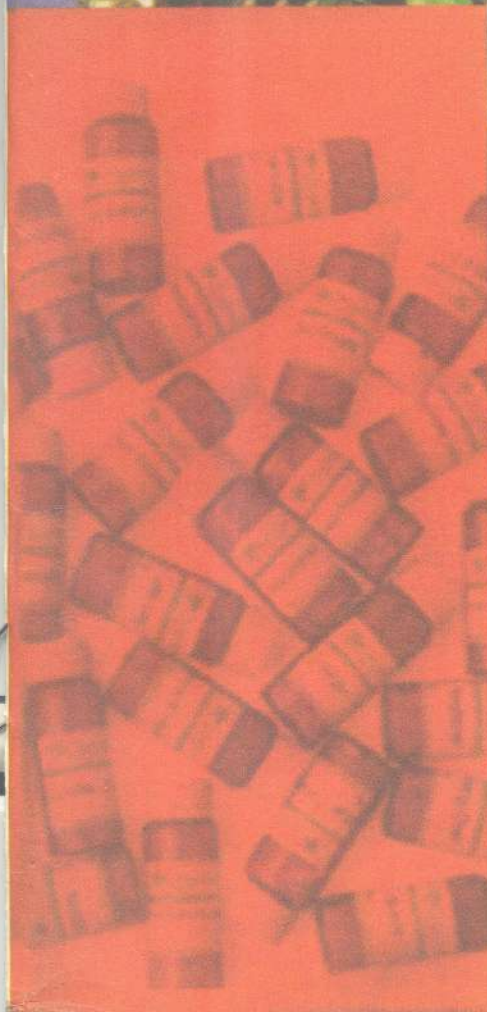
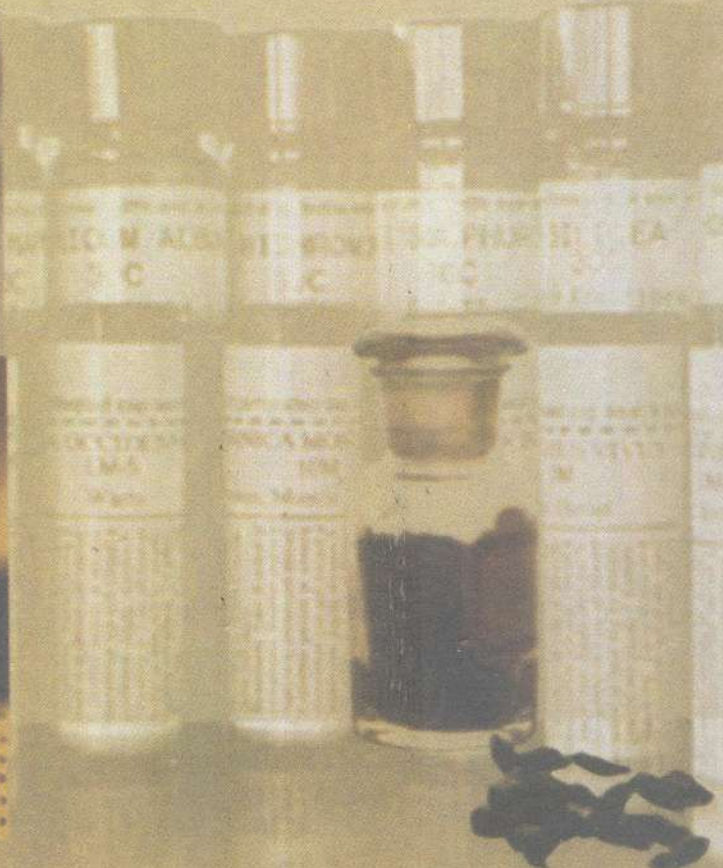


Open Vocational Education Programme

# Certificate in **HOMEOPATHIC DISPENSING**

718

## Module 1: Introduction to Homeopathy



**NATIONAL INSTITUTE OF OPEN SCHOOLING**

# **Certificate in Homeopathic Dispensing**

## **Module 1: Introduction to Homeopathy**

*Course Coordinator*  
*Dr. Mamta Srivastava*  
*Assistant Director*



विद्याधनं सर्वधनं प्रधानम्

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Certificate  
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Module 1a

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**Module 1 :**  
**Introduction to Homeopathy**

**CONTENT**

| <b>SR.NO.</b> | <b>LESSON NAME</b>                         | <b>PAGE NO.</b> |
|---------------|--|-----------------|
| 1.            | BASICS OF ANATOMY                          | 1               |
| 2.            | BASICS OF PHYSIOLOGY                       | 22              |
| 3.            | HISTORY OF HOMEOPATHY                      | 50              |
| 4.            | ORGANON OF MEDICINE                        | 58              |
| 5.            | INTRODUCTION OF HOMEOPATHIC MATERIA MEDICA | 75              |

**Module 1 :**  
**Introduction to Homeopathy**

# 1

## BASICS OF ANATOMY

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### 1.0 INTRODUCTION

Proper understanding of the human anatomy is very essential to know about structure of the human body.

In this lesson, we will study basics of Anatomy.

The bones : their classification, composition and functions. The structure and different function of the skin are also discussed. Then, the viscera of the human body is also described briefly.

### 1.1 OBJECTIVES

After Reading this lesson, you will be able to understand:

- Regional classification and composition of the bones
  - Functions of the bones
  - Classification of the bones according to their shape
  - Classification of the bones according to their development and structure
  - Structure and function of the skin.
-

- Description of the important viscera - Oesophagus, stomach, Duodenum, Jejunum, Ileum, caecum, appendix, colon, rectum, liver, gall bladder, pancreas, spleen, kidney, lung, heart, brain, uterus.

## 1.2 BONES

**Skeleton** - It is the main supporting framework of the body made up of bones and cartilages.

**Bone** - Bone is a living tissue capable of changing its structure as the result of the stresses to which it is subjected.

### REGIONAL CLASSIFICATION OF BONES

| Region of skeleton           | Number of bones |
|------------------------------|-----------------|
| <b>Axial skeleton</b>        |                 |
| Skull                        |                 |
| Cranium                      | 8               |
| Face                         | 14              |
| Auditory ossicles            | 6               |
| Hyoid                        | 1               |
| Vertebrae                    | 26              |
| Sternum                      | 1               |
| Ribs                         | 24              |
| <b>Appendicular skeleton</b> |                 |
| <b>Shoulder girdle</b>       |                 |
| Clavicle                     | 2               |
| Scapula                      | 2               |
| <b>Upper extremities</b>     |                 |
| Humerus                      | 2               |
| Radius                       | 2               |
| Ulna                         | 2               |
| Carpals                      | 16              |
| Metacarpals                  | 16              |
| Phalanges                    | 28              |



| Region of skeleton       | Number of bones |
|--------------------------|-----------------|
| <b>Pelvic girdle</b>     |                 |
| Innominate (hip) bone    | 2               |
| <b>Lower extremities</b> |                 |
| Femur                    | 2               |
| Patella                  | 2               |
| Fibula                   | 2               |
| Tibia                    | 2               |
| Tarsal                   | 14              |
| Metatarsal               | 10              |
| Phalanges                | 28              |
|                          | 212             |

### COMPOSITION OF BONES

**Organic matter** - It consists of collagen fibers, forms one third of the total weight, and provides a fibrous framework, imparts rugged elasticity so that bone is immensely strong.

**Inorganic matter** - It consists of mainly calcium phosphate and partly calcium carbonate and traces of calcium fluoride, calcium chloride and magnesium salts. It forms two-third of total weight, provides a groundwork which imparts hardness and rigidity.

### FUNCTIONS OF BONES

- Bones provide shape and support to the body. They transmit the body weight to the ground.
- Bones serve as levers for muscular action.
- The skull, vertebral column and thoracic cage protect brain, spinal cord and thoracic viscera respectively.
- They provide surface for the attachment of the muscles, tendons, ligaments, fascia and membranes.
- Bone marrow produces blood cells.

- They provide a site for reticulo-endothelial system.
- Bones are the richest site for storage of calcium and phosphorus.
- The large paranasal air sinuses in the bones of the skull affect the timber of voice.

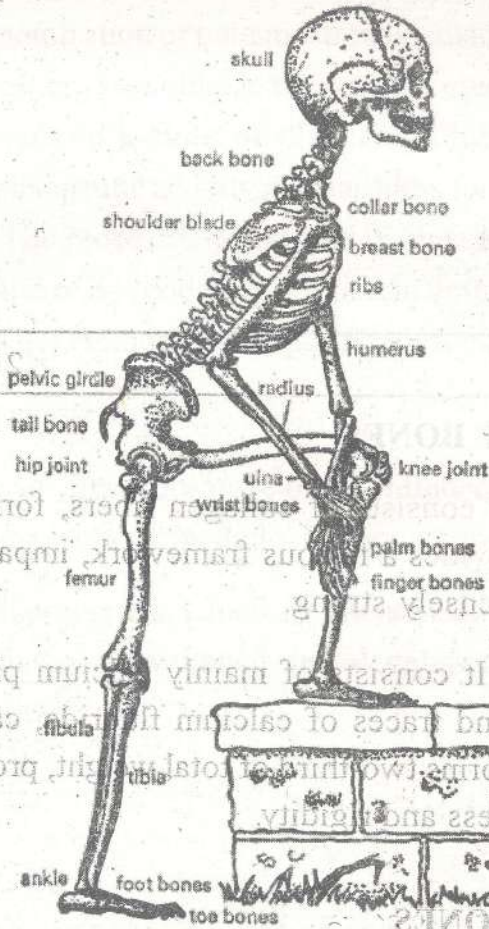


Fig. 11. Adult male skeleton (ventral view) showing the bones of the body.

### CLASSIFICATION OF BONES

The bones may be classified in various ways:

#### A) According to shape

i. **Long bones:-** Each long bone has an elongated shaft and two expanded

Bone marrow produces blood cells.

ends which are smooth and articular. e.g. Humerus, Radius, Ulna, Femur, Tibia and Fibula.

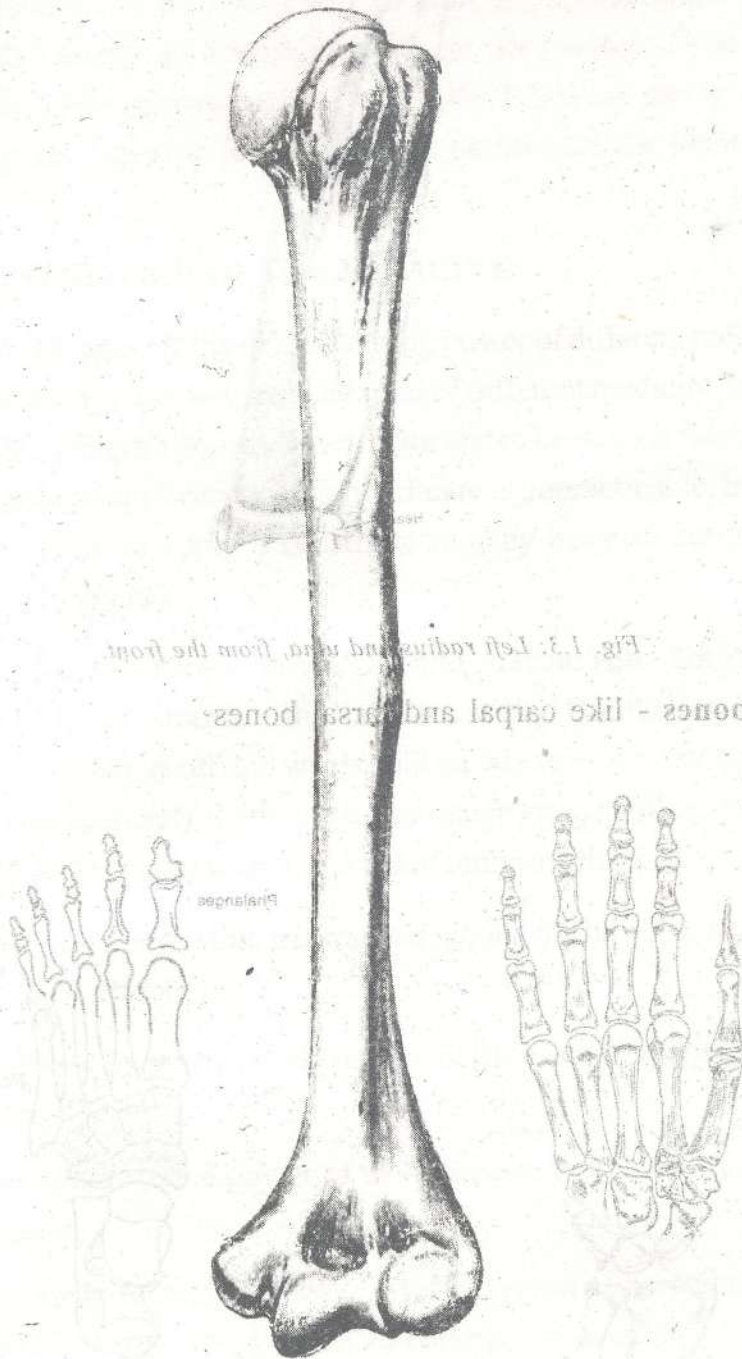


Fig. 1.2 : Left Humerus: anterior aspect.

Fig. 1.3: Left radius and ulna, from the front.

ii. Short bones - like carpal and tarsal bones.

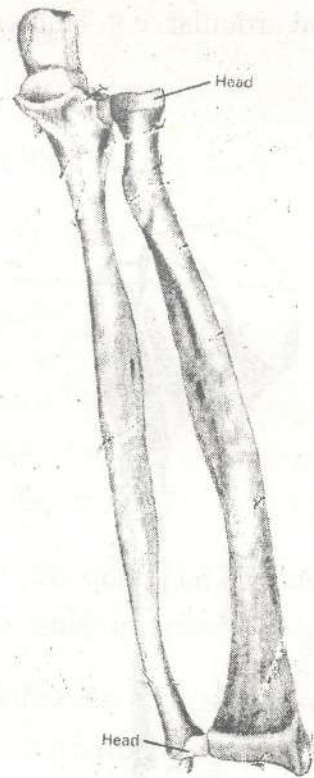


Fig. 1.3: Left radius and ulna, from the front.

ii. Short bones - like carpal and tarsal bones

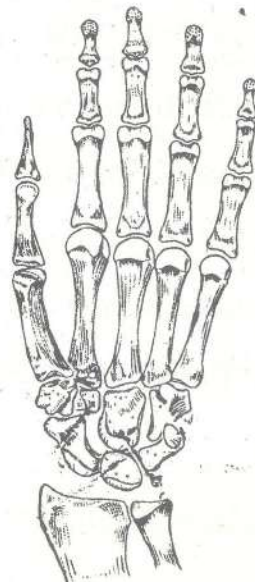


Fig. 1.4(a) :Bones of the left hand: palmar surface

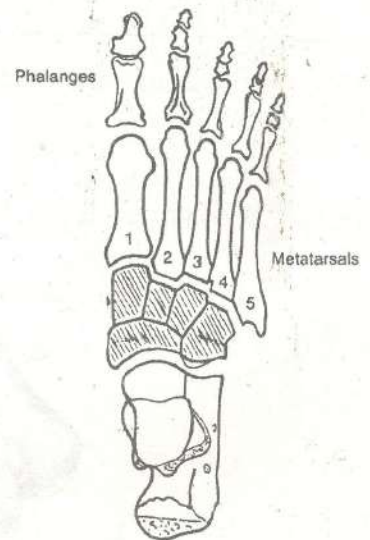


Fig. 1.4(b) :The dorsum of the foot and toes

iii. **Pneumatic bones** - Certain skull bones contain larger air cavities, e.g., maxilla. They make the skull light in weight and help in resonance of voice.

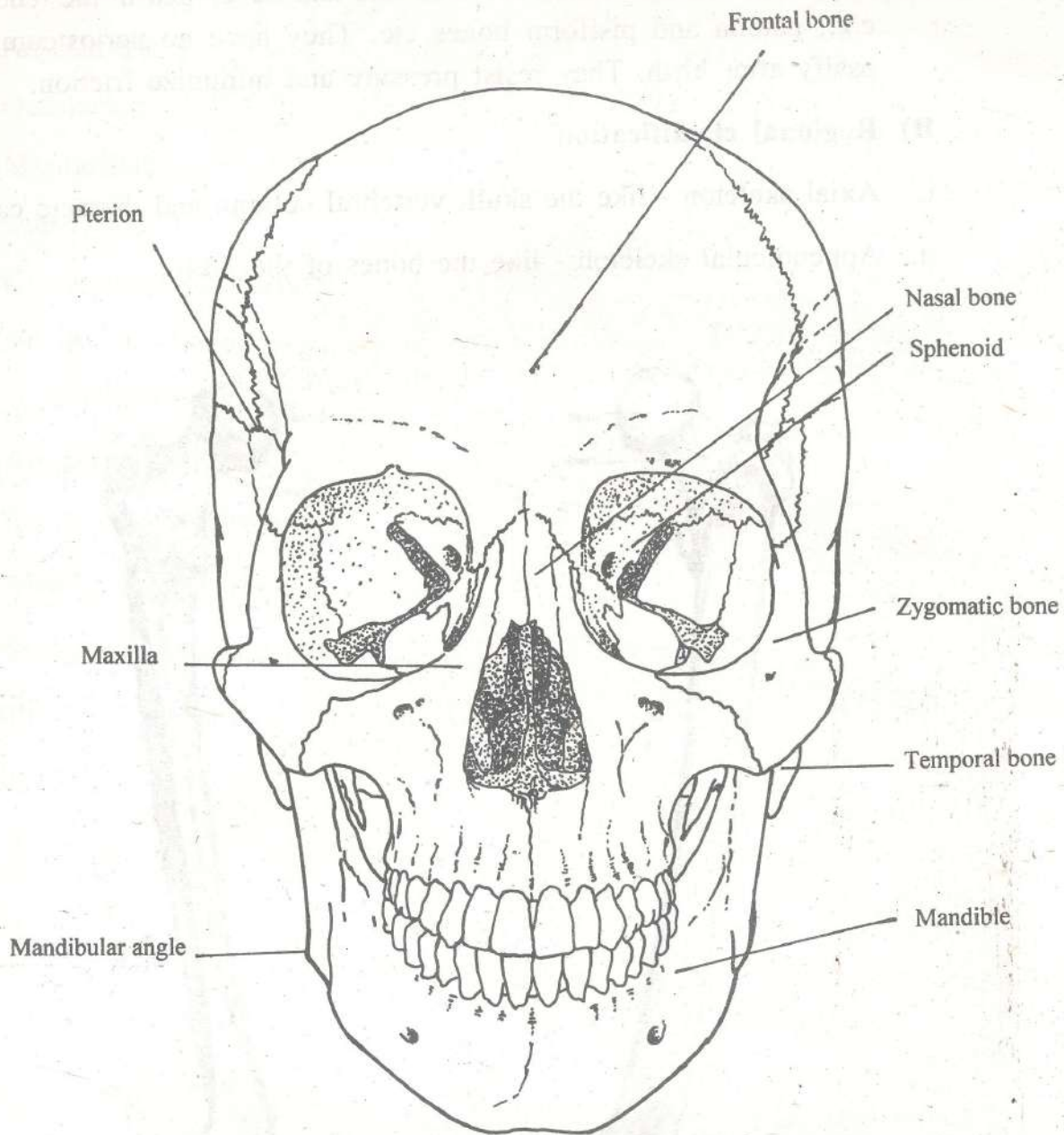


Fig. 1.5 : The skull: anterior aspect (norma frontalis)

- iv. **Flat bones** - Like shallow plates, e.g., scapula, iliac region of hipbone, sternum, ribs and many skull bones.
- v. **Irregular bones** - like vertebrae.
- vi. **Sesamoid bones** - These are seed like and developed in the tendons, e.g., patella and pisiform bones etc. They have no periosteum and ossify after birth. They resist pressure and minimize friction.

