

به نام خدا



Gastro esophageal Reflux Disease (GERD) and its management

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Objectives

- Definition of GERD
- Epidemiology of GERD
- Pathophysiology of GERD
- Clinical Manifestations
- Diagnostic Evaluation
- Treatment
- Complications

Anatomy

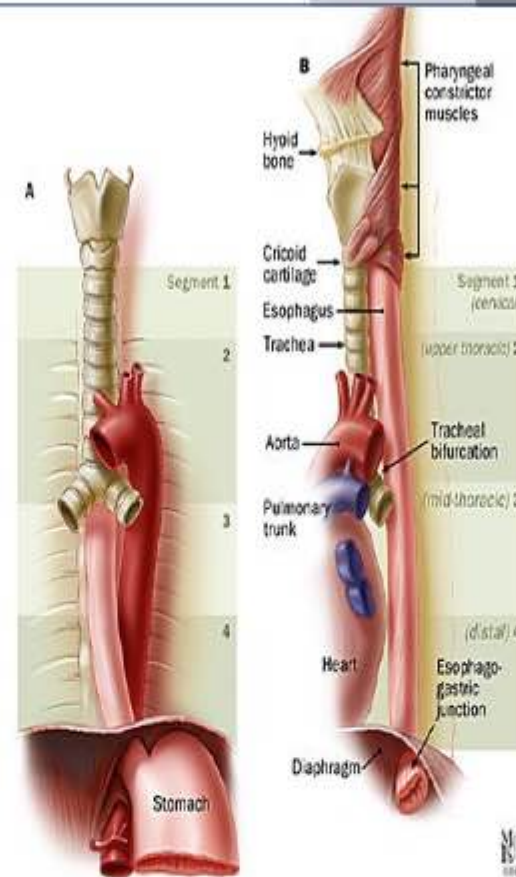
► The esophagus serves as a conduit between the pharynx and the stomach. The body of the esophagus is approximately 18–25 cm long, extending from the upper esophageal **sphincter (C5–C6 vertebral space at the junction of the pharynx and the esophagus)** to the lower **esophageal sphincter (T10 level at the junction of the esophagus and the stomach)**. The length of the esophagus correlates with an individual's height and is usually longer

► The esophagus transports food from the mouth to the stomach in a caudad direction and prevents the retrograde movement of gastric or esophageal contents. It is a hollow tube closed at the upper end by the upper esophageal sphincter and at the lower end by the lower esophageal sphincter.

lined with non-keratinizing stratified squamous epithelium. Underneath is a supporting layer of connective tissue called the lamina propria and a longitudinally oriented, thin layer of muscle fiber (muscularis mucosae). **These three layers compose the mucosal layer. The submucosa consists of loose connective tissue, blood vessels, lymphatics, and nerves. The muscularis propria has two layers, an inner circular muscle layer with circumferential fibers and an outer longitudinal layer with fibers oriented along the axis.**

The muscle in the muscularis mucosae is smooth along the length of the esophagus, whereas the muscularis propria is composed of striated

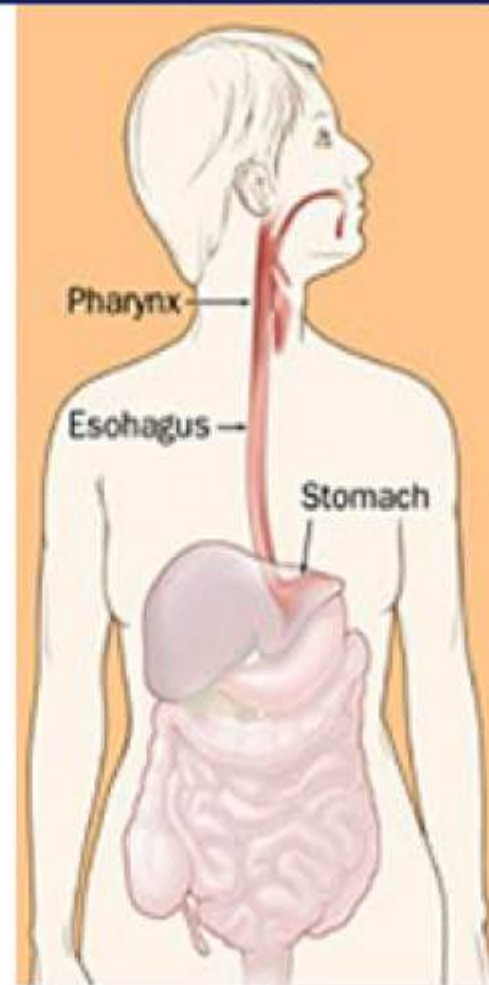
. This network communicates to the central nervous system via the vagi, the adrenergic ganglia, and the celiac ganglia



- ▶ **The junction of the esophagus** and the stomach lies caudad to the esophageal hiatus of the diaphragm.
- ▶ The **phrenicoesophageal** membrane is a peritoneal junction to the stomach (mean 1–2 cm).
- ▶ The **phrenicoesophageal membrane**, the **"intra-abdominal segment"** of the esophagus, **diaphragmatic crura**, **phreno-esophageal ligament**, **mucosal rosette**, and **angle of His** form a **barrier and limit refluxate into the lumen**.

transfer of

► Gastroesophageal reflux



GERD

What are the components of the EGJ
?

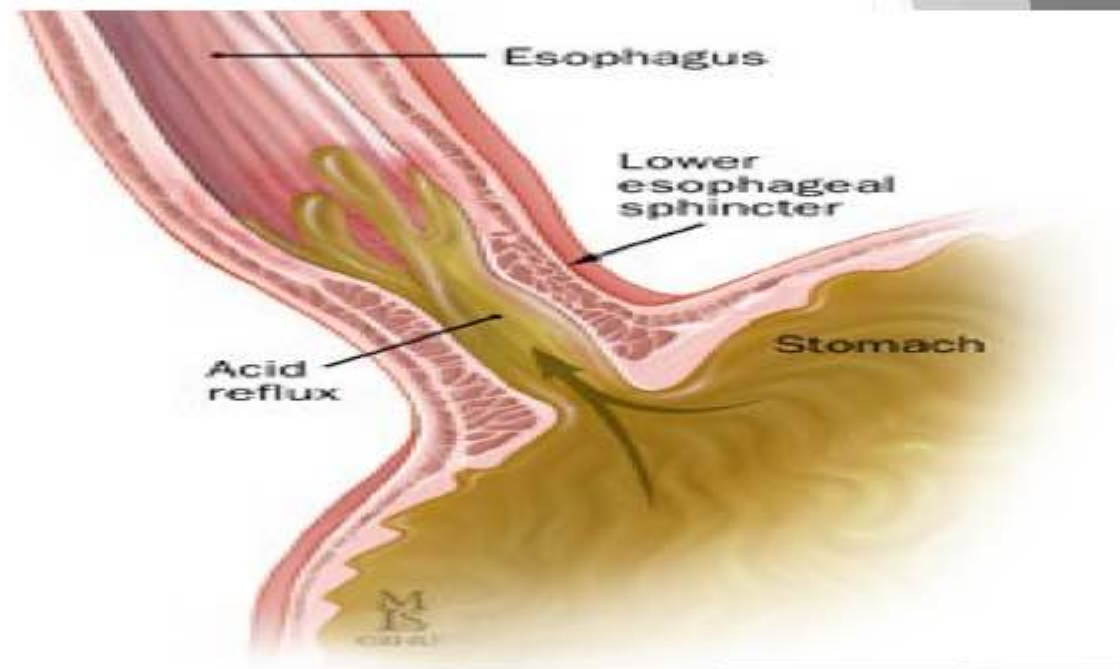
GERD

What is gastroesophageal reflux disease ?

Gastroesophageal **reflux** is the involuntary movement of gastric contents to the esophagus

. Gastroesophageal reflux is a normal physiological process that occurs several times a day **without** symptoms or damage of the esophageal mucosa in most otherwise healthy individuals.

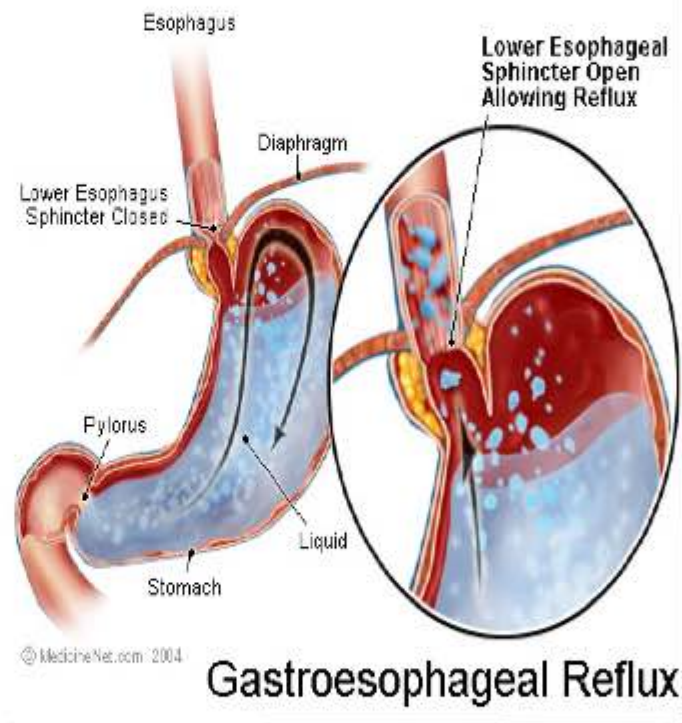
Gastroesophageal reflux disease (**GERD**) is a condition in which reflux of gastric contents into the esophagus produces frequent or severe symptoms that negatively affect the individual's quality of life or result in damage to esophagus, pharynx, or the respiratory tract.



Definition

Symptoms OR mucosal damage
produced by the abnormal
reflux of gastric contents into
the esophagus

Often chronic and relapsing
May see complications of GERD
in patients who lack typical
symptoms



Physiologic vs Pathologic

Physiologic GERD

- Postprandial
- Short lived
- Asymptomatic
- No nocturnal sx

Pathologic GERD

- Symptoms
- Mucosal injury
- Nocturnal sx

GERD

What is the epidemiology of GERD ?

Epidemiology

- GERD occurs in all ages but, most common in those older than 40 years of age.
- About 10-20% of people in western countries suffer from GERD symptoms on a weekly basis 30% of US
- About 7% have symptoms daily.
- Except for NERD and pregnancy , no much difference in incidence between men and women.
- But for Barrett's esophagus, prevalence is more in males particularly white adult males.

