

# Diploma in Pharmacy 1<sup>st</sup> Year

## Human Anatomy & Physiology Practical

*To study the given model of human digestive system.*

### **Aim:**

To study the given model of human digestive system.

### **Reference :**

Dr. Gupta G.D , Dr. Sharma Shailesh , Dr. Sharma Rahul Kumar ,“Practical Manual of Human Anatomy and Physiology” Published by Nirali Prakashan , Pg.No 134 - 138

### **Theory :**

The gastrointestinal tract and associated glands make up the digestive system. Ingestion, digesting, and absorption of food, as well as the elimination of waste products, are all processes of the gastrointestinal system.

## Parts of Digestive System:

**1. Mouth:** It is the upper expanded portions where the alimentary canal begins

- i) **Vestibule:** An exterior part that lies between the lips and the inner lining of the cheeks, as well as the gums and teeth
- ii) **Cavity of Mouth:** An interior region of the mouth, it is bordered on the sides by teeth and the mastoid bone, on the top by the palate, and on the bottom by the tongue. The most significant structure of mouth is.
  - a) **Tongue:** The tongue is located in the mouth's floor and is attached to the hyoid bone.
  - b) **Teeth:** Mastication is done with the teeth.
  - c) **Salivary Gland:** In the mouth, there are three pairs of salivary glands.
    - **Parotid Gland:** There is one below and in front of each ear on each side. Stensen's duct is present in Gland.
    - **Submandibular Glands:** There are two of these glands, one on each side of the jaw. Wharton's duct is a conduit that runs through each gland. It opens under the tongue near the midline
    - **Sublingual Glands:** These are located beneath the tongue. They directly inject secretions into the mouth through the tiny aperture.
  - d) **Saliva:** It is a mixture of saliva from all three pairs of salivary glands. It is an alkaline fluid that contains water to the point that it contains 99 percent of the water in saliva:
    - Mucin which is a glycoprotein.
    - Ptyalin, an enzyme which converts starch into maltose also it contains salts of sodium, potassium, calcium and magnesium.
    - Ptyalin is an enzyme through which starch gets converted into maltose and it also contains sodium, potassium, calcium, and magnesium salts.

**2. Pharynx:** Pharynx lies between the mouth and oesophagus. Pharynx consists of three parts:

- i. **Nasopharynx:** It is located behind the nasal cavity. It extends from the base of the skull to the soft palate.
- ii. **Oropharynx:** It is located behind the mouth. It extends from the soft palate to the upper aperture of the larynx below
- iii. **Laryngopharynx:** The laryngopharynx is the lowest region of the throat, located behind the larynx. The oropharynx and laryngopharynx work together to transport food and air

**3. Oesophagus:** It is a muscular tube that extends from the pharynx to the stomach's cardiac opening

### **Deglutition**

Food is masticated and thoroughly combined with saliva in the mouth.

Food is converted into a spherical mass termed bolus by the movement of the tongue and cheeks. This bolus is taken down and swallowed.

**4. Stomach and its Digestive Function:** The dilated section of the alimentary canal that takes food from the oesophagus is the stomach. It is located in the top section of the abdominal cavity, just behind the diaphragm's left half.

### **Part of Stomach:**

- i) **Two Surfaces:** An anterior and a posterior surface
- ii) **Two Borders:** An upper border called lesser curvature a lower border called greater curvature.
- iii) **Two Ends:** Upper end called cardiac end.
- iv) **Fundus:** A dome shaped upper part lying to left of cardiac end.
- v) **Body:** The main part of stomach.
- vi) **Pyloric Antrum:** The lower part.

## Secretion of Stomach

The mucosal membrane of the stomach contains glands that continuously release gastric juice. Gastrin is a hormone produced by the impact of food on the mucous membrane of the stomach.

- i) Pepsin: It converts protein to peptones in the presence of HCl acid.
  - ii) Renin: It is a protein that converts caseinogen, a soluble milk protein, into insoluble milk.
  - iii) Hydrochloric Acid: It is secreted by parietal cells of gastric gland
  - iv) Intrinsic Factor: It is necessary for absorption of vitamin B12
- v) Chyme: Chyme is semi-liquid form and is passed into duodenum.

**5. Small Intestine and Its Function of Digestion and Absorption:** The small intestine is the section of the alimentary canal that connects the pyloric end of the stomach to the intestine. Parts of small intestine are:

- i) Duodenum
- ii) Jejunum
- iii) Ileum

## Digestion in Small Intestine

The stomach's acidic chyme travels to the duodenum.

- i) The alkaline intestinal juice is called succus entericus
- ii) Alkaline secretion from liver and pancreas.

In the small intestine, digestion is carried out by enzymes:

Enterokinase: It converts trypsinogen of pancreatic juice into trypsin  
Erepsin: It converts polypeptides into amino acids.

- Sucrose, Maltase and Lactase: It converts the corresponding disaccharide into monosaccharide

## Absorption

Villi are minute projections found in the intestine's inner mucous layer

**6. Large Intestine:** The large intestine extends from the ileum to the rectum. The parts of the large intestine are the caecum, appendix, ascending colon, transverse colon, and sigmoid colon.

### **Function**

- 1) **Digestion:** It is carried out by colonic microorganisms. They act on the small intestine's undigested and unabsorbed waste,
- 2) **Absorption:** In the small intestine, all carbohydrates, proteins, and lipids are already absorbed. In the colon, only water and glucose are absorbed.
- 3) **Secretion:** Mucin is the only secretion found in the body. It lubricates the colon and makes it easier for faeces to move through.
- 4) **Excretion:** The large intestine is where iron and purgative are expelled .
- 5) **Rectum:** The lower posterior region of the pelvis is occupied by the rectum. It extends from the sigmoid colon to the anus
- 6) **Anus:** A sphincter called the anal sphincter protects the opening of the anus. It is managed on a voluntary basis,
- 7) **Defection:** Being a reflex mechanism this reflex, on the other hand, is under voluntary control. When a substantial amount of faeces collects in the rectum, the Defecation reflex is triggered.

**Result:** The given model of human digestive system was studied.