

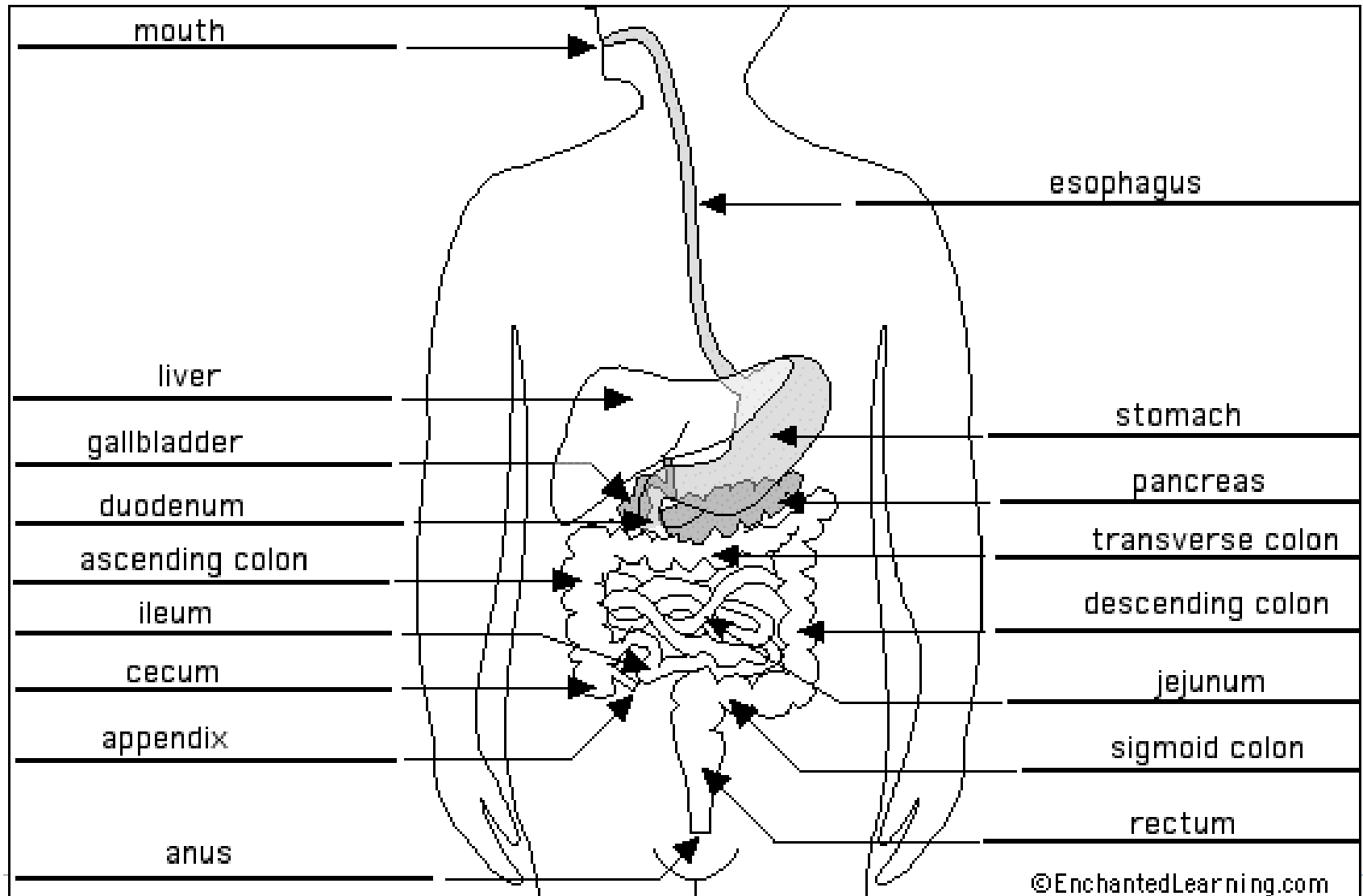


# DIGESTION



SBI 3C

# DIAGRAM OF DIGESTIVE SYSTEM:



# STAGES OF DIGESTION:

## 1. INGESTION

- ▶ Taking in nutrients

