

GASTROESOPHAGEAL REFLUX DISEASE (GERD)

BACKGROUND

- Gastroesophageal Reflux Disease (GERD) is the backward flow of gastric contents from the stomach into the esophagus.
- Statistics:
 - Most common upper GI problems in adults
 - Incidence of 14-16% in Asia
 - GERD was identified as one of the top three digestive concerns in the 2023 report of Makati Medical Center (MakatiMed).
- The intensity of injury to the esophagus and its level of severity – depends on the frequency of reflux, the amount of time the refluxed material stays in the esophagus, and the quantity of acid in the esophagus.

Stages

- STAGE 1: MILD GERD
Minimal acid reflux occurs once or twice a month. At this stage, GERD symptoms can usually be managed by dietary and lifestyle changes plus over-the-counter acid reflux medication if needed.
- STAGE 2: MODERATE GERD
Symptoms are **frequent enough to require prescription acid reflux medication**, which is typically taken daily. GERD symptoms may affect daily activities.
- STAGE 3: SEVERE GERD
Symptoms at this stage are **painful and may not be improved even with the help of prescription medication**. Quality of life is impaired, and your doctor may recommend surgical GERD correction.
- STAGE 4: PRECANCER OR CANCER
After several years of untreated severe GERD symptoms, **the esophagus can develop a precancerous condition known as Barrett's esophagus**. Precancerous lesions can progress into esophageal cancer without treatment.

4 Stages of GERD

Stage 1

(mild):

A person has infrequent heartburn and regurgitation happening once or less each week.

Stage 2

(moderate):

A person has regurgitation or heartburn occurring a few times a week.

Stage 3

(severe):

A person has regular heartburn, a chronic cough, regurgitation, a hoarse voice, and regurgitation of food.

Stage 4

(esophageal cancer or precancerous lesions):

A person has the same symptoms as stage 3, plus food getting stuck in the back of their throat when eating.



RISK FACTORS

- **Excessive body weight, particularly obesity, moderate/high alcohol consumption, smoking, postprandial and vigorous physical activity, as well as lack of regular physical activity.**
- Many studies indicate **fatty, fried, sour, spicy food/products, orange and grapefruit juice, tomatoes** and tomato preserves, chocolate, coffee/tea, carbonated beverages, alcohol as triggers for GERD symptoms.
- Eating habits: irregular meal pattern, large volume of meals, eating meals just before bedtime may correlate with the symptoms of GERD.
- The role of lifestyle, diet and eating habits as risk factors for GERD is not clearly understood, and the results of the available studies are often contradictory. Determination of modifiable risk factors for this disease and its symptoms is important for effective dietary prevention and diet therapy of GERD.

PATHOPHYSIOLOGY

- Classified into:
 - **Physiologic (or functional) gastroesophageal reflux.** px have no underlying predisposing factors or conditions; **normal growth and development are pharmacologic treatment not necessary.**
 - **Pathologic GERD.** Patients frequently experience some complications, requiring careful evaluation and treatment.
 - **Secondary gastroesophageal reflux** - underlying condition predisposes to gastroesophageal reflux; e.g. asthma (a condition which may also be, in part, caused by or exacerbated by reflux) and gastric outlet obstruction.
- Triggers/causes:
 - **Spicy foods and Acidic foods** (citrus fruits or juices)
 - Many spicy foods contain a compound called **capsaicin, which slows down digestion and causes food to sit in the stomach longer.** The longer food is in the stomach, the more risk of you having heartburn.

Second, spicy food can irritate the esophagus, which can worsen heartburn symptoms.