**B) Regional classification**

- i. **Axial skeleton** - like the skull, vertebral column and thoracic cage.
- ii. **Appendicular skeleton** - like the bones of the limbs.



A

B

*Fig. 1.6 : Right femur: A-anterior aspect; B posterior aspect.*

**C. Developmental classification**

- i. **Membranous bones** - Ossify in membranes, e.g., bones of vault of skull and facial bones.
- ii. **Cartilagenous bones** - Ossify in cartilage, e.g., bones of limbs.

**D. Structural classification**

- i. **Compact bones** - Is dense but extremely porous. It is best seen in context of long bones.

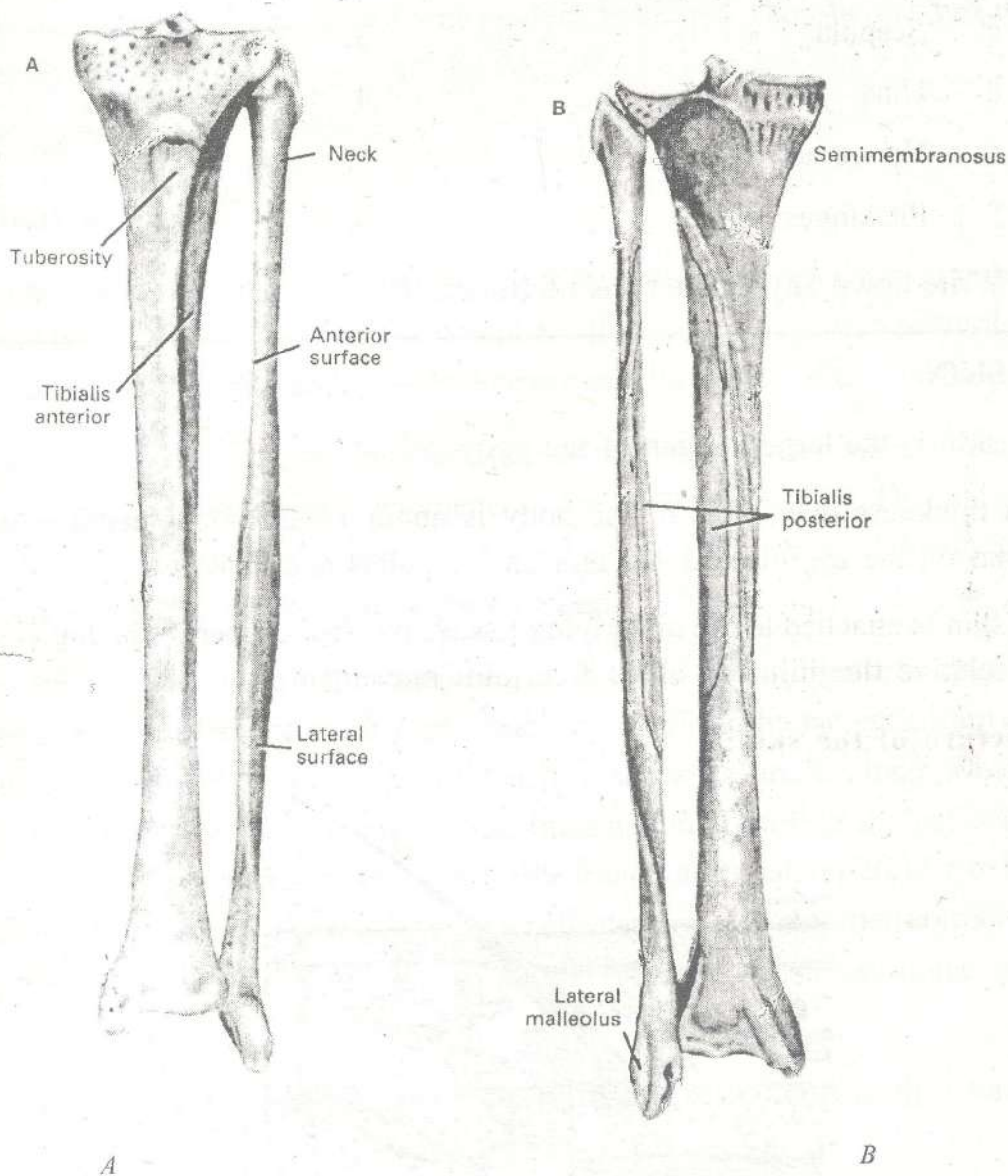


Fig. 2.7 : Left tibia and fibula: A from the front; B from behind.

- ii. **Cancellous or spongy bones** - It is made up of meshwork of trabeculae between which is marrow, spaces like ends of long bones, 'vertebrae, sternum etc

**INTEXT QUESTIONS 1.1**

1. Match the following

| Region of skeleton | Number of Bones |
|--------------------|-----------------|
| a Face             | 1. 2            |
| b Hyoid            | 2. 26           |
| c Scapula          | 3. 28           |
| d Ulna             | 4. 2            |
| e Vertebrae        | 5. 14           |
| f Phalanges        | 6. 1            |

2. Write down any 2 functions of Bones.

**1.3 SKIN**

The skin is the largest organ of the body.

Skin thickness over most of the body is about 1.2mm - compared with 0.5mm on the eyelids and 4-6 mm on the palms and soles.

The skin is attached to the underlying tissues by elastic fibers, which gives it a relative flexibility to allow free joint movement.

**Structure of the skin:**

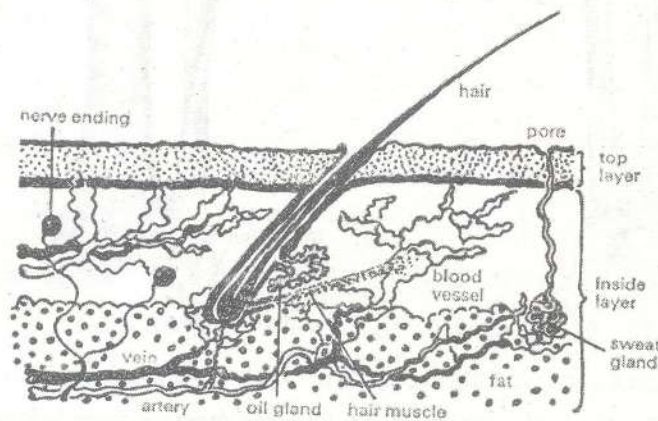


Fig. 1.8 : Structure of the skin and subcutaneous tissue.



1. The skin consists of two distinct layers - the *epidermis* or the outer layer and *dermis* or the inner layer.
2. The epidermis is covered by a thin layer of keratin - the horny protein material also found in hair and nails.
3. Deep to be dermis. just above the subcutaneous fatty layer, lies the sweat glands which secrete sweat through ducts, or pores.
4. Also found in the dermis are nerves, and the blood capillaries which nourish the epidermal cells.
5. Hairs are produced by specialized epidermal cells and grow from hair follicles, which extend down into the dermal layer. Each hair has its own erector muscle, and a sebaceous gland, which secretes grease or sebum to keep the skin supple.

#### **Functions of the Skin:**

1. It protects the more delicate internal organs, acting as a barrier against physical damage, harmful sun rays, and bacterial infection.
2. It also acts as a sensory organ, being more richly supplied with nerve endings than any other part of the body. Sensations of touch, pain, heat and cold from the skin provides the brain with a continuous flow of information about the body's surroundings.
3. It has a very important role in the regulation of body temperature. 85% of body heat loss is through the skin. During exposure to heat, blood vessels near the skin surface dialate so that more blood flow near the surface to lose its heat. When it is cold, these blood vessels contract to reduce blood flow near the skin surface, thereby retaining the heat within.
4. It functions as an organ of excretion through the process of perspiration.
5. It plays a part in the formation of Vitamin D into be sunlight and even of some antibodies.

**Perspiration:**

Perspiration is a term used to describe both the product of the sweat glands (sweat) and also the process during which this fluid is produced.

Sweat contains over 99% of water together with small amounts of salts, urea and other waste products

The process of perspiration helps to keep body temperature down because heat is lost when sweat evaporates.

**1.4 VISCERA**

Internal organs enclosed within a cavity, specially the abdominal organs.

**I. Abdominal viscera**

- i. Liver
  - ii. Spleen
  - iii. Kidneys
  - iv. Pancreas
  - v. Gall bladder
  - vi. Stomach
  - vii. Duodenum
  - viii. Jejunum
  - ix. Ileum
  - x. Caecum
  - xi. Appendix
  - xii. Ascending colon
  - xiii. Transverse colon
  - xiv. Descending colon
  - xv. Aorta
  - xvi. External iliac artery
-

**II. Neck viscera**

- i. Oesophagus
- ii. Thyroid gland
- iii. Parathyroid glands

**III. Thoracic viscera**

- i. Heart
- ii. Lungs
- iii. Arch of aorta
- iv. Pulmonary trunk

**IV. Pelvic viscera**

- i. In male
  1. Urinary bladder
  2. Ureters
  3. Rectum
  4. Sigmoid colon
- ii. In females
  1. Urinary bladder
  2. Ureters
  3. Uterus
  4. Ovaries
  5. Rectum
  6. Sigmoid colon

V. Viscera of skull

i. Brain

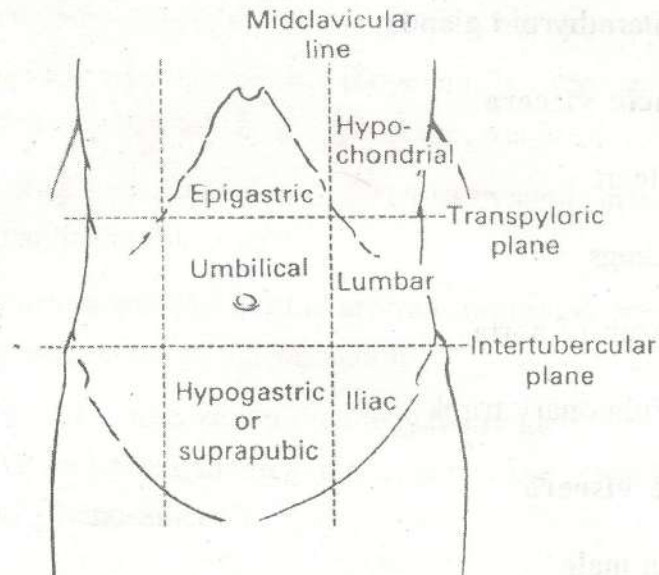


Fig. 1.9 Regions of the abdomen

**DESCRIPTION OF A FEW VISCERA**

**OESOPHAGUS** - The muscular tube about 9 to 9.75 inches long, that carries swallowed food and liquids from the pharynx to the stomach. At the junction with the stomach is the lower oesophageal which relaxes to permit passage of food, then contracts to prevent back up of stomach contents.

**STOMACH** - A muscular distensible saclike portion of the alimentary tube between the oesophagus and duodenum. It is below the diaphragm to the right of the spleen, partly under the liver.

It has two openings:

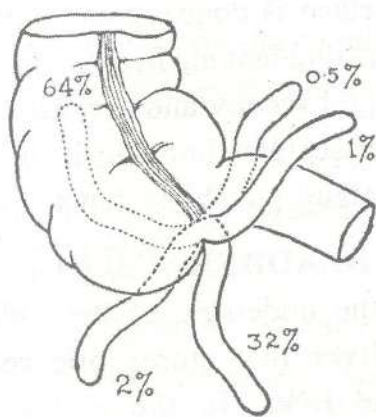
- i. The upper orifice opens from the oesophagus and is surrounded by the lower oesophageal sphincter.
- ii. The lower pyloric orifice opens into the duodenum and is surrounded by the pyloric sphincter.

The wall of the stomach has four layers. The outer serous layer or visceral peritoneum covers almost the entire organ. The muscular layer just beneath the peritonium. The submucosa is made of connective tissue that contains blood vessels. The muscular is the lining that contains the gastric glands, simple tubular glands of columnar epithelium that secrete gastric juice.

**DUODENUM** - The first part of the small intestine, between the pylorus and the jejunum. It is 8-11 inches long. The duodenum receives hepatic and pancreatic secretions through the common bile duct. The wall of duodenum contains circular folds (plicae circularis) and the villi, both of which increase the surface area. The microvilli of the epithelial cells are called the brush border, which also increase surface area for absorption. Intestinal glands between the bases of the villi secrete digestive enzymes. The common bile duct opens at the ampulla of Vater.

**JEJUNUM** - The 2nd portion of the small intestine extending from the duodenum to the ileum. It is about 8 ft. long, comprising of about two-fifths of the small intestine.

**ILEUM** - The lower three-fifths of the small intestine form the jejunum to the ileo-caecal valve. Its length varies in men from 9.6 meters to 4.72 meters.



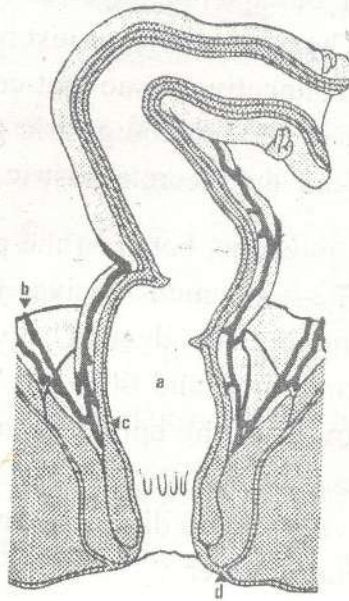
1.10 Various sites assumed by vermiform appendix and approximate frequencies. (After Wekele)

**CAECUM** - A blind pouch or cul-de-sac forms the first portion of the large intestine, located below the entrance of the ileum at the illocaecal valve. It averages about 6 cm in length and 7.5 cm in width. At its lower end is the appendix.

**APPENDIX** - It is a vestigial organ (non functionally) and the word itself means just an appendage.

**COLON** - The large intestine from the end of the ileum to the canal that surrounds the anus, about 59 inches (1.5 meters) long; divided into the ascending, the transverse, the descending and the sigmoid or pelvic colon. Beginning at the

**NORMAL BOWELS**



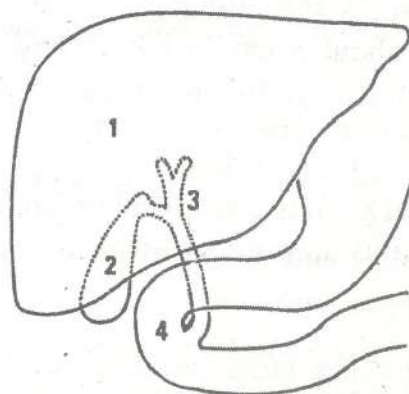
- a Rectum
- b Veins
- c Mucus Membrane
- d Skin

Fig. 1.11

caecum, the first part of the large intestine (ascending colon) passes upwards to the right colic flexure (hepatic flexure), where it turns as the transverse colon passing ventral to the liver and stomach. On reaching the spleen, it turns downward (left colic or splenic flexure) and continues as the descending colon to the brim of the pelvis where it is continuous with the sigmoid colon and extends to the rectum.

**RECTUM** - The lower part of the large intestine about 5 inches long between the sigmoid colon and the anal canal. The centres for the defaecation reflex are in the 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> sacral segments.

**LIVER** - The largest organ in the body approx, weighing 1200 to 1600 gm. It is situated on the right side beneath the diaphragm; occupies the right hypochondrium, epigastrium and part of the left hypochondrium; and is level with the bottom of the sternum. Its undersurface is concave and covers the stomach, duodenum, hepatic flexure of colon, right kidney and adrenal capsule. The liver secretes bile and is the site of a great many metabolic functions.



- 1 Liver
- 2 Gall Bladder
- 3 Bile duct
- 4 Duodenum

Fig. 1.12

**GALL BLADDER** - A pear shaped sac on the underside of the right lobe of the liver that stores bile received from the liver. In the gall bladder, bile is concentrated by removing water. About 500 to 600 ml of bile, is secreted each day. The bile is then

discharged through the cystic duct, which is 3 to 4 cm long. The cystic duct, which is about 0.25 inches in diameter, joins the hepatic duct to form the common bile duct, which empties into the duodenum at the ampulla of Vater

**PANCREAS** - Both an exocrine and endocrine gland, situated behind the stomach in front of the first and second lumbar vertebrae in horizontal position, its head attached to the duodenum and its tail reaching to the spleen. The portion between the head and the tail constitutes the body. Scattered throughout the exocrine glandular tissue are masses of cells called Islets of Langerhans endocrine glands that secrete hormones.

