



Gastroesophageal Reflux

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Objectives

1. Describe the epidemiology, pathophysiology, and risk factors for GERD
2. Recognize the typical and atypical clinical presentations of GERD
3. Apply a stepwise diagnostic approach to GERD
4. Discuss how to manage GERD
5. Explain the risks and benefits of long-term PPI therapy
6. Identify complications of chronic GERD

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Case-1

A 45-year-old woman presents with a 6-month history of **burning retrosternal discomfort** occurring after meals and at night. She reports occasional regurgitation but denies dysphagia, odynophagia, weight loss, anorexia, vomiting, or gastrointestinal bleeding. She has tried over-the-counter antacids with minimal relief. Physical examination is unremarkable. What is the **most appropriate next step in management**?

- A) Upper endoscopy
- B) Ambulatory pH monitoring
- C) Empirical trial of a proton-pump inhibitor (PPI) for 2 months
- D) Barium swallow
- E) Esophageal manometry

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Case-2

A 54-year-old man presents with a 6-month history of **heartburn and regurgitation**. He reports new-onset dysphagia and unintentional weight loss of 10 pounds over the past two months. He has no prior history of gastrointestinal disease and has not tried acid suppression therapy. Physical examination reveals no acute findings.

Which of the following is the **most appropriate next step in management**?

- A) Empirical trial of a proton-pump inhibitor
- B) Ambulatory pH monitoring
- C) Esophageal manometry
- D) Esophagogastroduodenoscopy (EGD)
- E) Barium swallow

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Case-3

A 60-year-old White man with a BMI of 32 kg/m² and a 12-year history of chronic **heartburn and regurgitation** presents for routine follow-up. He is a current smoker and has a family history of esophageal adenocarcinoma. He denies dysphagia, weight loss, or gastrointestinal bleeding. Which of the following is the most appropriate next step?

- A) Empirical trial of a proton-pump inhibitor
- B) Ambulatory pH monitoring
- C) Upper endoscopy to screen for Barrett's esophagus
- D) Esophageal manometry
- E) Barium swallow

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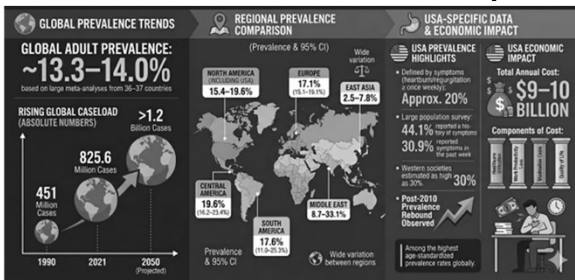
What is Gastroesophageal Reflux Disease (GERD)

GERD is a chronic disease characterized by

- **Symptoms** from regurgitation of gastric contents into the esophagus
- Supported by **objective evidence** of acid regurgitation

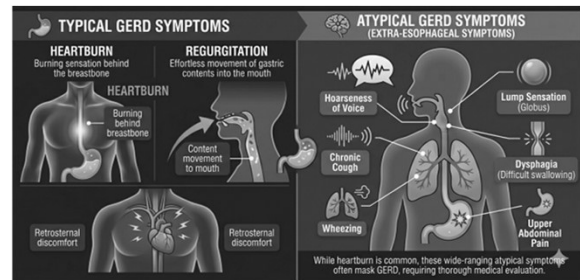
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Understanding GERD: Prevalence and Economic Impact



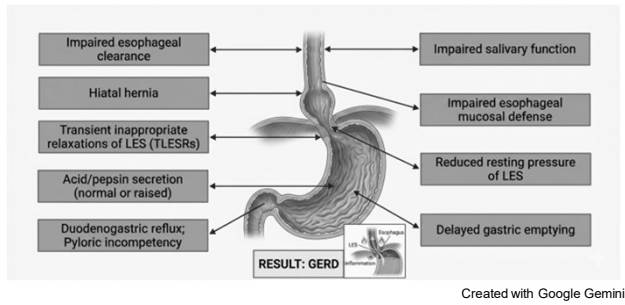
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Typical and Atypical Symptoms of GERD



