

KRISHNA TEJA PHARMACY COLLEGE



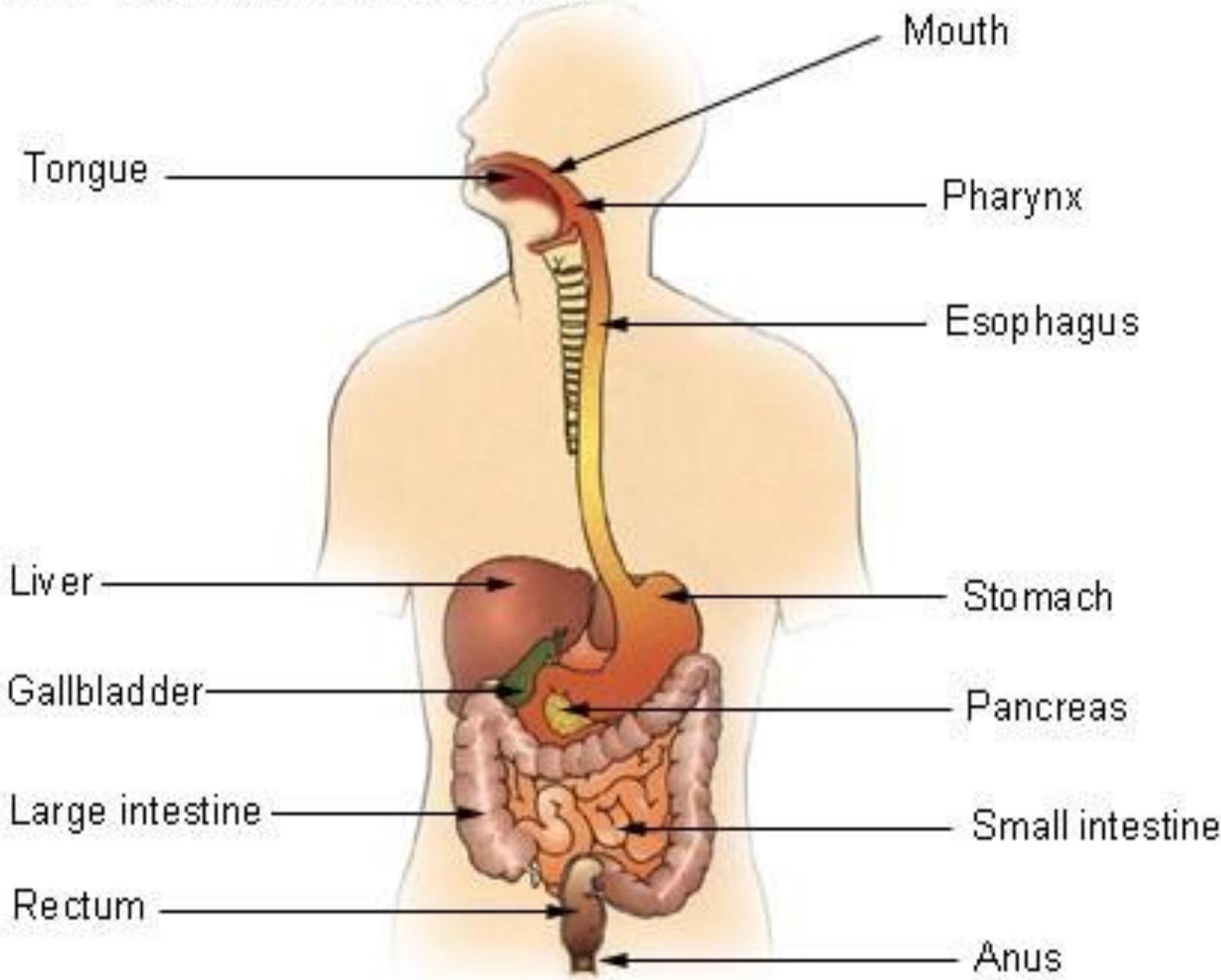
**HUMAN ANATOMY AND
PHYSIOLOGY**

DIGESTIVE SYSTEM

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KTPC**

Organs of the Digestive System



The Digestive System



Food undergoes six major processes:

