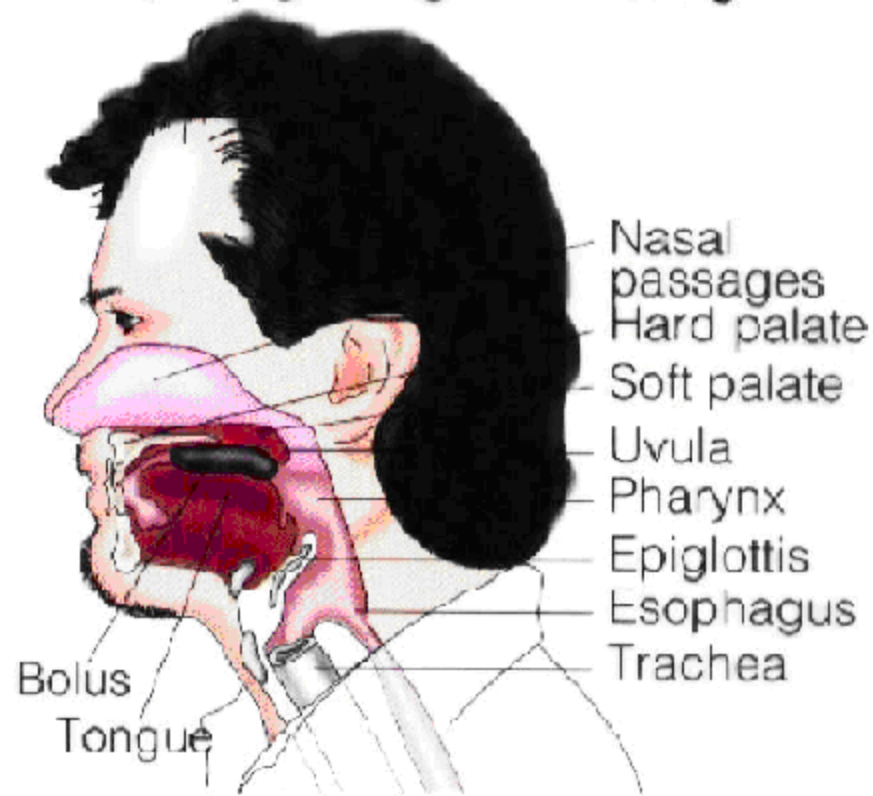


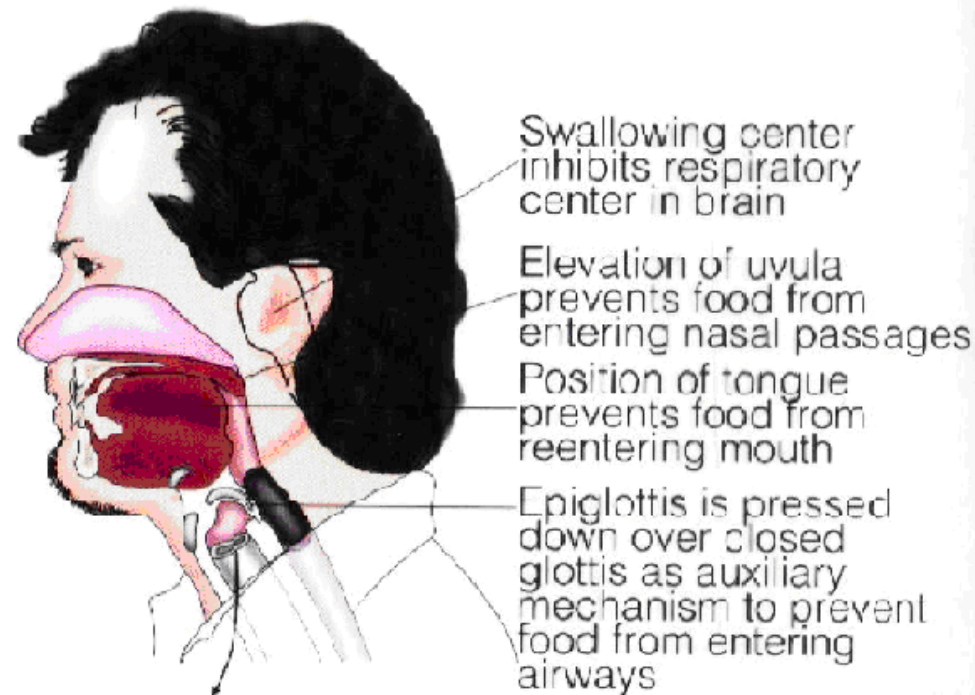
# Chewing (mastication)