Pathogenesis

- Amount of esophageal damage seen dependent on:
 - Composition of refluxed material
 - Volume of refluxed material
 - Length of contact time
 - Natural sensitivity of esophageal mucosa
 - Rate of gastric emptying

Pathophysiology

) *DECREASED LOWER ESOPHAGEAL SPHINCTER
PRESSURE*



May be due to

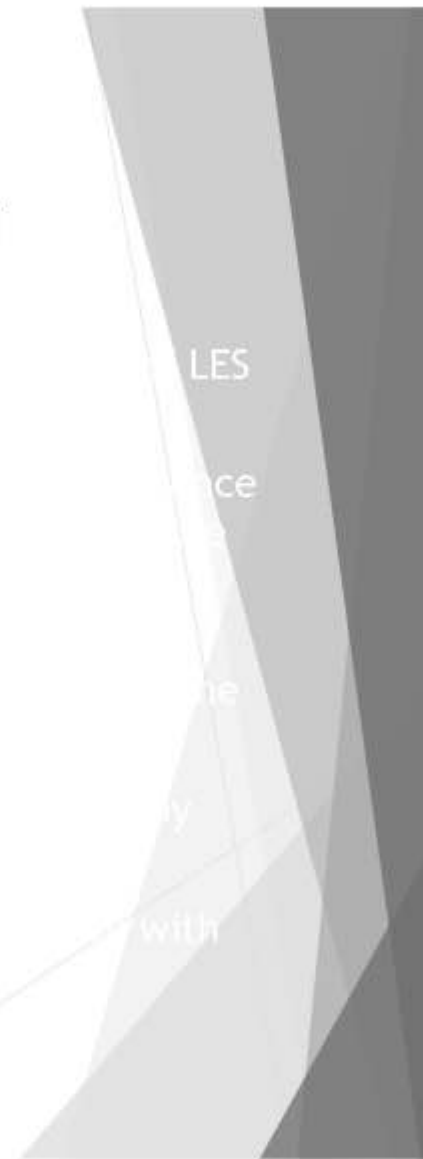


Pathophysiology (*contd.*)

DISRUPTION OF ANATOMICAL BARRIERS



ESOPHAGEAL CLEARANCE



Pathophysiology (contd.)

4) MUCOSAL RESISTANCE



DELAYED GASTRIC EMPTYING



GERD

- What is the pathology of GERD?



GERD

How does LES impairment lead to GERD ?

GERD

- How are increased TLESRs thought to contribute to GERD?

Factors affecting **LES** tone

Drugs that reduce LES tone include calcium channel antagonists (e.g., nifedipine, verapamil, diltiazem), nitrates, anticholinergic agents (e.g., tricyclic antidepressants, antihistamines), and oral contraceptives and estrogen.

Foods that reduce LES tone include chocolate, fatty foods, onions, peppermint, and garlic

Smoking (nicotine) reduces LES tone.

GERD

What type of medicines affect the resting pressure of LES?

GERD

How do impaired esophageal mucosal defenses lead
To GERD?

GERD

How can impaired esophageal peristalsis Impact GERD?

GERD

How is hiatal hernia associated with GERD?

Hiatal Hernia and Reflux



LES - pressure often low

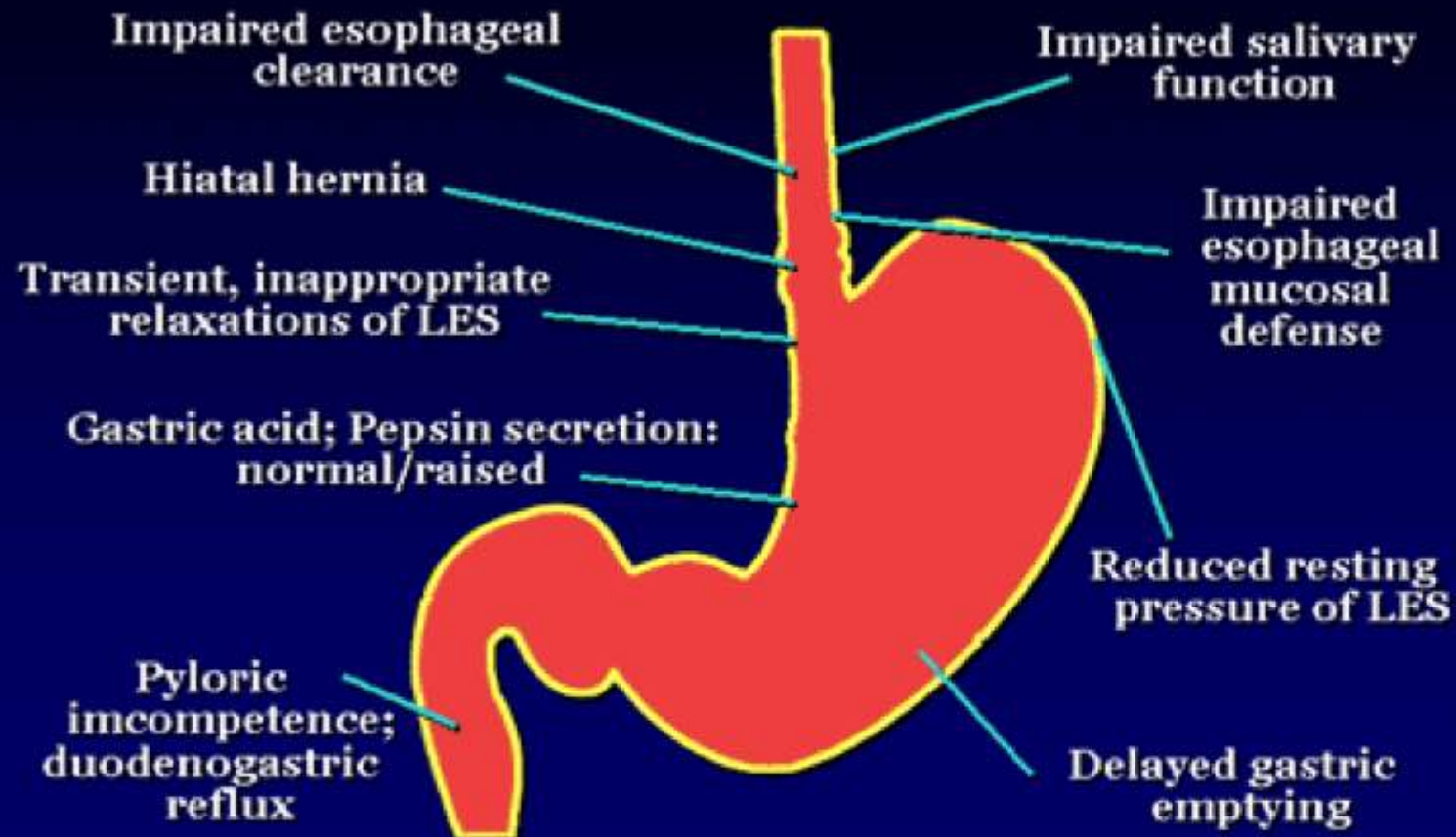
Gastric pouch - intra-thoracic
reservoir

Diaphragm - no esophageal
pinch

Hiatus Hernia



Pathophysiology of GERD



GERD

- What are the risk factors for GERD ?



GERD

What should be included in the differential of GERD?

GERD

What are the most typical symptoms of GERD ?

Symptoms of GERD

Esophageal

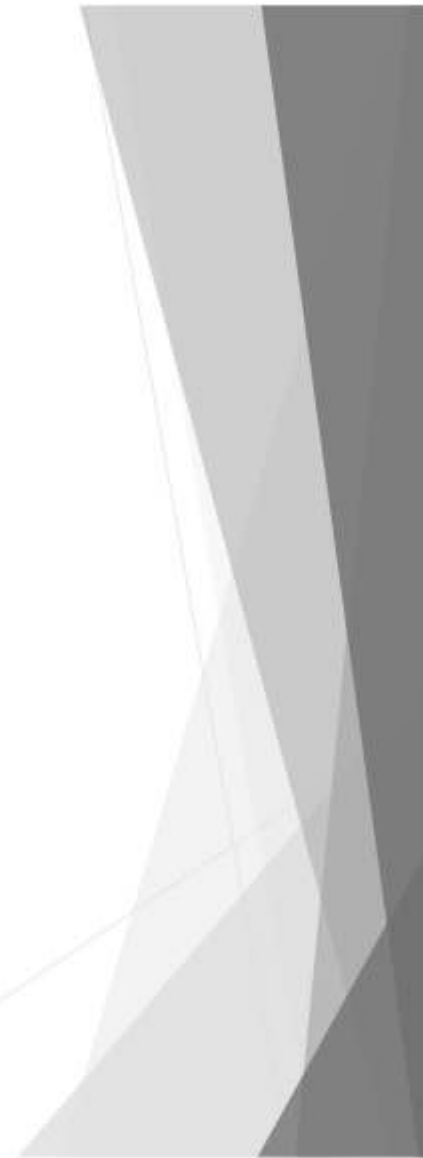
Heartburn

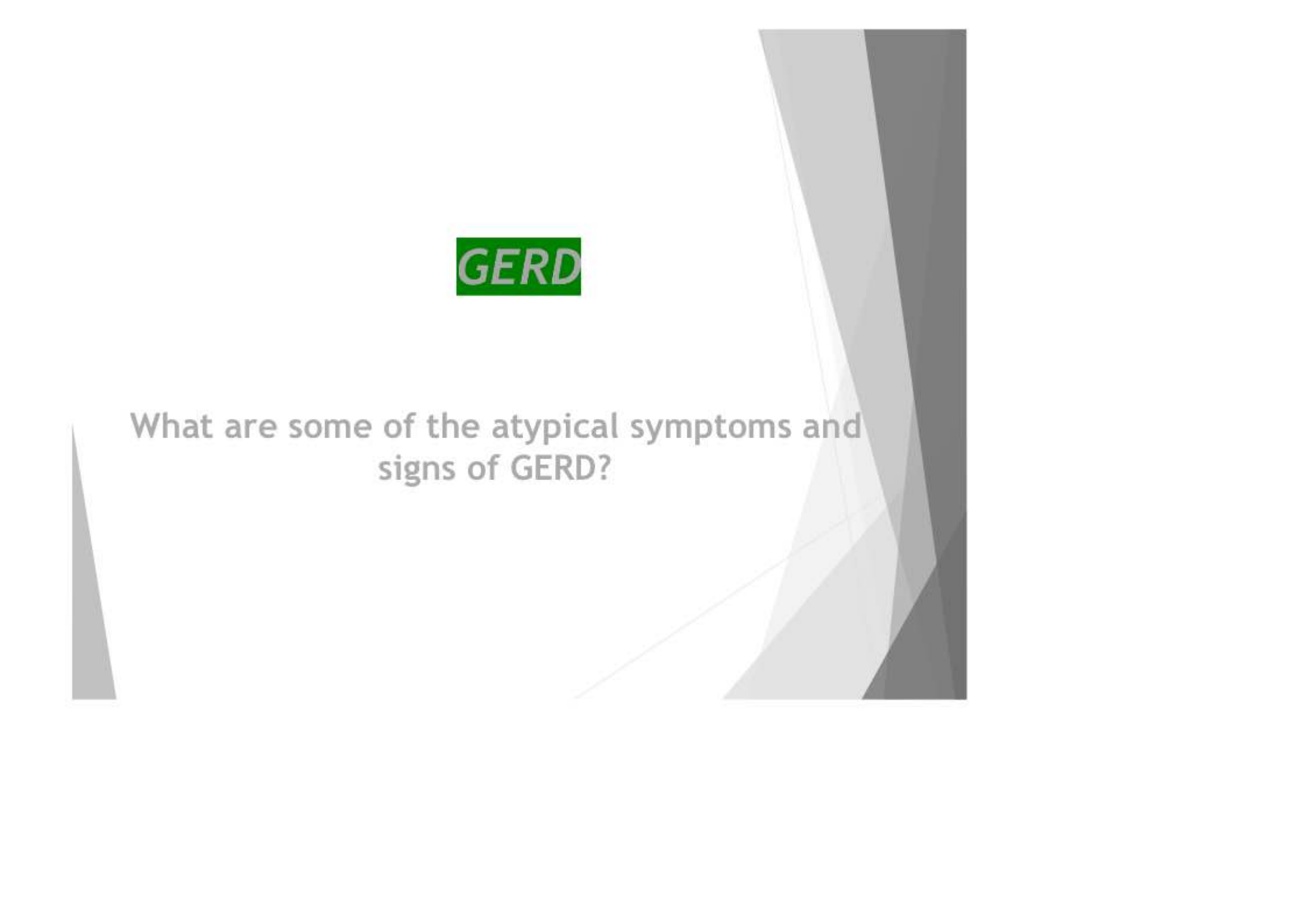
Dysphagia

Odynophagia

Regurgitation

Belching





GERD

What are some of the atypical symptoms and signs of GERD?