1. Ingestion : process of eating
2. Propulsion : passing of food down the GI tract
 - swallowing : voluntary
 - peristalsis : reflex, involuntary, involves alternating contractions of muscles in body walls of GI organs
3. Mechanical digestion
 - prepares food for chemical digestion
 - includes chewing, mixing with saliva by tongue action, churning in stomach...
4. Chemical digestion
 - catabolic steps in which food is broken down to basic building blocks
 - accomplished by enzymes in digestive juices
5. Absorption : passage of food particles into the blood-lymph
6. Defecation : elimination of indigestible food substances

Processing of food by the Digestive System involves 6 basic

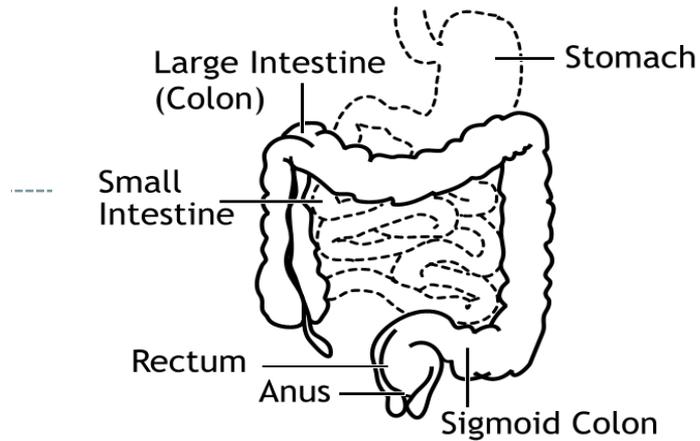
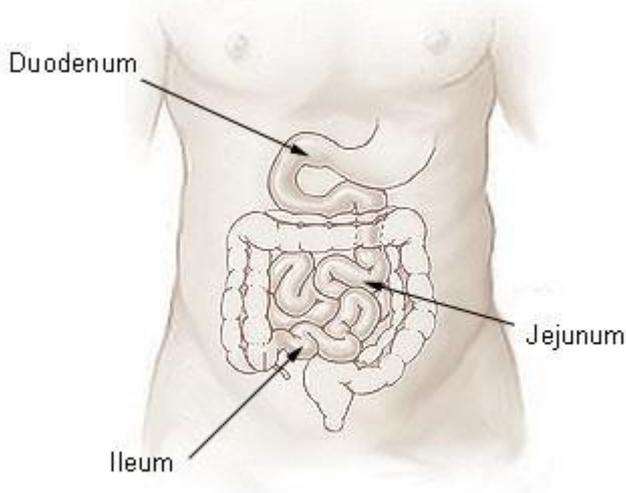
Parts of Human Digestive System

