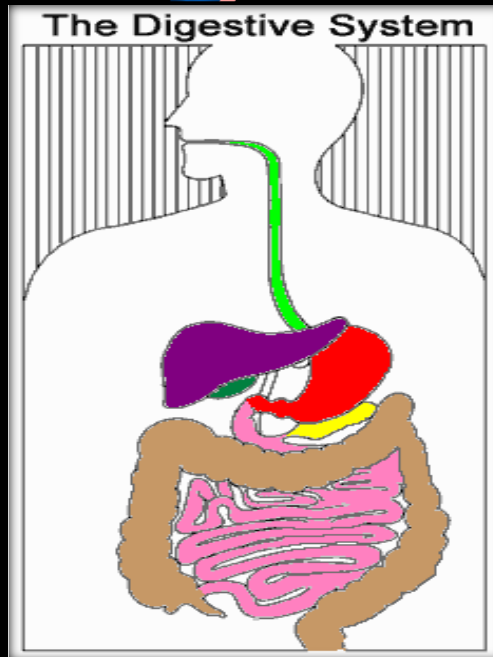


# The Human Digestive System



# Digestion

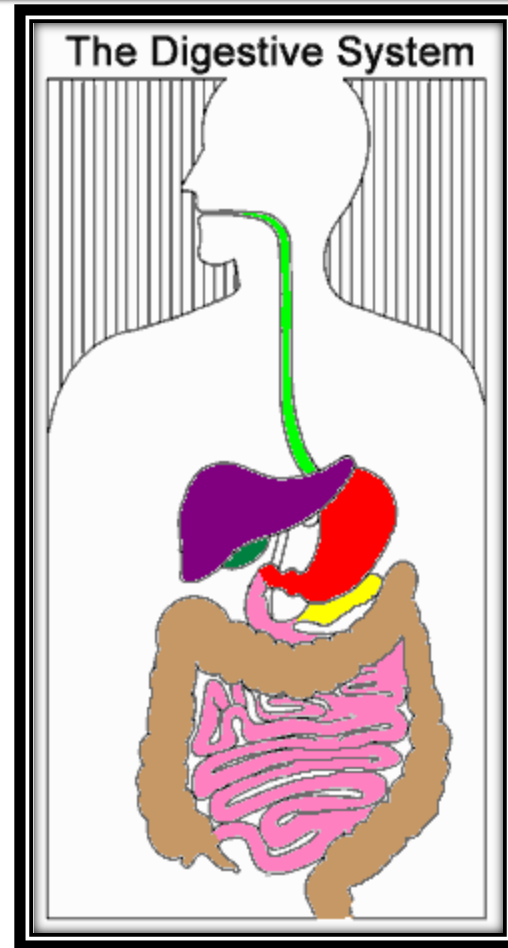
- Phases Include
  1. Ingestion
  2. Movement
  3. Mechanical and Chemical Digestion
  4. Absorption
  5. Elimination

# Digestion

- Types
  - Mechanical (physical)
    - Chew
    - Tear
    - Grind
    - Mash
    - Mix
  - Chemical
    - Enzymatic reactions to improve digestion of
      - Carbohydrates
      - Proteins
      - Lipids

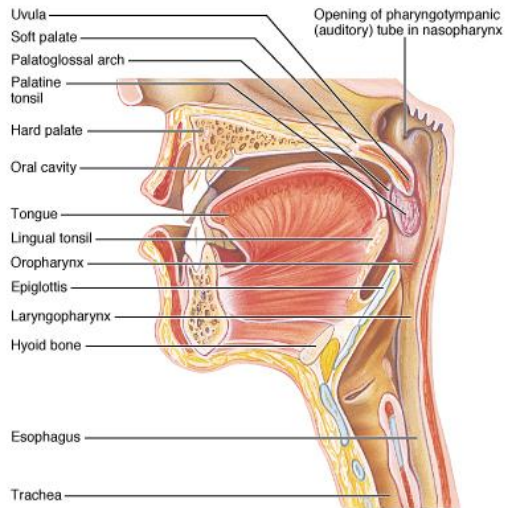
# Digestive System Organization

- Gastrointestinal (GI) tract
  - Tube within a tube
  - Direct link/path between organs
  - Structures
    - Mouth
    - Pharynx
    - Esophagus
    - Stomach
    - Small intestine
    - Large Intestine
    - Rectum