Extraesophageal

- Cough
- Wheezing
- Hoarseness
- Sore throat
- Globus sensation
- Epigastric pain
- Non-cardiac chest pain(NCCP)
- Dental erosion

Symptom

Predominance (%)

Heartburn

80

Regurgitation

54

Abdominal Pain

29

Cough

27

Dysphagia for solids

23

Hoarseness

21

Belching

15

Aspiration

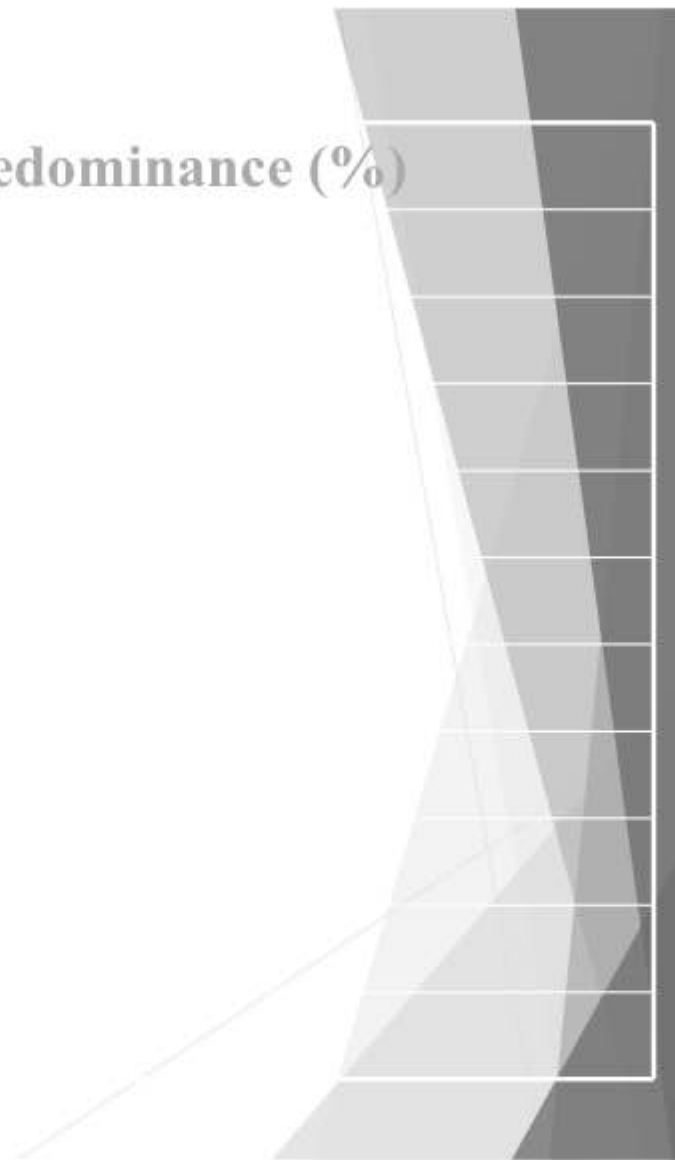
14

Wheezing

7

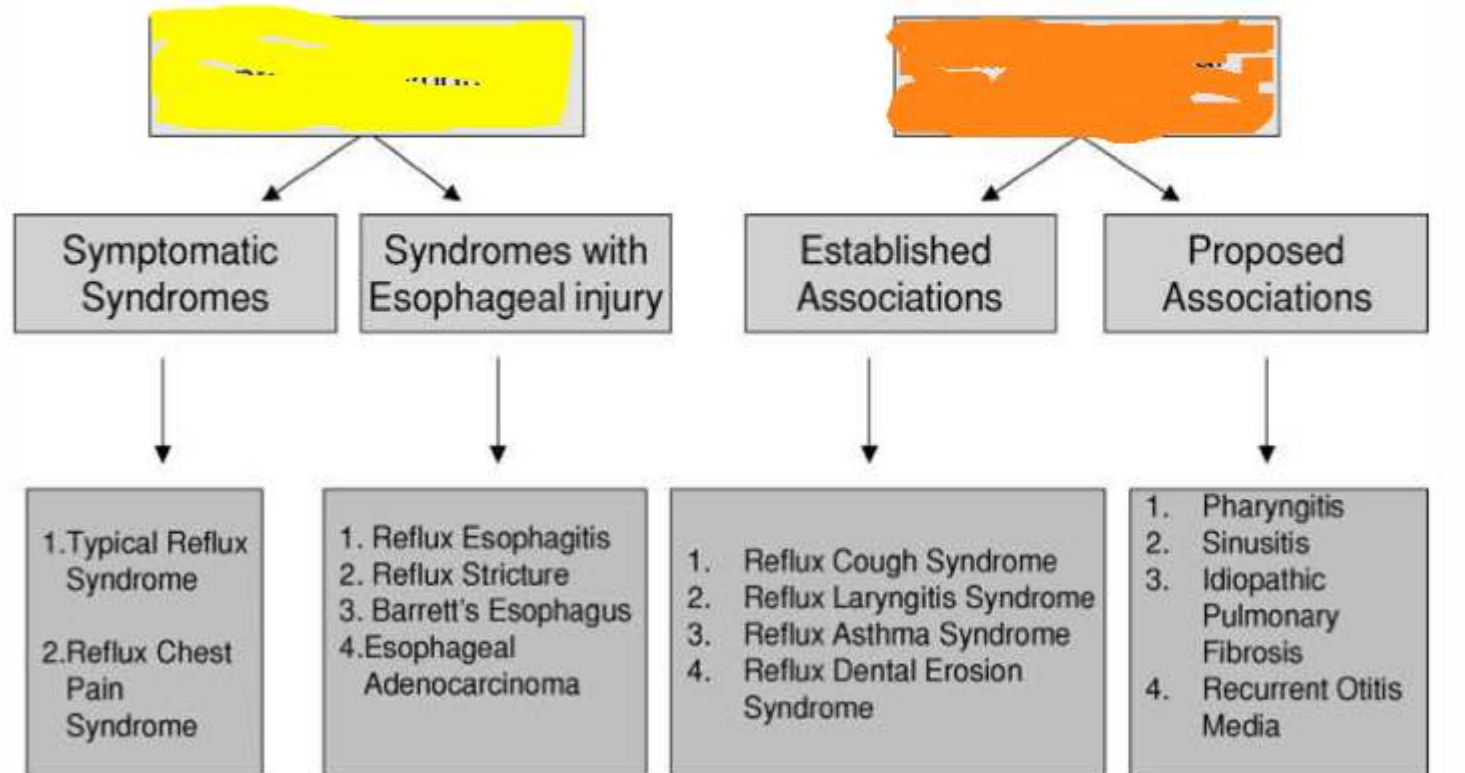
Globus

4



Montreal Classification of GERD

GERD is a condition which develops when the reflux of gastric content causes troublesome symptoms or complications



GERD

What type of foods affect the resting pressure of the LES?

Factors That Can Aggravate GERD

Diet - Caffeine, fatty/spicy foods, chocolate, coffee, peppermint, citrus, alcohol

Position/Activity - Bending, straining

External Pressure - pregnancy, tight clothing



GERD

What type of hormones affect the resting pressure of LES?



GASTRIN

MOTILIN

SECRETIN

GLUCAGON

ESTROGEN

PROGESTRONE

Complications

- Esophagitis
- Esophageal strictures and ulcers
- Hemorrhage
- Perforation
- Aspiration
- Development of Barrett's esophagus
- Precipitation of an asthma attack

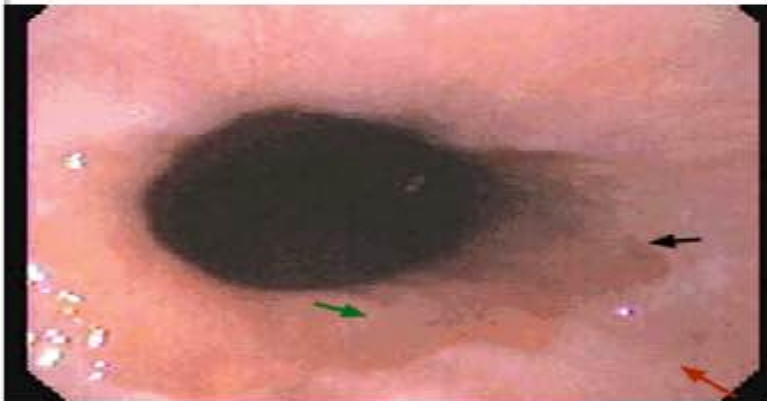
Complications

Erosive esophagitis

Erosive esophagitis is a condition in which areas of the esophageal lining are inflamed and ulcerated. The most common cause of **erosive esophagitis** is chronic acid reflux.

Responsible for 40-60% of GERD symptoms

Severity of symptoms often fail to match severity of erosive esophagitis.



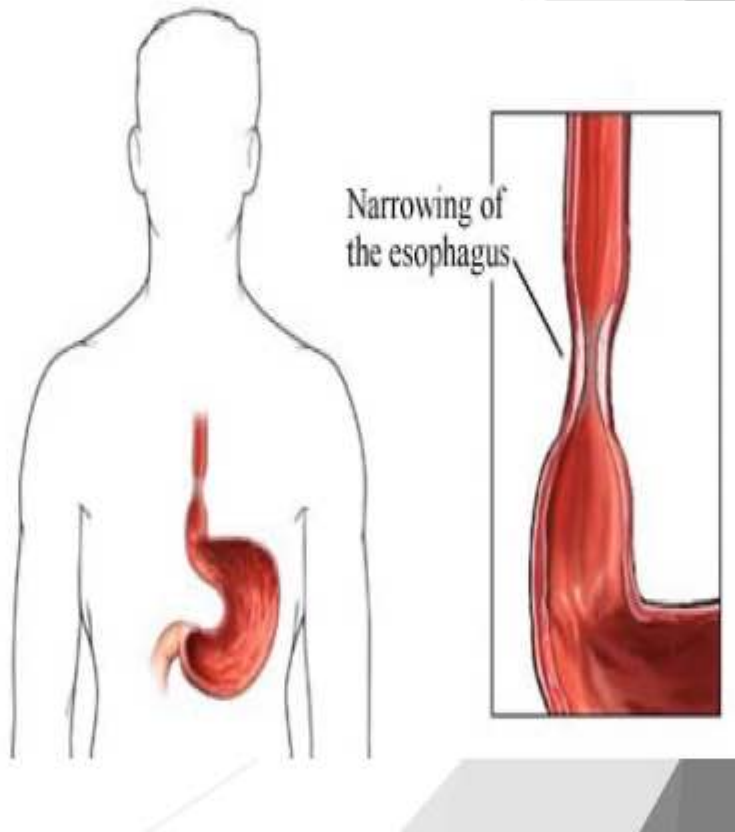
Complications

Esophageal stricture

A benign **esophageal stricture**, or **peptic stricture**, is a narrowing or tightening of the **esophagus** that causes swallowing difficulties.