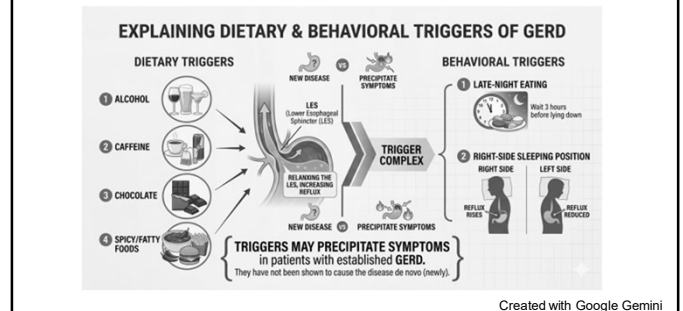
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What causes GERD



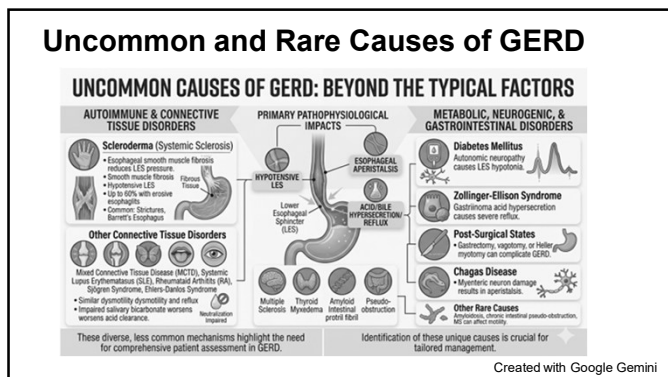
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Dietary and Behavioral Factors Causing GERD



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Uncommon and Rare Causes of GERD

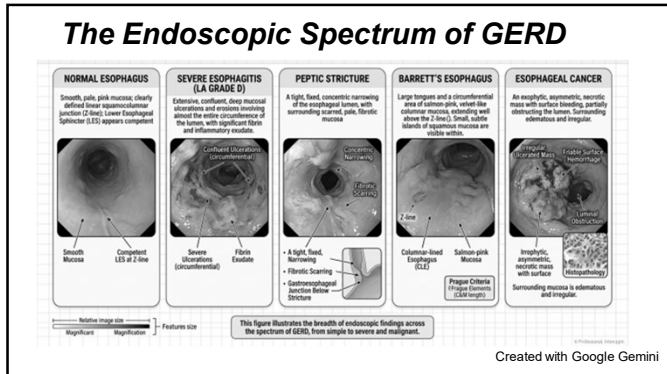


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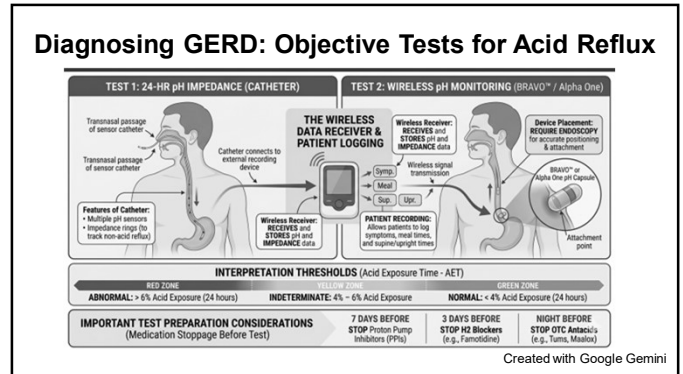
Diagnosing GERD

- Endoscopy:
 - Inflammation or esophagitis
 - Barrett's esophagus
 - Peptic stricture
- Esophageal pH monitoring test
 - High acid levels in distal esophagus

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When to consider objective testing for GERD

- Symptoms uncontrolled by empiric treatment
- Atypical symptoms
- When considering surgery to treat GERD
- Alarm symptoms
 - Dysphagia
 - Unintentional weight loss
 - Symptoms of upper GI bleeding

