Digestive System

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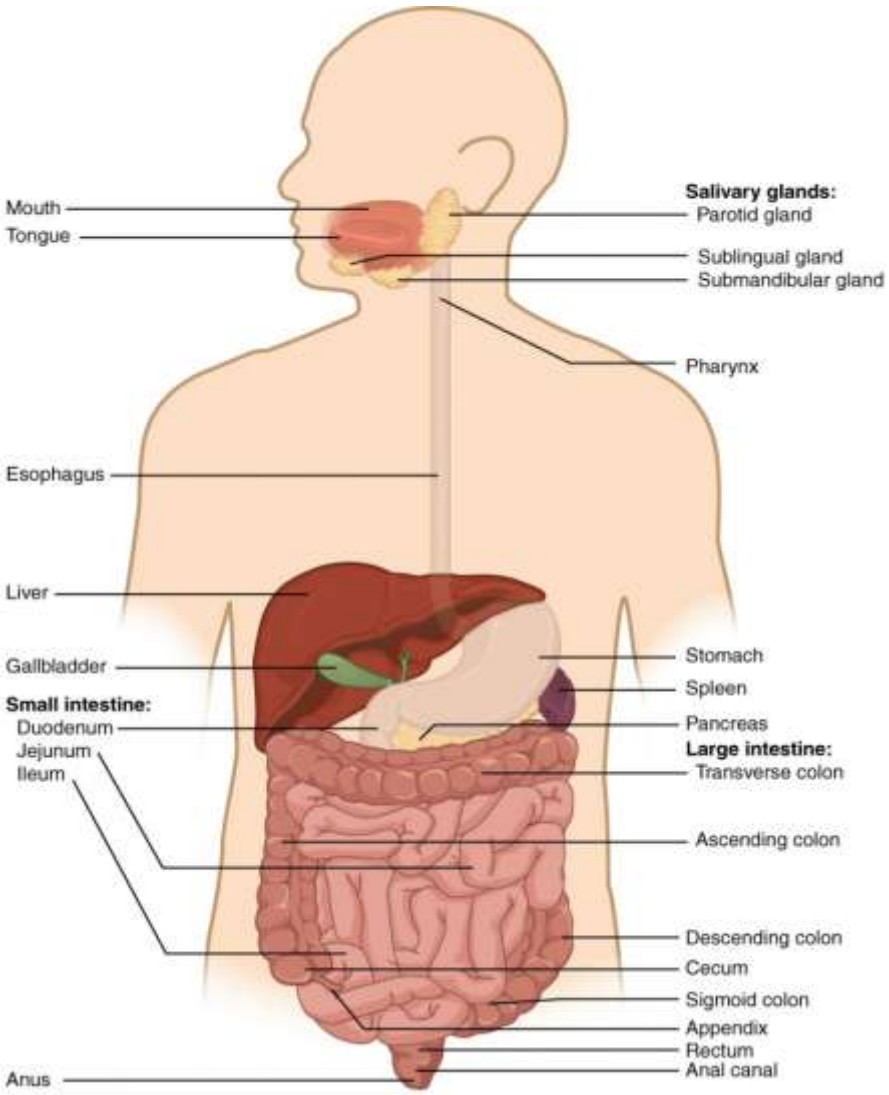
The Digestive System:

The **digestive system** consists of a group of organs that break down the food we eat into smaller molecules that can be used by body cells. Two groups of organs compose the digestive system : the **gastrointestinal (GI) tract** and the **accessory digestive organs** .

The GI tract or *alimentary canal* is a continuous tube that extends from the mouth to the anus through the thoracic and abdominopelvic cavities. Organs of the GI tract include the mouth, most of the pharynx, esophagus, stomach, small intestine, large intestine. The length of the GI tract is about 5-7 meters in a living person when the muscles along the wall of the GI tract organs are in a state of tonus (sustained contraction) and the loss of muscle tone after death.

The accessory digestive organs include the teeth, tongue, salivary glands, liver, gall bladder and pancreas. Teeth aid in the physical breakdown of food, and the tongue assists in chewing and swallowing. The other accessory digestive organs, however, never come into direct contact with food. They produce or store secretions that flow into the GI tract through ducts; the secretions aid in the chemical breakdown of food.



Overall, the digestive system performs six basic processes:

Ingestion:

This process involves taking foods and liquids into the mouth (eating).

Secretion:

Each day, cells within the walls of the GI tract and accessory digestive organs secrete a total of about 7 liters of water, acid, buffers and enzymes into the lumen (interior space) of the tract.

Motility:

Alternating contractions and relaxations of smooth muscles in the walls of the GI tract mix food and secretions and move them toward the anus. This capability of the GI tract to mix and move material along its length is called **motility**.

Digestion:

Digestion is the process of breaking down ingested food into small molecules that can be used by body cells. In mechanical digestion, the teeth cut and grind food before it is swallowed, and then smooth muscles of the stomach and small intestine churn the food to further assist the process. As a result, food molecules become dissolved and thoroughly mixed with digestive enzymes. In **chemical digestion** the large carbohydrate, lipid, protein and nucleic acid molecules in food are split into smaller molecules by hydrolysis. Digestive enzymes produced by the salivary glands, tongue, stomach, pancreas, and small intestine catalyze these catabolic reactions.

