dry. When the scabs fall off, they leave permanent pits or marks for life and make the face and arms disfigured. Sometimes the pocks are very close and leave no space in between. If a pock appears in the eye, it causes blindness and if it appears in the ear, it causes deafness.

**Treatment**—

1. Keep the patient in a dark room.
2. Keep the patient warm in bed.
3. If the temperature goes very high, cold sponge should be done.
4. Give liquid diet to the patient. Plenty of water should be given to drink.
5. Use hot fomentations to relieve pain in back and legs.
6. Keep the bowels cleaned; if necessary give enema.
7. To relieve itching, anointing with carbolated Vaseline will be effective.

**Precautions**—

1. To control the infection, immediately report to the health officer.
2. Vaccination should be given for protection.
3. Do not allow any child to come to the school if suspicion of any spot is seen on the face or arms.

4. Isolate the patient.
5. No person from the infected house should attend school or office.

**Q.5. What is tuberculosis? Describe its symptoms, treatment and prevention.**

**Ans.**

### **Tuberculosis (T. B.)**

Tuberculosis is a chronic inflammation caused by *Bacillus tuberculosis* which is a thin, curved, rod-like germ. It affects several lakhs of people in India (T. B.). One may get the germs through contact with patients of tuberculosis or drinking milk from cows having bovine tuberculosis. It is a slowly progressive disease. It attacks so slowly that we may discover it only when it is quite advanced. These days, with very good measures of detection and proper treatment it is an absolutely curable disease if detected early. Deaths occur due to tuberculosis because the patient does not go to the doctor for early detection or does not take proper and regular treatment.

**Causes**—The tuberculosis germs is a hardy germ and may live for six months if not exposed to sunlight. It is killed by boiling for 10 minutes and by direct sunlight within a few hours. The germs spread through the air which contains the dust of the dried sputum of infected persons. The germ may attack any part of the body, like the intestine, joint, bones, lymphatic glands, brain, skin, eyes and ears. The commonest form of tuberculosis is of the lungs, called pulmonary tuberculosis.

**Symptoms**—Loss of weight, loss of appetite, cough, fatigue, low temperature in the evenings, pain in the chest and frequent colds are all signs of tuberculosis; the lungs and sputum must be examined at once. Sometimes the patient may even cough out blood with his sputum.

**Treatment**—The chief factors in treating the disease are fresh air, sunlight, good food and complete rest. Sanatoriums like those at Panchgani, Miraj and Madanapalle afford ideal facilities for a patient to lead a carefully regulated life in the fresh air under expert medical supervision. The tissues do heal in time, the disease is arrested and the germs remain inactive. The patient should take the utmost care to avoid the spread of infection. He must spit only into a pot containing lysol or phenyl, must cover his mouth when he coughs, burn his sputum and handkerchiefs and live a quiet life away from the others. Early cases which are not infective may however take treatment at home but must not come in contact with small children.

**Prevention**—Wholesome food, fresh air, sunshine, suitable exercise and sufficient rest will prevent tuberculosis. The habit of spitting on roads and courtyards, in trains and cinema halls, etc. should be discouraged. Contact with TB patients should be avoided. Milk should be tested for TB germs. It should preferably be boiled before drinking. The neighbourhood should be kept clean, and dangers from dirt and dust should be minimized. Individuals should safeguard themselves against diseases which lower the resistance of the body to TB germs, e.g., whooping cough, bronchitis, etc.

**Q.6. Write short not on—**

- (i) Malaria,
- (ii) Plague.

**Ans.**

### **(i) Malaria**

Malaria is a very common disease which is spread by the bite of female mosquito. It is an infectious disease which is caused by the infection, spread by the mosquitoes.

**Symptoms**—When the patient suffers from malaria, the following symptoms are visible—

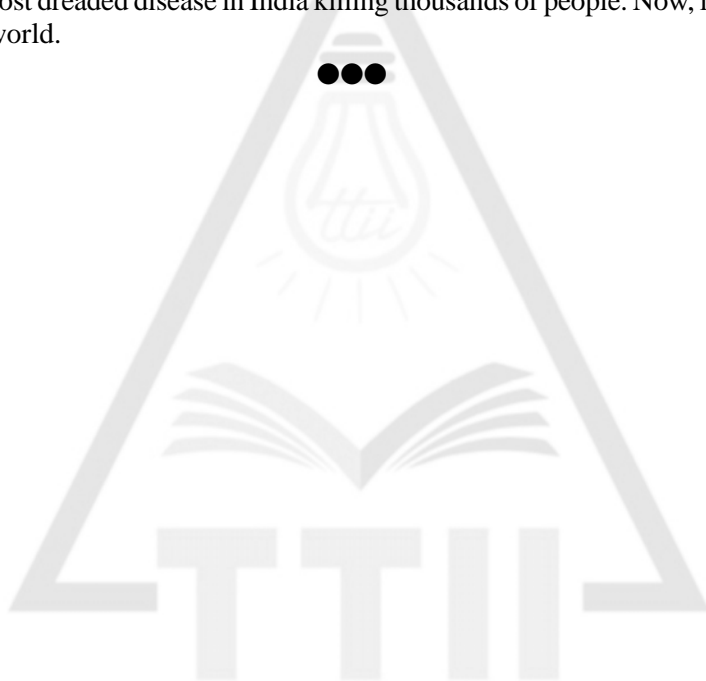
1. High temperature;
2. Headache, cold and shivering;
3. Excessive weakness; and
4. Perspiration.

**Treatment—**

1. It is very necessary to kill the mosquitoes, if we actually wish to eradicate malaria. Breeding places of mosquitoes, such as drainages, pounds, ditches and dirty places should be disinfected and sprayed with D.D.T.
2. The patient should be given rest. He should be placed in such a room which is hygienic and well ventilated.
3. External appliances like odomos that keep the mosquitoes away, should also be used on his body.
4. Quinine and its other preparations are the best medicines against malaria. Medicine should be given after getting the blood of the patient tested for confirmation that he is actually suffering from malaria.

**(ii) Plague**

It is infectious disease carried through rats. It spreads to human beings when rats die of it. Formerly it was the most dreaded disease in India killing thousands of people. Now, it has been completely wiped out from the world.



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## Chapter 7

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### BALANCED DIET

*“The balance diet is the diet which contains all the nutrients in required amount”.*

**Q.1. What is Balanced Diet? Describe the five groups of food which constitute a balanced diet.**

**Ans.**

#### **What is Balanced Diet?**

A balance diet means a diet which contains all the constituents (proteins, fats, starch, minerals, vitamins in needed, quantity, in accordance with the requirement age, sex, constitution of the body, the type of work and the climatic condition.

Usually our children, studying in schools take nothing but *Dal* and *Roti*. That way, they do not get sufficient minerals and vitamins. Their diet should include milk, fruits, sufficient quantity of vegetables and salts. Non-vegetarian, families should provide eggs, meat and fish to children. There should be a system of providing mid-day meals to children to supplement what they get at home. The Secondary Education Commission has recommended the provision of mid-day meals to primary school children, through the help of local organisation, UNICEF or CARE. The CARE scheme is already in vogue throughout the country, but these sources are meagre. The local public must donate for the mid-day meals.

The diagram on the next page shows that a balanced diet is based on various items of food derived from each of the five food groups indicated. Sometimes these foods are further sub-divided into seven or eleven groups.

#### **The Five Food-Groups**

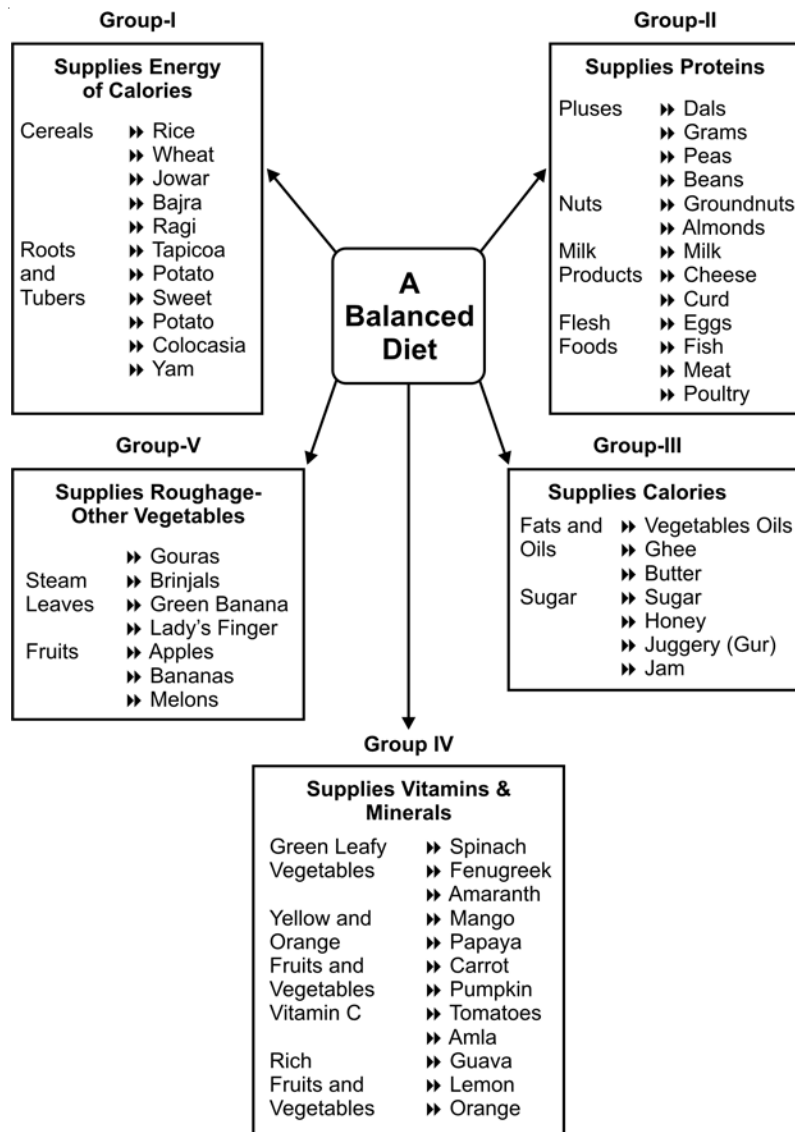
**Group I. Cereals, roots and tubers**—All these primarily supply energy or calories. This food group ranks as an important source of thiamine, niacin and iron. These include rice, wheat, jowar, bajra, ragi and other cereals, tapioca, potato, sweet-potato, arvi (colocasia) yam—roots and tubers.

Flours and cereals make a significant contribution towards calories, proteins, iron and vitamins. These are cheap and are taken in large amounts. They are important in low income group diets.

**Group II. Protein-giving foods**—This group includes primarily sources of protein, though cereals also furnish protein. Dals, grains, peas, beans, groundnuts, cashewnuts, almonds, coconut, milk, curd, butter-milk, paneer (cottage cheese), khoya, eggs, fish, mutton, chicken, pork and other flesh foods make up this group. It provides protein both from the vegetable and animal kingdom.

Milk and dairy products are important sources of calcium and riboflavin. They are second only to the meat group for their protein contribution. Meat, fish and eggs rank first for their protein, iron and niacin content.

**Group III. Fats/oils sugar/jaggery**—This group includes food stuffs which supply energy or calories such as vegetable oils, vanaspati ghee, butter, cream, sugar, jaggery. It constitutes about 16th of the energy value of the diet, but does not add appreciably to the protein, mineral or vitamin levels. Although oils should be, used sparingly in the diet they add taste and flavour to the food. In India, commonly available cooking oils include mustard oil, coconut oil, thil oil, groundnut oil, palm oil and sunflower oil.



#### **Food Groups for Balanced Diet**

**Group IV. Protective vegetables and fruits**—These are suppliers of minerals and vitamins *e.g.*

**Class A**—Green leafy vegetables, palak (spinach), methi (fenugreek leaves), arvi (colocasia) leaves, kulfa and similar greens.

**Class B**—Yellow or orange fruits and vegetables—Papaya, mango, carrots, yellow pumpkin.

**Class C**—Fruits and vegetables rich in vitamin C—amla, guava, lemon, orange, phalsa.

They are mainly the suppliers of minerals and vitamins. They are the only important sources of ascorbic acid, contribute half of the vitamin A requirement, supply 1/5th of the iron required, making them just below the meat and the four and cereal groups in importance.

**Group V. Other Vegetables**—These provide variety in taste and texture and furnish roughage in the diet, *e.g.*, fruits, stems, leaves and flowers of plants, lady's fingers, brinjals, bitter gourds and other gourds, cabbage, cauliflower, drumsticks.

Diets containing foodstuffs drawn from each of the groups shown in the diagram supply all the essential nutrients in adequate amounts and keep a majority of the individuals consuming them in a good state of health. It may be useful then at this state to consider in detail how each class of food stuffs suggested in the above diets supplies the daily requirement of the various nutrients. ●

**Q.2. What is the importance of Balanced Diet?**

**Ans.**

**Importance of Balanced Diet**

Following a balanced diet means securing the basic food requirements for good health. Balanced diet supplies energy, furnishes repair and growth-materials to the body and gives vitamins to regulate health. Some of these requirements are needed more at certain stages of life. In childhood and adolescence, one needs more growth materials like protein. In old age also more protein is needed for replacing the body tissues. Throughout life one needs energy which is supplied by carbohydrates. As a great part of our body is bone it needs calcium, phosphorus and other minerals. Vitamins are also needed to make up deficiency in the body. Following chart shows daily balanced diet for children.

Balanced diet supplies all these requirements. Along with these it also supplies iron, iodine, salt and zinc, which are essential for the normal functioning of the body. Herein lies the importance of balanced diet.

**Table-1 : Daily Balanced Diet for Children**

Food	Pre-school Children				School Children			
	1-3 years		4-6 years		7-9 years		10-12 years	
	Veg. (gr)	Non Veg. (gr)	Veg. (gr)	Non Veg. (gr)	Veg. (gr)	Non Veg. (gr)	Veg. (gr)	Non Veg. (gr)
Cereals	150	150	200	200	250	250	320	320
Pulses	50	40	60	50	70	60	70	60
Green leafy vegetables	50	50	75	75	75	75	100	100
Other Vegetables, green, roots and tubes	30	30	50	50	50	50	75	75
Fruits	50	50	50	50	50	50	50	50
Milk	300	200	250	200	250	200	250	200
Fats and Oils	20	20	25	25	30	30	35	35
Meat, fish and eggs	—	30	—	30	—	30	—	30
Sugar and jaggery	30	30	40	40	40	40	50	50

A diet, well-balanced in nutrition and taste, promotes healthier living, better personal appearance and an optimistic look on life. It is, thus, rightly said that ‘we are, what we eat’.





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## Chapter 8

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### CONSTITUENTS OF FOOD

*“Good nutrition is essential for the attainment of normal growth and development. It also prevents the disease”.*

**Q.1. Describe the constituents of our food.**

**Ans. Constituents or Ingredients of Food**

The following are the constituents or ingredients of food—

- |             |                  |
|-------------|------------------|
| 1. Proteins | 2. Carbohydrates |
| 3. Fats     | 4. Mineral Salts |
| 5. Vitamins | 6. Water.        |

#### (1) Proteins

**Meaning**—These are complex compounds of carbon, hydrogen, oxygen, nitrogen and sulphur.

**Sources**—These are only available source of nitrogen and are often called Nitrogenous food substances. Some of these contain phosphorus and iron. These are the more complex chemical structure than carbohydrates and fats. During the digestive process, they break up into absorptive units, called ‘amino acids’ which are essential for growth.

Proteins are available from two sources, vegetable kingdom and animal kingdom. But vegetable proteins, as available in ordinary diet are not easily digested and utilized, like proteins in meat. Thus due to their biological value, proteins of the animal origin have been grouped as ‘A class’ proteins and proteins from the vegetable kingdom as the ‘B class’ proteins. Chief sources of vegetable proteins are : cereals and lentils, wheat and wheat flour, pulses, rice, peas, beans, especially, soyabeans and peanuts. Most of the vegetables, cereals and proteins appear to be deficient in one or more of the essential ‘amino acids’. Animal Proteins are better sources of amino acids and the proteins of milk and milk products, eggs, fish, poultry such as chicken and fowl, glandular meat like liver, kidney, etc. are specially valuable.

**Uses**—Proteins supply building material to the body. Cells in the body, continuously consume nitrogen in their metabolic activities and protein is the only food, containing nitrogen. Thus, these are very essential for life.

Proteins are also known as tissue builders of the body. They build up the body defence against infections. In the absence of fats in the diet. Proteins and Carbohydrates are converted into fat to some extent.

#### Required Quantity

Keeping in view the value of proteins in the body, the Food and Nutrition Board at the National Research Council has proposed a standard intake of 70 gm. of proteins for a man, weighing 70 kg. and 60 gm. of proteins a day for a woman weighing 56 kg. More proteins are required during the growth period of a child. They are always required in the body for metabolic activities of the cell, throughout one’s life.

**Deficiency**—Deficiency of proteins in the body may cause loss of weight stunted growth irritability anaemia, reduced resistance to infectious diseases, lack of energy and dry lustless skin.