Voluntary, but has more of reflex behavior

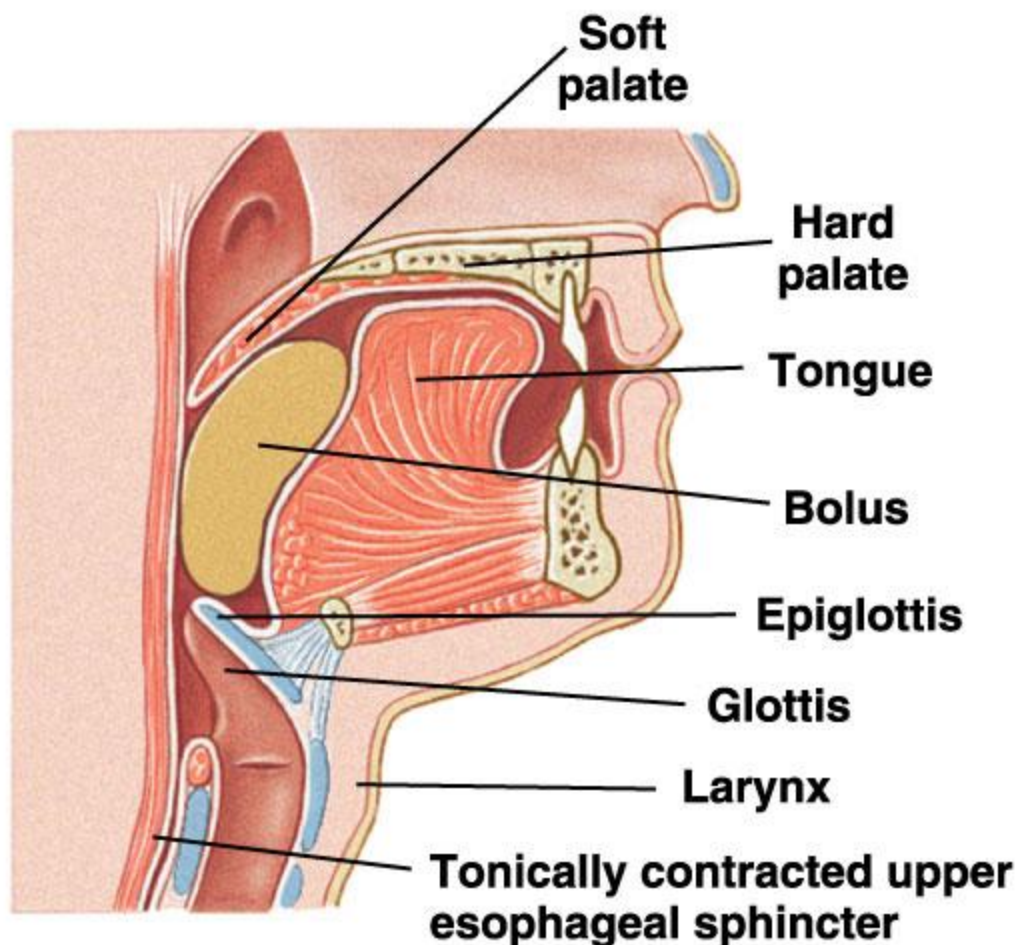
Mixing of food with saliva and grinding



Glottis at entrance of larynx



**Step 1**



**1. Tongue pushes bolus against soft palate and back of mouth, triggering swallowing reflex.**

# Gastrointestinal Motilities

# Swallowing

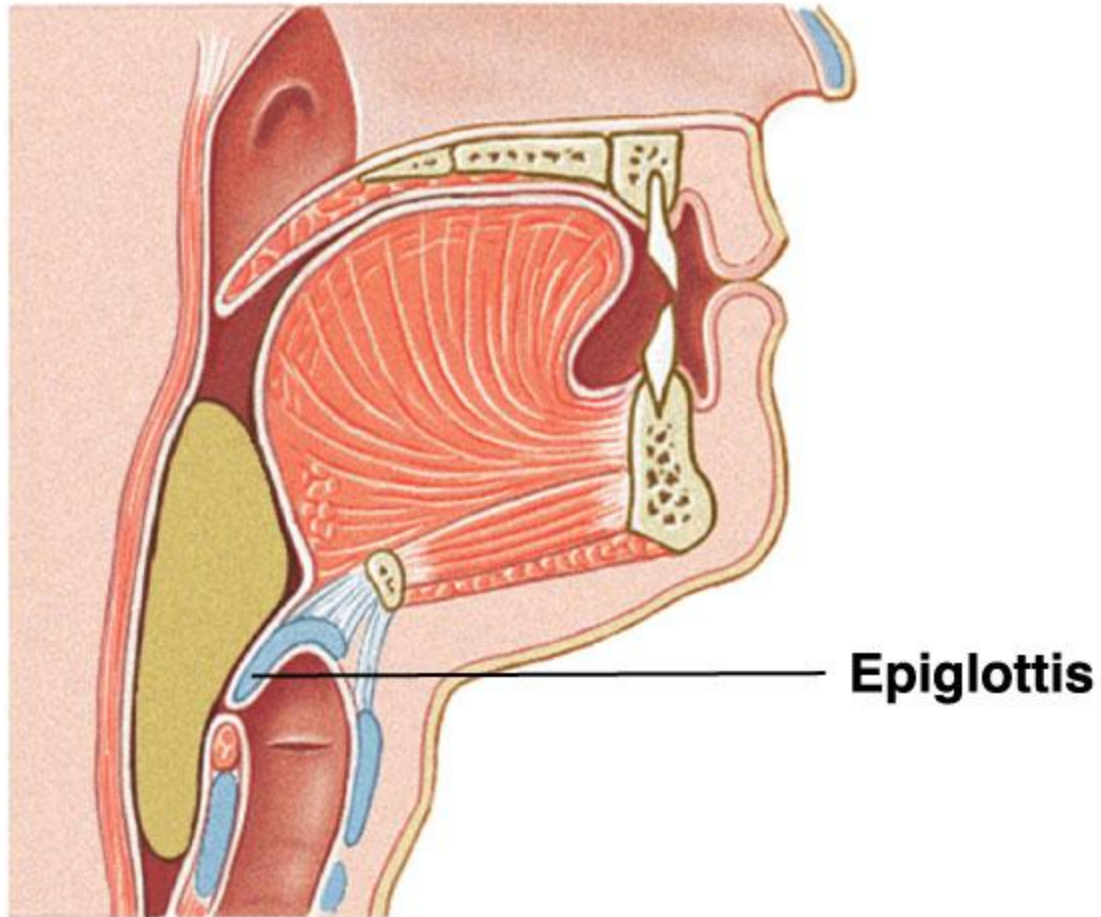
## Swallowing (deglutition)

- initiated voluntarily
- Continuing as involuntary reflex

### - **Voluntary stage:**

in which tongue is pressing food by upward and backward movement against soft palate, which results in squeezing food bolus into pharynx.