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Management of GERD

- Goals of therapy
- Control symptoms
 - Prevent or treat complications
 - **Peptic stricture** → Dysphagia
 - **Barrett's esophagus** → Esophageal adenocarcinoma
 - **Esophageal ulcer** → Odynophagia and GI bleeding

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Controlling Symptoms of GERD

- Lifestyle measures
- Medications
- Surgery

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Lifestyle Measures to Control GERD

LIFESTYLE MEASURES TO CONTROL GERD SYMPTOMS

MEASURES WITH STRONGEST EVIDENCE

- Weight Loss:**
 - **DO:** Reduce BMI. Dose-dependent symptom improvement.
 - **48% reduction** in symptoms with **avg. 11.3 BMI reduction** (in women).
 - **DO:** Avoid weight gain.
 - **Intensities:** Increased prevalence 37% → 15%.
- Head-of-Bed Elevation:**
 - **DO:** Elevate bed head end.
 - **DO:** Elevate on wedge pillows.
 - **DO:** Use a wedge pillow.
 - **RCT data supports** (multiple studies).
 - **DO:** Elevate bed head end.
 - **DO:** Elevate on wedge pillows.
 - **DO:** Use a wedge pillow.
 - **RCT data supports** (multiple studies).
- Avoid Late Meals:**
 - **DO:** Eat large meals especially at bedtime.
 - **DO:** Eat within 3 hrs of bedtime.
 - **DO:** Avoid short dinner to bed intervals.
 - **no food over the last 3 hours before bedtime.**
 - **RCT data supports** (multiple studies).
- Smoking Cessation:**
 - **DO:** Stop smoking.
 - **44% symptomatic improvement** after 1 year.
 - **Validated data supports.**

OTHER IMPORTANT LIFESTYLE CHANGES

- Sleep Positioning:**
 - LEFT SIDE:** preferential (reflux reduced).
 - RIGHT SIDE:** dependent position (increased reflux).
 - **DO:** Sleep in left lateral position.
 - **DO:** Positional pillows help.
 - **DON'T:** Sleep on right side.
- Dietary Modifications:**
 - MEAL SIZE:** 4 small meals vs 3 large meals.
 - AVOID TRIGGERS:** Spicy/Fatty/Fruit, Onion, Citrus, Chocolate.
 - LIMIT BEVERAGES:** Water, Alkalization, Aggravation, Acid, Carbonation, Alcohol, Caffeine, Tea, Coughsyrup, Drinks.
- Behavioral Measures:**
 - CLOTHING:** Snuggly, Chew Gum.
 - STRESS REDUCTION:** Stress, Caffeine, Alcohol, etc.
 - **DO:** Relaxation, Breathing, CBT, Leverages Gut-Brain Axis.

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Proton Pump Inhibitors

- Highly effective in healing esophagitis: 84% heal within 3 months compared to 52% for H2-blockers (e.g. Famotidine)
- Duration
 - **Short-term PPI (4-8 weeks):** Uncomplicated GERD
 - **Long-term PPI:**
 - Barrett's esophagus
 - Severe esophagitis
 - Complicated GERD
 - **On-demand PPI:** episodic heartburn and GERD symptoms without inflammation

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Proton Pump Inhibitors

- **Administration:** 30-45 mins before 1st meal of the day or before the evening meal if taking BID
- **Duration:** At least 4-8 weeks for patients without alarm symptoms
- **Discontinuation:** If symptoms improve, decrease the dose and ultimately discontinue
- Any PPI will do- no one is superior to another

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Long-Term Risks of PPI Use

DEFINITIVE RISK: SMALL INCREASE IN ENTERIC INFECTIONS

Non-*C. difficile* Enteric Infections

- **DO:** Be aware of a small definitive risk.
- **Odds Ratio (OR):** 1.33 (1.01-1.75)
- Absolute risk is **VERY SMALL** (0.03-0.2% per patient/year)
- Includes bacterial gastroenteritis, bacterial overgrowth

