

# **Human Anatomy**

**Lecture 4**

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## **Digestive System**

**The digestive system or gastrointestinal tract (GIT ), a tube extending from the mouth to the anus, and its associated accessory organs—primarily glands located outside the digestive tract that secrete fluids into it. The digestive tract is also called the alimentary tract, or alimentary canal.**

**The regions of the digestive tract include the following:**

- 1. Oral cavity, or mouth, with the salivary glands and tonsils as accessory organs**
- 2. Pharynx, or throat**
- 3. Esophagus**
- 4. Stomach**
- 5. Small intestine, consisting of the duodenum, jejunum, and ileum, with the liver, gallbladder, and pancreas as major accessory organs.**
- 6. Large intestine, including the cecum, colon, rectum, and anal canal**
- 7. Anus**

**The oral cavity, or mouth, is divided into two regions:**

**(1) The vestibule is the space between the lips or cheeks and the teeth.**

**(2) The oral cavity proper lies medial to the teeth.**

**The oral cavity: In the oral cavity lips, or labia are muscular structures formed mostly by the orbicularis oris muscle and connective tissue. The outer surfaces of the lips are covered by skin.**

**One or more labial frenula which are mucosal folds, extend from the alveolar process of the maxilla to the upper lip and from the alveolar process of the mandible to the lower lip.**

**The cheeks form the lateral walls of the oral cavity. The substance of the cheek includes the buccinator muscle, which flattens the cheek against the teeth, and the buccal fat pad, which rounds out the profile on the side of the face.**

**The posterior boundary of the oral cavity is the fauces or throat, which is the opening into the pharynx. The palatine tonsils are in the lateral wall of the throat.**

**The tongue is a large, muscular organ that occupies most of the oral cavity proper when the mouth is closed. Its major attachment in the oral cavity is through its posterior part. The anterior part of the tongue is relatively free, except for attachment to the floor of the mouth by a thin fold of tissue called the lingual (tongue) frenulum.**

**Salivary glands:** A number of salivary glands are scattered throughout the oral cavity. There are three pairs of large salivary glands: the parotid, the submandibular, and the sublingual glands.

The largest salivary glands, the parotid they are located just anterior to the ear on each side of the head.

Each parotid duct exits the gland on its anterior margin, crosses the lateral surface of the masseter muscle, pierces the buccinator muscle, and enters the oral cavity adjacent to the second upper molar teeth.

The submandibular (below the mandible) glands are mixed glands with more serous than mucous acini. Each gland can be felt as a soft lump along the inferior border of the posterior half of the mandible.

A submandibular duct exits each gland, passes anteriorly deep to the mucous membrane on the floor of the oral cavity, and opens into the oral cavity beside the frenulum of the tongue.

**The pharynx:** Consists of three parts - the nasopharynx, oropharynx, and laryngopharynx. Normally, only the oropharynx and laryngopharynx transmit food. The oropharynx communicates with the nasopharynx superiorly, with the larynx and laryngopharynx inferiorly, and with the mouth anteriorly.

The laryngopharynx extends from the oropharynx to the esophagus and is posterior to the larynx.

**The esophagus:** Is the part of the digestive tract that extends between the pharynx and the stomach. It lies in the mediastinum, anterior to the vertebrae and posterior to the trachea.

It passes through the esophageal hiatus (opening) of the diaphragm and ends at the stomach. An upper esophageal sphincter and a lower esophageal sphincter, at the upper and lower ends of the esophagus, respectively, regulate the movement of materials into and out of the esophagus.

**The stomach:** Is an enlarged segment of the digestive tract that primarily functions as a storage and mixing chamber. It is located in the left superior part of the abdomen. Its shape and size vary from person to person, even within the same individual from time to time, depending on food content and body posture.

A part of the stomach to the left of the cardiac part, the fundus, is actually superior to the cardiac opening. The largest part of the stomach is the body, which turns to the right, creating a greater curvature and a lesser curvature.

The body narrows to form the funnel-shaped pyloric part of the stomach. The wider part of the funnel, toward the body of the stomach, is the pyloric antrum.

The narrow part of the funnel is the pyloric canal. The pyloric canal opens through the pyloric orifice into the small intestine. The pyloric orifice is surrounded by the pyloric sphincter, or pylorus, a relatively

**thick ring of smooth muscle, which helps regulate the movement of gastric contents into the small intestine.**

**The small intestine: Consists of three parts:**

**The duodenum is about 25 cm long**

**The jejunum is about 2.5 m long**

**The ileum is about 3.5 m long**

**Two major accessory glands, the liver and the pancreas, are associated with the duodenum.**

**The duodenum begins with a short, superior part, where it exits the pylorus of the stomach, and ends in a sharp bend, where it joins the jejunum. Within the duodenum, about two-thirds of the way down the descending part, are two small mounds: the major duodenal papilla and the minor duodenal papilla. Ducts from the liver and/or pancreas open at these papillae.**

**The jejunum and ileum are similar in structure to the duodenum. However, progressing from the duodenum through the ileum, there are gradual decreases in the diameter of the small intestine, the thickness of the intestinal wall, the number of circular folds, and the number of villi.**

**The site where the ileum connects to the large intestine is the ileocecal junction.**

It has a ring of smooth muscle, the ileocecal sphincter, and a one-way ileocecal valve, which allow intestinal contents to move from the ileum to the large intestine, but not in the opposite direction.

**The liver:** is the largest internal organ of the body, weighing about 1.36 kg.

It is in the right-upper quadrant of the abdomen, against the inferior surface of the diaphragm. The liver consists of two major lobes, the right lobe and left lobe, which are separated by a connective tissue septum, the falciform ligament. Two minor lobes, the caudate lobe and the quadrate lobe, can be seen from an inferior view, along with the porta.

The porta (gate) is on the inferior surface of the liver, where the various vessels, ducts, and nerves enter and exit the liver. The hepatic portal vein, the hepatic artery, and a small hepatic nerve plexus enter the liver through the porta.

Lymphatic vessels and two hepatic ducts, one each from the right and left lobes, exit the liver at the porta. The hepatic ducts transport bile out of the liver.

**The large intestine:** Is the portion of the digestive tract extending from the ileocecal junction to the anus. It consists of the cecum, colon, rectum, and anal canal.

The cecum is the proximal end of the large intestine, where it meets the small intestine at the ileocecal junction.

**The cecum extends inferiorly about 6 cm past the ileocecal junction in the form of a blind sac. Attached to the cecum is a smaller, blind tube about 9 cm long called the vermiform (worm-shaped) appendix.**

**The colon about 1.5–1.8 m long, consists of four parts: the ascending colon, transverse colon, descending colon, and sigmoid colon.**

**The ascending colon extends superiorly from the cecum and ends at the right colic flexure (hepatic flexure) near the right inferior margin of the liver. The transverse colon extends from the right colic flexure to the left colic flexure (splenic flexure), and the descending colon extends from the left colic flexure to the superior opening of the true pelvis, where it becomes the sigmoid colon. The sigmoid colon forms an S-shaped tube that extends into the pelvis and ends at the rectum.**

**The rectum is a straight, muscular tube that begins at the termination of the sigmoid colon and ends at the anal canal.**

**Anal Canal The last 2–3 cm of the digestive tract is the anal canal. It begins at the inferior end of the rectum and ends at the anus.**

**Anus: Is the external digestive tract opening.**