**Step 2**



**2. Upper esophageal sphincter relaxes while epiglottis closes to keep swallowed material out of the airways.**

# Swallowing

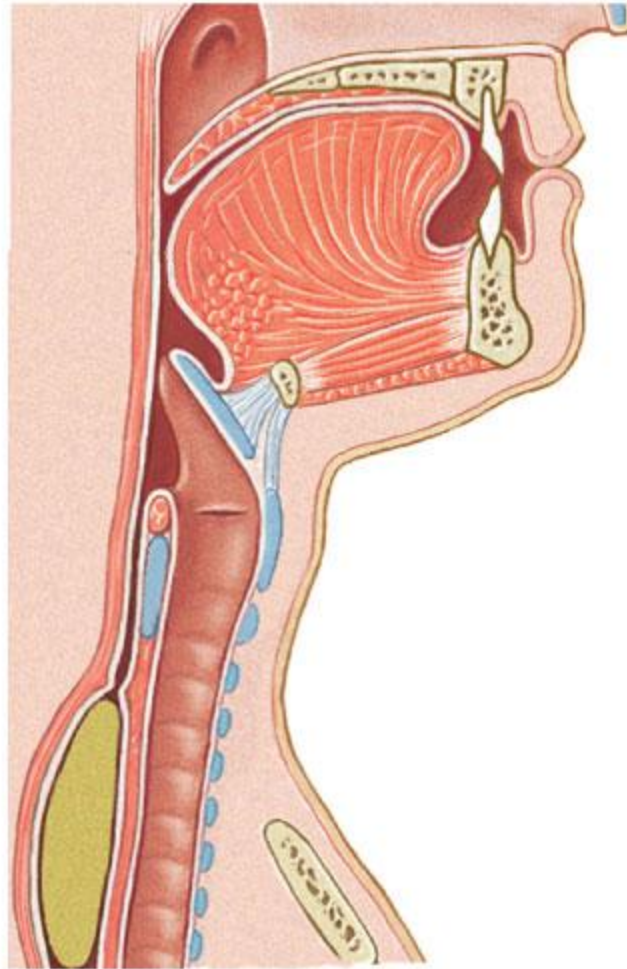
## Involuntary stages

Reflexes initiated by introducing food into pharynx.

- **Pharyngeal phase:**
- **Esophageal phase:**
  - **Primary peristaltic contractions**
  - **Secondary peristaltic contractions**