OBSERVATIONAL ASSOCIATIONS: RISKS ARE NOT SIGNIFICANTLY INCREASED

Clostridium difficile Infection OR: 2.26 (0.70-7.34) Non-significant association	Chronic Kidney Disease OR: 1.17 (0.94-1.45) Non-significant association	Dementia OR: 1.20 (0.81-1.78) Non-significant association
Bone Fracture OR: 1.02 (0.87-1.19) Non-significant association	Myocardial Infarction Not Significantly Increased	SBP in Cirrhotics Reported in observational studies; not significant
Micronutrient Deficiencies Not Significantly Increased Current evidence does not support significant increases in most widely studied associations. Close patient monitoring remains important.	GI Malignancies Reported in observational studies; not significant	

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Short Term Side Effects of PPIs

Most Common Adverse Reactions

Mild and resolve with discontinuation, may be PPI preparation specific

- Headache
- Abdominal pain
- Nausea or vomiting
- Diarrhea or Constipation
- Flatulence

Rebound Acid Hypersecretion

- Upon PPI discontinuation
- Due to PPI-induced hyperplasia of gastric enterochromaffin-like cells that release gastrin
- Can be mitigated by gradual tapering of PPI dose

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Other Side Effects of PPIs

- Acute interstitial Nephritis
- Hypomagnesemia
- Fundic gland polyps

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Other Side Effects of PPIs

- **Acute interstitial Nephritis**
 - Can occur at any time and at any dose
 - Suspect if unexplained rise in serum creatinine, particularly if nonoliguric
 - Stop PPI immediately
- Hypomagnesemia
- Fundic gland polyps

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Other Side Effects of PPIs

- Acute interstitial Nephritis
- **Hypomagnesemia**
 - Risk factors:
 - high dose PPI
 - concomitant diuretics
 - low dietary magnesium
 - Females
 - Diabetics
 - CKD
- Fundic gland polyps

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Other Side Effects of PPIs

- Acute interstitial Nephritis
- Hypomagnesemia
- **Fundic gland polyps**
 - More likely with longer duration of PPI use
 - Very low risk of dysplasia (1%) compared to FGPs associated with Familial Adenomatous Polyposis (25-46% dysplasia)
 - Routine endoscopic surveillance not recommended
 - Solitary polyps and large FGPs should be resected

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Potassium Competitive Acid Blockers

- **Vonoprozán**- available in USA
- **Administration:** Before or After meals
- **Efficacy in healing inflammation:** More than 80%
- **Duration:** At least 4-8 weeks for patients without alarm symptoms
- **Discontinuation:** If symptoms improve, can discontinue
- **Risks:** Similar to PPIs

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Histamine-2 Receptor Antagonists

- **Famotidine**- available in the USA
- **Administration:** before or after meals
- **Efficacy in healing inflammation:** Less effective
- **Duration:** As needed for patients without alarm symptoms
- **Risks:** Tachyphylaxis

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Antacids, Alginates and Mucosal Protectants

- Provide short-term symptomatic relief
- Useful for nocturnal or post-meal symptoms
- Used as adjuncts to PPIs in those with erosive esophagitis
- **Antacids:** Calcium carbonate
- **Alginates:** Reflux Gourmet™, Gaviscon Advance™
- **Mucosal protectant:** Sucralfate (tablet or Suspension)

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Baclofen

- **Mechanism:** Reduces the frequency of transient lower esophageal sphincter relaxation
- **Application:** Adjunct in regurgitation predominant GERD or Belching
- **Side effects:** Dizziness, fatigue, sleepiness

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Surgery For Reflux

- **When:**
 - Refractory symptoms despite optimum medical therapy
 - Patient's desire to avoid long term medications
 - Large hiatal hernias
- **What**
 - Fundoplication
 - Transoral Incisionless Fundoplication (TIF)
 - Magnetic sphincter augmentation
 - Roux-en Y gastric bypass

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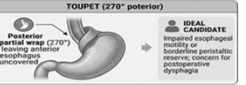
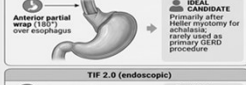



Surgery For Reflux

- **When not to recommend surgery:**
 - Patient well controlled on medical therapy
 - To prevent esophageal cancer in those with Barrett's esophagus

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Anti-Reflux Interventions: Key Features and Candidate Selection