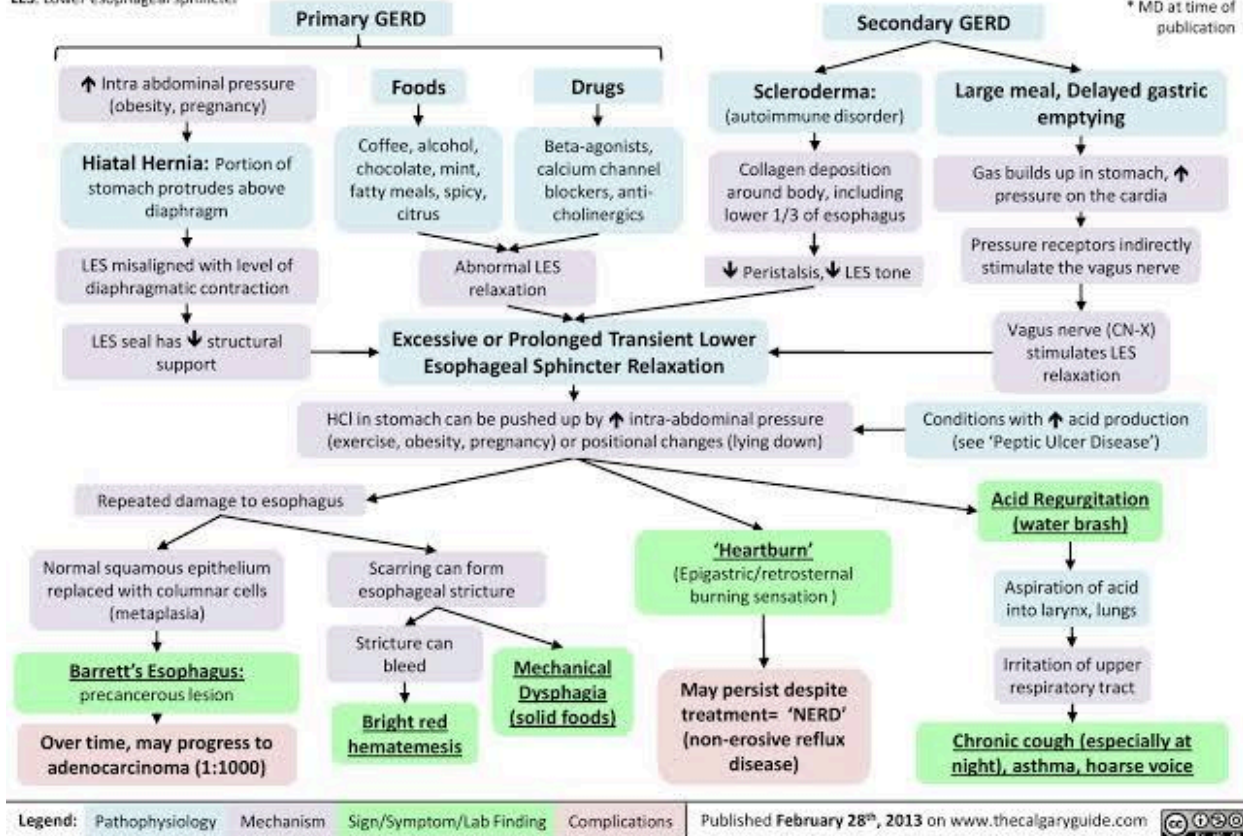
- **Increased intra abdominal pressure** (obesity, pregnancy)
- **Decreased lower esophageal sphincter (LES) tone** (d/t increasing age, prolonged gastric intubation, smoking and alcohol)
- **Drugs**
 - Beta agonist - causes smooth muscle relaxation - decreased LES
 - CCBs(calcium channel blockers - reduces the tone of LES
- **Large meals**
 - Delayed gastric emptying -> gas buildup -> vagus nerve stimulation -> vagus nerve controls the GI muscle layers in response to distention of the tract by food -> incomplete closure of the LES
 - It generally occurs 30-60 min after eating, especially a large meal or a meal rich in fat or acid foods.
- **MAIN POINT: STOMACH ACID BACKS UP IN ESOPHAGUS**
- These results to relaxation/opening of lower esophageal sphincter (sphincter between esophagus and stomach) which leads to reflux going up esophagus
- HCl in stomach can be pushed up by increase abdominal pressure (exercise, obesity, and pregnancy)
 - Damage to esophagus, Acid Regurgitation (acid, food or liquids backwashing from your stomach into your throat after eating)
 - Heart burn