**SPLEEN** - A dark red, oval organ in the upper left abdominal quadrant posterior and slightly inferior to the stomach.

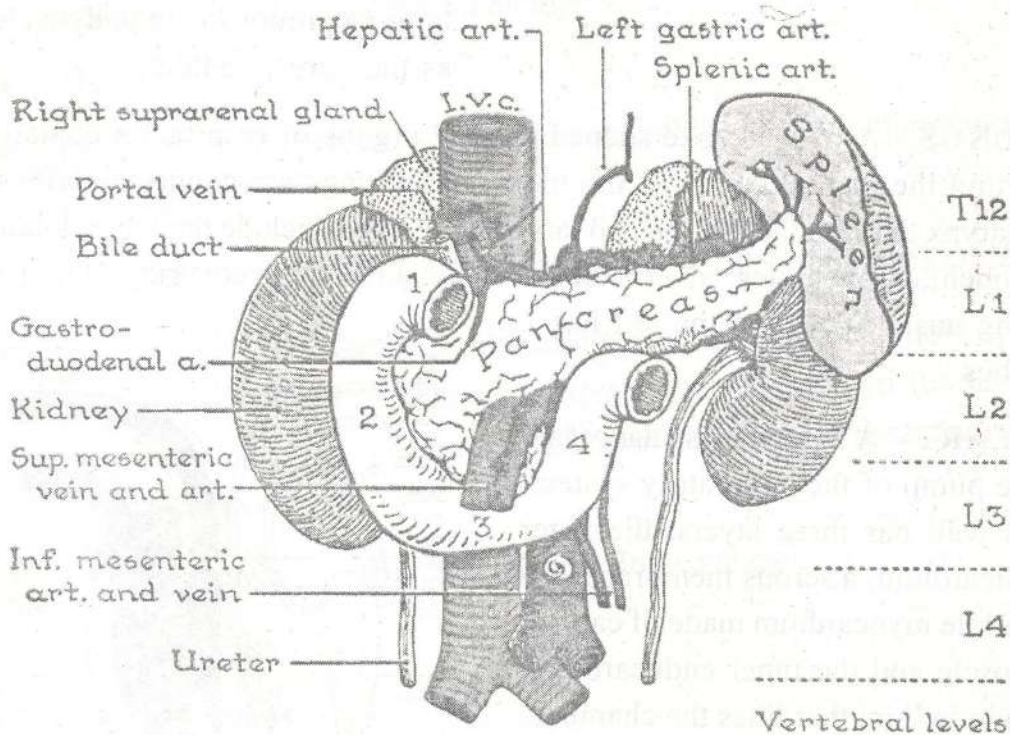


Fig. 1.13 Abdominal viscera and vessels - the key picture. IVC, inferior vena cava

Cross section of a kidney

- a Cortex
- b Medulla
- c Renal artery
- d Renal vein
- e Pyramid
- f Ureter

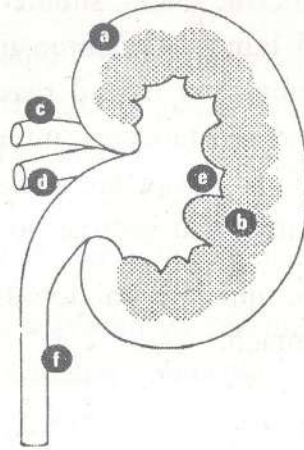


Fig. 1.14

**KIDNEYS** - A pair of purple brown organs situated at the back (retroperitoneal area) of the abdominal cavity; each is lateral to the spinal column. The kidneys form urine from blood plasma. They are major regulators of the water electrolyte and acid-base content of the blood and indirectly all body fluids. The right kidney is slightly lower than the left one. Each kidney weighs 113 to 170 gm. and each is about 11.4 cm long, 5 to 7.5 cm broad and 2.5 cm thick. The kidneys in the newborn are about three times as large in proportion to body weight as they are in adults.

**LUNGS** - A pair of cone shaped spongy organs of respiration contained within the pleural cavity of the thorax. The lungs are connected with the pharynx through the trachea and larynx. The lungs include the lobes, lobules, bronchi, bronchioles, alveoli or air sacs and pleural covering. The right lung has 3 lobes and the left has 2 lobes.

**HEART** - A hollow muscular organ, the pump of the circulatory system. Its wall has three layers: the outer epicardium, a serous membrane; the middle myocardium made of cardiac muscle and the inner endocardium, endothelium that lines the chambers and covers the valves. The heart is enclosed in a fibrous sac, the pericardium; the potential space between the parietal pericardium and the epicardium is the pericardial

Diagram showing the flow of blood through the heart's chambers

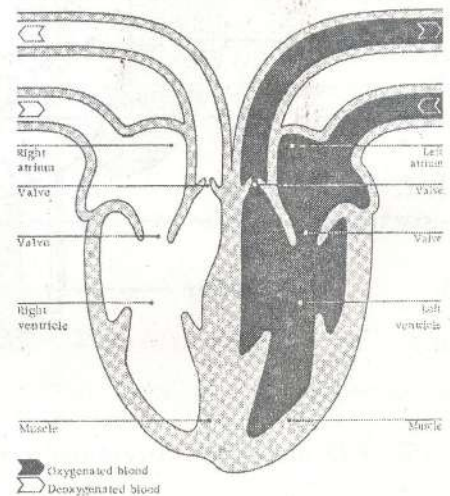


Fig. 1.15 Diagram showing the flow of blood through the heart's chambers



cavity, which contains serous fluid to prevent friction as the heart beats. Heart is divided into four chambers. The upper two are the atria and the lower two are ventricles. Atria are thin walled receiving chambers separated by the interatrial septum and the ventricles are the thick-walled pumping chambers separated by the interventricular septum. The right side receives deoxygenated blood via the vena cavae from the body and pumps it to the lungs; the left side receives oxygenated blood from the lungs and pumps it to the body via the aorta and arteries. Contraction of the heart chambers is called systole, relaxation with accompanying filling of the blood is called diastole. Heart has four valves, which prevent backflow of blood.

The atrioventricular valves are at the opening between each atrium and ventricle, the tricuspid valve, between the right ventricle and atrium; and the bicuspid or mitral valve, between left atrium and ventricle. The pulmonary semilunar valve is at the opening of the right ventricle into the pulmonary artery, the aortic semilunar valve is at the opening of the left ventricles into the aorta.

**BRAIN** - A large soft mass of nerve tissue contained within the cranium, the cranial portion of the central nervous system. The brain is composed of neurons (nerve cells) and neuroglia or supporting cells.

Section through the brain

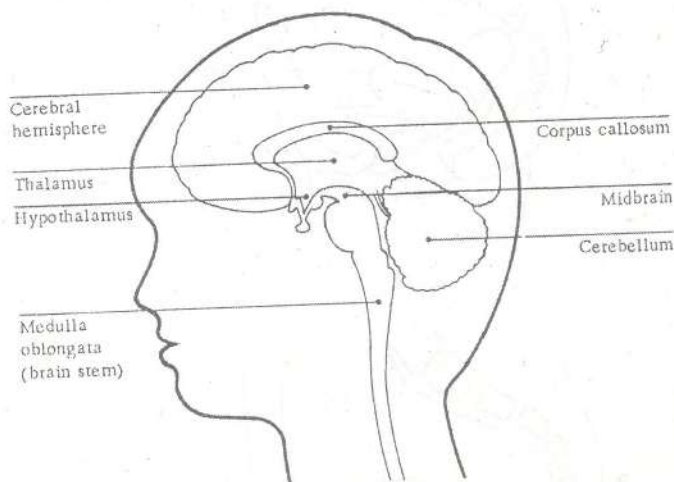


Fig. 1.16

The brain consists of gray and white matter. Gray matter is composed mainly of neuron cell bodies and is concentrated in the cerebral cortex

and the nuclei and basal ganglia. White matter is composed of neuron processes, which form tracts connecting parts of the brain with each other and with the spinal cord.

**UTERUS** – A reproductive organ for containing and nourishing the embryo and foetus from the time the fertilized egg is implanted to the time, the foetus is born. The uterus is a muscular, hollow, pear-shaped structure, partly covered by peritoneum; the cavity is lined by a mucous membrane, the endometrium. The uterus consists of three areas: the body or expanded upper portion, the isthmus or constricted central area, and the cervix, the lowermost cylindrical portion that joins the uterus to the upper end of vagina.

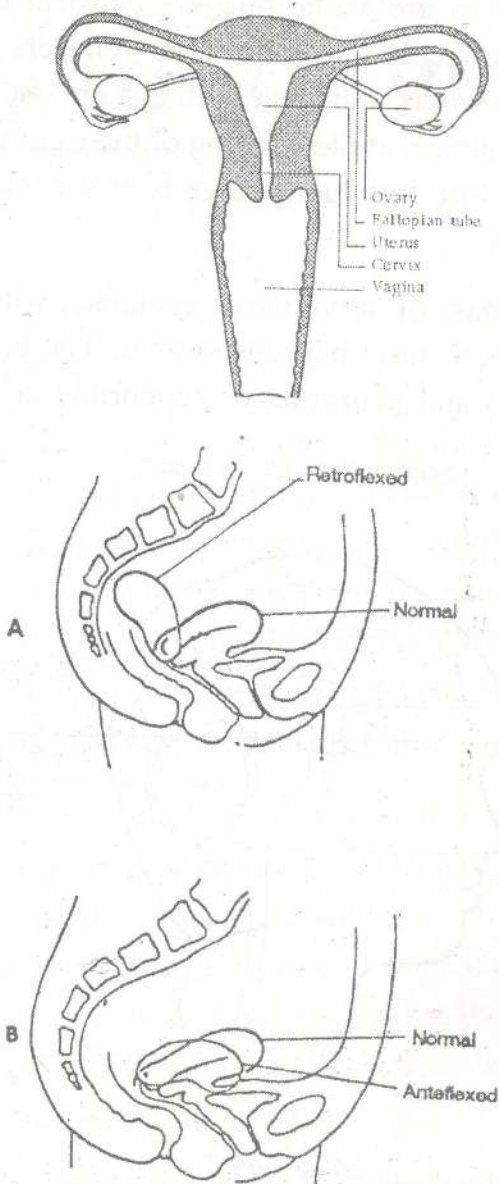


Fig.: Uterus Position of Uterus

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**INTEXT QUESTIONS 1.2**

---

1. Fill of the gaps:

- (i) The skin consists of 2 distinct layers namely \_\_\_\_\_  
& \_\_\_\_\_
- (ii) \_\_\_\_\_ is a term used to describe both the fluid produced by the sweat glands and also the process during which this fluid is produced.
- (iii) \_\_\_\_\_ is the second portion of the small intestine extending from the duodenum to the ileum

---

**1.5 TERMINAL QUESTIONS**

---

1. What is a bone? Write down the functions of the bones.
2. Explain the regional classification of bone and also the number of each bone in the body.
3. Describe the structure of the skin with a diagram.
4. Write down the functions of the skin.
5. Explain the viscerae stomach and pancreas in detail with diagrams.

**1.6 ANSWER TO INTEXT QUESTIONS****1.1**

1. (a) 5                      (b) 6                      (c) 1  
(d) 4                      (e) 2                      (f) 3

2. Functions of bones

1. Bones serve as levers for muscular action
2. Bone marrow produces blood cells.

1.2 (i) epidermis and dermis

(ii) perspiration

(iii) Jejunum

---

## 2

# **BASICS OF PHYSIOLOGY**

---

### **2.0 INTRODUCTION**

In this lesson, we have discussed the physiology of the human body, in detail. The various systems e.g. Digestive, Respiratory, Cardio Vascular, Urinary, Reproductive, Nervous system have been explained in detail. The special sense organs - Eye, Ear have also been discussed.

### **2.1 OBJECTIVES**

After reading this lesson you will be able to understand:

- What are the various organs through which the food passes while under process of digestion?
  - How the digested food gets absorbed?
  - What are the various organs involved in respiratory process?
  - Physiology of the normal respiration.
  - Components of the circulatory system.
  - Functions of the heart.
  - How to measure the blood pressure.
  - Components of the urinary system.
-

- Functions of the Kidney.
- Components of the Male Genital system and their functions.
- Components of the Female Genital system and their functions.
- How does the menstruation in female occur?
- Various components the Nervous system.
- Anatomical Structure of human eye.
- Physiology of vision.
- Anatomy and physiology of human ear.

## 2.2 DIGESTIVE SYSTEM

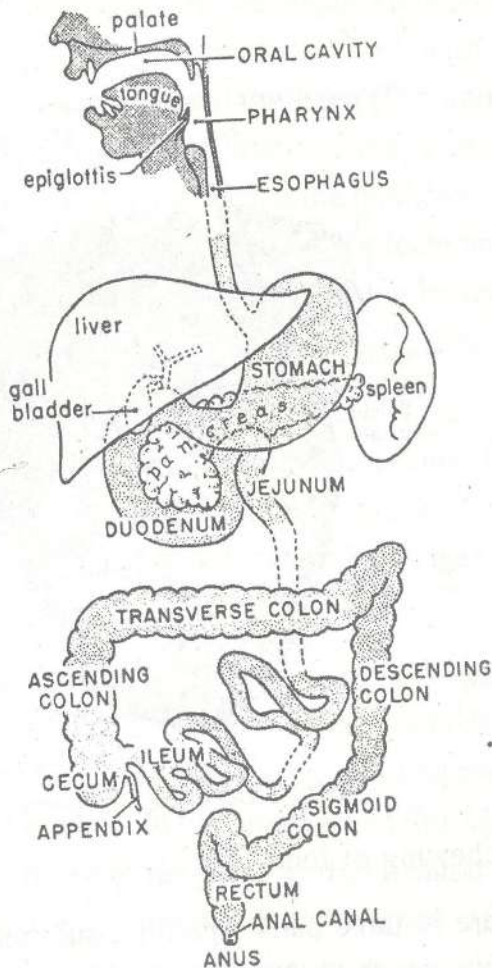


Fig. 2.1: Diagram of the digestive tract

The digestive system begins at the mouth cavity and ends in the anal orifice. It may be visualized as a hollow tube plus some glandular organs, which have outgrown from it.

**Mouth** - It is the cavity within the cheeks, contains the tongue and teeth and communicating with the pharynx. Palate forms the roof of the oral cavity.

**Palate** - is differentiated into two parts - the anterior hard palate is bony and helps in retaining the food in the buccal cavity for proper mastication. The posterior soft palate is formed of muscles and it helps in directing food towards oesophagus.

**Tongue** - is a muscular organ. It helps in ingestion of food, food and mixes saliva with food to make it softer.

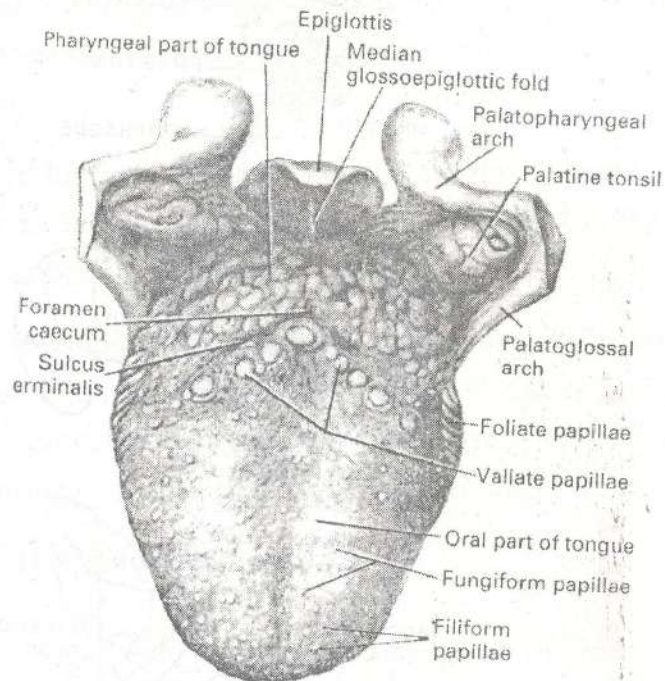


Fig.2.2 : Dorsum of the tongue

**Teeth** - help in chewing of food.

Salivary glands are in three pairs - parotid, sub-mandibular and sublingual. They secrete saliva, which passes through their ducts into the mouth. Saliva helps in breaking down of big polysaccharides into smaller one. It lubricates the food and even kills many of the bacteria.

**Oesophagus** - It is a muscular tube from which food passes down by peristaltic movements of its muscular walls. It opens into the stomach.

**Stomach** - It is the most dilated portion of the elementary canal. It stores food until it is partially digested. It secretes gastric juice to aid digestion. It churns the food into a fine pulp and mixes gastric juice.

**Small intestine** - It is 6 meter long and continues with the large intestine. It is divided into three parts - duodenum, jejunum and the ileum. Small intestine completes digestion, absorbs the digestive food and secretes hormones that control the secretion of the pancreatic juice, bile and intestinal juice.

**Large intestine** - The large intestine extends from the ileum to the anus and is about 1.5 m in length. It absorbs water, minerals and vitamins from the intestinal contents and eliminates undigested material during the defecation. The mucosa has no villi but contains glands that secrete mucus. Hyperactivity of the colon may cause diarrhoea.

### ABSORPTION OF DIGESTED FOOD

No appreciable absorption of food material takes place in buccal cavity and oesophagus.

Water, alcohol, inorganic salts and some amount of glucose (water soluble) is absorbed by the stomach wall.

Most of the digested nutrients are absorbed in the small intestine. The villi on the inner surface of intestine and the microvilli on the free surface of mucosal epithelial cells enhance absorption capacity of the intestine. The various processes involved in the absorption of nutrients across the plasma membrane of intestinal cells are classified into two categories:-

- (i) **Passive absorption** - The water soluble end products of carbohydrate and protein digestion are absorbed by intestinal epithelium by simple diffusion.
- (ii) **Active absorption** - By active absorption cells can absorb even when the concentration of a substance is less in the intestinal lumen than in the intestinal cells and blood.

---

### INTEXT QUESTIONS 2.1

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1. Fill in the gaps in the following:

- (i) The three pairs of salivary glands are \_\_\_\_\_,  
 \_\_\_\_\_ and \_\_\_\_\_.
-

(ii) In the oesophagus, the food passes down by \_\_\_\_\_ movement of its muscular walls.

(iii) Three parts of small intestine are \_\_\_\_\_ and \_\_\_\_\_

2. Mention True or False.

(i) Palate form the roof of the oral cavity.

(ii) Stomach secrets bile juice.

(iii) Absorption of food occurs in two ways Active and passive absorptions.

### 2.3 RESPIRATORY SYSTEM

Respiratory system is meant to replenish the blood with oxygen and to remove the carbon dioxide from blood.

#### Organs of Respiratory System :-

**Nose** - Nasal cavity is lined by ciliated epithelium containing goblet cells, which secrete mucus to trap dust particles and bacteria, which are present in the inhaled air.

