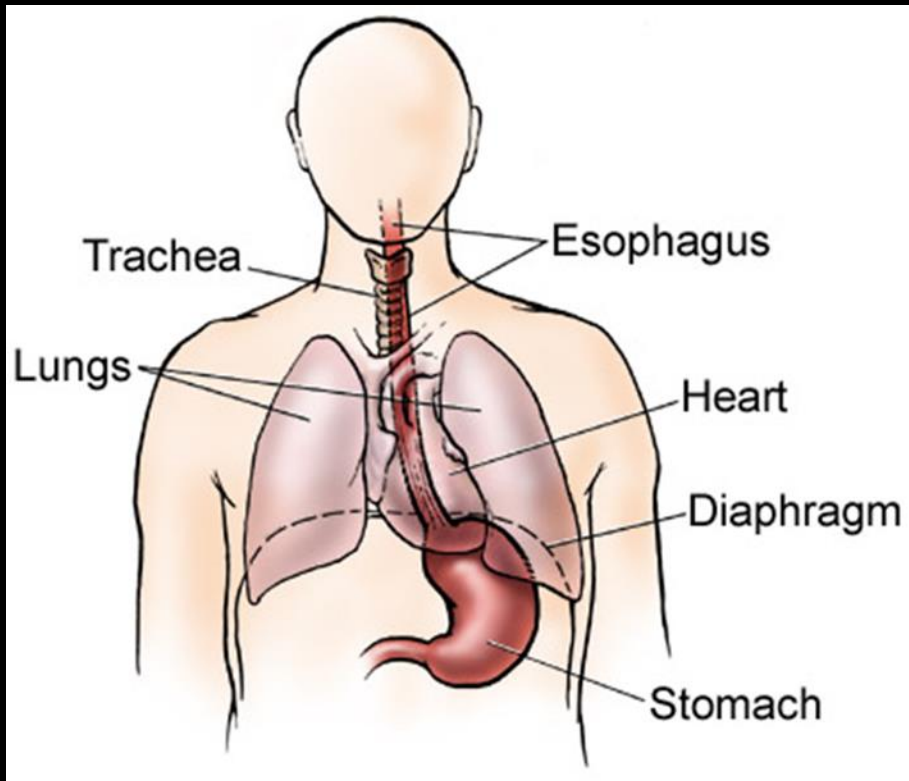


# Esophageal Motility

# Learning outcomes

- LO1: Should know the anatomical landmarks of esophagus and its physiological function
- LO2: Histology of esophagus and its relation to different pathology of esophageal diseases
- LO3: The physiological function of esophagus and how it initiate the swallowing of food
- LO4: The causes of motility disorder of the esophagus
- LO5: Example of esophageal motility disorder like Achalasia (causes, clinical presentation, diagnosis and treatment)