Absorption:

The movement of the products of digestion from the lumen of the GI tract into blood or lymph is called is called **absorption.** Once absorbed, these substances circulate to cells throughout the body. A few substances in food can be absorbed without undergoing digestion. These include vitamins, ions, cholesterol and water.

Defecation:

Wastes, indigestible substances, bacteria, cells sloughed from the lining of the GI tract, and digested materials that were not absorbed in their journey through the digestive tract leave the body through the anus in a process, called **defecation.** The eliminated material is termed **feces** or stool.

Mastication:

When the food enters the mouth, mechanical break down of food begins. The mouth is closed and the food moves between the teeth with the help of the tongue. The food is broken down into smaller pieces and it makes with saliva. This mechanical break down of food is called **mastication** or **chewing** .

Deglutition:

Swallowing is a complicated process which involves the coordinated activities of over 22 separate muscles.

Histological structure of the GI tract:

Layers of the GI tract:

The wall of the GI tract from the lower oesophagus to anal canal has the same basic, four-layered arrangement of tissues. The four layers of the GI tract, from deep to superficial,are:
a) **The mucosa layer**,

b) **The submucosa layer**

c) **The muscularis layer**

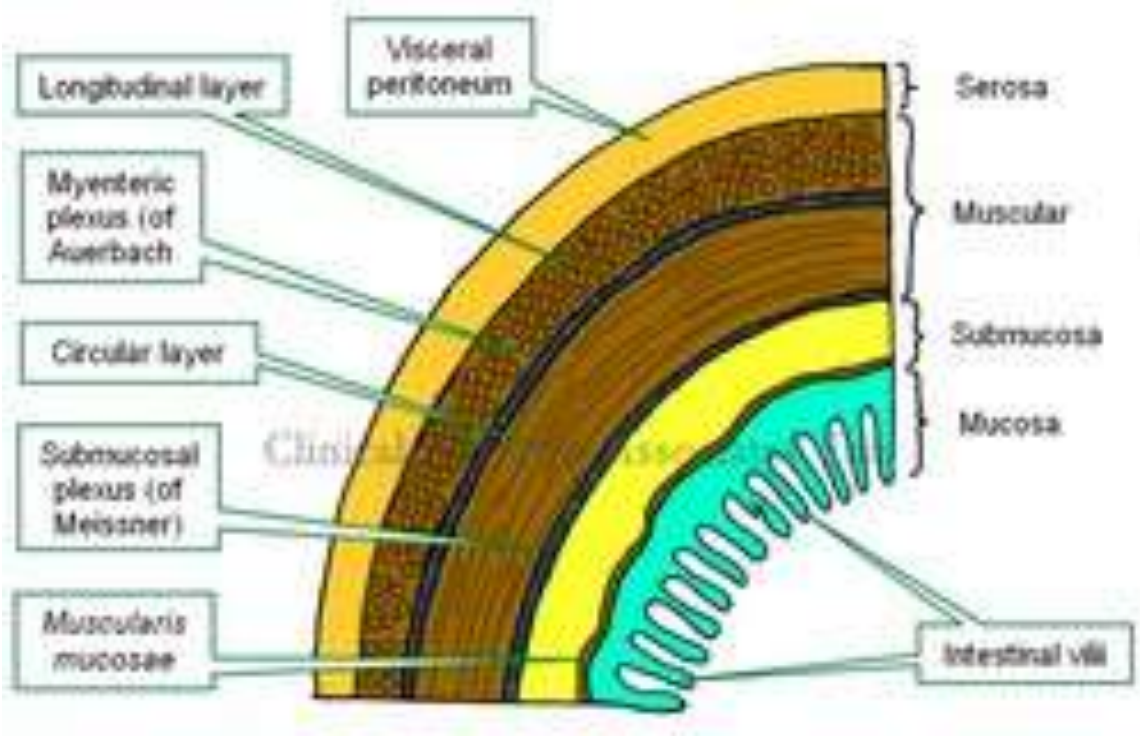
d) **The serosa layer**

a)The mucosa layer:

It is the inner most lining of the GI tract. This layer is mainly composed of simple columnar epithelial tissue and contain a large number of mucous secreting **goblet cell.** The main function of this layer is:

a) Secretion of mucous, digestive enzymes and hormones.
b) Absorption of end-product of digestion in blood.
c) Protection against infections and diseases.

The slippery mucous produced by this layer helps in the passage of food. The thick mucous layer also protect the GI tract wall from being digested by enzymes working on them.



b) The submucous layer:

Just outside the mucosa lining is the submucosa layer. This layer is made in dense connective tissue containing blood, lymphatic muscles, and nerve fibres and glands. This layer contains elastic tissue which helps the stomach to stretch at the time of food intake and recoils back when it is empty.

C) The Muscular externa or Muscularis:

The muscles present in this layer is responsible for the movement of the GI tract. The muscularis of the mouth, pharynx, and superior and middle part of the esophagus contains skeletal muscle that produces voluntary swallowing. Skeletal muscle also forms the external canal sphincter, which permits voluntary control of defecation. Throughout the rest of the tract, the muscularis consists of smooth muscle that is generally found in two sheets: an inner sheet of circular fibres and an outer sheet of longitudinal fibres. Involuntary contractions of the smooth muscle help breakdown of food, mix it with digestive secretions and propel it along the tract.

d) The Serosa layer:

Those portions of the GI tract, that are suspended in the abdominal cavity have a superficial layer called the serosa. As its name implies, the serosa is a serous membrane composed of areolar connective tissue and simple squamous

epithelium. The serosa is also called the **visceral peritoneum** because; it forms a portion of the **peritoneum**.