NISSEN (360° total fundoplication)  <p>Complete posterior wrap (360°) around distal esophagus</p> <p>IDEAL CANDIDATE: Normal esophageal motility; severe GERD (LA E/O); large hiatal hernia</p>	TOUPEET (270° posterior)  <p>Posterior partial wrap (270°) around distal esophagus</p> <p>IDEAL CANDIDATE: Impaired esophageal motility or borderline peristaltic reserve; concern for postoperative dysphagia</p>
DOR  <p>Anterior partial wrap (180°) over esophagus</p> <p>IDEAL CANDIDATE: Primarily after Heller myotomy for achalasia; rarely used as primary GERD procedure</p>	MSA (LINX device)  <p>Ring of magnetic beads augmenting LES</p> <p>IDEAL CANDIDATE: Non-obese; no prior gastrectomy; hiatal hernia < 3 cm; no prior gastric surgery</p>
TIF 2.0 (endoscopic)  <p>Transoral plication creating 270° flap valve at EJA</p> <p>IDEAL CANDIDATE: No/small hiatal hernia (< 2 cm); no hiatal regurgitation; patients declining surgery</p>	RYGB  <p>Small gastric pouch and long Roux limb prevents bile reflux</p> <p>IDEAL CANDIDATE: Obese (BMI > 35) with GERD; failed fundoplication in obese; concurrent metabolic disease</p>







These features help determine the most suitable intervention for each patient, based on comprehensive selection criteria. Close patient monitoring remains important.

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Anti-Reflux Interventions: Key Advantages and Disadvantages

SURGICAL & ENDOSCOPIC OPTIONS FOR GERD: PROS AND CONS (SIMPLE SUMMARY)

NISSEN FUNDOPPLICATION (360° total wrap)	TOUPEET FUNDOPPLICATION (270° posterior partial wrap)	DOR FUNDOPPLICATION (180° anterior partial wrap)	LINX (Magnetic sphincter augmentation)	TIF 2.0 (Endoscopic fundoplication)	ROUX-EN-Y GASTRO-ESOPHAGEAL BYPASS (RYGB)
 <ul style="list-style-type: none"> Best reflux control (gold standard) Strong LES pressure increase Excellent long-term durability (>20 years) 	 <ul style="list-style-type: none"> Reflux control similar to Nissen Much less dysphagia (<10% early) Preserves esophageal motility Little to no gas-bloat 	 <ul style="list-style-type: none"> Less dysphagia than Nissen Effective reflux control after Heller myotomy 	 <ul style="list-style-type: none"> Minimally invasive Shorter surgery time Preserves ability to switch and avoid PPIs Reversible 	 <ul style="list-style-type: none"> Inclusion/exclusion, outpatient procedure High short-term symptom control Many patients reduce or stop PPIs 	 <ul style="list-style-type: none"> Treats both obesity and GERD Major reduction in reflux symptoms High PPI discontinuation rates
<ul style="list-style-type: none"> Highest risk of dysphagia (>40% early) Costliest common (>30k) Inability to belch or vomit 	<ul style="list-style-type: none"> Possibly higher long-term GERD recurrence (debatable) 	<ul style="list-style-type: none"> Weaker reflux barrier than Nissen or Toupet Limited data as primary GERD surgery 	<ul style="list-style-type: none"> MRB restrictions (>1.5T) Small reservoir risk (<2%) Device removal risk (<4%) Dysphagia can be higher than fundoplication 	<ul style="list-style-type: none"> Not for severe esophagitis or large hernias Long-term durability uncertain Most patients require low-dose PPIs 	<ul style="list-style-type: none"> Major anatomical change Nutritional deficiencies Technically complex Reflux can recur; new GERD possible

Legend: Key Advantages; Key Disadvantages

Optimal anti-reflux intervention depends on comprehensive patient selection (confirmed GERD, motility assessment, BMI, hernia size).

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Management of GERD

STEP 1: INITIAL EVALUATION & EMPIRIC THERAPY

INITIAL EVALUATION (TYPICAL CASES)

NO ALARM FEATURES: Dysphagia, Weight Loss, GI Bleeding, Anemia

Typical symptoms: Heartburn and/or regurgitation.

