Medical management of gastroesophageal reflux disease in adults

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INTRODUCTION

The passage of gastric contents into the esophagus (gastroesophageal reflux) is a normal physiologic process. Most episodes are brief and do not cause symptoms, esophageal injury, or other complications. Gastroesophageal reflux becomes a disease when it either causes macroscopic damage to the esophagus or causes symptoms.

This topic will review the initial management of gastroesophageal reflux disease (GERD) and management of patients with recurrent GERD when treatment is discontinued. Our recommendations are largely consistent with the American Gastroenterological Association and the American College of Gastroenterology guidelines [1,2]. The evaluation and management of refractory GERD and the role of surgery and endoscopic therapy in patients with GERD are discussed separately. (See "Approach to refractory gastroesophageal reflux disease in adults" and "Surgical treatment of gastroesophageal reflux in adults" and "Radiofrequency treatment for gastroesophageal reflux disease".)

PRETREATMENT EVALUATION

Assessment of clinical severity — The frequency and severity of symptoms can guide the management of GERD. Symptoms are considered mild or moderate/severe based on whether

they impair quality of life. Symptoms may be intermittent (less than two episodes per week) or frequent (two or more episodes per week). (See "Clinical manifestations and diagnosis of gastroesophageal reflux in adults", section on 'Clinical features'.)

Are there indications for upper endoscopy? — Upper endoscopy is not required in the presence of typical GERD symptoms of heartburn or regurgitation [2]. We recommend an upper endoscopy if the diagnosis of GERD is unclear and to evaluate alarm features or abnormal imaging if not performed within the last three months. Upper endoscopy should also be performed to screen for Barrett's esophagus in patients with risk factors. Patients with GERD should receive empiric acid suppressive therapy, even if additional evaluation with an upper endoscopy is indicated. (See "Clinical manifestations and diagnosis of gastroesophageal reflux in adults", section on 'Evaluation in selected patients'.)

INITIAL MANAGEMENT

Overall approach — Our management approach to patients with gastroesophageal reflux disease (GERD) is based on the frequency and severity of symptoms and the presence of erosive esophagitis or Barrett's esophagus on upper endoscopy, if previously performed (algorithm 1). (See 'Pretreatment evaluation' above and "Clinical manifestations and diagnosis of gastroesophageal reflux in adults", section on 'Endoscopic findings'.)

In patients with mild and intermittent symptoms (fewer than two episodes per week) and no evidence of erosive esophagitis, we suggest step-up therapy for GERD. The step-up approach involves incrementally increasing the potency of therapy until symptom control is achieved. In patients who are naïve to treatment, we initially recommend lifestyle and dietary modification and, as needed, low-dose histamine 2 receptor antagonists (H2RAs) (table 1). We suggest concomitant antacids and/or sodium alginate as needed if symptoms occur less than once a week. For patients with continued symptoms despite these measures, we increase the dose of H2RAs to standard dose, twice daily for a minimum of two weeks. Further increases in the dose of H2RA, prolonging the course of treatment, or switching to another H2RA is unlikely to control symptoms [3,4]. Therefore, if symptoms of GERD persist, we discontinue H2RAs and initiate once-daily proton pump inhibitors (PPIs) at a low dose and then increase to standard doses if required (table 1). We make incremental changes in therapy at four- to eight-week intervals. Once symptoms are controlled, treatment should be continued for at least eight weeks.

In patients with erosive esophagitis, frequent symptoms (two or more episodes per week), and/or severe symptoms that impair quality of life, we use step-down therapy in order to optimize symptom relief. The step-down approach starts with potent antisecretory agents and

then involves incrementally, decreasing the potency of therapy until breakthrough symptoms define the treatment necessary for symptom control. We begin with standard-dose PPI once daily for eight weeks in addition to lifestyle and dietary modification (table 1). We subsequently decrease acid suppression to low-dose PPIs and then to H2RAs if patients have mild or intermittent symptoms. We discontinue acid suppression in all asymptomatic patients with the exception of patients with severe erosive esophagitis or Barrett's esophagus, in whom we suggest maintenance PPI therapy. (See 'Duration of acid suppression' below.)