Functional Anatomy of Digestive System:

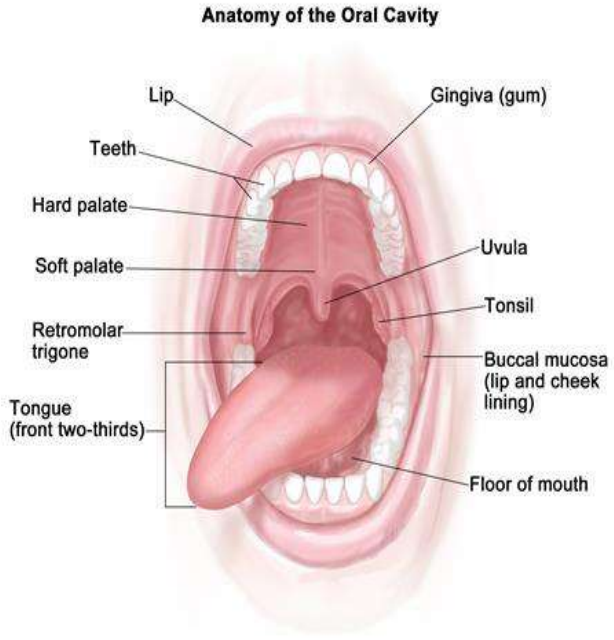
The digestive system is divided into the two major parts: the GI tract and the accessory digestive glands. The different parts of GI tract are discussed below:

a) Mouth:

The first part of the GI tract is Mouth which in a closed cavity is called, the **oral or buccal cavity.** The mouth is bound interiorly by the lips, laterally by the cheeks; superiorly by the palate and inferiorly by the tongue. The interior opening of the mouth is called **oral**. The mouth is continuous with the oropharynx.

The mouth is linked by stratified squamous epithelium . The lips are the outer covering of the oral oritis, it has two parts : the upper and the lower part. The lips open at the ingestion which allow the food maintain the mouth.

The palate forms the route of the mouth. The anterior part of the palate is hard formed by palatine bones and is called the **hard palate**.



The posterior portion of the palate is a mobile fold formed by skeletal muscle. The soft palate rises reflexively to close the nasopharynx when we swallow. The tongue occupies the floor of vocal cavity. It occupies most of the oral cavity when the mouth is closed. It is made up of bundles of skeletal muscle. During chewing it grips the food and constantly repositions it between the teeth for proper chewing. It helps to mix the food with saliva and ultimately, it forms a compact mass of food, called the **bolus.**

The tongue initiates the process of swallowing by pushing the bolus into the pharynx. A fold of mucosa, called the frenulum.

i) The tongue helps in the formation of food bolus.
ii) Aids in the process of swallowing.
iii) Helps us to speak
iv) The surface of the tongue bears taste buds which helps in the perception of taste.

Salivary Glands:

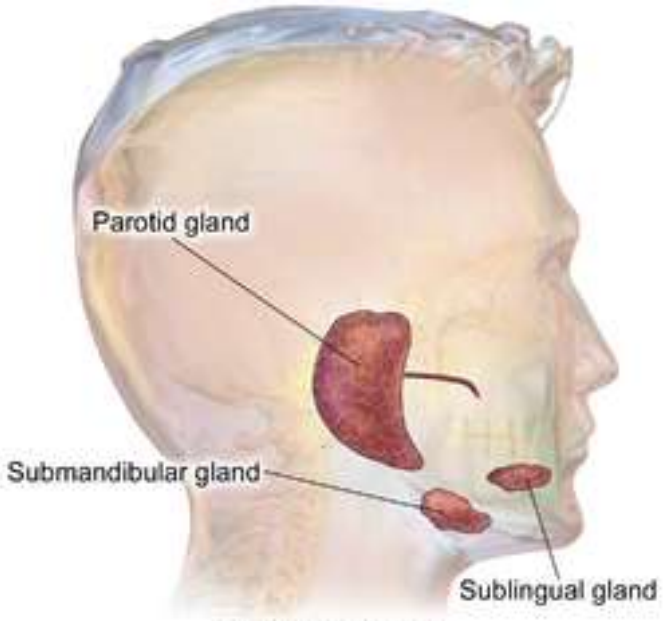
The accessory glands are salivary digestive gland present in the **orocavity**. The saliva

i) cleans the mouth.
ii) Dissolves the food chemicals to arouse the sense of taste.
iii) Moistens the food and helps in the formation of food bolus.
iv) Contains enzymes that helps in the digestion of starchy food. There are different types of salivary glands –
   a) Parotid gland
   b) Submandibular gland
   c) Sublingual gland present in the oral cavity.

There are three major salivary glands which are :

i) Parotid gland:

It is a large gland which lies anterior to the ear. The serrations of this gland releases the buccal cavity via parotid ducts which opens near the second upper molar teeth. Inflammation of the parotid gland due to viral infection causes mumps. This is a disease associated with high fever, swallowing problem etc.