Main Parts

- Mouth
- Esophagus
- Stomach
- Small Intestine
- Large Intestine

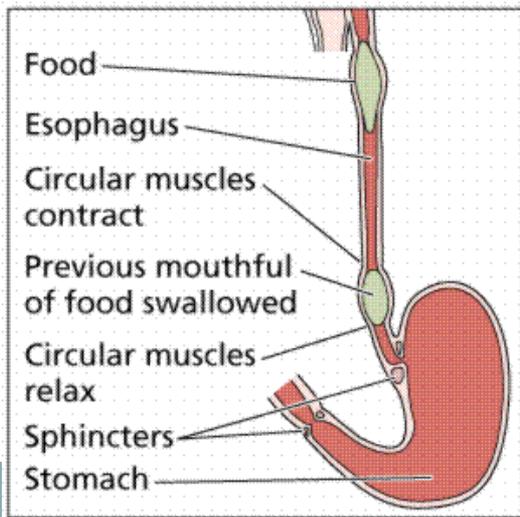
Accessory Parts

- Liver
- Pancreas
- Gallbladder
- Salivary Gland

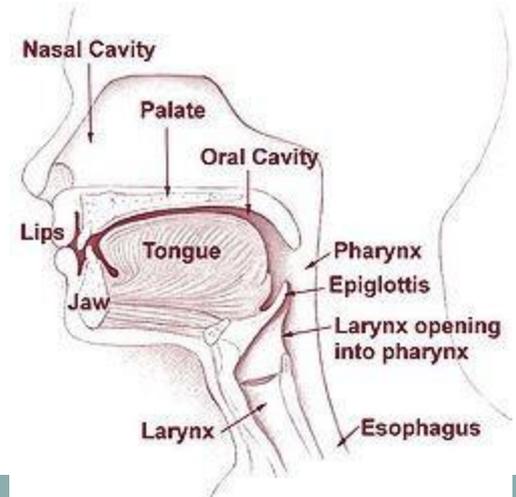
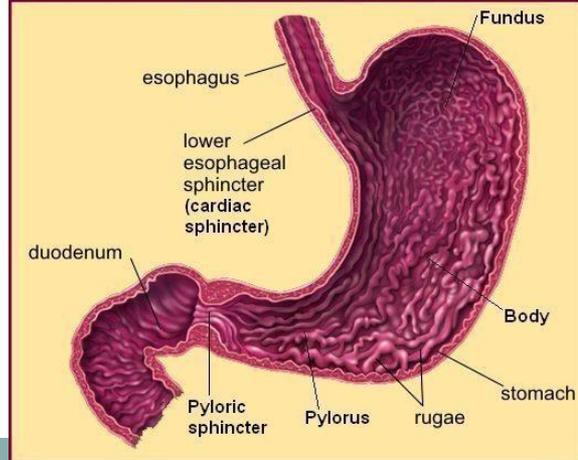


Main Parts of Digestive System

Peristalsis



The Stomach



Mouth



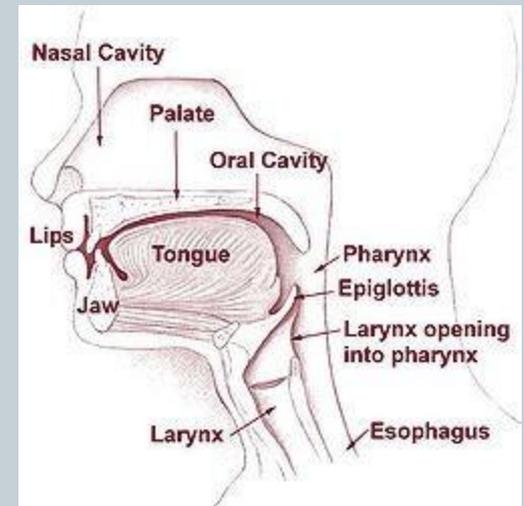
There two major processes which take place:

- **Mastication (Chewing):**

- *Breaks down large food molecules.*
- *Increases **surface area** of food particles.*

- **Secretion of Saliva:**

- *Contains **salivary amylase (ptyalin)** that digests starch to maltose.*
- *Provides an alkaline medium.*
- *Lubricants and moistens food.*

