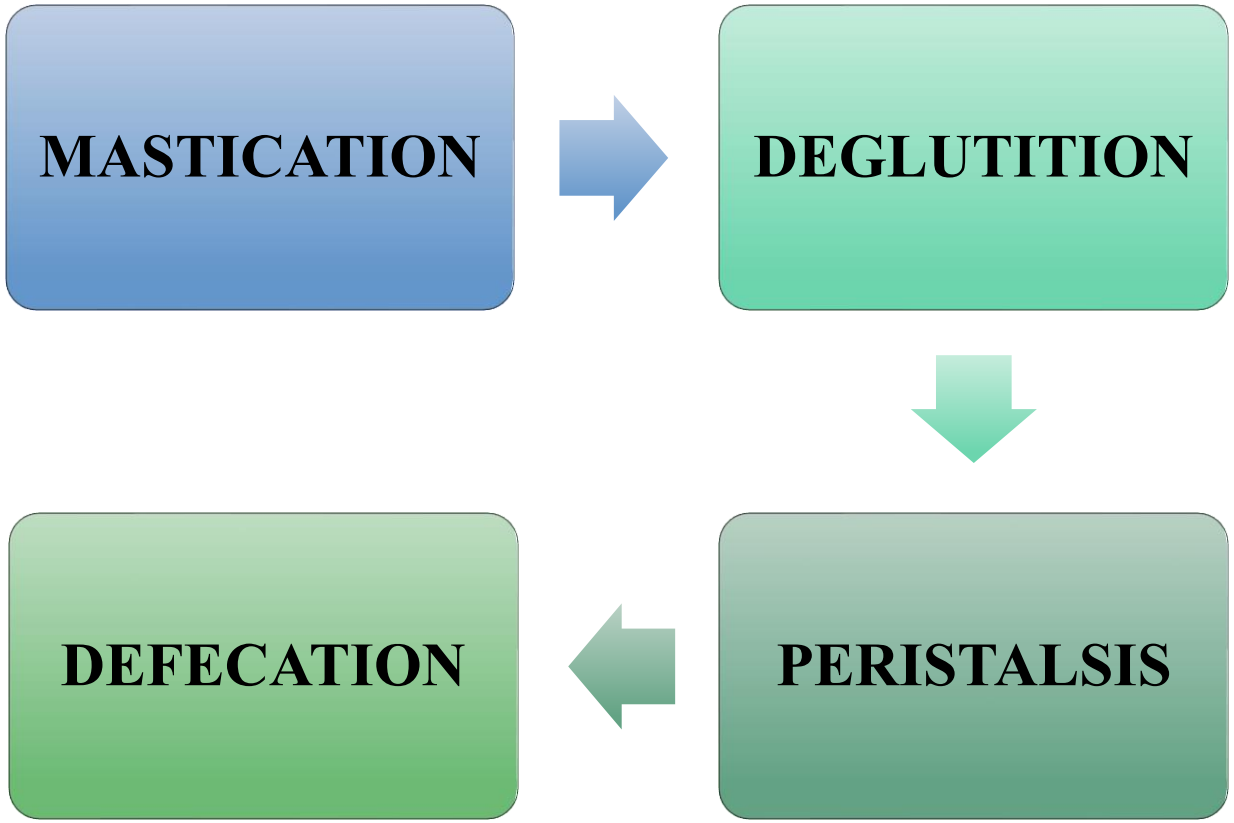
MOVEMENTS OF GUT

Dr. Savita

Types of Movement of Gut



MASTICATION

- Mastication or **chewing** is the first mechanical process in the gastrointestinal (GI) tract, by which the food substances are **torn or cut** into small particles and crushed or ground into a soft **bolus.**

SIGNIFICANCES OF MASTICATION

1. **Breakdown** of foodstuffs into smaller particles.
2. **Mixing** of saliva with food substances thoroughly.
3. **Lubrication** and **moistening** of dry food by saliva, so that the bolus can be easily swallowed.
4. **Appreciation** of taste of the food.

