

# Structures of the Digestive System

#### Major Structures

- Oral cavity (mouth)
- Pharynx (throat)
- Esophagus
- Stomach
- Small intestine
- Large intestine
- Rectum
- o anus



#### Accessory Organs

- Aid with digestion but not part of the digestive system
- Liver
  Gallbladder
  Pancreas

#### **Gastrointestinal Tract** Gastrointestinal Tract Pharynx Gastrointestinal Tract or "GI Tract" Esophagus Stomach. • Gastr/o = stomach Small intestine $\circ$ Intestin = intestine (small bowel) Large intestine $\circ$ al = pertaining to (colon) Rectun

- Upper GI Tract mouth, pharynx, esophagus and stomach
- Lower GI Tract small intestine, large intestine, rectum and anus

### Major Structures of the Oral Cavity or Mouth

- Lips
- Hard Palate
- Soft Palate
- Salivary Glands
- Tongue
- Teeth
- Periodontium

#### Mouth (Oral Cavity)



#### • Lips

- Form the opening of the oral cavity
- Hold food in while eating
- Aid the tongue and cheek in guiding food between the teeth during chewing
- Aid in speaking
- Aid in expression of emotions
- Aid in breathing



- Hard Palate bony anterior portion of the palate
   Covered in specialized mucous membrane
- Soft Palate flexible posterior portion of the palate
   Closes off the nasal passage during swallowing
- Uvula hangs from the free edge of the soft palate
   Moves up with the soft palate during swallowing
  - Important role in snoring
  - Plays a role in some formation of speech sounds

#### Tongue

- Strong, flexible and muscular
- Aids in speech
- Moves food during chewing and swallowing
- Papillae small bumps on the top of the tongue that contain the taste buds



# Soft tissue of the oral cavity

#### • Gingiva "gums" specialized mucous membrane

- surround the teeth
- cover the bone of dental arch
- line the cheeks



# **Dental Arches**

### • Dental Arches "upper and lower jaw"

- Maxillary and mandibular arches
- Firmly hold the teeth in position

### • Temperomandibular joint "TMJ"

- At the back of the mouth
- Maxillary arch and mandibular arch come together





### Structures and tissues of the teeth

- Crown portion of tooth visible in mouth
   Covered with enamel
- Root holds tooth securely in place within dental arch
- Cervix neck of tooth connects crown to root
- Dentin makes up bulk of tooth
  - Protected by enamel and cementum
- Pulp consists of a rich supply of blood vessels and nerves that provide nutrients to the tooth



# Saliva and Salivary Glands

#### Saliva

- Colorless liquid that moistens the mouth
- Begins the digestive process
- Lubricates food during chewing and swallowing
- 3 pairs of salivary glands
  - Parotid glands
  - Sublingual glands
  - Submandibular glands



# Pharynx

- Common passage for both food and air
- Epiglottis
  - Lid-like structure that closes off the entrance to the trachea to prevent food and liquids from moving from the pharynx during swallowing



# Esophagus

- Muscular tube through which ingested food passes from the pharynx to the stomach
- Lower esophogeal sphincter
  - "Gastroesophogeal sphincter" or Cardiac Sphincter"
  - Muscular ring that controls the flow between the esophagus and stomach



# The Role of the Mouth, Salivary Glands and Esophagus

- Mastication aka "chewing" breaking food down into smaller pieces, mixes with saliva and prepares it to be swallowed
- Bolus a mass of food that has been chewed and ready to be swallowed
- During swallowing food moves



# Stomach

# Sac-like organ

#### • 3 section

- Fundus upper, round part
- Body main portion
- Antrum lower part

# • Rugae – folds in the stomach lining

- Glands within the folds produce gastric juices that aid in digestion and mucus to create a protective coating on the lining of the stomach
- Pylorus connects stomach and small intestine



## The Role of the Stomach

- Gastric Juices contain hydrochloric acid and digestive enzymes to begin the digestive process
- The churning action of the stomach works with the gastric juices by converting food into chyme
- Chyme semi-fluid mass of partially digested food. Moves from the stomach into the small intestine

# **Small Intestine**

- Extends from the end of the pylorus to the large intestine
- Coiled organ up to 20 feet in length
- Food is digested and the nutrients are absorbed into the blood stream
- 3 sections
  - Duodenum
  - Jejunum
  - Ileum



# The Role of the Small Intestine

- Complete the conversion of food into usable nutrientsPeristaltic action moves the chyme through
- Duodenum chyme mixes with pancreatic juices and bile to break down fat globules
- **Jejunum** secretion of large amounts of digestive enzymes to continue digestion
- **Ileum** primary function is absorption of nutrients

## Large Intestine

- Extends from the small intestine to the anus
- Twice as wide as small intestine but only onefourth as long
- Waste products of digestion are processed in preparation for excretion
- 4 major parts
  - Cecum
  - Colon
  - Rectum
  - Anus





# The Role of the Large Intestine

• Receives waste products of digestion and stores until eliminated

- Enters as fluid form
- Excess water is reabsorbed into the body
- Remaining waste forms into feces
- Feces "stools" solid body wastes expelled through rectum and out anus
- Defecation "Bowel Movements" emptying of the large intestine
- Flatulence passing of gas out through rectum and anus

# Accessory Digestive Organs

#### • The Liver

- Located in right upper quadrant [RUQ] of abdomen
- Removes excess glucose from blood stream and stores it as glycogen
- Destroys old erythrocytes
- Removes toxins from blood
- Releases bile containing bilirubin which aids in digestion of fats.



# The Gallbladder

- Pear-shaped organ about the size of an egg located under the liver
- Stores and concentrates bile for later use
- Bile is used to break apart large fat globules





### The Pancreas

- Soft, 6 inch long gland located behind stomach
- Produces & secretes pancreatic juices into duodenum
- Aids in digestion & contains sodium bicarbonate to help neutralize stomach acid & digestive enzymes





# Digestion

• The process by which complex foods are broken down into nutrients the body can use.

- **Digestive enzymes** chemically break down food into simpler forms of nutrients
- Nutrient a substance that is necessary for normal functioning of the body
  - Carbohydrates
  - Fats
  - Proteins
  - Vitamins
  - Minerals



## Metabolism

• All processes involved in the body's use of nutrients

- Anabolism building up of body cells & substances from nutrients
- **Catabolism** breaking down of body cells or substances, releasing energy & carbon dioxide

# Absorption

 Process by which completely digested nutrients are transported to cells throughout body

- Villi cover the lining of the small intestine & absorb nutrients into blood stream
- Lacteals located in villi; absorb fat & fat soluble vitamins; transport them to cells of body via lymphatic vessels