May need dilation

Common in the distal esophagus and are generally 1 to 2 cm in length.



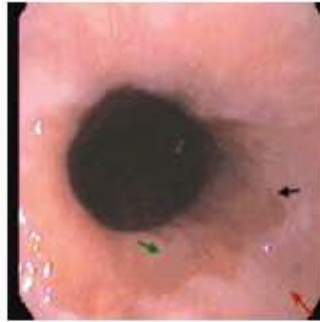
Complications

- ▶ **Barrett's Esophagus**



Complications

▶ Barrett's Esophagus



Asthma

GERD can lead to the reflux of fluid into the lungs; this can result in choking, coughing, or even pneumonia. In some patients, reflux may worsen asthma symptoms. Treating GERD may help improve asthma symptoms in these people. And GERD can be worsened by asthma and by some of the medicines that are used to treat asthma.

GERD can also lead to chronic hoarseness, sleep disturbance, laryngitis, halitosis (bad breath), growths on the vocal cords, a feeling as if there is a lump in your throat.

Clinical Manifestations

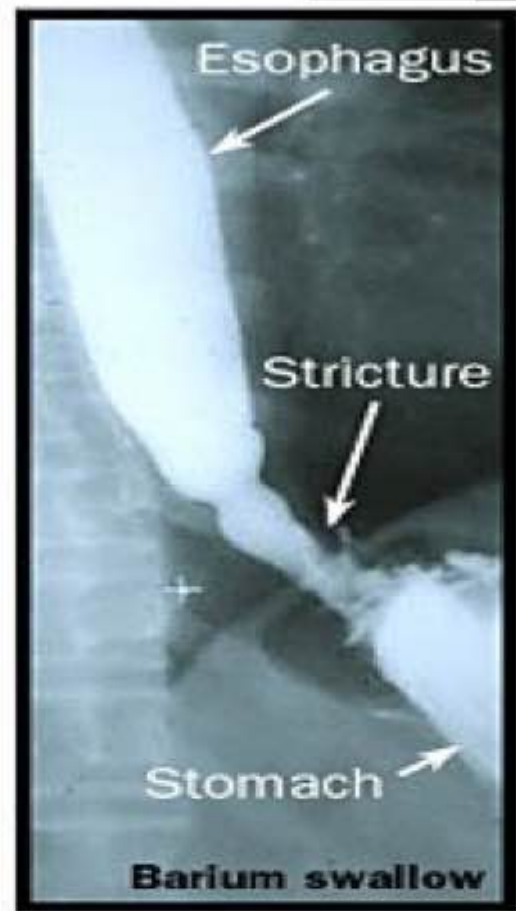
▶ **ALARM SIGNS/SYMPTOMS**

- ▶
- ▶ **Early satiety**
- ▶
- ▶ **Odynophagia**
- ▶
- ▶ **Unexplained Weight loss**
- ▶
- ▶ **Choking**
- ▶
- ▶

DIAGNOSTIC TESTS FOR GERD

- Barium swallow
- Endoscopy
- Ambulatory pH monitoring
- Acid perfusion (Bernstein test)
- Esophageal manometry
- Esophageal sonography

A barium esophagram is an x-ray study in which the structure and function of the esophagus is evaluated. This study is usually the first test used in patients with dysphagia (difficulty swallowing). It is excellent for the diagnosis of a stricture or other causes of obstruction, tumor



BARIUM SWALLOW

- Stricture (location, length)
- Mass (location, length)
- Hiatal hernia (size, type)

Limitations

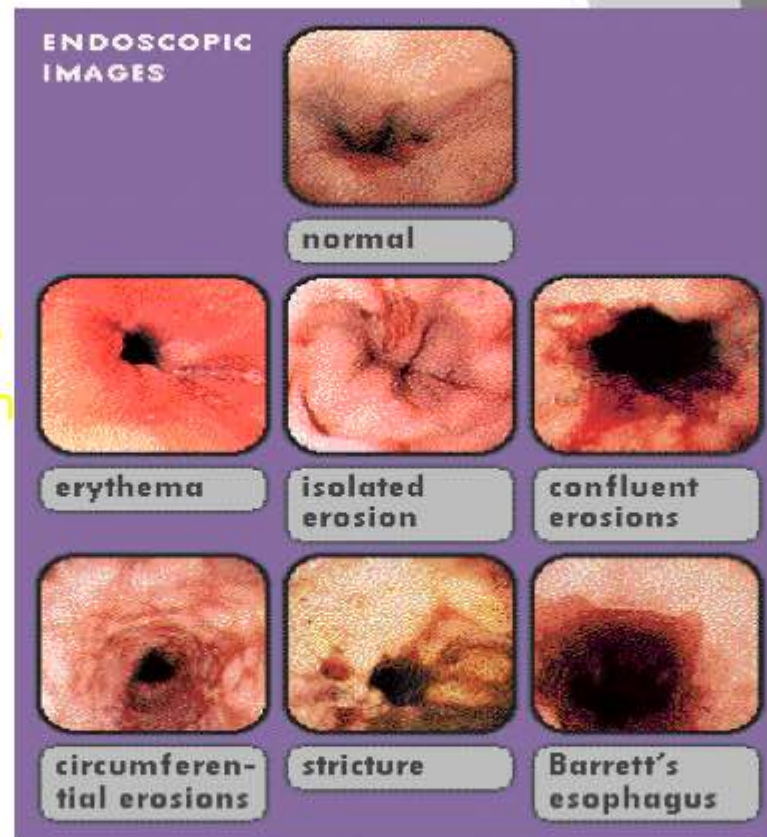
- Detailed mucosal exam for erosive esophagitis, Barrett's esophagus



ENDOSCOPY

Indications

- Alarm symptoms
- Empiric therapy failure
- Preoperative evaluation
- Detection of Barrett's esophagus



ESOPHAGO-GASTRO-DUODENOSCOPY

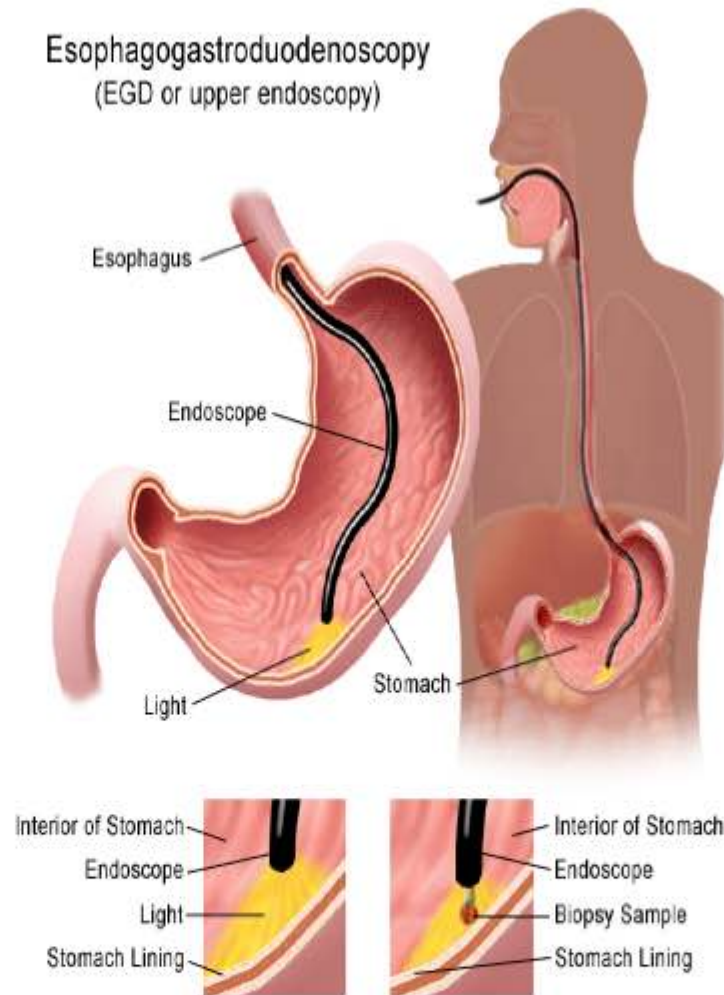
Endoscopy (with biopsy if needed)

In patients with alarm signs/symptoms
Those who fail a medication trial
Those who require long-term tx

Absence of endoscopic features does not exclude a GERD diagnosis

Allows for detection, stratification, and management of esophageal manifestations or complications of GERD

Esophagogastroduodenoscopy (EGD or upper endoscopy)



PH

manometry

24-hour

of medications

causing chest pain.