## 2. DIGESTION

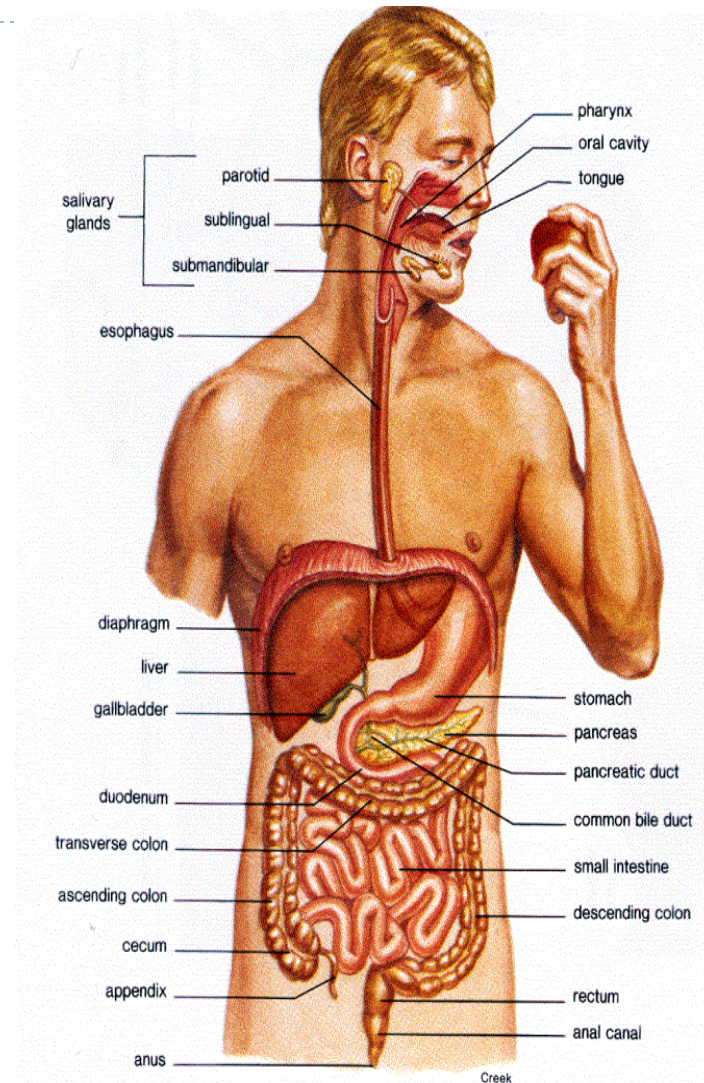
- ▶ Breakdown of complex organic molecules into smaller components by physical and chemical means