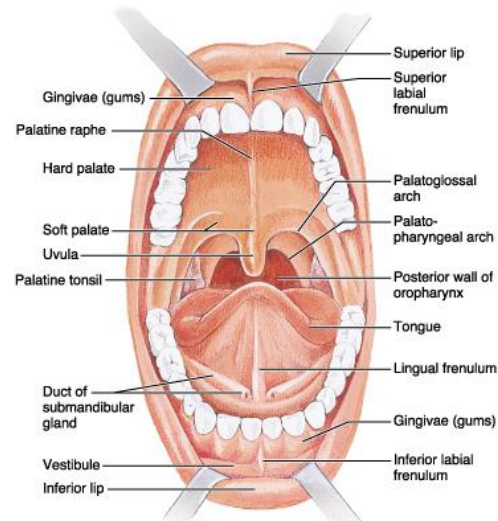
# Mouth

- Teeth mechanically break down food into small pieces. Tongue mixes food with saliva (contains amylase, which helps break down starch).



(a)  
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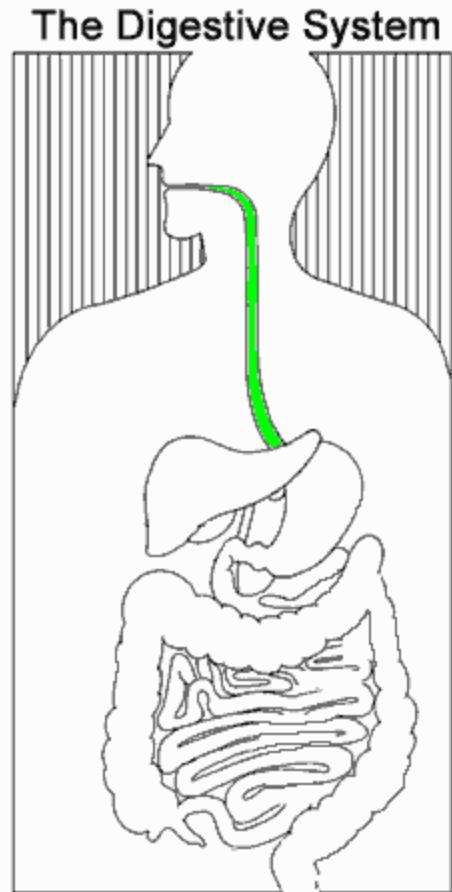
- Epiglottis is a flap-like structure at the back of the throat that closes over the trachea preventing food from entering it.



(b)  
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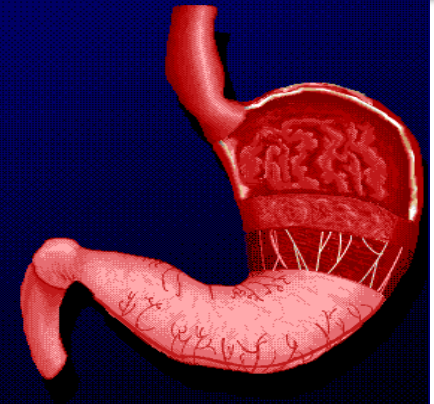
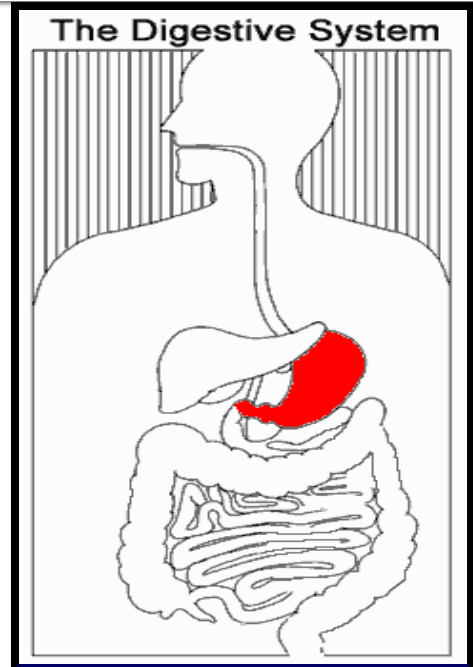
# Esophagus

- Approximately 10" long
- Functions include:
  1. Secrete mucus
  2. Moves food from the throat to the stomach using muscle movement called peristalsis
- If acid from the stomach gets in here that's heartburn.