## (2) Carbohydrates

**Meaning**—Carbohydrates are compounds of carbon, hydrogen and oxygen. The chief function of carbohydrates is to provide heat and energy to the body. So, it is known as the fuel food of the body. During the process of combustion with oxygen from lungs, heat and muscular energy is liberated and carbon dioxide and water are produced.

**Sources**—The digestion or breaking down of carbohydrates begins in the mouth and continues in the stomach and small intestines. Carbohydrates include all kinds of sugars and starches. Its main sources are : rice, potatoes, wheat, maize, barley, oat, arrow-root, banana, sweet potatoes, sugarcane etc. Deficiency of carbohydrates may result in loss of body weight.

**Uses**—Carbohydrates help in the metabolism of fats. They are especially valuable food, when a considerable amount of muscular work has to be undertaken. The energy value of carbohydrates is 4 calories per grain of the nutrient. There should be a balance between the supply of energy, (intake of carbohydrates) foods and the expenditure of energy. It means if one eats large amount of energy foods, one should engage himself in vigorous and muscular work, otherwise it may result in obesity (fatness),

## (3) Fats

**Meaning**—Like carbohydrates Fats are also the compounds of three elements—*carbon, hydrogen and oxygen*. But their proportion is different.

**Uses**—Fats are better sources of energy than carbohydrates. One grain of fats contains nine calories. Fats can be stored in the body. It is also known as the fuel food. Energy is produced by their burning process. They protect us from heat and cold. Fat is digested in the intestine where it is broken into fatty acids and glycerol by the action of the fat enzymes lipases—from the pancreas and intestines.

Fats and carbohydrates have a good combination. Fats digest quickly if taken with sugar or carbohydrates like; bread and butter; butter and sugar (ghee-shakar). Fats delay appetite and also cause nausea if taken in excess. Too much use of fats in the diet can cause obesity and indigestion. The fat which cannot be consumed is deposited under the skin, and this reserve fat hampers the action of bodily organs. But in the absence of fats in the food, carbohydrates and proteins are converted into fat, to some extent. Fat also serves as a carrier for the fat-soluble vitamins like A, D, E and K in the body.

Fats fill up the contours of the body and give shape and protect the internal organs, bones and joints from outside injury.

Fats are widely distributed in nature and are available in both the animal and vegetable kingdoms. Animal fats contain vitamin A and D and are easily digestible.

**Sources**—Main sources of fats are butter, curd, ghee, cheese, milk and milk products, fish, meat, margarine, all vegetable oils like coconut, mustard and vanaspati and codliver oils.

## (4) Mineral Salts

**Meaning**—Minerals are known as the protective foods. They are essential for the maintenance of the body. There are as many as 14 minerals needed in the body, forming 1/20th of the body weight and are known as the protective foods. They are not burnt to produce heat but they do help in building tissues and regulating bodily processes.

**Uses**—(i) They maintain a balance of acids and alkalies in the body.

(ii) They help in the production of digestive juices.

(iii) They constitute bones which act like pillars of the body, *i.e.*, calcium and phosphorus.

(iv) They constitute body cells of which muscles, blood corpuscles, liver etc. are composed, *i.e.*, minerals like iron, calcium and phosphorus.

- (v) Some soluble salts give composition and stability to the body, *i.e.*, sodium, potassium, chlorine and phosphorus.
- (vi) Some salts have their own specific functions like iron and copper for the formation of blood, iodine and thyroxine.
- (vii) They make possible normal rhythm in the heart beat.
- (viii) They help to maintain a normal response of nerves to stimuli.
- (ix) They are essential for blood clot formation.

## **Kinds**

**1. Iron**—It is the main constituent of blood. It produces haemoglobin. It is also present in the muscles. It acts as an oxygen carrier of the lungs. The daily requirement is 15 mgms. Its deficiency causes lack of blood or anaemia. Its chief sources are liver, eggs, meat, pulses, onions, lettuce, date, figs and dried fruits. Human milk also contains iron to the extent of one mg. per litre.

**2. Sodium Chloride**—(Common salt) It is necessary for all the tissues of the body, gastric juice and bile. Its daily requirement is 10 to 15 gms.

**3. Magnesium and Phosphates**—These are needed for bones and teeth. These are found in meat, eggs, milk and cheese.

**4. Sulphur**—It is needed for formation of brain, nails and hairs. It helps digestion of food. It is found in eggs, radish, spinach, pulses and cabbage.

**5. Chlorine**—It is needed to maintain the composition of blood and also in the formation of hydrochloric acid in the body. It is found in common salt, bananas, tomatoes, lettuce and green leafy vegetables.

**6. Copper**—It helps the formation of haemoglobin of blood along with iron. Its daily requirement is 2 mgms for an adult.

**7. Calcium**—It is essential for the growth of the bones and teeth. It regulates certain body processes. The heart muscles and blood clotting process depend upon the presence of calcium in the body. Calcium along with other minerals gives rigidity and permanence of bones and teeth. Its deficiency can cause irritability, skin diseases, nervous excitability, weak muscles, decayed teeth, rickets and asthma. Insufficient calcium in diet limits growth in the young. It may lead to stunted growth.

Foods rich in calcium—are milk, cheese, curd, nuts, green leafy vegetables, egg yolk, carrots and cabbage. Milling of grains removes large amount of calcium. White flour, polished rice and new process cornmeal are poor in calcium. Its daily requirement for an adult is 1.5 gms.

**8. Phosphorus**—It is an important constituent in every body tissue and is contained in every cell of the body. It is necessary for multiplication of cells and growth of the body, for healthy teeth and strong bones and for nervous system and blood serum. Its deficiency can cause stunted growth, poor bones and decayed teeth. Its daily requirement is 1.5 gms. Chief sources of phosphorus are cheese, yolk of egg, potatoes; almonds, nuts, lean meat, whole wheat, milk and liver. Milling of wheat, polishing of rice and wrong method of cooking rice, spoil the phosphorus content in it.

**9. Iodine**—It is a constituent of thyroxine—the active secretion of the thyroid gland. Iodine helps in maintaining a proper balance in calcium, phosphorus and magnesium in the body. It increases the metabolic rate in the body and helps in the growth and development. Its deficiency may cause goitre (enlarged thyroid gland) and feeble minded children. Deficiency of iodine is found in the diet of hilly people. Sea foods are rich in iodine. Salt, prepared from sea water contains iodine. It is found in water, yolk of egg, onions, fresh vegetables and seafish.

## **(5) Vitamins**

These were discovered in the beginning of the 20th century. Experiments were conducted on mice and it was found that only protein, fats, carbohydrates and minerals cannot keep the mice alive. In 1912 a new substance was discovered and named vitamin.

**Meaning**—Vitamins are life-giving substances.

**Uses**—These help in the proper growth of the body, resist diseases, facilitate the digestive system and tune the nervous system. They are of vital importance and must be included in food in order to maintain life. Six kinds of vitamins have been discovered so far, namely vitamin A, B, C, D, E and K. In the early years of the vitamin research, the chemical nature of vitamin was unknown. So they were designated by letters. Vitamin A, D, E, and K are soluble in fat and Vitamin B and C are soluble in water. Most of the vitamins are destroyed if food is cooked in uncovered utensils. Vitamin B, D, and K are destroyed if baking powder is used in cooking.

## Kinds

**1. Vitamin A—Source**—It comes from a substance, called carotene, found in certain plants. By eating such plants one gets vitamin A directly. Rich sources of vitamin A are green leaf vegetables, beans, peas, asparagus, yellow carrots, egg, milk and milk products, spinach, lettuce, apricot and mangoes. Vitamin A from animal sources are more effectively absorbed than from the vegetable sources.

**Uses**—It is fat soluble and is growth promoting and for this purpose it must be supplemented by iron and calcium. It keeps the skin and mucous membranes all over the body healthy. It protects the body against infections of cold and respiratory diseases.

**Result of deficiencies**—Continuous deficiency of vitamin A causes night blindness. In the retina of the eye, two types of cells function for vision, called cones and rods. Cones are concerned with colour and rod cells are coated with a substance called 'Visual Purple' which acts like silver coating on a photographic plate. It gives rise to an impulse to the nerve endings in the rods and enables us to see. Deficiency of vitamin A prevents the formation of visual purple and lowers the visibility. Tear glands also get dry.

Chronic shortage of vitamin A causes stone in the kidney, gastric ulcer and catarrh. Respiratory infection like bronchitis and broncho-pneumonia and common cold can also take place. Prolonged cooking and exposure to light destroys this vitamin in food.

**2. Vitamin B**—On its first discovery vitamin B was considered to be a single substance. But later on, it was broken up into several parts and today there are twelve derivatives.

### (a) Vitamin B<sub>1</sub>—(Thiamine)

**Uses**—It is soluble in water and is easily and widely available in nature. It is essential for neuromuscular efficiency and growth. It maintains normal health and weight in adults, keeps the brain, the heart, the liver, the digestion and the nerves healthy. It improves appetite and partly controls carbohydrates metabolism. Food containing sufficient quantity of vitamin B<sub>1</sub> becomes very tasty and is relished and easily digested. It cannot be stored in the body.

**Result of deficiency**—Deficiency of vitamin B<sub>1</sub> makes a person depressed, irritable, quarrelsome, uncooperative and fearful. Its deficiency also causes beri-beri, numbness of hands and feet, heart palpitation, short breaths, nausea, vomiting and diarrhoea, inflammation of the tongue, loss of appetite and diminished ability to be heavy work.

**Precaution**—As vitamin B is soluble in water, some loss follows if the vegetable is cooked in plenty of water and the water is thrown away (e.g. boiled rice). This vitamin is also destroyed in the presence of alkali (soda-bi-carb). Soda should not be added while cooking vegetables. Sources of this vitamin are : husk of rice and germ of cereals. It is rich in yeast cabbage, lettuce, peas, beans, potatoes, yolk of an egg, meat and brain of sheep.

**(b) Vitamin B<sub>1</sub> or Riboflavin**—Formerly known as vitamin G, Riboflavin is anti dermantic. Its deficiency causes pellagra (disease of the skin), scales on the ears, inflammation and cracks on the lips, stunted growth, premature ageing in adults, burning sensation of the eyes and dimness of the vision. It is more stable than vitamin B<sub>1</sub>. It withstands ordinary cooking and is decomposed by sunlight. Its sources are the same as for vitamin B<sub>1</sub>.

(c) **Vitamin B Complex**—It is a combination of ten vitamins. It is very useful for heart, liver, protection from deficiency and diseases, stability of glands and formation of red blood.

### **3. Vitamin C (Ascorbic Acid)—**

**Uses**—It is essential for maturation of red blood corpuscles. Its deficiency causes scurvy, characterised by easy ruptures of capillaries and allows blood to escape. The gums become soft and spongy and bleed. It also causes irritability, delay in healing of wounds, gastric ulcer, susceptibility to infections.

**Sources**—This vitamin is richly present in oranges, lemon, cabbage, tomatoes, apples, banana, carrots and Indian gooseberry (Amla).

**Precaution**—Vitamin C stands very light cooking. Prolonged cooking destroys it. 90% of vitamin C is destroyed in cabbage while cooking. It is also spoiled when exposed to sunlight. Young and fresh vegetables and fruit contain more vitamin than the old state ones.

**4. Vitamin D**—**Nature**—It is also known as calcifying vitamin. It exists in two forms—one is produced by ultra-violet rays of the sun and the other form is present in certain animal oils and fats. Vitamin D formed in the skin is absorbed in the blood when taken, orally. It is stored in the liver, skin, brain, lungs, spleen and bones. The liver is the main storage centre.

**Sources**—Cod liver oil is the richest source for vitamin D. Small amount is present in eggs, butter, green leafy vegetables, yellow carrots, tomatoes, mild germinated wheat and maize. It is also produced in the skin by the action of ultra-violet rays of the sun.

**Result of deficiency**—Deficiency of vitamin D causes rickets, stunted growth, delayed and irregular dentition.

**5. Vitamin E**—**Nature**—It is anti-sterile and is fat soluble. It is essential for the rapid division of cells. When the fertilized ovum begins to multiply itself to produce a new individual, this vitamin is necessary for this purpose. Its deficiency leads to abortion, sterility in males and females, death of the foetus in the uterus.

**Sources**—Vitamin E is present in whole wheat germ, leafy vegetables, carrots, cauliflower, lettuce, cucumber, green pepper, spinach, banana, milk and butter.

**6. Vitamin K**—It is necessary for the normal coagulation of blood and normal physiological activity of the liver. Its deficiency may permit extensive bleeding from the wounds and occurrence of haemorrhage in the skin. Its richest sources are cabbage, cauliflower, carrot-tops, soyabean oil and sea weeds. Small amount is also available in orange peel, tomatoes, milk and eggs.

## **(6) Water**

Man cannot live without water and it is the best fluid to drink in any form. 75% of the body consists of water. An average adult needs to take 4 to 5 points of water a day because the same amount is eliminated from the body in the form of urine, perspiration and water-vapours by the lungs, in the process of breathing out. It has very important functions in the body.

- (i) It helps in the elimination of poisonous elements and waste products from the body.
- (ii) It helps in the digestion of food. All digestive juices are in watery form.
- (iii) It forms basis of the body fluids like plasma of the blood, the lymph, digestive juices and other secretions.
- (iv) It saves the bones from becoming brittle and dry.
- (v) It maintains the tissues in a soft and flexible condition.
- (vi) It helps in the circulation of blood.
- (vii) It regulates the body temperature.
- (viii) It supplies mineral salts to the body.





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## Chapter 9

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### EXERCISE

*“Exercise vitalizes the body whereas over-exercise and violent exercise cause fatigue”.*

—Swami Paramahansa Yogananda

**Q.1. What are the benefits of exercise? Describe its rules.**

**Ans.**

#### **Significance of Exercise**

Exercise has a special significance in the lives of individuals. It helps in the healthy growth and development of children, adolescents and the youth. During adulthood, proper exercise helps in keeping us healthy or free from disease. It even helps in delaying the aging process in older adults. Swami Paramahansa Yogananda has highlighted the importance of daily exercise. According to him lack of exercise causes fatigue but regular exercise removes it. He has further emphasized that when we exercise, we spend some energy but get back much more, provided we do not overdo it. He said, *“Exercise vitalizes the body whereas over-exercise and violent exercise cause fatigue”*. The body should therefore be charged with only as much energy as it can stand. Thus the body will absorb the beneficial amount of energy from proper exercise. Since over-exercise creates toxins, faster than they can be handled by the system, it will cause fatigue. Keeping in view the beneficial effects of exercise, parents, teachers, government agencies and social institutions should provide opportunities and facilities to individuals for doing exercise.

#### **Beneficial effects of Exercise**

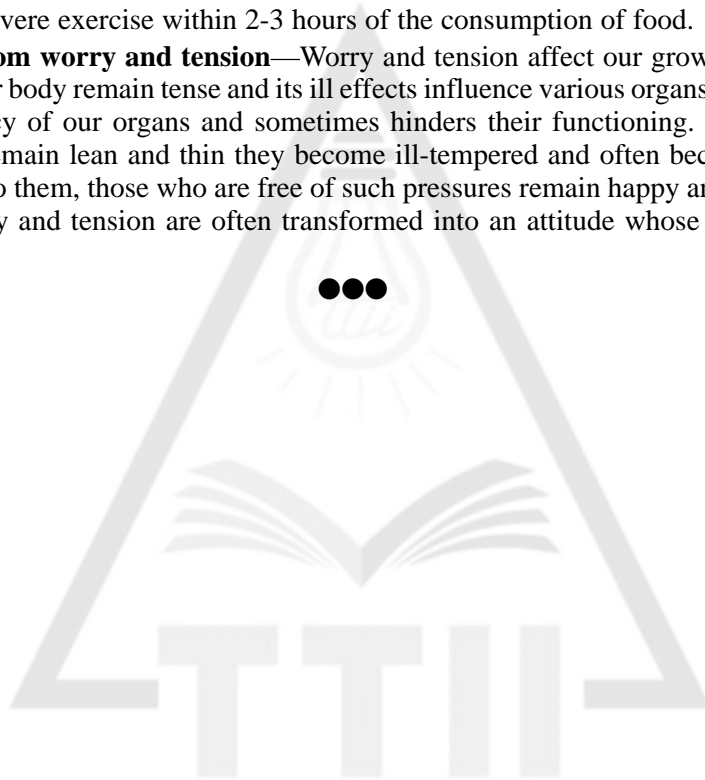
1. Improvement in shape and strength of muscles.
2. Growth and development of bones.
3. Improvement of circulatory and respiratory systems.
4. Improvement in our digestive and excretory systems.
5. Greater muscular coordination.
6. Mental stability due to the improvements in our nervous system.
7. Mutual adjustment between different systems of our body.
8. Prevention from disease.
9. Maintenance of flexibility and agility.
10. Aids in preventing obesity.
11. Prevention of premature aging.
12. Increasing life span.