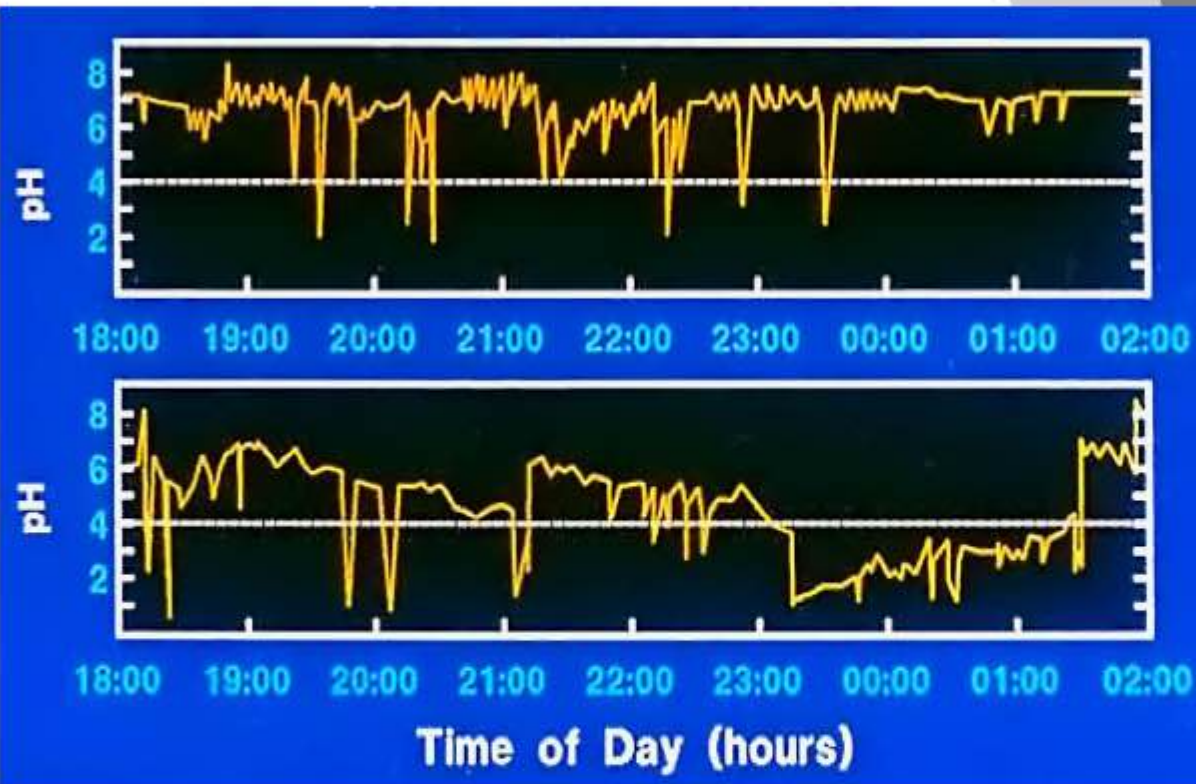
effectiveness

PH

- Trans-nasal catheter or a wireless, capsule shaped device

Ambulatory 24 hr. pH Monitoring

Normal



GERD

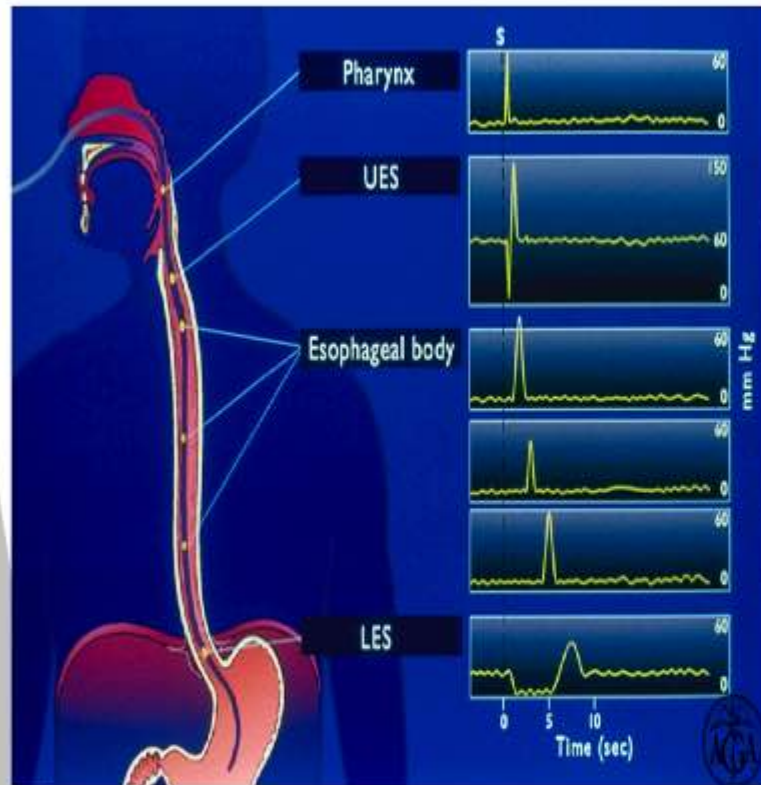
ACID PERFUSION (BERNSTEIN TEST)

Mild hydrochloric acid will be sent down the tube, followed by salt water (saline) solution

asked
any pain or discomfort

✓ Differentiate

Esophageal Manometry



Limited role in GERD

Assess LES pressure, location and relaxation

Assist placement of 24 hr. pH catheter

Assess peristalsis

Prior to antireflux surgery

DIAGNOSTIC EVALUATION

- If classic/typical symptoms like heartburn and regurgitation exist in the absence of “alarm symptoms” the diagnosis of GERD can be made clinically and treatment can be initiated

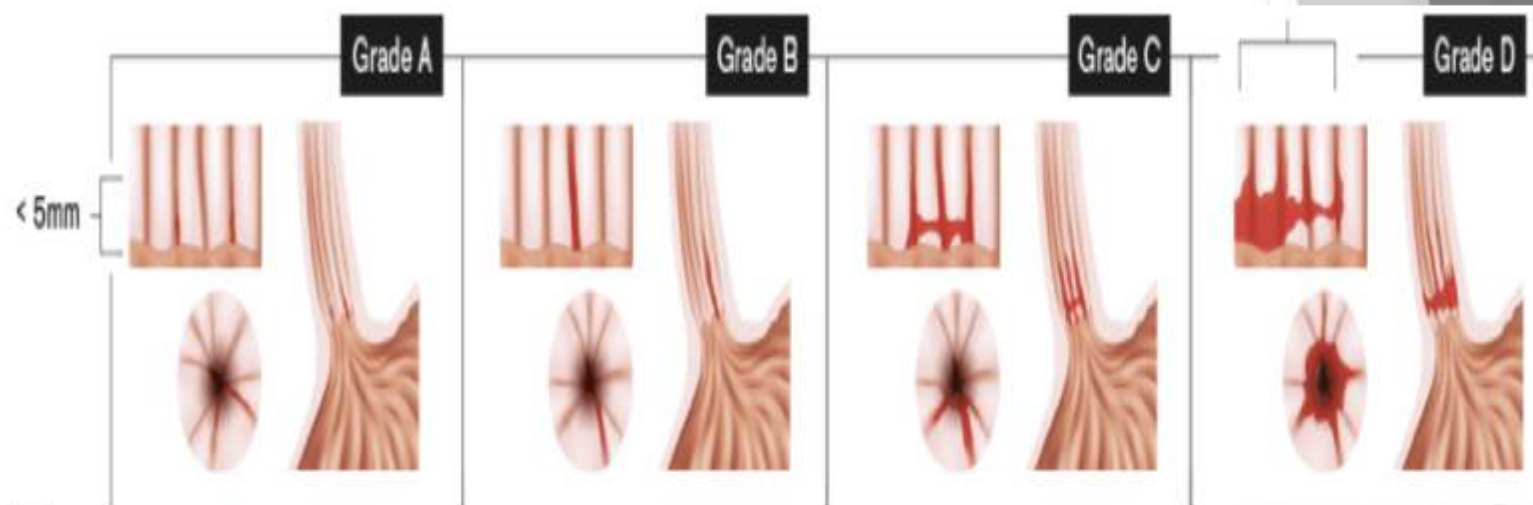
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Reflux Esophagitis: Los Angeles Classification



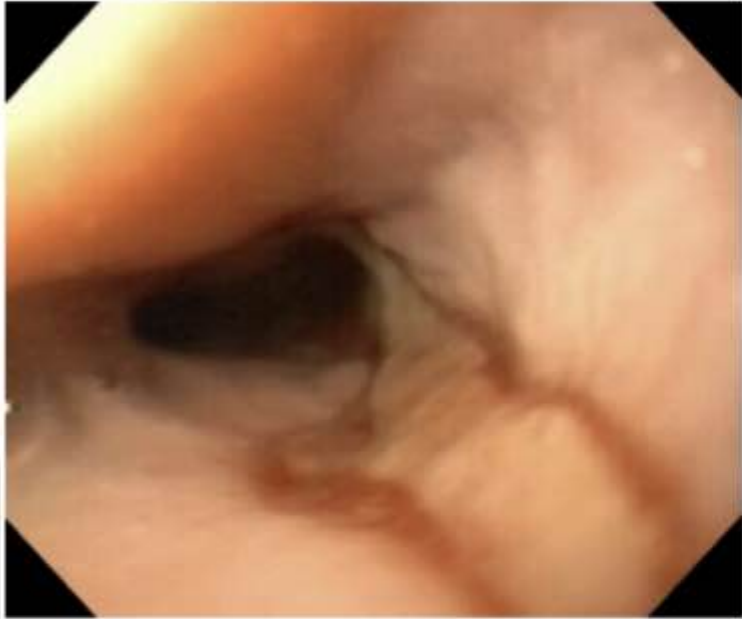
Mild reflux esophagitis – LA grade A + B



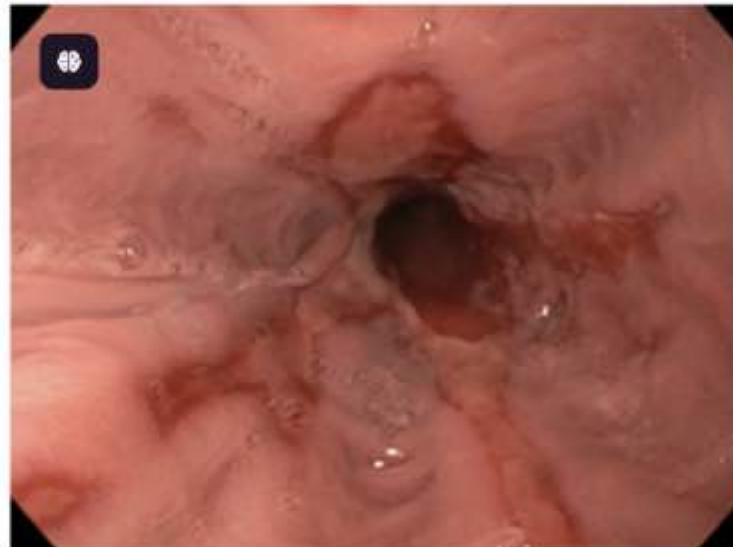
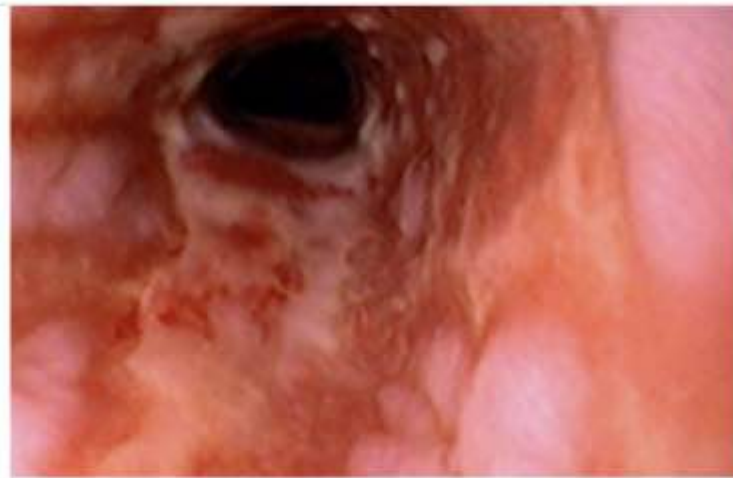


LA grade B: one or several erosions limited to the mucosal fold(s) and larger than 5 mm in extent (as secondary findings on the left lower image, cicatricial changes in the mucosa may be noted as signs of chronic recurrent reflux esophagitis).

Severe reflux esophagitis – LA grade C + D



LA grade C: erosion(s) extending over mucosal folds, but over less than three-quarters of the circumference.

