OPEN VOCATIONAL EDUCATION PROGRAMME

452/453

Diploma Course in

BASIC RURAL TECHNOLOGY

452 - Our Health

453 - Agriculture & Animal Husbandry

विद्यायनम् सर्वधनं प्रधानम्

NATIONAL INSTITUTE OF OPEN SCHOOLING

Open Vocational Education Programme

Course Code-452

Basic Rural Technology

1

OUR HEALTH

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Basic Rural Technology

OUR HEALTH

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FROM THE DESK OF CHAIRMAN .....

Dear Learner,

Welcome to the National Institute of Open Schooling!

By enroling with this institution, you have become a part of the family of the world's largest Open Schooling System. As a learner of the National Institute of Open Schooling's (NIOS) Vocational Programme, I am confident that you will enjoy studying and will benefit from this very unique School and method of training.

Before you begin reading your lessons and start your training, there are few words of advice that I would like to share with you. We, at the NIOS, are well aware that you are different from other learners. We realize that there are many of you who may have rich life experiences; you may have prior knowledge about trades and crafts that are part of your family's legacy; you may have a sharp business sense that will make you fine entrepreneur one day. Most importantly, you have the drive and motivation that has made you enrol with this institution, which believes in the spirit of freedom. Yes, we are aware that you have many positive aspects to your personality, which we respect and relate to them.

During the course of your study, NIOS will treat you as the manager of your own learning. This is why your course material has been developed keeping in mind the fact that there is no teacher to teach you. You are your own teacher. Of course, if you have a problem, we have provided for a teacher at your Accredited Vocational Institution (AVI). I would advise you that you should always be in touch with your AVI for collection of study material, examination schedules etc. You should also always attend the Personal Contact Programmes and practical / Training sessions held at your study centres. These will give you the necessary hands on training that is very essential to master a vocational course.

Studying for a vocational course is different from any other academic course. Here, while the marks obtained in the examination will indicate your grasp on your subject knowledge, your real achievement will be when you are able to apply your vocational skills in the market. I hope that this skill-based learning will help you perform your tasks better .This course of two year duration Diploma in basic Rural Technology has been developed in colloboration with Vigyan Ashram, Pune. It is a multi skilled programme, which will expose you to a variety of skills. We hope that you will find it useful. On behalf of NIOS, I wish you the very best for a bright and successful future.

Dr. S. S. Jena, Chairman,

National Institute of Open Schooling

FROM THE DESK OF DIRECTOR .....

Dear Learner,

In the fast expanding world of activities, learning new skills has become a necessity. Learning and re-learning has become essential for all. In such an environment, vocational education has assumed great importance. Vocational education, as a stream of education, promotes skill development, and training of youth and directs them towards meaningful employment.

In keeping with the needs of the Learners, NIOS conducts Vocational Education Programmes in many areas through distance mode. These programmes include Agriculture, Home Science, Engineering & Technology, Computer Science, Health & Paramedical. The Courses offered in these areas are aimed at providing self employment & wage employment opportunities for NIOS learners.

Vigyan Ashram under the leadership of late Dr.S.S.Kalbag, developed Rural Technology course for rural youth. Over the years, this course turned many youth into successful entrepreneurs. NIOS accrediated this course as Diploma in Basic Rural Technology and adopted it for further replication through AVI. This course will provide self-confidence to you and a new path to your future. You may be destined for starting a small enterprise and build your own future. This is multi-skilled programme, which will expose you to variety of skills. It includes Rural Engineering (Construction), Agriculture & Animal husbandry, Our Home Environment and Health sections. This will help in identifying learner's preference for future vocation. We are confident that this course will prove to be beneficial to you.

We wish you all the best in your future career.

Dr. K. P. Wasnik ,Director (VE),

National Institute of Open Schooling

DIPLOMA COURSE IN BASIC RURAL TECHNOLOGY

Course Curriculum

Introduction

About 90% of the children, who enroll in the primary school, do not cross the Senior Secondary (SSC) barrier. It is not that these children are unfit for education, in fact, they are the major work force for India. They start many small enterprises, do agriculture, works as skilled workforce and contribute substantially to the progress of India. They have probably dropped out because our book based education system did not suit them and the children lost interest in all education. Very often the very thought of schooling and examination frightens them.

The country is faced with a large proportion of school dropouts and a corresponding problem of unemployment and under-performance in the unorganized sector. In the present changing world scenario, this is a great handicap to progress of country. We, therefore, need a system by which the problem will be treated at the grass root level.

The main cause of this dropout problem is that our education system is almost entirely book based and a large section of the students, both during and after the schooling, find the education incomprehensible and irrelevant.

The multi-skill content of the Basic Rural Technology Course with hands-on experience stimulates the intellect by going through concrete operations and then abstracting the concepts. It uses the 'learning while doing' system and is closely linked to services in the community. At the same time by giving a variety of skills usable in every day life, they open the door of modern technology to the youth, allowing them to form their preferences and know their aptitudes, thus enabling them to choose a career. It also improves their self-image and gives them confidence and hope for the future. The level of training, though basic, empowers them to start their own enterprise after a short (less than a year) stint with another enterprise in the field.

The Diploma in Basic Rural Technology is the right course for such students. This course will give learners self-confidence and give a new path to their future. Learners may be destined for starting a small enterprise and build their own future.

This multi-skill program, will expose the learners to a variety of skills. Learners will work in Engineering-Construction, Energy-Environment, Agricultural and Animal husbandry and Health sectors. This will help in identifying Learners preferences for future vocation. This program is based on philosophy of "Learning while doing'. Students will get training by working in real life environment. They will also learn basic skills like drawing, costing and project planning in DBRT program during their training.

Objectives of the Course & Scope

Diploma in Basic Rural Technology, comprising of theory & practical component, is intended to *give learners self-confidence and a new path to their future. Learners may be destined for starting a small enterprise and build their own future. This is multi-skill programme, which will expose them to variety of skills. Learners will works in Engineering-Construction, Energy-Environment, Agricultural and Animal husbandry, home and health sections. This will help in identifying Learner's preference for future vocation.*

The programme is based on philosophy of "Learning while doing'. Students will get training by working in real life environment. Learner will also learn basic skills like Drawing, Costing and Project Planning in DBRT programme. The main objectives of this course are:

- To train the students using 'Learning while Doing' Philosophy.
- To train them for income generation through self-employment.
- To train students in multi-skills.
- To train students in different technologies and transfer these technologies to the society through them.
- To involve students in various rural development activities as a project work, thus integrating rural development and Education.
- To make available various services to the community at the modest cost and giving real life training to the students.

Eligibility Criteria

The admission for Diploma in Basic Rural Technology is open to those who fulfill the following Criteria:-

- Class 8th passed (Any one, who is willing to work with hands, handle machinery or play with animals or likes to grow plants, is well suited for this course. Learner should have passed the 8th standard school examination, so that learner can read and write fluently, do simple calculations.)

Job Opportunities

After passing through this course, the students can do apprenticeship in one of the areas of his interest and develop his career. Multiskilling helps in getting job in the following fields:-

1. Workshop in small scale industries / construction sites / Fabrication units.
2. Supervisor in agriculture and polyhouses / animal husbandry units such as poultry , dairy, goat farming etc.
3. In food processing industries.
4. Electric and Electronics workshops.

He can start his own enterprise after sufficient apprenticeship.

Duration of the Course

The duration of the course is two years. However, one can complete the course within five years of registration by appearing in any external examination as per rules of NIOS in force from time to time. The AVIs will be responsible for imparting training skills and competencies of a qualitative standard by adopting suitable training methods, strategies & systems.

Attachment of Trainees : Minimum 06 months attachment of trainee for internship.

Scheme of Study : 30% in Theory & 70% in Practical

Programme	Duration	Essential Contact Hrs. for Theory & Practical Training
Diploma in Basic Rural Technology	Two Years	600

Course Curriculum

The course curriculum comprises of four modules having both theory & practical components.

Subjects/Papers for First Year	Subjects/Papers for final Year
• Module - 1: Our Health	• Module – 3: Rural Engineering *((Material, Mechanics, Drawing & Costing)*
• Module – 2: Agriculture & Animal Husbandry	• Module – 4: Our Home Environment (Home Environment Basics of Electricity)

Out of four modules two are related to the living world and two to the non-living. Home- Environment (related to human society), and Agriculture (Plant and animal Kingdom) give the skills related to clothing, food and health of the society. Agriculture covers the skills needed for production and preservation of food of both plant and animal origin, including care of plants/crops, birds and cattle and their breeding. The Engineering (material-joining, shaping and otherwise fabricating into usable things, including housing) and Energy-Environment (application of electricity and maintenance of Diesel, petrol and other IC Engines, non-conventional principles). The content though it looks formidable, is easily worked through because of the 'learning while doing' method. Of course the mastery depends on the student putting hard work for practice, for which ample opportunities are given. The students are encouraged to take on contract jobs involving these skills for practice and reinforcement.

The study material will be provided in the form of self-instructional print material and the practical component/training shall be provided to each student at the study centres(AVI's).

Medium of Instruction

The medium of instruction is English.

Instructional System

- Self instructional printed material
- Visual support system

- Assignments
- Face to face counseling at AVIs/Study centres
- Practical/Training facilities at AVIs/Study centers
- On the job training, wherever applicable/required.

Scheme for Evaluation/Certification

There will be evaluation of both components, the theory as well as the practical separately. Internal assessment will also be taken into account while computing final result. The scheme of Assessment, Evaluation and Certification will be administrated through the guidelines designed by NIOS. NIOS will award the final certificate according to its rules and regulations.

Basic Rural Technology Training Prog.	**Theory**		**Practical**			
Paper	Max. Marks	Duration	Max. Marks In Practicals	Duration	Max. Marks in Project Work	Total
Paper – I Our Health	30	1 hr	50	2 hrs	20	100
Paper – II Agriculture & Animal Husbandry	30	1 hr	50	rs	20	100
Paper – III Rural Engineering (*(Material, Mechanics, Drawing & Costing)*	30	1 hr	50	2 hrs	20	100
Paper – IV Our Home Environment	30	1 hr	50	2 hrs	20	100
					Grand Total	400

MINIMUM PASSING CRITERIA

- In Theory, a trainee should secure 40% marks in each module/paper.
- In Practicals, a trainee, should secure 50% marks in each paper.
- In Internal Assignment, a trainee should secure 50% marks in each paper.

Procedure for Internal continuous Assessment

Practical / Training (Internal Assignments):

Assessment will be done by maintaining progress card of each candidate, indicating assessment of each Practical / experiments. (Total Marks = 80)

Course Fees:

A student will pay Rs.4000/- (Rs.500/- + Rs. 3,500/-) for the full course and will receive a set of printed material. In addition, the examination fee will be paid separately as per the NIOS rules.

Admission Procedure

Admission is done twice a year as per the dates notified by the NIOS. Application forms and Prospectus can be procured from either the NIOS or its Study Centrs (AVIs).

Criteria/Norms for Accreditation

The institutions having the following basic infrastructure may apply for accreditation:

(A) **Basic Infrastructure:**

1. Class Room: Classroom to accommodate 25 students (minimum area 225Sq. ft.) should have black board/white board, proper ventilation, adequate lighting, furniture, exhaust and ceiling fans etc.
2. One Lab: The Lab to accommodate 25 students (minimum area at least 20 ft. × 25 ft.) should have black board/white board, proper ventilation, adequate lighting, furniture, exhaust and ceiling fans etc.
3. One Workshop: The workshop to accommodate 25 students (minimum area at least 20 ft. × 25 ft.) should have black board/white board, proper ventilation, adequate lighting, furniture, exhaust and ceiling fans etc.
4. Agriculture land: Agriculture land for growing and cultivation the plants/crops.
5. Tools/ Environment: Details in this regard is available on our website.

Library: Library should have minimum 20 books/articles/magazines etc. related subject.

(B) Faculty & Supporting Staff

S.No.	Faculty & Supporting Staff	Educational/Professional Qualification	No.
1.	Coordinator	Graduate	01
2.	Instructor (part time)	Degree/Diploma in Nursing	01
3.	Instructor – Agriculture & Animal Husbandry	Degree/Diploma in Agriculture/Animal husbandry-DBRT with sufficient practical experience.	01
4.	Instructor – Engineering	Degree/Diploma in Engineering discipline – ITI-DBRT with sufficient practical experience.	01

5.	Instructor – Food lab.	Class 12th Pass – Home science or DBRT with practical experience in food processing	01
6.	Receptionist cum clerk	Relevant to job	01

Batch Size – Maximum 25 students in one batch.

Basic Rural Technology

1

OUR HEALTH

COURSE CONTENT

1

INTRODUCTION OF HUMAN BODY

1.1 INTRODUCTION

Man is the most intelligent and technologically advance living thing on earth. We have known about our gross body for centuries. Now, in this lesson we will understand how it looks from inside and how it performs its functions. The basic knowledge of structure, size, shape, location and functioning of various organs of the human body is provided by two important subjects-Human Anatomy and Physiology which one must study first to understand our body.

1.2 OBJECTIVES

After reading this lesson, you will be able to:

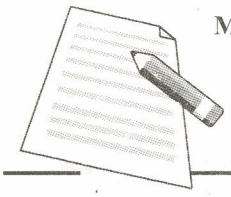
- Get the knowledge of structure and function of a healthy human body.
- Understand the meaning of Anatomy and Physiology.
- Know the important systems of human body.
- Explain the functions and contribution of each system.

1.3 ANATOMY AND PHYSIOLOGY

Now, let us find out what does 'Anatomy' and 'Physiology' mean.

Anatomy is the science which deals with the study of normal structure, shape, size and location of various parts of the body.

When the study relates to human body it is called human anatomy. For example, when we look at our body we can easily see that it has one face, two hands, two legs etc. and there is skin that completely covers the body. When we open or see inside our body, what do you observe?



Notes

We can see that internally it is composed of various organs, blood, muscles, bones etc. In this way, in anatomy we can study various structures and composition of our body.

Physiology is the study of normal functions of various organs of the body i.e. how each and every part of the body and body as a whole, perform its function?

INTEXT QUESTIONS 1.1

1. Define Anatomy.

2. Define physiology.

1.4 INTRODUCTION TO THE BODY AS A WHOLE

Man is a multi-cellular organism. The smallest functional unit of the body is **cell**. The cells of the body are too small to be seen with the naked eye.

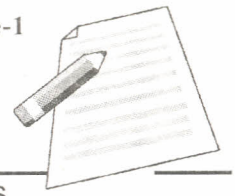
Groups of cells which have same physical characteristics tend to have similar functions. A large number of cells grouped together to perform same functions are called **tissues.**

An **organ** is a collection of various tissues to form a structure, to serve a specific function.

An **organ system** consists of various organs which coordinately perform a major function of the body.

Each system contributes to one or more vital functions of the body. However, because of specialization of cells, none of the systems can exist in isolation.

To summarize, in our body there are various systems which work in coordination to perform important functions. Each system is composed of different organs which work together for a particular system. Each organ is made up of various tissues and different tissues have number of cells, which is the smallest functional unit of the body.



Human Body – Organ system – Organs – Tissues – Cells

Do you know that there are nine different systems in our body?