#### **Rules for Exercise**

Whatever be the objective of doing exercise, be it for growth and development, for competition or for prevention of some disease, it should be done systematically and regularly. Irregular and unsystematic exercise may do more harm than good. Following rules should be observed while doing exercise—

1. One should perform exercise in open air.

2. Form and method of doing exercise should be based on the age, sex, profession and physical ability of an individual.
3. For balanced development of our body all parts should be exercised.
4. Load of exercise should be increased gradually by increasing time, speed and intensity.
5. Never attempt any severe activity without proper practice.
6. Warming up is essential before any hard work.
7. Never do exercise with jerks.
8. Exercise should be done according to one's capacity and it should be stopped before the onset of fatigue.
9. Proper rest is essential after exercise.
10. Exercise should be done regularly with suitable intervals.
11. Do not do severe exercise within 2-3 hours of the consumption of food.
12. **Freedom from worry and tension**—Worry and tension affect our growth and development. Because of worry our body remain tense and its ill effects influence various organs of our body. Tension reduces the efficiency of our organs and sometimes hinders their functioning. Children affected by worry and tension remain lean and thin they become ill-tempered and often become targets of some disease. In contrast to them, those who are free of such pressures remain happy and are generally stout in appearance. Worry and tension are often transformed into an attitude whose foundation is laid in childhood.





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## Chapter 10

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### CHARACTERISTICS OF INFANCY

*“Infancy or the period of newborn is the shortest of all the developmental periods. It begins at birth and ends when the infant is approximately two weeks old. This is the time when the fetus must adjust to life outside the uterine walls of the mother where he has lived for approximately nine months”.*

*—Elizabeth B. Hurlock*

**Q.1. What are the characteristics of infancy? Describe types of adjustments during infancy.**

**Ans.**

#### Characteristics of Infancy

In the words of **Elizabeth B. Hurlock**, *“Infancy or the period of newborn is the shortest of all the developmental periods. It begins at birth and ends when the infant is approximately two weeks old. This is the time when the fetus must adjust to life outside the uterine walls of the mother where he has lived for approximately nine months”.*

#### Two Periods of Infancy

The period of infancy is generally subdivided into two periods : the periods of the parturient and the period of the neonate—

**1. The Period of Parturient**—This is for the first fifteen to thirty minutes of postnatal life—from the time the infant emerges from the mother’s body into the world until the umbilical cord has been cut.

**2. The Period of Neonate**—The cutting of the umbilical cord marks the beginning of the second subdivision of the infancy period—the period of the neonate. At this time, the infant is no longer a parasite but has become a separate, distinct and independent individual. This period is characterized by making of adjustments to a new environment in the world outside the mother’s body.

Although the human life span legally begins at the moment of birth, birth is merely an interruption of the development pattern that started at the moment of conception. It is the graduation from an internal to an external environment. Like all graduations, it requires adjustments on the individual’s part. It may be easy for the infant to make these adjustments or so difficult that he will fail to do as **Miller** has commented, *“In all the rest of his life, there will never be such a sudden and complete change of locale”.*

#### Adjustments in Infancy

##### Criteria of Adjustment

**1. Medical Criteria**—The adjustment is completed with the fall of the umbilical cord from the naval.

**2. Physiological Criteria**—It is completed when the infant has regained the weight lost after birth.

**3. Psychological Criteria**—Adjustment is completed when the infant begins to show signs of development progress in behaviour. However most infants complete this adjustment in two weeks or slightly less. Those whose birth has been difficult or premature require more time.

Even in the case of difficult births, it seldom takes more than forty-eight hours for the fetus to emerge from the mother’s body into the world outside. By contrast, it requires approximately two

weeks adjusting to this new environment. In the words of Montague, “Birth is an event which embraces a vast number of critical changes which exercises an important series of influences upon the fetus about to be born and which prepare him for the new kind of life he will live outside womb”.

## Types of Adjustments

There are four major types of adjustments the infant must make before he can resume his developmental progress. His life will be threatened if he does not make them and make them quickly. There will be no developmental progress, while these adjustments are being made. Instead, the infant will remain on a plateau or may even regress to a lower stage of his development. The major adjustments he must make include adjustments to temperature changes, to breathing, to sucking and swallowing and to elimination.

**1. Adjustments in temperature changes**—In the sac in the mother’s uterus, there is a constant temperature of approximately 100°F. In the hospital or home, it will vary from 60° to 70°. The infant has to adjust to this change.

**2. Adjustments in breathing**—During prenatal life, the necessary supply of oxygen came from the placenta through the umbilical cord to the fetal body. With the cutting of the umbilical cord, oxygen must come from inhaling and exhaling air through the lungs. The lungs must be inflated before this is possible. This normally occurs with the birth cry. As first, breathing is irregular and imperfect. It must sometimes be supplemented with the administration of oxygen.

**3. Adjustments in sucking and swallowing**—During prenatal life, nourishment came in a constant supply through the placenta and umbilical cord to the fetal body from nutritive substances in the maternal bloodstream. As result, the fetus grew and developed at a rapid rate. After birth, nourishment must come from the infant’s sucking and swallowing.

These reflex activities are usually imperfectly developed at birth. Hence the infant often does not get as much nourishment as he needs. Consequently, he loses weight. He will get enough nourishment to regain his lost weight and resume the pattern of growth interrupted at birth, only after the reflexes of sucking and swallowing become more regular.

**4. Adjustments in Elimination**—During parental life, waste products, are eliminated from the fetal body through the umbilical cord and the placenta into the maternal bloodstream. After birth within a few minutes or hours the infant’s organs of excretion begin to function. This takes care of the elimination of waste products from his body.

## Difficulties in Adjustments

There are three major difficulties the infant has to face in adjusting to postnatal life. These difficulties include loss of weight, disorganization of behaviour, and the relatively high infant mortality rate.

**Q.2. What is the significance of the physical development of the infant. List the important characteristics of infant’s physical development.**

**Ans. Physical Development of the Infant**

The physical development of the infant is very important for a number of reasons. “*Healthy mind in a healthy body*” an old adage is true to the core. When an infant is busy in some physical activity, he is emotionally involved in it and is so mentally active. Physical development is important for the infant both for his individual and social development. Appropriate physical development makes valuable contribution to the personality.

The teacher will do well to remember that certain aspects of physical development have great educational value. Mostly they are concerned with the development of manual skills, proper use of eyes and ears for better perception, eye-hand coordination and finger dexterity, and use of large body muscles for ensuring good postures and active habits.

By not giving proper care and attention to the physical development of the infant, we may be guilty of causing serious handicaps to the total development of the child including his emotional, intellectual, social and even ethical and spiritual.

A knowledge of the process of the physical growth and development enables the teacher to equip him for setting his programmes according to the needs of his students.

## Dimensions of Physical Growth and Development in Infancy

Physical growth and development refers to a process which brings about bodily and physiological changes—*internal* as well *external*. Generally these changes take place in the following dimensions—

**1. Change in physical structure or physique**—These involve changes in terms of height, weight, body proportions and general physical appearance.

**Table-1 : Height and Weight of Infant and Children Upto 5 Years**

Age	Boys		Girls	
	Height in cm	Weight in kg	Height in cm	Weight in kg
Less than 3 months	56.2	4.5	55.0	4.2
3 months	62.7	6.7	60.9	5.6
6 months	64.9	6.9	64.4	6.2
9 months	69.5	7.4	66.7	6.6
1 year	73.9	8.4	72.5	7.8
2 years	71.6	10.1	80.1	9.6
3 years	88.8	11.8	87.2	11.2
4 years	96.0	13.5	94.5	12.9
5 years	102.1	14.8	101.4	14.5

(Source : Growth and Physical Development of Indian Infants and Children : Indian Council of Medical Research New Delhi, 1972)

**2. Changes in internal organs**—These are concerned with changes in the function of glands, nervous system and other body systems—circulatory, respiratory, digestive and muscular, etc.

**3. Changes in height and weight**—During the first three months, a child's overall height increases by about 20 per cent, nearly 50 per cent by one year and 75 per cent by age of two. Thereafter the growth is steady upto 11 years. By five years, the height of child, approximately becomes double and he acquires almost three times his birth weight. During the period of adolescence, there is sudden increase in both height and weight.

Weight of the brain increases rapidly in the early years of the life of child. By the times the child completes the age of four, his brain gains almost 40 per cent of its total weight. Another 10 per cent is added by the time he completes his eight years. The brain gains almost all its weight by the 20th year.

**4. Changes in body proportions**—There are changes not only in the size of the body of the child but also marked changes in the proportion of the different parts of the body. For instance, the head constitutes about one-fourth of the height of the body at birth. The size of the head is relatively much larger than the arms and legs.

**Q.3. Write shot note on—Linguistic Development of the Child.**

**Ans. Linguistic Development**

Studies show that the first word by the infant is uttered about one year of age (10 months). There may be delay in speech when children receive little reinforcement. The comprehension and speech depends on a number of factors, particularly the socio-economic background and parental

education. Verbal interaction between parent and child is less in the lower-class homes than in middle-class homes. The educated middle-class parent simulates his child linguistically by reading to him or discussing events with him.

By one year the infant knows about 3 words; by two years he knows nearly 300 words, by three years he knows nearly 1000 words and by five years he knows 2000 words.

The order of priority in language learning must be; listening-speaking-reading-writing. Of course learning to speak a language is the shortest road to read and write it.

There are four major tasks in learning to speak. They are pronouncing words, learning new words, connecting meaning with words and putting words together into sentences. All the four tasks improve during the early years of childhood. The amount of improvement depends upon chances to hear and guidance.

### **Ways to Improve Infant's Language**

1. Short sentences should be talked to them for a short time.
2. They should be encouraged to pay attention to these sentences.
3. Whenever a new word is used, it must be explained properly.
4. They should be asked questions to make sure that they understand.
5. Gestures and facial expressions should be used until the child's vocabulary is fairly large. They give more meaning to the words we use.
6. Every possible chance should be made use of to teach them new words and their meanings.
7. It should be ensured that the speech infants hear daily is correct so that they have good model to imitate.

#### **Q.4. Write an essay on—Care of Infants.**

**Ans.**

### **Care of Infants**

For the sake of convenience, the stages of the child, as it grows, are classified as follows—

**Infant**—Birth to one year.

**Pre-school child**—One to five years.

**School child**—Five to twelve years.

### **Infant Food**

Babies are fed with mother's milk, cow's milk, buffalo's milk, goat's milk, donkey's milk, mare's milk or camel's milk and we have the fable of Romulus and Ramus, the founders of the city of Rome having been fed by a she-wolf. In modern times we have artificial, tinned milk for babies, such as 'Cow & Goat', 'Ostermilk', 'Glaxo', 'Dumex', 'Lactogen' and the little Mother's milk is undoubtedly the ideal food for the baby. Where the mother is unable to feed the child, "wet nurses" are employed at times, if available; otherwise cow's milk is the most common substitute. Fruit juices also form part of the baby's food.

### **Kinds of Food**

**1. Human milk**—Mother's milk is the most natural and ideal food for the baby in the first year of its life. The composition of human milk best suits the human infant's digestion and rate of growth. It is the birthright of every infant to the breast-fed. The protein and fat in human milk are much more easily digested and absorbed than those of cow's milk.

Moreover, human milk is available at the proper temperature, there is no danger of bacterial contamination, and it is the healthiest. One need not have fear of errors in calculation and in the formulae for preparation as with tinned or fresh cow's milk. Further, human milk has antibodies which prevent children's diseases.

Psychologically, breast-feeding gives the baby a feeling of safety, security, protection and love, and the mother a sense of accomplishment. Breast-fed infants have a better chance of surviving the rather perilous years of early life than the less fortunate babies nurtured with artificial milk. The mortality rate is high in artificially fed infants, especially in the lower economic classes.

**2. Cow's Milk**—If for any reason the infant has to be reared on foods other than breast milk, cow's milk in a suitable dilution can be used, water being added for the dilution. To every four ounces of diluted cow's milk, one level teaspoonful of sugar should be added to make the milk more sweet, as cow's milk has less sugar than breast milk and dilution further reduces the percentage of sugar. Also sugar serves to supply energy to the baby. The dilution should vary according to the baby's age. In the first month it should be one part of cow's milk to two parts of water. Then, up to the third month, the proportion should be equal parts of water and milk. From the third month till the twelfth the water should be gradually reduced and the milk content in the feed increased. When the child completes one year of age, cow's milk can be given undiluted. It should be well boiled before being given, as boiling kills the germs and make the protein easily digestible. A few grains of sodium citrate or cereal water may also be added to make the protein form a softer curd in the baby's stomach.

**3. Fruit juice, fruit, etc.**—Fruit juice should also be given to babies. A small quantity of orange juice, strained, sweetened and diluted, is good for the baby as it is a source of Vitamin C. Tomato juice may also be given.

In addition, a few drops of Adexolin may be added to the feeds carefully. Cod liver oil, Vitamin C pills dissolved in water and a little iron in liquid form may also be given for additional nourishment.

Artificially-fed babies thrive well on bananas. The banana should be freed of fibres, mashed up in milk and then given to the baby. Banana feeds should be started only after the fourth month.

## Intervals of Feeding

A new-born baby's stomach can hold only about two tablespoonfuls of food. Therefore feeding must be frequent. The infant requires 2½ ounces of breast milk per day per pound of its body weight. Three-hourly feeds will be suitable for smaller babies. For larger babies, needing six feeds a day the schedule may be four-hourly feeds at 6 a.m., 10 a.m., 2 p.m., 6 p.m., 10 p.m., and 2 a.m. The 2 a.m. feed is not necessary after the second month. Water should be given between feeds from a bottle or spoon; but the intervals should be flexible. Rigid adherence to time schedule or feeding the baby whenever it cries is extremes, one as bad as the other.

If the baby is satisfied at the end of the feed, it falls asleep promptly and sleeps quietly for several hours. This is an indication of its having sucked milk to its heart's content. If the baby gains weight satisfactorily from week to week it will be obvious that it is getting enough milk and nourishment. Normally, the weight at birth of a well-fed, healthy child is doubled at the end of six months and trebled at the end of 5 years.

**Weaning**—Weaning is gradual process whereby breast feeding is substituted by artificial, feeding. It is considered that the eruption of the first incisor tooth is an indication to start weaning the child. Normally weaning should be done when the baby is nine months old. In India, because of economic conditions, most mothers do not take the child completely off the breast even when it is a year old. Weaning is done by giving one or two bottle feedings at six months, and progressively increasing the number.

One has to cautious about weaning in hot weather or when the baby is uncomfortable because of a cold or teething.

**4. Supplemental Food**—Supplemental food is added gradually according to the infant's age development, growth and physical condition. Yolk of egg in very small quantities is given to the baby when it is six months old. Cooked and strained vegetables are served. In South India *iddili* and *iddiappam*,



both steam-cooked foods, are also used for supplementary feeding of infants after six to eight months of age. Well boiled rice, sago, suji and plantains and white bread may also be used as supplementary foods. A child may also be given Ragi cooked into a gruel mixed with a little milk.

**Table-2 : Diet Schedule for a 10 Months Old Baby**

6 a.m.	1 glass of cow's milk.
7 a.m.	½ an iddily and 2 teaspoonsful of yolk of egg.
10 a.m.	1 cup of cow's milk with 2 tablespoonful of cereal such as Farex.
1 p.m.	Well mashed cooked rice with greens, and water to drink.
3 p.m.	1 cup of orange juice.
4 p.m.	1 rusk and a little of ripe banana mashed in milk.
7 p.m.	1 glass of cow's milk.

### **Choice and Care of Feeding Bottles**

Feeding bottles should be of heat resisting material, and transparent. The bottle should have openings at both ends to facilitate proper cleaning. If bottles with one opening are used the mouth, neck and bottom of the bottle should be large. The side should be smooth, rounded and without ridges. Round bottles are better. Nipples should not be of tough and rigid rubber, nor have large holes.

All articles connected with a baby's feeding should be kept clean to guard against illness. Bottles, nipples, etc., should be rinsed and cleaned thoroughly soon after use. Bottles should be brushed in soapy water to remove any oily matter and then washed in hot water. Nipples should be cleaned well. Brushes should be rinsed in clean water after use and dried. The feeding bottle should be boiled each time after use. Rinsing the bottle immediately after use is a healthy practice. The feeding bottle, and nipple should not be exposed to dust and dirt. The feeding bottle should be covered or immersed in water and the nipple kept covered in a container. If the nipples are kept in water, a teaspoonful of salt should be added to the water to prevent the nipples from getting soft.

Nursing mothers and nurse's should be very careful about their own personal cleanliness, apart from keeping clean the articles used for baby's feeding. They should not handle feeding bottles without washing their hands clean. Since babies are very susceptible to diseases, and have not as much resistance as grown-ups, absolute cleanliness must be strictly observed by mothers.

### **Food for the Pre-school Child**

By the time a child is one year old, all types of food in simple, easily digestible form will have been incorporated in his diet. He will get sieved cereals, tailed vegetables and fruit, yolk of egg, etc., in addition to milk.

Foods that can be chewed should be given towards the end of the first year and gradually increased during the second year. As the child grows and develops, his diet should be enlarged. New foods should be introduced as soon as his digestive tract can handle them successfully. In between meals, children should not have snacks as these spoil the appetite.