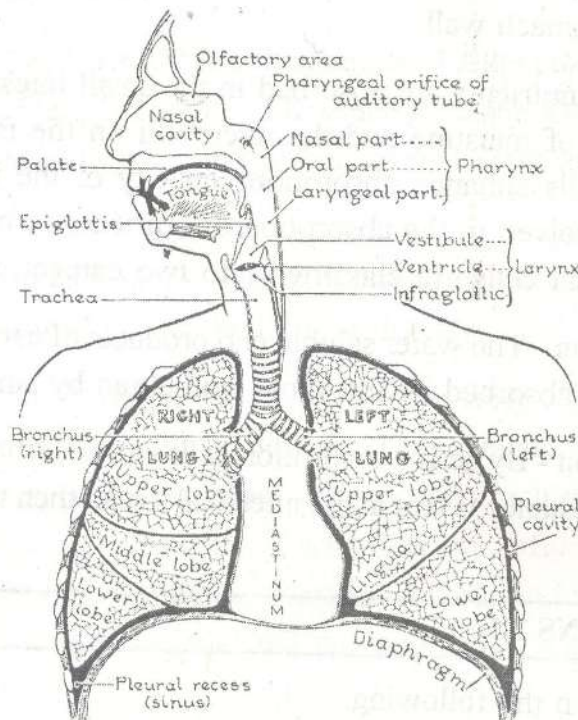


Fig. 2.3 : Diagram of the respiratory system



**Pharynx** - It is a muscular tube which in part is shared by the respiratory and digestive systems. It is 12-14 cm long extending from base of the skull to the level of 6<sup>th</sup> cervical vertebra where it opens into oesophagus. Pharynx has three parts: Nasopharynx, Oropharynx, Laryngopharynx.

**Larynx** - It is a box like structure, which extends from the roof of tongue to the level or upper end of trachea. It acts as the organ for the production of voice and also as a valve to prevent the entry of food into trachea during act of swallowing. It opens above in laryngopharynx and below into the trachea.

**Trachea** - It is a 10 cm long tube extending upto 5<sup>th</sup> thoracic vertebra where it divides into right and left bronchi. Trachea is kept open by 10-12 "C" shaped cartilages. It therefore has a part in the neck and a part in the upper portion of thoracic cavity.

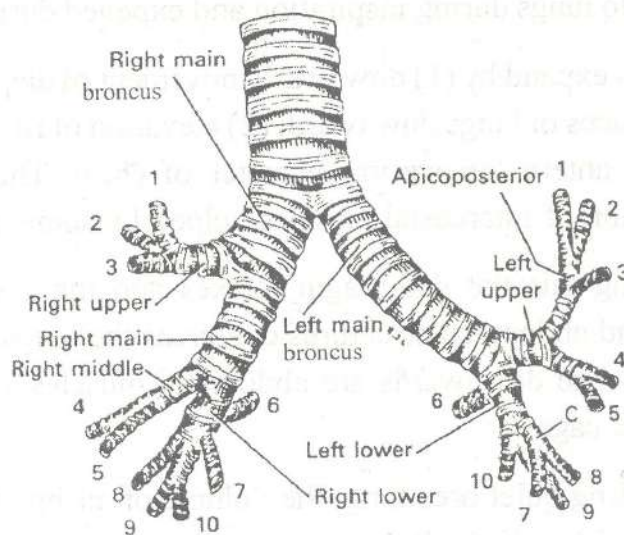


Fig. 2.4: Main, lobar and segmental bronchi. The main and lobar bronchi are named, the segmental bronchi are given their numbers as listed in the text and on the left 7 and 8 share a common stem(C).

**Bronchi** - Right bronchus is straighter and shorter as compared to the left and therefore, right lung is more prone to infection.

**Lungs** - Both the lungs are principal organs of respiration. Lungs are cone shaped organs, highly elastic and vessels enter each lung through a slit on its medial surface, called hilum. The right lung is larger than the left. The right lung is divided into 3 lobes-superior, middle and inferior, while the left lung is divided into 2 lobes - upper and lower. The lungs are enclosed by a double

layered membrane called pleura. The pleural membranes are separated by a thin space filled with pleural fluid.

**Diaphragm** - It is a fibromuscular sheet, which lies between the thoracic and abdominal cavities. Its' upper convex surface is slightly covered with pleura and pericardium and its lower concave surface by peritoneum. When diaphragm contracts, it moves downward, the thoracic cavity is increased in capacity and air is drawn into lungs.

### **PHYSIOLOGY OF RESPIRATION**

Primary function of respiratory system is to make available adequate amount of Oxygen to the body tissues and to remove carbon dioxide in the expired air.

The air is drawn into lungs during inspiration and expelled during expiration.

**Inspiration** - Lungs expand by (1) downward movement of diaphragm, which pulls the lower surfaces of lungs downward; (2) elevation of ribs and sternum. This increases the antero - posterior diameter of chest. This is achieved mainly by contraction of intercostal muscles helped by some other muscles.

**Expiration** - During this the diaphragm relaxes and the elastic recoil of lungs, chest wall and abdominal structures compress the lungs. The muscles which pull the rib cage downwards are abdominal muscles and intercostal muscles of thoracic cage.

**Tidal volume** - During quiet breathing, the volume of air breathed in or out is known as tidal volume (500ml).

**Gas transport in blood** - The Qxygen is mainly carried in red cells as oxyhaemoglobin, which when dissociated releases oxygen for use in tissue respiration. The dissociation of oxygen is almost complete in tissues during muscular exercise. However, carbondioxide is transported from tissues to the lung capillaries in the blood in solution, as bicarbonate and partly combined with haemoglobin as carboxy-haemoglobin.

---

### **INTEXT QUESTIONS 2.2**

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1. Fill in the gaps in the statements given below:

- (i) Nasal cavity is line by \_\_\_\_\_ epithelium containing \_\_\_\_\_ which farite to trap dust particle and bacterias which are present in the inhaled air.
-

- (ii) Pharynx has 3 parts \_\_\_\_\_ namely \_\_\_\_\_, and \_\_\_\_\_
- (iii) Larynx act as an organ for the production of \_\_\_\_\_
- (iv) During quiet breathing, volume of air breathed in or out is called \_\_\_\_\_
- (v) Oxygen is carried out in red cells mainly as \_\_\_\_\_
- (vi) Carbondioxide is transported from tissues to lungs in the blood in solution as \_\_\_\_\_ and partly combined with haemoglobin as \_\_\_\_\_

## 2.4 CIRCULATORY SYSTEM

**Blood** - It is the red fluid, which fills the cardiovascular system i.e. the heart and the blood vessels. The cells present in the blood are the Erythrocytes (R.B.C.), the Leucocytes (W.B.C.) and the Thrombocytes (platelets). These cellular components of blood are also called formed elements. An adult male average value of blood volume is 6 litres and in an adult female it is 5 litres.

**R.B.C.** - Red blood corpuscles or the erythrocytes constitute the major cellular component of the blood (4 to 5.5 million/ cu. mm.). These are non-nucleated, bi-concave discs and contain the pigment haemoglobin which makes them red. It carries out many functions such as:

- Carrying out gas transport
- Maintaining acid base balance
- Formation of bilirubin
- Maintain viscosity of whole blood

**W.B.C** - White blood corpuscles or leucocytes are not white, rather they are colourless. These defend body against diseases by fighting infections (bacterial, viral, parasite etc.) antigens and also against malignancy.

Red blood cells : a. front view,  
b. side view

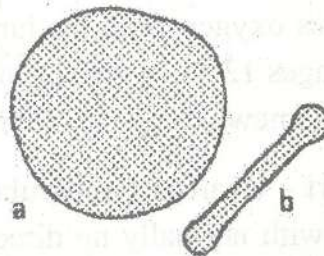


Fig. : 2.5

W.B.C. are of the following types :

- Neutrophils - 60-70%
- Eosinophils - 1-4%
- Basophils - 0-1%
- Lymphocytes - 25-30%
- Monocytes - 5-20%

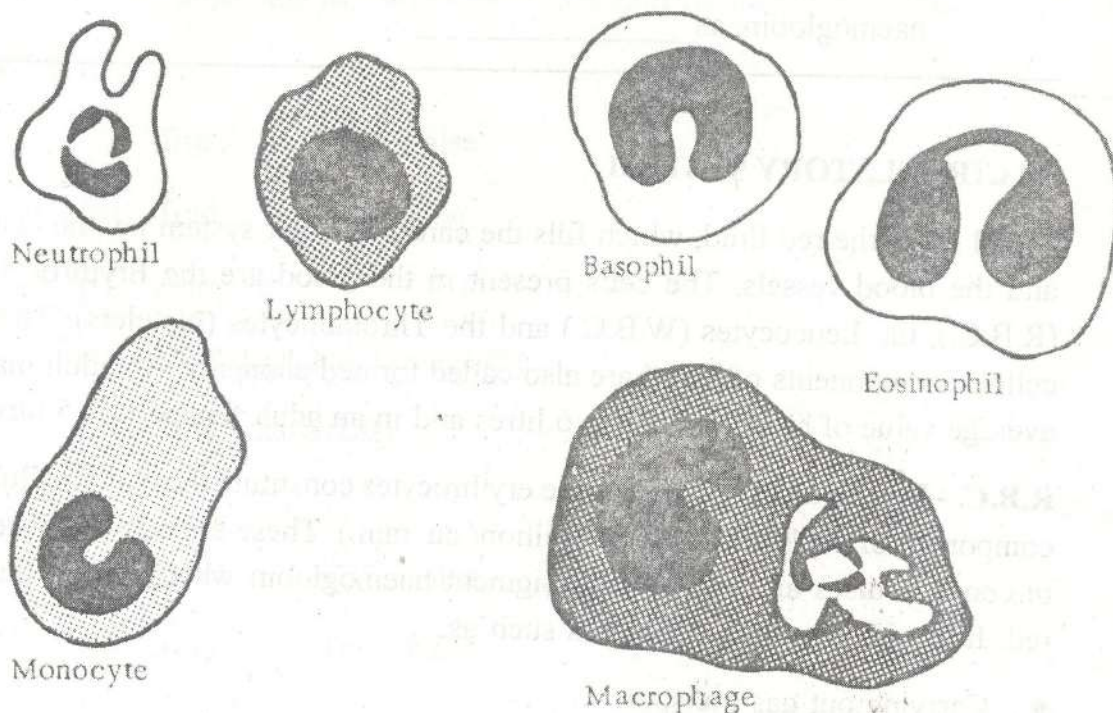


Fig. 2.6 : DEFENSE: White blood corpuscles

**Haemoglobin** - The iron-containing pigment of the red blood cells, which carries oxygen from the lungs to the tissues. The amount of Hb in the blood averages 12 to 16 gm./100ml. of blood in women, 14 to 18 gm/100 ml in men and somewhat less in children.

**Heart** - Heart is a muscular pump, consisting of 4 chambers, 2 right and 2 left, with normally no direct communication between 2 sides The right side of heart is venous whereas the left side of heart is arterial.

**Functions of the heart**

- Circulation of blood.

- To provide all sufficient amount of oxygen and nourishment.
- Proper removal of waste products to all cells, tissues and organs of body.

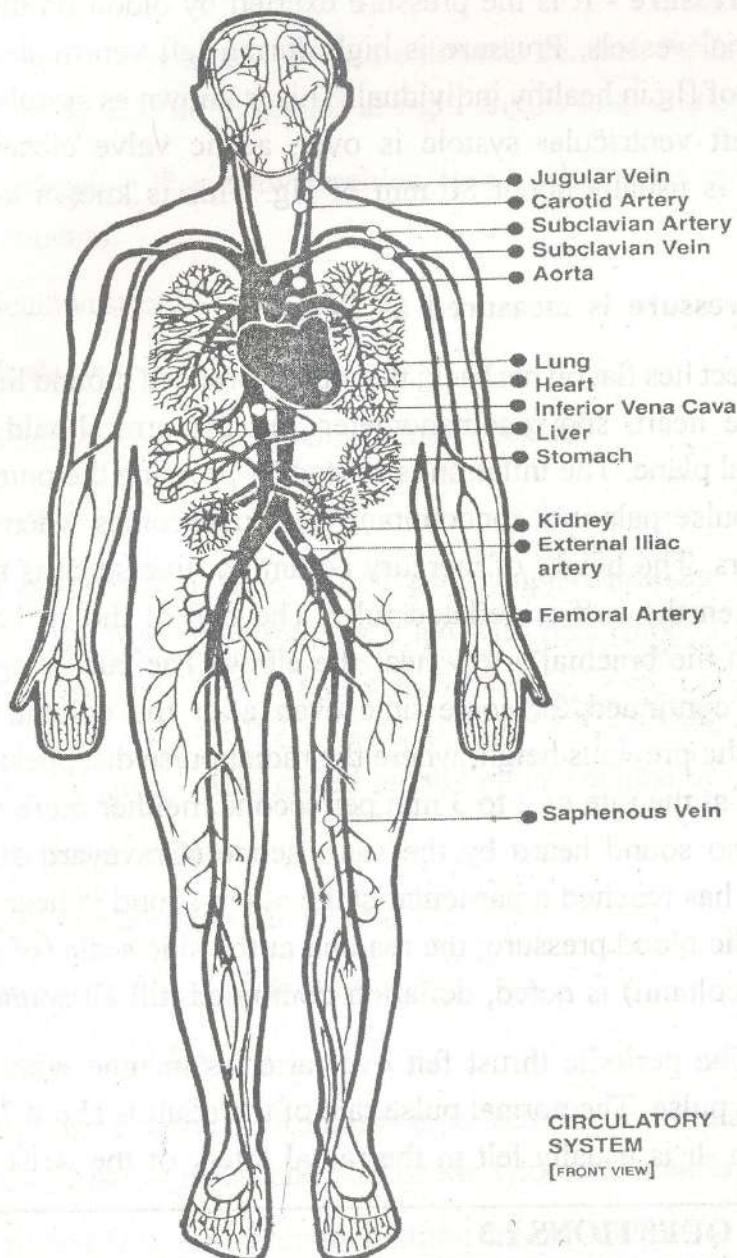


Fig. 2.7 : Cardiovascular system includes heart and blood vessels.

**Cardiac cycle** - Period from the beginning of one heart beat to the beginning of the next is called cardiac cycle. Each cycle is initiated by sinus node, situated in right auricle of the heart.

**Systole and diastole** - Cardiac cycle consists of a period of relaxation called diastole during which heart fills the blood, followed by a period of contraction called systole.

**Blood pressure** - It is the pressure exerted by blood on the lateral walls of the arterial vessels. Pressure is high during left ventricular systole, around 120 mm of Hg in healthy individual. This is known as systolic blood pressure. When left ventricular systole is over, aortic valve closes. Lowest blood pressure is usually about 80 mm of Hg. This is known as diastolic blood pressure.

**Blood pressure is measured as follows :**

The subject lies flat on his back; the cuff is wrapped around his arm (preferably left). The heart, sphygmomanometer and the arm should be at the same horizontal plane. The inflation is started by pressing the pump, and the radial arterial pulse palpated concomitantly. A time comes when the radial pulse disappears. The height of mercury column at this stage is noted in the side scale. Then the cuff is deflated fully. The bell of the stethoscope is placed lightly on the brachial artery near the elbow. The cuff is again inflated and inflation continued for some time even after the column of mercury has attained the previous height where the radial pulse disappears. The deflation is started at the rate of 2 to 3 mm per second, neither more nor less. At first, there is no sound heard by the stethoscope (Graveyard silence); after the deflation has reached a particular stage, a tap sound is heard and this marks the systolic blood pressure; the reading at the side scale (of the height of the mercury column) is noted, deflation continued, till all sounds disappear.

**Pulse** - The periodic thrust felt over arteries in time with the heartbeat is known as pulse. The normal pulse rate of the adult is about 72 in men and 80 in women. It is usually felt in the radial artery of the wrist.

---

### INTEXT QUESTIONS 2.3

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1. Fill in the gaps in the following statements:

- (i) The cells present in blood are \_\_\_\_\_ and \_\_\_\_\_
  - (ii) The average amount of haemoglobin present in blood is \_\_\_\_\_ in females and \_\_\_\_\_ in males.
  - (iii) The Cardiac Cycle Consist of a period of relaxation called \_\_\_\_\_ and a period of contraction called \_\_\_\_\_.
-

- (iv) The normal pulse rate in adult men is \_\_\_\_\_ and adult female is \_\_\_\_\_.
2. Write true or false as the case may be:
- RB.C are nucleated.
  - RB.C have haemoglobin and are biconcave.
  - The normal range of neutrophils is 0-5%.
  - Heart has 6 Chambers.
  - The normal systolic pressure is 120 mm Hg and normal diastolic pressure is 80mmHg.
  - The instrument to measure Blood pressure is called Sphygmomanometer.

## 2.5 URINARY SYSTEM

Urinary system is comprised of a pair of kidneys, ureters and urinary bladder. Removal of waste products from the body such as urea, uric acid, creatinine, purine compounds, ketone bodies, derivatives of hormones and drugs is carried out by the urinary system.

The basic functional unit of the kidneys is a nephron.

### Functions of kidneys:

- to produce glomerular filtrate
- regulation of water and electrolyte balance
- maintenance of blood pH
- maintenance of body calcium level
- production of rennin
- production of erythropoietin

**Ureters** - Urine formed by the kidneys reaches the urinary bladder via the ureters. Ureters are tubes about 25 cm. in length extending from pelvis of kidneys to the posterior surface of urinary bladder. Peristaltic waves help in pushing the urine from pelvis of the kidneys down to the urinary bladder at the lower end of ureters where a mucous fold serves as a valve, which prevents backward flow of urine particularly during contraction of the bladder.

**Urinary bladder** - It is an elastic distensible bag which can accommodate

200 to 400ml. of urine. It is located behind the symphysis pubis. There are 3 openings in floor of the bladder - 2 for the ureters and 1 urethral opening. The interior of the bladder is lined by mucous membrane, which, in an empty bladder, is thrown into folds forming rugae.

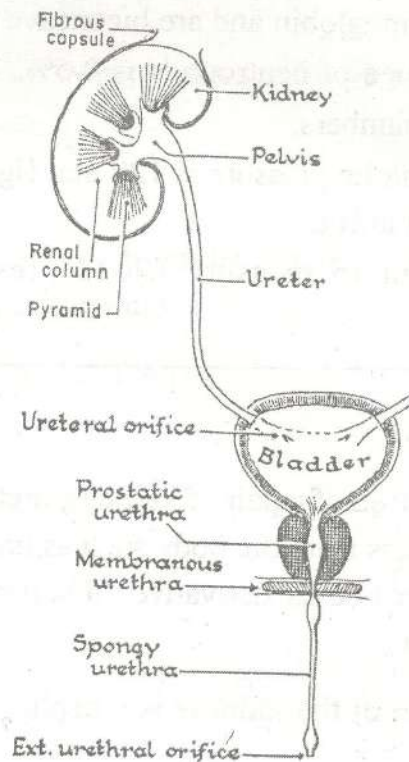


Fig. 2.8 : The urinary system (male)

**Urethra** - It is a tube, which starts from the lower end of the bladder and opens to the exterior at the tip of penis in males and by small opening anterior to the vaginal opening in case of female.