The important systems of the human body are:

1. **Skeleton system**
2. **Muscular system**
3. **Digestive system**
4. **Respiratory system**
5. **Circulatory system**
6. **Excretory system**
7. **Endocrine system**
8. **Nervous system**
9. **Reproductive system**

INTEXT QUESTIONS 1.2

Answer in one word please:

1. The smallest functional unit of the body is: _____
2. The collection of various tissues is known as: _____
3. The total number of systems in our body are: _____

1.5 IMPORTANT SYSTEMS OF HUMAN BODY

(A) SKELETON SYSTEM

The skeleton system (also known as the Bony system) consists of bones and cartilage.

The skeleton is the framework of bones which are organized to form distinct parts such as skull, vertebral column, thoracic cage, hands and legs. The joints give the movements to the bones. Bones have great tensile strength, almost as high as that of cast iron.

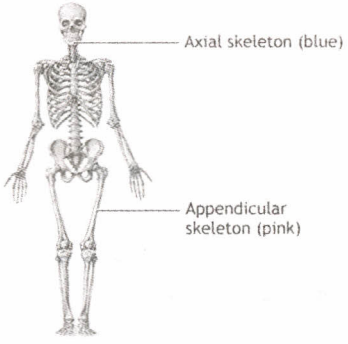


Fig. 1.1 Skeleton

Module-1

Notes

There are different types of bones in our body:

Long, short, flat and irregular bones.

The skeleton system consists of 206 bones in human.

Functions

The skeleton system performs following functions:

1. It gives framework to the body.
2. It gives shape and posture to the body.
3. The primary purpose of skeleton is to support the body.
4. It protects the soft and delicate organs like heart, lungs, brain etc.
5. It also permits necessary movements and locomotion.

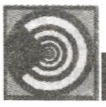
(B) THE MUSCULAR SYSTEM

There are a large number of muscles (about 500) that help in movement of our body. The muscles bring about movement and locomotion of various organs and parts of the body.

Functions

The main functions of muscles are:

1. They help in movement and locomotion of various organs and parts of the body.
2. They give shape to the body.
3. They provide protection to the internal organs of the body, for example- muscles of the abdomen form a strong muscular anterior wall of the abdominal cavity.
4. Muscles help in various important internal processes of the body like respiration, urination, circulation, changing facial expression etc.
5. Muscles store glycogen, which is used as energy during movements of the muscles.



INTEXT QUESTIONS 1.3

1. Fill in the blanks:

   a) The skeleton system consists of _____ and _____.

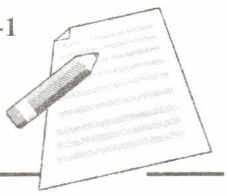
   b) There are _____ bones in our body.

   c) Muscles help in _____ and _____.

   d) Muscles store _____.

(C) THE DIGESTIVE SYSTEM

To do any kind of work, our body needs energy. This energy comes from the food that we eat. The process of digestion can be defined



as the breakdown of big and complex food particles into smaller and simpler form so that it is suitable for absorption. The food that we eat, has to be converted into simpler form through a series of changes which release its constituent nutrients i.e. proteins are converted into amino acids, carbohydrates into starch and fats into fatty acid. These changes occur with the help of enzymes, which are secreted into the alimentary canal by special glands.

Enzymes are chemical substances that causes, or speeds up a chemical change in other substances without itself being changed.

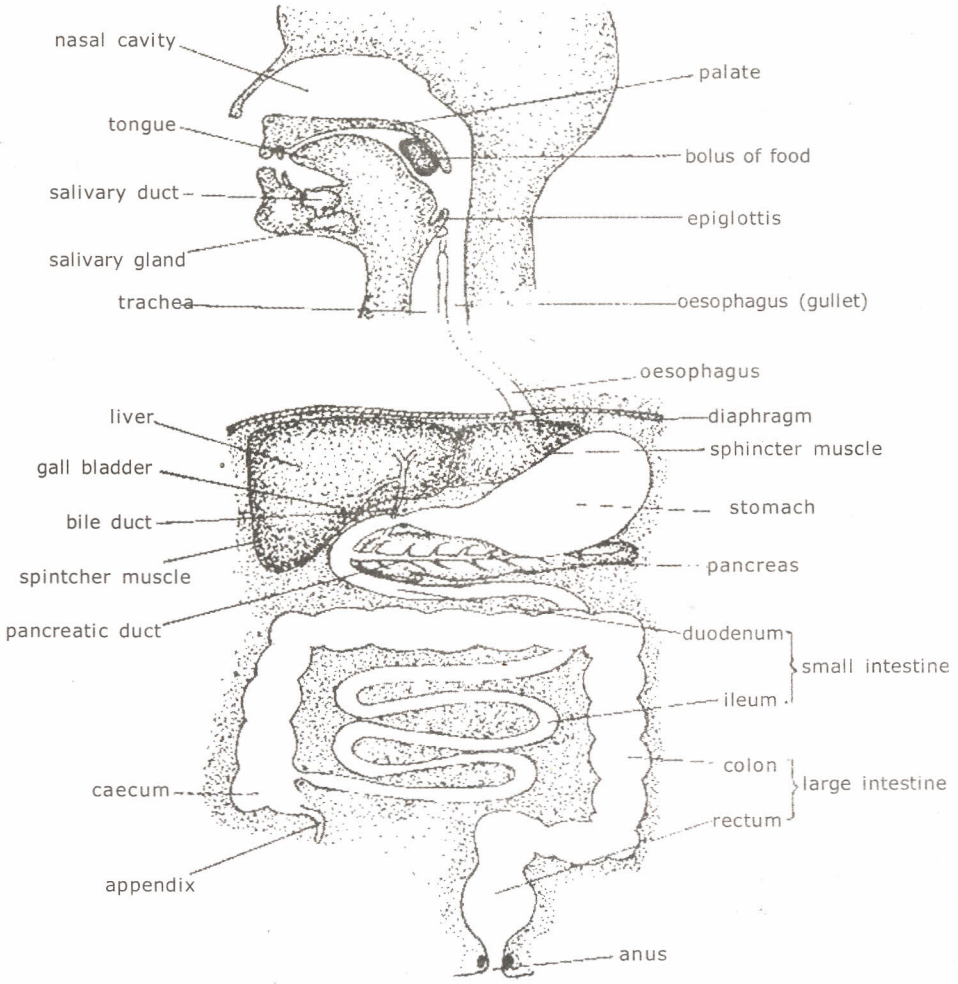


Fig.1.2 Organs of the digestive system

Organs of the digestive system:

Digestive system mainly consists of alimentary canal, which is a long tube like structure through which food passes. It begins at the mouth and terminates at the anus. Various organs of digestive system are:

Mouth (food is taken in by mouth)

↓

Oesophagus (or food pipe)

↓

Stomach

(Digestion of food takes place with the help of gastric juice which is Secreted from the stomach)

↓

Small intestine

(Further breakdown or digestion of food takes place with the help of bile and some enzymes)

↓

Large intestine

(The digested food particles are absorbed in the blood and some of the water and electrolytes are removed from the food)

↓

Rectum

(The solid waste material is temporarily stored here)

↓

Anus

(It is an opening from where waste materials are excreted out as faeces)

(D) THE RESPIRATORY SYSTEM

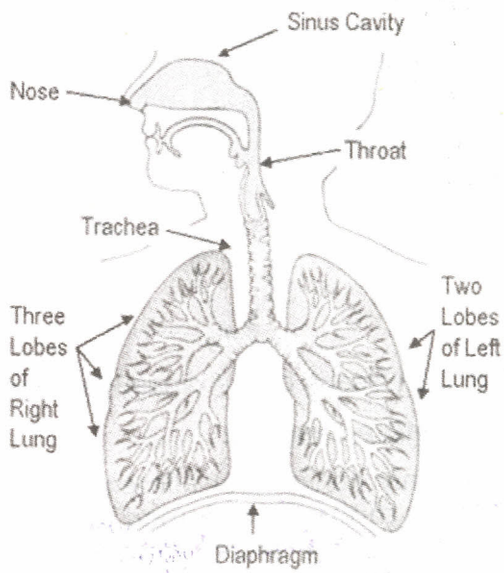
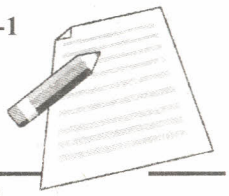


Fig. 1.3 Organs of the respiratory system



The respiratory system provides the route through which 'oxygen' – which is present in the atmosphere, enters inside the body and carbon dioxide isexcreted out from the body.

The exchange of gases between the blood and the lungs is called external respiration and that between the blood and the cells is known as internal respiration.

The organs of the respiratory system are:

Nose: It is the first of the respiratory organs and consists of a large irregular nasal cavity, divided into two equal parts (i.e. right and left nostril) by a septum.

Pharynx: It is a tube like structure that lies behind the nose and mouth.

Larynx: It is a small chamber situated in the region of neck. It is also known as 'voice box', since it helps in the production of sound.

Trachea: It is also known as windpipe and is a continuation of the larynx. It extends downward and divides or bifurcates into the right and left bronchi, one bronchus going to each lung.

Two bronchi: The two bronchi enter into right and left lungs of either side. Inside the lungs, they are further divided into many smaller bronchioles and finally into alveoli.

Two Lungs: There are two lungs, one lying on each side of the midline in the thoracic cavity. They are cone-shaped. Each lung is covered by a layer called 'pleura' which contains a fluid called pleural fluid.

Muscles of respiration i.e. the intercostals muscles and the diaphragm.

(E) THE CIRCULATORY SYSTEM

The circulatory or the blood circulatory system consists of the heart, which acts as a pump and the blood vessels through which the blood circulates. The main blood vessels are Arteries, veins and capillaries.

Arteries are the blood vessels that carry blood away from the heart.

Veins are the blood vessels that transport blood to the heart.

The smallest arterioles break up into a number of minute vessels called **capillaries.**

Heart

The heart is a cone-shaped hollow muscular organ. It is situated in the thoracic cavity in between the lungs, a little more to the left than the right. Interior of the heart is divided into a right and

left side by the septum, so that blood cannot cross the septum from one side to the other. Each side is further divided by an atrioventricular valve into an upper chamber, the atrium and a lower chamber, the ventricle. Hence the human heart has four chambers viz. right atrium, right ventricle, left atrium and left ventricle.

The size and shape of our heart is like our own fist.

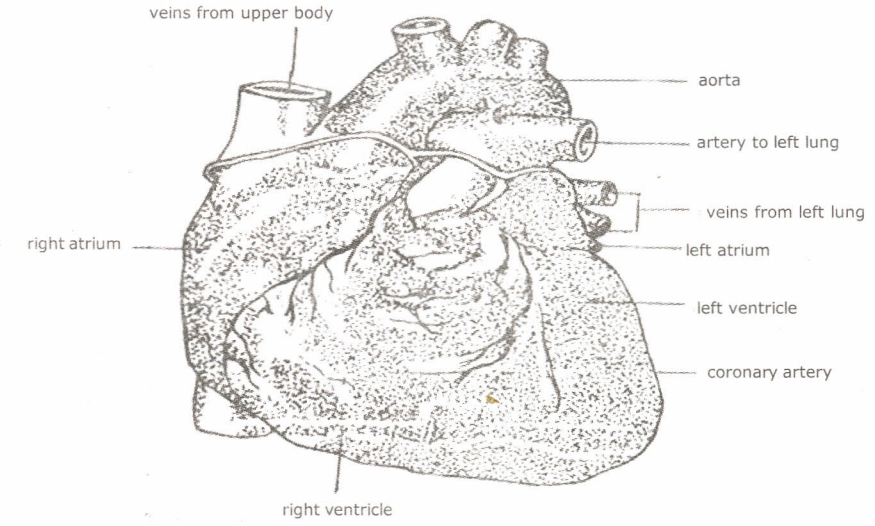


Fig. 1.4 (A) Heart with major blood vessels.

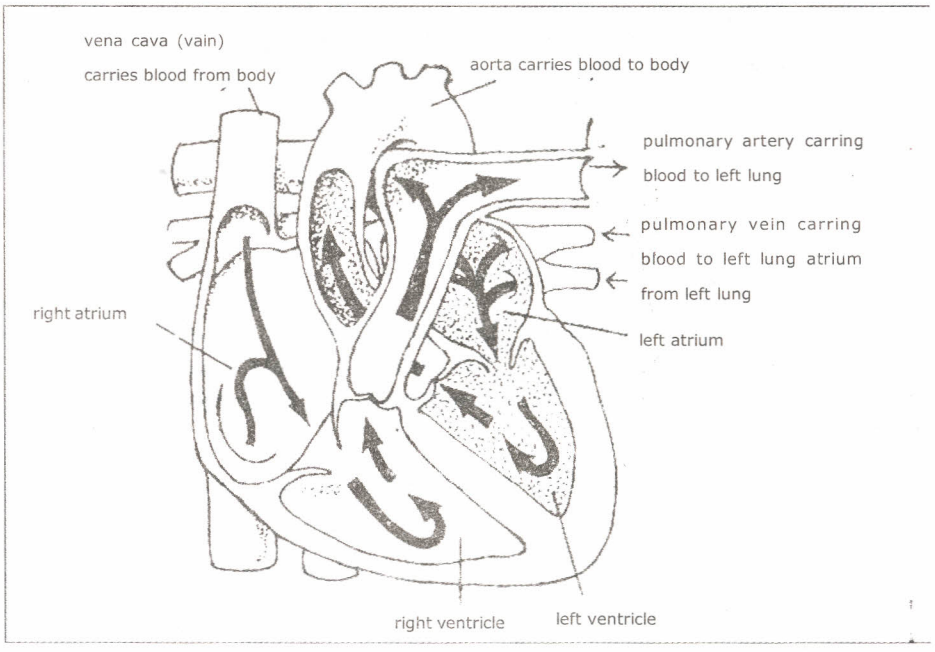


Fig.1.4(B) Internal view of heart arrows show direction of flow of blood.

The main function of the heart is to maintain a constant circulation of blood throughout the body.

The blood passes from the right side of the heart to the left side via the lungs. The right side of the heart deals with deoxygenated or impure blood.

The left side of the heart deals with oxygenated or pure blood.

Both atria contract at the same time, followed by the simultaneous contraction of both ventricles.

Note: Your left hand side shows the right side of the heart and the right hand shows the left side of the heart.

The number of heart beats per minute ranges from 70 to 80 (average 72 times).

INTEXT QUESTIONS 1.4

State True or False:

1. Diaphragm is a respiratory muscle. ( )
2. Pharynx is also known as 'voice box'. ( )
3. In a minute we respire for about 72 times. ( )
4. The interchange of gases takes place in heart. ( )
5. Arteries carry blood away from the heart. ( )

Please tick the correct answer:

1. After digestion proteins are converted into:
   a) Fatty acids ( )
   b) Amino acids ( )
   c) Starch ( )
   d) Remain unchanged ( )
2. Stomach secretes:
   a) Bile ( )
   b) Saliva ( )
   c) Enzymes ( )
   d) Gastric juice ( )
3. Total number of chambers present in human heart is:
   a) 1 ( )
   b) 2 ( )

c) 3 ( )

d) 4 ( )

4. Arteries and veins are:

a) Muscles ( )

b) Glands ( )

c) Blood vessels ( )

d) Chamber ( )

(F) THE EXCRETORY SYSTEM (OR THE URINARY SYSTEM)

All plants and animals produce harmful substances due to a number of metabolic activities occurring in their body. The waste material formed by the body must be removed.