## 3. ABSORPTION

- ▶ Absorbing digested molecules into cells of digestive tract

## 4. EGESTION

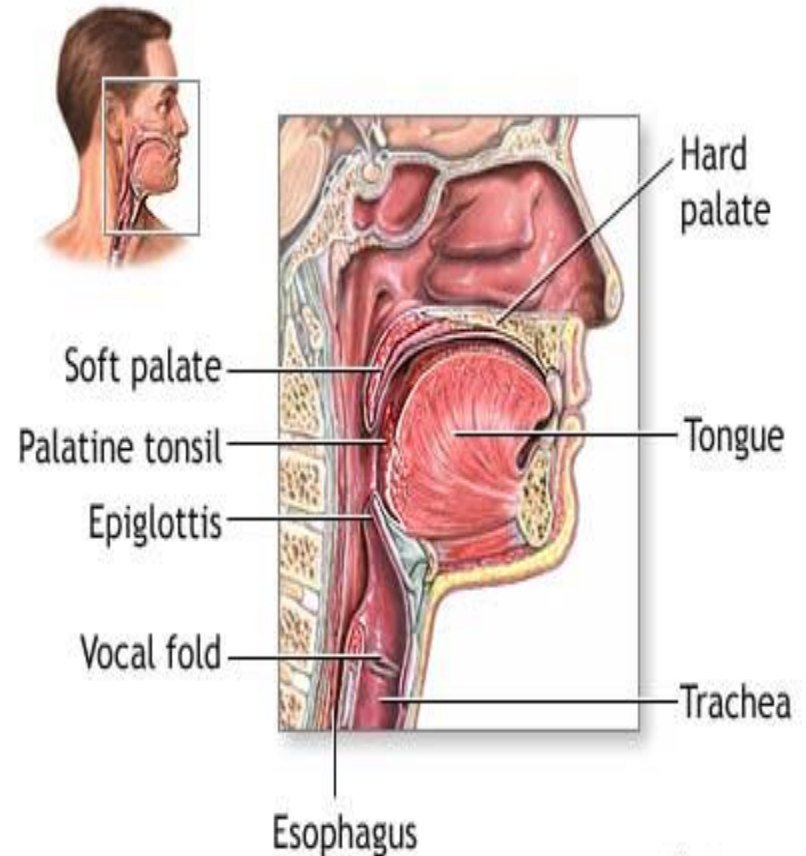
- ▶ Removal of waste food materials from the body



# STEP 1: INGESTION

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- ▶ Teeth chew the food
- ▶ Saliva moistens
- ▶ Enzyme in saliva (amylase) breaks down carbs
- ▶ Muscular tongue pushes food back to pharynx
- ▶ Epiglottis – flap covers trachea so food doesn't get in
- ▶ Food stretches walls of esophagus and moves downward through waves of contractions called **peristalsis**

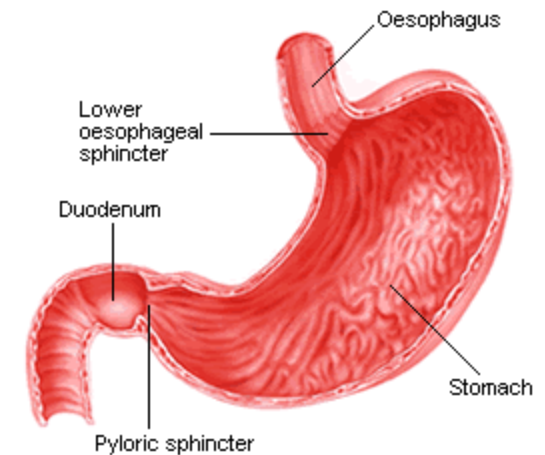


# STEP 2: DIGESTION:

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## ▶ STOMACH:

- ▶ Food moves in and out through sphincters (circular muscles)
- ▶ Stomach contracts and relaxes to churn the food
- ▶ Hydrochloric acid:
  - ▶ Breaks down food
  - ▶ Destroys foreign organisms (bacteria) in food
- ▶ Pepsin:
  - ▶ Enzyme
  - ▶ Breaks down proteins into polypeptides
- ▶ Mucus:
  - ▶ Protects stomach lining from acid
- ▶ Some absorption of water, medicine and alcohol here