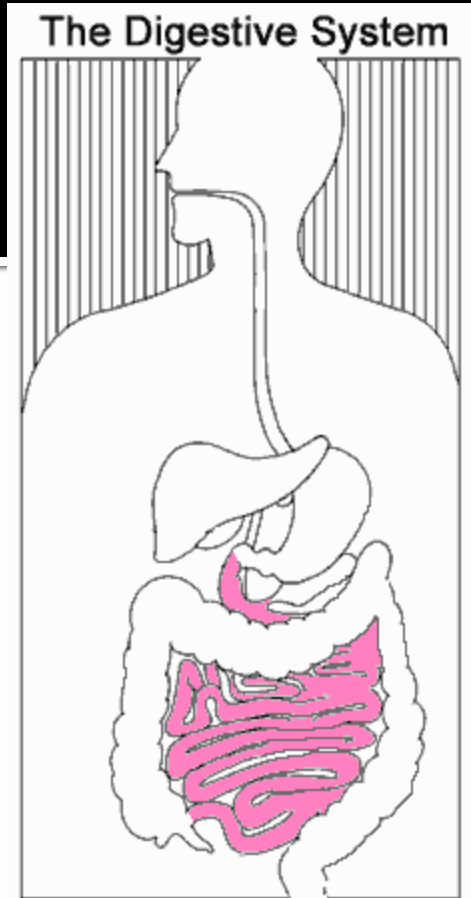
# Stomach

- J-shaped muscular bag that stores the food you eat, breaks it down into tiny pieces.
- Mixes food with digestive juices that contain enzymes to break down proteins and lipids.
- Acid in the stomach kills bacteria.
- Food found in the stomach is called chyme.