Gastroesophageal Reflux Disease (GERD): Pathogenesis & Clinical Findings

Author: Matthew Harding
 Reviewers: Dean Percy,
 Jason Baserman, Yan Yu,
 Kerri Novak*
 * MD at time of
 publication

Abbreviations:

LES: Lower esophageal sphincter



LES (lower esophageal sphincter) Pressure abnormalities

- Physiologically, relaxations of the LES, prior to contractions of the esophagus, allows food to pass through into the stomach
- GERD patients have a constantly weak low-pressure LES, which permits reflux every time the pressure in the stomach exceeds the LES pressure

ASSESSMENT & S/SX: (source: ppt ni sir and Brunner-Sudarth)

"Painful burning sensation that moves up and down, commonly occurs after meals"

- Dietary Pattern - food triggers
- Nausea & vomiting
- **Heartburn** (Elicit PQRST)
- If acid goes up to throat => **acid regurgitation**
 - Can cause aspiration -> upper respiratory tract irritation => **chronic cough at night, asthma, sore throat**
- **Pyrosis** (burning sensation in throat)
- **Dyspepsia** (indigestion)
- **Dysphagia or odynophagia** (pain on swallowing) - d/t throat irritation from acid reflux
- **Esophageal stricture** (narrowing of esophagus)

- **Hypersalivation**
- **Esophagitis**
 - Due to acid repeatedly damaging esophageal epithelium
- Repeated damage to esophagus can increase risk for **esophageal cancer**
- **Hematemesis/ Blood in vomit**

The symptoms may mimic those of a heart attack. The patient's history aids in obtaining an accurate diagnosis.

DIAGNOSTICS

- **Upper endoscopy**
 - Endoscope inserted down patient's throat to see inside the patient's esophagus and stomach.
 - **Test results may not show problems when reflux is present, but an endoscopy may detect inflammation of the esophagus (esophagitis) or other complications.**
 - Can also be used for biopsy to test for complications such as Barrett esophagus (precancerous lesion)
 - In some instances, if the esophagus is narrowed, it can be stretched or dilated during this procedure. This is done to improve trouble swallowing (dysphagia).
- **Ambulatory acid (pH) probe test**
 - **A monitor is placed in the esophagus to identify when, and for how long, stomach acid regurgitates there.** The monitor connects to a small computer that the patient wears around their waist or with a strap over your shoulder.
 - The monitor might be a thin, flexible tube (catheter) that's threaded through your nose into your esophagus, or it might be a clip that's placed in the esophagus during an endoscopy.
 - The clip passes into your stool after about two days.
- **X-ray of the upper digestive system (Esophagram)**
 - X-rays are taken after the patient drinks a chalky liquid that coats and fills the inside lining of the digestive tract.
 - The coating allows the doctor to see a silhouette of the esophagus and stomach.
 - This is particularly useful for people who are having trouble swallowing
 - Patients may also be asked to swallow a barium pill that can help diagnose a narrowing of the esophagus that may interfere with swallowing.
- **Esophageal manometry.**
 - **measures the rhythmic muscle contractions** in the esophagus when the patient swallows.
 - also measures the **coordination and force exerted by the muscles of the esophagus.**
 - Typically done in people who have trouble swallowing.
- **Transnasal esophagoscopy.**
 - Assess for any **damage in your esophagus.**

NURSING DIAGNOSIS

- Imbalanced nutrition: less than body requirements related to the inability to intake enough food because of reflux.
- Acute pain related to irritated esophageal mucosa / from heartburn
- Risk for aspiration related to esophageal compromise affecting the lower esophageal sphincter.
- Deficient knowledge related to lack of information regarding condition/disease process.