EMPIRIC TRIAL (4-8 WEEKS)

A 4-8 week trial of **ONCE-DAILY PPI** < PPI before a meal.

IF SYMPTOMS DO NOT ADEQUATELY IMPROVE

KEY POINT FOR INTERNISTS: Most patients do not need immediate testing; initial empiric therapy is appropriate in uncomplicated, typical GERD.

Options: **A** Increase to **TWICE-DAILY PPI** or **B** Switch to a more potent acid suppressant before moving to testing.

STEP 2: ASSESS RESPONSE & OPTIMIZE PPI THERAPY

IF SYMPTOMS IMPROVE ON PPI

TITRATE & MINIMIZE

Titrate to lowest effective dose.

Avoid ineffective high-dose therapy.

IF LONG-TERM PPI THERAPY IS ANTICIPATED

AGA RECOMMENDATION: Perform **OBJECTIVE REFLEX TESTING**.

WHY THIS MATTERS: Not all patients who respond to PPIs truly have GERD.

Confirm GERD & guide long-term management.

This stepwise approach from Step 1 (Empiric Therapy) to Step 2 (Optimizing Therapy or Confirming GERD) ensures effective, rational management.

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Management of GERD

MANAGEMENT OF GERD: STEPS 3 & 4

STEP 3 - OBJECTIVE TESTING FOR NON-RESPONDERS OR UNPROVEN GERD

Upper Endoscopy (EGD)

Upper Endoscopy is Indicated in:

- PPI non-response.
- Alarm symptoms
- Isolated extra-esophageal symptoms (e.g., chronic cough, laryngitis)
- Barrett's esophagus screening candidates

A Complete Endoscopic Assessment Should Include:

- Esophagitis severity (LA classification)
- Hiatal hernia
- Gastroesophageal Reflux valve (pH grade)
- Barrett's esophagus (Chicago classification/CAM)

Important Distinction: For patients with isolated extra-esophageal symptoms, **objective reflux testing OFF medications is preferred** upfront, rather than empiric PPI therapy.

STEP 4 - REFLEX MONITORING AND PHENOTYPING

When Endoscopy is Normal (No Erosive Disease or Barrett's)

Perform **prolonged wireless pH monitoring off PPI** (16-hour preferred).

Confirms or excludes GERD and defines reflux burden.

For Patients with Proven GERD But Ongoing Symptoms on PPI

Use **24-hour pH-impedance monitoring on PPI**.

Identifies whether symptoms are due to:

- Persistent acid reflux
- Non-acid reflux
- Reflux hypersensitivity
- Non-reflux causes

Key Shift: Management decisions are based on **mechanism, not just symptoms.**

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Management of GERD

MANAGEMENT OF GERD: STEPS 5 & 6

STEP 5 – PHENOTYPE-DRIVEN ADJUNCTIVE THERAPY

When symptoms persist despite optimized PPIs, adjunctive therapies should match the dominant symptom pattern:

- Post-prandial or breakthrough symptoms → Algininate antacids
- Nocturnal symptoms → Bedtime H2-receptor antagonists
- Regurgitation- or belch-predominant symptoms → Baclofen
- Coexistent gastroparesis → Prokinetics

Internist takeaway: Not all persistent symptoms mean "more acid." Target the physiology.

STEP 6 – FUNCTIONAL ESOPHAGEAL DISORDERS

Patients with:

- Normal endoscopy
- Physiologic acid exposure

Symptoms triggered by reflux events or unrelated to reflux.

Often have: Functional heartburn, or Reflux hypersensitivity.

Recommended approach:

- Neuromodulators (e.g., low-dose antidepressants)
- Behavioral therapies (CBT, hypnotherapy, diaphragmatic breathing)
- Gradual PPI de-escalation, as tolerated

Key concept: These patients do not benefit from escalating acid suppression.