Hence, the process of excretion can be defined as the elimination of wastes from the body which otherwise are toxic if retained within the system. The kidney, large intestine, skin, lungs and the liver do the work of removing the waste material out of the body.

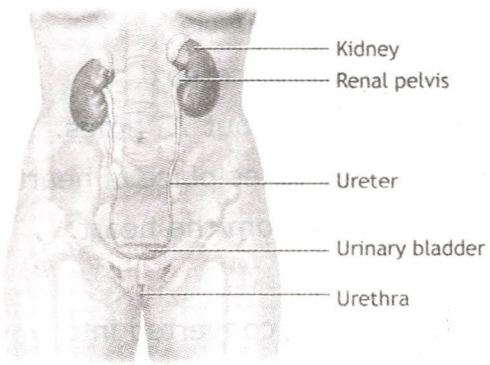


Fig.1.5.(A) Urinary system

The urinary system is one of the excretory systems of the human body. It consists of the following parts:

Two kidneys – Which helps in the formation of urine.

Kidneys are bean-shaped organs, present on the posterior abdominal wall, one on each side of the vertebral column. Each kidney is made up of numerous (about 1 million) functional units, the nephrons.

Two ureters – These are 2 tubes which convey the urine from the kidneys to the urinary bladder.

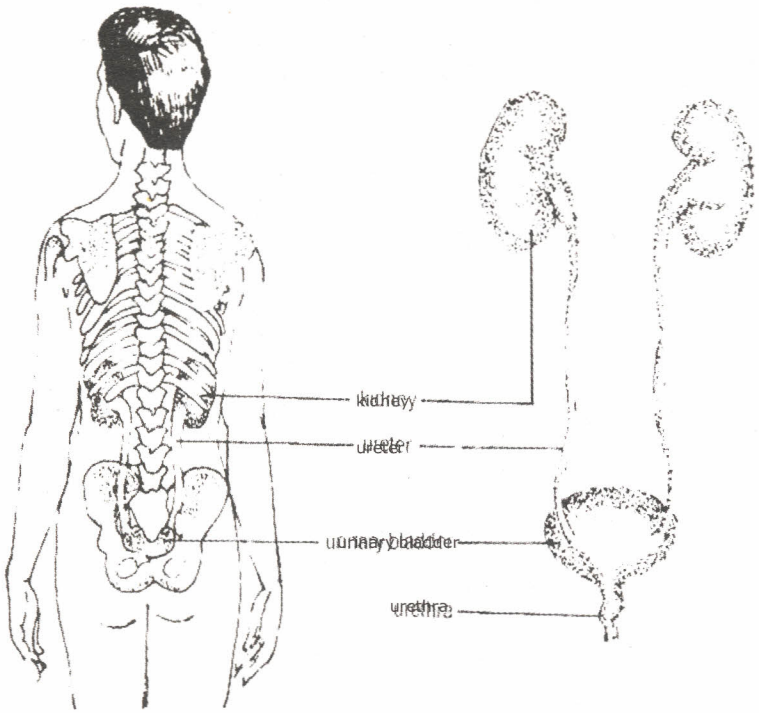


Fig.1.5. (B) Urinary system

One urinary bladder – it is an elastic distensible bag where urine collects and is temporarily stored.

One urethra – it is an opening through which urine is discharged from the urinary bladder to the exterior.

Functions of the excretory system

Functions of the excretory system are as follows:

1. It excretes waste products from the body for example, ammonia, urea and uric acid.
2. It helps in the maintenance of fluid and electrolyte balance.
3. It helps to maintain the normal pH of blood and other fluids.
4. It also helps to maintain the optimum concentration of certain constituents of blood like calcium.
5. It maintains the osmotic pressure in blood and tissues.

(G) THE ENDOCRINE SYSTEM

The endocrine system consists of various glands that are widely separated from each other. These glands are commonly known as the 'ductless glands' because the hormones they secrete pass directly from the cells into the blood. The ductless glands secrete many hormones which play a vital role in the normal functioning of the body.

A hormone is a chemical substance which, having been formed in one gland or, is carried in the blood to another organ or the target organ where organ influences activity.

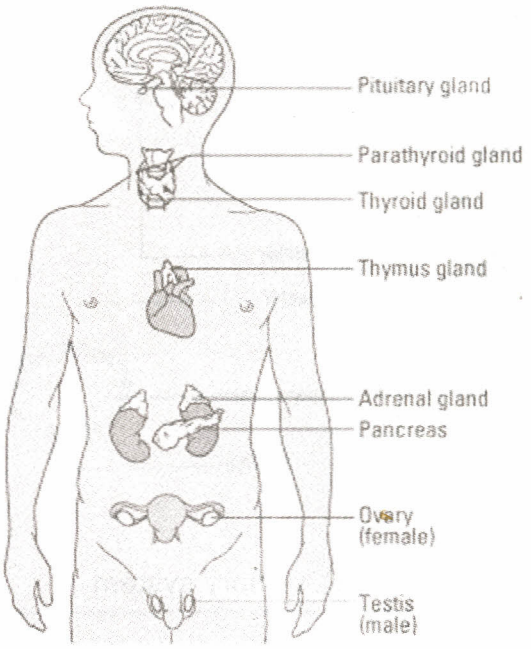


Fig. 1.6 Position of endocrine glands in the body

Our body cannot work and grow normally without hormones. Glands which release chemicals directly into blood stream.

The endocrine system consists of the following glands:

Pituitary gland – This gland is located on the ventral side of the brain.

It is known as the master gland of the body because it secretes maximum number of hormones and also it controls the secretion of hormones secreted by other glands.

Thyroid gland – It is found in the neck region, at the base of larynx.

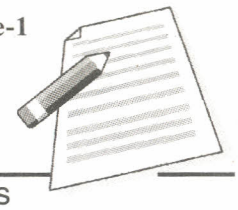
It secretes thyroxin which helps in normal development of the body.

Parathyroid glands – They are 4 small oval shaped bodies, two on each side of thyroid glands.

Adrenal glands – One situated on the top of each kidney.

Pancreas (Islets of Langerhans)-

It secretes 'insulin' hormone that helps in maintaining normal blood sugar level.



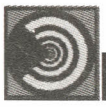
Pineal gland – This gland is situated in the brain near pituitary.

2 Ovaries in female

They secrete two important female sex hormones - estrogen and progesterone.

2 Testes in male

They secrete male sex hormone - Testosterone.



INTEXT QUESTIONS 1.5

Q.1 What do you mean by excretion?

Q.2 What is hormone?

(H) THE NERVOUS SYSTEM

The system that receives the stimulus, transmits it to other parts of the body and the corresponding effects shown is known as the nervous system.

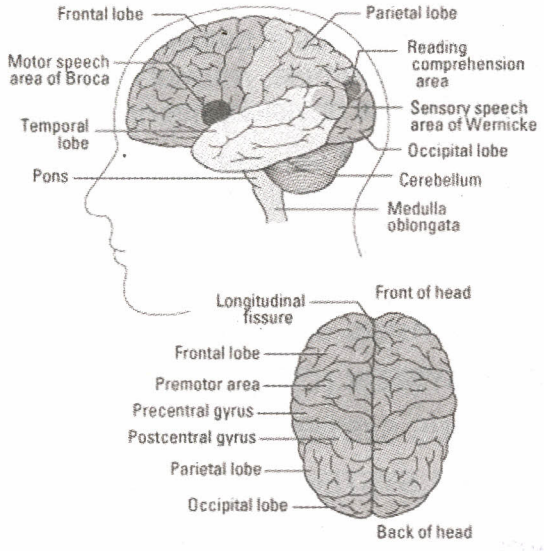


Fig.1.7.(A) Diagram of Nervous system showing brain

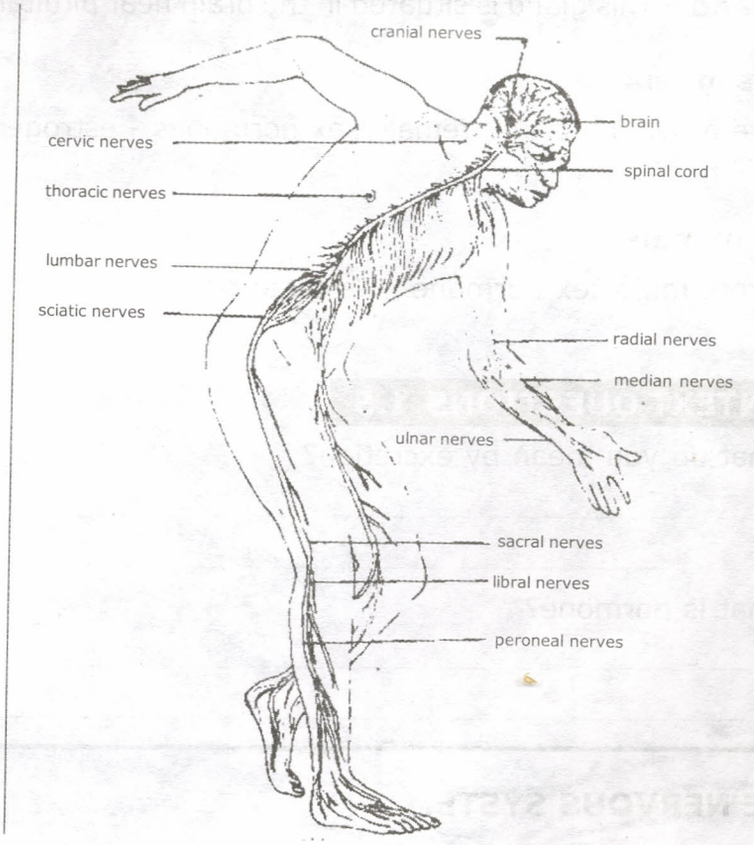


Fig.1.7.(B) Brain and spinal cord

The nervous system consists of a large number of units called **'neurons'**. Neurons are simply referred as nerves.

Nervous system is concerned with the following main functions:

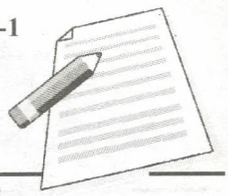
1. It controls and regulates various activities of the organs and the organism as a whole. For example, muscular contraction, rate of respiration, heartbeat, sense of vision, hearing, pain etc.
2. It coordinates the working of various glands and tissues of the body; thus regulating the internal environment of the body.
3. It helps the organism to react to the external environmental fluctuations.

Nervous system mainly consists of three parts:

1. CENTRAL NERVOUS SYSTEM (CNS)
2. PHERIPHERAL NERVOUS SYSTEM (PNS)
3. AUTONOMIC NERVOUS SYSTEM (ANS)

Central Nervous System

It consists of the brain and the spinal cord. Entire CNS is protected and surrounded by membranes called 'meninges'. These cavities or



the space between the membranes and the brain or spinal cord are filled with a clear fluid called 'cerebrospinal fluid' or 'CSF'.

Peripheral Nervous System

It consists of the nerves that arise from brain and spinal cord. Nerves are solid, white and thread like structure. There are mainly there types of nerves: sensory, motor and mixed nerves.

The peripheral nervous system consists of-

31 pairs of spinal nerves (arising from the spinal cord)

12 pairs of cranial nerves (arising from the brain)

Autonomic Nervous System

The ANS controls the functions of the body carried out automatically, which are initiated in the brain. For example, maintenance of blood pressure, secretion of glands.

(I) THE REPRODUCTIVE SYSTEM

The ability to reproduce is one of the properties that distinguish living beings from non-living matter. The reproductive system is a system of organs within an organism which work together for the purpose of reproduction. Human reproduction is a sexual reproduction that takes place as internal fertilization.

In human beings the reproductive organs of the male and the female differ anatomically and physiologically. Both males and fe-

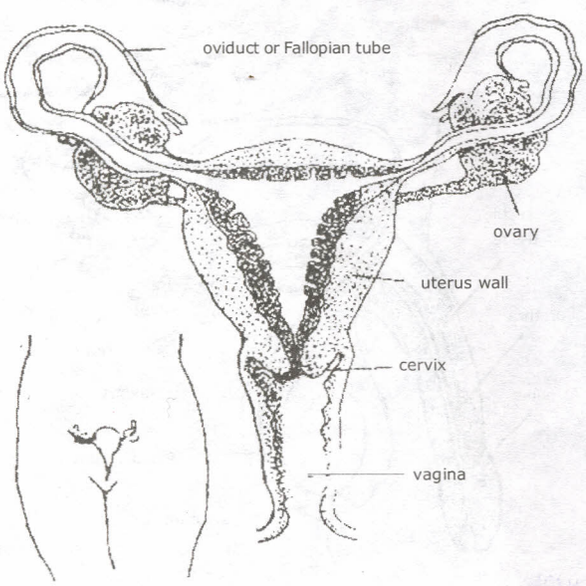


Fig.1.8 Female reproductive system as seen in a median sagittal section

males produce specialized reproductive cells known as gametes, containing genetic material-genes and chromosomes.

Female reproductive system

The human female reproductive system consists of a series of organs primarily located inside the body and around the pelvic region of a female that contribute towards the reproductive process.

The internal organs of the female reproductive system lie in the pelvic cavity and consist of:

Vagina, which acts as the receptacle for the male's sperm

Uterus, which holds the developing foetus

Two fallopian or uterine tubes which extend from the sides of the uter.. and

Two ovaries (female sex glands) which produce the female's ova.

Breasts are located in the chest region. They play an important role in reproductive functioning such as breast feeding.

Important sexual hormones of females include ' estrogen' and 'progesterone'.

Male reproductive system

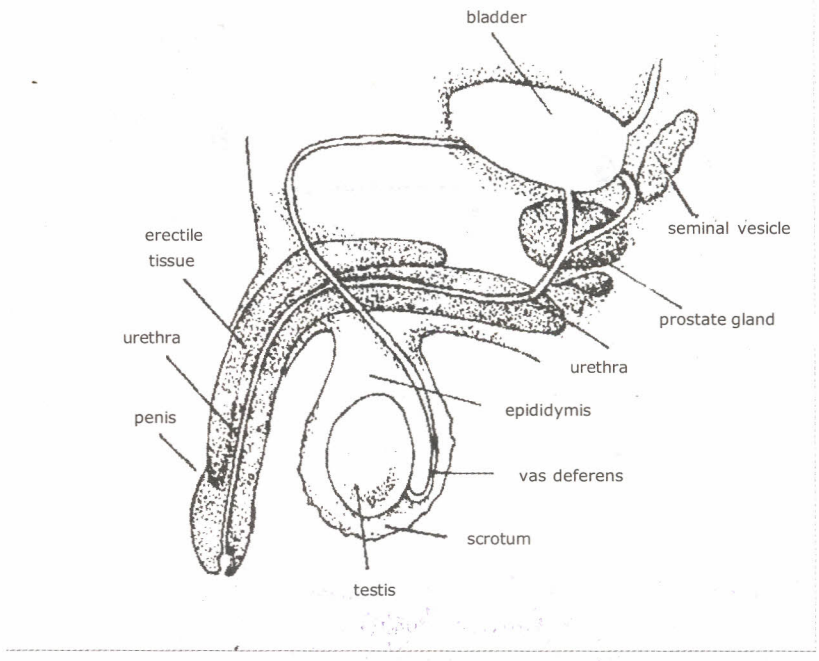


Fig.1.9 Male reproductive system

The primary direct function of the male reproductive system is to produce spermatozoa for fertilization of the ovum.