Usually by the time a child is one year old, he is on a three-meal-a-day schedule. During the second year, increased quantities of the food to which the child is accustomed will suffice. By then his tastes will have widened. Having become used to more solids, he may refuse milk. But he should be made to drink at least a pint of milk every day. Cod liver oil or any other rich source of Vitamin D should be given up to two years of age, especially if the baby is bottle-fed.

### **Baby Clothes**

Some mothers make elaborate preparations for the baby, long before it arrives—stitching sets of clothes, napkins, etc. Others get dresses made soon after it is born. Since there is not much difference



in the clothes for new born babies, boys and girls, there is no harm in having made beforehand. However, some people shy of doing so out of superstition.

Dressing her little darling is the pleasure of every mother. A baby's clothes need not be full of frills or elaborate, since baby's comfort should be the main criterion. His clothes are meant to protect him from colds and chills, while allowing enough freedom of movement for his limbs. Clothes should not be tight or they will hamper the circulation or breathing.

In the selection of a baby's clothes, his age and the climate should be taken into consideration. In warm weather the baby should be lightly clad and in cold weather, wrapped up well in warm clothes.

Baby-clothes should be so designed as to render the easy to put on and take off without discomfort to the little ones. They should be of thin, smooth, durable, soft, simple and washable material and whenever possible white in colour. A dress should open right down the back or front to enable the mother to slip it on with ease. Draw-strings should not be used especially at the neck, as they may get pulled tight by baby's movements and strangle him. Cotton is the best material for any clothing that comes in contact with baby's skin. Outer garments such as a sweater, a warm woollen cap, etc., may be used in cold weather.

All clothes worn during the day should be changed before putting a child to sleep at night. A loose slip or night-gown is excellent. Baby's clothes should be well-stitched, with strong seams and be attractive in colour and design.

**1. Diaper**—Using a diaper or napkin for the baby is a sound practice. It prevents the soiling of bed clothes, or baby's or mother's clothes. Diapers are best made oblong, 36 inches long by 18" wide. They can then be doubled to form a square and again folded to form a triangle. This is wrapped about the hips and between the limbs in the form of drawers. The ends are either pinned together or tied up in a knot which is easily untied. The several thicknesses of the napkin are advantageous in keeping the body warm and preventing moisture from penetrating and spoiling the outer clothing. Diaper material should be of soft absorbent cotton and not of bulky or thick texture.

**2. Napkin**—The napkin should be removed soon after the baby urinates or has a motion and a fresh one used. They should be kept clean, washed regularly and dried in the hot sun on a line. Soiled napkins should not be thrown about on the floor. They should be put into a covered pail and later on taken out and washed. This will prevent flies from carrying germs from them to the feeding bottles or food of the baby. If the napkins smell strongly of ammonia, they should be properly boiled and dried before use. Napkins should not be tied too tight around the baby's waist or they may hurt his tender skin. Rough or dirty napkin will cause diaper-rash or reddening of the skin around the groins and buttocks. They may even cause sores and blisters. After removing a wet napkin, the wet parts of the body covered should be gently wiped, with a soft cloth before a new one is tied or pinned on. It is a good thing to use bath powder during each change of napkin.

In very hot weather, a napkin is clothing enough for a baby, with a thin cloth spread over the chest.

Special care should be taken when changing napkins at night, since carelessness will affect the child's health. Wet napkins can cause a cold and lead on to more serious infections such as bronchitis and the like. When the child is trained in toilet habits, the diaper may be abandoned and drawers substituted. The drawers should be neither too tight nor too loose and cumbersome. They should be of soft material and not rough.

**3. Shoes**—A baby's shoes serve no other purpose than to give protection to his feet and make him look attractive and well dressed. During the crawling stage they protect his tender feet, especially if the floors are rough. The shoes used should be roomy and not so tight as to cramp his toes. They should be of soft leather, without heels, and be shaped exactly like the foot so as to fit comfortably. Socks, when used, should be of soft material. They should not crowd the baby's toes.

## Infant Baths

### General Rules

Almost all babies, unless they are sickly, enjoy having a bath. It is good for their general health, and they should be given at least one a day in warm water of a temperature of 37.8°C to 40.6°C. On very hot days they can be given more than one. Oil baths are also good for the baby, especially in hot weather, as they have a cooling effect. Bathing a baby should be done skilfully and carefully. It is good to be systematic about it, sticking to a particular time everyday. A baby should not be given his bath within an hour after feeding. It is better to give it just before the feed. If he has a bath and is then fed and put to bed, he will sleep well.

### Preparing for the Bath

It is wise to have everything needed for the baby's bath close at hand. The mother or the nurse who bathes the baby should have within reach the basin or tub or the plank on which the baby is bathed; a pitcher of water, soap, towel, change of dress, powder, etc. The water should be lukewarm. Only a mild toilet soap should be used. The room in which the baby's bath is given should be reasonably large, comfortably, warm, and sufficiently lighted. The doors and windows should be closed to prevent exposure to cold draughts. After the bath too, the baby should not be brought out of the room before it is properly dried and dressed; special care is necessary in cold and rainy weather, it is important to keep the baby warm at all times.

### Bathing the Baby

Babies are bathed in different ways in India; inside a basin or tub, as in western countries or laid on the mother's or nurse's lap or outstretched legs or on a plank.

The person who gives baby his bath should see that his neck and back are well supported since he cannot support them by himself. In soaping him, his body should be rubbed gently but vigorously to stimulate circulation. The soap must be carefully rinsed off afterwards. It must not be allowed to get into his eyes. While washing the hair and head, neither soap nor water should be allowed to run down the baby's face.

The baby should be dried with a soft towel. Mucus or dirt from the nose may be removed with the corner of the towel twisted like a wick, or with cotton twisted into a thread. When the skin is thoroughly dried, some talcum powder may be lightly sprinkled between the folds of the baby's skin, especially the axilla, elbow, neck, back of knees, groins and buttocks.

### Kinds of Bath

**1. Oil bath**—Peculiar to India is the oil bath for children, usually with gingelly oil. This is cooling and refreshing. Soapnut powder is not to be used for a baby's oil bath. Usually green gram powder is used to remove the excess oil.

**2. Sun-bath**—A sun-bath is not an absolute necessity in hot countries, though plenty of sunshine is good for a baby. Weather permitting, a sun-bath may be given, but care should be taken not to keep the child exposed to the sun too much, since it may have adverse effects. While sun-bathing a baby, great care should be taken to protect his eyes from too much glare.

### Provision of Fresh Air

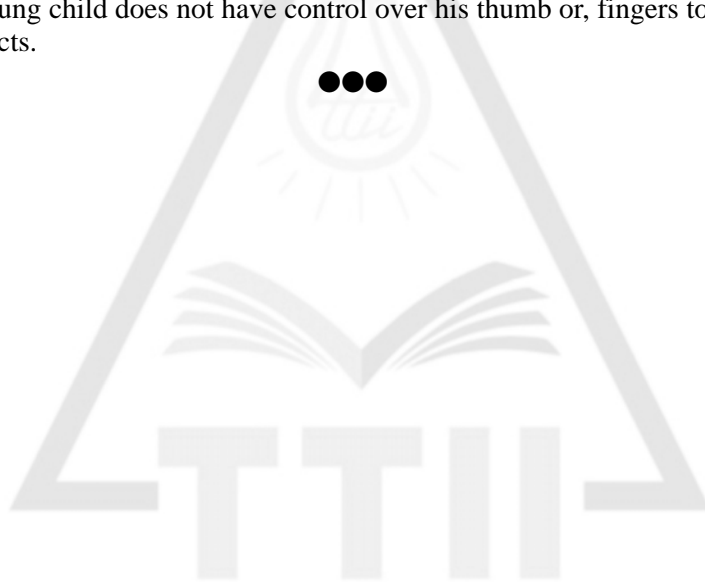
The baby should have plenty of fresh air. Rooms where children live and sleep, should be well ventilated. There should be enough natural light and the room should have a sunny aspect with open windows and ventilators. Taking babies for a morning or evening stroll in a perambulator or carrying them in one's arms is a good habit, as the child will get plenty of fresh air. However, the baby should be properly covered and sheltered alike from cold wind and hot sun.

## Infant Games

To a baby in the cradle, playing is just kicking the legs in the air and waving the arms. But as he advances in age, play becomes a serious affair, and proper selection of toys is necessary to enable the child to develop his muscular faculties. Since the objects with which a baby plays are important, toys and other such articles should be carefully chosen to suit his age and ability.

Babies generally enjoy bright-coloured, fairly large objects which can produce some noise. Rubber balls, animals, composition beads, rattles, wooden spoons, spools, small pails, small and large bells, are appropriate. They can manipulate such things as they like. They will feel them, roll them and shake them; drop them, pick them up, and repeat the action over and over again in an exploratory manner, till they are tired of them.

Since the sucking instinct is strong in babies, the natural inclination for them is to put objects in their mouths. Therefore care should be taken in the choice of playthings. The colours of the toys should not run, as the baby may suck them, which would be dangerous. Similarly the paint should not be such as can be rubbed off by the baby's gums, since, some paints cause lead poisoning. Toys should be smooth without too many ridges or sharp corners and without splinters. Pointed and sharp objects should be kept away or the baby may hurt himself by poking them into his mouth, nose, ears or eyes. Toys should be easily washable. Further; a baby's toys should not be too small for him to pick up or hold, since a very young child does not have control over his thumb or, fingers to the extent of getting a proper grip of objects.



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## Chapter 11

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## WATER

*“Water is an inevitable necessity of man. Without water man cannot survive. A man may live for a few days without food, but it is not possible for him to live for more than three days—without water”.*

**Q.1. What are the impurities of water and sources of impurities?**

**Ans.**

### Impurities of Water

Pure water means that water which does not contain any substance likely to endanger the health of its consumers. Impurities in water may be of two types—

**1 Chemical**—Dissolved impurities like gases; salts such as calcium, magnesium sulphates, etc.

**2 Bacterial**—These may include organisms, causing typhoid, cholera, dysentery and a severe form of jaundice.

The larval stages of certain parasitic worms live in water, or in water animals such as the water-snails. Spread of disease through these are particularly serious in some tropical countries.

There is also the possibility rendering the water supplies unsafe by accidental or deliberate contamination with chemicals or bacteria. A recent source of contamination and one which may assume much greater proportions in the future is that due to the disposal of radio-active water-products.

Therefore, the protection of water supplies is of utmost importance. The prevention of contamination should begin with the air, for rain falling through a heavily polluted atmosphere brings down with it impurities which, if not directly injurious to man, are certainly harmful to plants and other vegetable and animal life.

### Sources of Impurities

Water may receive impurities as much from the soil through which it flows as from the atmosphere through which it falls down as rain. Water of rivers, ponds and tanks, etc. may be polluted by the discharge of sewage matter or while it is stored in the storage tanks. Many times leakage in the distribution pipes might also pollute the water.

Some of the diseases that spread through impure water are typhoid, dysentery, cholera and hookworm. ●

**Q.2. Explain the methods of purification of water for drinking.**

**Ans.**

### Purification of Water

Water may be purified by either of the following methods—

#### [A] Natural Methods

1. Storage and sedimentation
2. Oxidation
3. Dilution.

#### [B] Artificial Methods

1. Physical—
  - (i) Distillation
  - (ii) Boiling

## 2. Chemical—

(i) Precipitation

(ii) Germicides

## 3. Filtration—

(i) Boiling

(ii) Domestic filters

(iii) Slow sand filters

(iv) Rapid filters or mechanical filters.

**[A] Natural Purification**

**1. Storage and Sedimentation**—When water is stored the bacteria are carried down to the bottom where they become entangled and die. Secondly the bacteria which settle down at the bottom are eaten up by lower forms of animals, e.g. fishes. Storage and sedimentation also help to purify water by getting rid of the photogenic bacteria which die a natural death in water stored for a long time.

**2. Oxidation**—Water in the rivers, ponds and lakes gets purified to a certain extent through absorption of oxygen.

**3. Dilution**—Small tributaries flow into big rivers thereby diluting the impurities. The impurities get so diluted as to lose all the poisonous and injurious effects.

**[B] Artificial Methods of Purification****1. Physical methods—**

(i) **Distillation**—The water is first changed into steam by heating it; the steam is then condensed into water by cooling. Water thus obtained is chemically pure, though insipid in taste. This method is chiefly used in ships and is not practicable on a large scale.

(ii) **Boiling**—The water should be strained, then boiled quickly from seven to ten minutes so as to kill all germs. It should then be poured into a clean *chatti* and covered with a piece of *mulmul*, clean plate or saucer. A clean dipper should be used to draw out the water when it is needed.

**2. Chemical Methods—**

(i) **Precipitation**—A precipitant like alum or lime is added to water and a precipitate is formed which settles down to the bottom and in so doing, entangles and carries down suspended matter and micro-organisms. One to four grains of alum per gallon or 60 to 240 mgm of alum per 4.5 litres of water should be enough. Alum is usually used before filtration as it hastens the settling down of the suspended impurities.

**(ii) Germicides—**

(a) **Potassium permanganate**—It oxidizes the organic matter. It is usually used for purifying well water. The quantity to be used depends upon the extent of impurities in the water: 28 gms of potassium permanganate in a bucketful of water is sufficient. It is poured down the side of the well. If the water turns brown it indicates that water is not pure as yet and more potassium permanganate should be added. Only when the potassium permanganate solution remains pink for 4 to 5 hours after being added to water, does it indicate that the water of the well is purified.

(b) **Copper sulphate**—It is useful for removing algae and other vegetable bacterial growth but not for destroying bacteria. One part in a million parts of water should be enough.

(c) **Lime**—It is a cheap germicide though a slightly weak one. A tank meaning 15 sq. metres requires about 6 kg. of lime.

(d) **Iodine**—One part of free iodine in 2,000 parts of water completely sterilizes the water in 10 minutes.

(e) **Chlorine**—It is used in the form of bleaching powder, and is very effective in sterilizing drinking water. Bleaching powder of good quality at the rate of 30 grams for 100 gallons of water should be used for effective purification. The amount of bleaching powder required

depends upon the impurities extent in water : the more, the organic matter the more the bleaching powder required because part of the bleaching powder is required to oxidise the organic impurities. This method of purification is cheap, reliable, easily applicable and harmless.

**3. Filtration**—The best ways are by boiling and by the use of filters.

(i) **Boiling**—The water should be strained, then boiled quickly for 2 to 10 minutes so as to kill all germs. It should then be poured into a clean chatti and covered with a piece of mulmul, clean plate or saucer. A clean dipper should be used to draw out the water when needed.

(ii) **Domestic Filters**—A common filter is the old fashioned 3 or 4 *ghurra* filter. This has 3 or *ghurras* in a stand. The charcoal catches some of the germs and others are caught in the sand and gravel. The trouble with this filter is that germs can live in dirty charcoal and so make the water worse than before. It is safest to boil the water after filtration. The charcoal, sand and gravel must be frequently changed and the *ghurras* must be renewed.

The best kinds of filters are the Berkefeld filter or the Filter bottle. In these filters the water has to find its way through the tiny pores in the porcelain. (The porcelain is like a *chatti*). Here the germs are caught. The Berkefeld filter is expensive and only small quantities of water can be treated at a time.

(iii) **Slow sand filtration**—In this process large shallow reservoirs containing sand and gravel serve as filtering media. Water is passed through them very slowly from above downwards. Water is first collected in large open reservoirs called setting tanks. Here it is allowed to stand for a few days till the solid suspended impurities settle down. After this, water is drawn out of the tanks and taken for filtration. Sometimes a coagulant is added which quickens the sedimentation and helps to kill bacteria.

Filter beds are about 365 cm deep airtight reservoirs, rectangular in shape, built of bricks and lined with cement. Filtering medium consists of 91 cm. of fine sand, 10-11 cm of coarse sand, 5-6 cm pf fine stones and pebbles, and lastly 15 cm of bigger stones. Below these are two layers of bricks arranged in such a way as to allow water to pass through. The water from the sedimentation tanks is brought to the top of filter beds from where it trickles down slowly.

(iv) **Rapid filtration**—Rapid filtration, as the name implies, is a much quicker process and at the same time is cheaper and more efficient. The process involves three steps : (a) coagulation; (b) formation of floe; and (c) filtration.

Impure water is allowed to stand in sedimentation tanks to enable the suspended impurities to settle down. From here water is taken on to a plant where alum is added. The water then passes down a pipe, where the coagulant is well mixed. The water now enters the coagulating chamber where flocculation takes place, thereby breaking the solid precipitate into small thread-like 'flocules'. The water now enters the rapid filters which comprise of iron or brick tanks full of sand, and is purified.

**Q.3. What is hardness and softness of water? How can these be removed?**

**Ans.**

### Hardness and Softness of Water

The most important dissolved impurities in water from the laundering point of view are compounds of calcium and magnesium, and in certain cases compounds of iron. The presence of these salts makes the water unsuitable for laundry and is known as hard water. The water free from the above-mentioned impurities is called *soft water*.

### Hardness

**Meaning**—Hardness in water is the power to kill soap. There can be no lather from soap until the hardness has been removed. When soap is added to hard water the salts of calcium and magnesium



react with the soap to form insoluble lime soaps, which form a paste or deposit on the surface. This reaction “kills” the soap and renders it useless for washing; the sticky paste traps dirt and deposits it back on the fabric in the form of black scum.