MEDICAL-SURGICAL INTERVENTIONS

- Pharmacologic intervention
 - **H2-receptor blockers (#1 MED - Acid reduction drugs)**
 - H2 blockers are a class of medications that **block the action of histamine** at the histamine H2 receptors of the stomach cells, **reducing the amount of acid that the stomach produces**
 - Cimetidine (Tagamet®)
 - Famotidine (Fluxid, Pepcid)
 - Nizatidine (Axid, Tazac)
 - Ranitidine (Zantac)
 - **Prokinetic Agents**
 - They are mainly beneficial for treating motion problems caused by various medical conditions and gastroesophageal reflux disorders. Prokinetic agents act in the following ways:
 - Promote **emptying of stomach contents**
 - Increase wave-like contractions in the esophagus
 - **Increase contractions** in the stomach

Prokinetic agents induce all the above actions by stimulating excitatory chemical messengers (neurotransmitters) like acetylcholine

- **Proton Pump Inhibitors (PPI)**
 - Reduce **stomach acid production**
 - irreversibly inhibits the H⁺ / K⁺ + ATPase proton pump in the stomach lining
 - Omeprazole
 - Lansoprazole
 - Pantoprazole
 - Rabeprazole
 - Esomeprazole
- **Surgical Intervention**
 - **Surgical fundoplication**
 - GERD can weaken the muscles that help move food down into your stomach, including the sphincter that closes the opening between the esophagus and stomach. Fundoplication **helps strengthen** this opening to prevent food and acid from going back up.

- This procedure is usually successful and has a good long-term outlook. Each procedure can be done laparoscopically.
 - Nissen 360-degree wrap. The fundus is wrapped all the way around the bottom of your esophagus to tighten the sphincter. This prevents you from any burping or vomiting that may make your GERD worse.
 - Toupet 270-degree posterior wrap. The fundus is wrapped about two-thirds of the way around the back side, or posterior, of the bottom of your esophagus. This creates a sort of valve that lets you more easily release gas through burps or vomit when necessary.
 - Watson anterior 180-degree wrap. The part of the esophagus next to the diaphragm is reconstructed. Then, the fundus is wrapped halfway around the front, or anterior, of the bottom of the esophagus and attached to part of the diaphragm tissue.

To prepare for this surgery, you may be asked to do the following:

- Consume only clear liquids for at least 24 to 48 hours before the surgery. No solid foods or colored sodas and juices will be allowed during this period.
- Take any prescribed medications to help clear out your digestive tract during the final 24 hours before surgery.
- Don't take any anti-inflammatory medications, such as ibuprofen (Advil) or acetaminophen (Tylenol).
- Ask your doctor if you should stop taking blood thinners. This includes warfarin (Coumadin). These can increase your risk of complications during surgery.
- Tell your doctor about medications and dietary or herbal supplements you're taking. You may be asked to stop taking them so they don't interfere with the surgery.
- Have a family member or close friend take you to the hospital. Have someone available to take you home when you're released, too.

AFTER

- 2 weeks after surgery. Eat soft or liquid foods, including yogurt, soup, and pudding. Only drink beverages like water, milk, and juice — don't drink soda or carbonated beverages that can increase gas buildup in your stomach.
- 3 to 4 weeks after surgery. Slowly introduce solid — yet still softened — foods back into your diet. Try pasta, breads, mashed potatoes, peanut butter, and cheese.
- 1 to 3 months after surgery and beyond. You'll be able to gradually return to the diet you had before. You may want to stop eating foods that can get stuck in your esophagus, such as steak, chicken, or nuts.

Synthetic Angelchik prosthesis

It consisted of a C-shaped ring of silicon fitted around the gastroesophageal junction. The ring was secured in place by means of a fitted Dacron tape. It was well favored at the time compared to other anti-reflux surgeries because of the simple and standardized technique of insertion of the device.