The major reproductive organs of the male are:

Penis- It is the male sex organ for sexual intercourse.

Scrotum- It contains the testes.

Testes- Production of sperm and sexual hormone takes place in testes.

Epididymis- Development and storage of sperms takes place in epididymis.

Prostrate- Nourishment of sperm takes place with the help of prostate fluid.

Urethra - It is the tube that carries urine from the bladder to outside the body. In addition it ejects semen.

An important sexual hormone of males is 'testosterone'.

INTEXT QUESTIONS 1.6

1. Fill in the blanks:
   1. The functional unit of nervous system is _____.
   2. CNS consists of _____ and _____.
   3. PNS consists of _____ spinal nerves and _____ cranial nerves
   4. Our body contains _____ chromosomes.
   5. _____ is a male sex hormone.

1.6 WHAT YOU HAVE LEARNT

In this lesson, you have gained the knowledge of the structure and function of human body, the contribution of each system and a general description of interrelationships between all body systems. You can now understand how our body performs its functions. The sum of these activities enables the human being to live in and utilize his environment in a useful way.

1.7 TERMINAL QUESTIONS

1. Describe the process of digestion.
2. With the help of a diagram explain the flow of blood through the heart.

Notes

2

HEALTH AND HYGIENE

2.1 INTRODUCTION

Health education plays an important role in the community hygiene. To prevent illness and have positive health attitude, correct and complete knowledge of health is necessary. Health is cleanliness and cleanliness is one of the main defenses against diseases, whether contagious or self-generated. In this lesson we will discuss the actual meaning of health and hygiene, so that the aim of good health can be achieved through sanitary habits and healthy way of living.

2.2 OBJECTIVES

After reading this lesson you will be able to:

- Know the meaning of health.
- Understand the importance of physical, mental and spiritual health.
- Know the meaning and importance of hygiene.
- State the necessity of personal, environmental and food hygiene.

2.3 WHAT IS HEALTH?

Health is a positive state of well being, where every part of the body and mind is in harmony and in proper functioning balance with every other part. In other words, when every organ of the body is functioning normally, the state of physical well being is known as health. It has been well said that only that person can be called really healthy who has a sound mind in a sound body. Health is the characteristic of life that enables a person to live longer.

According to World Health Organisation (WHO):

"Health is the state of complete physical, mental, spiritual and social well-being and not merely absence of disease".

If a person is disease free or in a good physical state, but under stress, tension, anger, greed etc. than that person is not considered as a healthy person. Hence, in addition to physical health, we must consider the mental and emotional health also, only than spiritual and social health can be achieved and man can progress forward for the well being of the society.

Let us understand the various aspects of health-

- **Physical health** – When the body is free from any physical ailment or abnormal condition, it is physical health.
- **Mental health** – The state of absence of stress, tension, worry, negative thoughts etc. is mental health.
- **Emotional health** – A balanced state of absence of anger, greed, proud, hatred etc. is emotional health.
- **Spiritual health** – To live in yourself with uniformity and harmony is spiritual health. Also, to have faith in your religion and respect & view other's religion with equal harmony is known as spiritual health.

Community health is the art and science of maintaining, protecting and improving the health of people through organized community efforts.

Fig. 2.1 clean the enviornment

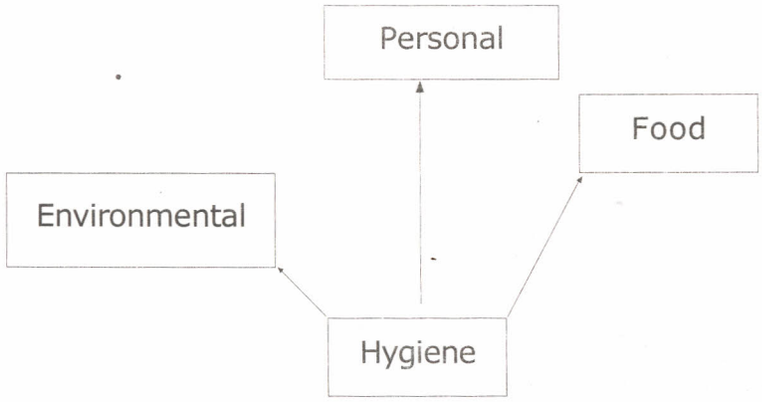
INTEXT QUESTIONS 2.1

Q.1 Define 'Health' according to WHO.

Q.2 What do you mean by 'mental health'?

2.4 HYGIENE

Hygiene is defined as the science and art of preserving and improving health. The purpose of hygiene is to allow man to live in healthy relationship with his environment. It deals both with an individual and a community as a whole. In order to be healthy one must realize that hygiene and sanitation play a very important role.



Various aspects of hygiene

2.5 PERSONAL HYGIENE

Personal hygiene means cleanliness of our body.

It usually relates to consideration of individual health. Personal aspects of hygiene involve consideration of internal and external cleanliness, proper sleep, food, water, exercise, work and care of some vulnerable parts of the body. It also depends upon environmental factors like proper ventilation, adequate lighting and on

personal factors like daily bath, clean absorbent underwear and foot wear, also on social factors like working condition, family life and good social friends.

Personal hygiene involves everything with which we come in contact like:-

(a) Personal cleanliness habits:

- Personal habit of getting up early in the morning.
- Washing hands before meals.
- Use of soap for removal of infection.
- Regular going to toilet everyday.

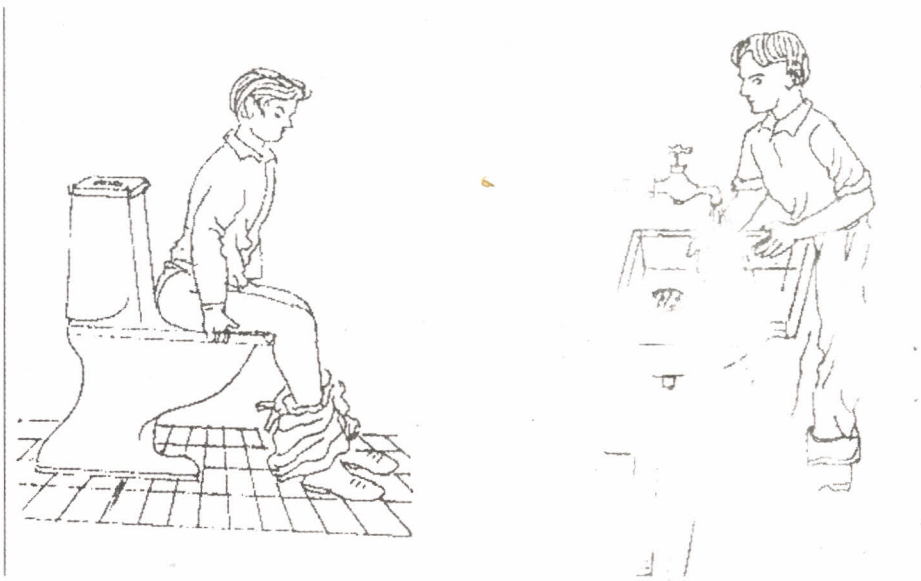


Fig.2.2 Personal Hygiene

All these helps to keep the body clean.

(b) Proper nutrition, well-balanced diet simple to digest and free from dust and parasites, taking more of raw vegetables and fruits keep the internal system healthy.

(c) There should be balance between rest and activity.

(d) Regular exercise will keep the weight down, will give good digestion and keep the mind active and cheerful. Exercise and physical activity is a well deserved preventive method to keep the body and mind healthy.

(e) Many people think themselves in good health regardless of the fact that the bowels may be irregular. They suffer from foul breath; they have coated tongues and many other indications of auto-intoxication. Constipation is very rightly called 'the mother of nearly all diseases' and therefore, should be avoided, but not by

strong medicines but by regulating the diet (that is rich in roughage), by proper exercise, in short by observing the laws of health.

In short,

A clean body is a healthy body

General care of important body parts

Lack of personal hygiene gives rise to various diseases because disease causing microbes grow in dirty and unhygienic atmosphere. So to keep the body healthy, cleanliness of following body parts should be given extra care:

1. Eyes

Eyes are one of the wonderful gifts from nature, but if we pay less attention to its care, then consequences in the form of blindness or wearing spectacles can occur. Hence we must remember the following points:-

- Wash eyes with normal cold water 3-4 times daily.
- Do not use your or other's dirty hanky or any other dirty cloth and dirty hands for wiping your eyes.
- Do not use spectacle (glasses), or hanky which has been used by other person.
- While reading or writing, light should come from the left side and there should be a distance of at least 32cm between your eyes and the book.
- Do not read while lying down on the bed.
- Avoid using *kajal* or similar cosmetics for eyes.

Do you know...

Eyelashes and eyebrows keep dirt and dust out of the eyes.

2. Ears

For proper hearing, care and cleanliness of ears is important. For this:

- Keep your ear dry and clean.
- Whenever necessary clean your ears with a dry and clean ear-bud.
- Do not put ear-bud deep into the ears.
- Never put any sharp and pointed objects like pen, pencil, match-

stick or tooth-pick into your ear because they might damage the ear-drum.

- Protect your ears from loud noise.
- Cover your ear properly in case of severe cold.
- Do not put oil or other liquids inside the ear as they may cause fungal infection.

3. Teeth

Teeth help in mastication (chewing) and proper pronunciation of words. If proper cleansing is not done, then some food particles may get stucked in between the teeth and get fermented and that results in pyria, bad odour, toothache etc. Hence, for healthy teeth following points must be remembered:

- Brush your teeth properly in the morning and at night before going to bed. After brushing, clean your tongue gently with a tongue cleaner.

Fig. 2.3 Brushing teeth twice a day

- Rinse your mouth with water after every meal.
- Do not eat hot and cold products at the same time.
- Use maximum of citrus fruits like orange, lemon etc. which contains vit.c, calcium and phosphorus, which are helpful for healthy teeth.

4. Skin

Cleanliness of skin is very important because sweat and other toxins are excreted out from the body through skin. If proper care is not taken, then dust particles, microbes etc. are deposited on the skin in the form of a layer thus covering the pores of skin, as a result rash, pimples and foul odour appears in the skin. Therefore, following points must be remembered:

- Take bath daily with clean water.

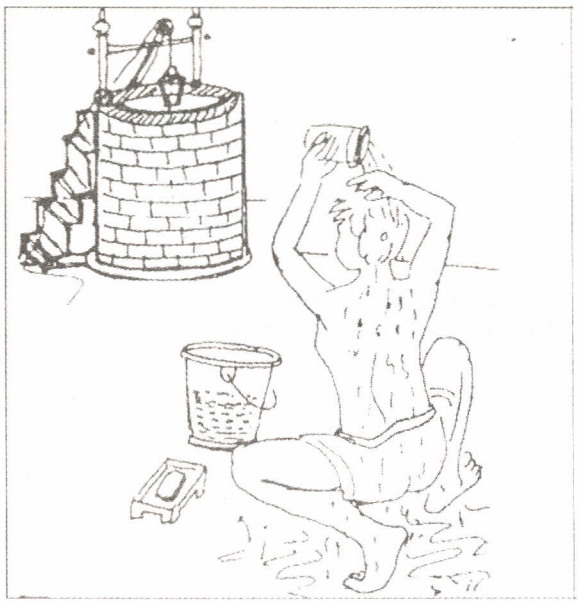


Fig. 2.4 Bathing with clean water

- Use maximum of cotton clothing. The clothing should be loose and neat & clean.
- Take more of nutritious, alkaline diet (about 60–70%) such as, seasonal green vegetables, fresh seasonal fruits, raw salad etc.
- For healthy skin, avoid oily and spicy food like *kachori, samosa* etc.
- To keep your skin healthy, drink plenty of water in a day.

5. Nails

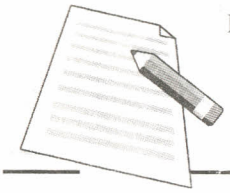
Abnormal growth of nails causes deposition of dust and germs inside the nails and that is a big danger to the health. Hence for proper cleansing of the nails, following points must be remembered:

- Keep your nails clean and trimmed.
- Do cut your nails with a nail-cutter once in a week.
- Do not cut the nails with teeth.

6. Hair

If proper hygiene is not maintained for hair then consequences in the form of dandruff, lice and other diseases can occur. So to avoid all this following things are helpful:

- Wash hair regularly and use shampoo or soap at least twice in a week.
- Comb your hair properly so that all the dust comes out and the hair will not get tangled.
- Put oil in the hair at regular intervals.



Important note:

Toothbrush, comb, towel, soap, nail cutter and handkerchief help us to keep ourselves clean. Keep these things clean and in their proper place.

INTEXT QUESTIONS 2.2

State True or False:

1. Reading while lying down on the bed is good for eyes. ( )
2. Putting oil or liquids inside the ear is a good habit. ( )
3. Brushing teeth twice daily is good. ( )
4. Long nails are good for health. ( )
5. Oily and spicy food is good for skin. ( )

2.6 ENVIRONMENT HYGIENE

Health education of the masses helps to develop an interest in the environmental sanitation. Though we try to keep ourselves personally very clean, we do not usually care for our surroundings. Our sources of water are constantly getting polluted. Unhygienic surrounding invites mosquitoes and flies.

Environmental hygiene or sanitation thus helps to reduce the incidences of those diseases which are commonly acquired or transmitted through excreta or contaminated water, food and drinks. These include gastrointestinal diseases like diarrhoea, dysentery, cholera etc. and insect-borne infections like malaria, dengue, plague, filariasis, etc.

Because of its universal use, water can be the channel for spreading various diseases like typhoid, cholera, dysentery etc. Besides these, viral hepatitis, polio and worm infestation are also transmitted because of the use of contaminated water. Drinking water supplies may be liable to get contaminated with sewage or other excreted matter.

Water pollution can be effectively controlled by:

- Educating the people regarding use of safe drinking water.
- Wherever possible, the drinking water should be provided through the piped water supply.
- Sanitary wells should be provided where the piped water supply is not possible.
- Conventional water purification ways like disinfection by bleaching powder or chlorine gas should be regularly employed.

- Domestic filters should be used where chemical disinfection of water is not feasible.

Unsafe disposal of faeces (stool) is one of the major causes of spread of diseases, especially in rural areas. Many illnesses are caused by the germs and worms (or their eggs) which are found in the stools or faeces of the infected persons. These germs get into the water, into food, utensils and to the surfaces used for preparing food and are transmitted to new hosts either by the dirty fingers or by contaminated food or water. Hence, personal as well as public cleanliness or sanitation is important in order to prevent this faecal to mouth transmission of infections.