**Objective**—The object in preparing water for laundry work is to remove a large amount of hardness and for this purpose one should have an idea of its nature.

**Kinds**—There are two kinds of hardness in water: temporary and permanent. The *temporary hardness* is so called because it can be removed by boiling the water. It is due to bicarbonates of calcium and magnesium. On boiling, these soluble bicarbonates are changed into insoluble carbonates. These separate from the water in the form of sediment. The accumulation of this sediment is responsible for the scale or fur which forms in kettles and pans where hard water is used.

**Causes**—Permanent hardness is due mainly to sulphate of calcium and magnesium and, to a lesser degree to other compounds of calcium and magnesium. Both kinds of hardness can be removed from water by chemical treatment known as water softening.

**Removal of hardness**—Most water, contain both temporary and permanent hardness and the efforts should be made to remove all the hardnesses without leaving the water alkaline. The housewife may use washing soda, ammonia or borax to remove hardness. For large scale softening lime and soda may be used.

**1. Borax**—Borax if left in the water does not harm fabrics but it is useful only for softening water containing very little hardness.

**2. Ammonia**—Ammonia in solution also acts as a softening agent. However, if used in excess it will damage the lustre of rayon discolour and injure animal fabrics and loosen the dyes of coloured articles.

**3. Soap**—Soap may also be used as a softening agent but it must be remembered that it is an extravagant practice on account of the high cost of soap compared with washing soda.

**Removal of permanent hardness**—Sodium carbonates or washing soda removes both temporary and permanent hardness. It is inexpensive and easy to use; so this makes it the ideal substance for softening water in the home. However, care must be taken in the usage of correct amount of the chemical. The soda should be added to the water, allowed to dissolve and to interact with the hardness; then sufficient soap should be added to form a lather.



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## Chapter 12

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## NUTRITION

*“Nutrition must perforce be concerned with the social, economic, cultural and psychological implications of food and eating”.*

**Q.1. What is nutrition? Define different terms used in its context.**

**Ans.**

### **What is Nutrition?**

Nutrition is the Science of Foods, the nutrients and other substances therein; their action, interaction and balance in relationship to health and disease. It can be defined as the process by which the organism ingests digests, absorbs, transports and utilises nutrients and disposes off their end-products. Nutrition can also be defined as “food at work in the body”. *“Nutrition must perforce be concerned with the social, economic, cultural and psychological implications of food and eating”.*

### **Terms in the Context of Nutrition**

**1. Food**—It can be defined as anything solid or liquid which when swallowed, digested and assimilated in the body keeps it well. Like air and water, food is also basic to our existence. In fact, food is the primary concern of man in his physical environment throughout all recorded history. Food or the lack of it has greatly influenced the destinies of man. One must eat to live and what one eats affects to a high degree one's ability to keep healthy, to work, to be happy and to live well.

**2. Nutrients**—There are the constituents in food that must be supplied to the body in suitable amounts. These are proteins, carbohydrates, fats, minerals, vitamins, water and roughage.

**3. Nutritional status**—It is the condition (state) of health of an individual as influenced by the utilisation of nutrients in his body, it can be found out only by a careful medical and dietary history, a thorough physical examination and appropriate laboratory investigations. *It can be defined as the level of nourishment in an individual.*

**4. Nutritional care**—It is the application of the science and art of Human Nutrition in helping people to select and obtain food for the primary purpose of nourishing their bodies in health or in disease throughout their lives.

**5. Good nutrition**—Good, adequate and optimum are the terms applied to that quality of nutrition in which the essential nutrients in correct amounts and balance are utilised to promote the highest level of physical and mental health throughout one's life. ●

**Q.2. Why do the requirements of various nutrients increase during pregnancy and by how much? Explain.**

*Or*

**What is the importance of adequate nutrition in pregnancy?**

*Or*

**Plan a day's diet for a sedentary active pregnant woman (latter half of pregnancy) belonging to middle income group. Also calculate its energy and protein content.**

**Ans.**

### **Nutrition during Pregnancy**

In India, the mothers generally give more importance to the diets of their children and husbands. They themselves are usually satisfied with leftovers. They are more particular about the health of their family and in the process neglect their own nutritional needs. Nutritious food is not only important for

children and men but is equally important for women, otherwise their health would be affected adversely. This will reduce their capacity to work and they will not be able to look after their family properly.

The requirements of women are further increased during the periods of physiological stress, *i.e.*, pregnancy and lactation. If these requirements are not met with their health suffers adversely. Therefore, it is important for the mothers not only to look after the needs of their family members but also to take care of their own nutritional needs to keep themselves healthy.

### **Nutrition for Pregnant Mothers**

Pregnancy has its own significance in a women's life. Every mother wants her baby to start a healthy life for which the foundation is laid soon after conception. During pregnancy it is essential for the mother to take care of her health so that she can provide adequate nutrition for her growing foetus and she herself does not face any difficulty at the time of delivery.

Pregnancy is a condition when maximum changes take place in the woman's body. Due to rapid growth of the foetus mother's own tissue metabolism is enhanced greatly. Her body weight is also increased. In addition, extra body reserves of the nutrients are to be built (in her body) which can be utilized at the time of delivery and during lactation. Thus, there is an increase in almost all the nutrient requirements, especially energy, proteins, calcium, iron and various vitamins which should be provided through diet.

Thus, we can conclude that pregnant woman not only requires nutrition to fulfil her own demands but also for the growing foetus, for the development of her own body organs and some for body reserves. Despite all this, it is not right to say that a pregnant mother should eat for two. Her nutrient requirements are definitely increased but are not doubled. So, she should not eat more than what is required, lest she should become obese which in turn may pose many other problems.

If the pregnant woman takes adequate diet, most likely she will not face any difficulties during pregnancy and at the time of delivery. Not only this, the foetal growth and development will also be proper and she will deliver a full-term healthy baby. In contrast, if adequate nutrition is not provided, foetal growth is adversely affected and in most cases it may lead to premature child birth. Even if the child born full-term, improper growth and development may result in low birth weight of the baby. Poor nutritional status during pregnancy may lead to many other problems too.

Keeping in view the nutritional needs for pregnant women ICMR (1990) has given the recommended daily intakes of various nutrients for women in 2nd and 3rd trimester of pregnancy.

The table 1 clearly indicates that a pregnant mother needs more nutrients as compared to a normal woman. Now it becomes very important to know how to meet these increasing demands so that a healthy life can be started.

It is most important to meet the needs of energy, proteins, calcium, iron and vitamins of B group. Energy intake can be increased by increasing the amount of cereals and fat in the diet. Milk is a good source of protein, calcium and riboflavin, apart from which it also provides many other nutrients. In case of limited income, skimmed milk can be used which is not only cheap but also provides proteins and calcium in the same amounts. It is only low in energy and vitamin A which can be provided through other economical sources.

In addition to milk, proteins can also be obtained from other food items like pulses, groundnuts, soyabean etc. which are comparatively economical also. Meat, fish, chicken and egg etc. are the sources of good quality proteins but these are expensive and only non-vegetarians can eat them.

For iron, foodstuffs like egg, meat, liver and green leafy vegetables should be included in the diet. Use of whole wheat flour is also an important and cheaper source of iron. In addition to the above, seasonal fruits and vegetables can also contribute appreciable amounts of iron in the diet.

Keeping the above in mind, certain food items should be provided in increased quantities to the pregnant mother to meet her increasing demands. Thus, ICMR (1981) has recommended that the additional amounts of following food items should be provided to the pregnant mother as compared to her diet prior to pregnancy—

Cereals	35 gm.	Milk	100 gm.
Pulses	15 gm.	Sugar	10 gm.

Thus by providing these additional quantities of the suggested food items, the pregnant mother's diet should include following amounts of various food items per day as per her physical activity.

**Table 1 : Balanced Diets for Pregnant Women**

Food Items	Sedentary worker (gms.)	Moderate worker (gms.)	Heavy worker (gms.)
Cereals	445	475	610
Pulses	55	60	65
Green leafy vegetables	100	100	50
Other vegetables	40	40	100
Root vegetables	50	50	60
Milk	200	250	300
Ghee and Oil	20	25	40
Sugar and jaggery	30	30	50

**Note**—For non-vegetarian mothers, 2 eggs or 60 gm. meat can be included instead of 40 gm. pulses or 30 gm. meat or one egg can be provided in place of 20 gm. of pulses. Along with this, the amount of ghee or oil should be increased by 10 and 5 gm. respectively. ●

**Q.3. Explain in detail the nutritional needs of a lactating mother.**

**Or**

**Plan a day's diet for a moderately active lactating mother belonging to lower income group. Also calculate its energy, protein and calcium content.**

**Ans.**

### **Nutrition for Lactating Mother**

During lactation adequate nutrition is even more important because the infant derive all his nutrition from the mother's milk at least for the first few months. Generally, the child is fed on breast milk till 6 to 9 months. Thus, after delivery, mother needs additional nutrient till the child is breastfed. Hence during lactation the requirements of energy, proteins, vitamins and minerals are higher than that during pregnancy.

On the basis of the composition of mother's milk (Table 4) and that a mother generally secretes around 600-850 ml. of milk daily, we can easily estimate the increased nutrient needs of the mother during lactation.

**Table 2 : Composition of Mother's Milk**

Nutrients	Amount per 100 gm.	Nutrients	Amount per 100 gm.
Calories	65 Kcal	Protein	1.1 gm.
Carbohydrate	7.4 gm.	Fat	3.4 gm.
Calcium	2.8 mg.	Vitamin A	137 I.U.
Thiamine	0.02 mg.	Riboflavin	0.02 mg.
Vitamin	3 mg.		

Seeing to the importance of all this ICMR has suggested the amounts of various nutrients required for lactating mothers in their daily diets.

Lactating mothers need additional energy for the production of milk. In our country, a lactating mother generally produces 600-850 ml. of milk daily and thus her energy needs are increased accordingly. Most of these increased energy needs are to be provided through the diet but some calories are also provided by the fat stored in her body during pregnancy. The amount of fat stored in the body depends on her nutrition during pregnancy—however, in general about 4 kilogram of fat is deposited by the mothers. Therefore, ICMR has recommended that during first 6 months of lactation there should be an increase of 550 calories than her pre-pregnancy requirements and from 6 to 12 months of lactation an intake of 400 extra calories has been recommended. By increasing the amount of cereals, pulses, sugar and fat etc. in the diet of lactating mothers, the additional energy needs can be easily met with.

For the production of milk, protein needs also increase but at the same time it is essential that proteins of good quality are included in her diet. Milk and milk products should therefore be provided in her daily diet. Good quality proteins are easily available to the non-vegetarians but for vegetarians the amount of pulses, groundnuts etc. have to be increased. Pulses-cereal combinations can also be used to improve the quality of protein. Additional requirements of calcium, phosphorus, Vitamin A and D for the child are also fulfilled by these food items.

Milk is not a good source of iron, therefore, no increase has been suggested in respect of iron needs during lactation. However, adequate amount of iron in the diet is good for mother's own health. Therefore, one should make use of green leafy vegetables, eggs and whole wheat flour in the diet.

Keeping the above points in mind, the amount of certain food items should be increased in the daily diet of the lactating mother to meet her increasing demand. ICMR (1981) has recommended that lactating mother should take an additional amount of the following food items daily as compared to her diet prior to pregnancy.

Cereals	— 60 gms.	Ghee or Oil	— 10 gm.
Pulses	— 30 gms.	Sugar	— 10 gm.
Milk	— 100 gms.		

Thus, by providing these additional quantities of the suggested food items, the lactating mother's diet should include following amounts of various food items per day as per her physical activity.

**Table 3 : Balanced Diet for Lactating Mothers**

Food Items	Sedentary worker (gms.)	Moderate worker (gms.)	Heavy worker (gms.)
Cereals	470	500	635
Pulses	70	75	80
Green leafy vegetables	100	100	50
Other vegetables	40	40	100
Root vegetables	50	50	60
Milk	200	250	300
Ghee and oil	30	35	50
Sugar & Jaggery	30	30	50

**Note**—For non-vegetarians, changes can be made in the same way as suggested for pregnant mothers. ●

**Q.4. What is malnutrition and under-nutrition? What are its types? What are its symptoms, deficiencies and problems? How can malnutrition among children can be prevented and treated? What is the role of the school in this regard?** Or

**Suggest a suitable diet for children so as to avoid malnutrition.**

Ans.

## Malnutrition

**Meaning**—Malnutrition means insufficient and unwholesome feeding. When a person does not eat the right food or does not eat enough, he is said to be undernourished. In our country a large number of people are unable to get proper diet. They are ill-fed, ill-clothed and ill-housed. They are unable to give proper diet to their children with the result that they are malnourished. This affects their physical and mental health.

### Causes of Malnutrition and Undernourishment

1. Improper diet.
2. Insufficient amount of food.
3. Poor preparation of food.
4. Irregular mealtimes.
5. Random lunching and snacks.
6. Worry or psychological disturbances-parental coercion.
7. Digestive problem or disease.
8. Excessive activity interfering with meals.
9. Inadequate rest.
10. Mealtime tension in the home.
11. Wrong examples set by others.

### Symptoms of Malnutrition

#### [A] Physical Conditions

1. Bad postures.
2. Laziness.
3. Easily fatigued.
4. Susceptibility to disease.
5. Pale and charmless face.
6. Drowsiness.
7. Under-weight.

#### [B] Mental Conditions

1. Gloomy nature.
2. Un-enthusiasm.
3. Forgetful memory.
4. Lack of concentration.
5. Slow comprehension.
6. Irritability.

### Deficiencies and Problems of Malnutrition among Children

1. Failure of the child to grow or gain weight.
2. Slowness in talking, thinking or walking.
3. Thin arms and legs.
4. Swollen bellies.
5. Sadness.
6. Lack of energy.
7. Swelling of face, feet and hands.
8. Often marks or sores on the skin.
9. Thinning or loss of hair or loss of its colour or shine.
10. Dryness of eyes and sometimes blindness.
11. Loss of appetite.
12. Desire to eat dirt.
13. Night blindness.

### Diseases Especially Infections Caused by Malnutrition or Poor Nutrition

**1. Diarrhoea**—Poorly nourished children are much more prone to severe diarrhoea and also to die from it than children who are well nourished.

**2. Meals**—These are especially dangerous in children who are malnourished.

**3. Tuberculosis** is more common and gets worse more rapidly in those who are undernourished.



**4. Minor problems**—These include the common cold are often worse and last longer children who poorly nourished.

Wet Malnutrition or Kwashiorkor	Dry Malnutrition or Marasmus
<ol style="list-style-type: none"> <li>1. Swollen 'moon' face</li> <li>2. Miserable</li> <li>3. Growth stops</li> <li>4. Sores and peeling skin</li> <li>5. Swollen hands and feet</li> <li>6. Colour loss in hair and skin</li> <li>7. Thin upper arms</li> <li>8. Wasted muscles but may have some fat</li> </ol>	<ol style="list-style-type: none"> <li>1. Face of an old man</li> <li>2. Always hungry</li> <li>3. Pot belly</li> <li>4. Very underweight</li> <li>5. Very thin</li> </ol>

Often a child may indicate the signs of wet malnutrition as well as dry malnutrition.

## Prevention of Malnutrition among Children

Malnutrition can be prevented and treated by giving children enough body-building and protective foods like milk, beans, lentils, fruits, vegetables, eggs, meat and fish. Following are some of the measures for checking malnutrition—

1. Maintaining a balance diet, concentrating on high-calorie food.
2. Using inexpensive but nutritional food items and getting good foods at low cost.
3. Regular mealtimes.
4. Well prepared and attractively served foods.
5. Adding light snacks between meals and at bed time.
6. Making mealtime environment calm, cheerful and encouraging.
7. Supplementing school meals.

**Q.5. Bring out the need for supplementing diet by the school. Briefly describe the role of various agencies in providing meals for children. Suggest remedies for malnutrition. Or What is the significance of school meals? How can they supplement children's diet? What steps should be taken for making the best use of this scheme?**

**Ans. School Meals**

It is now generally recognized that in view of under-nutrition and malnutrition of the most of the Indian children, the school must take up the responsibility to make up this deficiency. This will not only assist in improving the health and physical development of the child but also assist him in making quicker and sounder progress in his learning because a child who is better-fed and healthier makes rapid progress. It is, therefore, essential that we must develop a universal programme of school meals as an integral part of its programme of universal, free and compulsory primary education.

Properly organised school meals also help in developing good social and individual habits. Children get training in community living.

## Contents of Mid-day Meals

The School Health Committee (1960) recommended that it should be based on cheap, nutritious and locally available foods. A menu may comprise a minimum of cereals and millet—2.5 oz; pulses—1 oz; non-leafy vegetable—1 oz; oil— 1/4 oz; and condiment and salt.

## Storage, Preparation and Distribution

It must be stressed that food should be prepared and served under proper hygienic conditions. There should be adequate storage facilities and also adequate space for feeding of children.