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#### INTEXT QUESTIONS 2.4

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1. Write any two functions of the kidney.
  2. Name the basic functional unit of the kidneys.
  3. Name the waste products of the urinary system which it excretes out from the body.
-



## 2.6 REPRODUCTIVE SYSTEM

**Male reproductive system** - It consists of 2 testes, 2 epididymis, 2 seminal ducts, 2 seminal vesicles, 2 ejaculatory ducts, 1 prostate gland, 2 bulbo-urethral glands and the penis.

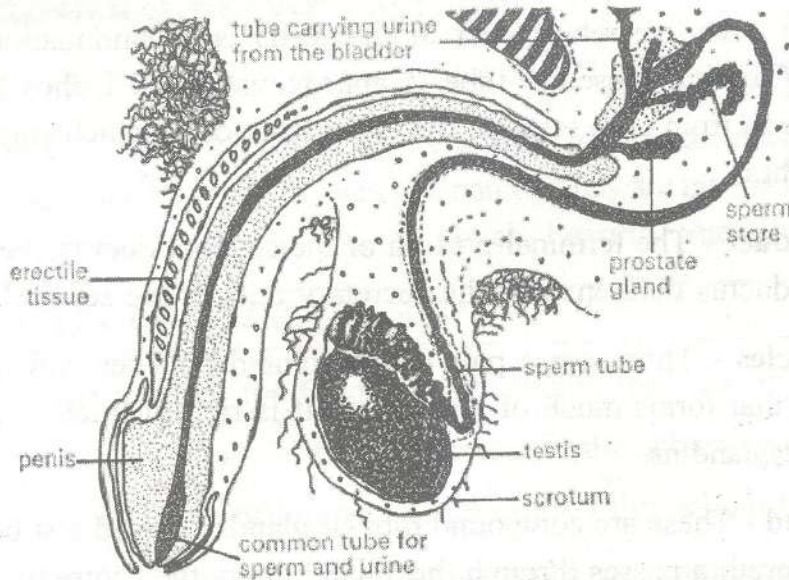


Fig. 2.9

**The Testes** - This is a glandular organ located in the scrotum. Testes are oval in shape suspended by spermatic cord, which is a fibrous connective tissue containing seminal duct, testicular artery, vein, lymphatic vessels and nerves. Its functions are spermatogenesis and secretion of hormones.

**Scrotum** is a skin-covered pouch lying below the pubic symphysis in front of the thighs. The muscle of scrotum i.e., dartos muscle divides the scrotum into 2 compartments - left and right, each containing a testis. Each testis is about 4 cm. long, 3 cm. wide and 2 cm. thick. Testes have a large number of coiled tubes called seminiferous tubules. These tubules form sperms. This process is called spermatogenesis. The seminiferous tubules finally join together to form plexus from where duct comes out and enters the head of epididymis.

**Epididymis** - Each epididymis consists of a single tightly coiled narrow tube enclosed in fibrous covering. It is about 20 feet long. It lies along the side and top of testis. Its head end is connected with seminiferous tubules and tail end connected with vas deferens.

**Functions :**

- It serves as a duct for the passage of sperms from testis to vas deferens.
- Stores sperms prior to ejaculation.
- Contributes to seminal fluids.

**Vas deferens** - The secretory duct of the testis is a continuation of the epididymis. The slim muscular tube is approximately 18 inches long and transports sperm from each testis to the ejaculatory duct, which empties into prostatic urethra.

**Ejaculatory duct** - The terminal portion of the seminal duct formed by the union of the ductus deferens and the secretory duct of the seminal vesicle.

**Seminal vesicles** - These are a pair of convoluted pouches which secrete viscous fluid that forms much of the semen. It is rich in fructose and also contains prostaglandins.

**Prostate gland** - These are compound tubular glands situated just below the bladder. The urethra passes through the small hole in the centre of prostate. Enlargement of prostate in older persons squeezes the urethra and causes urine retention.

**Function :**

- Prostate secretes a thin alkaline substance that contributes to the largest part of seminal fluid.
- Its alkalinity protects sperm from acid present in male urethra and female vagina, neutralizes activity in the urethra caused by urine..
- Increases the sperm motility.

**Bulbo-urethral glands or Cowper's gland** - These lie below prostate and are of the size of the peas. These also secrete alkaline fluid of semen similar to prostate fluid.

**Penis** - It is the copulatory organ that deposits sperm into the vagina of female. It is formed of 3 cylindrical masses of erectile; each enclosed in a separate fibrous covering but held together by a covering of skin. Urethra passes through penis that serves as passage for urine and semen.

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## FEMALE REPRODUCTIVE SYSTEM

It consists of a pair of ovaries, a pair of fallopian tubes, uterus, cervix and the vagina.

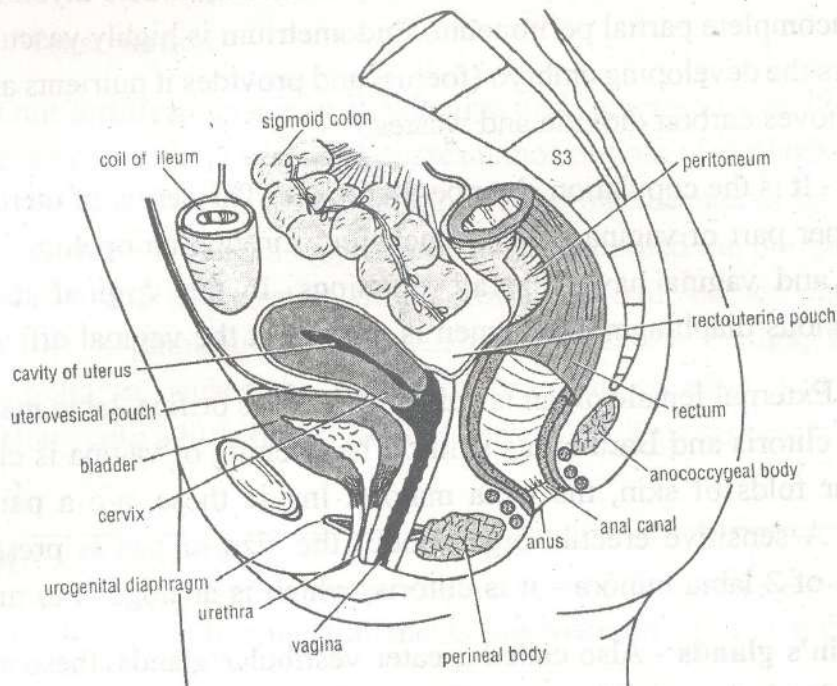


Fig.2.10: Sagittal section of the female pelvis.

**Ovaries** - These are a pair of almond like structures one on either side of vertebral column in the abdominal cavity. Each ovary is attached to the posterior surface of broad ligament by mesoovarian ligaments.

### Functions :

- Produces ova.
- Secretes female hormones - oestrogen and progesterone. These hormones control
  - Secondary sexual character
  - Growth and development of fallopian tube, uterus and vagina
  - Controls menstrual cycle
  - Changes and development of mammary glands

**Fallopian tubes or oviducts** - A pair of these tubes extend from ovary to the uterus.

**Uterus** - It is a pyriform muscular organ in the pelvic region of female. Its upper broad part is called body while the narrow lower part, the cervix. The thick uterine wall has 3 layers - inner endometrium, middle myometrium and outer incomplete partial peritoneum. Endometrium is highly vascular. Uterus harbours the developing embryo (foetus) and provides it nutrients and oxygen and removes carbon dioxide and wastes.

**Vagina** - It is the copulation chamber in female. The cervix of uterus projects into upper part of vagina. Vagina opens out through an opening. In female, urethra and vagina have separate openings. In the virginal state, a thin membranous diaphragm, the hymen is present at the vaginal office.

**Vulva** - External female organ is vulva. It includes orifice, labia majora, labia minora, clitoris and Bartholin's gland. The opening of vagina is closed by 2 muscular folds of skin, the labia majora. Inside these, are a pair of labia minora. A sensitive erectile organ about the size of pea is present at the junction of 2 labia minora - it is clitoris, which is analogous to male penis.

**Bartholin's glands** - Also called greater vestibular glands, these are 2 bean shaped glands one on either side of vaginal orifice. These secrete lubricating fluid and open into the vestibule.

## **MENSTRUATION**

Around every 28th day, from about the age of 12 to about the age of 47, a woman has a discharge of blood and mucus from the vagina. The discharge lasts from 2 to 8 days (4 to 6 is most usual) and may be preceded or accompanied by various unpleasant symptoms such as headaches and nausea. This, of course, is menstruation, or "the period" - the outward sign of the routine cycle of egg production and hormone change in a woman's body. It is a process that requires the wearing of pads or tampons (absorbent tubes placed in the vagina), if the menstruating woman is to avoid soiling her clothes.

### **Egg Production**

Each ovary contains groups of cells called follicles, which themselves contain immature eggs (ova). When the girl is about 12 these eggs begin to mature

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at the rate of one every 28 days or so - usually in alternate ovaries. (At birth, a female child's ovaries contain perhaps 3,50,000 immature eggs. Between puberty and menopause, only about 375 ever mature.) As each egg matures, it bursts from the ovary - a process called ovulation - and passes into the Fallopian tube leading down from that ovary to the uterus.

### Process of Menstruation

If the egg is not fertilized by a sperm, it begins to degenerate 24 to 48 hours after leaving the ovary, and eventually passes unnoticed out of the body in the normal flow of fluid from the vagina. But meanwhile the uterus has been preparing to receive a fertilized egg. Hormones have caused the lining of the uterus to thicken, and to excrete a fluid so that the fertilized egg could be nourished while implanting itself. When no fertilization occurs, further hormone stimulation causes the thickened lining to crumble, and to be discharged along with a little blood, through the vagina. This process is called menstruation.

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### INTEXT QUESTIONS 2.5

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1. Write whether the following statements are Mention True or False
    - (i) Epididymis stores the sperms prior to ejaculation.
    - (ii) Dartos muscle divides scrotum into 4 parts.
    - (iii) Ovaries Produce OVA
  2. Fill in the gaps in the following.
    - (i) \_\_\_\_\_ is the middle dialated part of the fallopian tube where fertilization occurs.
    - (ii) Ovaries secrete two hormone namely \_\_\_\_\_ and \_\_\_\_\_.
    - (iii) \_\_\_\_\_ horomones causes the egg to burst releasing the egg.
- 

### 2.7 NERVOUS SYSTEM

On the basis of gross anatomical features nervous system is said to be divided into two parts:

- Central Nervous System (CNS) - consisting of brain and spinal cord
-

- **Peripheral Nervous System (PNS)** - consisting of cranial and spinal nerves, autonomic nerves and ganglia

### **CENTRAL NERVOUS SYSTEM (CNS)**

Brain and spinal cord are both located in bony case provided by cranial bones and vertebrae. Bony covering provides protection to the delicate texture of brain and spinal cord. Brain and spinal cord are covered by membranes known as meninges. Inward to outward is pia mater, arachnoid dura mater and a subarachnoid space is formed between arachnoid and pia mater. Inflammation of meninges is called meningitis.

**Cerebro-spinal fluid (CSF)** - It is present in the subarachnoid space and is present in the ventricles of brain from the network of capillaries (choroid plexus). CSF serves as a protective cushion around the brain and spinal cord and also serves as a medium for exchange of nutrients and chemicals. Normal CSF is colourless, and cell free, and has a pH of 7.3.

**The brain** - Most of the adult brain weighs around 1 to 1.5 Kg. Neurons of the brain undergo mitosis only before birth. Brain grows in size at a rapid rate only during first eight years.

**Spinal cord** - It is elongated part of CNS, lies in the vertebral canal, extended from the foramen magnum where it is continuous with medulla oblongata. It ends in a tapered form forming a cone known as conus medullaris from where a fine fibrous ligament called filum terminale intends downwards. Thus below the 2nd lumbar vertebrae a needle can be passed to suck CSF.

31 Pairs of nerves arise from spinal cord, which are named according to the site of origin

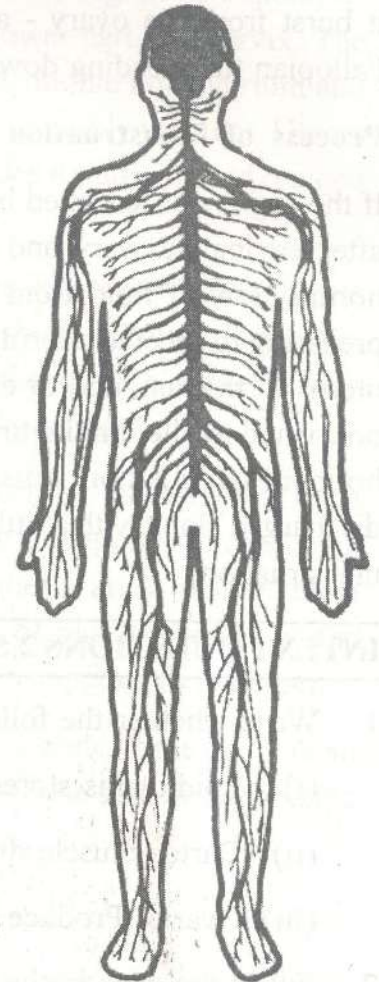


Fig. 2.11

|           |   |    |
|-----------|---|----|
| Thoracic  | - | 12 |
| Lumbar    | - | 5  |
| Sacral    | - | 5  |
| Coccygeal | - | 1  |

## PERIPHERAL NERVOUS SYSTEM (PNS)

It includes 12 pairs of cranial nerves and 31 pairs of spinal nerves.

**Cranial nerves** - 12 pairs of nerves arise from under surface of brain. They are identified both by numbers and names. They are responsible for conduction of all special senses, like vision, touch, hearing, smell, heat etc.

### INTEXT QUESTIONS 2.6

- Write whether the following statements are True or False.
  - Cerebrospinal fluid is present in the subarachnoid space.
  - Neurons of brain undergo mitosis throughout the life.
  - There are 31 pairs of nerves arising from the spinal cord.
- Fill in the gaps the following sentences:
  - Brain and spinal cord are covered by the membranes called \_\_\_\_\_.
  - Total number of thoracic nerves are \_\_\_\_\_-and lumbar nerves are \_\_\_\_\_.

## 2.8 EYE

The organ of vision that consists of the eyeball and the optic nerve.

- The wall of the globe (eyeball) is composed of a dense, elastic supporting membrane.
- The anterior wall of the membrane is transparent - the Cornea;
- The remainder is opaque - the Sclera.
- The anterior part of the Sclera is covered by a mucous membrane - the Conjunctiva, which is reflected from its surface onto the lids.
- Lining the inner aspect of the Sclera are two structures: the highly vascular

Uveal tract and the true visual nerve endings concerned with the reception and transformation of light stimuli, called Retina.

- The Uveal tract consists of three parts
  - Two posteriorly - Choroid and the Ciliary body, line the Sclera.
  - One anteriorly - a free circular diaphragm, the Iris.
- The aperture of the diaphragm is the pupil.
- Situated behind the iris and in contact with the pupillary margin is a biconvex mass, the Crystalline Lens.
- The anterior chamber is a space filled with fluid, the aqueous humour, it is bound in front by the cornea, behind by the iris and the part of the anterior surface of the lens, which is exposed in the pupil.

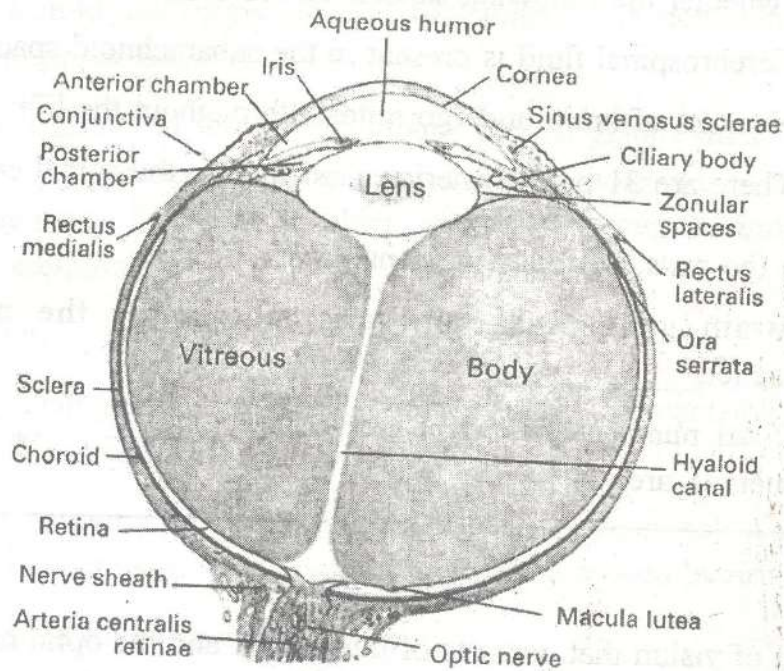


Fig.2.12: Horizontal section of the right eyeball : superior aspect

- Behind the lens is the large vitreous chamber, containing the vitreous humour, which is a jelly-like material containing a few cells and wandering leucocytes.
- The retina consists of a number of layers formed by three strata of cells Namely of neural epithelium rods cones & their synapses.



## PHYSIOLOGY OF VISION

- When light falls upon the retina, it acts as a stimulus to the rods and cones, which serve as the sensory nerve endings.
- As contact of the skin with a foreign substance causes the sensation of touch, so stimulation of the retina by the light causes visual sensations; upon these sensory cells the images of the objects in the outside world are focused by the dioptric system of the eye.
- Light falling upon the retina, however, causes two essential reactions, photochemical and photoelectrical.
- It is this photochemical reaction, which initiates the visual process and gives rise to the changes in the electrical potential (photo electrical) which are transmitted through the bipolar cells to the ganglion cells and along the fibres of the optic nerve to the brain.