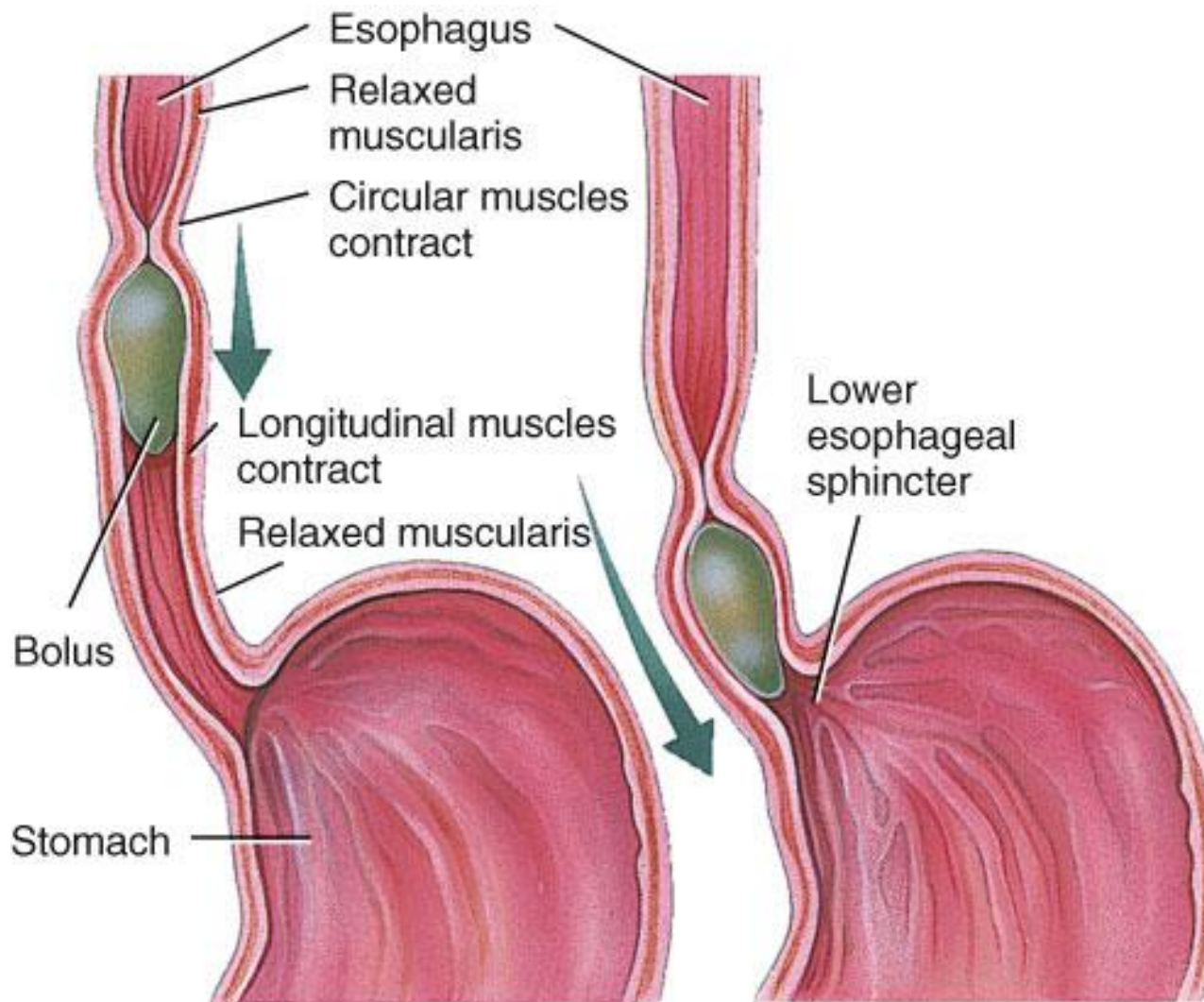


**Step 3**



**3. Food moves downward into the esophagus, propelled by peristaltic waves and aided by gravity.**



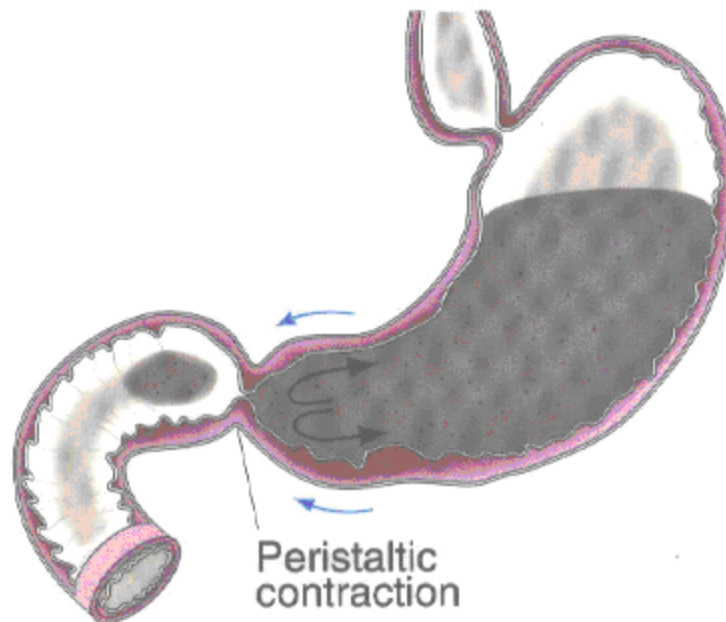
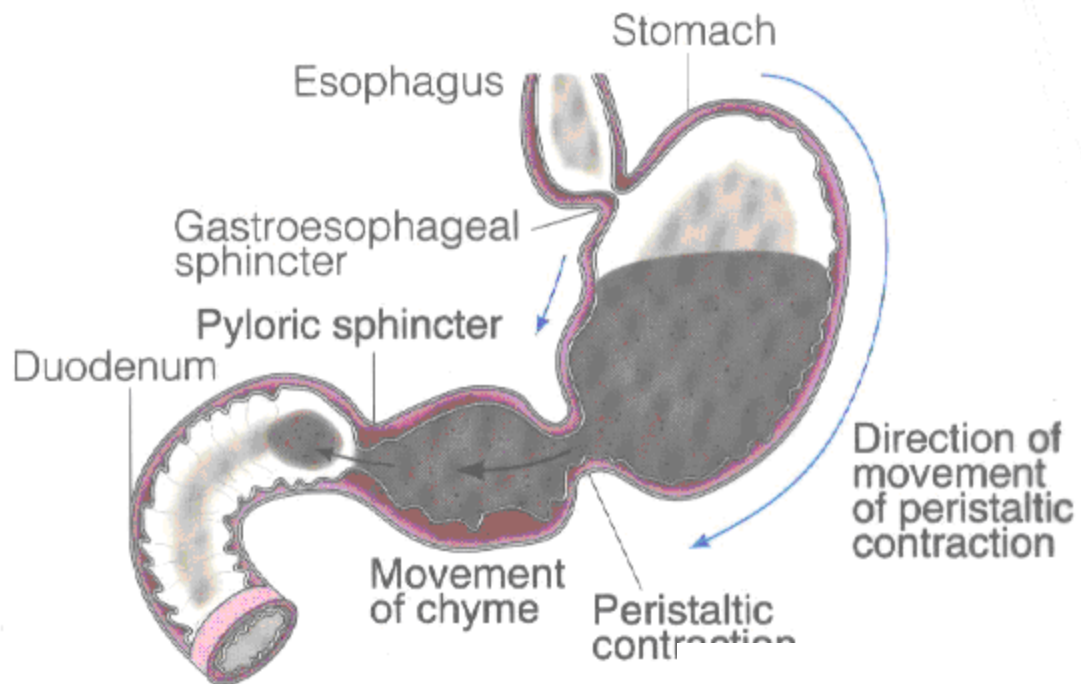