## **Subsidy by the Government**

The committee recommended that the Government should support the school meal programme besides the contribution of the community at the rate of 50 percent of the total cost.

## **Various Supplementary Food Programmes**

**1. Special Nutrition Programme (SNP)**—This programme was launched in 1970-71 to provide supplementary nutrition to children below six years of age and expectant nursing mothers living in rural slum, tribal areas and backward rural areas. Under the programme supplementary feeding is given for 300 days in year to provide about 300 calories and 10 grams of protein per child per day and about 500 calories and 20 grams of protein to a mother.

**2. Wheat Based Supplementary Nutrition Programme**—The programme has two components—Centrally, funded component and State funded component. Under the Centrally funded component, central assistance for the programme, consists of supply of free wheat and supportive costs for other ingredients such as sugar, pulses, oil, etc. to make different kinds of recipes and also to meet expenditure on cooking and transport, etc. Assistance to State Government is given at the rate of 75 paise per beneficiary per day for 300 days in a year, including the cost of wheat. This programme is being implemented in 16 States and 3 Union Territories to cover about 30 lac beneficiaries in ICDS areas.

**3. Balwadi Nutrition Programme (BNP)**—This programme has been implemented since 1970-71 through the Central Social Welfare Board and four national level voluntary organisations including the Indian Council of Child Welfare. About 5600 Balwadis are being provided with supplementary food and about 2.29 lakh children in the age group of 3-5 years are covered.

## **Remedies for Malnutrition**

The following steps may be taken to prevent malnutrition of school children—

**1. Pleasant home and school environment**—The home and school environment must be as neat and clean as possible. Kitchen, dining room and lavatories should receive special attention.

**2. Mid-day meals**—Provision should be made to provide nutritious mid-day meals to students in the school.

**3. Medical examination**—Arrangements should be made for the medical examination of each student, at least once in a year. This duty should be entrusted to the school medical officer, school nurse and the school health educator.

**4. Imparting knowledge of personal hygiene and health**—During school hours, adequate stress, should be given on imparting good knowledge of personal hygiene and health to students of all grades by subjects teachers in general and the health educator in particular.

**5. Stress on the importance of balanced, well-cooked and tasty food**—Students should be told again and again that a mixed diet, containing almost all important constituents, should be taken by them. It should be hygienically cooked and delicious in taste. But anything and everything should not be taken for the sake of taste alone.

**6. Leading regular and balanced life**—Mental work, physical activity, rest, sleep and recreation all should have their proper places in an individual's daily life. Work alone or rest alone is injurious. Then meals should be taken regularly and punctually. As far as possible, alcohol, tobacco and harmful drugs must not be taken. Such useless things have no nutritive value.



## Chapter 13

### FIRST AID

*“The first aider should be trained, active, tactful, kind-hearted and intelligent enough to handle all serious and non serious situations, promptly and accurately, until proper medical aid is received”.*

**Q.1. What is First-Aid? Explain First-aid for broken bones.**

**Ans.**

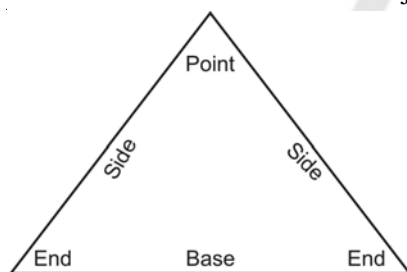
#### What is First Aid?

According to the Concise Oxford Dictionary, “*First aid is the help given to injured person before the doctor comes*”. This means that the person giving first aid is not a doctor. He, however, is very well conversant with the rules of first aid. First aid is itself a science and an art. It requires both knowledge and practice.

#### First Aid for Broken Bones

##### Slings and Bandages

Everyone should know how to fold and apply a triangular bandage (Figure 1) and how to put on an arm sling. A metre square of strong cotton cloth cut diagonally across from corner to corner will form two bandages; or a large handkerchief may be folded and used without cutting. It may be used as an arm sling when there is injury to the hand, or when arm necessitates its being raised to prevent their flow of blood downwards. In order to put on a sling, place one end so as to hang a few centimetres over the front of the shoulder on the injured side. Take the bandage behind the neck, bring it over the other



**Fig.1. Triangular Bandage**

shoulder, spread it out on the chest with its point towards the elbow of the injured arm. Bend the arm on the middle of the bandage. Bring the hanging end outside the injured arm up to the other end hanging over the front shoulder and tie the two ends with a reef knot. With two safety pins, secure the point at the elbow to the bandage on the outside.

By folding the triangular bandage with its point to the base and then folding it in two, as in Figure 2, a broad bandage is obtained. If folded in three, a medium bandage is obtained. By folding a broad bandage into two a narrow bandage is obtained. The broad bandage may be used for a sling, instead of the unfolded triangle.

##### Broken Bones : Fractures

If anyone falls and breaks a bone, the broken ends must be put closely together and held in that position. Otherwise they cannot knit together again. If the patient has to be moved, care must be taken not to displace the broken ends nor allow them to lacerate the flesh. If the skin is broken, apply an antiseptic to prevent the entrance of pus-forming bacteria.

There are many kinds of fractures. According special methods of bandaging must be applied to the position of the broken bone. Wrap a bandage around the broken limb. Then place splints around it and tie them to the limb to keep it straight and steady. If nothing is available, strap the broken leg to the

uninjured leg, or the broken arm to the side of the body. Slip a blanket carefully under the patient; place two poles on either side and tie the blanket to, or roll the edges round the poles. A stretcher is thus formed. Carry the patient home on this stretcher. Keep his broken limb straight until the doctor comes or the patient reaches the hospital.

## Dislocation

When a bone gets out of place it is usually because the ligaments have been broken around the joint. It takes a skilful person like a physician to put it back into its place. Call a doctor at once to do this, before the joint becomes more swollen. The bone must be kept in place. Remove the clothing and place the limb on a pillow and apply a cold water dressing. If that does not relieve the pain, apply a hot cloth. Keep the patient warm. The limb must be bandaged.

## Sprains

The most common form of sprain occurs when an ankle is turned too far, thus pulling the ligaments away from the bone. It heals when new ligaments form taking the place of the broken or torn ones, but it often takes a long time. Treat sprains as you would treat dislocations. Stroke the injured part, pressing the blood up towards the body. Bandage carefully and exercise as soon as the pain stops. Otherwise the joint will become stiff.

### Q.2. Describe First Aid in Bleeding.

Ans.

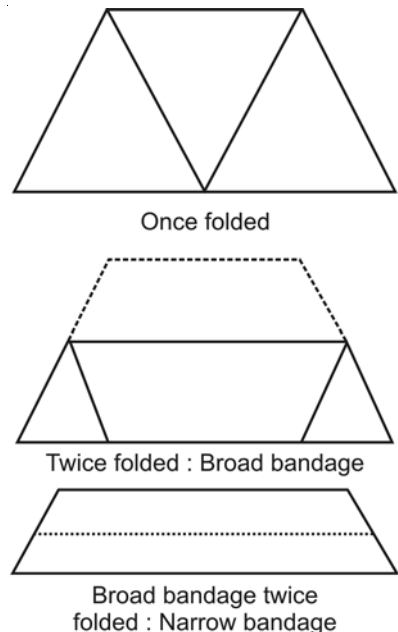
### First Aid in Bleeding

The fresh blood with new oxygen in the red corpuscles comes away from the heart through the arteries and, therefore, its colour is bright red. In contrast, the blood in the veins, having lost its oxygen appears dark. The heart pumps the blood into the arteries in jumps. With each beat of the heart the blood jumps into the arteries. However, the blood flows steadily in the veins.

When any type of bleeding occurs, send for the doctor at once. In the meanwhile, if an artery is cut, it would be necessary to stop the flow from the direction of the heart. If a vein is cut control the flow from the direction farthest from the heart. How can this be done? First stop the bleeding by pressing hard with your finger above the cut. If it is an artery, tie a cloth tightly around the limb, between the cut and the heart, if possible, where an artery passes over a bone. Make a knot with the cloth so that it will lie on top of the artery. If this is not sufficient, put a pad or a coin under the knot. To make the binding very tight put a stick through the cloth and twist it. A bandage thus twisted tight is called a *tourniquet*. Do not let a tourniquet stay for more than twenty minutes without loosening it for a moment. Raise the part of the body that is bleeding. When you loosen the tourniquet press your finger over the artery to keep it from bleeding. Tie the tourniquet again until the doctor comes. The treatment for a bleeding vein is similar. The only difference is that the pressure should be on the part farthest from the heart, between the extremities and the wound.

Internal bleeding, called *internal haemorrhage*, needs the immediate attention of a doctor. Till the doctor comes, keep the patient lying flat, undo all the tight clothing, give fresh air and fan him. Give ice to suck or cold water to drink. Apply an ice bag locally if the seat of the injury is known. If the patient faints rectify that with suitable treatment, but give no stimulant to drink.

Although the blood vessels in the skin respond very readily to changes of temperature, heat or cold tend to coagulate the blood and check its flow. The application of slight warmth on the skin brings



**Fig. 2. Folding a triangular bandage**

the blood to the surface while the application of cold drives it to the internal organs. That is why in headaches and sprains, where the pressure of excess blood causes heat and pain, we apply ice. On the other hand where pain is felt internally, we apply, hot fomentations to draw the blood to the surface. When the skin is exposed to sudden chills, the blood rushes inwards, and something sets up inflammation which brings about a condition favourable to the development of a cold. Under such situations, a hot mustard bath for the feet will draw the blood downwards from the overheated internal regions and help to check the cold.

If the nose bleeds, do not let the patient lie down but keep his head up. Let him sit in front of the window with arms up and get someone to hold them so. He must breathe through his mouth instead of the nose. Place a cold, wet cloth (ice is better) over his nose and also at the back of his neck. Place his feet in hot water. Sometimes bleeding will stop, if he puts a wad of paper between his upper lip and teeth, and then presses on me outside. In small cuts, the bleeding is stopped by the clotting of the blood. Do not let the patient wash away the clot or blow his nose. Then the bleeding will begins again. He can stop the nose from bleeding by compressing the nose between the finger and thumb for ten minutes. ●

**Q.3. Explain First Aid for choking.**

**Ans.**

**First Aid for Choking**

Sometimes, in the act of swallowing food, a person laughs or coughs, thus letting the food slip past the epiglottis and enter the trachea, instead of the oesophagus. This causes him to 'choke'. Usually a thump on the back, with the head forward and arms lifted, will be sufficient to dislodge the obstruction. Coughing will sometimes bring it up. If the choking persists, let him force the forefinger as far down the throat as possible and pull out the obstacle but avoid forcing it further down.

If a child swallows an article, such as a button, that sticks in his throat, hold him upside down and slap him on the back, sometimes you can pull the article out with forceps. If breathing ceases, try artificial respiration and send for the doctor at once. ●

**Q.4. Describe First Aid for drowning.**

**Ans.**

**First Aid for Drowning**

**Asphyxia**

People drown because water cuts off the air from their lungs. Therefore, in any case of drowning, our aim must be to get air into the lungs as quickly as we can. First, drain the water from the lungs by lifting the patient, face down, and jerking the body repeatedly and quickly. A heavy person may be rolled over a barrel.

The next step is to fill the lungs with air. Act quickly and make a pillow of anything available and lay the patient face down, with the pillow under his chest. Loosen his garments at the neck and waist. Start artificial respiration. Stand or kneel astride the patient and place your hands over his lower ribs on each side. Press down steadily, with the weight of your body on your hands, to drive the air out of the lungs. Then relax the pressure without removing your hands, thus allowing the air to come into the lungs again. Again press the air out, and again remove the pressure, but not the hands. Repeat this action fifteen times a minute and keep it up until the patient revives. Do not give up hope for two hours at least.

If there is someone to help, let him rub the limbs along the veins, in the direction of the heart, thus forcing the blood to circulate. Keep the body warm in all the ways possible, with blankets, hot water bottles, hot stones wrapped in cloth, or hot sand in a bag. Place one at the head but avoid having the bag too hot.

When the patient begins to revive and can swallow, let him drink strong hot coffee. A little alcohol or sweet spirits of ammonia in water are good stimulants. Change his clothing and keep him warm.

In the case of suffocation, the same trouble exists—lack of oxygen in the lungs—and therefore artificial respiration is necessary. Whenever breathing ceases, by reason of shock, asphyxiation or choking, try restoration by artificial respiration.

When poisonous, gases have been inhaled, remove the patient to fresh air. Sprinkle cold water on his face. ●

**Q.5. Write a short note on—First Aid for electric shock.**

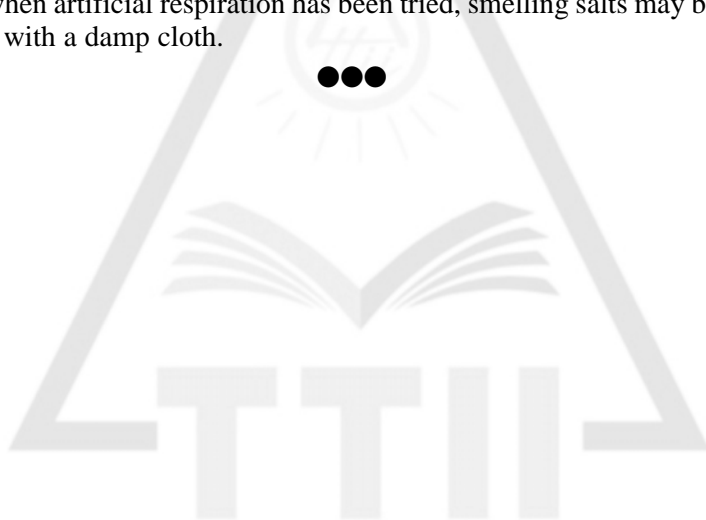
**Ans.**

### **First Aid for Electric Shock**

If the patient is touching a wire or an electrified rail, cut off the source of electricity immediately. If not, remove the patient. The human body is a conductor of electricity so that your body touching the patient's body while touching the source will immediately become electrified. Thus, far from helping the patient, you will fall unconscious and need help yourself. Therefore, stand on wood or a dry coat, a rubber mat, or some layers of dry newspaper, and push his body, away with a dry stick, or pull it away quickly with your hands thickly covered with some dry, non-conducting material like rubber, dry cloth or newspaper. If you want to cut the wire, cut on both sides of the patient with an axe which has a dry wooden handle. When the patient is disconnected from the source of the electric current, you can handle him without danger. Then, give artificial respiration if needed.

A person struck by lightning should be treated at once with artificial respiration. Sometimes pouring buckets of water on the bodies of lightning-struck animals helps in their recovery.

In all cases when artificial respiration has been tried, smelling salts may be applied to the nose, and the chest flicked with a damp cloth.





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## Chapter 14

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### PROVISION OF PURE WATER AND AIR IN THE SCHOOL

*“Ventilation on provision for letting in fresh air is essential, Sunshine give sufficient health throughout the year”.*

**Q.1. Describe and explain the provision of pure air or ventilation in school.**

**Ans.**

#### **Provision of Pure Air**

#### **What is Ventilation?**

Ventilation is a process by which the products of respiration and combustion are removed from an enclosed space as for instance, a room, by supply of fresh air. In other words, it is the removal or dilution of the air which has become warm, moist and stagnant by air which is drier, cooler and circulating. This process of exchange is known as internal ventilation. But to admit fresh, pure air into houses it is necessary that the outside air (in street and surrounding area) should also be clean. Keeping the outside air pure and in circulation is called the process of external ventilation. In order to have adequate internal ventilation, it is essential to have adequate external ventilation also.

#### **Methods of External Ventilation**

Efficient external ventilation may be brought about by the following methods : (a) speedy removal of street and other refuse; (b) minimizing smoke nuisance; (c) keeping plenty of open space between houses; (d) having parks and open lawns; (e) having industrial areas away from the residential quarters; and (f) careful inspection of all drains and sewers. Houses built back to back or with courtyard where cattle are hygienically not desirable. Plenty of open space in front or all rounds must be provided for each house. The streets and roads, should be sufficiently broad. For ventilation to be effective the following factors should be taken into consideration: (a) size of the room; (b) number of persons living in the room; (c) heat stagnation produced by lack of air movement; and (d) water vapour content. An average adult requires about 3000 cubic feet air per hour and a child requires about 2000 cubic feet of air per hour. In a community, about 3000 cubic feet of air per hour per person is sufficient. Animals require about 10,000 to 20,000 cubic feet of air per hour, this works out to 23 to 25 cubic feet of air approximately per hour for every pound of their body weight.

#### **Space Requirement**

Sufficient floor space for each person in a dwelling is an important factor for proper ventilation. Where the floor space is inadequate, it leads to overcrowding, overheating, excessive humidity, air stagnation and defective ventilation. The spread of droplet infection is facilitated by shortening the path which the germs have to travel from one person to another. In ordinary houses the floor space for a single person should be 150 square feet or so. It should be noted that where the cubic space is large there is less need for a frequent changing of air. For example, for a man occupying room having an area of 100 cubic feet, the air should be changed thirty times per hour in order to provide 3000 cubic feet of air, while the air needs to be changed only thrice if the man is occupying area of 1000 cubic feet.