To prevent this and to maintain proper environmental hygiene, one must remember and follow the underline points:

- Public toilets (latrines) should be built and used.
- If that is not possible, people should defecate (pass stool) at designated places away from habitation (houses).
- After defecating, the faeces should be buried right at that place.
- The faeces of babies and children have as many dangerous germs as the faeces of adults, so their faeces should be cleared up immediately.
- Latrines should be cleaned regularly and kept covered.
- The faeces of animals should also be kept away from houses and water sources.
- The dung or 'gobar' of cattle should be either used in the gas plant or in a manure pit or made into cakes (*uple*) for fuel at a secluded place.
- It is important to wash hands with soap after defecating and after cleaning the bottom of a baby, who has just defecated.
- In villages, if soap is not available, instead of using mud the better alternative for cleaning the hands is 'ashes' of burnt wood (*raakh*).
- Children put their hands into their mouths quite often, so it is important to wash a child's hands often, especially before giving him food.
- A child's face should be washed every time he makes it dirty. This helps to keep flies away from the face and prevent eye and skin infection.

2.7 FOOD HYGIENE

Food hygiene is an essential part of maintaining good health. If the basic rules of hygiene are ignored or overlooked while buying, preparing, cooking and storing food; the consequences in terms of 'food poisoning' can be sudden and severe.

So, one should adopt following measures to maintain good food hygiene:

(a) A clean kitchen:

In order to multiply, bacteria need food, warmth, moisture and time. So, we must keep our kitchen clean and dry.

- Keep food covered.
- Do not leave scraps lying around and wipe away any spillages (left over food).
- Empty rubbish bins (dust bins) frequently.

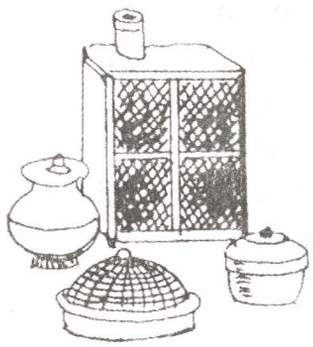


Fig. 2.5 Keep food covered

Fig. 2.6 Use dustbin

- Keep pets away from food and from the kitchen.
- All these measures will help to prevent insects such as flies, cockroaches' etc. spreading diseases.

(b) Cleanliness during preparation of food:

Always wash your hands with soap before touching food.

- If you need to cough, blow your nose or sneeze use a clean cloth or handkerchief, so as not to spread germs and wash your hands before touching the food again.
- Vegetables need to be washed properly and carefully as soil may contain bacteria.
- Wash knife thoroughly before and after cutting raw food items, meat etc.

(c) Cleaning of refrigerator:

- Do clean the refrigerator (fridge) regularly.
- Take out all food items and wash all surfaces including the shelves with hot soapy water.

- A solution of bicarbonate of soda and warm water is a good cleanser and will not make the refrigerator smell.

(d) Clean water:

- As you have learnt previously that many diseases are water borne. For good health, it is necessary to have a plentiful supply of safe piped water from a tube-well or deep hand pump.
- Water should be boiled at least for 5-10 minutes to kill all germs and then kept in a sterilized bottle before drinking.

(e) Storage of food:

- Store food and drinking water in clean and dry place.
- Keep food items covered and out of reach of cockroaches, rodents(rats) etc.
- Maintain temperature for storage of food as per food items.

2.8 WHAT YOU HAVE LEARNT

In this lesson you have learnt the meaning and importance of personal hygiene and Various aspects of hygiene which are needed for healthy living you can now very well understand that by co-ordination, co-operation and proper planning we can improve our hygienic standards and save our country from epidemics and endemics and increase the longevity of the people.

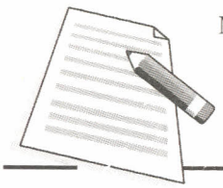
2.9 TERMINAL QUESTIONS

1. What is 'Hygiene'?
2. Write any four important points of personal hygiene.
3. Discuss some important measures to maintain good food hygiene.

2.10 ANSWER TO INTEXT QUESTIONS

2.1

1. According to WHO, health can be defined as - "Health is the state of complete physical, mental, spiritual and social well-being and not merely absence of disease".
2. The state of absence of stress, tension, worry, negative thoughts etc. is mental health.



Module-1

Notes

2.2

1. False
2. False
3. True
4. False
5. False

3

NUTRITION

3.1 INTRODUCTION

To perform various vital functions, our body needs energy. Do you know from where does this energy come from? The answer is 'food'. Food plays an important role in the maintenance of good health and in the prevention and cure of disease. The human body builds up and maintains healthy cells, tissues and organs only with the help of various nutrients. In this lesson, we are going to study about food and nutrition, different types of nutrients and also about balanced diet and dietary management of some deficiency diseases.

3.2 OBJECTIVES

After reading this lesson, you will be able to:

- Explain the definition and functions of food.
- Know what is nutrition and different nutrients.
- Understand the importance of balanced diet.
- Discuss various deficiency diseases and their dietary treatment.

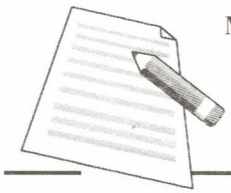
3.3 FOOD AND NUTRITION

All living things need food. Food gives us energy to do work and activities. Our body needs food to grow strong and healthy. The term 'food' refers to anything that we eat and drink and which nourish the body.

Functions of food

The important functions of food include:

- It is essential for the growth of human body.
- It provides the power to the body to resist diseases.



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- It provides energy for the production of heat and for the maintenance of all metabolic activities.
- It is essential for the repair of daily wear and tear.

INTEXT QUESTIONS 3.1

1) What is food?

2) List two important functions of food.

3.4 NUTRITION AND NUTRIENTS

Nutrition, which depends on food, is also important in the cure of disease. It tells us about what happens to the food when it enters our body.

Nutrition is the process by which the body ingests, digests, absorbs, transports and utilizes the nutrients. Almost all foods contain nutrients in varying proportions.

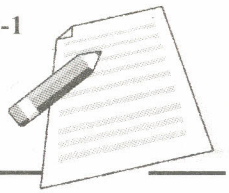
Nutrients are the constituents of food that must be supplied to the body in suitable amounts.

Following are the important nutrients which are present in food:

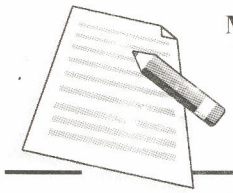
(a) Carbohydrates
(b) Proteins
(c) Fats
(d) Vitamins
(e) Minerals
(f) Water
(g) Roughage (Fiber)

Let us now discuss various nutrients in detail:-

Nutrient	Types	Sources	Function	Deficiency
Carbohydrates	Sugars, starches, Fibre	Wheat, rice, potato, sweet potato, milk, sugars, dried fruits etc	1) Carbohydrates are the main source of energy for the body function. 2) They regulates fat metabolism and aids in the utilization of body fat (1 gm of carbohy-drate yields	



			about 4 calories of energy)	
Proteins	Animal protein Plant protein	Pulses, eggs, fish, peas soybeans, Milk and certain Grains	1. Proteins provide the building blocks needed for growth, repair and maintenance of body	
Fats	Animal and Vegetable fat	Eggs, meat, cheese, milk, butter, ghee, Vegetable oil	1) Fats are the rich source of calories for energy 2) They make food tasty and palatable 3) Fat is used in the formation of cholesterol	
Vitamins	1) Fat soluble- Vit. A, D,E, and K 2) Water soluble- Vit. B, Vit.C			
Vitamin A		Carrots Papaya,Green Leafy Vegetables.	1) It is essential for growth, for good vision and immune system.	1) Poor night vision 2) Increased risk of infection 3) Eye damage, may leads to blindness.
Vitamin D		Fish liver oil, eggs and sun light.	It is required to absorb calcium and phosphorus for normal formation of bones and teeth.	1) Ricket in children 2) Osteomalacia in adults
Vitamin E		Vegetable oil, wheat germ, nuts, and seeds	It is a good antioxidant	1) Muscular weakness 2) Habitual abortions
Vitamin K		Green leafy vegetables, esp. cabbage, spinach and broccoli	It is needed for normal blood clotting	Impairing clotting of blood.
Vitamin B complex	Vit.B1 Vit.B2 Vit.B6 Vit.B12	Whole wheat cereals, nuts, soyabean, banana, egg, fish and pulses	1) Regulate growth 2) Important in carbohydrate and protein metabolism.	1) Fatigue, Loss of appetite, 2) Mental confusion and nervous disorders
Vitamin C		Citrus fruits like, orange lemon, guava, amla, chillies	Important antioxidant	1) Soregums 2) Joint pains 3) Scaly skin 4) Fatigue and loss of appetite 5) Scurvy and anemia
Minarals	Calcium, Iron, Magnesium, Potassium, Sodium, Copper, Iodine etc.	Milk, Green leafy vegetables, whole grain cereals, nut, seeds and fruits	1) Help build bones and teeth 2) Maintain fluid and electrolyte balance in the body 3) Helps in developing immunity	1) Muscular weakness 2) Soft and brittle bones 3) Goiter 4) Anemia 5) Reduce resistance to infection
Roughage (Fiber)		Whole wheat, whole grains, Dalia, fruits and vegetables	1) Roughage act as ' Broom' in the body and stimulate bowel movements	1) Constipation



			2) It gives bulk to the diet and helps to satisfy the appetite 3) It lowers blood cholesterol	
Water		Drinking water, Fruit juices, Tea, Milk	1) Water helps in digestion 2) It helps excrete out waste material from the body in the form of urine, feaces, sweat and tears	1) Dehydration 2) General weakness 3) Dry skin

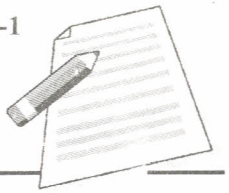
INTEXT QUESTIONS 3.2

Q.1. Chose the correct answer:

1. Proteins are needed in the body:
   - a. To provide energy. ( )
   - b. For growth and repair. ( )
   - c. To increase weight. ( )
   - d. For making food tasty. ( )
2. Iron is found in:
   - a. Milk ( )
   - b. Salt ( )
   - c. Nuts ( )
   - d. Green leafy vegetables ( )
3. Water soluble vitamin is:
   - a. Vitamin A ( )
   - b. Vitamin E ( )
   - c. Vitamin C ( )
   - d. Vitamin D ( )
4. Vitamin A is good for:
   - a. Heart ( )
   - b. Bones ( )
   - c. Eyes ( )
   - d. Skin ( )

3.5 BALANCED DIET

You can not eat only fruits, you need something more. You can not eat only vegetables. You need something more. Hence, to maintain normal functioning of the body, we need varieties of food which gives us proteins, carbohydrate, fat, vitamins and minerals.



A diet containing all the essential food constituents in correct proportions is called a 'balanced diet'.

A balanced diet should have the following qualities:

- It must be rich in various essential nutrients and include foods from all food groups.
- It should provide necessary energy required by the body.
- It should be economical.

3.6 DEFICIENCY DISEASES

Different food gives us different nutrients. So, we must try and eat a little of all types of food everyday.

In adequate intake of essential nutrients in the diet and their improper utilization leads to deficiency diseases.

Deficiency disease is a condition in which a particular nutrient has been inadequate or missing from our daily meals for a prolonged period.

The deficiency symptoms starts showing after inadequate consumption of the specific nutrients for sometime. They may also occur as a result of some other diseases e.g. anemia due to bleeding or worm infestation.

Some Common deficiency diseases are:

Sr. No.	Disease	Symptoms	Dietary treatment
1	Protein Energy Malnutrition (PEM)-Kwashiorkor	1) Lack of growth in the children 2) Gastrointestinal disturbances like loss of appetite, nausea and diarrhoea 3) Swelling in hands, feet and face	Protein rich food such as soyabean, ground nut and pulses.
2	Marasmus	1) Loss of body weight and failure in weight gain 2) Child shows the appearance of an old man	Wheat dalia, Ragi halwa, Idli, Sweet potato, Green vegetables, Milk and its products are some of the protein rich low cost food items.
3	Anemia	1) Yellow pallor (skin and eye colour) 2) Poor digestion 3) General weakness	1) Give extra iron and folate 2) Diet rich in green leafy vegetables like spinach, chaulai etc. 3) Fish, meat, (esp. liver) 4) Cereals and pulses.

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3.7 WHAT YOU HAVE LEARNT

In this lesson you read the functions and meaning of food, nutrition and various types of nutrients. Now you can understand that all the nutrients like Carbohydrate, Proteins, Fats, Vitamins, Minerals, Water and Roughage are vitally important and they work together. A well balanced and correct diet play an important role for the maintenance of good health and healing of diseases. Our diet must contain all the food groups in correct proportion.

3.8 TERMINAL QUESTIONS

1. What do you mean by deficiency disease? Mention any three deficiency disease with their symptoms and dietary management.
2. Write an essay on Nutrition & Nutrients.

3.9 ANSWER TO INTEXT QUESTIONS

3.1

1. The term 'food' refers to anything that we eat and drink and which nourish the body.

2.

- It provides energy for the production of heat and for the maintenance of all metabolic activities.
- It is essential for the repair of daily wear and tear.

3.2

1. b
2. d
3. c
4. c

4

DISEASES

4.1 INTRODUCTION

Disease is often used more broadly to refer to any condition that causes pain, dysfunction, distress, social problems, and/or death to the person afflicted, or similar problems for those in contact with the person. It sometimes includes injuries, disabilities, disorders, syndromes, infections and isolated symptoms. That is why proper knowledge of diseases is necessary. **Not only knowledge of disease but knowledge of its prevention is also very important. In prevention of diseases, vaccination plays an important role. So in this lesson we will also focus on the vaccination.**

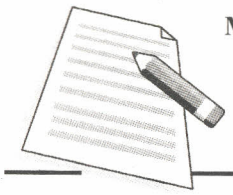
4.2 OBJECTIVES

After reading this lesson, you will able to:

- understand the disease & its classification;
- explain some common diseases, their symptoms, treatments and prevention;
- know the importance of vaccination.

4.3 WHAT IS DISEASE?

A **disease** is an abnormal condition of an organism that impairs bodily functions, associated with specific symptoms and signs. In simple words, it is a condition of an individual not feeling well or a condition opposite to health.



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Classification of diseases

Diseases can be classified as:

1. **Air borne:** Disease which occur due to inhalation of germs from the diseased person through air. E.g. T.B., Influenza, swine flu etc.
2. **Water borne:** Disease caused by drinking contaminated water having microorganisms like bacteria, virus etc. E.g. Cholera, typhoid, Hepatitis, jaundice etc.
3. **Food borne:** Disease caused by taking contaminated or infected food having microorganism. E.g. Food poisoning, Diarrhoea, vomiting, Worm infestation, etc.
4. **Insect borne:** Disease caused by bite of mosquitoes of different types E.g. Malaria, Dengue, filaria etc.