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### INTEXT QUESTIONS 2.7

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1. Fill in the gaps in the following:
    - (i) The aperture of the diaphragm is \_\_\_\_\_.
    - (ii) Anterior chamber space filled with the fluid called \_\_\_\_\_.
    - (iii) Light falling upon the retina, causes two important reactions \_\_\_\_\_ and \_\_\_\_\_.
- 

## 2.9 EAR

The ear is divided into

1. External Ear
2. Middle ear
3. Internal Ear or Labyrinth

### A External Ear -

The external ear consists of the -

- **Auricle or pinna** - The projecting shell-like structure on the side of the head with the external acoustic meatus.
-

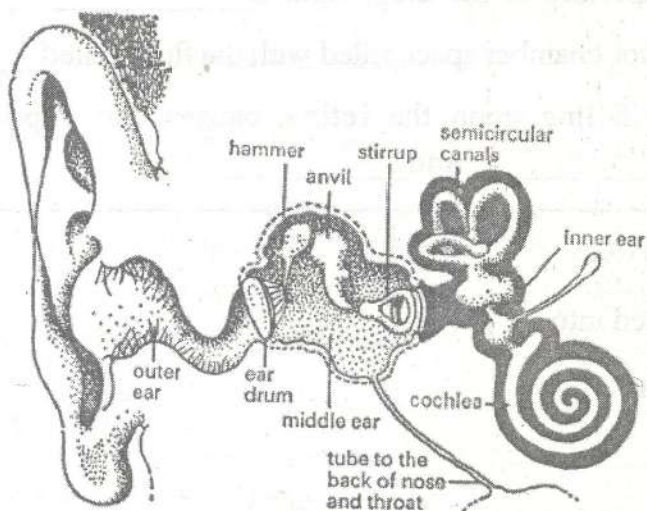
- **External acoustic canal** - It extends from the bottom of Concha to the tympanic membrane. It is not a straight tube; It is divided into 2 parts : Cartilaginous part and Bony part. Therefore, to see the tympanic membrane, the pinna has to be pulled upwards, backwards and laterally so as to bring the two parts in a straight line.
- **Tympanic Membrane** - It forms a partition between the external acoustic canal and the middle ear.

### B. Middle Ear:

The ossicles conduct sound energy from the tympanic membrane to the oval window and then to the inner ear fluid.

There are three ossicles in the middle ear

1. The malleus
2. The incus
3. The Stapes



*Fig. 2.13 Oblique section through the external ear, middle ear and pharyngotympanic tube: anterior aspect*

### C. Internal Ear or Labyrinth

The internal ear or the labyrinth is an important organ of hearing and balance. It consists of a bony and a membranous labyrinth.

**Bony Labyrinth:**

It consists of three parts

- The Vestibule - is the central chamber of the labyrinth.
- The Semicircular Canals - They are three in number, the lateral, posterior and superior, and lie in planes at right angles to one another.
- The Cochlea - The bony cochlea is a coiled tube containing three compartments:
  1. Scala vestibuli
  2. Scala tympani
  3. Scala media or the membranous cochlea

**Membranous Labyrinth:**

It is filled with a clear fluid called endolymph while the space between membranous and bony labyrinths is filled with perilymph.

It consists of

1. the cochlear duct - Also called membranous cochlea or the scala media.
2. the utricle and saccule,
3. the three semicircular ducts, and
4. the endolymphatic duct and sac.

**PHYSIOLOGY OF EAR**

- A sound signal in the environment is collected by the pinna, passes through external auditory canal and strikes the tympanic membrane.
- Vibrations of the tympanic membrane are transmitted to stapes footplate through a chain of ossicles coupled to the tympanic membrane.
- Movements of the stapes footplate cause pressure changes in the labyrinthine fluids, which move the basilar membrane. This stimulates the hair cells of the organ of corti.
- It is these hair cells, which act as transducers and convert the mechanical energy into electrical impulses, which travel along the auditory nerve.

- Thus, the mechanism of hearing can be broadly divided into
  - Mechanical conduction of sound (Conductive apparatus)
  - Transaction of mechanical energy to electrical impulses (Sensory system of Cochlea)
  - Conduction of electrical impulses to the brain (Neural pathways)

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### INTEXT QUESTIONS 2.8

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1. Fill in the gaps in the following:

- (i) Ear is divided into three parts \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.
- (ii) \_\_\_\_\_ forms a partition between external acoustic canal and middle ear.
- (iii) The three ossicles in the middle ear are \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.
- (iv) The cochlear has 3 compartments \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.
- (v) Membraneous labyrinth has \_\_\_\_\_ semicircular ducts.
- (vi) Membraneous labyrinth is filled with a clear fluid called \_\_\_\_\_ and space between membraneous and bony labyrinth is filled with \_\_\_\_\_.

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### 2.10 TERMINAL QUESTIONS

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1. Draw a diagram of the Digestive system. Describe the absorption of the digested food.
  2. Write shorts note on
    - Lungs
    - Blood
    - Urinary system
    - Prostrate Gland
-

## 2.11 ANSWER TO INTEXT QUESTIONS

### 2.1

- (i) Submandibular, sublingual, parotid Peristaltic  
(ii) Peristaltic  
(iii) duodenum, jejunum, ileum

- (i) True (ii) False (iii) True

### 2.2

- (i) Ciliated  
globlet  
(ii) Nasopharynx  
Oropharynx  
Laryngopharynx  
(iii) Voice  
(iv) Tidal volume  
(v) Oxyhaemoglobin  
(vi) bicarbonate and carboxyhaemoglobin

### 2.3

- (i) R.B.C, W.B.C and platelets  
(ii) 12-16 gm/100ml and 14-18gm/1 00  
(iii) diastole and systole  
(iv) 72 and 80
- (i) False (ii) True (iii) False (iv) False  
(v) False (vi) True

**2.4**

1. Two functions of the kidneys are :
  1. To produce glomerular filtrate
  2. To maintain body calcium level.
2. The basic functional unit of the kidney is nephron.
3. Waste products of the urinary system are urea, uric acid, creatine, purine compounds, ketone bodies, derivatives of hormones and drugs.

**2.5**

1. (i) True           (ii) False  
(iii) True          (iv) True
2. (i) Ampulla  
(ii) Oestrogen and progesterone  
(iii) Luteinizing (LH)

**2.6**

1. (i) True           (ii) False  
(iii) True          (iv) False
2. (i) Meninges  
(ii) Hydrocephalus  
(iii) 12 and 5

**2.7**

1. (i) Pupil  
(ii) aqueous humour  
(iii) photochemical & photoelectrical
-

## 2.8

1. (i) External ear, middle ear, internal ear or labyrinth
- (ii) Tympanic membrane
- (iii) Malleus, Incus, stapes.
- (iv) Scala vestibuli, Scala tympani and Scala media or membranous cochlea
- (v) Three
- (vi) endolymph perilymph

## 3

# **HISTORY OF HOMEOPATHY**

### **3.0 INTRODUCTION**

Homeopathy a system of medical treatment promulgated by Dr. Christian Fedrich Samuel Hahnemann, a German physician.

He had spared a long and useful life of 88 years during which he benefited the suffering humanity immensely by introducing this new system of medicine.

In this lesson, a short life sketch of Dr Hahnemann has been given and also how he discovered Homeopathy, a great system of healing.

### **3.1 OBJECTIVES**

After reading this lesson, you will be able to :

- Know the life sketch of Dr. Hahnemann.
- Understand what is the 'Law of cure', how it originated.
- Understand what is Homeopathy and how it was discovered.
- Understand how Homeopathy is an art and a scientific system of medicine.

### **3.2 BIOGRAPHY OF Dr. HAHNEMANN**

Christian Friedrich Samuel Hahnemann, the founder father of Homeopathy

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was born on April 10, 1755 in the Electorate of Saxony, the Meissen town, one of the most beautiful parts of Germany. He was the third child of a porcelain Painter, Christian Gottfried Hahnemann, who worked in a porcelain factory.

At the age of 12 years Samuel Hahnemann got admitted in the town school on 20th July 1767 and spent few years in that school. But because of poverty, he had to leave the school for some time and subsequently got admitted to the reputed Prince's School, mainly due to patronage of the Rector of the school, who loved and adored Hahnemann like his own child. After completion of school study at the age of 20 years he attended the University of Leipzig. At Leipzig, while studying, he had to struggle hard to earn his living by teaching French and German and by translating books from other languages. In between he became master of dozen of languages - Greek, Latin, Italian, Arabic, English, Spanish etc.

From Leipsic he went to Vienna for higher studies in Medicine. Subsequently he was appointed as the family physician & librarian of the Governor of Transylvania, on honorable term, where he had the opportunity of acquiring knowledge of collateral sciences, which came very much advantageous in his future works. After one year & five months he went to the University of Erlangen to complete the Medical Studies. On August 1779, he was awarded the honourable degree of Doctor of Medicine (M.D.) from the Erlangen University, the subject of his thesis being, "A consideration of the etiology and therapeutics of spasmodic affections".

Hahnemann, started practice. His interest and study in Chemistry brought him in contact with Hasler's Pharmacy, where he became acquainted with Hasler's daughter, whom he married on 17th November 1782.

But during that time a medical anarchy was prevailing. He was greatly dissatisfied with the vague and unsatisfactory medical knowledge of the day.

He had an absolute bitter experience and being dissatisfied and demoralised by the then unscientific medical treatment he renounced the practice of medicine. Actually, there was no fixed principle on which the practice of medicine was based at that time. This prevailing system disappointed him.

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“After relinquishing medical practice, Hahnemann concentrated himself on literary works for his livelihood. He started translating various scientific books mainly from English. In 1790, he got a light in search of truth while translating Cullen’s *Materia Medica* from English to German and came upon the idea ‘Law of Similars’ which led him to discover Homeopathy and the Law of Cure was announced publicly in 1796. (Birth year of Homeopathy).

In 1805, he published ‘*Medicine of Experience*’ (consisting *Doctrines of Homeopathy*) and the 1st edition of *Organon* (*Organon of Rational Art of Healing*) was published in 1810. In this book, he outlined and explained the concepts and methodology of Homeopathy and bitterly criticized other prevailing methods of treatment, especially, the dominant one he called Allopathy.

The 1st edition of *Organon* was the signal for the commencement of a violent warfare against Master Hahnemann. He was attacked by various medical journals of that time. He was called quack, an ignorant person and various negative adjectives were used for him. Meanwhile, Hahnemann not being least discouraged, continued his works and published several volumes of *Materia Medica* (total 8 volumes) first being published in 1811 and subsequent editions of *Organon* with all possible modifications.

However, in June 1821, amidst the antagonism of Allopaths, Pharmacists and Govt. officials, the Duke Ferdinand of Koethen gave permission to Hahnemann to live and practice Homeopathy in Koethen where he was subsequently elected as Privy Councilor.

In 1828, Hahnemann’s famous classic “*Chronic Diseases: Their nature and Homoeopathic Treatment*” saw the light of the day.

His wife died on 31 st March 1830, nearly after forty-eight years of happy married life and four year later in January 1835. Hahnemann tied his life’s knot with a French beautiful lady who was a poetess, rich and very famous. In the same year he went to France and by the active influence of his second wife he was accorded permission to practice in Paris. In France, Hahnemann received reward of his years of trial and starvation. He got name, fame, money and peace at Paris.

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Hahnemann was in extensive research work, till last breath to improve the system of medicine for achieving the smooth healing of ailing mankind. He could complete the manuscript of last edition of Organon, the 6th edition, what he termed as the new, altered but perfect, in 1842, when he was 87 years old.

The long journey through the rough and tough weather came to an end on 2<sup>nd</sup> July 1843 at 5 a.m. when Hahnemann breathed his last at the ripe old age of 88 years.

### **3.3 DISCOVERY OF LAW OF CURE**

Dr. Christian Friedrich Samuel Hahnemann was awarded the honorable Degree of Doctor of Medicine (M.D.) from the Erlangen University in 1779. He started medical practice but was greatly dissatisfied with the vague and unsatisfactory medical knowledge of the day. Being demoralized by the then unscientific medical treatment he felt a great necessity of regeneration of medicine. When healing the sick, he found that the medicine used for healing purpose, so easily causes death or produces new effects and ultimately he renounced the practice of medicine. He was in strong belief that God must have ordained certain gentle methods of healing the sick. (The uncertainty and lack of any fixed principle of healing disappointed him).

After renouncing medical practice Dr. Samuel Hahnemann, being a versatile genius and master of various languages, began to translate various scientific and medical books mainly from English to other languages for maintaining his livelihood.

In 1790, the very auspicious moment, Hahnemann was engaged to translate Dr. Cullen's *Materia Medica* from English to German, which should be dated as the discovery of Law of Cure. Dr. Cullen was a professor of Medicine at London University and covered about twenty pages of this *Materia Medica* to the therapeutic indication of Peruvian bark. Dr. Hahnemann's attention was arrested by the remark of the author that Peruvian bark (*Cinchona*) cured Malaria because of its bitterness and tonic effects on stomach. This explanation appeared.

In an attempt to discover its true mode of action he did something

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extraordinary. He took crude Cinchona juice in bulk doses twice for few days. To his great astonishment, he was attacked by the symptoms very similar to Malaria fever. This unexpected result inspired him to conduct similar experiments on himself and on other healthy individuals with many other medicines whose curative action in certain diseases had been well established. He found that in the healthy persons, the medicines produce symptoms very similar to what they cure in diseased individuals.

So he was led to the inference that medicines cure diseases only because they can produce similar symptoms in healthy individuals. The whole of Homeopathy derives from this law. In it resides the revolutionary break through to a wholly new dimension in the understanding of medicine.

In 1796, after 6 years of his first experiment he published an article in Hufeland's Journal Vol-II part 3 and 4. "An essay on a New Principle For Ascertaining. The curative Powers of Drugs and Some Examinations of the Previous Principle."

He thus put forward his new doctrine of *simila similibus curantur* (Like cures Like) in Contrast to the age old doctrine of *Contraria Contrariis Curantur* (opposite cures opposite).

Thus, 1796, is called the birth year of Homeopathy. By *Simila Similibus Curantur* it means, one should apply in remedy which is able to stimulate another artificially produced disease, as similar as possible and stronger than the former and former will be healed *Simila Similibus* - likes with likes.

### **3.4 HOMEOPATHY - SCIENCE & ART**

#### **Science**

Homeopathy is a scientific system of medicine because:

- It is an accumulating body of knowledge seeking to establish general laws governing the occurrence of certain observable phenomena in health and in disease.
  - It expresses the relation between two series of phenomenon i.e. the disease and drug phenomenon.
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- The prognosis of homeopathic medicine's action upon the patient is based on the knowledge of details of patient, the knowledge of the remedy and a comprehension of the laws and their expression in varying states of health and disease.
- It is based on the Nature's law of cure, which possesses the requisite characteristics of scientific law. The law justified by induction, deduction and verifications.
- It follows the scientific principle of observation, generalization, evaluation and analysis.
- It can predict the effect of its applications.

### Art

The Art in Homeopathy is the art of obtaining

- The essence of suffering of the patient.
- The symptoms of suffering in their totality through the process of trained observation and interviewing the patient, his friends, relatives etc. followed by prescribing medicine.
- The actual and individual portrait of the patient by careful study of a patient physically, mentally, emotionally, sociologically and spiritually. This embraces the art of the physician in securing the confidence of the patient and to collect the subjective symptoms of mind, body and spirit. It also embraces the art of observation of the general atmosphere & surroundings of the patient which is essential in case taking and is the key to success in the treatment as Homeopathy is a therapeutic method of symptom similarity.

Homeopathy is an art of individualization. Individualization of patient and remedy is the basis of treatment as the nosological terms are having no role in prescribing the remedy. One has to learn the art of homeopathy and equip himself for application of the science of homoeopathy.

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### INTEXT QUESTION 3.1

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1. Fill in the blanks in the following sentences.

- (i) Homeopathy was discovered by \_\_\_\_\_
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- (ii) The birth year of Homeopathy was \_\_\_\_\_.
- (i) \_\_\_\_\_ is the date of birth of founder of homeopathy and \_\_\_\_\_ is the date of his death.
- (ii) \_\_\_\_\_ is the year of publication of the 1st edition of organon and \_\_\_\_\_ is the year of completion of the manuscript of the 6th edition of Organon.

**2. Give two reasons for the following**

- (i) Homeopathy is a science
- (ii) Homeopathy is an art

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**3.5 SUMMARY**

The 10th April, 1755 is a red letter day in the annals of medicine which witnessed the birth of a former, the founder of Homeopathy, Dr. Christian Friedrich Samuel Hahnemann.

In 1790, while translating Cullen Materia Medica he was dissatisfied with the explanation given that Cinchona bark cures malaria due to its bitterness and toxic effect on stomach. Thus, he did many experiments and took several drams of Cinchona juice himself. Finally, he was surprised to see the symptoms of ague and malaria were produced in him. Thus, he discovered that a substance can only cure the symptoms which it can produce in healthy human being in its crude form. This is law of cure. 'Similia similibus curantur' i.e. let likes be treated by likes. This law makes homeopathy a scientific system of healing.

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**3.6 TERMINAL QUESTIONS**

1. How and when was Homeopathy discovered? What is the birth year of Homeopathy. Write in short.
2. "Homeopathy is a science and also an art". Justify the statement in brief.

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**3.7 ANSWERS TO INTEXT QUESTIONS**

1. (i) Christian Freidrich Samuel Hahnemann
- (ii) 1796
-

(iii) 10th April 1755 and 2nd July 1843

(iv) 1810 and 1842

2. 1. Two reasons for considering Homeopathy a Science :-

(i) It is based on certain laws and fixed principles (observation, generalization, evaluation and analysis)

2. It is based on Nature's law of cure.

3 Reasons for considering Homeopathy an art :-

(i) The essence of suffering of patient is to be evaluated.

(ii) Totality of the symptoms of the patient by trained observation, case taking and interviewing the patient's relatives is an art.

## 4

# ORGANON OF MEDICINE

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### 4.0 INTRODUCTION

Modern medical treatment relies on the assumption that the human body is composed of separate independent pieces and not of an indivisible unit. On the other hand, traditional therapists of the eastern countries regard the human body as one indivisible unit or entity (as a whole). In their opinion, no individual part of the human body can remain healthy or unhealthy independent of the other parts. Their approach is to treat the patient and not the disease. The philosophy of Homeopathy is based on this axiomatic truth.

Modern medical treatment relies on the assumption that the human body is composed of separate independent pieces and not of an indivisible unit. On the other hand, traditional therapists of the eastern countries regard the human body as one indivisible unit or entity (as a whole). In their opinion, no individual part of the human body can remain healthy or unhealthy independent of the other parts. Their approach is to treat the patient and not the disease. The philosophy of Homeopathy is based on this axiomatic truth.