# Anatomy of The Esophagus



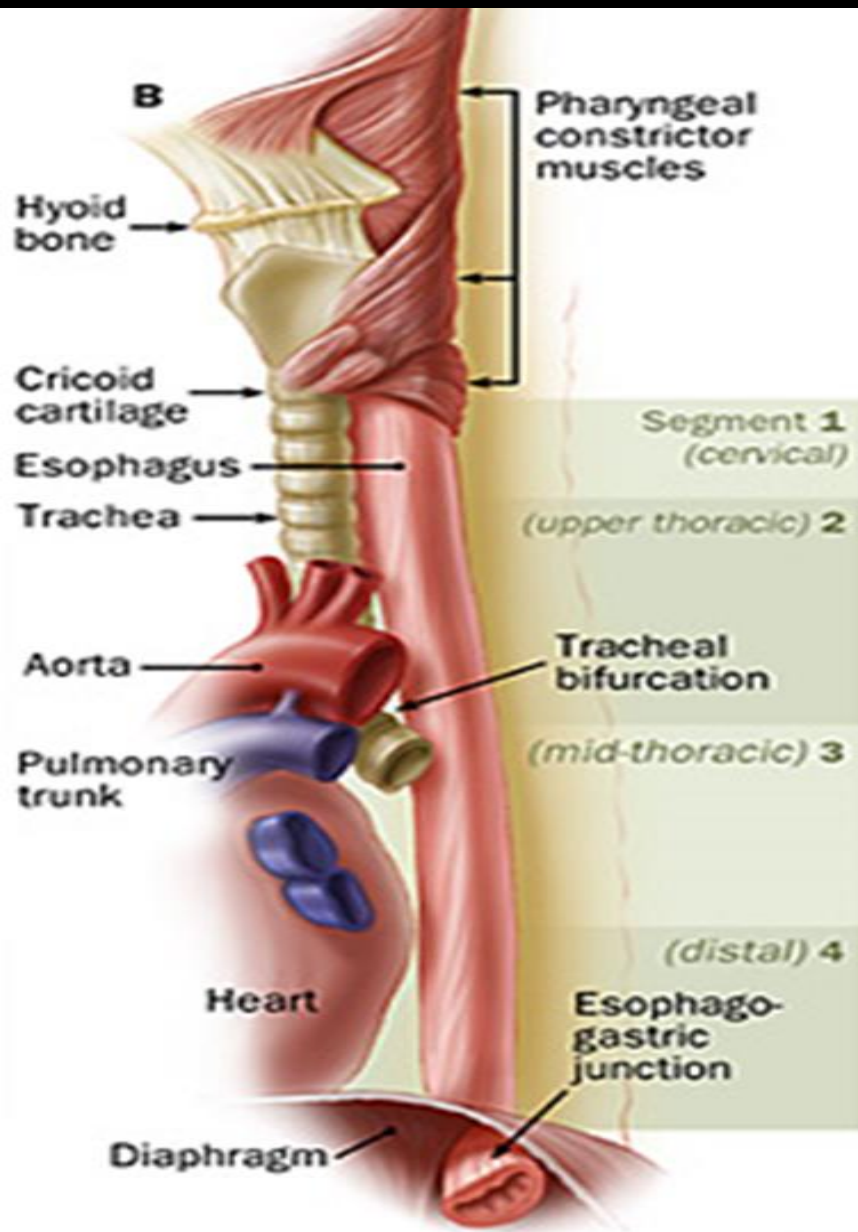
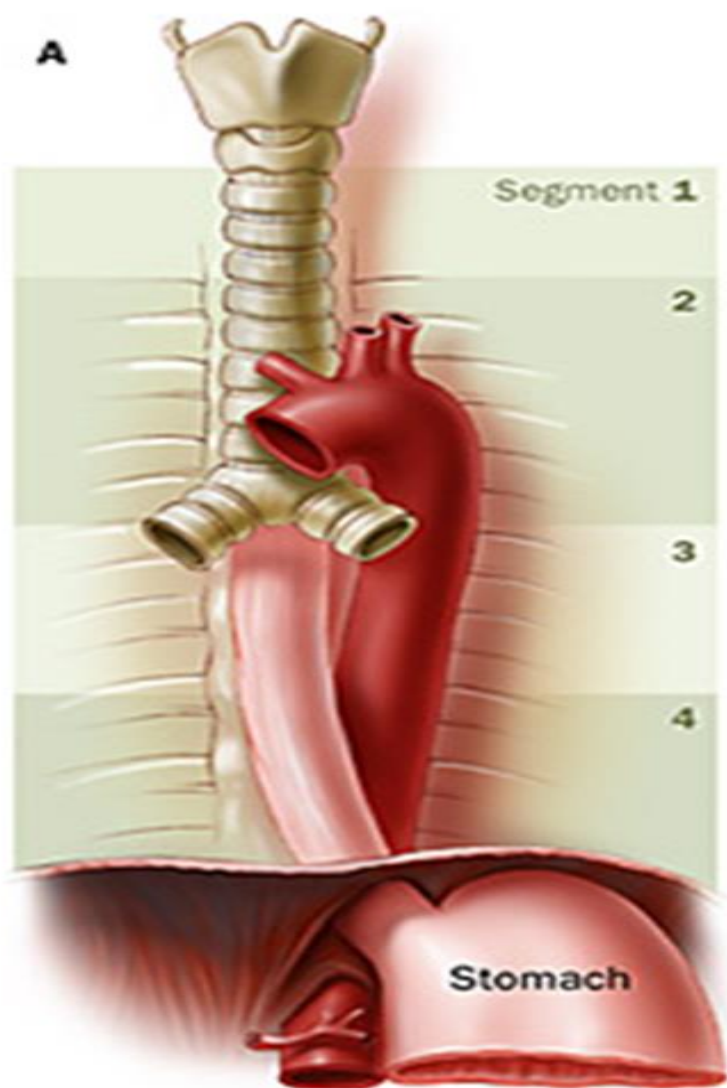
- **The esophagus is a hollow muscular organ, approximately 25cm in length that extend from the pharynx to the stomach**
- **Back: vertebra (C6---T11)**
- **Front: larynx & lower airway**
- **Innervation mainly by celiac ganglia (Vagus n.)**