Salivary Glands

ii) Submandibular gland:

The size of the gland is about the size of a walnut. It lies in the medial aspect of the

mandibula and its ducts open at the base of the lingual frenulum.

iii) **Sublingual gland:** The small sublingual gland lies anterior to the submandibular gland under the lung . It has 10-12 ducts which open in the floor of the mouth.

Anatomical structure of salivary gland:

The salivary glands are composed of two types of cells: i) Mucous cells ii) Serous cells. The serous cells produce a watery solution which contains enzymes, ions and a little bit of mucin. The mucous cells secrete a viscous liquid called, **mucous .**

Composition of Saliva:

Saliva is a watery secretion, (Its concentration depends on the glands that are active at the time of salivation. The serous cells when stimulated saliva becomes watery where as the stimulation of mucous cells releases thick sticky saliva.) It is slightly acidic in pH (6.75-7). It contains some solutes which include Na^+, K^+, PO_4^- and bicarbonate ions. The digestive enzyme salivary amylase is present in saliva. (Saliva also contains protein, mucin, lysozyme, IgA and some metabolic wastes. The mucin present in the saliva lubricates the oral cavity for easy passage of food.

Saliva provide protection against microorganisms due to the following reasons:

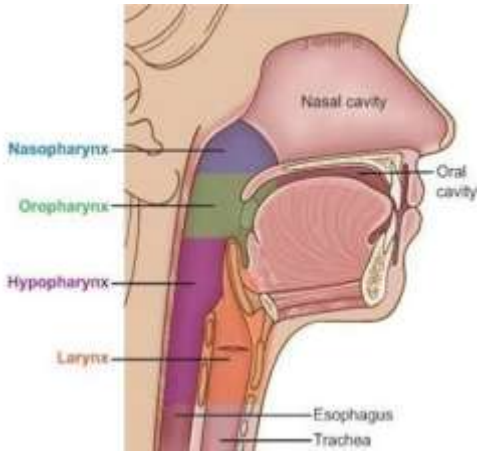
i) IgA antibodies are present.
ii) Lysozyme inhibits the bacterial growth in mouth and also prevents tooth decay.
iii) Defensins is a local antibiotic which helps to prevent growth of microorganisms.

Saliva

- **Water (99.5%)**
- **Solid (0.5%)**
  - **Organic (0.3 %)**
    - Ptyalin
    - Kallikrein
    - Lysozyme
    - Carbonic anhydrase
    - Blood group substances
    - Nerve growth factor (NGF)
    - Mucin
      Antibodies (Ig A)
  - **Inorganic (0.2%)**
    - **Cations**
      - Na^{+}
      - K^{+}
      - Ca^{2+}
      - Mg^{2+}
    - **Anions**
      - Cl^{-}
      - HCO_3^{-}
      - PO_4^{3-}
      - SO_4^{2-}
      - Br^{-}
      - Thiocyanate

Pharynx:

From the mouth the food passes to the next part of GI tract the **pharynx.** The pharynx is a hollow space. The food from the mouth enters into the area, called **oropharynx** which then moves into the **laryngopharynx,** it is a common passage way for food, liquid and air.



The histological structure of pharynx is similar to the oral cavity. The wall contains several mucous producing cells. The wall of the pharynx contains skeletal muscle, contraction of which propel the food into the oesophagus.

Oesophagus:

It is a muscular tube and about 25 cm in length . When there is no food, it remain in a collapsed state when the food enter the oesophagus, due to the peristaltic movement of the muscles the food gradually approaches the stomach.

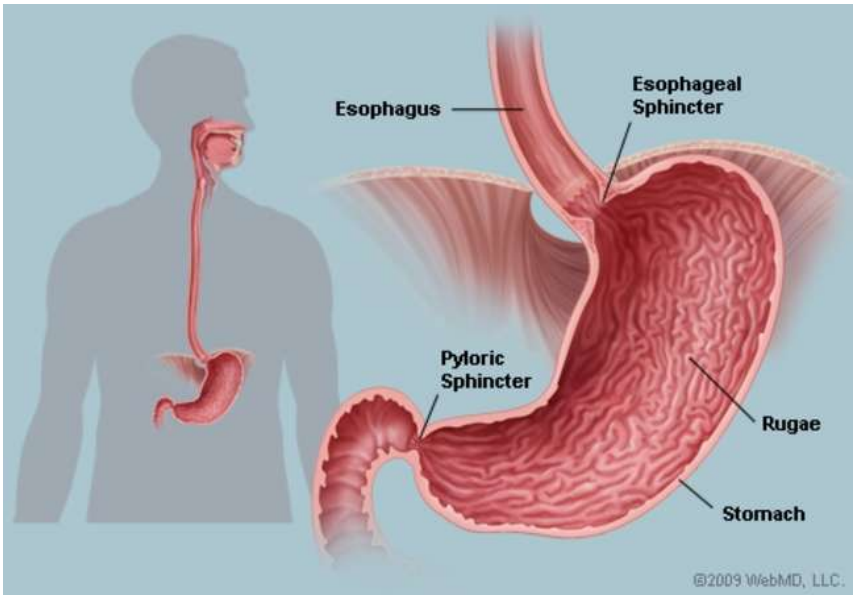
The oesophagus more or less straight tube which enters the abdominal cavity by piereing the diaphragm. In the abdominal cavity it joins the stomach. The joining is guarded by a sphincter called **gastro-oesophageal sphincter**. The oesophagus contain mucous secreting glands which lubricates the oesophageal lining and aids in the movement of food. The muscular layer of the oesophagus shows some interesting features, the upper 1/3 of the oesophagus is made up of skeletal muscle, the middle 1/3 is a mixture of both skeletal or smooth muscle, where as the inferior 1/3 is totally made up of smooth muscle fibre. So, the act of swallowing is a voluntary process but as the food passes through the oesophagus, its movement is totally under involuntary control.

