

The Digestive System

Digestion

- Processing of food
- Converting food into simple molecules that can be absorbed and used
- Types
 - Mechanical (physical)
 - Chew
 - Tear
 - Grind
 - Chemical
 - Enzymes... REMEMBER these????
 - Carbohydrate
 - Protein
 - Lipid

GROSS ANATOMY

- Alimentary Canal (9m)
 - Major Organs
 - Mouth
 - Pharynx
 - Esophagus
 - Stomach
 - Small intestine
 - Large intestine
 - Accessory Organs
 - Salivary glands
 - Liver
 - Pancreas
 - Gall bladder

Anatomy of the Mouth and Throat Mechanical

Human Tooth

1. Incisors (2 x 4)
Bite
2. Canines (1 x 4)
Shred
3. Pre-molars (2 x 4)
Grip
4. Molars (3 x 4)
Grind

Dorsal Surface of the Tongue

Pushes food against palate to form a **BOLUS**

1. Taste
2. Speech
3. Swallowing
4. Chewing
5. Cleaning

The Major Salivary Glands - Chemical

Saliva: moistens food

- Water
- Mucus
- Amylase

Salivary Glands:


- Parotid
- Submandibular
- Sublingual

Esophagus - Mechanical

- Muscles
 - Longitudinal
 - Circular
 - Cardiac sphincter
- Peristalsis
 - Wave-like contractions
- Functions
 - Secrete mucus
 - Transport food

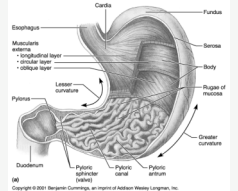
Stomach - Mechanical and Chemical

- Usually "J" shaped
- Left side
- Rugae (folds)
- Muscles (churning)
 - Circular
 - Oblique
 - Longitudinal
- Gastric Glands
 - Gastric Juice
 - Mucus
 - HCl (pH 1-2)
 - Pepsin
- Chyme empties into SI



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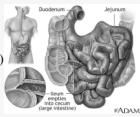
Anatomy of the Stomach



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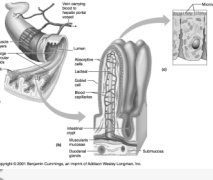
Small Intestine - Mechanical and Chemical

- Extends from pyloric sphincter → ileocecal valve
- **Regions**
 - Duodenum (1 ft)
 - Jejunum (8 ft)
 - Ileum (13 ft)
- **Movements**
 - Peristalsis
- **Enzymes**
 - From SI
 - Maltase
 - Sucrase
 - Lactase
 - Peptidase
 - From Pancreas
 - Amylase
 - Trypsin
 - Lipase



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Structure of the Villi in the Small Intestine

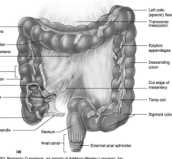


- Majority of digestion occurs here!!!
- Absorption of nutrients:
 - Carbohydrates
 - Proteins
- Mediated by:
 - Villi
 - Microvilli

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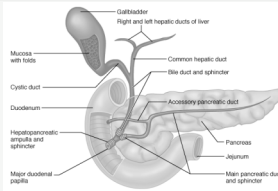
Large Intestine - Mechanical and Chemical

- Extends from ileocecal valve to anus
- Absorbs water
- Intestinal flora
- Concentrate/eliminate waste
- **Regions**
 - Colon
 - Ascending
 - Transverse
 - Descending
 - Rectum
 - Anal canal



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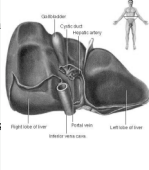
The Duodenum and Related Organs



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Liver - Accessory Organ

- Location
 - Upper right abdomen
- 4 Lobes
- Function
 - Detoxifies
 - Stores glycogen
 - Secretion of bile salts
 - Emulsification

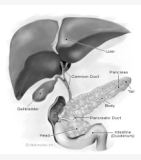


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Pancreas - Accessory Organ

Gland Organ Function:

1. Exocrine
 - Secretes pancreatic juice (digestive enzymes)
 - Produces sodium bicarbonate
2. Endocrine
 - Produces hormones: Insulin, glucagon, somatostatin



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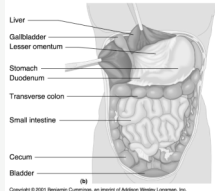
Gall Bladder - Accessory Organ



Stores bile

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The Organs and Positions in the Abdominal Cavity



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Summary of Digestion

1. Mouth - mechanical digestion
2. Saliva - chemical digestion (amylase)
3. Bolus of food (palates, uvula, pharynx)
4. Epiglottis
5. Esophagus (peristalsis)
6. Stomach (cardiac sphincter) -
7. Chyme through pyloric sphincter to duodenum
8. Mixes with bile (liver), bicarbonate (pancreas), amylase, trypsin, lipase (SI)
9. Absorption through villi
10. Large intestine - water reabsorbed
11. Anus

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