MUSCLES OF MASTICATION

1. Masseter muscle
2. Temporal muscle
3. Pterygoid muscles
4. Buccinator muscle.

MOVEMENTS OF MASTICATION

1. Opening and closure of mouth
2. Rotational movements of jaw
3. Protraction and retraction of jaw

CONTROL OF MASTICATION

- Action of mastication is mostly a reflex process.
- It is carried out voluntarily also.
- The center for mastication is situated in **medulla** and **cerebral cortex**.
- Muscles of mastication are supplied by **mandibular division of 5th cranial (trigeminal) nerve.**

DEGLUTITION

- Deglutition or **swallowing** is the process by which food moves from mouth into stomach.

Stages of Deglutition

- Deglutition occurs in three stages:

I. Oral stage, when food moves from mouth to pharynx

II. Pharyngeal stage, when food moves from pharynx to esophagus

III. Esophageal stage, when food moves from esophagus to stomach.

ORAL STAGE OR FIRST STAGE

- Oral stage of deglutition is a voluntary stage.
- In this stage, the bolus from mouth passes into pharynx by means of series of actions.

Sequence of Events during Oral Stage

1. Bolus is placed over postero-dorsal surface of the tongue.

It is called the preparatory position

2. Anterior part of tongue is retracted and depressed.

3. Posterior part of tongue is elevated and retracted against the hard palate.

This pushes the bolus backwards into the pharynx.

4. Forceful contraction of tongue against the palate produces a positive pressure in the posterior part of oral cavity.

This also pushes the food into pharynx.

PHARYNGEAL STAGE OR SECOND STAGE

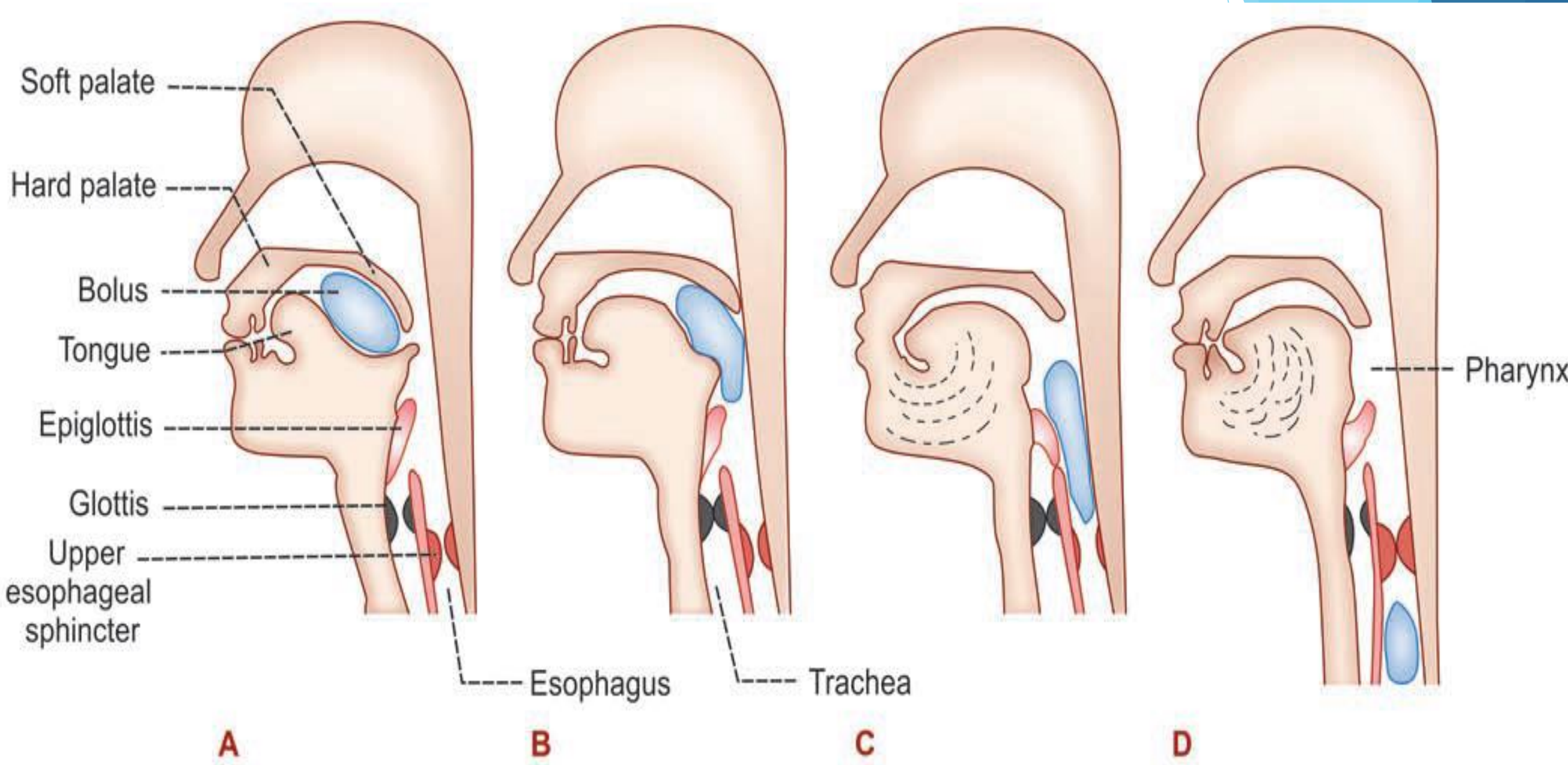
- Pharyngeal stage is an involuntary stage.
- In this stage, the bolus is pushed from pharynx into the esophagus.
- Pharynx is a common passage for food and air.
- It divides into larynx and esophagus.
- Larynx lies anteriorly and continues as respiratory passage.
- Esophagus lies behind the larynx and continues as GI tract.