Some common diseases

Let us now discuss some common diseases, their symptoms and their preventive measures:

S.No.	Name of Disease	Caused by	Symptoms	Immediate measure	Prevention
1	Tuberculosis	Bacteria-*Mycobacterium tuberculi*	1) Fever, 2) Chronic cough with sputum, 3) sudden weight loss, 4) chest pain	1) Isolate the patient. 2) Collect sputum in covered box and disposed away from habitat. 3) Start DOTS treatment	1) Cover mouth and nose while coughing and sneezing 2) BCG vaccine
2	Swine flu	Virus-H1N1	1) Fever, 2) cough and cold for more than 3 days. Body ache	1) Blood test for H1N1. 2) Send patient to nearby hospital	1) Cover mouth and nose while coughing and sneezing 2) Avoid going out in a crowded place.
3	Pneumonia	Bactria-*Streptococcus pneumoniae*	1) High fever (sometimes 104°F), 2) shaking chills, 3) cough with sputum, 4) short of breath.	If fever and cough persist for more than 3 days send the patient to a hospital for proper diagnosis.	1)Vaccination 2) Wearing warm clothes for children
4	Cholera	Bacteria-*Vibrio cholerae*	1) Watery stool 2) Vomiting 3) Pain in stomach with cramps	To avoid dehydration give ORS, homemade fluids like rice water, lemon water(Shikanji), Lassi,Dal ka Pani, and breast milk for the babies, Coconut water.	1) Proper disposal of stool and vomit of the patient. 2) Health education regarding purification of water. 3) Maintain hygiene.

5	Typhoid	Bacteria-*Salmonella typhi* and *Salmonella paratyphi*	1) Fever, 2) Poor appetite 3) Headache 4) Abdominal pain.	1) Blood test.	1) Maintain Proper personal and food hygiene. 2)Vaccination
6	Jaundice	Contaminated food and water	1) Eyes, nails and skin become yellowish 2) Dark yellow Urine 3) Enlarged liver 4) Loss of appetite	1) Blood and Urine test 2) Avoid Oily and fatty diet.	1) Avoid outside food And water. 2) Avoid cut foods.
7	Diarrhoea	Contaminated food and water	1) Loose watery stool more than 4-5 times in a day 2) Sunken eyes 3) Dry tongue 4) Weak pulse	1) ORS 2) Homemade fluids like dal ka pani, shikanji, coconut water, buttermilk.	1) Personal hygiene and cleanliness while cooking and eating food.
8	Worms	Parasites-Hookworm, tapeworm, roundworms.	1)Loose motions with blood and mucus 2) Abdominal Pain	1) Stool test	1) Personal and food hygiene 2) Boiling of drinking water 3) safe disposal of human excreta
9	Scabies	Mites-*Sarcoptes scabiei*	1)Skin Rash 2)Itching	1)Ointments 2) oral medicine	1) Personal hygiene
10	Skin infection	Bacteria, Fungi	1) Acne, pimples 2) Lesions on the skin 3) Irritation and itching of the skin	1) In sever case isolate the patients 2) Use of ointments and apply on the skin	1) Personal Hygiene is important 2) Do not share cloths

INTEXT QUESTIONS 4.1

1. State True false:

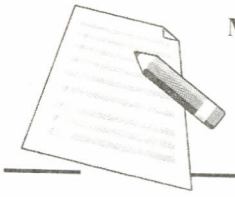
1) Swine flu is air borne disease. ( )

2) In tuberculosis, there is not chronic cough with sputum.( )

3) ORS is very effective in treatment of the Diarrhoea. ( )

4.4 HIV/AIDS

HIV is Human Immunodeficiency Virus. It infects and weakens the body's immune system. It survives in body fluids such as blood, semen, vaginal and cervical fluids.



Persons infected with HIV are called HIV positive people. They may look and feel perfectly healthy and can work like normal persons. They may not even know that they are infected and can infect others. PLWHA (People living with HIV/AIDS) is a term commonly used for HIV/AIDS patients.

AIDS

A = Acquired - One gets it from somebody infected. It is not hereditary.

I = Immune - It affects the immune system of the body.

D = Deficiency - Inadequacy of the body's immune system to fight infections.

S = Syndrome - A group of diseases or symptoms. It is not just one single disease.

AIDS is the late stage of HIV infection. A person with HIV is said to have got AIDS when his/her immune system is totally broken down and opportunistic infections (infections that take opportunity to cause diseases because HIV has weakened the body's immune system) invade his/her body. It may take more than 8 to 10 years for a person to develop AIDS after the initial infection with HIV. Most HIV positive people will eventually develop AIDS.

Women are More Vulnerable to HIV infection

Women are more vulnerable to HIV infection because of the following reasons:

- Limited access to information and educational messages.
- Biological vulnerability- large vaginal area and delicate vaginal membrane allow the virus to pass through easily.
- Increased risk of infection from man to woman - Higher concentration of virus in the semen; HIV transmission from man to woman more rapid than in the reverse direction.
- Many women suffer from asymptomatic STIs which facilitates HIV transmission.
- Poor access to healthcare services.
- Different social norms - most societies are male dominated; women having no say in matters of sexual relationships.
- Lower literacy rates.
- Lower socio-economic status- women often economically dependent on men.
- Passive attitude of women towards sexual issues.

- Women often require blood transfusion (during childbirth or for treating anemia) and face the risk of infection due to the possibility of infected blood transfusion.
- Lesser social support when infected.

Modes of HIV Transmission

Four main ways or routes of transmission of HIV are:

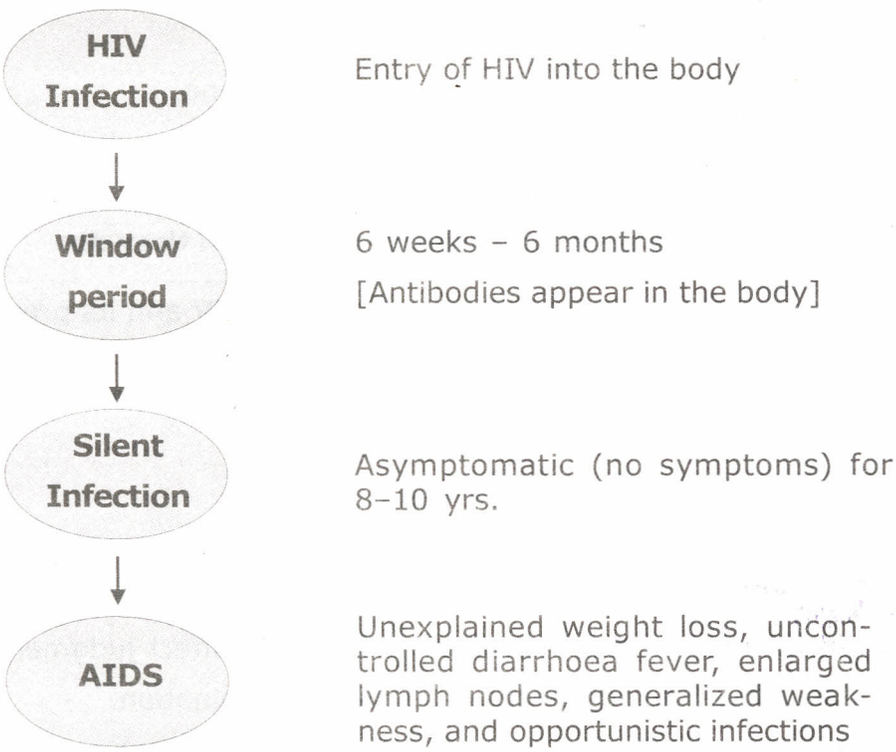
1. By transfusion of infected blood or blood products.
2. Having unprotected sex (without a condom) with HIV infected person.
3. By infected needles, syringes and other instruments
4. By an infected mother to her unborn child during pregnancy or childbirth.

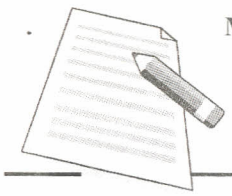
Ways in which HIV is not transmitted

HIV is not spread through:

- Casual contacts such as shaking hands, hugging, eating or drinking from the same utensils, etc.
- Traveling together
- Donating blood
- Mosquito bites (the virus doesn't survive in mosquito's body)

Progression of HIV in the body





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- Normal use of toilets and urinals
- Coughing, sneezing (not an air borne disease)
- Caring for people living with HIV/AIDS

The length of time it takes from HIV to develop into AIDS widely differs from person to person.

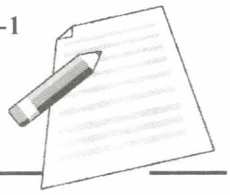
Preventive Measures

Preventive measures to be taken for protection from HIV include:

- Having appropriate information about HIV/AIDS, and skills to make correct choices.
- Making sure the blood is tested before transfusion.
- Abstaining from sex.
- Resisting negative peer pressure.
- Avoiding alcohol and drugs.
- Not having unprotected sex.
- Having a mutually faithful sexual relationship with an uninfected person.
- Practicing safer sex.
- Not injecting drugs.
- Not sharing needles and syringes with anyone.
- Pregnant women to get tested for HIV.
- Universal precautions to be observed.

How young people can contribute/What can they do:

- Learn and understand basic facts about HIV and its prevention.
- Develop life skills to protect themselves and others.
- Assess personal risk for HIV infection.
- Share information with others.
- Dispel myths.
- Tackle stigma in school and in the community.
- Avoid alcohol and use of drugs that may affect judgment.
- Treat PLWHA with compassion, not discrimination.
- Practice abstinence (not having sex with anyone).



ANTI RETROVIRAL THERAPY (ART)

There is no cure for HIV/AIDS yet. However, now Anti Retro Viral (ARV) drugs are available which stop people with HIV from becoming ill for many years. ARV treatment for HIV or ART consists of drugs that have to be taken by the HIV person for the rest of his/her life.

ART increases the person's ability to fight the disease. The drugs control the reproduction of the HIV virus, there by reducing HIV levels in blood and semen. They slow down the progression of HIV-related disease and make people with HIV live longer. They reduce symptoms and delay the onset of AIDS. In other words, ART converts HIV infection from a fatal disease to a chronic disease. But they do not cure HIV infection.

4.5 VACCINATION

Vaccination plays an important role in the prevention of diseases. It increases Immune power of human body to fight against microorganisms that causes disease. Because of vaccination, body is always prepared to remove disease causing microorganism from the body.

A **vaccine** is a biological preparation that improves immunity to a particular disease.

Vaccine (injection) of any particular disease contains disease causing microorganism of that disease only. Many times these microorganisms are killed or weakened. Vaccine stimulates body's Immune system to recognize disease causing microorganism and destroy it.

Do you Know.....

Vaccine is discovered by Edward Jenner's in 1796 (Small pox vaccine)

Methods of administration:

Administration of vaccine may be:

- Oral (E.g. Polio drops)
- By injection (intramuscular, intradermal, subcutaneous injections like BCG, DPT, Hepatitis etc.)
- By puncture
- Transdermal (Under the skin)

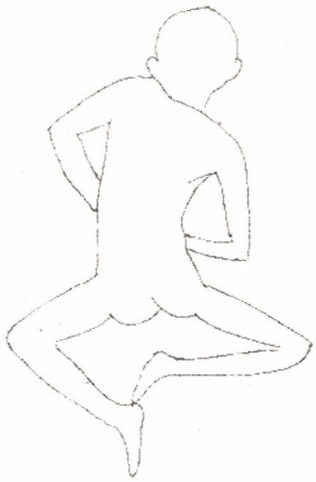


Fig. 4.1 (A) Patient of Polio

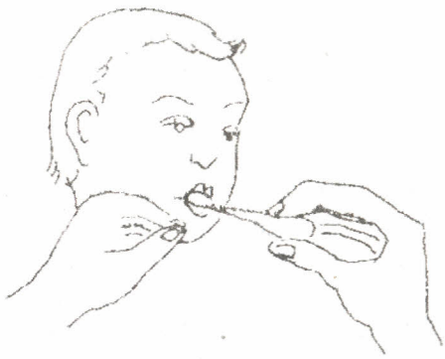


Fig. 4.1 (B) Polio Drops

4.6 IMMUNIZATION SCHEDULE

Under National Immunization Schedule, vaccination against some common Communicable diseases is done which is essential for child development and survival. These diseases are Polio, Whooping cough (Pertussis), Tetanus, Measles, Diptheria and Tuberculosis. Most of the child deaths are due to these diseases so it is very important to do active immunization in children from first year of their life.

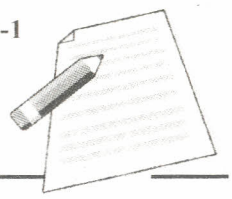
Vaccination Chart

At Birth	• B.C.G for T.B. • OPV (Oral Polio Vaccine) • Hepatitis B – first dose
6–8 weeks	• D.P.T. – 1st dose • Polio–1st Dose
10–14 weeks	• D.P.T. – 2nd dose • Polio–2nd dose
16–20 weeks	• D.P.T. – 3rd dose • Polio–3rd dose • Hepatitis B–2nd Dose
9 months	• Measles • Vitamin A–1st dose
15-18 months	• MMR (Mumps, Measles, Rubella) • Vitamin A–2nd dose
16-24 months	• DPT – 1st booster dose • Oral Polio – 3rd dose
5-6 years	DT
10-16 years	TT (Tetanus Toxoid)

Note: 1) Vaccination can be done during minor cough, Cold and mild fever.

2) Interval between 2 doses should not be less than 1 month.

3) Some other important vaccines which are not included in immunization schedule but can be given to children are chicken pox, typhoid, influenza vaccine etc.



Some Important Vaccine available:

Name of Vaccine	Disease
B.C.G.	Tuberculosis(TB)
TT	Tetanus
OPV	Polio
Small pox vaccine	Small pox
DPT	Diptheria, Pertussis and tetanus
Hepatitis vaccine	Hepatitis A and Hepatitis B
Measles vaccine	Measles
Hlb	Meningitis(Brain fever)
Chicken pox vaccine	Chicken Pox

INTEXT QUESTIONS 4.2

Q.1 State True or False:

1. Vaccine prepare by disease causing microorganisms. ( )
2. Vaccination decreases human Immune response. ( )

Q.2 Match the following:

	Vaccine	Disease
i.	DPT	Tetanus
ii.	B.C.G.	Polio
iii.	TT	Diptheria, Pertussis and Tetanus
iv.	Polio Vaccine	Tuberculosis(TB)

4.7 WHAT YOU HAVE LEARNT

In this lesson we studied what are diseases, how diseases are transmitted from one person to another. We have also discussed some common diseases, their causative agent, symptoms and preventive measure for those diseases. We have also discussed HIV/Aids, modes of HIV transmission, preventive measures and Anti Retroviral Therapy (ART).

In this lesson we also learnt about vaccination schedule and some important vaccines.

4.8 TERMINAL QUESTIONS

1. What is diseased condition?
2. Give classification of diseases with the examples.
3. Write a short note on vaccination.

4. Write causing agent, symptoms and prevention for any 5 diseases.

4.9 ANSWER TO INTEXT QUESTIONS

4.1

i. True

ii. False

iii. True

1) i. True

ii. False

2) i. DPT _____ Diptheria, Pertussis and tetanus

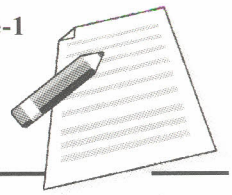
ii. B.C.G. _____ Tuberculosis (TB)

iii. TT _____ Tetanus

iv. Polio Vaccine _____ Polio

SUGGESTED ACTIVITY

Collect information regarding outbreaks of diseases in recent years.



5

FIRST AID

5.1 INTRODUCTION

Sometimes we cut ourselves or hit or get burns while working in the home. Such incidents cause minor injuries. But when vehicle hits someone or someone falls from a height or gets severe electric shock, the injuries caused are serious. These incidents are called accidents.