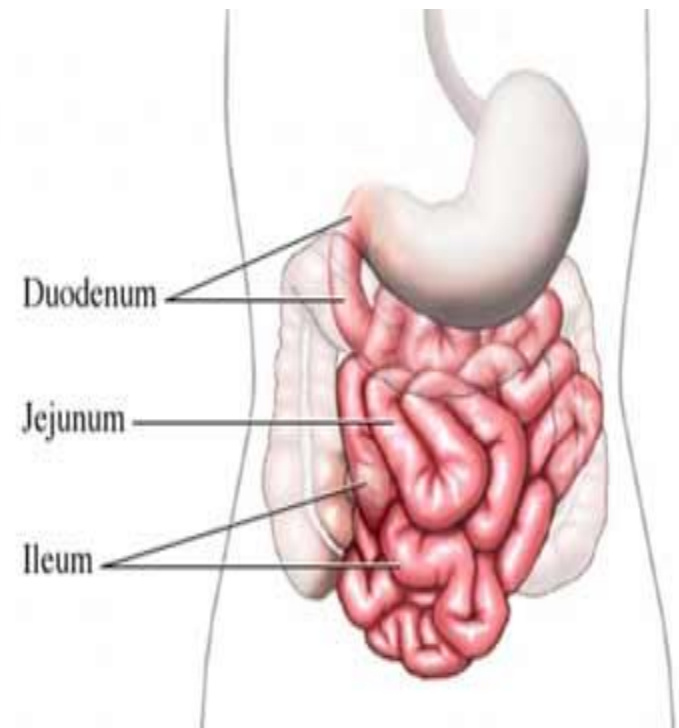


# STEP 2: DIGESTION

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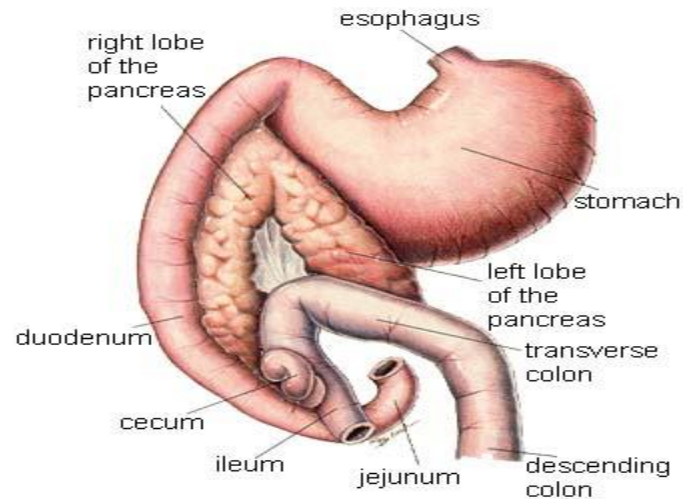
## ▶ SMALL INTESTINE:

- ▶ Up to 7m in length, 2.5cm in diameter
- ▶ The small intestine is divided into 3 parts: the duodenum, the jejunum, and the ileum
- ▶ It is the primary site of nutrient absorption to the blood
- ▶ Secretes peptidase which completes digestion of proteins
- ▶ Only the small intestine can absorb lipids (fats), carbohydrates, and amino acids (from proteins)



# ACCESSORY ORGAN: PANCREAS

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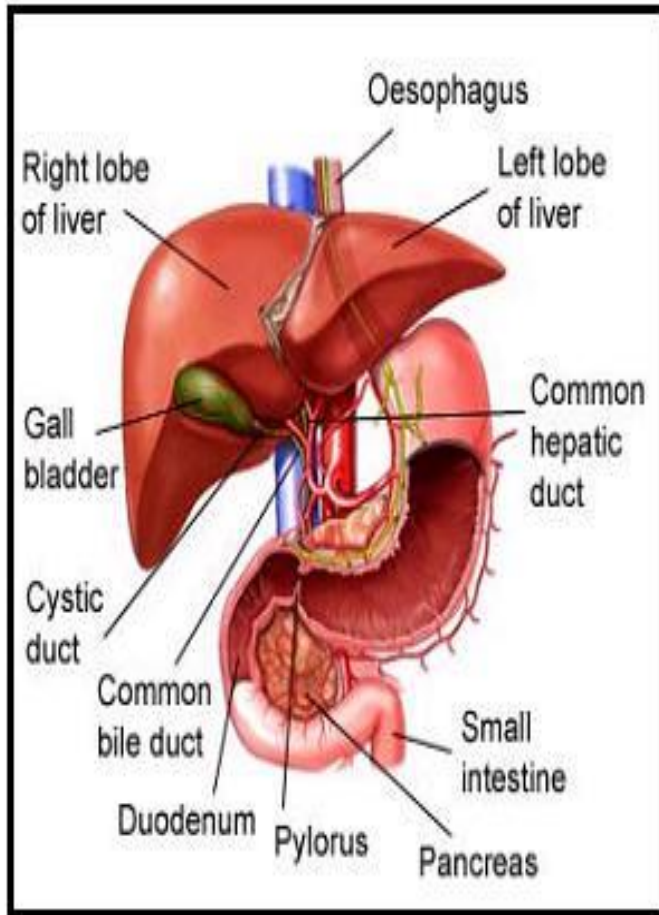


