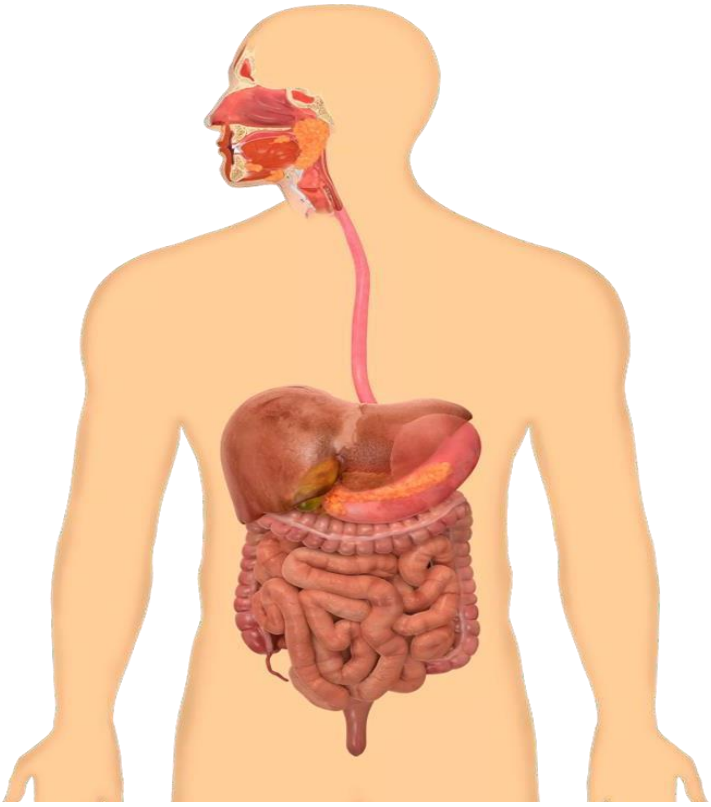
Human Anatomy: Lecture 5

Anatomy of the Digestive system



The Digestive System has two main components:

The Gastrointestinal (G.I.) Tract and various Accessory Structures and Organs.

The G.I. Tract is also called the **alimentary canal** and consists of long muscular tube starting from the oral cavity, where food enters the mouth, continuing through the pharynx, esophagus, stomach, small and large intestines, to the rectum and anus, where waste is expelled as fecal matter.

The Accessory Structures and organs include: The salivary glands; mucous glands; tongue; teeth; the liver; gallbladder and pancreas. All of these have important functions in the digestive system. Food is propelled along the length of the G.I. tract by peristaltic movements provided by the muscular layers in the walls of the G.I. tract.
Many accessory structures assist the tract by secreting enzymes or substances to help transform, digest, absorb or transport food as it travels along the tract.

The primary purpose of the gastrointestinal tract is to break down the large nutrients (polymers) from the food ingested into smaller units (monomers).

Once the nutrients have been broken down into their smallest unit, they can then be absorbed across the epithelial lining into the body and these nutrients and materials can be used in a number of ways, including providing energy for the body.

The 6 Basic Digestive Processes

1. Ingestion – taking food or drink into the mouth or oral cavity.

2. Propulsion – movement through alimentary canal. This includes movement of tongue and cheeks and involves contraction of the muscles of swallowing, in addition to the peristaltic movement generated by the muscular layers of the tract and the cavities created by the canal.

3. Mechanical Digestion – the Physical breakdown of food (chewing, churning), mechanical processing and moistening of foods. This is most often required prior to chemical digestion.

4. Chemical Digestion – the Enzymatic breakdown of food (from complex to simple building blocks) by the use of enzymes made by the body. This involves the breaking of chemical bonds.

5. Absorption – the transportation of digested products from lumen of G.I. tract across an epithelial lining and into the blood and lymph vessels, which are considered to be inside the body.