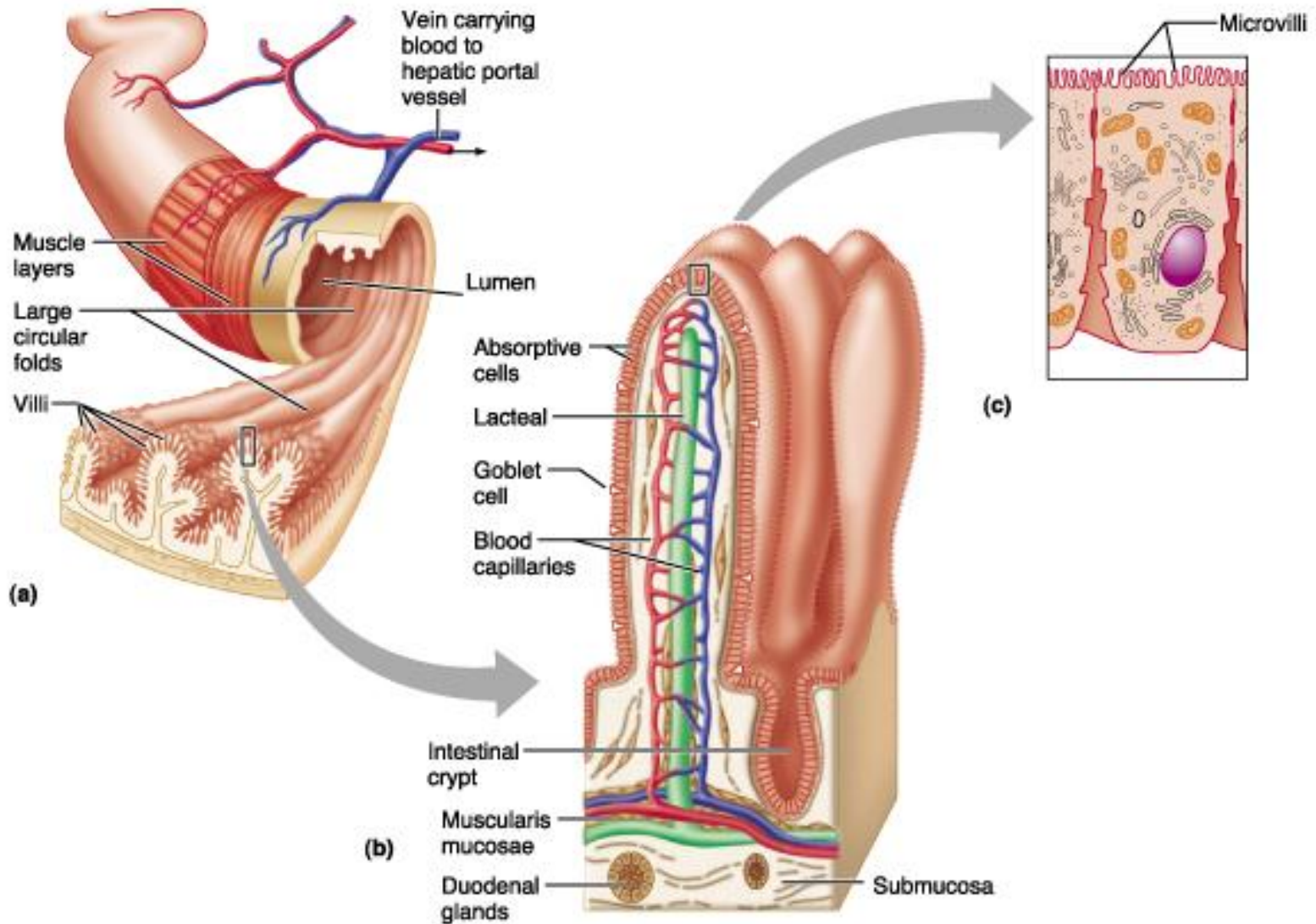


# Small Intestine

- Small intestines are roughly 7 meters long
- Lining of intestine walls has finger-like projections called villi, to increase surface area.
- The villi are covered in microvilli which further increases surface area for absorption.

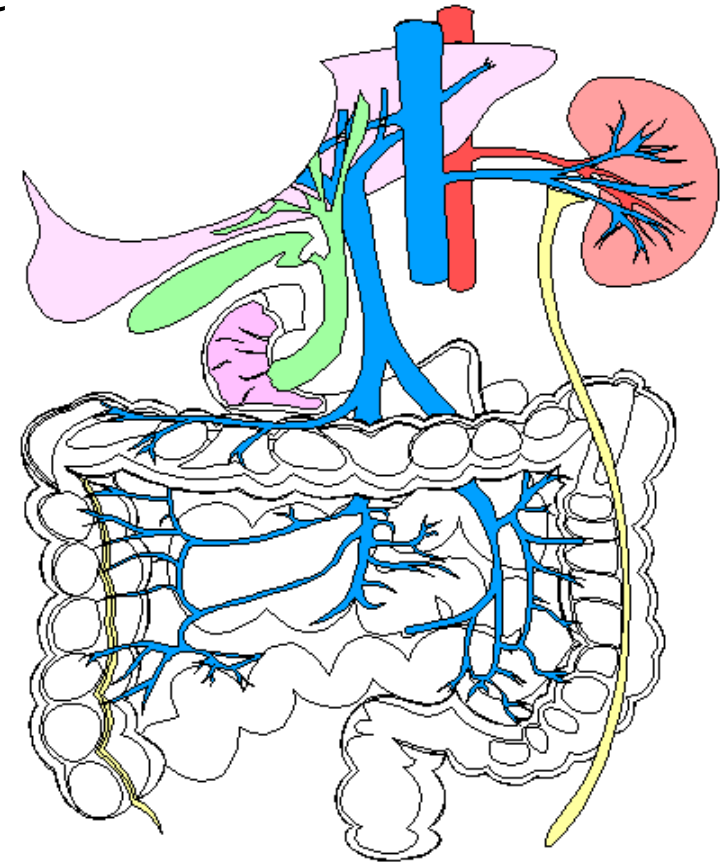






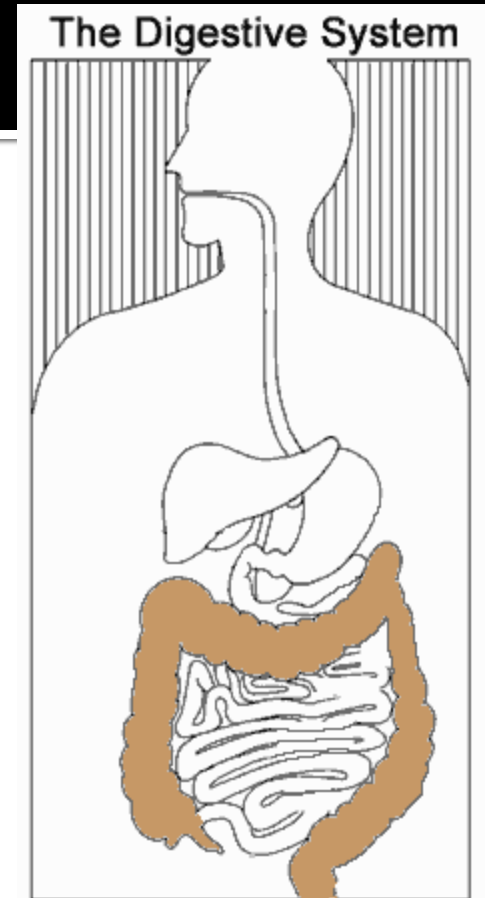
# Small Intestine

- Nutrients from the food pass into the bloodstream through the small intestine walls.
- Absorbs:
  - 80% ingested water
  - Vitamins
  - Minerals
  - Carbohydrates
  - Proteins
  - Lipids
- Secretes digestive enzymes