Patients with GERD may be managed with a step-up or step-down approach to therapy. While the optimal strategy is controversial, both have advantages [5-7]. The step-up approach minimizes the use of PPIs and their associated costs and side effects, whereas step-down therapy provides faster symptom relief. (See "Proton pump inhibitors: Overview of use and adverse effects in the treatment of acid related disorders", section on 'Adverse effects'.)

Lifestyle and dietary modification — Although several lifestyle and dietary modifications have been used in clinical practice, a systematic review of 16 randomized trials that evaluated the impact of these measures on GERD concluded that only weight loss and elevation of the head end of the bed improved esophageal pH-metry and/or GERD symptoms [8-13].

We suggest the following lifestyle and dietary measures [14,15]:

- Weight loss for patients with GERD who are overweight or have had recent weight gain.
- Elevation of the head of the bed in individuals with nocturnal or laryngeal symptoms (eg, cough, hoarseness, throat clearing). This can be achieved either by putting six- to eight-inch blocks under the legs at the head of the bed or a Styrofoam wedge under the mattress. We also suggest a corollary to this recommendation: refraining from assuming a supine position after meals and avoidance of meals two to three hours before bedtime [2]. (See "Clinical manifestations and diagnosis of gastroesophageal reflux in adults", section on 'Clinical features'.)
- We suggest selective elimination of dietary triggers (caffeine, chocolate, spicy foods, food with high fat content, carbonated beverages, and peppermint) in patients who note correlation with GERD symptoms and an improvement in symptoms with elimination. In a prospective study of 48,308 women, intake of coffee, tea, and soda, but not milk, water, or juice were associated with a modest and dose-dependent increase in risk of GERD symptoms (HR 1.34, 1.26 and 1.29) [16]. Substitution of two servings per day of coffee, tea, or soda with water was associated with a small reduction in GERD symptoms (HR, 0.96; tea HR, 0.96; and soda HR, 0.92, respectively).

Other measures that have a physiologic basis but have not consistently been demonstrated to improve reflux symptoms include [8,15,17,18]:

- Avoidance of tight-fitting garments to prevent increasing intragastric pressure and the gastroesophageal pressure gradient. (See "Pathophysiology of reflux esophagitis", section on 'Gastroesophageal junction incompetence'.)
- Promotion of salivation through oral lozenges/chewing gum to neutralize refluxed acid and increase the rate of esophageal acid clearance.
- Avoidance of tobacco and alcohol, as both reduce lower esophageal sphincter pressure and smoking also diminishes salivation.
- Abdominal breathing exercises to strengthen the antireflux barrier of the lower esophageal sphincter.

In a prospective study of 42,955 females, the risk for GERD symptoms was significantly lower for those with five antireflux lifestyle factors as compared with females without adherence to antireflux lifestyle factors (HR 0.50; 95% CI 0.42-0.59) [19]. These measures included eating a diet rich in whole grains, vegetables, and fruits; maintaining a healthy body weight; not smoking; exercising for 30 minutes per day; and drinking no more than two cups of soda, coffee, or tea per day. Up to 40 percent of weekly GERD symptoms could be prevented through five dietary and lifestyle factors. The decreased risk of GERD symptoms associated with these measures was observed even among regular users of PPIs and H2RAs.

Mild and intermittent symptoms

Antacids — As antacids do not prevent GERD, their role is limited to intermittent (on-demand) use for relief of mild GERD symptoms that occur less than once a week [4]. Antacids usually contain a combination of a magnesium salt, aluminum hydroxide, or calcium carbonate (eg, aluminum hydroxide-magnesium hydroxide), which neutralize gastric pH, thereby decreasing the exposure of the esophageal mucosa to gastric acid during episodes of reflux. Antacids begin to provide relief of heartburn within five minutes, but have a short duration of effect of 30 to 60 minutes. The side effects of antacids are discussed separately. (See "Antiulcer medications: Mechanism of action, pharmacology, and side effects", section on 'Adverse effects'.)