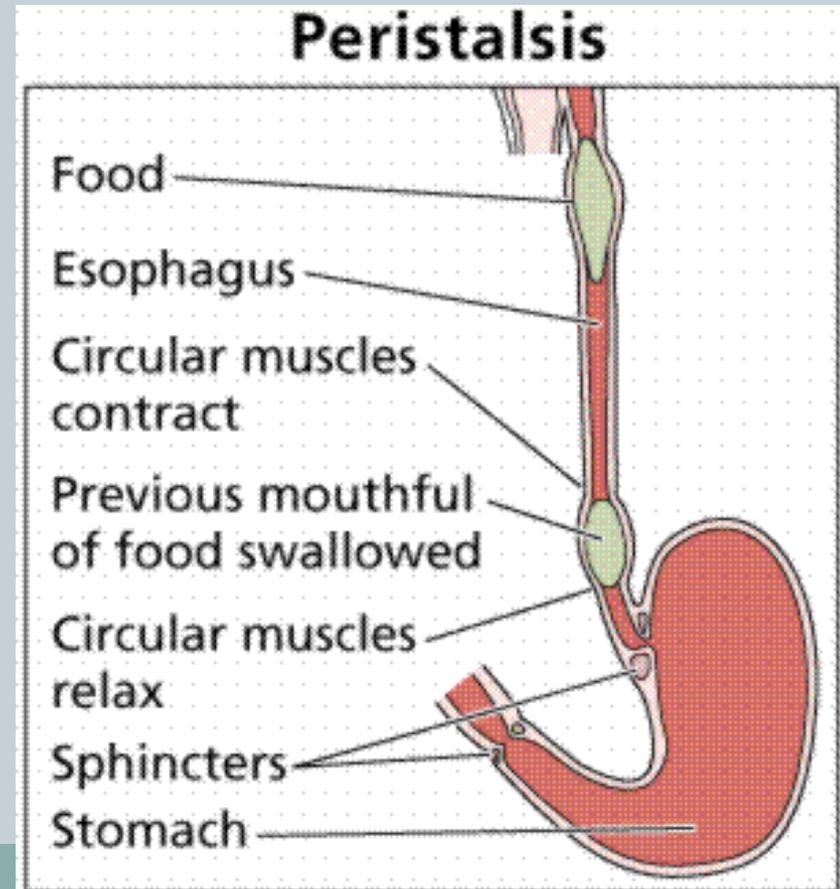


Esophagus

- *It is a mucus muscular membrane lined tube.*
- *There occurs a process known as **Peristalsis**.*

Peristalsis:

It is an involuntary process of muscular contraction forcing the bolus (food) down to the stomach.



Stomach

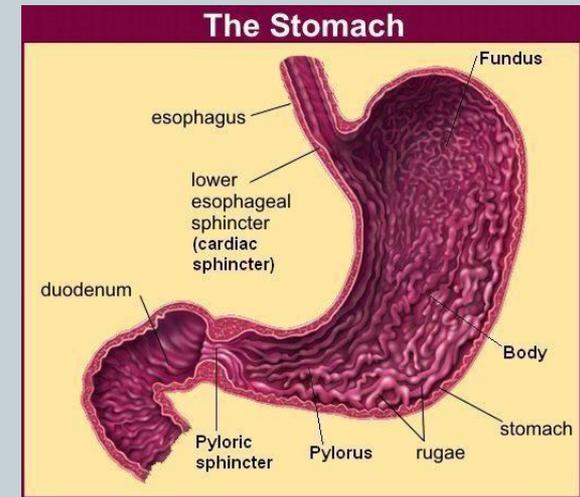


- The stomach is a hollow, muscular holding pouch for food. The stomach has three main regions:

- The fundus body pylorus

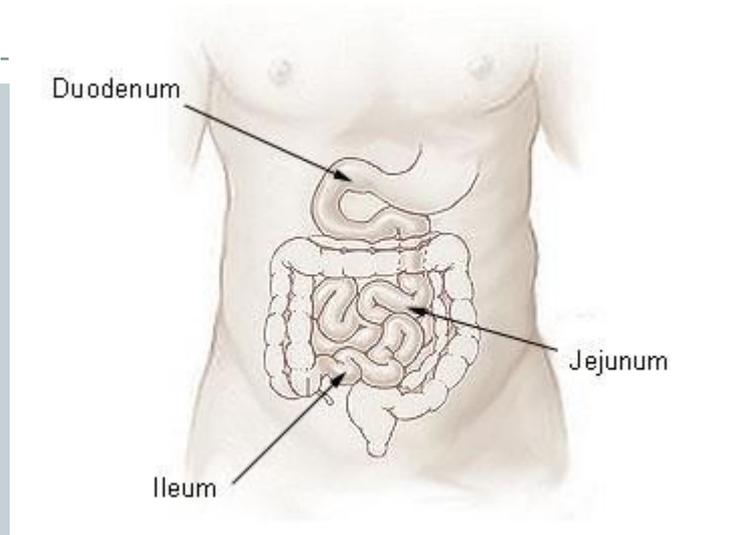
- The food enters this part of the stomach from the esophagus. The esophageal (cardiac) tissue,

sphincter, a circle of muscular surrounds the place where the esophagus enters the stomach and keeps food from going back up the esophagus after it has entered the stomach



In humans, the stomach has a relaxed volume of about 45 ml, it generally expands to hold about 1 litre of food, but can hold as much as 4 liters.