6. Defecation – the Elimination of indigestible material and waste products from body (feces)

Function of Digestive System

- **Digestion**

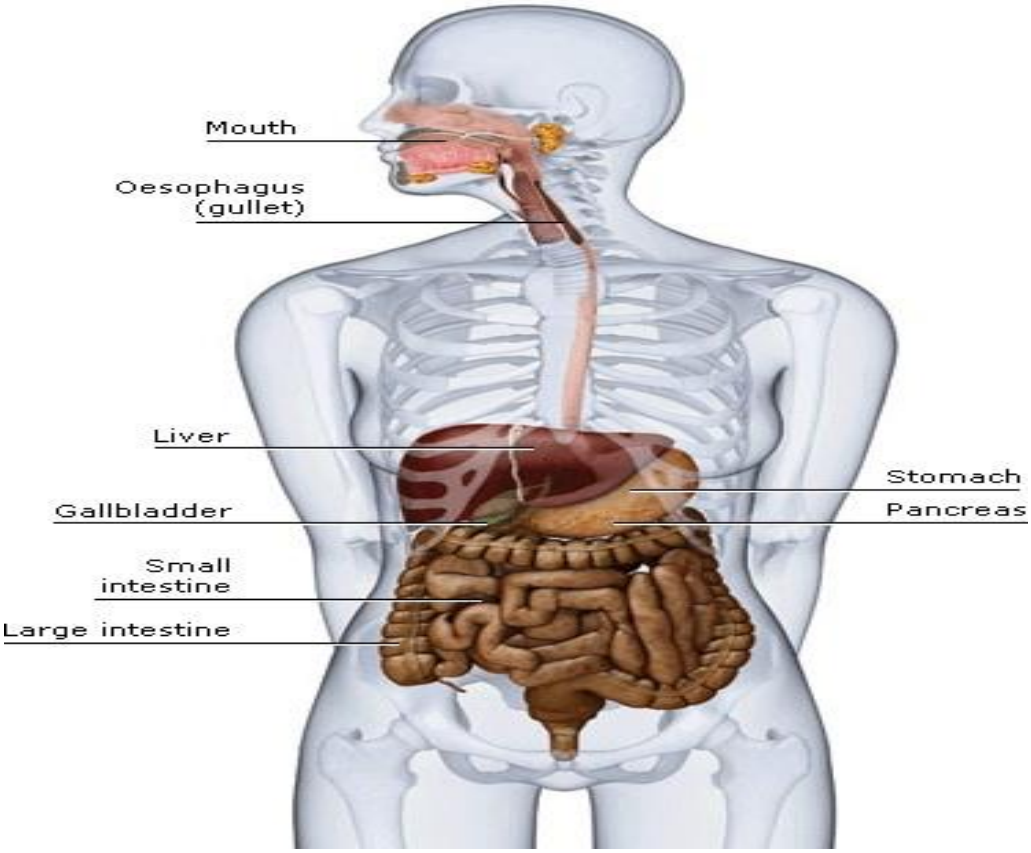
  The mechanical and chemical breakdown of foods for use by the body's cells

- **Absorption**
  - The passage of digested food (nutrients) from the digestive tract into the circulatory system (blood)
  - **Metabolism**
  - Production of cellular energy (ATP)
  - **Elimination**
- The expulsion of undigested food or body wastes

Main parts of the alimentary canal

The Alimentary canal consist of:

- Mouth
- Pharynx
- Esophagus
- Stomach
- Small intestine
- Large intestine
- Anus



Mouth (Oral Cavity)

The Oral Cavity The mouth or the oral cavity is the hollow space formed by the area between the lips, cheeks, tongue, hard, soft palates and the throat, It allows food, liquid and air to enter the body.

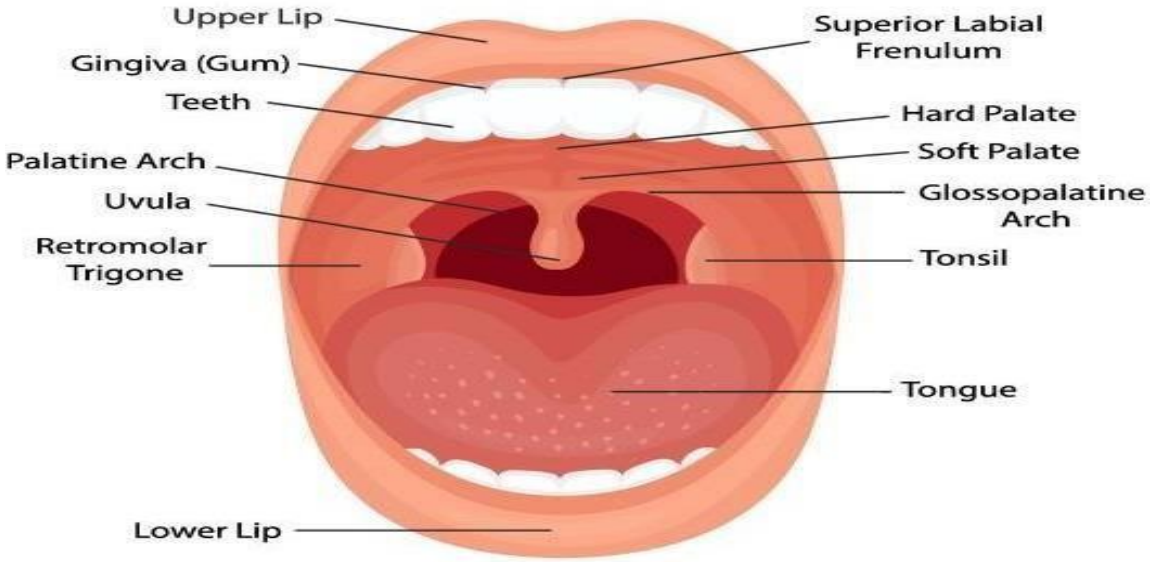
The mouth contains many other organs, such as the teeth, tongue and the ducts of the extrinsic salivary glands. These structures work together to aid in the ingestion and digestion of food.