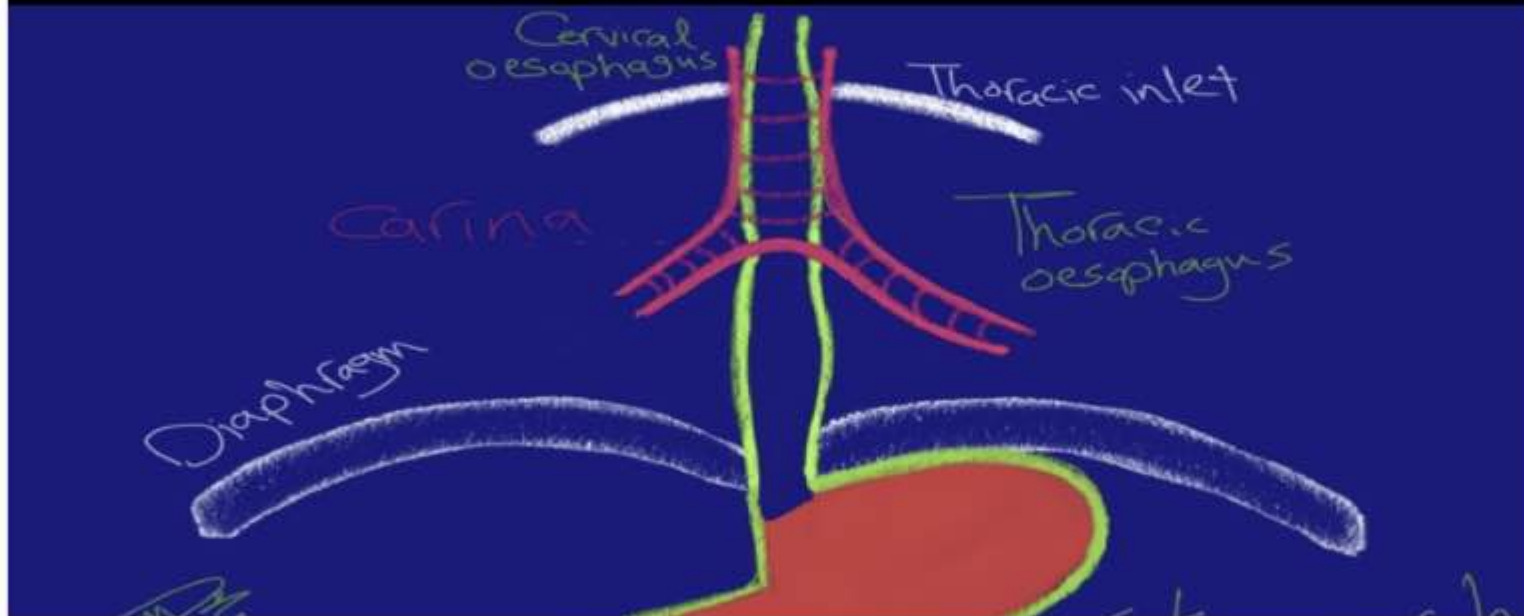
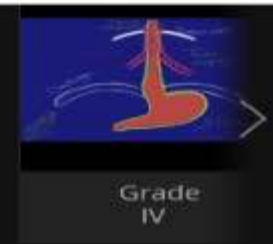
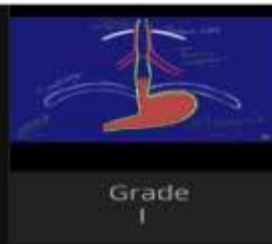


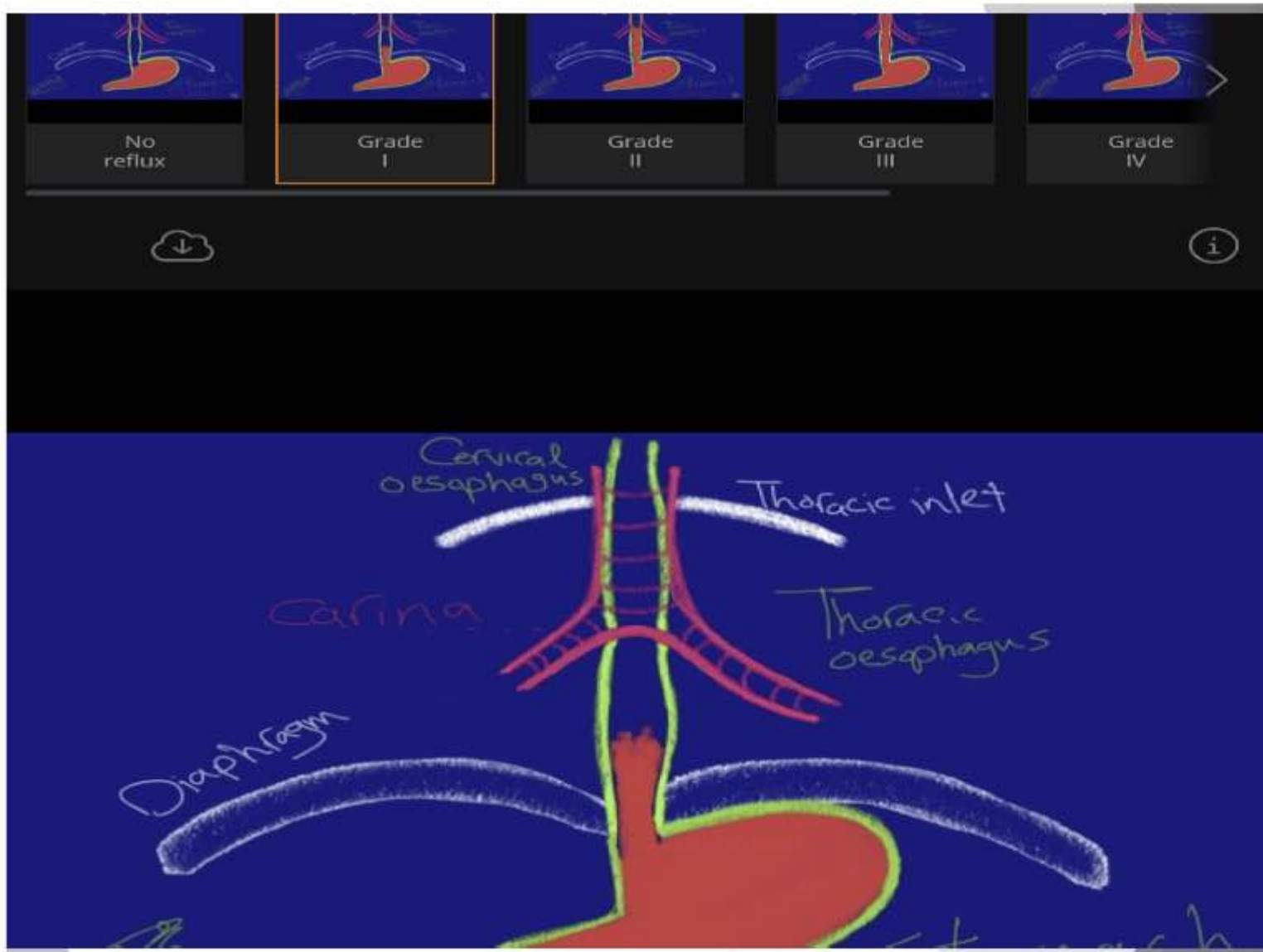
LA grade D: confluent erosions extending over more than three-quarters of the circumference (circular defects).

Classification

This grading system is based on the vertical height that refluxed contrast media reaches during fluoroscopy

- *grade I: reflux in the distal esophagus*
- *grade II: reflux up to or just above the carina*
- *grade III: reflux into cervical esophagus*
- *grade IV: reflux in the cervical esophagus with cardia dilatation*
- *grade V: reflux with tracheal / lung aspiration*
- *grade D: reflux observed in above*