# Clinical facts about the esophagus

- **Cervical esophagus** :Is 5 cm in length and 15cm distance from upper incisors
- **Thoracic esophagus** :Is 12cm in length and 25cm distance from upper incisors
- **Abdominal Esophagus**: Is the smallest portion of the esophagus (2-4cm length). It has lower esophageal sphincter (LES)- non anatomical with normal resting pressure 10-20mmHg

# Lower Esophageal Sphincter

- **Pressure barrier between esophagus and stomach.**
- **Relaxes shortly after swallow**
- **LES must prevent reflux from the positive intra abdominal to the negative intra thoracic pressure. Effectiveness depends on the resting pressure of the LES, abdominal length of the esophagus, overall length of the esophagus.**



# Histology Of The Esophagus

## ■ The esophageal wall:

- The proximal esophagus is predominantly striated muscle.
- The distal esophagus is predominantly smooth muscle.
- The mid esophagus contained a graded transition of striated and smooth muscle.





# Histology of The Esophagus

## ■ The esophageal wall:

- Beneath the muscle layers lies the submucosa which contain mucus gland, blood and lymphatic vessels and network works of nerve fibers (meissners).
- Beneath the submucosa is the mucosa which consist of squamous epithelium except the distal 2cm at G-E junction (Z-line) or transition to columnar epithelium.

# Physiology of The Esophagus

- The function of the esophagus is to transport the ingested material from the pharynx to the stomach by peristaltic waves.

# Esophageal Motility Disorders

- **Achalasia**
- **Spastic esophageal motility disorders such as diffuse esophageal spasm, nutcracker esophagus and hypertensive LES**
- **Secondary esophageal motility disorders related to scleroderma, diabetes, alcohol consumption -----**

# Achalasia (failure to relax)

- **Is the only esophageal motility disorder with an established pathology.**
- **The predominant pathophysiology of achalasia is the loss of Auerbach ganglion cells from the wall of the esophagus , starting at LES and progress proximally.**

- **Characterized by failure of LES to relax completely during swallowing**
- **The loss of nerve ganglion along the esophageal wall cause a peristalsis leading to stasis of food and subsequent dilatation.**

# Clinical History Achalasia

- **The hall mark is dysphagia to both solid and liquid.**
- **Regurgitation commonly occur at night**
- **Retrosternal chest pain.**
- **Heartburn occur in 30% of patients which may be related to food fermentation and lactic acid.**

# Diagnosis

- **History**
- **Physical examination-unremarkable**
- **Barium Swallow**
- **Bird peak appearance- classic for achalasia**





- ❑ **Esophagoscopy to rule out tumor or inflammatory lesion but not to diagnose esophageal dysmotility.**
- ❑ **Manometry study is to evaluate the esophageal motor pattern, contraction amplitude and LES pressure (Manometry may reveal elevated LES pressure > 40 mmHg in 60% of patients)**

# Treatment

- The primary goal is symptomatic relief directed at relieving the physiologic obstruction at the level of LES by **surgical** or **balloon dilatation**.
- Nitrate and Calcium channel blockers are currently used in all patients with esophageal motility disorders.
- Antireflux therapy e.g. proton pump inhibitors (esomeprazole) + prokinetic such as domperidone or erythromycin.

- **Botulinum toxin injection (Botox):** Injected endoscopically into LES. Inhibitor of acetylcholine release from nerve terminals. It is indicated in those pt. not candidate for surgery or refuse surgery.
- **Endoscopic balloon dilatation:** This is the standard therapy for patients with achalasia.
- **Surgery (Heller Myotomy):** surgical treatment targets to disrupt the LES.