However, enthusiasm for the device hugely subsided when long-term results became available. Up to 70% of patients developed moderate to severe dysphagia. In addition, other complications were frequently reported including migration of device (due to Dacron tape failure) and erosion into surrounding structures

PHARMACOLOGICAL INTERVENTIONS (Savarino et al., 2021)

- The most practical therapeutic approach relies on targeting the individual elements of GERD pathophysiology according to each clinical situation and implies that our medical treatment will be always palliative, because it is unable to control the functional alterations representing the real mechanisms of the disease
- Gastric acid secretion control and neutralization of the acid pocket
 - **Proton pump inhibitors (PPIs)**
 - the contact of acid with esophageal mucosa remains a key factor in the generation of symptoms and in the induction of inflammatory lesions at the distal part of the esophagus even if gastric acid secretion is not increased in patients with GERD
 - first-choice therapy in both short- and long-term medical treatment
 - PPI - lansoprazole, omeprazole, pantoprazole
 - **Potassium competitive acid blockers (PCABs)**
 - These novel antisecretory drugs differ from PPIs because they compete with K^+ and induce a selective and reversible inhibition of the proton pump in a dose-dependent manner.
 - Compared to PPIs, onset of action is immediate and the control of gastric acid secretion occurs after the first dose and within the first day of administration.
 - Longer retention time, thus cover both daytime and nighttime compared to PPIs with less nocturnal period efficacy
 - veraprazan, linaprazan, vonoprazan, tegoprazan, etc.
 - Adverse effects:
 - Other adverse effects: changes in the gut microbiome have been documented with vonoprazan, thus increasing the risk of enteric infections in patients travelling to tropical areas.
- **TLESR-associated reflux**
 - **Reflex Inhibitors**
 - Baclofen, a gamma-amino-butyric acid (GABA) receptor type B agonist, has been identified as the first reflux inhibitor and, as such, is able to reduce the number of TLESRs and all types of reflux events, both acid and weakly acidic
 - Limited clinical use due to poor tolerability because of neurological adverse effects
- **Esophageal clearance and defensive properties**
 - **Prokinetics**
 - Prokinetic agents - metoclopramide

NURSING INTERVENTIONS

- **Promoting Optimal Nutritional Balance**

- The nutritional status of patients with (GERD) can be affected by various factors.
 - Avoid trigger foods and beverages such as **sour, spicy, salty, and fatty food groups and carbonated beverages**
 - Promote foods that can ease reflux such as high-fiber vegetables, bananas and grain
- **Maintain a healthy body weight**
 - Abdominal obesity increases the pressure in the abdomen, easily propelling stomach contents and acid right back up into the esophagus
- Practice portion control
 - Eat small and more frequent meals
 - Avoid late-night meals

- **Managing Acute Pain**

- Pain in patients with GERD may occur due to the irritation of the esophageal mucosa and oral cavity from stomach acid reflux.
 - Increase your liquid intake.
 - Take OTC pain relievers such as acetaminophen

- **Preventing Aspiration**

- Patients with GERD may be at risk for aspiration due to factors such as compromised lower esophageal sphincter, impaired swallowing, and depressed gag and cough reflexes. These conditions can lead to increased intragastric pressure, causing stomach contents to reflux into the lungs and airways, potentially leading to aspiration pneumonia or other respiratory complications. (Gaude, 2009)
 - **Instruct to remain in an upright position at least 2 hours after meals; avoid eating 3 hours before bedtime to control reflux and causes less irritation from reflux action in the esophagus**

- **Reducing Anxiety**

- Patients with GERD may experience anxiety due to the discomfort and pain associated with the condition, which can be especially distressing for young children who may not understand what is happening to them. The fear of experiencing symptoms or not being able to communicate their symptoms effectively can further exacerbate anxiety in these patients.

- **Patient Education and Health Teachings**

- Avoid smoking, alcohol drinking, and caffeinated beverages that increase acid production and may cause esophageal spasms.
 - **Nicotine relaxes the esophageal sphincter and stimulates the production of stomach acid. It can also injure the esophagus causing irritation and making it more susceptible to damage from acid reflux. Lastly, smoking can decrease gastric motility and reduces the effectiveness of digestion because the stomach takes longer to empty.**

- Instruct patient to avoid bending over, coughing, straining at defecations, and other activities that increase reflux to promote comfort through decreasing intra-abdominal pressure, which reduces the reflux of gastric contents

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