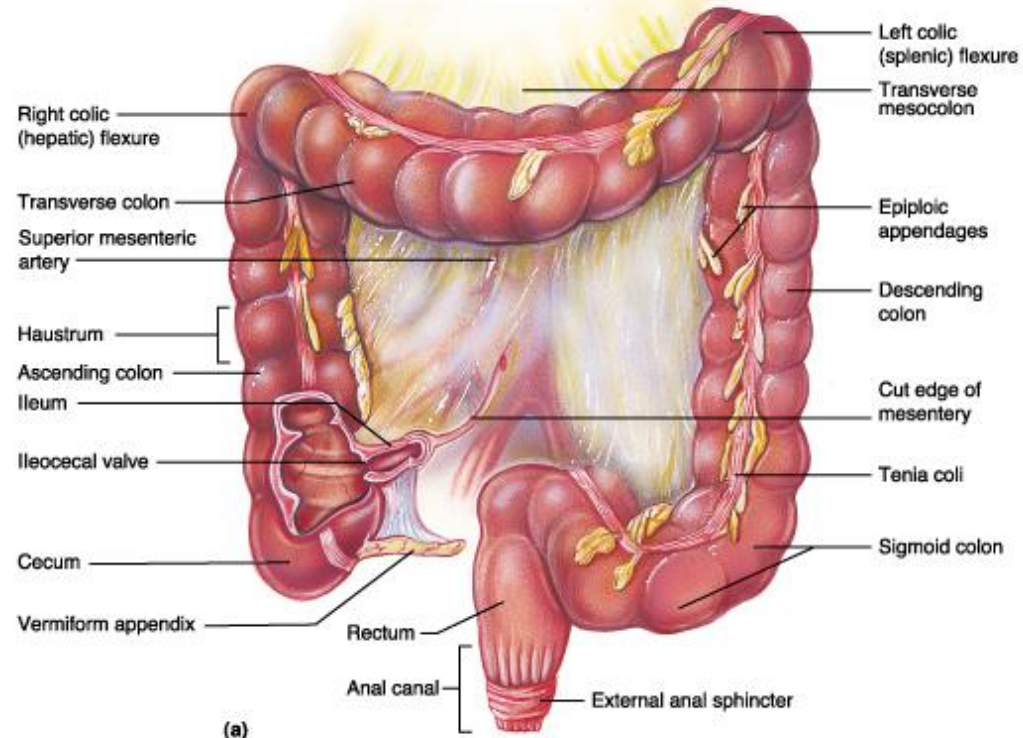
# Large Intestine

- About 5 feet long
- Accepts what small intestines don't absorb
- Rectum (short term storage which holds feces before it is expelled).



# Large Intestine

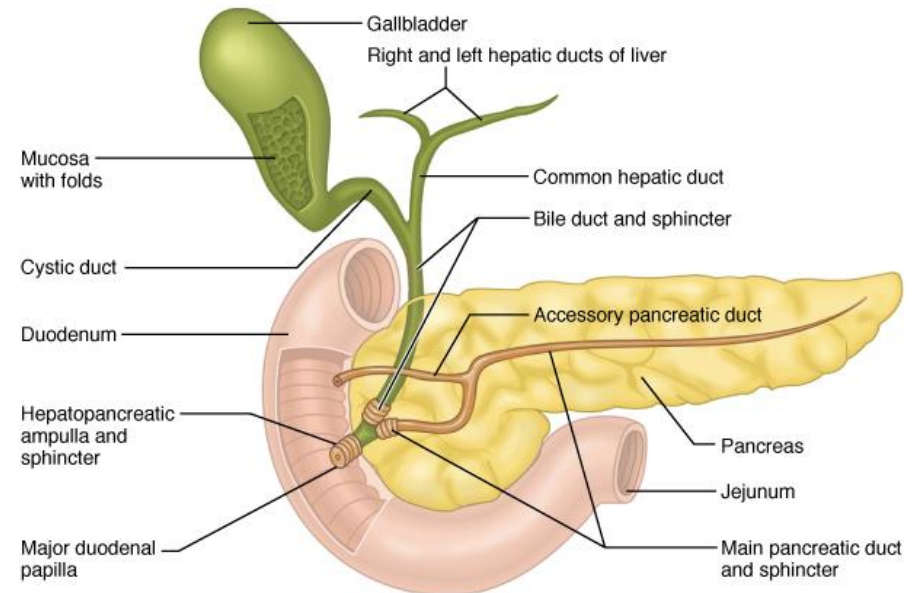
- Functions
  - Bacterial digestion
    - Ferment carbohydrates
    - Protein breakdown
  - Absorbs more water
  - Concentrate wastes