No
reflux



Grade
I



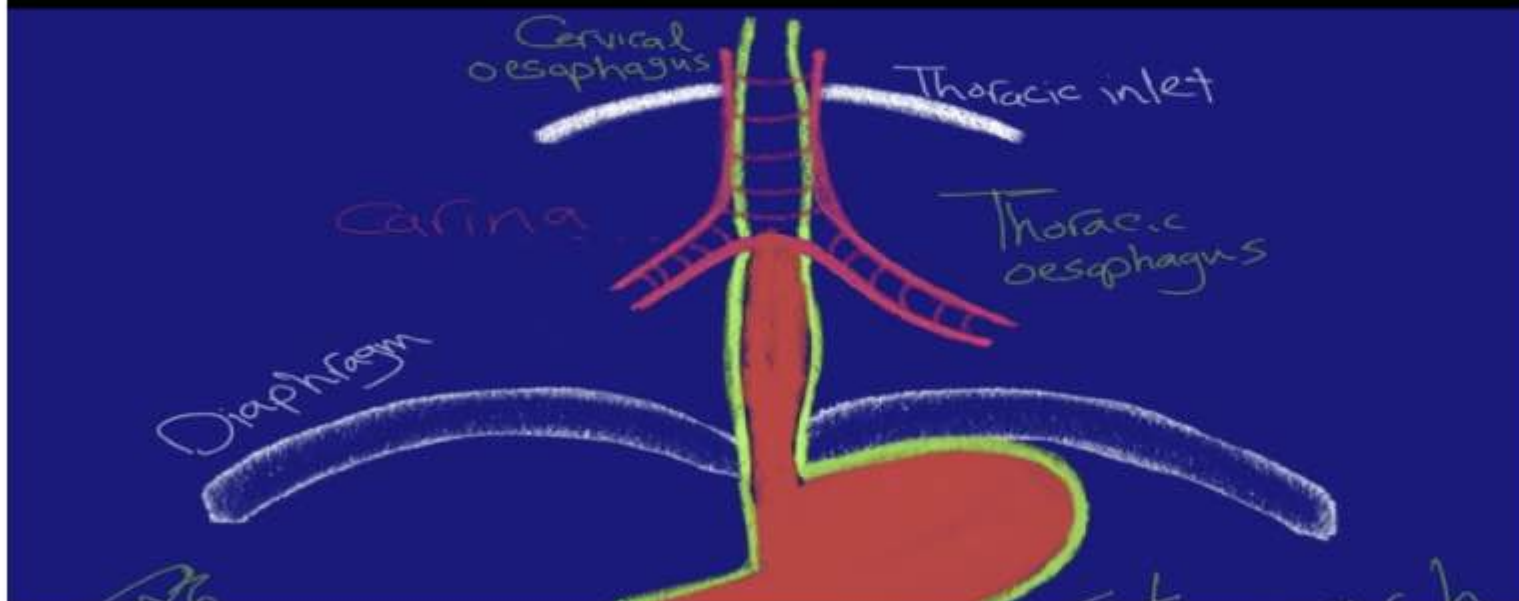
Grade
II



Grade
III

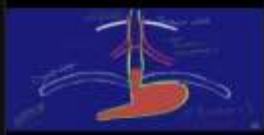


Grade
IV





No
reflux



Grade
I



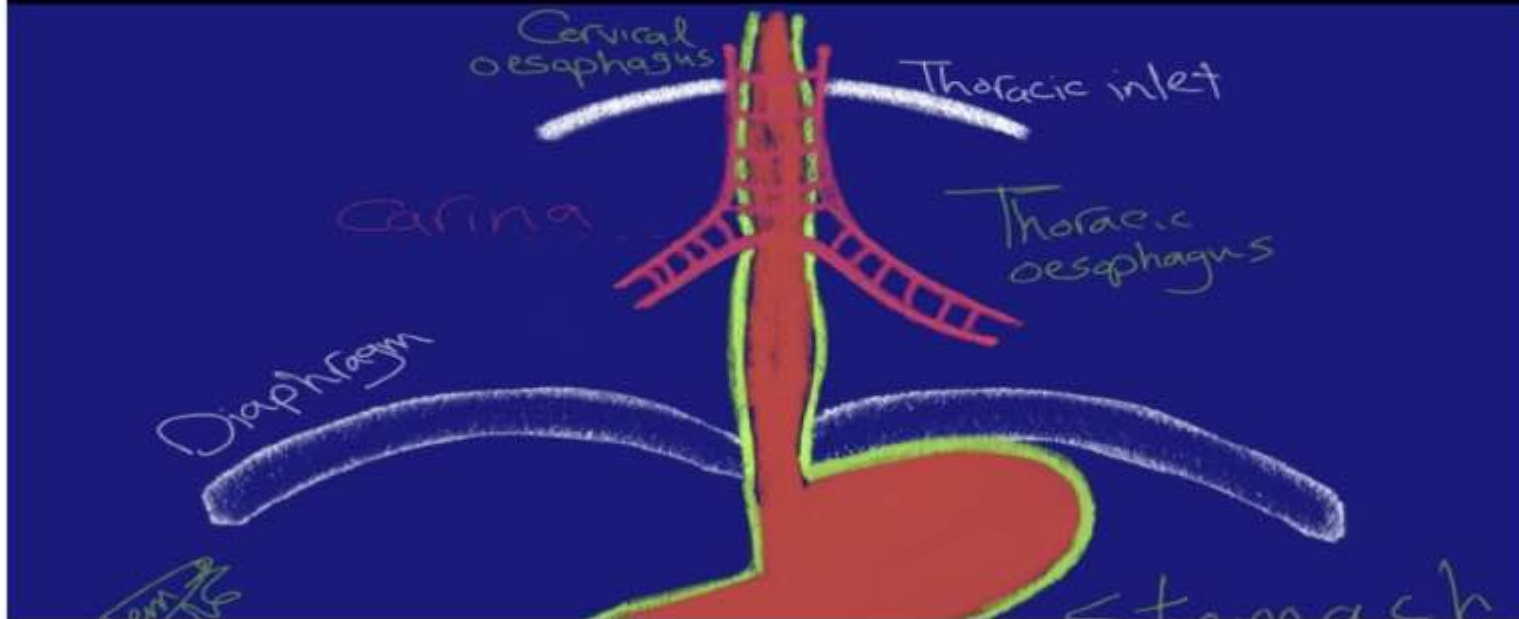
Grade
II

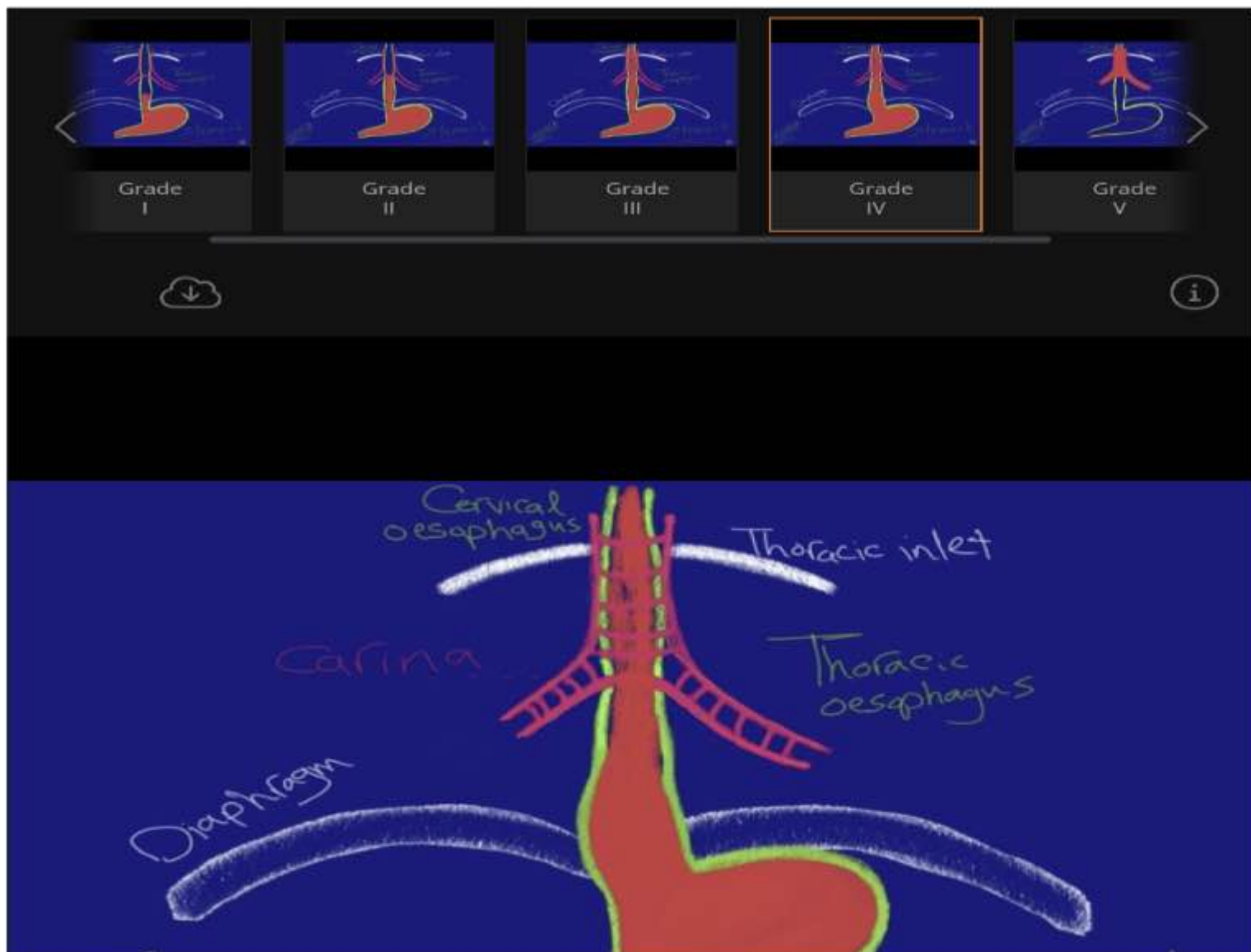


Grade
III



Grade
IV







Grade II



Grade III



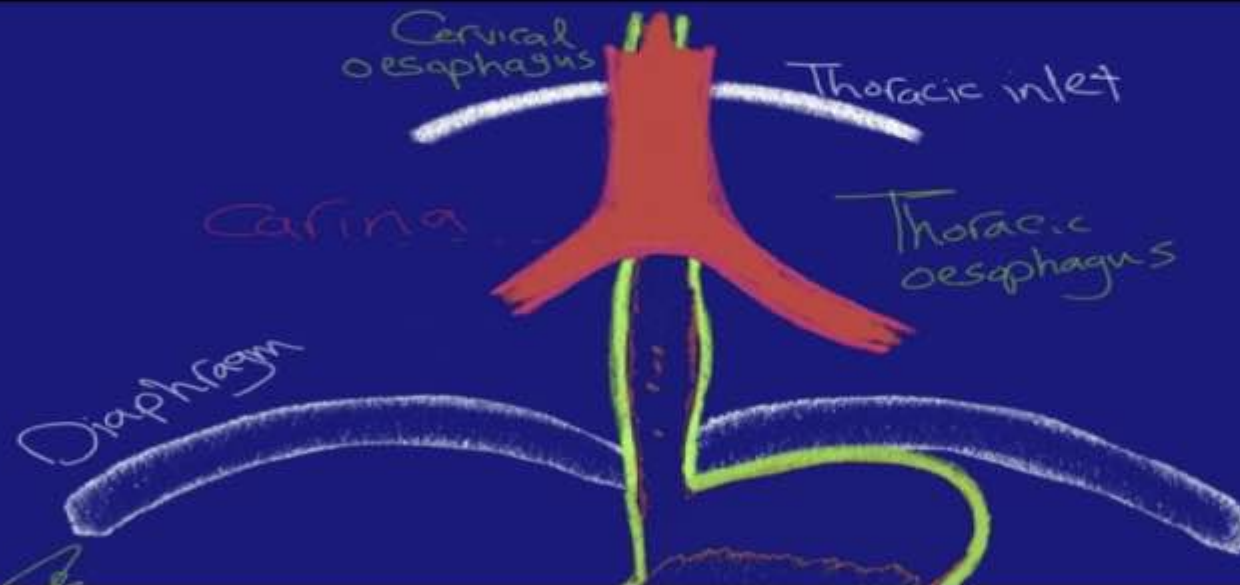
Grade IV



Grade V



Grade D





Grade II



Grade III



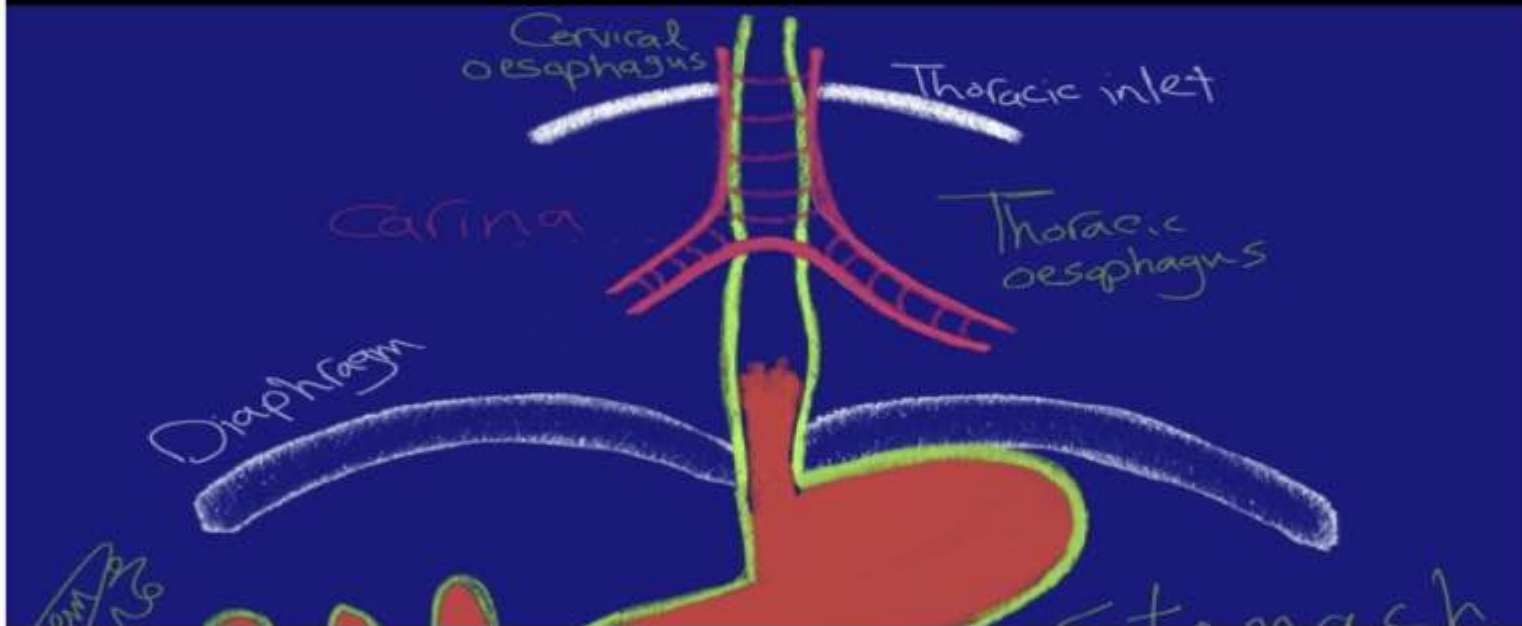
Grade IV



Grade V



Grade D



Thank you for your attention...