Stomach:

The oesophagus joined the stomach which is the 'J' shaped muscular pouch for the temporary storage of food. The chemical breakdown of protein also starts here. Due to the movement of the stomach to food material is further broken down into smaller particles and mixes with the stomach contents, it is converted into a greavy paste, called **Chyme**.

Anatomy of stomach:

The stomach lies in the left upper quadrant of the peritoneal cavity. The size of the adult stomach varies from 15-25 cm and its diameter and volume depend on the amount of food contained in it. An empty stomach as a volume of 50 ml but it can hold 4 lit of food when fully distended. When empty, the stomach collapse inward and its mucosa shows large longitudinal force called **Rugae.**



The stomach can be divided into 3 portions. The region next to the esophagus is called, **cardiac stomach**. This part is so called because it lies close to the heart. The food enters the stomach through a small opening from the oesophagus, called the **cardiac orifice**, the opening is guarded by a sphincter. The next part of the stomach is a dom shaped stomach structure and its called the **fundus**. The stomach ultimately joins the duodenum and the portion of the stomach is called **pyloric stomach**. The opening of the stomach into the duodenum is guarded by the another sphincter, which is called the **pyloric sphincter**.

The convex surface of the stomach is called the **greater curvature** and the concave portion is called the lesser curvature.

Microscopic Anatomy of Stomach:

The stomach has the typical four layers common to the GI tract but due to its function, some structural modifications is observed in stomach. The mechanical digestion of food is completed due to the movement of the stomach wall, the muscular layer of the stomach is modified for this purpose. Besides the normal longitudinal and circular muscle layers, there is another muscle layer called the **oblique muscle layer**. This arrangement of muscle allows the stomach not only to move food along the tract but also to churn mix and crush foods.

The epithelial layer shows a large number of mucous producing **goblet cells.** The mucous provides a thick protective layer of the epithelial layer and prevents the enzymatic activity of the stomach wall the mucous also protects the stomach lining from the corrosive action of HCl. Here are a large number of dots present in the stomach lining, these are called **gastric pits**. These are the opening of the gastric gland which produce a juice secretion, called the **gastric juice**.

Types of cells in the stomach:

There are numerous secretory cells in the stomach but the following cells are very important.

a) **Mucous neck cells:**
   These cells are found in the upper or neck region and they produce mucous which is soluble and have been found to constitute a part of soluble mucinogen droplets of the gastric juice under electron microscope.

b) **Parietal or Oxyntic cells:**
   These cells are found in the middle region of the gastric gland and are oval in shape. They secrete hydrochloric acid and the intrinsic factors. The HCl makes the stomach

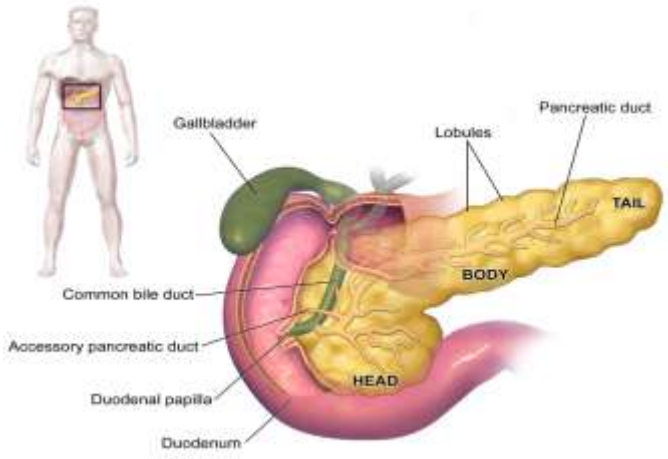
lumen acidic (pH: 1.5-3.5). This acidic pH is essential for the activation and optimal activity of gastric pepsin. The acid medium also kills some bacteria present in the ingested food. Intrinsic factor is a glycoprotein which is required for the absorption of vit B_{12} in the small intestine.

c) **Chief(zymogenic)cell:** These cells in the body of the glands or peptic cells: These cells are basophilic and secrete pepsin and contain zymogen granules which are precursors of pepsin. In addition to pepsinogen, the chief cells probably produce gastric rennin, and a gelatin-splitting enzyme, known as **gelatinase.** These cells produce **pepsinogen**, which is the inactive form of a protein digestive enzyme **pepsin.** The chief cell produce the inactive pepsinogen which is present in HCl is activated to active pepsin which can act on the protein molecules. It has been observed that most of the proteolytic enzymes secrete in an inactive form and are activated in presence of food and other substances. This prevents the proteolytic digestion of GI tract, when there is no food.

d) **Argentaffin (Enterochromaffin cells):**
These cells are responsible for the secretion of vasoconstrictor serotonin and are present in fundic glands.