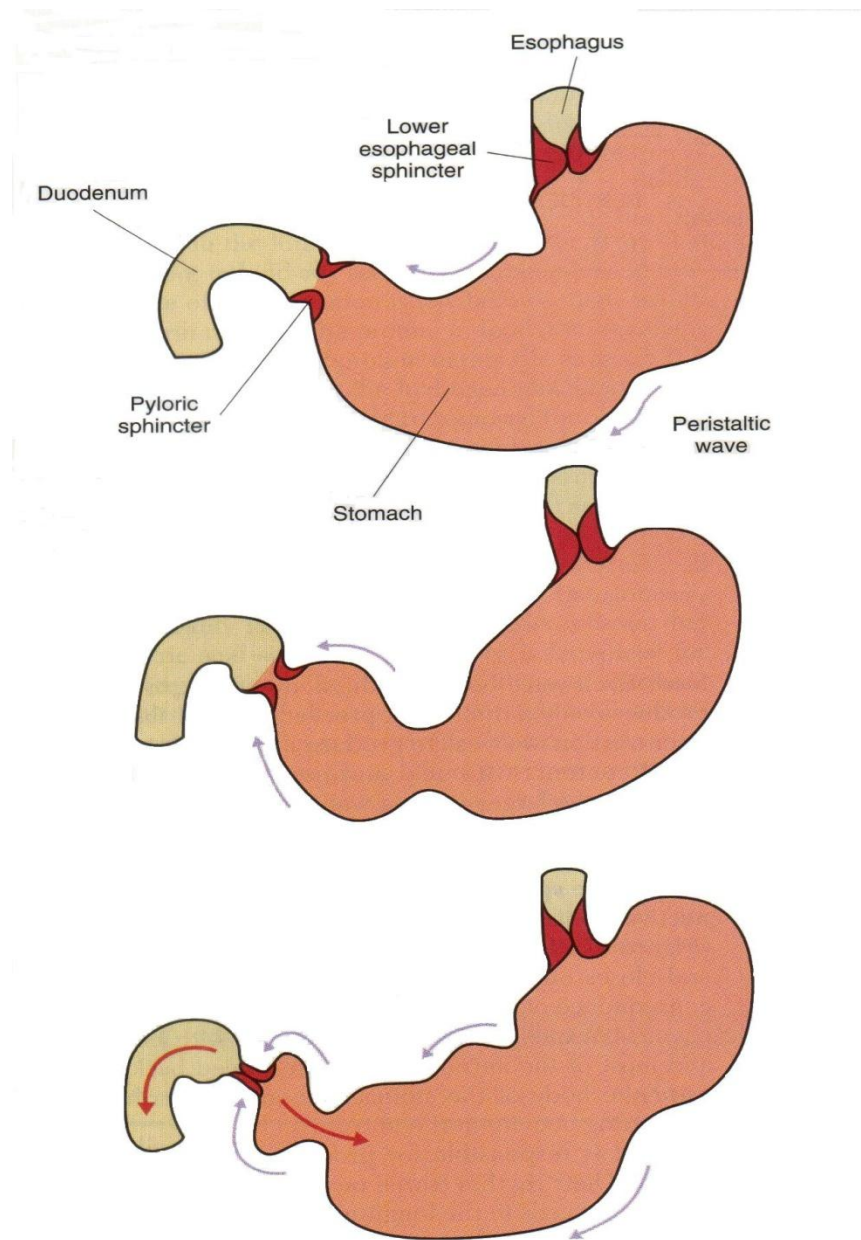
Anterior view of frontal sections peristalsis in esophagus

# Gastric Motilities

- Receptive relaxation
- Gastric Peristaltic movements
  - Retropulsion
  - Gastric emptying
- Hunger contractions

## Gastric Emptying and Mixing as a Result of Antral Peristaltic Contractions

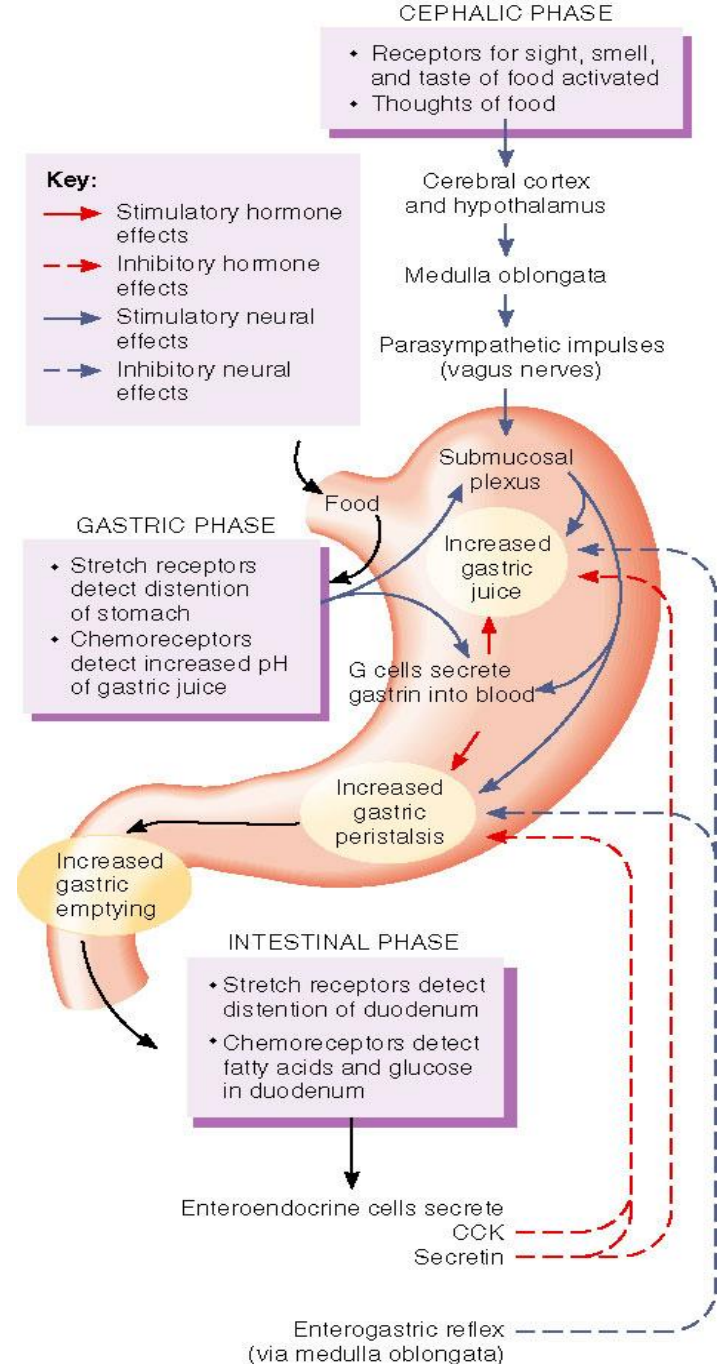




# Gastric Motilities

- Receptive relaxation
- Gastric Peristaltic movements
  - Retropulsion
  - Gastric emptying
- Hunger contractions