Incidents of convulsion, swallowing object in smaller children might lead to serious consequences. These incidents also need immediate action. In all these situations, immediate treatment or first aid is required.

5.2 OBJECTIVES

After reading this lesson, you will be able to:

1) Understand the concept of First Aid.
2) Learn about different procedures and practice of giving First Aid.
3) Provide First Aid to the victim in case of any emergency and save lives.

5.3 FIRST AID

The immediate treatment that is given to the victim of an accident or sudden illness before any medical help arrives is called "**First Aid**". Emergency care is required at any time in life and first aid provided at right time not only saves life but also prevents gross damage of essential parts of the body.

Aim of First Aid:

- It saves Life.
- Helps in early recovery.

- Prevent worsening of the victim's condition.
- To reduce pain and sufferings.

Important Rules of First Aid:

When you are giving first aid to the victim, you are lessening the pain and making him/her comfortable before the arrival of medical help.

For this you have to follow some basic rules, as follows:

1) **Be calm**–Try to be calm so that you can provide proper first aid to the victim.

2) **Disperse the crowd**–In case of road accident, try to keep surrounding people away from the victim and loosen his cloths so that he can breathe easily.

3) **Move the victim in a suitable safe place**–If the victim has received burns or an electric shock or is choking due to smoke then take him away from the accidental spot.

4) **Give artificial respiration**–If the patient is having difficulty in breathing, artificial respiration must be given.

5) **Call for a medical help** or take the victim to a hospital immediately.

INTEXT QUESTIONS 5.1

Answer in one word:

1. The aim of first aid is to save _____.
2. Important rule of first aid is try to be _____.

5.4 FIRST AID MANAGEMENT IN SOME COMMON CONDITIONS

Excessive Bleeding

First Aid:

- Press the wound firmly with your fingers or with your hand till bleeding stops.
- Raise the bleeding part so that blood does not flow out quickly.
- Wash the wound with clean water.
- If the injured person is bleeding profusely, the wound is

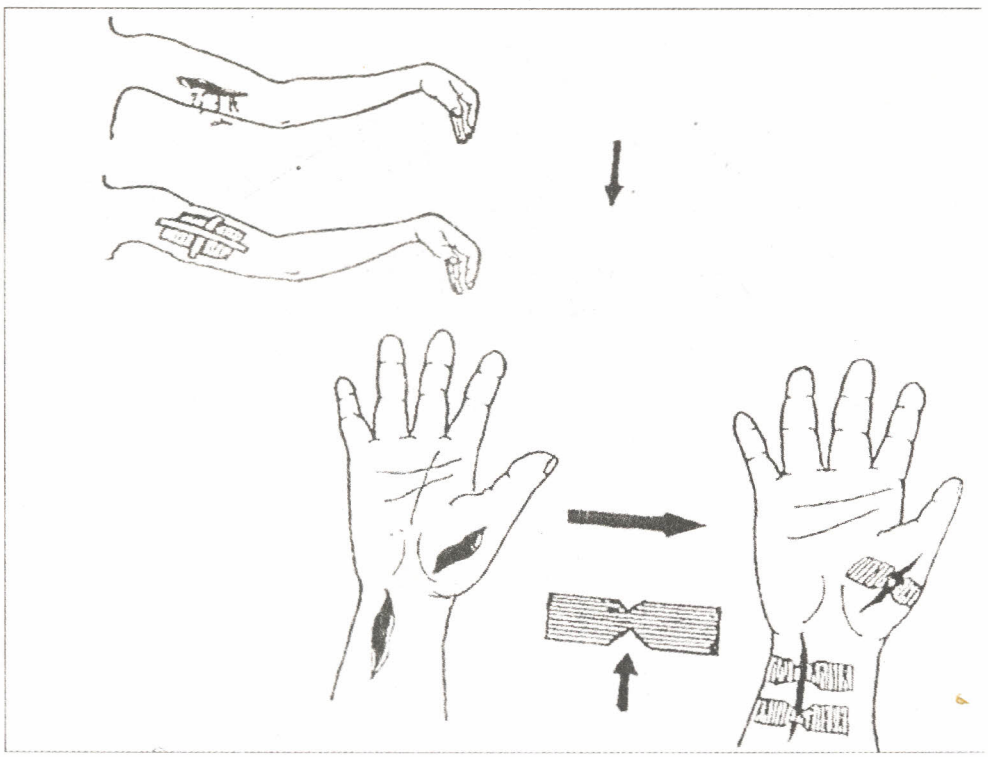


Fig. 5.1 To stop bleeding

bandaged with the handkerchief or a clean cloth & the person is moved to a hospital immediately.

Fractures (break in the bone)

Signs of fracture

Affected body part becomes:

- Very painful (severe pain)
- Swells up
- Victim is unable to move it

First Aid:

- Handle the victim very gently and try to avoid all unnecessary movements.
- Never attempt to bring the bones to normal position.
- Support the affected part with the appropriate support like Splint, piece of wood, padding in the form of folded handkerchief, towel, newspaper or magazine.
- Tie the splint firmly but not too much tight to stop the circulation.
- Call a doctor immediately or take the patient to a hospital.

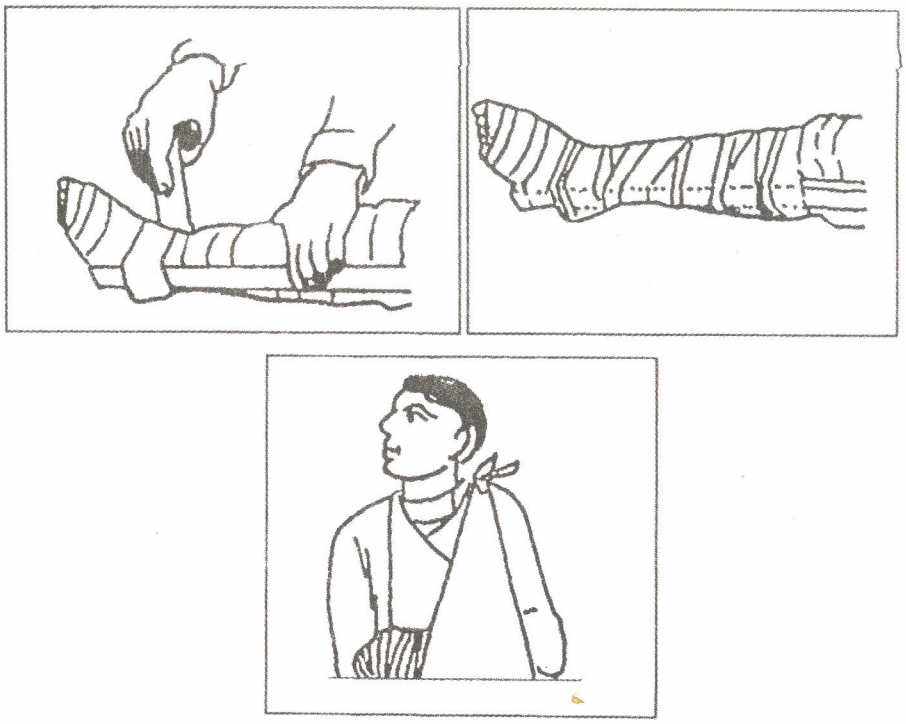


Fig. 5.2

Splints should be long enough so that joints above and below the injured part can't move

Electrical Shock

First Aid:

- Switch off the current or pull out the plug and disconnect the victim from the source of current with the help of wooden stick.
- Never touch the victim before disconnecting, otherwise you may get a shock.
- If the victim is not breathing properly or his heart beat has stop, give artificial respiration and external cardiac massage.
- Check for other injuries like shock or burn.
- Take the victim to a hospital immediately.

Points to remember:

1) Never touch the victim until the current has been turned off or the victim has been separated from the electrically live wire or object.
2) Never touch the victim with wet hands or metallic objects.

Fig.5.3 Electric shock

Burns

First Aid:

- Put the burnt area e.g. fingers, hand, legs under a running cold water.
- Do not apply cotton wool directly over the burnt area.
- Do not apply any greasy substance like cream, lotion etc. on the burnt area.
- Cover the burnt area gently with a bandage or a clean cloth.
- Treat the victim for the shock.
- Take the victim to a hospital immediately.

In case of blisters on the skin, do not try to break it.

Bites and Stings

A) Snake Bite

First Aid:

- Tie a bandage, handkerchief or a clean cloth above the bite area so that poison do not spread in the body.
- Do not move the bitten area.
- Gently wash the wound with water.
- Victim of snake bite feels very sleepy so keep him awake.
- Take the victim to a doctor immediately.

B) Dog Bite

First Aid:

- Wash the bitten area with soap and water.
- Keep it open.
- Take the victim to the doctor for anti-rabies treatment.

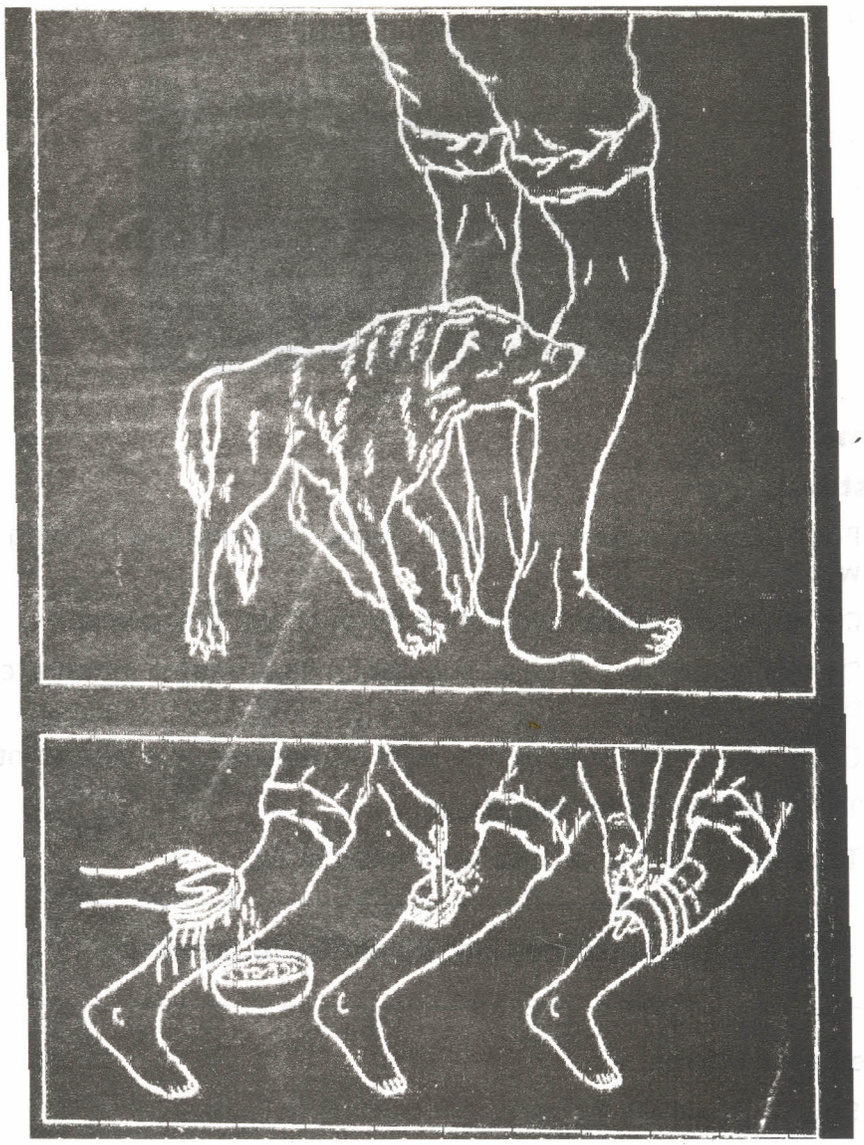


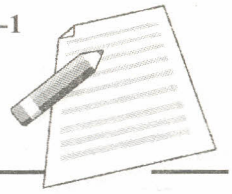
Fig. 5.4 Dog Bite and First Aid

Swallowing Objects and choking

Children quite often put small objects in their mouth or nose like coins, beads, toy parts, electric parts, small nuts, seeds of plants etc.

First Aid:

- Hold the child upside down & pat vigorously on the back.
- In case of grown-ups, stand behind the victim put your arms below the armpit and encircle the abdomen below the navel.
- Join both the hands together and clasp it.



- Press both fists on the abdomen with a quick jerk in the midline.
- If the victim fails to respond send the patient to a hospital for the removal of foreign body.

Poisoning

By disinfectants like phenyl, rat poison, kerosene, sleeping pills or poisonous gases like LPG, Smoke from charcoal etc.

First Aid:

- Make the victim vomit by the rubbing the back of the throat.
- Make the victim drink plenty of water.
- Take the victim to a hospital immediately.

INTEXT QUESTIONS 5.2

Fill in the blanks:

1. In any accident related to the electricity, the first thing to do is to switch off the _____.
2. Do not apply any _____ substance on the burnt area.
3. For cooling the burnt area, it is advisable to use _____.
4. The fractured area can be tied with a _____.
5. _____ the bleeding part so that blood does not flow out quickly.

5.5 FIRST AID KIT

Till now you have learnt to give first aid to the victims of different kind of health emergencies. Different situations require different materials. Let us list out the things which are required to make a First Aid Box, which can be use in case of health emergencies:

1. Bandages - There are 2 types of bandages:
   (i) Roller Bandage (These are long strips of cloths)
   (ii) Triangular Bandage
2. Cotton - sterilized cotton for cleaning of wounds.
3. Dettol - To clean wounds.
4. Small scissors - to cut the bandage.
5. Safety pins - for pinning bandages.
6. Burnol - to apply on the burns.

7. Torch or candle - to be used in dark.
8. Hot water bottle - to give warmth to the patient etc.

Fig. 5.5 First Aid Kit

5.6 WHAT YOU HAVE LEARNT

In this lesson we have understood the concept of the First Aid and importance of first aid to save human lives. First aid helps in preventing conditions from worsening. We have learnt important roles of First Aid and First Aid Management on some common conditions. We have also learnt about the First Aid Kit.

- It saves Life.
- Helps in early recovery.
- Prevent worsening of the victim's conditions.
- To reduce pain and sufferings.

The immediate treatment that is given to the victim of an accident or sudden illness before any medical help arrives is called "**First Aid**". Emergency care is required at any time in life and first aid provided at right time not only saves life but also prevents gross damage of essential parts of the body.

Aim of First Aid:

Important Rules of First Aid:

When you are giving first aid to the victim, you are lessening the pain and making him/her comfortable before the arrival of medical help.

For this you have to follow some rules, as follows:

1) **Be calm**–Try to be calm so that you can provide proper first aid to the victim.
2) **Disperse the crowd**–In case of road accident, try to keep surrounding people away from the victim and loosen his cloths so that he can breathe easily.
3) **Move the victim in a suitable safe place**–If the victim has received burns or an electric shock or is choking due to smoke then take him away from the accidental spot.
4) **Give artificial respiration**–If the patient is having difficulty in breathing, artificial respiration must be given.
5) **Call for a medical help** or take the victim to a hospital immediately.