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GERD Management in Special Populations

1. PATIENTS WITH EXTRAESOPHAGEAL SYMPTOMS
(Chronic cough, laryngitis, asthma)

WHAT TO DO

- Do NOT start with empiric PPI therapy
- Order objective reflux testing OFF acid-suppressive therapy first

WHY

- PPI response rates are low
- Most have non-reflux causes
- Avoids unnecessary long-term PPI use and diagnostic delay

Practical takeaway: If the main complaint is cough or throat symptoms without classic heartburn, test first—do not trial PPIs.

2. OBESE PATIENTS (BMI ≥35)

WHAT TO DO

- PREFERRED PROCEDURE: RYGB
- AVOID SLEEVE

WHY

- RYGB improves both obesity and GERD
- Sleeve gastrectomy often worsens reflux

Practical takeaway: In patients with severe obesity and GERD, bariatric surgery choice matters—RYGB treats reflux; sleeve may aggravate it.

3. SEVERE EROSIVE ESOPHAGITIS (LA Grade C or D)

WHAT TO DO

- Indefinite maintenance PPI or anti-reflux surgery
- Repeat endoscopy in 8-12 weeks

WHY

- High relapse risk if PPIs are stopped
- Repeat EGD ensures healing and rules out Barrett's esophagus

Practical takeaway: These patients need lifelong reflux control and documented mucosal healing.

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When Should You Refer GERD Patients to a Gastroenterologist?

URGENT REFERRAL: ALARM SYMPTOMS

- DYSPHAGIA
- ODYNOPHAGIA
- WEIGHT LOSS
- GI BLEEDING
- IRON-DEFICIENCY ANEMIA
- PERSISTENT VOMITING

NEEDS PROMPT UPPER ENDOSCOPY

NON-RESPONDERS & UNCERTAINTY

REFRACTORY SYMPTOMS

- Persistent symptoms despite optimized PPI
- Correct timing & adherence
- BID PPI for ~8 weeks
- Recurrence after stopping PPI

DIAGNOSTIC UNCERTAINTY

- Need to confirm or exclude GERD
- Requires specialized testing: Upper Endoscopy, Ambulatory pH/Impedance monitoring

SCREENING & CONFIRMATION

BARRETT'S ESOPHAGUS SCREENING

- Patients meeting guideline risk thresholds (e.g., chronic GERD with multiple additional risk factors)

OBJECTIVE CONFIRMATION

- Before long-term PPI use
- For patients started on chronic PPIs without proven GERD
- Prove GERD with Endoscopy & Reflux Testing first

SPECIAL SITUATIONS & COMPLICATIONS

ISOLATED EXTRAESOPHAGEAL SYMPTOMS

- Chronic cough, laryngitis, asthma with suspected reflux
- Requires UPFRONT OBJECTIVE REFLUX TESTING (not empiric PPI trial)

CONSIDERING ANTI-REFLUX PROCEDURES

- Evaluation for: Fundoplication, LINX, Endoscopic therapy
- Requires specialized testing (Endoscopy, Manometry, Reflux Monitoring)

COMPLICATED GERD

- Needs specialized management
- LA Grade GD esophagitis
- Peptic strictures
- Barrett's esophagus
- Requires healing confirmation, surveillance, endoscopic therapy

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Screening for Barrett's Esophagus

WHO SHOULD BE SCREENED FOR BARRETT'S ESOPHAGUS?

CORE PRINCIPLE: SCREEN WHEN RISK ACCUMULATES, NOT BASED ON REFLUX SYMPTOMS ALONE.

Screening is best reserved for patients with multiple established risk factors, where likelihood of BE and EAC is measurably higher.

CONSIDER SCREENING ENDOSCOPY IN PATIENTS WITH CHRONIC GERD PLUS ADDITIONAL RISK FACTORS, ESPECIALLY WHEN SEVERAL ARE PRESENT.

Screening is not recommended for everyone with GERD.

HOW RISK FACTORS ADD UP—VISUALIZING ACCUMULATING RISK

GERD + FIRST-DEGREE FAMILY HISTORY: +2% prevalence

GERD + ALONE: -3% prevalence

GERD + ADDING RISK FACTORS: Risk increases by +2% per additional factor

GERD + FIRST-DEGREE FAMILY HISTORY + 2% High-Dose Proton Pump Inhibitor: +3% prevalence

CLINICAL IMPLICATION: RISK FACTORS ARE ADDITIVE, AND SCREENING YIELD RISES SHARPLY AS THEY ACCUMULATE.