Pancreas:

Pancreas is a tadpole shaped organ, which extend across the abdomen and is encircled by the "C" shaped duodenum. It is a soft structure and the elongated portion of the pancreas is called **tail** and its broader part is referred to as the **head** of the pancreas.



Pancreas is an accessory digestive organ and it is a mixed gland. It has both the **exocrine** and **endocrine** part. The exocrine part produces digestive juice rich in enzyme which enters the duodenum along with the common bile duct. The endocrine part of pancreas produces hormones which are essential for normal life processes.

When viewed under microscope, the pancreas shows clusters of secretory cells surrounding the ducts. These cells are called **pancreatic acini**. These cells are full of **rough endoplasmic reticulum (RER)** and deep staining zymogen

granules. These granules contain the secretory enzymes manufactured by pancreas. Scattered within the acini are some lightly stained cells known as **pancreatic islets or islets of langerhans.** This endocrine gland releases insulin and glucagon, two major hormone related to carbohydrate metabolism.

Functions:

Pancreas plays an essential role in converting the food we eat into fuel for the body's cells. The pancreas has two main functions: an exocrine function that helps in digestion and an endocrine function that regulates blood sugar.

Exocrine Function:

The pancreas contains exocrine glands that produce enzymes important to digestion. These enzymes include trypsin and chymotrypsin to digest proteins; amylase for the digestion of carbohydrates and lipase to break down fat. When food enters the stomach, these pancreatic juices are released into a system of ducts that culminate in the main pancreatic duct. The pancreatic duct joins the common bile duct to form the **ampulla of Vater** which is located at the first portion of the small intestine, called the **duodenum**. The common bile duct originates in the liver and the gall bladder and produces another important digestive juice called **bile.** The pancreatic juices and bile that are released into the duodenum, help the body to digest fats, carbohydrates and proteins.

Endocrine Function:

The endocrine component of the pancreas consists of islet cells (islets of Langerhans) that create and release important hormones directly into the blood stream. Two of the main pancreatic hormones are **insulin**, which acts to lower blood pressure and **glucagon**, which acts to raise blood sugar. Maintaining proper blood sugar level is crucial to the functioning of key organs including the brain, liver and kidneys.

Diseases of the pancreas:

Disorders affecting the pancreas include pancreatitis, precancerous conditions and pancreatic cancer. Each disorder may exhibit different symptoms and requires different treatments.

Pancreatitis:

It refers to an acute or chronic inflammation of the pancreas. It can also lead to secondary diabetes. Inflammation can occur if the main duct from the pancreas is blocked by a gallstone or tumor.

Pancreatic juices will accumulate in the pancreas, causing damage to the pancreas. The pancreas may start to digest itself. Pancreatitis can happen as a result of mumps, gallstones, trauma and the use of alcohol, steroids and drugs.

Acute Pancreatitis:

It is rare but it needs immediate medical attention.

Symptoms include:

- Intense abdominal pain, tenderness, and swelling
- Fever
- Muscle aches

Chronic Pancreatitis:

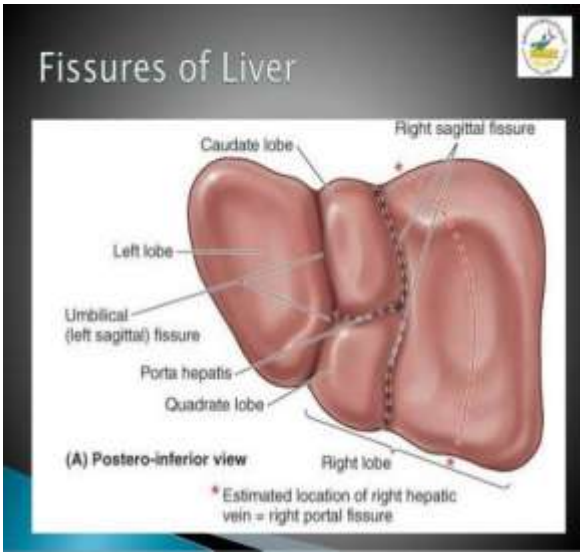
It can develop, if acute pancreatitis happens repeatedly, resulting in permanent damage. The most common cause is alcohol abuse and it mostly affects middle-aged men.

Symptoms include:

- Peristaltic pain in the upper abdomen and back
- Weight loss
- Diarrhea
- Diabetes
- Mild jaundice

Liver:

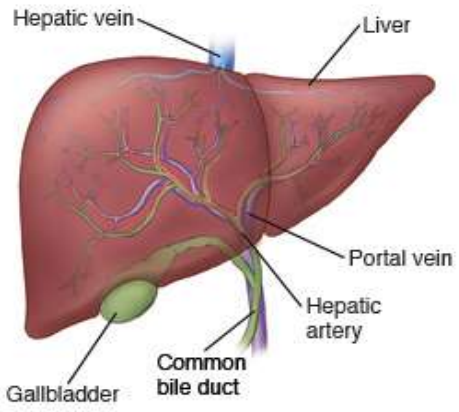
The liver is the largest gland in the body weighing about 1.4 kg and reddish brown in colour. It occupies the right upper part of the abdominal cavity, it is located just below the diaphragm and is protected entirely by the ribcage.