Trial of Medications

H2RA or PPI

- Expect response in 2-4 weeks

- If no response

 - Change from H2RA to PPI

 - Maximize dose of PPI

If PPI response inadequate despite maximal dosage

- Confirm diagnosis

 - EGD(Esophagogastroduodenoscopy)

 - 24 hour pH monitor

Patient with heartburn

☐

Initiate tx with H2RA or PPI

H2RA taken
BID

☐

Good response

☐

Yes

Frequent relapses

☐

No

On demand tx

No

PPI taken QD

☐

Good response

No

No

Yes

Yes

No

No

Maintenance therapy
with lowest effective dose

☐

Symptoms persist

☐

Consider EGD if
risk factors
present
(> 45, white, male

Increase to
max dose QD
or BID

☐

Good response

☐

No

No

Confirm diagnosis
EGD, ph monitor

Treatment

► *Goals of therapy*

-
-
-
-

Better Living

Lifestyle modifications

- Avoid large meals
- Avoid acidic foods (citrus/tomato), alcohol, caffeine, chocolate, onions, garlic, peppermint
- Decrease fat intake
- Avoid lying down within 3-4 hours after a meal
- Elevate head of bed 4-8 inches
- Avoid meds that may potentiate GERD (CCB, alpha agonists, theophylline, nitrates, sedatives, NSAIDs)
- Avoid clothing that is tight around the waist
- Lose weight
- Stop smoking

Treatment



Antacids

Over the counter acid suppressants and antacids appropriate initial therapy
Approx 1/3 of patients with heartburn-related symptoms use at least twice weekly
More effective than placebo in relieving GERD symptoms

Treatment

Histamine H₂-Receptor Antagonists

- Competitively block the histamine receptors in gastric parietal cells, thereby preventing acid secretion
- More effective than antacids for relieving heartburn in patients with GERD
- Faster healing of erosive esophagitis
- Can use regularly or on-demand

Treatment

AGENT

Cimetadine
Cimetidine(tab), Zydus Cadila

Famotidine
Famocid(tab), Sun

Nizatidine
Axid

Ranitidine
Aciloc(tab), Cadila

DOSAGE

400-800mg twice daily

20-40mg twice daily

150mg twice daily

150mg twice daily

Treatment

Proton Pump Inhibitors

- Effective not only with patients having erosive esophagitis or complications (Barrett's esophagus), but also with non erosive GERD who have moderate to severe symptoms.
- Act by decreasing the basal and stimulated gastric acid secretion through inhibition of the final step of acid secretion by the parietal cell- the H^+/K^+ ATPase proton pump.
- Better control of symptoms with PPIs vs H2RAs and better remission rates
- Faster healing of erosive esophagitis with PPIs vs H2RAs

Treatment

AGENT

Esomeprazole
Esomac(tab), Cipla

Omeprazole
Lomac(cap), Cipla

Lansoprazole
Lan(Cap), Intas

Pantoprazole
Pan-OD(tab), Burgeon

Rabeprazole
Rabeloc(tab), Cadila

DOSAGE

20-40mg daily

20mg daily

15mg daily

40mg daily

20mg daily

Treatment

H2RAs vs PPIs

12 week freedom from symptoms

48% vs 77%

12 week healing rate

52% vs 84%

Speed of healing

6%/wk vs 12%/wk

Treatment

Antireflux surgery

- Failed medical management

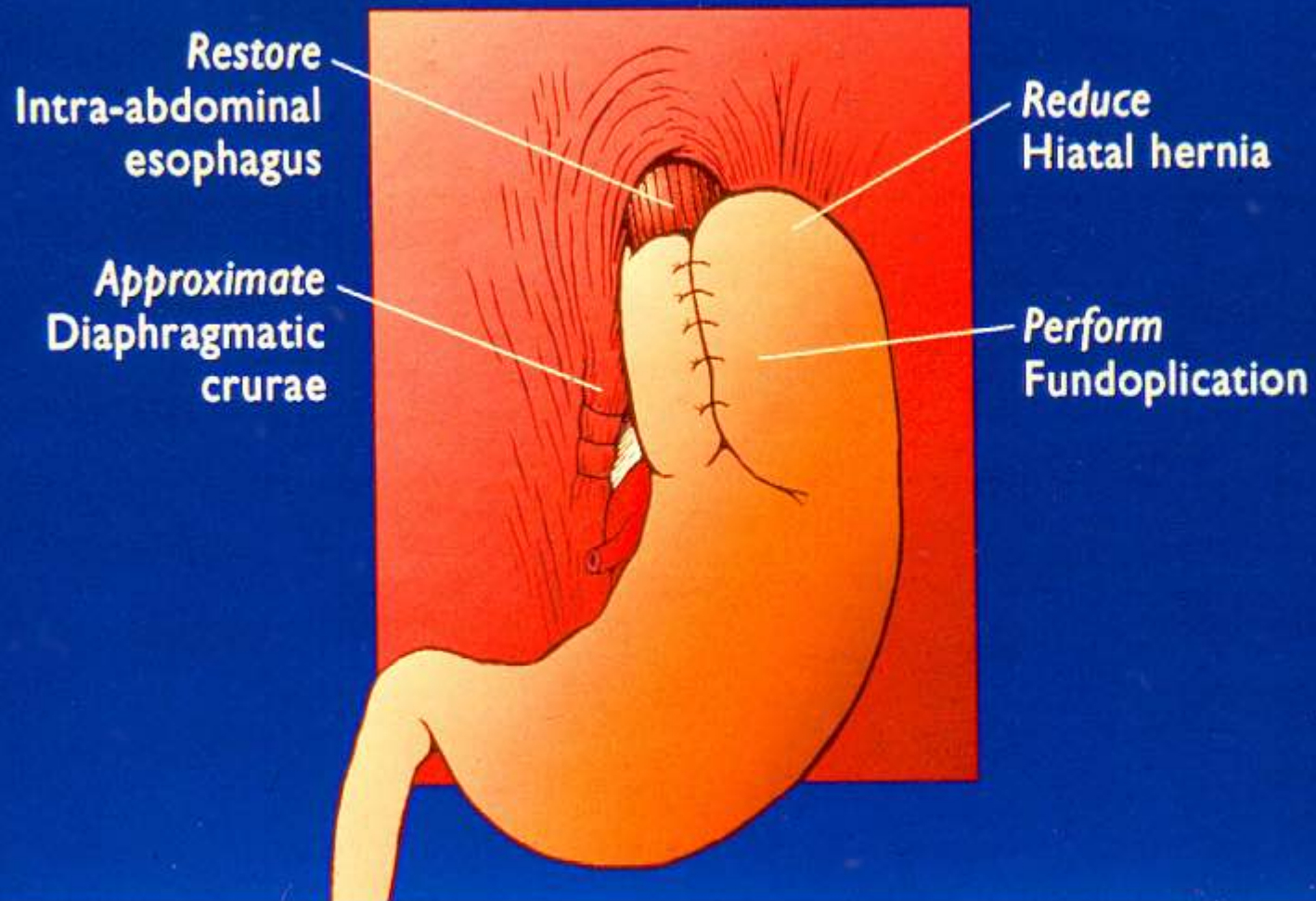
- Patient preference

- GERD complications

- Medical complications attributable to a large hiatal hernia

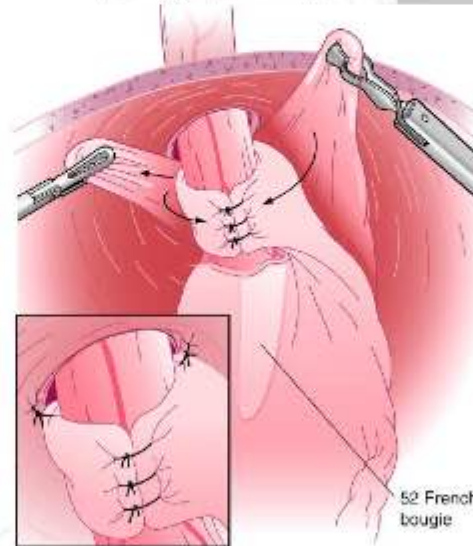
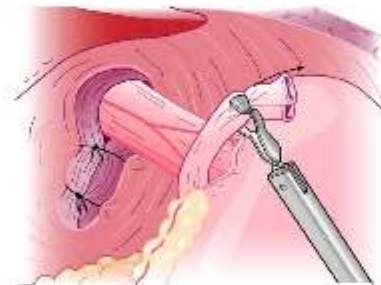
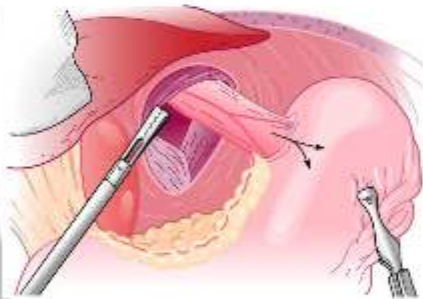
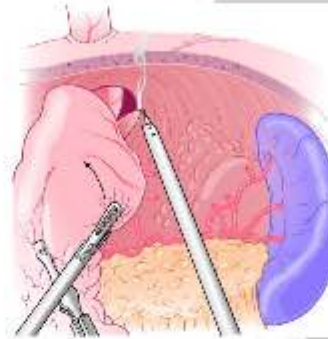
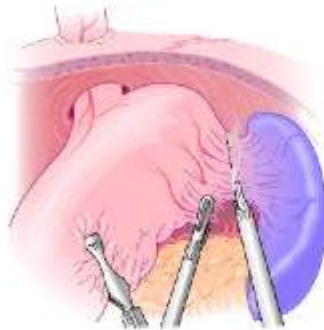
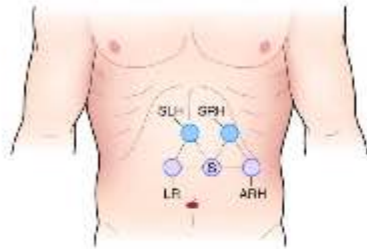
- Atypical symptoms with reflux documented on 24-hour pH monitoring

Principles of Anti-Reflux Surgery



NISSEN FUNDOPLICATION

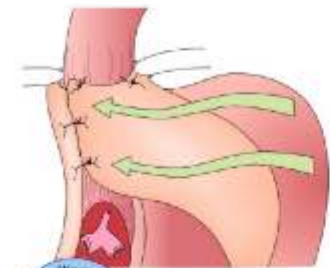
Laparoscopic



COMPLETE VS. PARTIAL FUNDOPPLICATION

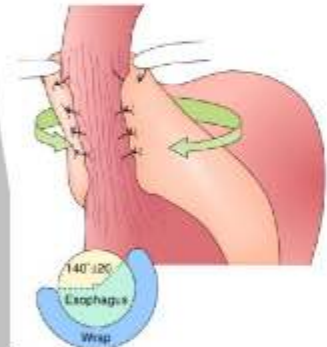


A



B

- Ant. partial fundoplication
Thal/Dor procedure



C

- Post. partial fundoplication
Toupet procedure

Treatment

Postsurgery

- 10% have solid food dysphagia
- 2-3% have permanent symptoms
- 7-10% have gas, bloating, diarrhea, nausea, early satiety
- Within 3-5 years 52% of patients back on antireflux medications

Treatment



Three categories



a nonresorbable

Thank You.....



TTS Balloon Dilation of a Peptic Stricture