# Control of Gastric Motility



# Motility in Small Intestine

Site of most digestion and absorption:  
*duodenum and jejunum*

types of movement

**Segmentation** (mixing) - digestive state

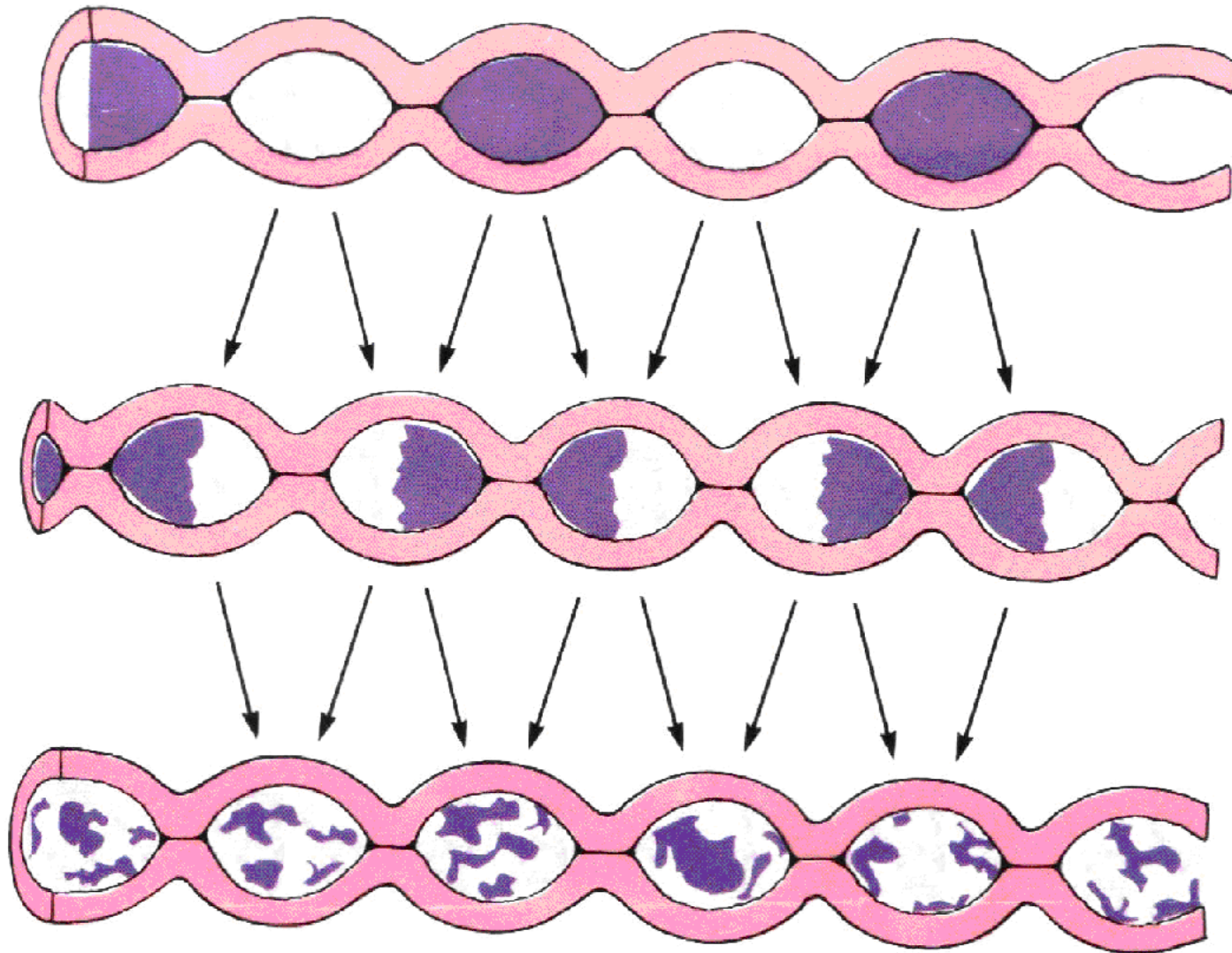
**Peristalsis** (propulsive)-inter-digestive

**Migrating** motor complex

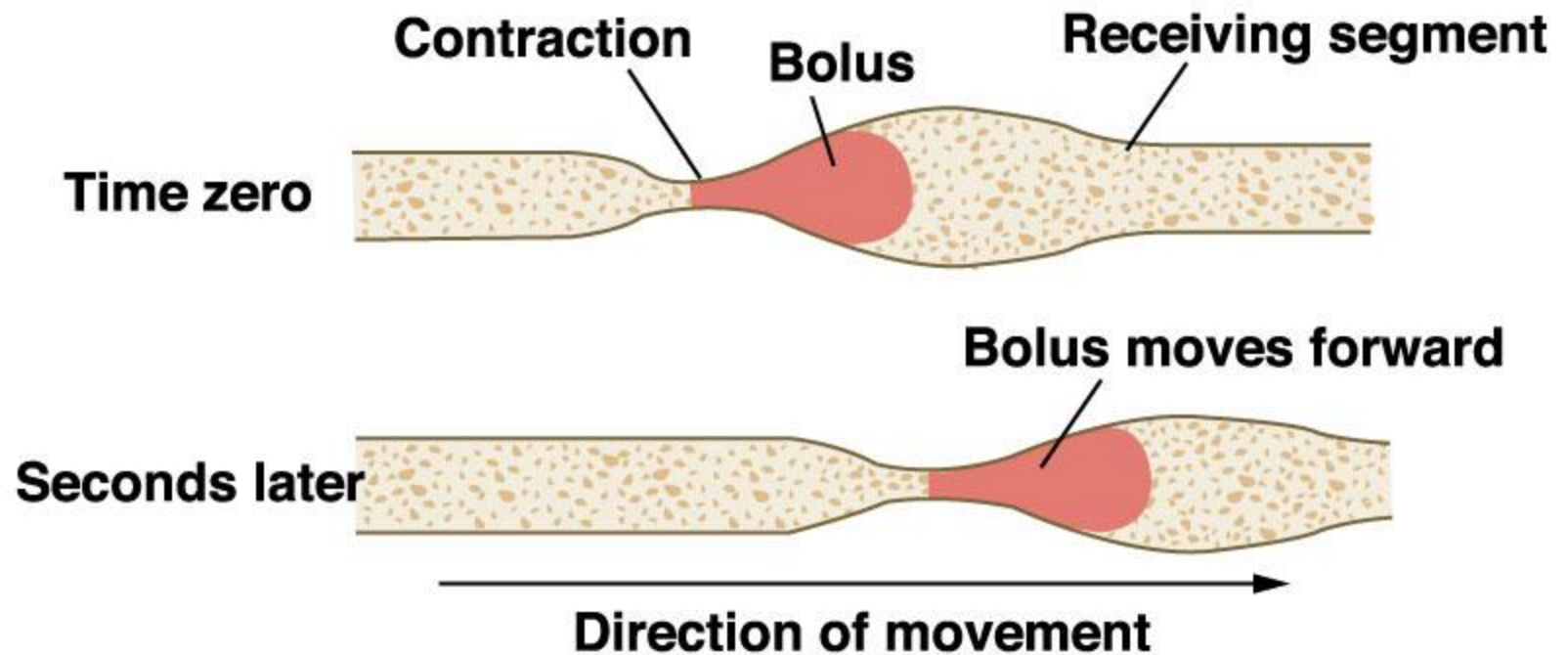
**Peristaltic rush** (power propulsion)