- ▶ Secretes digestive enzymes trypsin, lipase, and amylase into the duodenum to break down carbohydrates, proteins and fats
  - ▶ Neutralizes acidic stomach contents (called chyme) before they enter the small intestine
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# ACCESSORY ORGAN: LIVER

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- ▶ Weighs between 1200-1500g, 2-5% of adult human body weight
- ▶ Besides skin, it is the largest organ

## Roles:

- Cleans and detoxifies blood draining from the stomach, small intestine, large intestine, pancreas and spleen
  - Stores carbohydrates, fats, vitamins and minerals
  - Converts hormones and vitamins into active forms
  - Makes **bile** which helps break down fats
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# ACCESSORY ORGAN: GALLBLADDER

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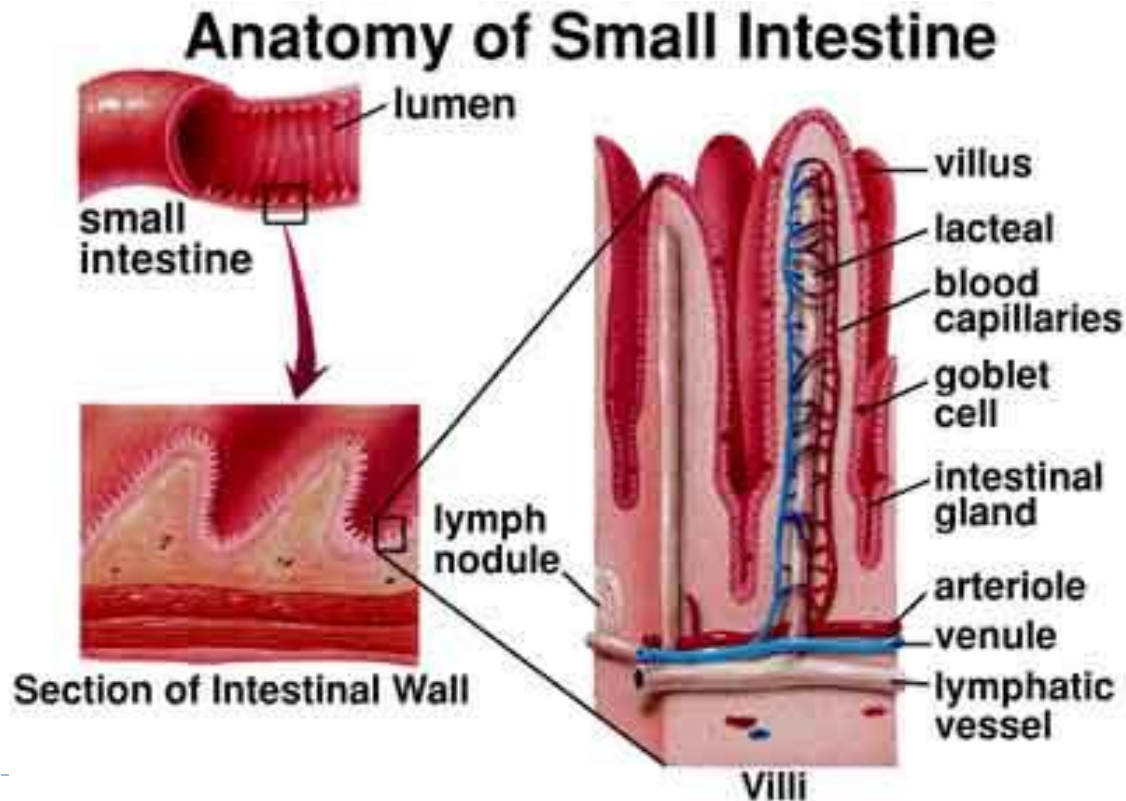
- ▶ Stores and concentrates bile and delivers it to the duodenum during a meal
- ▶ Not an essential organ, people can live without their gallbladder
- ▶ Gallbladder is sometimes removed because of gallstones which are hard “stones” made of calcium and salt