Small Intestine



The small intestine, which is about 20 feet long, is so named because its diameter is much smaller than that of the large intestine. The small intestine has three regions, called the duodenum, the jejunum, and the ileum

Small Intestine

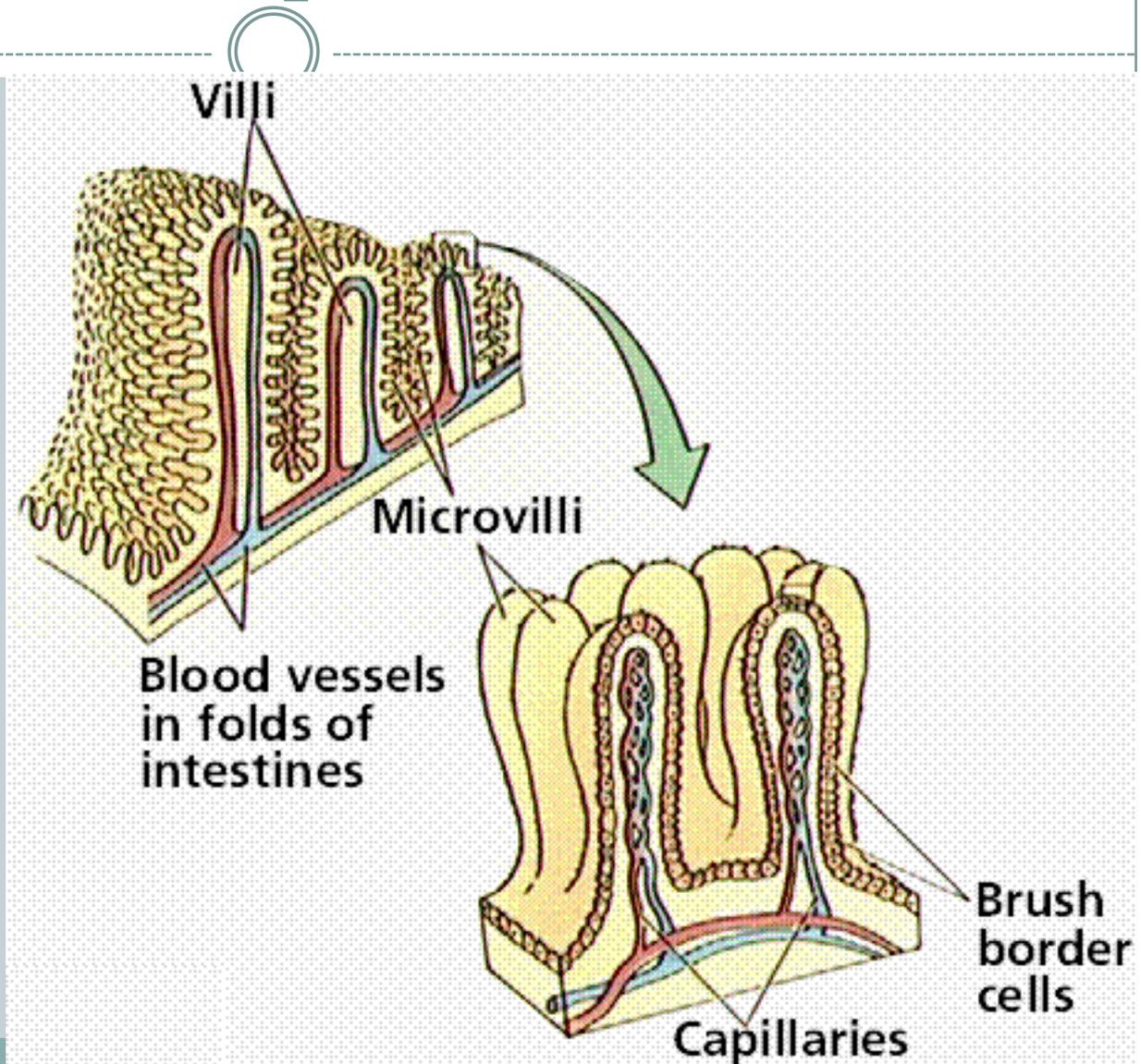


The small intestine extends from the pyloric sphincter to the ileocecal valve, where it empties into the large intestine. The small intestine finishes the process of digestion, absorbs the nutrients, and passes the residue on to the large intestine. The liver, gallbladder, and pancreas are accessory organs of the digestive system that are closely associated with the small intestine.