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# Accessory Organs

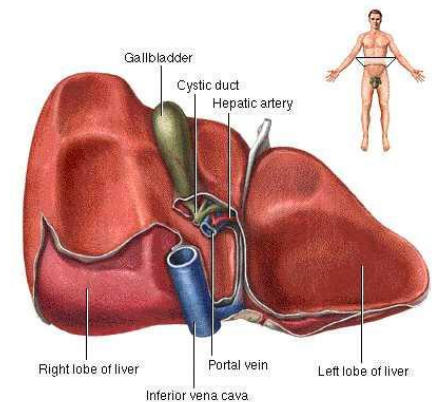
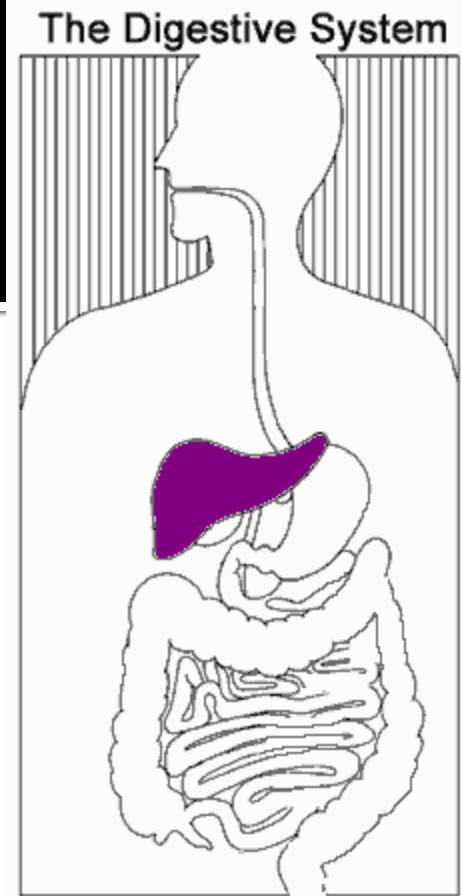
- Not part of the path of food, but play a critical role.
- Include: Liver, gall bladder, and pancreas



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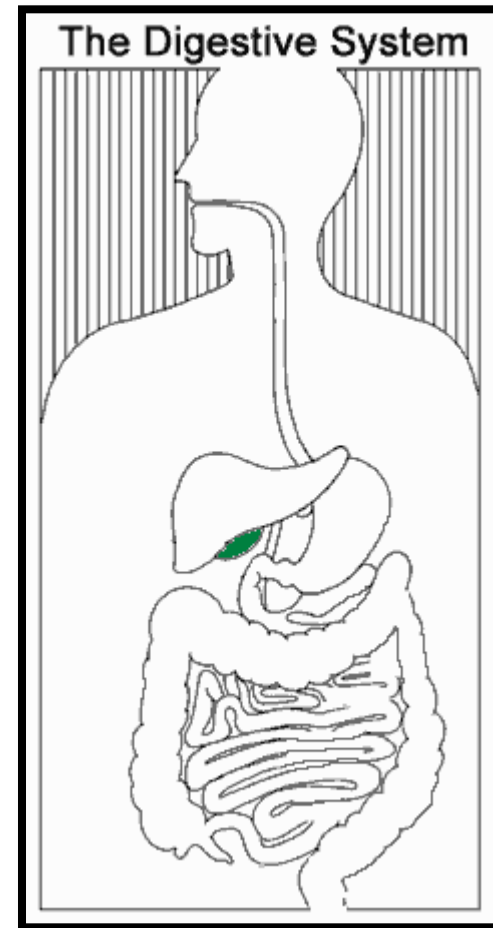
# Liver

- Directly affects digestion by producing bile
  - Bile helps digest fat
  - filters out toxins and waste including drugs and alcohol



# Gall Bladder

- Stores bile from the liver, releases it into the small intestine.
- Fatty diets can cause gallstones



# Pancreas

- Produces digestive enzymes to digest fats, carbohydrates and proteins
- Regulates blood sugar by producing insulin