## Natural System of Ventilation

The natural system of ventilation depends on three factors—

1. Wind,
2. Difference in temperatures,
3. Diffusion of gases.

**1. Wind**—Wind is powerful ventilating agent. It forces itself into the room through open doors, windows and even through porous bricks as a result of the movement of natural air current. Simultaneously, as the air moves, it drives the air before it lessens the pressure around it and causes the surrounding air to move towards it.

**2. Difference in temperature**—According to the law of physics heat expands a substance, whereas cold contracts it. Thus if the air of a room is heated, it expands and becomes lighter in weight. It then rises up and escapes through the openings. The outer cooler air rushes in through every available opening to take its place till the temperature becomes constant. But the incoming air in its turn becomes heated, expands, rises up and escapes. Thus a constant current of air is always maintained. This coming in of the cool fresh air is called draught and takes place easily when doors and windows are placed directly opposite one another. When wind blows across the top of a chimney, it suck up the bad warm air from inside so that an open chimney, even when a fire is not used, helps to ventilate a room.

**3. Diffusion of gases**—Diffusion is the tendency of gases to mix when in contact. The fragrance of a perfume in a corner of a room, or a little petrol vapour spreads in a short time and the smell pervades the whole room. When doors and windows are open, even if there is no wind blowing, the inside air and the outside air mix and dilute the impurities.

## Types of Natural Ventilation

The openings through which ventilation is carried out are known as inlets and outlets. Inlets are intended for the entrance of pure air and the outlets for the escape of impure air.

**1. Inlets**—These may be in the form of doors, windows and special openings at floor or roof level or in the wall. Doors and windows should be kept open and placed opposite one another so that fresh air can pass through the room. The special openings are important in cold countries so that cold air from outside does not suddenly rush into a room.

**2. Outlets**—These are usually near the ceiling so that warm impure air which is lighter in weight and rises up can escape out of a room. Outlets and inlets should preferably be of the same size and placed opposite one another so that air can enter through the inlet from one side and flow out through the outlet from the other.

## Chimneys

Chimney is an excellent and most efficient outlet. When the fire burns in the chimney, air surrounding the fire gets heated and is drawn up through the chimney, while to take its place fresh air flows towards the fire place from the rest of the rooms. Thus a current of air is set up. Secondly the wind blowing over the top of the chimney lessens the pressure of the air in the chimney, producing an up draught while fresh air is drawn into the room to take its place.

## Ventilators

Ordinary ventilators placed near the ceiling and working on a hinge, act as outlets for impure air.

For terraced roofs, *i.e.* roofs over which there is no building, the best plan is to have a longer—about 9-10½ inches—pipe fitted into the roof and covered with a wire gauge or an ordinary cover. Foul air rises up through the tube and escapes at the upper end.

Rooms with sloping roofs can have outlets along the top of the wall as in the case of Indian huts.

Windows placed opposite each other serve both as inlets and outlets. ●

**Q.2. Write a short note on—Artificial Ventilation.**

**Ans.**

### **Artificial Ventilation**

#### **Meaning**

Artificial ventilation is the method of ventilation in which special mechanical devices are used either to force the fresh air into the room, or to extract the foul air from the room, or a combination of both.

#### **Uses**

Artificial ventilation is used for supplying fresh air to large buildings, like lecture halls, theatres and factories occupied by many people at a time.

#### **Methods**

There are three main methods of artificial ventilation—

1. Vacuum system.
2. Plenum system or propulsion system.
3. Balanced system.

**1. Vacuum System**—Mechanical means are employed for extracting the foul air out of the room. The air is drawn out by means of exhaust fans. These fans suck the air out of the room.

**2. Plenum System or Propulsion System**—The air is driven into the rooms by mechanical forces like fans and blowers. It is necessary to note that the air in this method should be introduced at a lower level, whereas the foul air should be extracted from the higher level.

The advantages of this system are as follows—

- (a) Source of air can be selected.
- (b) Amount required can be regulated.
- (c) Temperature of air can also be regulated.

The disadvantage is that the air or driven in loses its freshness which the fresh, free circulating air has.

**3. The Balanced System**—The combination of the vacuum system and the propulsion system is known as the balanced system. This is the most satisfactory method. It is used for ventilating large houses and halls with extensive seating capacity.

#### **Advantages of the Artificial System**

1. Control over the air can be maintained and can be conveyed to any point.
2. The air can be washed, purified, warmed or cooled as desired.
3. It is a quick and useful method.

#### **Disadvantages**

1. Air may lose some of its freshness in its passage through long tubes.
2. It is rather expensive to install any of the mechanical devices.

**Q.3. What should be done for provision of pure water in the school?**

**Ans.**

### **Provision of Pure Water in the School**

For provision of pure water in the school, the following steps should be taken—

1. Sources of water should be clean and reliable.
2. Water should be stored in clean and closed utensils.
3. Water stored should be changed occasionally.
4. Taps of water should be easy to operate and good in functioning.
5. Steps should be taken to purify water before supply, if there is the slightest doubt in its purity.
6. Storing pots and sources of water should be checked occasionally and strictly.



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## Chapter 15

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### PHYSICAL DEFORMITIES AND THEIR PREVENTION

*“Proper exercise is as much necessary as the food, fresh air or water for the body. If body is healthy mind also remain healthy”.*

- Q.1. Identify the different measures for the prevention of physical deformities among children at the school stage.** *Or*  
**Examine common physical deformities and suggest remedial measures.** *Or*  
**What are the physical deformities common among the school children? Suggest some remedies for their prevention.**

**Ans.**

#### **What is a Deformity?**

Any abnormal condition of the body acquired due to some accident or disease or congenital present at birth may be termed as a deformity. Deformities are handicapping defects that lower physical efficiency and cause poor emotional, social and scholastic adjustments.

A child with physical deformity is a handicap in one way or the other. Though basically he is a normal child except for is deviation. He is a normal child with a special problem. He may deviate from the normal child in mental and physical equipment but he has the same interests, desires, ambitions and potentialities as the normal children have.

He needs to be treated as normal child in the family and normal student in the class. He is entitled to every service and adjustment facilitating his growth. The members of the family and teachers in the school should not treat him as an inferior child.

#### **Types of Deformities**

Physical deformities are of two types—

**1. Functional Deformities**—In these the soft tissues, muscles, ligaments or organs are affected and deformities like defective vision, defective hearing, defective speech, cleft palate, hare-lip, club foot, etc. are caused. These deformities can be congenital or due to some injury, disease or accident.

**2. Structural Deformities**—These occur when the body structure is affected or changed. These can also be congenital or caused due to acquired reasons, like disease, accident, malnutrition, bad habits or some injury. Structural deformities include all postural deformities like dislocation of the hips, bow legs, deformities of the spine, kyphosis, lordosis, scoliosis, head and neck deformities. ●

- Q.2. Describe types, causes and remedies of deformities of vision.**

**Ans.**

#### **Common Physical Deformities**

**Deformities of the Vision**—These are very common amongst school children. Sometimes the child is ignorant about this deformity and only the physical examination by a doctor brings the defect to notice. Generally students have the following vision problems—

1. Short sightedness or myopia;
2. Hypermetropia or long sight;

3. Semi-blind;
4. Blind; and
5. Squint.

The teacher can detect these defects of the vision by observation if he has this possibility in mind.

#### **Symptoms of Affected Children—**

1. Children holding the book nearer than twelve inches while reading.
2. Children complaining of headache.
3. Children committing more mistakes while copying from the chalk board.
4. Children whose eyes are congested.
5. Children who suffer from sore eyes.
6. Children who feel difficulty in reading a map, diagram or board.
7. Children who turn their head in slanting position or turn sideways while reading.
8. Children who squint occasionally or constantly.
9. Children who peer and blink when they wish to see anything, particularly the distant objects.

### **(1) Short Sightedness or Myopia**

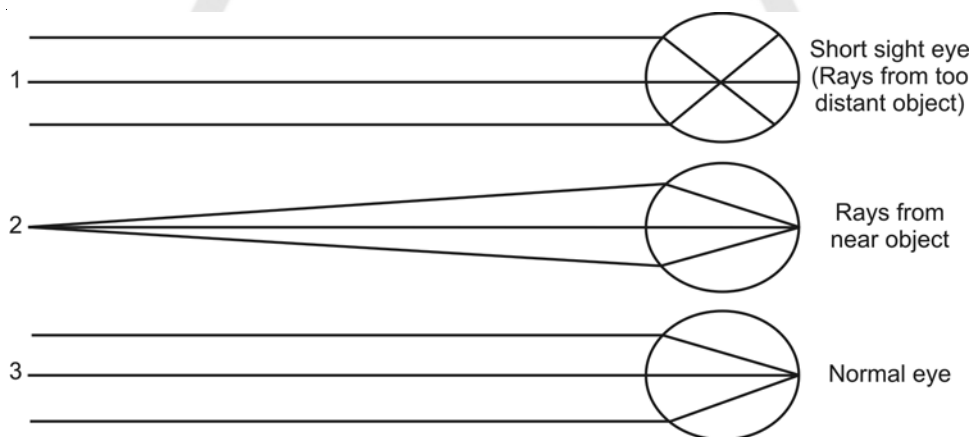
In myopia the eye ball is too thick and parallel rays coming from a distant object are not focussed on the retina, but in front of it, thus forming a blurred vision. When the eye looks at near objects it receives divergent rays of light which require a greater distance to bring them to focus, and which tend to come to a focus further back. Hence, rays focus on the retina and clear image is formed on it.

**Causes of Myopia**—It is always acquired and never congenital. It can be prevented if proper care is taken and following causes are avoided—

**1. Malnutrition**—Short sight is common among the malnourished and weak children. The sclerotic of the eye becomes less capable of withstanding strain.

**2. Heredity**—The tendency to short-sight is hereditary. It is not congenital but inherited weak sclerotic from the parents, causes short sight.

**3. Disease**—The diseased pale and laxed condition of the body lowers the resisting power of the eye, as of every other organ. An impaired physique brings with it many other evils, a weak resistance to the active causes of short sight.



*Fig. 1*

#### **Symptoms of Short Sightedness—**

1. The child holds the book or the note book very close to the eyes and bends over it while writing.

2. He commits mistakes while reading or copying from the black board.
3. He complains of headache.
4. Sometimes he feels irritation in the eyes and he rubs them and the eyes get watery.
5. He is not able to see the distant objects and becomes inattentive to the lesson and gives an impression of dullness.

#### **Prevention and Remedy—**

1. The oculist (a physician who examines the eyes) should conduct a thorough examination of the eyes and detect the cause.
2. The child should be provided a front seat in the class,
3. The reading, writing and sitting posture of the child should be checked.
4. The child should avoid reading fine prints.
5. Spectacles with concave lens should be recommended.
6. In case of severe defect, the child should be sent to special class, a myopic class or sight saving class. In such classes the number of children is not more than twenty and it is possible for the teacher to pay individual attention.
7. More oral work should be given to the child than reading and writing work.
8. Specially printed books with bold type should be prescribed.
9. The class room should be well lighted.

### **(2) Long Sight or Hypermetropia**

It is congenital defect. In this, the eyeball is too short and flat. The rays of light are not focussed upon the retina. Rays from a distant point focus behind the retina, vision is not clear. However, near objects need more accommodation and finally a limit is reached within which the eye fails to see objects distinctly.

#### **Symptoms of Hypermetropia—**

1. Long-sighted eyes are small, deep set with contracted eye-ball.
2. The person blinks too much as eyes get watery.
3. He holds the things a long way off.

#### **Remedies of Hypermetropia—**

1. An eye specialist should be consulted.
2. The convex lens spectacles are the best remedy.

### **(C) Blindness**

Loss of vision, partial or total is termed as blindness. A gross defect to the eye ball, to the visual centre in the brain or sensory nerves or impulses will cause blindness.

#### **Causes of Blindness—**

1. Due to some congenital defect.
2. Due to some disease, specially small pox, when the pock come on the eye and causes blindness.
3. Congenital syphilis is also responsible for blindness in most of the cases.
4. Myopia or short sightedness also causes blindness in some cases.
5. Due to the inflammation of the eyes of the newly born child, resulting opaque condition of the cornea. It is also known as ophthalmia neonatorum.
6. If the artery supplying blood to retina gets obstructed.
7. Any injury to the eye ball in which the internal structure of the eye is injured.

#### **Precautions and Preventive Measures—**

1. Cleanliness of the eyes is the best prevention to avoid eye trouble.



2. For any eye infection immediately the eye specialist should be consulted.
3. In case of any inflammation of the eye of the newly born infant, immediately the skilled advice should be obtained.
4. For educating the blind children, they should be sent to their special schools where special apparatus, brail, is used.
5. Some technical or vocation education should be given to the children who proves beneficial to the person concerned. ●

**Q.3. Explain symptoms, causes and remedies of various defects of hearing.**

**Ans.**

**Defects of Hearing**

Deaf children with impaired hearing overlooked and sometimes accepted as mentally dull. Without proper physical expropriation many children suffering from hearing problems are missed. Deafness is a serious problem and a handicap in education since a child misses much of the oral teaching.

**Kinds of Deafness**

1. **The Partial deafness**—It varies from slightest degree of deafness to complete deafness. It is an acquired condition due to some infection.
2. **Speaking deaf**—Those who become deaf after learning to speak.
3. **The semi-mute**—Those who become deaf in infancy.
4. **The deaf-mute**—Those who are deaf from the very birth. Since the child cannot hear so he has never learn to speak as speech comes from the imitation of the sounds heard.

**Signs of Defective Hearing**

1. They feel a singing sound in the ears.
2. Sometimes the ears discharge.
3. The child suffers from headache.
4. The child misses words or directions.
5. The child tries to lip-read the teacher.
6. The child has a strained attention in the beginning of the lesson but after some time, due to early tiredness, shows no interest in the lesson.
7. Sometimes one ear has better hearing than the other. In this case the child keeps the better ear in the direction of the sound to have better hearing. That was he twists his body.
8. To have better hearing the child breathes through mouth.
9. Sometimes the child complains giddiness.
10. The child may feel ear ache.
11. The child may develop a mental defect due to defective ear and not due to defective brain.

**Causes of Deafness**

1. **Heredity**—Deafness may be hereditary and is said to be comparatively common in children who are the result of marriages with near blood relations, such as first cousins.
2. **Due to some disease**—Deaf-mutism acquired at an early age may be due to variety of diseases, such as meningitis, mumps, inflammation of the internal ear or scarlet fever.
3. **Accident**—Due to some accident, the hearing centre in the brain is damaged and may lead to speaking deaf.
4. **Accumulation of wax**—Sometimes wax is accumulated in the external canal of the ear and obstructs hearing.
5. **Age factor**—Old age is also one factor for deafness. Internal ear deafness is usually due to old age.

**6. Poisons**—Poisoning of the nerve of hearing by tobacco or quinine or by the poisons of the diseases, like syphilis or mumps. But this cause is not common and it is most difficult to cure.

**7. Loud voice or Blast**—Sometimes with a sudden blast or loud voice the ear drum is ruptured, causing deafness.

**8. Wrong punishment**—Sometimes the teachers slaps very forcefully on the face injuring the auditory nerves or they slap on the head which may injure the hearing centre in the brain.

**9. By putting pins or pieces of hard wood in the ear**—Many people are in the habit of using hair pins or other hard objects in the ear and damage the ear.

**10.** Exposure to cold also causes ear disturbances.

**11. By diving in cold salt water**—In diving, the pressure of water may force infection in the ear.

### **Preventions and Treatment of Deafness**

1. Allow partially deaf children to sit in the front rows of the class.
2. Hearing aids can be recommended to the semi-deaf children.
3. Through examination of the ear should be conducted by the ear specialist and suitable treatment be given.
4. Completely deaf or stone-deaf children should be educated in the special schools for such children.
5. Children should be asked to use ear plugs for swimming.
6. At times, foreign substances get into the ear canal. Insects may fly in or children may put grain of corn, peas or beads into the ear. Such cases should be referred to the physician as they need careful removal.
7. For any pain in the ear or ear discharge, the ear specialist should be consulted immediately.

### **Tests of Hearing**

The school doctor, alongwith the class teacher and health education teacher should conduct hearing tests from time to time. This will enable the teacher to know the weaknesses of the children and instead of declaring them dull or mentally handicap, the teacher can render them all possible help in the class. The following tests may be given—

**1. The Whisper test**—This test is most commonly used in the schools specially in the physical education classes. Each ear is gradually diminished at a distance of twenty feet. The distance is tested one by one, first until the whisper voice is heard. It is difficult to conduct this test at noisy places.

**2. The Watch test**—In this test the examiner should have normal hearing himself, because the hearing ability of children is compared with the examiner and the distance in inches at which the child hears and watches, is noted. If the examiner hears the ticking at twenty four inches and the child only at 12 inches the fraction would be,  $12/24$  or half of normal hearing. But it is not a standardized test because the ticking sound differs from watch to watch and noise in the room will also affect.