The most important factor for regulating secretions in the small intestine is the presence of chyme. This is largely a local reflex action in response to chemical and mechanical irritation from the chyme and in response to distention of the intestinal wall. This is a direct reflex action, thus the greater the amount of chyme, the greater the secretion.

Absorption

- *It occurs within the ileum in finger-like projection known as Villi.*



Villi



- *Amino acids and simple sugars like glucose, fructose diffuse through **thin Epithelial cells** into the blood capillaries.*
- *Fatty acids and glycerol enter the **Lacteal** into the lymphatic system then finally into the blood system through the **Innominate vein**.*

Absorption of the majority of nutrients takes place in the jejunum, with the following notable exceptions:

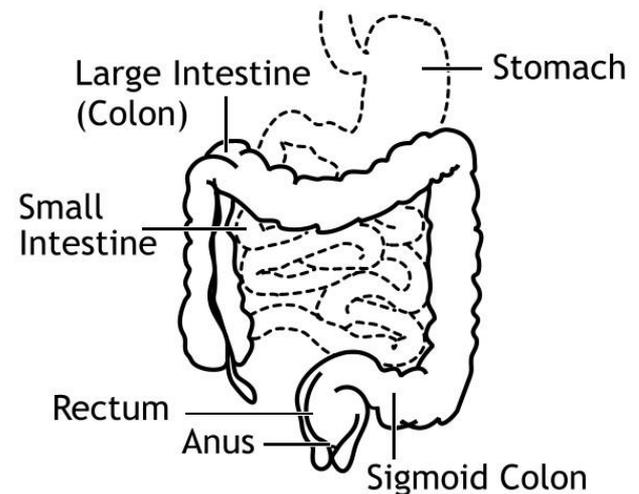
- Iron is absorbed in the duodenum.
- Vitamin B12 and bile salts are absorbed in the terminal ileum.
- Water and lipids are absorbed by passive diffusion throughout.
- Sodium is absorbed by active transport and glucose and amino acid co-transport.
- Fructose is absorbed by facilitated diffusion.

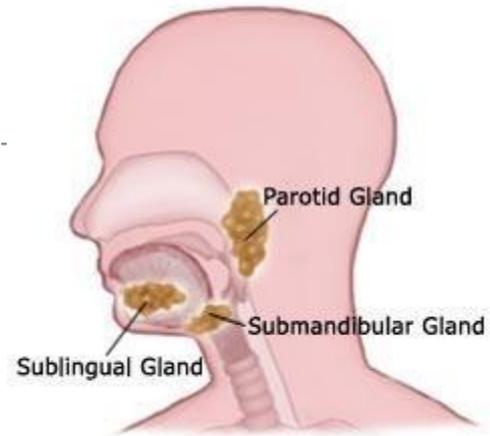
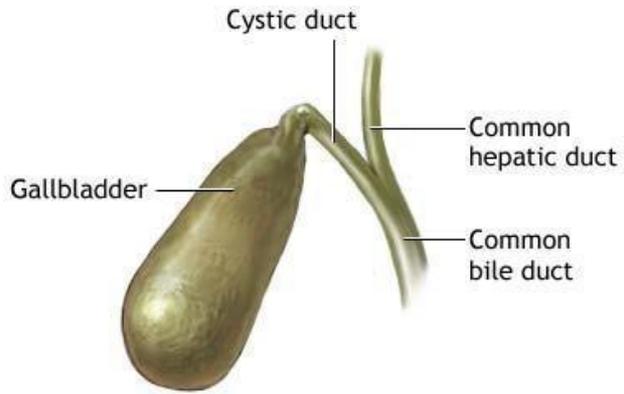
Large Intestine

The **large intestine** is the last part of the digestive system—the final stage of the alimentary canal—in vertebrate animals. Its function is to absorb water from the remaining indigestible food matter, and then to pass this useless waste material from the body.