Liver can be divided into four parts or lobes. The largest lobe is called the **right lobe** and is visible on all liver surfaces. The **left lobe** is smaller and separated from the right lobe by a deep fissure. In the posterior region it is divided into **caudate lobe** and **quadrate lobe** . These two lobes are visible in an interior view of layer. The

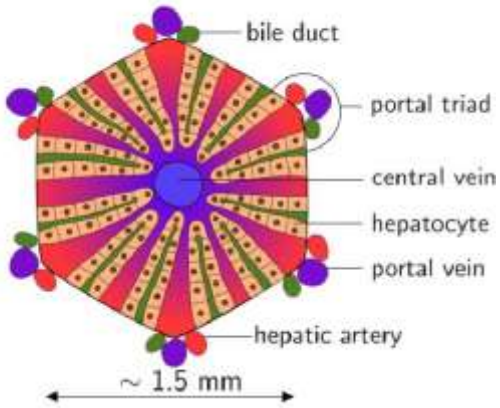
falciform ligament seperates the right and left lobes and suspend the liver in the abdominal wall.

The hepatic artery and the hepatic portal vein carry bloods to the liver produces bile which leaves the liver through several small bile ducts, which ultimately fuse to form the common hepatic duct. The liver bile is temporarily stored in a small pouch called the gallbladder from where it is delivered to the duodenum.



Microscopic anatomy :

The liver is composed of structural and functional unit, is called liver lobules. Each lobule is a hexagonal structure containing hepatocyte containing liver cells. The hepatocytes are arranged like bricks in a wall. There is a central vein in the middle of each lobule from which the hepatocyle cells plates radiate outward.



At each of the six corners of a lobule there is a specialized structure called **portal triad**. It is so named because it contains 3 basic structures in it.-

i) A branch of hepatic artery
ii) A branch of hepatic portal vein
iii) A bile duct

The hepatic artery carries oxygen rich blood to the liver, the hepatic portal vein carries venous blood rich in nutrients from digestive viscera and the bile duct carrying bile.

Between the hepatocytes there are hollow spaces which are known as liver sinusoids. Blood from some leaky capillaries percolates this region. Within this sinusoid there are star shaped macrophages called **Kupffer cells**. These cells remove debris such as bacteria and worn out blood cells from the circulation.

The hepatocytes contain large amount of both RER (rough endoplasmic reticulum), SER (smooth endoplasmic reticulum), golgi

apparatus and mitochondria. Beside producing bile, they also perform the following functions:

i) Process blood borne nutrients
ii) Stored fat soluble vitamins
iii) Plays important role in detoxification process for example converting ammonia to urea.

Fuctions :

The liver is classed as a gland and associated with many functions. It is difficult to give a precise number, as the organ is still being explored, but it is thought that the liver carries out 500 distinct roles:

The major fuctions of the liver include:

- **Bile production:**
  Bile helps the small intestine break down and absorb fats, cholesterol, and some vitamins. Bile consists of bile salts, cholesterol, bilirubin, electrolytes and water.
- **Absorbing and metabolizing bilirubin:**
  Bilirubin is formed by the breakdown of haemoglobin. The iron released from haemoglobin is stored in the liver or bone marrow and used to make the next generation of blood cells.
- **Supporting blood clots:**
  Vitamin K is necessary for the creation of certain coagulants that help clot the blood. Bile is essential for vitamin K absorption and is created in the liver. If the liver does not produce enough bile, clotting factors can not be produced.
- **Fat metabolization:**
  Bile breaks down the fats and makes them easier to digest.
- **Metabolizing carbohydrates:**
  Carbohydrates are stored in the liver, where they are broken down into glucose and siphoned into the bloodstream to maintain normal glucose levels. They are stored as glycogen and released whenever a quick burst of energy is needed.
- **Vitamin and mineral storage:**
  The liver stores vitamins A, D, E, K and B_{12}. It keeps significant amounts of these vitamins stored. The liver stores iron from haemoglobin in the form of ferritin, ready to make new red blood cells. The liver also stores and releases copper.
- **Helps metabolize proteins:**
  Bile helps breakdown proteins for digestion.

- **Filters the blood:**
  The liver filters and remoives compounds from the body, including hormones, such as oestrogen and aldosterone, and compounds from outside the body, including alcohol and other drugs.
- **Immunological function:**
  The liver is part of the mononuclear phagocyte system. It contains high number of kupffer cells that are involved in immune activity. These cells destroy any disease-causing agents that might enter the liver through the gut.
- **Production of albumin:**
  Albumin is the most common protein in blood serum. It transports fatty acids and steroid hormones to help maintain the correct pressure and prevent the leaking of blood vessels.
- **Synthesis of angiotensinogen:**
  This hormone raises blood pressure by narrowing the blood vessels when altered by production of an enzyme called renin in the kidneys.

Diseases of Liver:

Hepatitis:

It is inflammation of the liver, called **hepatitis.** It may occur due to viral infection . There are large number of virus related to hepatitis: hepatitis A virus, hepatitis F virus : of these two virus HVA and HVF are transmitted enterically and the infections are self limiting infection. The infection caused by HVD and HVC lead to chronic hepatitis. There are also Hepatitis B virus. Hepatitis can have non-infectious causes too, including heavy drinking, drugs, allergic reactions, or obesity.