Illness, in fact, is not inevitable. By observing the rules of Nature one can easily preserve and restore normal state of health. Dr.Hahnemann, 'Proved' the drugs

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on healthy enlightened human bodies and found that the drugs affected the mind, emotion and the normal healthy body and the effects are expressed through modalities and symptoms leading to sickness. He also found that drugs administered under controlled potency are being able to remove/cure similar sickness appearing in the human beings.

Thus, in fact, the philosophy of Homeopathy is the truthful interpretation and explanation of various aspects of Hahnemann's work to establish Homeopathy - a therapeutic process on the basis of rigid universal law.

#### 4.1 OBJECTIVES

After reading this lesson, you will be able to understand:

- Fundamental principles of Homeopathy
- What is health, disease, cure and vital force?
- The action of Homeopathic medicines?
- The case taking?
- Palliation and suppression? The meaning of the scope and limitations of Homeopathy?

#### 4.2 FUNDAMENTAL OR CARDINAL PRINCIPLES OF HOMEOPATHY

Every science has certain basic Principles which guide the whole system. Homeopathy as a Science of medical treatment, has its own fundamental principles which are quite distinct and different from those of the other schools of medical sciences.

Following are seven cardinal principles of Homeopathy:-

1. Law of Similia
2. Law of Simplex
3. Law of Minimum
4. Doctrine of Drug Proving
5. Theory of chronic disease

6. Theory of Vital force
7. Doctrine of Drug-dynamization

#### **4.2.1 Law of Similia**

Homeopathy is a system of medicine founded on a definite law of Similia

Similibus Curantur' which means like cures like. Homeopathy is a Greek derivation as 'Homoeos' means 'Similar' and 'Pathos' means 'Suffering'. In nature, it is observed "A weaker dynamic affection is being permanently extinguished in the living organism by a stronger one if the latter (whilst differing in kind) is very similar to the former in its manifestation."

Homeopathy is a system to treat the patient by a medicine i.e. an artificial morbid agent, which is having the capability to produce such similar symptoms and will be stronger than the former. The weaker natural disease symptoms will be extinguished by the similar but stronger symptoms produced by the homoeopathic medicine. Dr. Hahnemann made a series of research work in practical field and declared that the said law is universal and a basic Law of therapeutics.

#### **4.2.2 Law of Simplex - The Single Remedy**

It is one of the fundamental principles of Hahnemann's approach to the practical therapy where only one single, simple medicinal substance is to be administered in a patient at a time. This is due to the following reasons:

The homoeopathic medicines were proved singly and the materia medica. Only one medicine can be the most similar at a given time with the condition of any given patient.

If more than one medicine is used it cannot be ascertained which one was curative and a source of future guidance is being obscured.

A mixture of more than one medicine in a single dose would constitute a new medicine, which should be proved on healthy person to ascertain the probable effects of that mixture.

Besides every thing, the vital force, the life principle governing the complex

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to correct the disturbance and disharmony of the patient's vital force should always be single, one at a time.

#### **4.2.3 Law of Minimum**

It is also one of the fundamental principles of Hahnemann's approach to the practical therapy where the dose of the medicine should be the minute. This is one of the most important factor to achieve the most harmless and gentle action of the well-selected medicine.

The minute dose means the quantity of a medicine which is capable of producing the least possible excitation of the vital force and yet sufficient to effect the necessary change in it. The minimum quantity is appropriate for a gentle remedial effect.

The advantages of minimum dose are:

1. unwanted medicinal aggravation is being avoided;
2. the uncommon, characteristic and distinguishing symptoms of the drug are being produced by the specific dynamic action of the minimum quantity of medicine on a patient;
3. the minuteness of the medicine does not allow the drug to do any organic damage and there is no risk of drug addiction and drug effects;
4. the concept of minimum dose can be verified by Arndt Schultz Law that
5. to avail the full advantage of the finer & finest curative effect of the medicines, they should be administered in minimum doses;
6. Law of Least action: The quantity of action necessary to affect any change in nature is the least possible, the decisive amount is always a minimum, an infinitesimal;
7. Law of Quantity: The quality of action of the homeopathic remedy is determined by its quantity in inverse ratio.

#### **4.2.4 Doctrine of drug proving**

In Homeopathy we prescribe only those medicines whose medicinal properties are known through Drug Proving. Hahnemann was the first person who wanted

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are known through Drug Proving. Hahnemann was the first person who wanted to know the action of the drugs.

Drug proving is a systematic investigation of pathogenetic (disease producing) power of medicine (hence disease curing power also) on healthy human beings of different ages, both sexes and of various constitutions.

Different medicines must be proved thoroughly in order to obtain full details of their curative properties as well as to combat thousands of diseases.

The drugs must be proved on human beings because:

1. Animals do not give subjective or mental symptoms.
2. Effects of the same drug on animals and on human beings are different.
3. We won't get the modalities and finer symptoms of the drugs.

The drug must be proved on healthy human beings because:

1. The symptoms of the drug and that of the disease will be mixed together.
2. Moreover, the action of drug on the sick person is different from the normal person.

#### **4.2.5 Theory of Chronic Diseases**

In spite of the best homoeopathic medicines prescribed, Hahnemann observed that in some cases, the symptoms would reoccur after intervals and the disease was not cured. This failure led him to investigate thoroughly a large number of chronic affections and after 12 years of experiment and observations, he reached to the conclusion that chronic diseases are caused by chronic miasms, which are Psora, Syphilis & Sycosis.

Psora is the real fundamental cause and producer of innumerable forms of diseases. It is the mother of all diseases and at least seven-eighth of all chronic maladies spring from it while the remaining one eighth spring from Syphilis and Sycosis. Cure is only possible by proper antimiasmatic treatment. Hence, concept of chronic disease is essential for homoeopathic treatment.

This theory was incorporated in 4<sup>th</sup> edition of Organon (1829), but Hahnemann

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meopathic treatment.”

#### 4.2.6 Theory of Vital force

The human organism is a tri entity consisting of body, mind and spirit. This spirit which is responsible for all different manifestation of life is termed as Vital force. This doctrine was introduced in 5<sup>th</sup> Organon of Medicine in 1833. Later it was changed to vital principle in the 6<sup>th</sup> edition.

In healthy condition, it is the vital force which maintains the normal functions and sensations of the organism. But when this vital force is primarily dynamically deranged by morbidic dynamic influence, it causes abnormal sensations and functions which are manifested outwardly through the material body as abnormal signs and symptoms, the totality of which constitutes the disease.

Again, if a cure is to be established it is the vital force that must arouse itself or be aided to arise for the recovery. If the vital force is too exhausted and debilitated, then no medicinal aid is of help because the vital force has receded beyond the reach of external aid. Concept of vital force gives a non materialistic approach to treatment of disease which makes homeopathy a non-injurious and rational art of healing.

#### 4.2.7 Doctrine of Drug-Dynamization

Homeopathic dynamization is a process by which the medicinal properties, which are latent in natural substances while in crude state, become awakened to an incredible degree.

Homeopathic dynamization or potentization is a mathematico-mechanical process for the reduction, according to scale, of crude, inert or poisonous medicinal substances to a state of physical solubility, physiological assimilability and therapeutic activity and harmless for use as homeopathic healing medicine. The process is conducted by means of either successive process of succussion or by process of friction in definite order & direction in accordance with the Homeopathic pharmacopoeia.

#### **Object of Dynamization:**

**Object of Dynamization:**

1. To reduce the medicinal substance by a continued process which helps to avoid the unnecessary medicinal aggravation and side effects.
2. The medicinal properties, which are latent in the natural substances in crude form become awakened and developed into activity to an incredible degree.
3. Homeopathy believes that vital force is dynamic in nature and when affected by disease, can only be cured by the dynamic power of serviceable medicine.
4. The more a drug is dynamized, the greater its dynamic medicinal power is increased to an incredible degree.
5. The most virulent and deadly poisons are transformed into beneficent healing medicine by the process of dynamization.
6. By the process of dynamization the medicinally inert substances become most effective for healing the sick (e.g. common salt - 'Nat Mur,' charcoal - 'Carbo Veg.', 'Sand-Silicea').

**Method of Dynamization :**

Drugs are being dynamized/potentized by two methods:-

1. Trituration - In case of insoluble substances.
2. Succussions - In case of soluble substances.

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**INTEXT QUESTION 4.1**

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1. Name the seven Cardinal Principles of Homeopathy.
  2. What is the meaning of 'Similia Similibus Curantur'?
  3. Give two reasons why we should prescribe a single medicine at a time?
  4. Give two advantages of prescribing a minimum dose.
  5. Give two reasons why we should prove drugs on human beings and not on animals.
  6. Why are drugs proved on healthy human beings?
  7. Name the three chronic miasms?
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9. What is Homeopathic Dynamization?

10. Give two objectives of Dynamization.

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### 4.3 TOTALITY OF SYMPTOMS

By totality of symptoms, we not only mean the sum total of symptoms, but it is, in itself one grand symptom, the symptom of the patient.

Basically, as said by Dr.Hahnemann it is “Outwardly reflected picture of the internal essence of the disease, that is, of the affection of the vital force.”

When the vital force is dynamically derailed by the external dynamic morbid force it leads to abnormal sensations and functions which are reflected outwardly by signs and symptoms, the totality of which constitutes the disease. Thus, “Totality of the symptoms is to the therapist, the disease”.

It is not a mere haphazard jumble of symptoms thrown together without rhyme or reason, not merely the numerical aggregate but totality means “all the symptoms of the case which are capable of being logically consined into a harmonious and consistent whole, having form, coherence and individuality. For example, a working machine is not only numerical aggregate of its thousands of parts but these parts are arranged in proper plan or design or assembled properly, therefore the functioning of the machine is possible. Similarly totality is such a harmonious combination of symptoms that it gives the true and only conceivable portrait of the disease.

### 4.4 CONCEPT OF HEALTH, DISEASE AND CURE IN HOHOEOPATHY

Human beings are not merely a simple aggregate to material units of flesh, blood, bones, muscles, nerves as well as mind. If so, modern biochemist know the composition of protoplasm, so they would have synthesized it in the laboratory. But, they are not able to do it. This is because there is some thing supersensual. Life is actually the combination of Body, Mind and Spirit. This spirit is called by Hahnemann as the Vital force.

**Health:** It is the normal condition of life characterized by a sensation of ease (well being) and comfort due to the harmonious playing of the vital force.

It is the stage of optimal physical, mental and social well being and not merely

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It is the stage of optimal physical, mental and social well being and not merely the absence of disease.

**Disease:** Disease is the abnormally altered state of life characterized by a sensation of uneasiness and discomfort due to the dynamic derangement of the vital force.

**Cure:** It is not merely the removal of the external secondary, tangible products of disease but it is the restoration of the normal functioning of the vital force, so that the functions of the organisms are again performed normally and the patient is in the state of health.

In healthy condition the vital force, a dynamic force, maintains normal functioning and sensations of the organism. But when this vital force is dynamically derailed by morbid dynamic influence, it causes abnormal sensations and functions, which are manifested outwardly through the material body as abnormal signs and symptoms, the totality of which constitutes the disease. So disease is nothing but the derangement of the vital force.

To achieve CURE, the vital force is having the prime role to receive the impression of the artificial, similar but superior medicinal disease & ultimately expels the natural, similar but comparatively weaker disease and restitutes the health in order. That is the vital force must arouse itself for the recovery.

The concept of vital force has given a non-materialistic conception of diseases to the homoeopathic school. This non-materialistic approach to the treatment of diseases has made homeopathy a non-injurious and rational art of healing.

#### **4.5 HOW DO THE HOMOEOPATHIC MEDICINE ACT?**

The modus operandi of Homoeopathic medicine has been clearly stated by Hahnemann as "A weaker dynamic affection is permanently extinguished in the living organism by a stronger one, if the latter (whilst differing in kind) is very similar to the former in its manifestation".

When a medicine is administered to a patient on the basis of accurate similarity of symptoms, it affects the morbidly deranged vital force and similar but stronger medicinal disease is produced by the primary action of the medicine and this

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lar, natural disease. The vital force is now only medicinally diseased. The medicinal disease gradually becomes weaker due to.

1. (i) minuteness of dose (ii) Fixed and shorter duration of action of the medicinal agent.
2. Secondary Curative action of the vital force: As there is similar relation between drug and disease the vital force indifferentiates itself and employs its increased energy to overcome the medicinal disease.

Finally, a time will come when the vital force is free from both the natural and medicinal disease and can carry on the vital life functions. Thus, perfect health is restored.

#### 4.6 CASE TAKING

##### Definition

It denotes the recording of the complaints of the patient in such a way that the picture of the diseased person is so completed that the physician can prescribe a suitable homeopathic remedy after determining the totality of the symptom.

Thus, it is the process to individualize a patient undergoing treatment to sort out all the characteristic, peculiar and general symptoms of a patient. By this, all the physical, pathological, mental, emotional etc. changes occurred due to the disease affection in a patient are to be recorded.

The patient will narrate all his sufferings and cause of the disease in details without any interference, as any interference may break the patient's train of thought. He may only be interrupted, when he is shifting to another topic, which is not related to the actual case. More information regarding the patient's behaviour and other activities noticed by the friends and relatives are also to be collected from them. All that information collected are to be recorded correctly. The physician will keep silent so long they will continue the relevant statement. No leading questions are to be asked.

The physician will have to attend the patient's bed for searching out the altered and unusual character of the patient.

The physician will make a systematic study of the statements made by the patient & his friends without any prejudice or bias. He 'will orient all the symptoms including his own findings. Now, he will interrogate the patient & friends to assess the particular information regarding causation, sensation, location, modalities etc. of the individual symptoms where it is necessary. He will make more queries, if necessary, to clarify, till he is in a position to draw a clear portrait of the patient, the guide to diagnose the curative remedy. The said process of collecting and recording the symptoms is to be conducted during all subsequent follow-up steps.

In epidemic diseases a large number of people suffer from similar kind of symptoms. During such occurrence, recording of the symptoms is being done in first few cases and the characteristics are found out. Peculiarly it is found that in almost all the cases the same remedy comes out to be the indicative one and this type of selection is called Genus epidemicus.

The aforesaid processes of recording symptoms in respective cases are to be conducted very honestly, faithfully and with all integrity to achieve success.

### **Case Taking Proforma (in Brief)**

#### **I. Particulars of the patient**

Name

Age

Sex

Address

Religion

Occupation

Marital Status

Date of first visit

- #### **II. Present complaints with duration (in the chronological order of occurrence) :** The most recent one, should come in the last. These complaints should be complete in the sense of location, sensation, modalities and concomitants.
-

**III. Past History :** All the complaints suffered by the patient since birth, any accident, vaccination, Surgery etc. (in chronological order). Any treatment taken earlier.

**IV. Family History:**

Any Addiction

Occupation

Marital Status

Diet

**VI Gynae and Obs. History**

No. of deliveries

Type of deliveries

Any complications

No. of living children

**VII Mental symptoms**

Symptoms pertaining to mind.

**VIII Physical (general)**

Desires

Aversions

Thermal Reaction

Appetite

Thirst

Stool

Sweat

Sleep

Dream

### **IX General Physical Examination**

|           |   |                  |   |
|-----------|---|------------------|---|
| Built     | - | Lymph nodes      | - |
| Decubitus | - | Pigmentation     | - |
| Anaemia   | - | Respiratory Rate | - |
| Cyanosis  | - | Pulse            | - |
| Clubbing  | - | B.P.             | - |
| Jaundice  | - | Tongue           | - |

### **X Systemic Examination**

Respiratory System

Central Nervous System

Cardiovascular System

Abdominal Examination

Skin

Joints & Bones

### **4.7 INDIVIDUALIZATION**

All the lives are individual and characterized by some particular and peculiar feature. Dr. Hahnemann was the first to introduce the concept of individualization of the patient and medicines in Homoeopathic system of treatment. The individual patient is being treated as a whole covering all the peculiar characteristics. No two persons are alike, be in health or in disease. This approach is one of the most important basis of Homoeopathic system of Medicine.

#### **INDIVIDUALIZATION OF THE PATIENT**

It is a process by which one patient is differentiated from other suffering from the same nosological disease. Some common features and symptoms are found in all the patient suffering from a particular disease viz., Body temperature above normal in all the cases of 'fever' and these are least important for selecting a curative medicine. But certain characteristic and peculiar symptoms are always

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available with the individual patient suffering from the said disease i.e. fever viz., one patient is showing dry, clean and red tongue with great thirst, drinks much but little at a time, most restless, so on/so forth and another shows coated yellowish/ dark brown/ white tongue with great thirst, drink much at a time, worse by any motion, so on/so forth. The aforesaid characteristic feature of the patients will indicate the specific remedy for the respective one. As such the physician should be keen enough to find out the individual characteristic feature in selecting the curative remedy for the patient on the basis of symptom similarity.

### **INDIVIDUALIZATION OF THE MEDICINE**

Homeopathy recognizes the disease curing power of different medicines, which varies from one another individualization of different medicine to discriminate their effectiveness is a very important factor and to be studied thoroughly without which the judicial application of the medicine is impracticable. In Homeopathy there is no scope to apply a substitute remedy because action of different medicines vary greatly.

Example :- Two medicines, Secale Cor and Arsenic Alb - both are chilly. But the Secale Cor and Arsenic Alb - both are chilly. But the Secale Cor patient wants all the coverings off and wants cold air where as Arsenic patient wants all things hot (except head). So they are separate from each other. The whole of the Materia Medica is based upon this kind of individualization.

The success of Homeopathic treatment depends on the accuracy of patient and drug individualization.

- That caused by injury or destruction of tissues which are incapable of restoration.
- Where vital reactive power of the organism to medicines is exhausted or obstructed.
- Where symptomatic likeness of which may not be perceptibly produced in the healthy organism by medicinal means, nor to affections in which such symptoms are not perceptible.

ends which are smooth and articular. e.g. Humerus, Radius, Ulna, Femur, Tibia and Fibula.