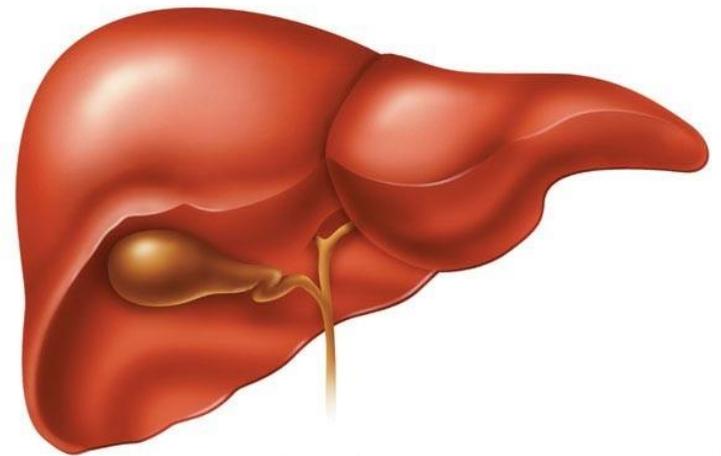
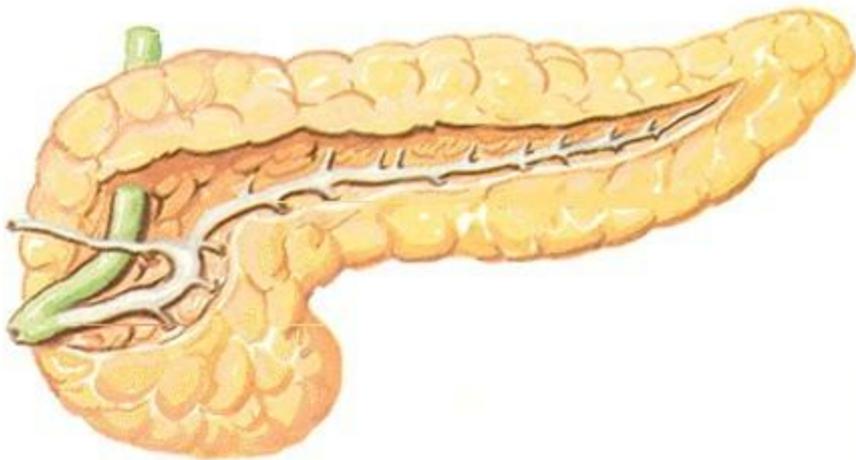
The large intestine consists of the cecum and colon. It starts in the right iliac region of the pelvis, just at or below the right waist, where it is joined to the bottom end of the small intestine. From here it continues up the abdomen, then across the width of the abdominal cavity, and then it turns down, continuing to its endpoint at the anus.

The large intestine is about 1.5 metres (4.9 ft) long, which is about one-fifth of the whole length of the intestinal canal.





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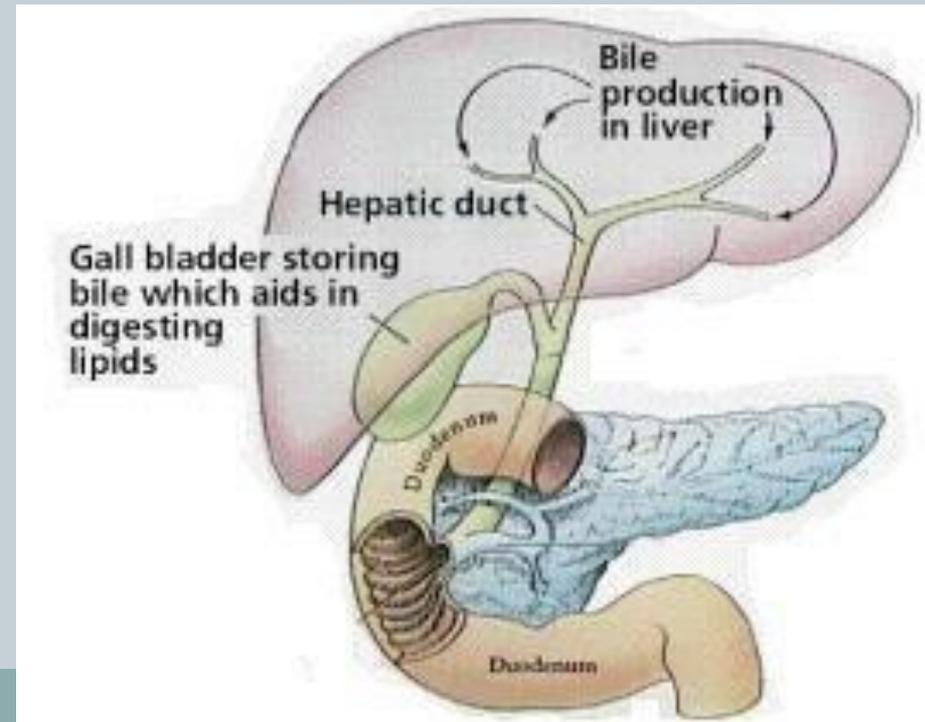