The mouth also plays a major role in the production of speech through the movements of the tongue, lips and cheeks.

Tongue

While many people think of the tongue a muscle, it is actually an organ **made** of epithelium, several skeletal muscles, nerves, and connective tissues.

The tongue forms the inferior portion of the mouth, but often moves throughout the mouth to occupy almost any region of the hollow cavity.



- An opening through which food and air enter the body
- It opens to the outside at the lips and empties into the throat Its boundaries are defined by the lips, cheeks, hard and soft palates, and uvula.
- **Lips** (labia) – protect the anterior opening
- **Cheeks** – form the lateral walls
- **Hard palate** – forms the anterior roof
- **Soft palate** – forms the posterior roof
- **Uvula** – fleshy projection of the soft palate

The mouth is divided into two sections:

1- **Vestibule** – space between lips & cheeks externally and teeth and gums internally
2- **Oral cavity** – area contained by the teeth

Tonsils

1- **Palatine tonsils**: embedded in the lateral walls of the opening between the mouth and the pharynx

2- **Lingual tonsil**: occupying the posterior part of the tongue surface

Pharynx

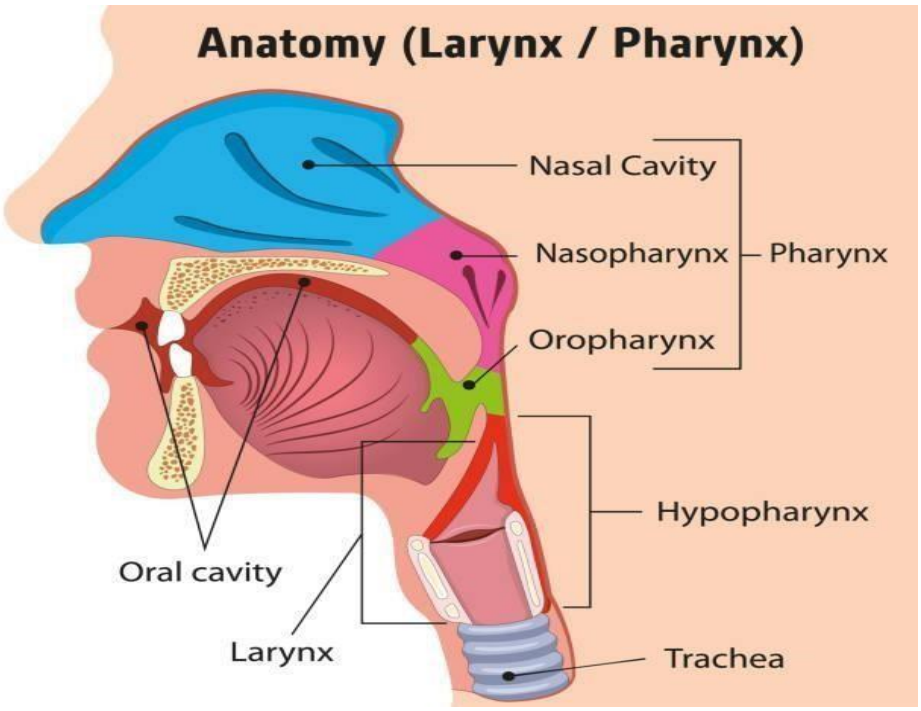
The throat is the pharynx, a funnel-shaped tube posterior to the mouth.

The pharynx **connects** the nasal cavity and mouth to the esophagus and larynx (voice box) in the neck.

Pharynx Anatomy

The pharynx include

- **Nasopharynx** – superior region behind nasal cavity but not part of the digestive system
- **Oropharynx** – middle region behind mouth
- **Laryngopharynx** – inferior region, connected to the esophagus
- Serves as a passageway for air and food
- Food is propelled to the esophagus by alternating contractions (peristalsis) of two muscle layers
- Longitudinal layer
- Circular layer



Esophagus

- Approximately 25cm long
- Runs from pharynx to stomach through the diaphragm
- Conducts food by peristalsis (slow rhythmic squeezing)
- Passageway for food only