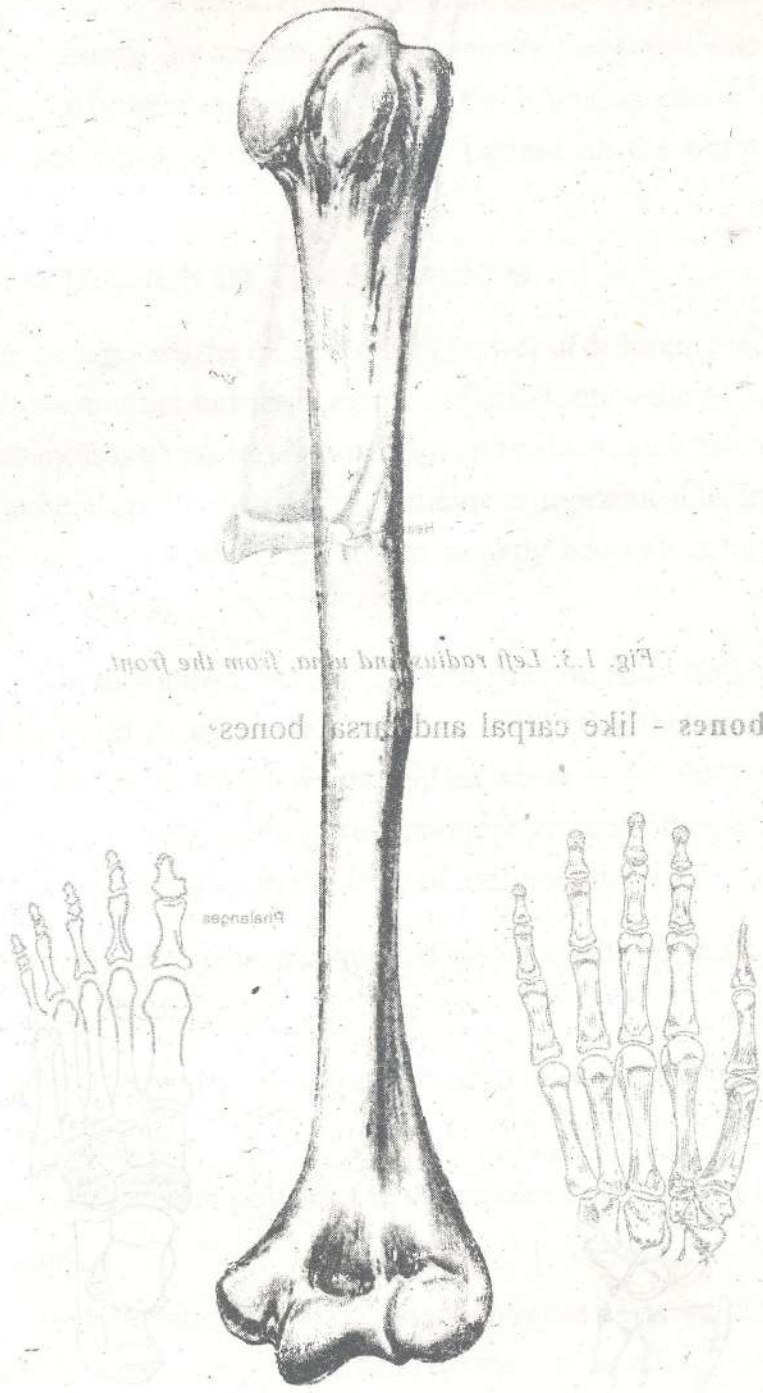


Fig. 1.1: Left radius and ulna, from the front.

ii. Short bones - like carpal and tarsal bones.

Fig. 1.2 : Left Humerus: anterior aspect.

Fig. 1.3

3. Law of Minimum
4. Doctrine of Drug proving
5. Theory of Chronic Disease
6. Theory of vital force
7. Doctrine of drug dynamization

## 2. Similia Similibus Curanttr

This means like cures. like. In Homeopathy, the patient is treated by a medicine which is having the capability to produce such similar symptoms and which will be stronger than the former. The weaker natural disease symptoms will be extinguished by the similar but stronger symptoms produced by the homeopathic medicine.

3. Two reasons for prescribing a single medicine at a time :
  1. Only one medicine can be most similar at a given time with the condition of any given patient.
  2. If more than one medicine be used it cannot be ascertained which one was curative and a source of future guidance is being obscured.
4. Two Advantages of prescribing a minimum dose:
  1. Unwanted medicinal aggravation is being avoided;
  2. The minuteness of the medicine does not allow the drug to do any organic damage and there is no risk of drug addiction and drug effects.
5. Two reasons why we should prove on human beings and not on animal:
  1. Animals do not give subjective or mental symptoms.
  2. Effect of same drug on animals and on human beings are different.
6. The drugs are proved on healthy human beings :
  1. The symptoms of the drug and that of the disease will be mixed together.
  3. More over, the action of drug on the sick person is different from the normal person.

7. The three chronic miasms are:-  
Psora, syphilis and sycosis
8. Vital force: The human organism is a triune entity consisting of body, mind and spirit. This spirit which is responsible for all different manifestations of life, is termed as vital force.
9. Homoeopathic Dynamization or potentization is a mathematico mechanical process for the reduction, according to the scale, of crude, inert or poisonous medicinal substances to a state of physical solubility, physiological assimilability and therapeutic activity and harmless for use as homoeopathic healing medicine. The process is conducted by means of either successive process of succussion or by process of friction in definite order & direction in accordance with the Homoeopathic pharmacopoeia.
10. Two Objects of Dynamization
  1. To reduce the medical substance by a continued process which helps to avoid the unnecessary medicinal aggravation and side effects.
  2. The medicinal properties, which are latent in the natural substances in crude form become awakened and developed into activity to an incredible degree.



## 5

# INTRODUCTION OF HOMEOPATHIC MATERIA MEDICA

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Disease is far older than mankind. Rather, it is as old as life on earth. The earlier documents on medical history are only about four thousand years old. But before the invention of 'writing' some fossils as that of teeth, bones and mummies give ample evidence of disease and mode of treatment applied then, i.e. in the prehistoric era.

Medical science and art had been constantly changing and progressing by omitting the old concepts and adopting the newer ways. The scenario of medical practice in 18<sup>th</sup> century was a mixture of various kinds of treatments some of which had no fixed laws to follow and some followed the law of opposites. Part/Parts of a man was thought to be sick and treatment was given accordingly only to somehow relieve that part. The father of medicine- Hippocrates (460-379 B.C.) observed the sick people and not diseases. But his ideas were adopted by very few physicians, one of them being the father of homoeopathy - Master Hahnemann.

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Hahnemann finished his medical education, got M.D. in 1779 and started practising. Soon he got disgusted with the then medical practice where blood letting and leaching was treatment for inflammations, emetics were used in so-called stomach derangements, venesection was done in cases of swellings and etc. His conscience could not allow him to practice in this way anymore. He gave up practising but he had a family to look after. So, to earn his livelihood, he started translating various books, mainly that of medicine and chemistry, the subjects which interested him a lot. During one of such translations of Cullen's *Materia Medica* (William Cullen, an famous physician) in 1790, he found a peculiar statement made about Cinchona bark viz., it cures ague because of its astringent action and bitter taste. However, this didn't appeal to Hahnemann's intellect and to find the fact, he himself started taking 4 drachms of juice of Cinchona bark, twice daily. To his astonishment he was attacked by symptoms of malaria - like fever. He then started experimenting with other medicinal substances which were already known to cure certain disease conditions. He discovered that a similar disease condition which a substance is known to cure a person, is produced when the same substance be administered to a healthy person. Thus the disease producing power of drugs were actually found to be their disease curing power.

In 1796, Hahnemann published an article in Hufeland's journal revealing the facts that he found, the title of the article was "An Essay on a New Principle to ascertain the curative powers of drugs and some examination of the previous principles".

Master Hanemann emphasised that such experiments to ascertain the disease producing and curing powers of substances should be done only on human beings, not on animals because animals can't express the subjective as well as mental symptoms and moreover, the affects produced on animals and human beings by the same substance may be different. Master also restricted the experimentation upon **healthy** human beings only because a healthy person can sharply observe least changes brought out by the substance and also because the symptoms produced in a sick person will not give a complete picture as some symptoms may get cured or some may get exaggerated, etc.

This process of ascertaining the curative and disease - producing effects of substances by experimenting on healthy human beings of different ages, sexes

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and constitutions was termed as Drug Proving. This required trustworthiness and keen power of observations. Initially Master made this experiments upon himself, his family members and relatives. Later, some of his friends, followers and other conscientious physicians also joined him in his tedious work. In 1805, Master wrote the proving of 27 drug substances in a book in Latin language.

Master continued drug proving and soon brought out 'Materia Medica Pura'. The first volume of first edition came out in 1811 and third editions of first and second volumes came out in 1830. Master named his book so, as the Materia Medica of so-called rational school (old school) of medicines were based on hypothetical guess works and provided no logical reasoning for its application. The book contained symptoms of 67 medicines divided in VI volumes originally. The symptoms included, results of drug proving, accidental poisoning and overdose of old school observers. The medicines included are:

- |                        |                                   |                            |
|------------------------|-----------------------------------|----------------------------|
| (1) Aconitum nap.      | (20) China                        | (39) Magnes                |
| (2) Ambra grisea       | (21) Cicuta virosa                | (40) Magnetis polus        |
| (3) Angustura          | (22) Cina                         | Arcticus                   |
| (4) Argentum           | (23) Cocculus                     | (41) Magnetis polus        |
| (5) Arnica montana.    | (24) Colocynthis                  | Australis                  |
| (6) Arsenicum          | (25) Conium                       | (42) Manganum aceticum     |
| (7) Asarum             | (26) Cyclamen<br>europaeum        | (43) Menyanthes trifoliata |
| (8) Aurum              | (27) Digitalis                    | (44) Mercurius             |
| (9) Belladonna         | (28) Drosera rotandifolia         | (45) Moschus               |
| (10) Bismuthum         | (29) Dulcamara                    | (46) Muriaticum acidum     |
| (11) Bryonia alba.     | (30) Euphrasia officinalis        | (47) Nux vomica            |
| (12) Calcarea acetica  | (31) Ferrum                       | (48) Oleander              |
| (13) Camphora          | (32) Guaiacum                     | (49) Opium                 |
| (14) Cannabis sativa.  | (33) Helleborus niger             | (50) Phosphoricum acidum   |
| (15) Capsicum an.      | (34) Hepar sulphuris<br>calcareum | (51) Pulsatilla            |
| (16) Carbo animal is   | (35) Hyoscyamus niger             | (52) Rheum                 |
| (17) Carbo vegetabilis | (36) Ignatia                      | (53) Rhus                  |
| (18) Chamomilla        | (37) Ipecacuanha                  | (54) Ruta                  |
| (19) Chelidonium       | (38) Ledum                        | (55) Sambucus              |

|                   |                   |                     |
|-------------------|-------------------|---------------------|
| (56) Sarsaparilla | (60) Stannum      | (64) Taraxacum      |
| (57) Scilla       | (61) Staphisagria | (65) Thuja          |
| (58) Spigelia     | (62) Stramonium   | (66) Veratrum album |
| (59) Spongia      | (63) Sulphur      | (67) Verbascum      |

In the beginning of drug proving Master started the experiments with crude drug substances but later as the methods of potentisation were devised and the immense arousal of latent powers was confirmed since then Master mentioned about proving with 30th development of power. Instructions for drug proving have been given mainly from § 105 to § 145 in 5th and 6th editions of his Organon of Medicine.

In 1828, Master declared his observations about chronic diseases in 4th edition of Organon as well as he wrote a separate book on 'Chronic Diseases, their nature and treatment'. In the latter he mentioned the theoretical details about how he observed and finally made what conclusions as well as he described symptomatology of some anti-psoric medicines. He gave details of 48 medicines including much of his clinical experience with these. Some drugs were a repetition from Materia Medica Pura but in Chronic Diseases the number of symptoms increased much more than what were in Pura. In Pura, Master at first gave an introduction to each drug in which he mentioned some key features of the drug and the way it was prepared and administered for proving. Introduction also has been either modified or left as the same in 'Chronic Diseases'. The medicines which appear in both the major writings are 1) Arsenium, 2) Aurum, 3) Carbo animalis, 4) Carbo vegetabilis, 5) Colocynthis, 6) Conium maculatum, 7) Digitalis, 8) Dulcamara, 9) Guaiacum, 10) Hepar sulphuris calcareum, 11) Muriaticum acidum, 12) Phosphoricum acidum, 13) Sarsaparilla, 14) Stannum and 15) Sulphur.

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Following are the total medicines mentioned in Chronic Diseases:

- |                         |                                   |                          |
|-------------------------|-----------------------------------|--------------------------|
| (1) Agaricus muscarius  | (17) Colocythis                   | (33) Muriaticum acidum   |
| (2) Alumina             | (18) Conium maculatum             | (34) Natrum carbonicum   |
| (3) Ammonium carbonicum | (19) Cuprum                       | (35) Natrum muriaticum   |
| (4) Ammonium muriaticum | (20) Digitalis                    | (36) Nitri acidum        |
| (5) Anacardium          | (21) Dulcamara                    | (37) Nitrum              |
| (6) Antimonium crudum   | (22) Euphorbium                   | (38) Petroleum           |
| (7) Arsenicum album     | (23) Graphites                    | (39) Phosphorus          |
| (8) Aurum, Gold         | (24) Guajacum                     | (40) Phosphoricum acidum |
| (9) Aurum falliatum     | (25) Hepar sulphuris<br>calcareum | (41) Platina             |
| (10) Baryta carbonica   | (26) Iodium                       | (42) Sarsaparilla        |
| (11) Borax veneta       | (27) Kali carbonicum              | (43) Sepia               |
| (12) Calcareo carbonica | (28) Lycopodii pollen             | (44) Silicea terra       |
| (13) Carbo animalis     | (29) Magnesia carbonica           | (45) Stannum             |
| (14) Carbo vegetabilis  | (30) Magnesia muriatica           | (46) Sulphur             |
| (15) Causticum          | (31) Manganum                     | (47) Sulphuricum acidum  |
| (16) Clematis erecta    | (32) Mezereum                     | (48) Zincum              |

Master Hahnemann himself proved 99 medicines in his lifetime and was working on the 100<sup>th</sup> when the inevitable death grasped him in July 1843. Many other stalwarts also proved drugs on their own like Dr. Hering gave us Lachesis and Crotalus horridus etc., Dr. Stapf gave us Crocus sativa, Colchicum etc., Dr. Burt gave us Dioscorea villosa, Dr. Smith gave us Equisetum and so on the list goes endlessly.

This is how Homeopathic materia medica came up and still continues enriching its constituents. As it is based on fixed laws of nature, exact observation, correct interpretation and proper conclusion so it remains unchanged even today and will remain so forever. The ingredients and formulae of allopathic medicines according to newer diagnosis keeps on changing but homeopathic medicines stand the test of time always.

Some physicians adopted the method of remembering only keynotes as it is not

possible to remember all the hundreds and thousands of symptoms from books like Pura, etc. Leaders among such physicians were Dr. H.N.G. Guerensy, Dr. H.C. Allen, Dr. Nash, Dr. Pullford, etc. Keynotes are such symptoms without which a drug cannot be recognized or such symptoms which individualise a drug. This concept is in conformity with § 153 of 5th and 6th editions of Organon of Medicine in which Master mentions that such medicine is to be selected for a case which corresponds to the more striking, singular, uncommon and peculiar (characteristic) signs and symptoms of the case of disease.

Some other physicians like Dr. E.A. Farrington, Dr. M.L. Tyler, Dr. Kent, etc. preferred to remember and explain materia medica in a picturesque form, i.e. they narrated each medicine as a personality. Thus came up the great varieties of Materia Medica after Hahnemann's classical works.

Applicability of Materia Medica lies in knowing the totality of symptoms of each drug. This is to be matched with the totality of symptoms of a sick person in order to cure the person in rapid, gentle and permanent manner.

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#### INTEXT QUESTIONS

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1. Who is known as the father of medicine and who is the father of homoeopathy?
  2. Why Hahnemann gave up his medical practice of old school, though he was having M.D. degree?
  3. In which language Hahnemann's provings published first?
  4. Mention the year of publication of first volume of first edition of Materia Medica Pura.
  5. Total number of medicines
    - (1) included in Materia Medica Pura are
    - (2) included in 'Chronic Diseases - their nature and treatment' are
    - (3) proven by Hahnemann in his life time are
- 

#### ANSWERS TO IN-TEXT QUESTIONS

1. Hippocrates is the father of Medicine and Master Hahnemann is known as the father of Homoeopathy.
-

2. Hahnemann gave up his medical practice of old school because
    - (1) their treatment was not based on any fixed laws
    - (2) that treatment was only given to relieve the part/parts affected
    - (3) he got very much disgusted with this kind of treatments
  3. Latin.
  4. 1811.
  5.
    - (1) 67
    - (2) 48
    - (3) 99
-

## FUNDAMENTAL DUTIES Part IVA (Article 51A)

It shall be the duty of every citizen of India :-

- a) to abide by the Constitution and respect its ideals and institutions, the National Flag and the National Anthem;
- b) to cherish and follow the noble ideals which inspired our national struggle for freedom;
- c) to uphold and protect the sovereignty, unity and integrity of India;
- d) to defend the country and render national service when called upon to do so;
- e) to promote harmony and the spirit of common brotherhood amongst all people of India transcending religious, linguistic and regional or sectional diversities; to renounce practices derogatory to the dignity of women;
- f) to value and preserve the rich heritage of our composite culture;
- g) to protect and improve the natural environment including forests, lakes, rivers and wild life, and to have compassion for living creatures;
- h) to develop the scientific temper, humanism and the spirit of inquiry and reform;
- i) to safeguard public property and abjure violence;
- j) to strive towards excellence in all spheres of individual and collective activities so that the nation constantly rises to higher levels of endeavour and achievement.
- k) Who is parent or guardian to provide opportunities for education to his child or, as the case may be, ward between the age of six and fourteen years.

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### A brief Guide to NIOS web site

The success of Open Learning and Distance Education very much depends upon the harnessing of the new and latest technology. The emerging Internet and Web technology help in effective dissemination of knowledge, breaking all geographical boundaries. The web-site is a dynamic source of the latest information and is also an electronic information guide. The contents in the NIOS web-site is open to all.

The learners can have access to NIOS web-site at the following addresses:

<http://www.nos.org> & [nios.ac.in](http://nios.ac.in)

Clicking the site address will bring the users to the NIOS home page that will further guide them to visit different information pages of the NIOS. The NIOS is also developing a school network through the Internet known as Indian Open Schooling Network (IOSN). The network will provide a common communication platform for learners and educators. The NIOS is offering a Certificate in Computer Applications (CCA) through selected AVI. This course is also offered through the Internet on the NIOS web-site.

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