# ABSORPTION:

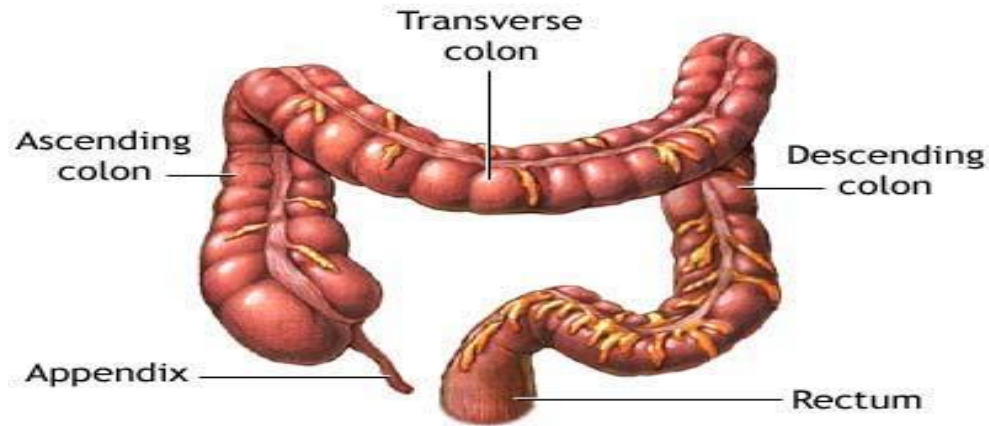
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- ▶ Most absorption of nutrients takes place in small intestine
- ▶ Small intestine is lined with villi:
  - ▶ Finger-like projections that increase surface area for absorption



# LARGE INTESTINE

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ADAM.

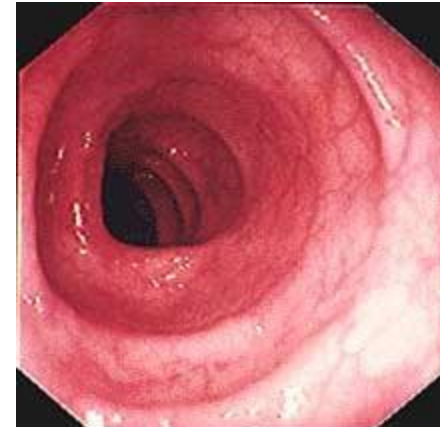
- ▶ Large intestine is 1.5 meters in length
- ▶ The large intestine (also known as the colon) reabsorbs fluids and electrolytes
- ▶ Harmless bacteria live here producing vitamin K and B
- ▶ Any undigested food that remains is called feces
- ▶ Fecal matter is stored here before elimination through the anus



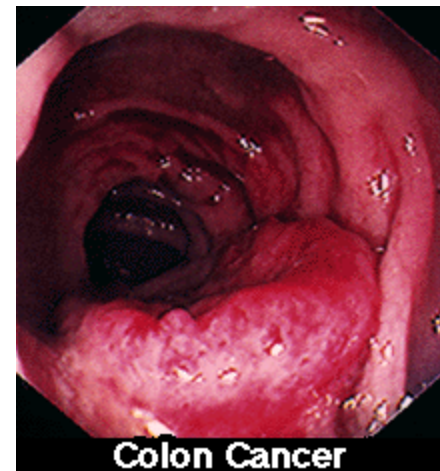
# EGESTION:

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- ▶ Occurs in the large intestine
- ▶ Main component of feces:
  - ▶ Cellulose: makes up plant cell walls, cannot be digested by humans
  - ▶ Living and dead bacteria
  - ▶ Water
- ▶ Toxic wastes are removed through egestion
  - ▶ People who don't eat enough cellulose (plant material and fibre) have fewer bowel movements and are at risk of colon cancer



Normal Colon Lining



Colon Cancer

