

Gastrointestinal Tract

The digestive system is made up of the digestive tract. This consists of a long tube of organs that runs from the mouth to the anus and includes the **esophagus, stomach, small intestine, and large intestine**, together with the **liver, gallbladder, and pancreas**, which produce important secretions for digestion that drain into the small intestine.

Its **primary function** is to take in food, digests it to extract and absorb energy and nutrients, and expels the remaining waste as feces.

Digestion: is the process by which food is broken down into smaller pieces so the body can use them to build and nourish cells and to provide energy.

Digestion involves the mixing of food, its movement through the digestive tract (also known as the alimentary canal), and the chemical breakdown of larger molecules into smaller molecules.

Gastrointestinal Tract Part:

GI tract is formed by two types of organs:

- 1. Primary digestive organs:** are the organs where actual digestion takes place. Mouth, Pharynx, Esophagus, Stomach, Small intestine and Large intestine.
- 2. Accessory digestive organs:** are those which help primary digestive organs in the process of digestion. Teeth, Tongue, Salivary glands, Exocrine part of pancreas, Liver and Gallbladder.

Digestive System Physiology

The digestive system is responsible for taking whole foods and turning them into energy and nutrients to allow the body to function, grow, and repair itself. The six primary processes of the digestive system include:

- 1- Ingestion of food.
- 2- Secretion of fluids and digestive enzymes.
- 3- Mixing and movement of food and wastes through the body.
- 4- Digestion of food into smaller pieces.
- 5- Absorption of nutrients.
- 6- Excretion of wastes.

Process of Digestive System

1- Ingestion

The first function of the digestive system is ingestion, or the intake of food. The mouth is responsible for this function.

2- Secretion

In the course of a day, the digestive system secretes around 7 liters of fluids. These fluids include:

- Saliva moistens dry food and contains salivary amylase, a digestive enzyme that begins the digestion of carbohydrates.
- Mucus serves as a protective barrier and lubricant inside of the GI tract.
- Hydrochloric acid helps to digest food chemically and protects the body by killing bacteria present in our food.
- Enzymes are like tiny biochemical machines that disassemble large macromolecules like **proteins, carbohydrates, and lipids** into their smaller components.
- Finally, bile is used to emulsify large masses of lipids into tiny globules for easy digestion.

3- Mixing and Movement

The digestive system uses 3 main processes to move and mix food:

1- **Swallowing:** Swallowing is the process of using smooth and skeletal muscles in the mouth, tongue, and pharynx to push food out of the mouth, through the pharynx, and into the esophagus.

2- **Peristalsis:** Peristalsis is a muscular wave that travels the length of the GI tract.

3- **Segmentation:** Segmentation occurs only in the small intestine as short segments of intestine contract like hands squeezing a toothpaste tube. Segmentation helps to increase the absorption of nutrients.

4- Digestion

Digestion: is the process by which food is broken down into smaller pieces so the body can use them to build and nourish cells and to provide energy.

- **Mechanical digestion:** is the physical breakdown of large pieces of food into smaller pieces. Teeth, stomach and intestine.
- **Chemical digestion:** food is also being chemically digested as larger and more complex molecules are being broken down into smaller molecules that are easier to absorb.
 - * Mouth with salivary amylase digest carbohydrates.
 - * Pancreas secretes pancreatic juice, which is capable of digesting lipids, carbohydrates, proteins and nucleic acids.

6- Absorption

Absorption begins in the **stomach** with simple molecules like **water** and **alcohol**

Most absorption takes place in the walls of the small intestine.

The large intestine is also involved in the absorption of **water** and vitamins B and K before feces leave the body.

6- Excretion

Defecation: it is the process of the excretion of waste. Defecation removes indigestible substances from the body so that they do not accumulate inside the gut.