- Since pharynx communicates with mouth, nose, larynx and esophagus, during this stage of deglutition, bolus from the pharynx can enter into four paths:
  1. Back into mouth
  2. Upward into nasopharynx
  3. Forward into larynx
  4. Downward into esophagus.

ESOPHAGEAL STAGE OR THIRD STAGE

- Esophageal stage is also an involuntary stage.
- In this stage, food from esophagus enters the stomach.
- Esophagus forms the passage for movement of bolus from pharynx to the stomach.
- Movements of esophagus are specifically organized for this function and the movements are called peristaltic waves.
- Peristalsis means a wave of contraction, followed by the wave of relaxation of muscle fibers of GI tract, which travel in aboral direction (away from mouth).
- By this type of movement, the contents are propelled down along the GI tract.

Stages of deglutition. **A.** Preparatory stage; **B.** Oral stage; **C.** Pharyngeal stage; **D.** Esophageal stage



PERISTALSIS

- Typical movement of oesophagus, stomach and intestine is called Peristalsis.
- After food is swallowed, it is moved down the esophagus by Peristalsis.
- The muscle in the stomach, small intestine and large intestine continue the process.
- When bolus reaches the esophagus, the peristaltic waves are initiated. Usually, two types of peristaltic contractions are produced in esophagus.

1. Primary peristaltic contractions
2. Secondary peristaltic contractions

1. Primary peristaltic contractions

- When bolus reaches the upper part of esophagus, peristalsis starts.
- This is known as primary peristalsis.
- After origin, the peristaltic contractions pass down through the rest of the esophagus, propelling the bolus towards stomach.
- Pressure developed during the primary peristaltic contractions is important to propel the bolus.

2. Secondary peristaltic contractions

- If the primary peristaltic contractions are unable to propel the bolus into the stomach, the secondary peristaltic contractions appear and push the bolus into stomach.

Role of Lower Esophageal Sphincter

- Distal 2 to 5 cm of esophagus acts like a sphincter and it is called lower esophageal sphincter.
- It is constricted always.
- When bolus enters this part of the esophagus, this sphincter relaxes so that the contents enter the stomach.
- After the entry of bolus into the stomach, the sphincter constricts and closes the lower end of esophagus.
- The relaxation and constriction of sphincter occur in sequence with the arrival of peristaltic contractions of esophagus

DEFECATION

- Voiding of feces is known as defecation.
- Feces is formed in the large intestine and stored in sigmoid colon.
- By an appropriate stimulus, it is expelled out through the anus.
- Act of defecation is preceded by voluntary efforts like assuming an appropriate posture, voluntary relaxation of external sphincter and the compression of abdominal contents by voluntary contraction of abdominal muscles.

- Usually, the rectum is empty.
- During the development of mass movement, the feces is pushed into rectum and the defecation reflex is initiated.
- The process of defecation involves the contraction of rectum and relaxation of internal and external anal sphincters.

THANK YOU