Liver

- *It is the largest organ in the mammalian body.*
- *It secretes **bile** which is stored in the **gall bladder**. **Bile** breaks down fats into tiny droplets through **emulsification**.*

Roles:

- *Regulates sugar/glucose*
- *Breaks down excess RBC*
- *Storage of blood*
- *Detoxification*
- *Generation of heat*



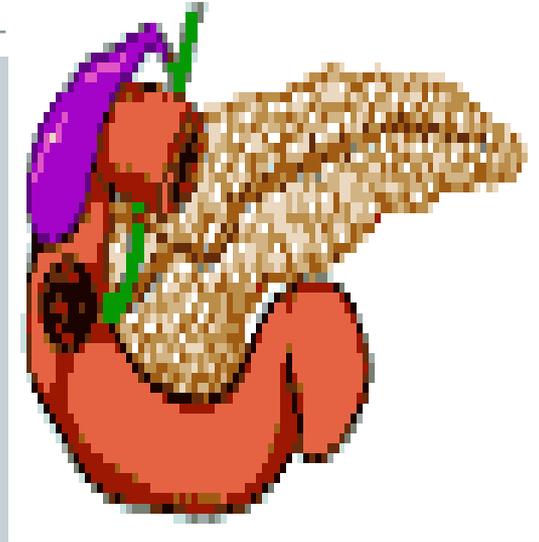
Pancreas



• *It is an endocrine gland because it secretes **Insulin hormone** - converts excess **glucose** into **glycogen** for storage.*

• *It is also an exocrine gland because it secretes **pancreatic juice** in the **duodenum***

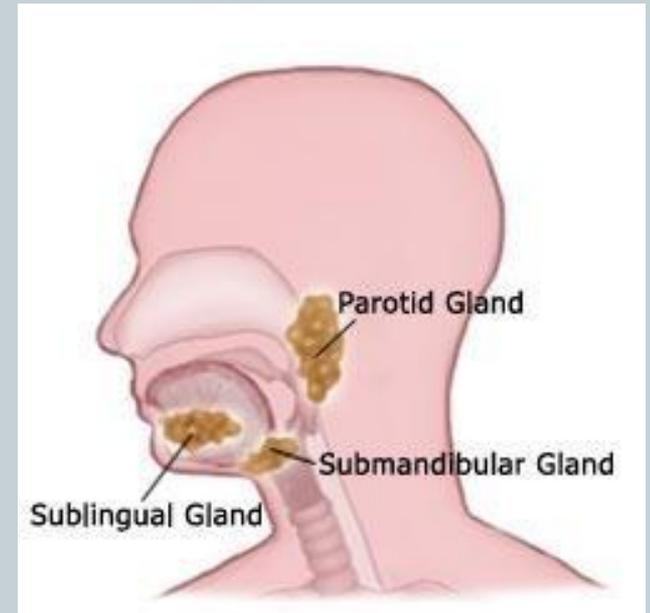
- *pancreatic juice contains **lipase**, **trypsin** and **pancreatic amylase** for digestion of **lipids**, **proteins** and **starch**.*



Salivary Glands



- The salivary glands are located near the mouth
- They produce and secrete saliva, a substance that helps with chewing and swallowing by moistening the food



Gallbladder

- The gallbladder is a pear-shaped sac that is attached to the visceral surface of the liver by the cystic duct. The principal function of the gallbladder is to serve as a storage reservoir for bile. Bile is a yellowish-green fluid produced by liver cells. The main components of bile are water, bile salts, bile pigments, and cholesterol.
- Bile salts act as emulsifying agents in the digestion and absorption of fats. Cholesterol and bile pigments from the breakdown of hemoglobin are excreted from the body in the bile.