5.7 TERMINAL QUESTIONS

1 Write down the qualities of good first aid worker.

2 Write a short notes on the first aid treatment in the following situations:

1. Electric shock
2. Bleeding
3. Fracture

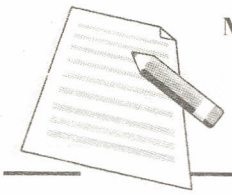
5.8 ANSWER TO INTEXT QUESTIONS

5.1

1. life
2. calm

5.2

1. current
2. greasy
3. cold running water
4. splint
5. Raise



5.9 SUGGESTED ACTIVITY

1) Practice all the procedures in first aid during different type of emergencies along with other school mates.

6

YOGA AND EXERCISE

6.1 INTRODUCTION

Exercise is necessary for the body since it strengthen the bones and slowdown the progress of many diseases. Yogic exercise promotes inner health and harmony; their regular practice helps prevent and cure many common ailments. In this lesson we will discuss the actual meaning and importance of yoga in our daily life.

6.2 OBJECTIVES

After reading this lesson you will be able to:

- Understand the meaning and importance of the yoga.
- Explain the precautions and rules of doing yoga.

6.3 WHAT IS YOGA

Exercise can be of different types, but yogasans are the foremost amongst exercises for the muscles and joints.

Fig.6.1 Sikpping

Fig.6.2 Yoga

"Yoga is the union of Pran and Apan."

"Yoga is the union of Jivatma and Parmatma."

Yoga is the method by which the restless mind is calmed and energy is directed into constructive channels. Men develop fully- physically, mentally, intellectually and spiritually by means of yoga.

6.4 ASHTANG YOG

According to Patanjali, there are 8 stages of yoga. These are :-

1) YAM - Universal moral commandments or ethical discipline.

It consists of : –

1. Ahinsa (Non violence)
2. Satya (Truth)
3. Asteya (Non-stealing)
4. Brahamyacharya (Celibacy)
5. Aparigraha (non hording)

2) NIYAM -

1. Shaucha (Internal cleanliness of body)
2. Santosha (Contentment)
3. Tap
4. Svadhyaya (Study of the self)
5. Ishvara Pranidhana (Dedication to the lord)

3) ASAN

4) PRANAYAM (rhythmic control of breath)

5) PRATYAHAR

6) DHARANA (Concentration)

7) DHYAN (Meditation)

8) SAMADHI

Note: The first 4 steps of Ashtang Yog can be practiced by all worldly persons. But the last 4 components can be practiced by Rishi, Munis and Yogis.

INTEXT QUESTIONS 6.1

1. What is Yoga?

2. What are the different stages of Ashtang Yog, according the Patanjali?

6.5 ASANS

Before we start the practice of yogasans, it is absolutely necessary to follow the principles of YAM and NIYAM and we have to purify our mind and body by regulating our conduct and behavior, also our thoughts and emotions. If we will just keep on doing Asans or simply keep or twisting and turning our body, then we cannot hope much. It will give you only 8-10% benefit. But if we follow YAM and NIYAM and change our habits, way of life, our thoughts and emotions and purify ourselves inside out and then starts doing the Asans, then we can hope for at least 80-90% benefits of the yoga.

As many as 84 lakh asans or postures are mentioned in the classics of yoga, however only few asans are commonly used in the day to day practice. Some of them are:-

1. SUKHASAN
2. PADMASAN
3. VAJARASAN
4. SARVANGASAN
5. DHANURASAN
6. SHALABHASAN
7. BHUJANGASAN
8. PAWANMUKTASAN
9. MANDUKASAN
10. SHAVASAN
11. SURYANAMASKAR

6.6 ESSENTIALS OF THE YOGA PRACTICE

In order to get full benefit of yoga, it is necessary to understand the following requirements and rules related to its practice:

1) Morning time, before breakfast is regarded best for practicing yoga but one can also do it in the evening during the empty stomach.
2) In general yogasans should be practiced before taking meals.
3) The body and mind should be in a restful and normal condition at the time of practicing yoga.
4) One should do yoga at the same time every day.
5) The place of practice should be neat, clean, airy and well ventilated.
6) One should practice yoga on the floor, avoid bed.
7) Use a carpet or mat on the floor.
8) Wear light, loose and cotton cloths.
9) Maintain silence while doing yoga, any conversation and listening of music should be avoided.
10) Always breathe through the nose while doing asans.
11) Do Yagasans according to the limits of your body.

6.7 PRANAYAM

Pranayam is the yogic art of breathing.

It consists of long, sustained inhalation (puraka), exhalation (rechaka) and retention of breath (Kumbhak).

Purak stimulates the system.

Rechaka throws out the toxins and bad air from the body.

Kumbhaka distributes the vital energy throughout the body.

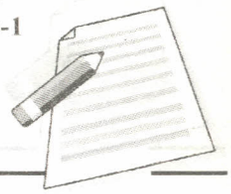
Thus the purpose of pranayam is to inspire, motivate, regulate and balance the vital force or *prana* inside the body. That is why pranayama is called the soul of yoga.

As bathing is necessary for purifying the body, similarly pranayam is essential for purifying the mind.

6.8 BENEFITS OF PRANAYAMA

Regular practice of pranayam has following benefits:

1. Pranayam leads to control of the emotions which in turn brings stability, concentration and mental peace.
2. Pranayam keeps the lungs pure by increasing the flow of fresh oxygenated blood.
3. Pranayam purifies *nadis* and remove sluggishness from the body.



4. It increases vigor, vitality, memory and perception.
5. Pranayam is a divine method which clean the organs, senses mind, intellect and ego.

6.9 ESSENTIALS OF PRANAYAM

Following factors are important will doing pranayam:-

- The best position to practice pranayam is *padmasan.* If for some reason that position is difficult to adopt, it can be done while sitting in any comfortable position like Sukhasan.
- One should keep the back, neck and head in a straight line.
- The body and mind should be in its natural relaxed condition.
- Use your right finger and thumb on either side of the nose to control the right and left nostril during inhalation and exhalation.
- One should inhale and exhale slowly and rhythmically.
- The beginner of pranayam should practice inhaling and exhaling only, for a few days, in the ratio of 1:2. For example if inhalation takes 5 seconds, exhalation should be for 10 seconds.
- While practicing Pranayam maintain the ratio of 1:4:2 for inhaling, retention of breath and exhale respectively.

6.10 TYPES OF PRANAYAM

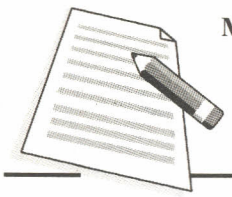
According to yogshastra following types of pranayam are beneficial in the treatment of some common disease. These are:-

1. Nadishodhan Pranayam
2. Suryabhedhi Pranayam
3. Ujjayi Pranayam
4. Shitkari Pranayam
5. Shitali Pranayam
6. Brahmari Pranayam
7. Bhastrika Pranayam
8. Kapalbhati Pranayam

INTEXT QUESTIONS 6.2

(A) State True or false:-

1. Pranayam is the yogic art of breathing. ( )
2. While doing pranayam one should keep the back, neck and head in a straight line. ( )



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3. While practicing Pranayam maintain the ratio of 1:2:3 for inhaling, retention of breath and exhaling respectively. ( )

(B) Fill in the Blanks

1. The best position to practice pranayam is _____.
2. _____ keeps the lungs pure by increasing the flow of fresh blood.
3. The practice, which is used to achieve the powers of your mind is known as _____.

6.11 MEDITATION

Meditation and Dhyan sadhna is a scientific aspect of Indian spiritual culture, which helps the practitioner to visualize or gain knowledge of minute secrets present inside them. This can be achieved with the power of your mind and subconscious mind. The practice, which is used to achieve the powers of your mind is known as Dhyan Sadhna. *Dhayan* is a pure and free stage of our inner soul. Meditation helps in strengthening the powers and keeps disturbed mind in peaceful condition. It increases the concentration power. Meditation is equally important for everybody.

6.12 TERMINAL QUESTIONS

1. Name few commonly used asans in day-to-day life.
2. What do you mean by Pranayam? List the Pranayam.
3. Write the names of any five Asanas.

6.13 ANSWER TO INTEXT QUESTIONS

6.1

Ans.1. Yoga is the method by which the restless mind is calmed and energy is directed into constructive channels.

Ans.2. According to patanjli 8 stages of Yog are:-

1) YAM
2) NIYAM
3) ASAN
4) PRANAYAM
5) PRATYAHAR
6) DHARANA
7) DHYANA
8) SAMADHI

6.2

(A)

1. True
2. True
3. False

(B)

Fill in the blanks:-

1 Padmasan

2 Pranayam

3 Dhyan Sadhna

SUGGESTED ACTIVITY

Visit any yoga centre of your locality and observe various asans and pranayam.

7

LAB ARRANGEMENT AND SAFETY PRECAUTION

7.1 INTRODUCTION

Lab assistants & Technicians should know many important things while working in a pathology laboratory .Clean & neat laboratory facilities are necessary to give good services to the patients. It will help to produce more accurate results If the technicians know well about do's & dont's in the lab, he will work effectively which will ultimately lead to keeping good standard of work & giving accurate results. Disinfection in the lab is a very important step for safety of patients as well as for technicians.

In this lesson, we will discuss the details about lab arrangement & lab methodology.

7.2 OBJECTIVES

After reading this lesson you will be able to know & understand about:

- laboratory arrangement & set up;
- electric supply;
- water supply;
- norms-behavior of technician;
- various ways of Disinfection in the lab.

7.3 LABORATORY ARRANGEMENT AND SET UP

- Clean & good laboratory facilities are necessary to give good services to the patients.
- The lab should be airy & with big windows to get natural light.
- The walls should be painted with white or light colors.

- Reagent bottles & glassware should be kept in open racks which can be easily picked up.
- The lab should have proper furniture such as working tables, writing tables & chairs etc.
- Laboratory sinks should be washable for glass wears.
- The lab arrangement will depend on available space. In a small laboratory, technicians working table, arrangement for blood collection, writing tables should be arranged in one room.
- In big laboratories there would be separate waiting room for patients, room for blood collection, room for carrying out test.
- The lab should have attached toilet & arrangement for disposal of samples.
- There should be adequate washing facilities.

INTEXT QUESTIONS 7.1

State true & false.

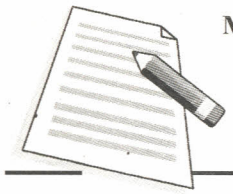
1. The lab room would be airy & with big windows to get natural light. ( )
2. Reagent bottles & glass wear should be kept in open racks which can be easily picked up. ( )

7.2 ELECTRICITY SUPPLY

- The electricity supply plays an important role in lab to run the instruments like centrifuge, refrigerator, hot water bath & sterilizer.
- The electric supply would be three phase connection with proper earthing.
- Regular check up of electric instruments for shock help to avoid any accidents.

7.3 WATER SUPPLY

- The Laboratory needs water for cleaning & washing of glass wear.
- It would be through tap up to wash basin or sink.
- If there is no tap water available from municipal council, the lab room would be supplied with overhead water supply tank.
- The lab would have proper disposal facilities to dispose samples & chemicals & used water after washing & cleaning.
- Waste water from the laboratory would be collected in soak pit which would be absorbed in the soil.



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INTEXT QUESTIONS 7.2

Fill in the blanks

- The lab have instruments like_____, _____, _____.
- The electric connection should have proper _____.
- _____ of electric instruments for shock will help to avoid any accident.
- The lab would have water supply through tap up to _____.
- The laboratory would need water for cleaning & washing of _____.
- The lab would have proper _____ facilities to dispose samples & chemicals & used water after washing & cleaning.

7.4 NORMS–BEHAVIOR OF TECHNICIAN

The lab technicians would to know that what are the duties & behaviour of the Lab Technician-

- Punctuality at workplace is very important.
- Neatness & clean clothes, using the lab coat is also important.
- Arranging the glass wear, needles, chemical bottles at proper place is also very important. Giving proper instructions to the patients while sample collection will help for accurate lab results.
- Wash the hands after completing the test. Bringing eatables in the lab should be strictly avoided.
- Honesty & clean practices while carrying out test is very important.
- If there occurs any mistake by the technicians while carrying out the procedure it should be repeated; do not disclose any confidential information about the patient reports to others.
- Put off gas connection, electric connections & other electric instruments, water taps before closing the lab.

INTEXT QUESTIONS 7.3

Fill in the blanks

1. Giving proper instructions to the patients while sample collection will help for_____ lab results.
2. Bringing _____ in the _____ should be strictly avoided.

3. Do not disclose any _____ information about the patient reports to others.
4. List out the precautions to be taken before closing the lab

   1) _____ 2) _____

   3) _____ 4) _____

7.5 DISINFECTION OF LAB

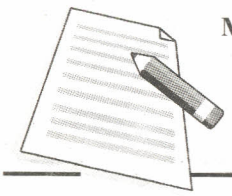
Various ways of Disinfection -

- Disinfection with boiling water- Needles & blood lancets are disinfected with boiling water of 100°c for 20 minutes Glass wears, syringes, test tubes, pipettes are also disinfected in this way.
- Heating with spirit lamp –Metal appliances used for bacteriology such as needles, forceps, wire loops are sterilized by heating until red hot with spirit lamp.
- Disinfection with help of pressure cooker- During MPN test the medium is kept in boiling water in the pressure cooker for 20 minutes .
- Disinfection by incineration –The test samples for sputum test are discarded by burning or incineration.
- Use new needle for every new patient.
- All the urine samples should be discarded in the toilet.
- The sputum & blood samples should be mixed with disinfectant solution & then discarded in toilets.
- Wash all the specimen collection bottles with detergent solution & use pressure cooker for sterilization.
- The floor in the lab should be cleaned daily with Dettol solution.
- Any specimen spilled on the table or floor should be wiped first with cotton swab & then clean with spirit.

INTEXT QUESTIONS 7.4

Fill in the blanks

1) _____ & _____ are disinfected with boiling water of 100°c for 20 minutes.
2) During _____ the medium is kept in boiling water in the pressure cooker for 20 minutes.
3) Use _____ needle for every new patient.
4) Any specimen spilled on the table or floor should be wiped first with cotton swab & then clean with _____.



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7.6 WHAT YOU HAVE LEARNT

- Clean & neat laboratory facilities are necessary to give good services to the patients & to produce accurate results.
- Arrangements in Big Laboratory- separate waiting room for patients, room for blood collection, room for carrying out test.& attached toilet & arrangement for disposal of samples.
- The electric supply should have proper earthing & regular check up of instruments.
- The water supply is necessary for cleaning & washing.
- Various ways of Disinfection in the lab, would be followed.

7.7 TERMINAL QUESTIONS

1. Write an essay on the Lab arrangement.
2. Describe the various ways on Disinfections.

7.8 ANSWER TO INTEXT QUESTIONS

7.1

1) True 2) True

7.2

1) centrifuge, refrigerator, hot water bath 2) earthing 3) Regular check up 4) basin 5) glass wear 6) disposal

7.3

1) accurate 2) eatables, lab 3) confidential 4) Put off gas connection, electric connections & other electric instruments, water taps.

7.4

1) Needles; blood lancets 2) MPN test 3) New 4) Spirit

SUGGESTED ACTIVITIY

Visit a pathology laboratory in your town & observe the arrangements & set up in the lab. Take an interview of the technician on, do's & don't of the technician disinfection in the lab.