Liver cirrhosis:

Long- term damage to the liver from any cause can lead to permanent scarring, called cirrhosis. The liver then becomes unable to function well and it typically results from chronic alcoholism and severe chronic hepatitis.

Jaundice:

Jaundice, itself is not a disease. It is a symptoms of diseases involving liver and gall bladder. Bile from the gall bladder enters the duodenum, via cystic duct. Blockage of bile ducts prevent the bile from entering the intestine as a result of which bile accumulates in the blood. The bile pigment eventually are deposited in the skin, and other soft tissues including the eye causing it to become yellow, the condition is called **Jaundice**.

Liver cancer: The most common type of liver cancer, hepatocellular carcinoma, almost always occurs after cirrhosis is present and cholangiocarcinoma. The leading causes are alcohol and hepatitis.

Liver failure:

Liver failure has many causes including infection, genetic diseases, and excessive alcohol.

Ascites:

As cirrhosis results, the liver leaks fluid (ascites) into the belly, which becomes distended and heavy.

Gallstones:

If a gallstone becomes stuck in the bile duct draining the liver, hepatitis and bile duct infection (cholangitis) can result.

Hemochromatosis:

It allows iron to deposit in the liver, damaging it. The iron also deposits throughout the body, causing multiple other health problems.

Primary biliary cirrhosis:

In this rare disorder, an unclear process slowly destroys the bile ducts in the liver. Permanent liver scarring (cirrhosis) eventually develops.

Fascioliasis:

This is caused by the parasitic invasion of a parasitic worm known as a **liver fluke**, which can lie dormant in the liver for months or even years. Fascioliasis is considered a tropical disease.

Fatty liver disease:

This usually occurs alongside obesity or alcohol abuse. In fatty liver disease, vacuoles of fat build up in the liver cells. If it is not caused by alcohol abuse, the condition is called non-alcoholic fatty liver disease (NAFLD).

It is usually caused by genetics, medications, or a diet high in fructose sugar. It is the most common liver disorder in developed countries and has been associated with insulin resistance.

Gilbert's syndrome:

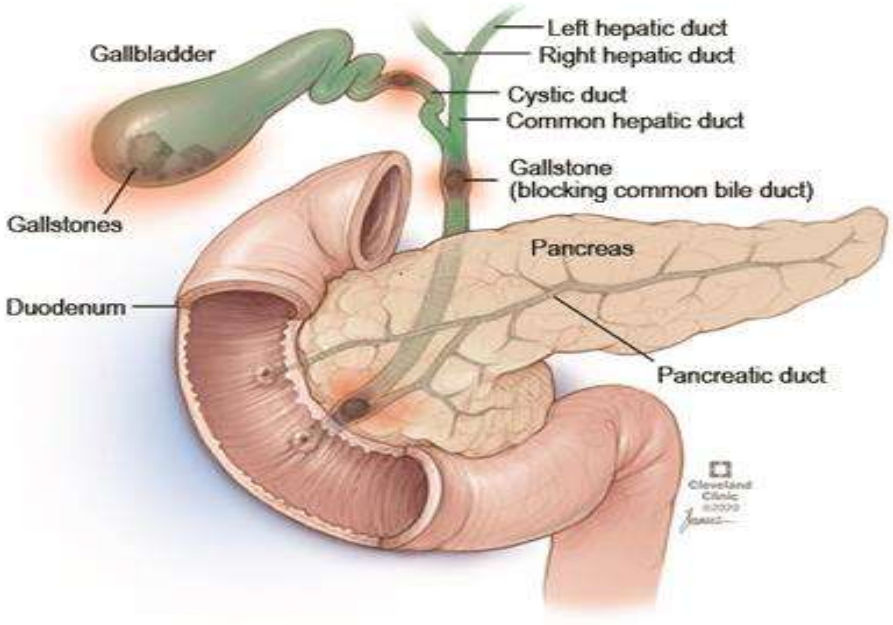
This is a genetic disorder affecting 3 to 12 percent of the population. Bilirubin is not fully broken down. Mild jaundice can occur, but the disorder is harmless.

Gall bladder:

The gall bladder is a small pouch that sits just under the liver. The gall bladder stores bile produced by the liver. After meal, the gall bladder is empty and flat, like a deflated balloon. Before a meal, the gall bladder may be full of bile and about the size of a small pear.

Structure:

The gall bladder is a hollow organ that sits in a shallow depression below the right lobe of the liver, that is grey blue in colour. In adults, the gall bladder measures approximately 7-10 cm in length and 4 cm in diameter when fully distended. The gallbladder has a capacity of about 50 mm.



The gall bladder is shaped like a pear, with its tip opening into the cystic duct. The gall bladder is divided into three sections: the fundus, body and neck . The fundus is the rounded base, angled so that it faces the abdominal wall. The body lies in depression in the surface of the lower liver. The neck is continuous with the cystic duct, part of the billiary tree.

Functions:

It receives and stores bile, produced by the liver, via the common hepatic duct and releases it via the common bile duct into the duodenum, where the bile helps in the digestion of fats.

The main purpose of the gall bladder is to store bile, also called gall, needed for the digestion of fats in food. Produced by the liver, bile flows through the small vessels into the larger hepatic ducts and ultimately through the cystic duct (parts of the biliary tree) into the gall bladder, where it is stored.