## Segmentation



**Peristaltic contractions are responsible  
for forward movement**



# Migrating motor complex

cycle of quiescence and intense motor activity that begins in antrum and continues along the small intestine

**Function:** Sweeps the stomach and intestine between meals.

# Other movements

- **Peristaltic rush:**

Remove harmful agents-

- **Movements caused by the - activity of muscularis mucosa: :**

Spreading chyme -  
over the mucosa-

# Control of Intestinal movements

- **Electrical activity of muscle-**
- **Neural control: ENS, ANS**
- **Hormonal control**
  - **Gastrin, CCK, Serotonin** enhance intestinal motility.
  - **Secretin and Glucagon** inhibit intestinal motility.

# Summary of Motilities of Small intestine

**Segmentation contraction:** characterize the digestive or fed state and have mixing effects

**Peristaltic contractions:** mainly Propulsive effect

**Migrating motor complex** characterizes the inter-digestive state, ended with ingestion of food

**Peristaltic rush** is a response to harmful agents

# Motilities of the Colon

- **Haustration contractions:**

effect: **propulsive**

- **Mass contractions: -**

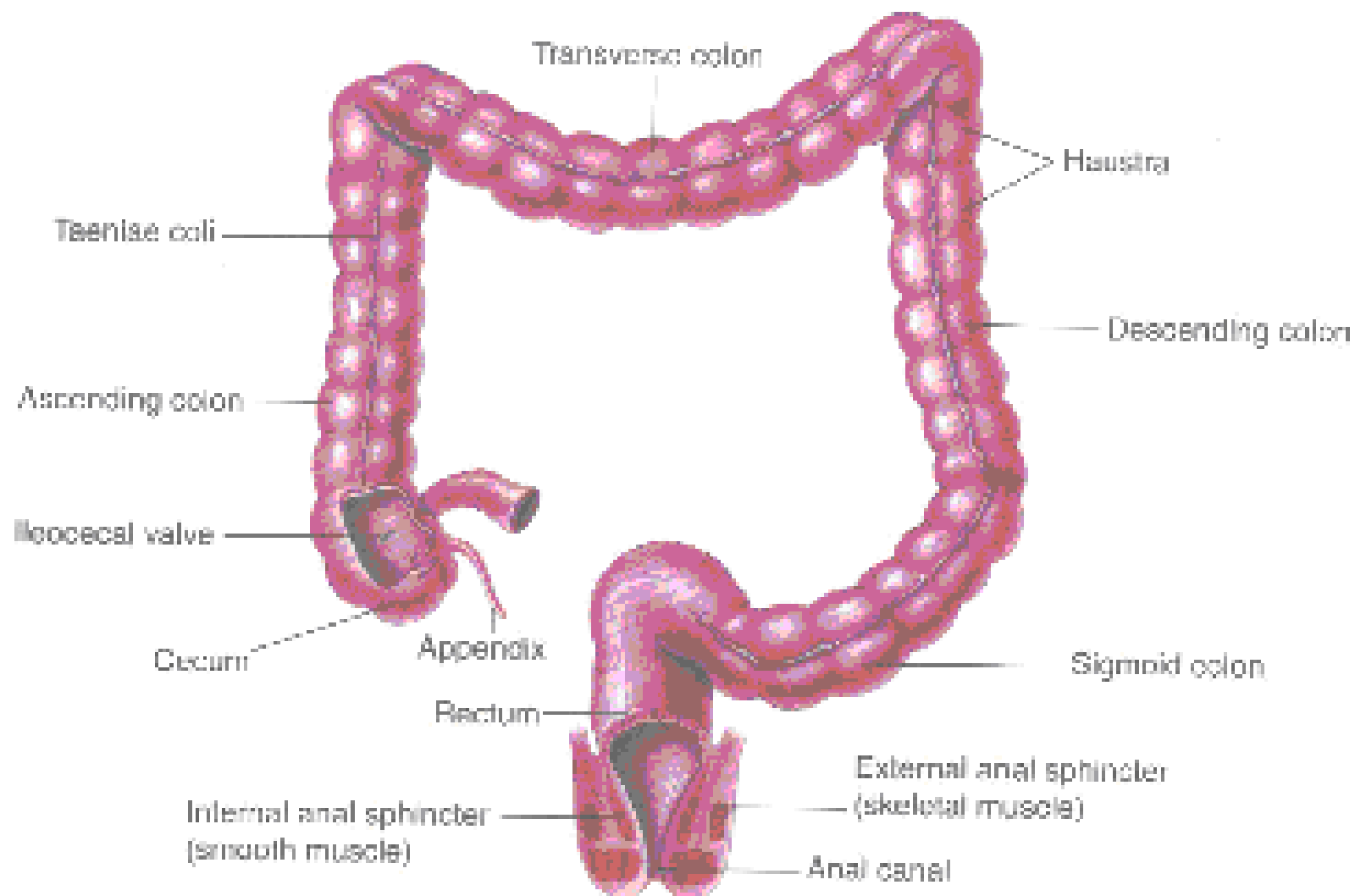
- facilitated by:

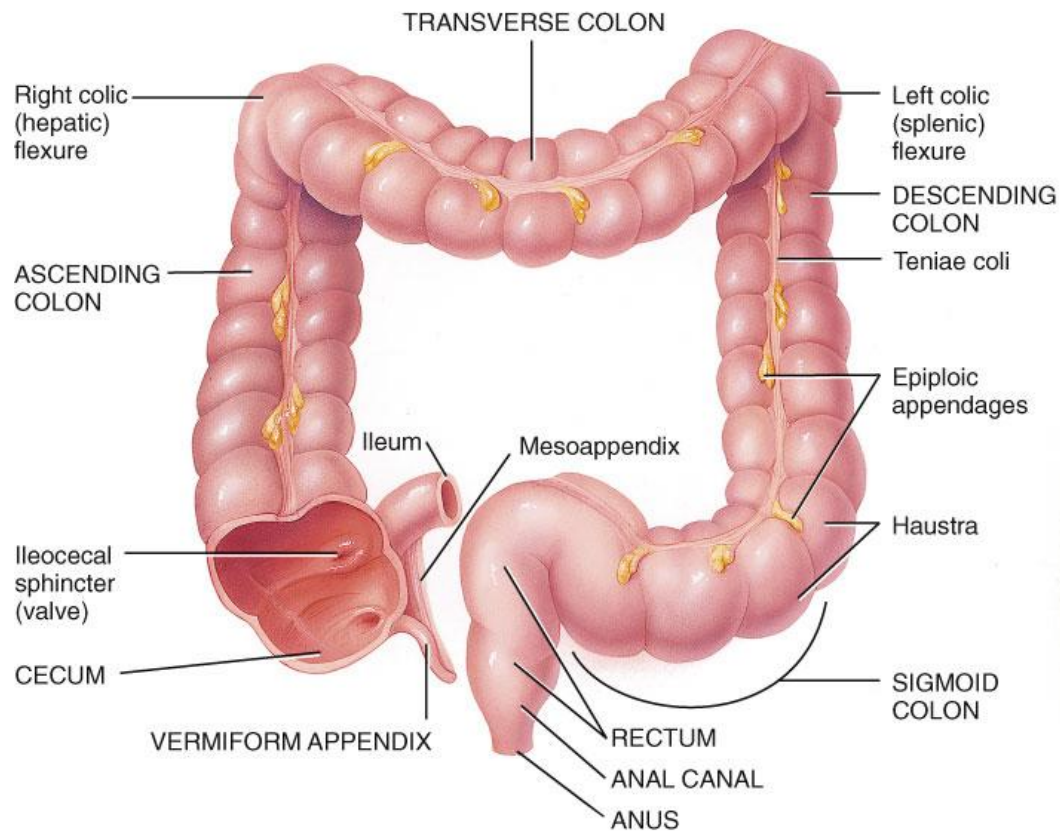
gastrocolic and duodenocolic reflexes-

effect: **propulsive**

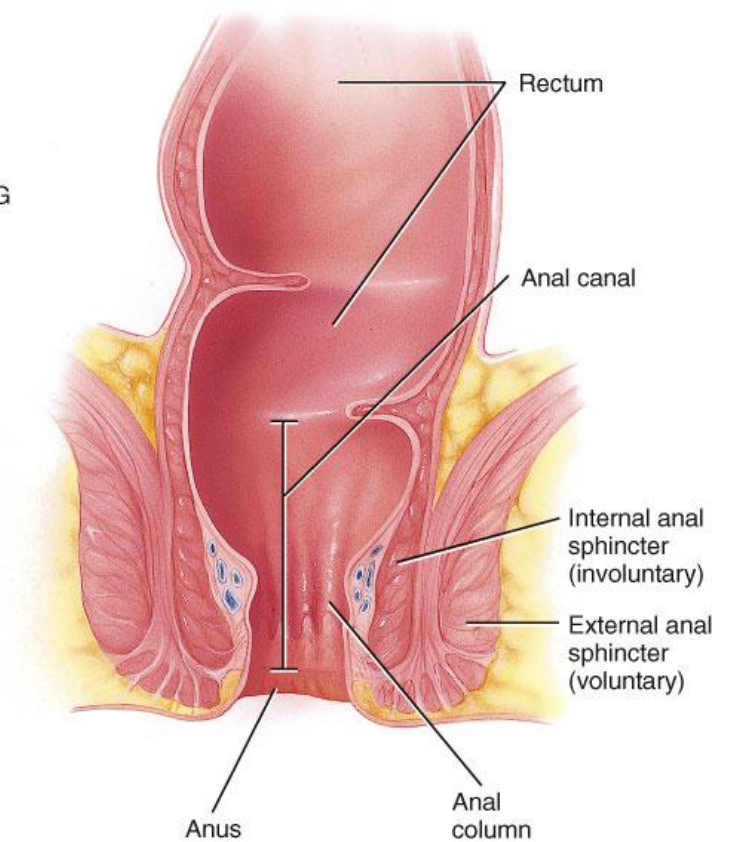


## Anatomy of Large Intestine





(a) Anterior view of large intestine showing major regions



(b) Frontal section of anal canal

# Defecation

- **Intrinsic reflexes**
- **Extrinsic reflexes**