**3. By Audiometer**—Audiometer is the most accurate means of testing and a number of children can be tested simultaneously. This test consists of gramophone and a number of headphones connected to it. A specially made gramophone record is used for the test. The record produces a voice, speaking a series of numbers in gradually diminishing tones, child writes down all that he hears. It is an expensive apparatus but can be operated anywhere and everywhere. It is a standardized test. ●

**Q.4. Describe symptoms, causes and treatment of defects of speech.**

**Ans.**

### **Defects of the Speech**

The most common speech defect is stammering. There is a sudden check to the utterance of words or the sounds with which the difficulty arises and is repeated over and over again. It is essentially

a nervous disorder due to lack of coordination of various mechanisms, concerned with speech and not due to any defect of speech organs. It is more common amongst boys and girls but boys outnumber girls.

### **Kinds of Stammering**

1. Initial stammerer in which there is difficulty in commencing to say the first consonant or syllable of a word like P, B, T, D, R and K.
2. A repetition stammerer, in which there is reiteration of the consonant sound at the beginning or middle of a word. It is sometimes referred to as stuttering.

A curious thing about stammering is that it is only present when the victim speaks in a conversational tone; if he sings, no stammerer can be detected. The reason is that the thoughts are then occupied with getting the correct musical tones and the muscles which control the movements of speaking are then used unconsciously. Stammering appears most often in childhood or during the school period of life, when it may prove a very real handicap to a child's progress.

### **Causes of Stammering**

1. It may be due to neuropathic heredity.
2. Imitation. Mostly children imitate either voluntarily or involuntarily, sometimes to tease the stammerer.
3. Due to acute illness, accident or impaired general health.
4. Due to fear, lack of confidence.
5. Lack of active vocabulary.
6. Speech conflict—Speaking in one language but thinking in another. (Thinking in mother tongue but trying to speak a foreign language).
7. Due to careless habits—Use of words whose meaning and pronunciation are beyond the mental development of the child.
8. Presence of enlarged tonsils or adenoids.
9. Unusual nervous strain, worries, shyness, anxiety or nervousness.
10. Nervous debility.
11. Faulty motor habits of breathing and enunciation.

### **Treatment of Stammering**

1. Attention should be given to the mental condition.
2. Breathing exercises or exercises for the tongue and lips should be given.
3. The teacher should pay special attention to the child and develop confidence in him.
4. Treatment of stammering consists mainly in re-educating the child in the use of his voice sounds. Collection of such words, over which the child stammers, be made and the child should be asked to read them again and again. It is a good exercise to improve the pronunciation of words.
5. Attention should be given to the general health of the child.
6. Encourage activities which help in the development of self-confidence.
7. The child should not be laughed at by the teachers or by his friends and class fellows.
8. Try to remove the cause of the fear.
9. When you start teaching the child, he should not be allowed to speak anything in the school or at home for about fifteen days.
10. The teacher should seek full cooperation of the parents also.
11. Ask the child to speak slowly.

**Q.5. Write short notes on—(i) Cleft Palate, (ii) Hare-Lip, (iii) Club-Foot.**

**Ans.**

### **(i) Cleft Palate**

#### **Meaning**

This deformity is congenital. In this the palate or roof of the mouth is formed by two palates of bone in front and muscle behind which normally join together in the middle line of the roof of the mouth. In cleft palate the two sides of the roof of the mouth do not completely join up, with the result that a gap is left. Due to this, the child feels difficulty in speaking and feeding.

#### **Treatment**

The only treatment for cleft palate is operation. By operation this gap is closed. Some-times a specially prepared dental palate is also worn.

### **(ii) Hare-Lip**

#### **Meaning**

Hare-lip is also a congenital deformity. In this the child is born with the two halves of his upper lip not joined together. It resembles the split lip of a hare. So it is called 'hare-lip'.

#### **Treatment**

The only treatment for hare-lip is operation. After the birth of the child the hare-lip is left for some weeks till the child learns to suck. Then by operation the two parts of the lip are joined together. The operation is a successful treatment. Very little traces of the defect can be seen later on.

### **(iii) Club-Foot**

Club foot or talipes is a congenital deformity in which the foot is twisted so that it is no longer able to be placed on the ground. Club-foot can occur in later life as a result of paralysis or injury.

#### **Kinds of Club-Foot**

- 1. Talipes equines**—In which heel is raised from the ground and the person walks on the ball of the foot.
- 2. Talipes calcaneus**—In this condition the heel rests on the ground and the front of the foot is raised.
- 3. Talipes varus**—In this condition the sole of the foot is turned inward and the person walks on the outer edge of the foot.
- 4. Talipes valgus**—In this condition the foot is turned outwards, causing the person to walk on the inside of the foot.

These forms are combined usually in an individual.

#### **Treatment of Club-Foot**

1. Club-foot should be treated as early as possible. In congenital conditions, the treatment should start immediately as the bones are soft and pliable. The position of the foot must be corrected several times daily-bringing the foot, to normal position and holding for a few minutes.
2. Operation is the best treatment for club foot.
3. Wearing of special splints, shoes or retentive apparatus until foot is fully grown will be beneficial.
4. When the deformity is due to paralysis, massage and electricity treatment may be found beneficial.
5. If the deformity is due to injury or contraction of the muscles due to any reason, the operation is necessary.
6. Support to the ankle by a special apparatus is useful. It keeps the foot in the correct position.
7. Lot of patience is required as the treatment is very prolonged.



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## Chapter 16

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### SYSTEMS IN HUMAN ORGANISM

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*“The human body is a complex machine. It is made up of number of parts which play different functions; these are dependent on each other and cannot work independently”.*

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**Q.1. Describe muscular and circulatory system in Human organism.**

**Ans. Muscular System**

Muscular system is the system containing muscles of the body. These are in every part of the body.

Through exercise some important changes take place in the muscular system of our body which are more or less of a permanent nature and can be ascertained easily.

1. Muscles become strong as a result of systematic training. The gain in strength is due to the strengthening of Sarcolemma *i.e.* the outer covering of muscle cells.
2. Prolonged exercise stimulates growth of muscle fibres causing them to thicken and increase in size. As a result thereof muscles appear to be bigger, stronger and solid. This change in size is due to the increase in Sarcoplasm.
3. Tissues that bind the muscle together increase in amount and tensile strength.
4. Muscles gain the ability to withstand stress of a prolonged activity *i.e.* endurance develops.
5. Colour of the muscles improves. This change in colour is due to increase in the number of capillaries supplying blood to the muscles.
6. As a result of training, muscles remain in a state of partial contraction. This state of muscles makes them more efficient and acts as a safety measure.
7. Muscles gain in speed with which an activity can be performed.
8. Foods are stored and are available in larger quantities.

As a result of systematic training, the body of an individual appears to be healthy, tough and beautiful. His general ability to do work increases.

#### Circulatory System

Blood is the most essential fluid in our body. It is to perform unlimited functions but its volume in our body is limited. It must therefore be used over and over again *i.e.* it must circulate. The flow of blood through a system of closed channels is known as circulating. Heart, by acting as a central pump makes the blood flow through this system. During circulation, blood gets reduced in tissues and oxygenated in the lungs. Hence circulatory system is divided into two parts : (1) The systemic circulation passing through the tissues. (2) Pulmonary circulation passing through the lungs. For this reason the heart is divided into two sections which do not communicate with each other. The right side receives the impure blood from the great veins which have collected it from systemic circulation and pumps it through the lungs for re-oxygenation. The left side receives the oxygenated blood from the lungs or from pulmonary circulation and pumps it into the arteries of the systemic circulation for nourishment of tissues.

The role of blood in our circulatory system is of immense importance. Therefore, in order to understand the effects of exercise and training on the circulatory system, it is important to know about

the composition of blood. Blood is red viscous fluid found in our body. It consists of liquid intercellular substance known as plasma in which are suspended red blood corpuscles, white blood corpuscles and platelets. The average volume of blood found in human body is about six litres. The plasma consists of fluid consisting of 90% water. It contains many substances in solution, the chief of them are : Glucose, Amino-acids, Inorganic salts, Hormones, Urea and Uric acid, Proteins, Fat globules and dissolved gases. ●

**Q.2. Describe respiratory and digestive system.**

**Ans.**

### **Respiratory System**

The energy needed by the cells for existence is derived from the oxidation of absorbed material. Oxygen for this purpose is obtained from air we breathe in and while doing so we also get rid of a waste product *i.e.*, Carbon dioxide. Respiration, therefore, is defined as a process concerned with the interchange of Oxygen and Carbon dioxide between the organism and the environment. This change is effected in the body in two stages. Oxygen must get into capillaries, and from there into the tissues while Carbon Dioxide must pass in the opposite direction. Thus respiration in the ultimate sense is the gaseous exchange between capillaries and tissues.

### **Digestive System**

The alimentary tract is a tubular structure which begins at the mouth and ends at the Anus. It guides and controls the passage of food through the body and has mechanism for ingestion, digestion, absorption and ultimate excretion. The alimentary tract consists of Mouth, Oesophagus, Stomach, Pylorus, Pancreas, Liver, Small Intestine, Large Intestine and Rectum. All these structures are largely glandular and muscular.

The journey of food ingested begins in the mouth. Here it is thoroughly crushed by the teeth. During this process, Saliva secreted by the Salivary Glands is mixed with food. Saliva reduces cooked starch such as potato contained in food to Maltose and then to Glucose. Saliva also helps in keeping the mouth, tongue and lips etc. moist. It also helps to dissolve food and gives rise to the sensation of taste. Thoroughly masticated food mixed with saliva is shaped into a pellet called Bolus which is swallowed and passed down the Gullet into the stomach. On reaching the stomach Gastric Juice is mixed with food. The constituents of gastric juice are Hydrochloric Acid, Pepsin and Rennin etc. Gastric juice is acidic in reaction. It acts as a mild antiseptic against swallowed bacteria and helps in the digestion of food. It stops the effect of saliva on starches. Pepsin acts upon proteins (upto peptone stage). The secretion of gastric juice starts almost immediately after food reaches its maximum between one and a half to two hours and then gradually declines and comes to the fasting level after three to four hours.

The stomach begins to discharge its contents through the Pylorus, into the small intestines about half an hour after the food is swallowed and is normally quite empty after about three to four hours. Here the acid contents from the stomach are neutralised by the alkaline juices secreted by the glands of the intestines. Secretions from the Pancreas and Liver *i.e.*, Pancreatic Juice and Bile are mixed with food near the upper end of small intestine. Bile helps in the digestion of fats and Pancreatic juice helps in the digestion of (1) Reduced proteins *i.e.* peptone, (2) Starch, (3) Fatty Acid and (4) Carbohydrates. The food takes about two hours to pass through the small intestine and during that time insoluble substances are converted into soluble ones. A network of capillaries around the small intestines, which are about 22 feet long, help in the absorption of food.

By the time the contents reach the large intestine, digestion is complete. During the passage of food through the large intestine, most of the water from residual food is absorbed. Residual contents of food remain in the rectum until expelled. The total time which elapses in between the ingestion of food and its arrival in the rectum is more than 18 hours. ●



**Q.3. Write a short note on—Nervous System.**

**Ans.**

### **Nervous System**

Our nervous system consists of the Brain, protected by the skull, the Spinal Cord passing through the special canal formed by the Vertebrae, Ganglia and the Nerves which reach all parts of our body. Nerves connect various parts of this system to the muscles, glands and other organs of the body.

The nervous system may be compared with telephone network where the brain performs the work of a central exchange. Messages sent from all parts of the body such as eyes, ears, nose, mouth and muscles etc. are rapidly sorted, interpreted and correlated in the brain which then relays information and instructions for necessary action throughout the body. In brief the nervous system by its connection with the muscles causes and controls the motions of the body; by its connection with the glands and muscles of the alimentary system, regulates digestion and by its connection with the sense organs becomes aware of the environment. Our nervous system is basically divided into two parts, but this must not be taken to mean that they are in any way separate entities. The two parts are—

1. Central Nervous System,
2. Autonomic Nervous System.

**1. Central Nervous System**—It is also called Cerebro-Spinal system. Through this system the body reacts to external environmental changes leading to a consciousness of the external world and takes appropriate actions, as may be called for. It consists of the brain and spinal cord. The whole system is symmetrically arranged into two lateral halves and one half is the mirror image of the other.

**2. Autonomic Nervous System**—It is that portion of the nervous system which controls the activities of the viscera, glands and blood vessels. In other words it controls the internal environment and the adaptation to emergency needs in muscular activity, severe haemorrhage and emotions. Its actions are generally independent of will and consequently its motor processes are all reflex actions. It consists of the long chain of Ganglionated fibre lying on each side of the vertebral column. These fibres are of a greyer colour than the whitish nerves of the central nervous system, Ganglia are linked with the spinal cord on one side and heart, glands, stomach, intestines, ureters and urethra etc. on the other through delicate nerve fibres. The autonomic nervous system also consists of two parts: (1) Sympathetic, and (2) Parasympathetic Nervous System.

## Chapter 17

### CONTRIBUTION OF SCHOOL

*“One’s ideal of health should be the highest realization of his physical, mental and spiritual possibilities rather than mere freedom from diseases and deformities”.*  
—W. A. Yeager

**Q.1. What are the characteristics of a healthy child.**

*Or*

**List general objectives of health education in school.**

**Ans. Characteristics of A Healthy Child**

1. He is active and never listless.
2. He does not tire easily.
3. His muscular control is coordinate to age.
4. His movements are quick and positive.
5. His eyes are bright and clear, alert and interested.
6. His hair is glossy.
7. He is plump and not fat.
8. He makes regular increases in height and weight which are in proper proportion to age and body build.
9. His flesh is firm.
10. His lips are moist and pink.
11. His appearance is good.
12. He loves to play.
13. He remains happy and cheerful.
14. He enjoys food.

**General Objectives of Health Education in School**

1. To make the student realise the necessity of having good health.
2. To give information on regarding health rules.
3. To develop healthy habits among children.
4. To develop certain skills concerning health, e.g., training in first aid, etc.
5. To enable children to understand the educative value of sanitation, cleanliness and healthful living.
6. To develop a will to listen to rules relating to health.
7. To develop better human relationship in matters concerning health,
8. To acquaint children with the causes and remedies of general diseases.
9. To influence parents and other adults to better habits and attitudes through the health programme of school and to make the school an effective agency for the promotion of the social aspects of health education in the family community as well as the school itself. ●

**Q.2. What are the most important guidelines for the promotion of pre-school child’s health.**

**Ans. Guidelines for the Promotion of Pre-School Child’s Health**

According to *All For Health* published by UNICEF following are ten guidelines for child health—

1. The health of both women and children can significantly improved by spacing births at least three years apart, by avoiding pregnancies before the age of 18, and by limiting the total number of pregnancies to three.
2. To reduce the dangers of child-bearing, all pregnant women should go to a health worker of pre-natal care and all births should be assisted by a trained person.
3. For the first few months of a baby's life, breastmilk alone is the best possible food and drink. Infants need other foods, in addition to breastmilk, when they are four-to-six months old.
4. Children under three have special feeding needs. They need to eat five or six times a day and their food should be specially enriched by adding mashed vegetables and small amount of fats or oils.
5. Diarrohea can kill by draining too much liquid from a child's body. So the liquid lost each time the child passes a watery stool must be replaced by giving the child plenty of the right liquids to drink—breastmilk, diluted gruel, soup, or a special drink called ORS. If the illness is more serious than usual, the child needs help from a health worker—and the special ORS drink. A child with diarrhoea also needs food to make good recovery.
6. Immunization protects against several diseases which can cause poor growth, disability and death. All immunizations should be completed in the year of the child's life. Every woman of child-bearing age should be immunized against tetanus.
7. Most coughs and colds will get better on their own. But if a child with a cough is breathing much more rapidly than normal, then the child is seriously ill and it is essential to go to a health centre quickly. A child with a cough or cold should be helped to eat and to drink plenty of liquids.
8. Many illness are caused because germs enter the mouth. This can be prevented by using latrines; by washing hands with soap and water after using the latrine and before handling food; by keeping food and water clean; and by boiling drinking water if it is not from a safe piped supply.
9. Illnesses hold back a child's growth. After an illness, a child needs an extra meal every day for a weak to make up the growth lost.
10. Children between the ages of six months and three years should be weighed every month. If there is no gain in weight for two months, something is wrong. ●

**Q.3. State briefly the importance of health for pre-primary children.**

**Ans. Importance of Health for Pre-Primary Children**

Early childhood covers a period of about 2.5 years to about 6 years of age. It is also called pre-school or pre-primary period. During this period, the child is prepared for life. It is the foundation upon which the development of the personality of an individual depends. Just at this period is the foundation of the development of the personality of the individual, likewise the promotion of health at this stage becomes the basis of the motor, physical intellectual, social and even ethical development of the individual.

The future well-being of a nation depends upon the well-being of its individuals. It depends on the health of the pre-primary children. Keeping in view the significance of the health of the child, the United Nations Children's Emergency Fund (UNICEF) has accepted the health of the pre-school child as the index of the development of a nation. UNICEF has given priority to the infant mortality to measure human development. Mortality rate under five (U5MR) is used as the principal Indicator of progress and not the per capita income. Under 5 mortality rates is known to be the result of a wide variety of inputs; the nutritional health, and the health knowledge of mothers, the availability of food and income in the family, etc.