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Case-1

A 45-year-old woman presents with a 6-month history of **burning retrosternal discomfort** occurring after meals and at night. She reports occasional regurgitation but denies dysphagia, odynophagia, weight loss, anorexia, vomiting, or gastrointestinal bleeding. She has tried over-the-counter antacids with minimal relief. Physical examination is unremarkable. What is the most appropriate next step in management?

- A) Upper endoscopy
- B) Ambulatory pH monitoring
- C) **Empirical trial of a proton-pump inhibitor (PPI) for 2 months**
- D) Barium swallow
- E) Esophageal manometry

Answer: Empirical trial of a proton-pump inhibitor (PPI) for 2 months.

Rationale: In the absence of alarm symptoms (such as dysphagia, odynophagia, weight loss, anorexia, vomiting, or gastrointestinal bleeding), an empirical course of PPI therapy is a reasonable initial diagnostic and therapeutic approach for patients with typical GERD symptoms. This strategy is supported by evidence showing that a short course of high-dose PPI has a pooled sensitivity of 79% for GERD diagnosis in patients with typical symptoms and no alarm features. Upper endoscopy is reserved for patients with alarm symptoms or those at risk for Barrett's esophagus.

Fass R., *New England Journal of Medicine* Volume 387 • Number 13 • September 29, 2022; Pages: 1207-1216

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Case-2

A 54-year-old man presents with a 6-month history of heartburn and regurgitation. He reports new-onset dysphagia and unintentional weight loss of 10 pounds over the past two months. He has no prior history of gastrointestinal disease and has not tried acid suppression therapy. Physical examination reveals no acute findings.

Which of the following is the most appropriate next step in management?

- A) Empirical trial of a proton-pump inhibitor
- B) Ambulatory pH monitoring
- C) Esophageal manometry
- D) **Esophagogastroduodenoscopy (EGD)**
- E) Barium swallow

Answer: Esophagogastroduodenoscopy (EGD).

Rationale: Upper endoscopy is indicated in patients with GERD symptoms who present with alarm features such as dysphagia or weight loss, as these may signal underlying complications including malignancy or strictures. EGD allows direct visualization and biopsy of the esophageal mucosa to evaluate for erosive esophagitis, Barrett's esophagus, or other pathology.

Fass R., *New England Journal of Medicine* Volume 387 • Number 13 • September 29, 2022; Pages: 1207-1216

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Case-3

A 60-year-old White man with a BMI of 32 and a 12-year history of chronic heartburn and regurgitation presents for routine follow-up. He is a current smoker and has a family history of esophageal adenocarcinoma. He denies dysphagia, weight loss, or gastrointestinal bleeding. Which of the following is the most appropriate next step?

- A) Empirical trial of a proton-pump inhibitor
- B) Ambulatory pH monitoring
- C) **Upper endoscopy to screen for Barrett's esophagus**
- D) Esophageal manometry
- E) Barium swallow

Answer: Upper endoscopy to screen for Barrett's esophagus is indicated in patients with chronic (≥ 5 years) GERD symptoms and three or more of the following risk factors: male sex, age >50 years, White race, tobacco smoking, obesity, or a family history of Barrett's esophagus or esophageal adenocarcinoma. This approach is justified because these factors are associated with increased risk for Barrett's esophagus and esophageal adenocarcinoma, and targeted screening may allow for earlier detection and management of premalignant changes

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Summary: Take Home Points

- Optimize PPI timing, dose, and adherence
- Many PPI nonresponders lack true GERD
- Use objective testing before long-term PPI therapy
- Titrate PPIs to the lowest effective dose
- Match adjunctive therapy to symptom phenotype
 - Alginates for postprandial breakthrough
 - Famotidine for nocturnal symptoms
 - Baclofen for regurgitation or belch-predominant symptoms.
- Confirm reflux before surgical referral
- Procedure choice depends on anatomy and BMI

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