Digestive System

Functions:

- <u>Digestion</u> \rightarrow body breaking down food in smaller pieces
- Absorption \rightarrow nutrients enter the bloodstream
- <u>Elimination</u> \rightarrow removing unneeded materials (waste)

Types of Digestion

<u>Mechanical</u> Grinding food into smaller pieces <u>Chemical</u> Chemical break down of food **Saliva → mixture of mucus & serous fluids

I ypes of Teeth

- Premolars Incisors
- <u>Incisors</u> Your incisors are eight teeth in the front center of your mouth (four on both bottom and top)
- <u>Canines</u> Your canines are the next teeth that develop in your mouth. ...
- <u>Premolars</u> Premolars are used for tearing and crushing food. ...
- <u>Molars</u> Your molars are your largest teeth.

A normal adult mouth has **32** teeth, which (except for wisdom teeth) have erupted by about age 13:

<u>Incisors (8 total)</u>: The middlemost four teeth on the upper and lower jaws.

<u>Canines (4 total):</u> The pointed teeth just outside the incisors.

<u>Premolars (8 total):</u> Teeth between the canines and molars.

Molars (12 total): Teeth in the very back



SECONDARY TEETH

PRIMARY TEETH

Organs of the Digestive System	
Mouth	 Teeth grind food Salivary gland produces saliva Epiglottis blocks airway, uvula closes the nasal cavity
Esophagus	 muscular tube connecting the throat (pharynx) with the stomach about 8 inches long runs behind the windpipe (trachea) and heart, and in front of the spine
Stomach	 Stores food Break down food, by churning in gastric juices Empties into small intestine
Small Intestine	 winding, tightly folded tube about 20 ft long in adults Food is digested and absorbed Finger-shaped tissues (villi), absorbs calories and nutrients from food

Large Intestine	 3-4" in diameter, 5 ft long Has appendix → waste, sometimes gets infected
Accessory Organs:	Pancreas \rightarrow fats/proteins into the bloodstream Liver \rightarrow bile absorb fats into blood system Gallbladder \rightarrow bile storage
Colon	 Last chance to reduce water
Rectum/ Anus	Waste through the anus

The pharynx, a common passageway for solid food, liquids, and air



If (II is Franke & Science, 14)

Digestive Tract: Pharynx and Epiglottis

Epiglottis





Esophogus

TOMACH

Stomach

Lower Esophageal sphincter

Pyloric sphincter







C201501000



Serous Fluid -

is any of various body fluids resembling serum, that are typically pale yellow and transparent and of a benign nature. The fluid fills the inside of body cavities.

Gastric Juices-

gastric juice, thin, strongly acidic (pH varying from 1 to 3), almost colorless liquid secreted by the glands in the lining of the stomach. Its essential constituents are the digestive enzymes pepsin and rennin (see rennet), hydrochloric acid, and mucus.

1 Acid

14 Base <u>Chemical Digestion-</u> large food molecules are broken down to their building blocks by enzymes

<u>Mechanical Digestion-</u> mixing of food in the mouth by the tongue; churning of food in the stomach, segmentation in the small intestine

Ingestion- an active, voluntary process of placing food in the mouth

<u>Defecation-</u> elimination of indigestible substances from the body

<u>Absorption-</u> transport of digested end products from the lumen of the GI tract to the blood or lymph

Bolus- chewed food prepared for swallowing

<u>Chyme-</u> the pulpy acidic fluid that passes from the stomach to the small intestine, consisting of gastric juices and partly digested food

<u>Propulsion-</u> foods are propelled from one organ to the next by peristalsis and segmentation

<u>Peristaltic-</u> the involuntary constriction and relaxation of the muscles of the intestine or another canal, creating wavelike movements that push the contents of the canal forward.

<u>Sphincter-</u> a ring of muscle surrounding and serving to guard or close an opening or tube, such as the anus or the openings of 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.



Food travels down the esophagus, through a series of involuntary rhythmic contractions (wave-like) called **peristalsis**.

Function:

The lining of the esophagus secretes mucus lubricating to support the movement of food.



Stomach

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

The fundus The body The pylorus

The food enters this part of the stomach from the esophagus. The esophageal (cardiac) sphincter, a circle of muscular tissue, 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



1.DUODENUM

- The first part is the *duodenum*, u-shaped organ.
- o approximately 30 cm in length.
- This area completes most of the digestion processes.
- Enzymes are secreted into the duodenum form the pancreas and the gall bladder. The duodenum is lined by folds of tissue called *villi*.
- The villi are covered by fine brush-like *microvilli*.
- These folds increase the surface area of the small intestine increase the rate of absorption.



The jejunum is approximately 2.5 m long.

 Although some digestion is completed here, it has more villi and microvilli; its role is absorption o nutrients.

3.lleum

- The *ileum*, is approximately 3m long.
- has fewer villi and microvilli than the other two parts.
- Although absorption also occurs here, it is responsible for pushing the waste materials into the large intestine.

Absorption

• It occurs within the ileum in finger-like projection known as



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.

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.



COMPONENTS OF LARGE INTESTINE

- The large intestine is composed of several very distinctive parts:
- o Cecum:
- o Colon:. The colon consists of four parts:
- Ascending colon
- Transverse colon
- Descending colon
- Sigmoid colon
- Rectum





CECUM

- o first section of your large intestine
- o looks like a pouch,
- two inches long.
- o ROLE
- taking in digested liquid from the ileum(small intestine) &
- o passes it on to the colon.



COLON :

- o major section of the large intestine
- Function:
- o the principal place for water reabsorption,
- o absorbs salts when needed.
- o Components :
- The colon consists of 4 parts:
- Ascending colon
- Transverse colon
- Descending colon
- Sigmoid colon



Digestion time varies between individuals and between men and women. After you eat, it takes about six to eight hours for food to pass through your stomach and small intestine. Food then enters your large intestine (colon) for further digestion, absorption of water and, finally, elimination of undigested food.

In the 1980s, Mayo Clinic researchers measured digestion time in 21 healthy people. Total transit time, from eating to elimination in stool, averaged 53 hours (although that figure is a little overstated, because the markers used by the researchers passed more slowly through the stomach than actual food). The average transit time through just the large intestine (colon) was 40 hours, with significant difference between men and women: 33 hours for men, 47 hours for women.

The average time of transit from mouth to anus for the group was 33 hours.