Surface agents and alginates — Sucralfate (aluminum sucrose sulfate), a surface agent, adheres to the mucosal surface, promotes healing, and protects from peptic injury by mechanisms that are incompletely understood. However, given the short duration of action and

limited efficacy as compared with PPIs, the use of sucralfate is limited to the management of GERD in pregnancy [2,20]. (See 'Pregnancy and lactation' below.)

Sodium alginate is a polysaccharide derived from seaweed that forms a viscous gum that floats within the stomach and neutralizes the postprandial acid pocket in the proximal stomach [21]. Studies evaluating the efficacy of alginates on GERD symptoms and esophageal acid exposure suggest this may be beneficial, especially for postprandial symptoms in individuals with relatively mild reflux disease [22-25]. They are also used as add-on therapy in patients with refractory GERD. (See "Approach to refractory gastroesophageal reflux disease in adults", section on 'Residual acid reflux'.)

Histamine 2 receptor antagonist — Histamine 2 receptor antagonists (H2RAs) decrease the secretion of acid by inhibiting the histamine 2 receptor on the gastric parietal cell. However, the development of tachyphylaxis within two to six weeks of initiation of H2RAs limits their use in the management of GERD [26]. (See 'Mild and intermittent symptoms' above.)

In contrast to antacids, H2RAs have a slower onset of action, reaching peak concentrations 2.5 hours after dosing, but a significantly longer duration of action of 4 to 10 hours [27]. H2RAs are also more effective in decreasing the frequency and severity of heartburn symptoms as compared with antacids and placebo.

However, H2RAs have limited efficacy in patients with erosive esophagitis. While mucosal healing rates in patients with mild erosive esophagitis are 10 to 24 percent higher with H2RA therapy as compared with placebo, H2RAs are ineffective in patients with severe esophagitis [28-30].

Severe or frequent symptoms or erosive esophagitis — We use step-down therapy in patients with erosive esophagitis, frequent symptoms (two or more episodes per week), and/or severe symptoms that impair quality of life in order to optimize symptom relief. We begin with standard-dose PPI once daily for eight weeks in addition to lifestyle and dietary modification (table 1). (See 'Lifestyle and dietary modification' above.)

Proton pump inhibitors — PPIs should be used in patients who fail twice-daily H2RA therapy and in patients with erosive esophagitis and/or frequent (two or more episodes per week) or severe symptoms of GERD that impair quality of life. (See 'Mild and intermittent symptoms' above and "Clinical manifestations and diagnosis of gastroesophageal reflux in adults", section on 'Endoscopic findings'.)

PPIs are the most potent inhibitors of gastric acid secretion by irreversibly binding to and inhibiting the hydrogen-potassium (H-K) ATPase pump. PPIs are most effective when taken 30

to 60 minutes before the first meal of the day because the amount of H-K-ATPase present in the parietal cell is greatest after a prolonged fast. PPIs should be administered daily rather than on demand because continuous therapy provided better symptom control, quality of life, and higher endoscopic remission rates [31,32]. (See "Proton pump inhibitors: Overview of use and adverse effects in the treatment of acid related disorders", section on 'Dose and timing of administration'.)

PPIs at standard doses for eight weeks relieve symptoms of GERD and heal esophagitis in up to 86 percent of patients with erosive esophagitis [27,33]. There are no major differences in efficacy among PPIs and no consistent increase in symptom resolution or esophagitis healing rates between different doses or dosing regimens of PPI therapy [31]. (See "Proton pump inhibitors: Overview of use and adverse effects in the treatment of acid related disorders", section on 'Pharmacology'.)

As compared with H2RAs, PPIs provide faster symptom relief and are more effective in relieving symptoms of GERD [34-36]. In a meta-analysis of 34 trials that included 1314 individuals, PPIs were significantly more effective than H2RAs in relieving heartburn in patients treated empirically for GERD and in patients with nonerosive reflux disease on upper endoscopy (relative risk [RR] 0.66 and 0.78, respectively) [36]. PPIs are also more effective than H2RAs in healing erosive esophagitis, regardless of the severity of esophagitis and the dose and duration of treatment [28,37,38].

Limitations of PPIs include a higher cost as compared with H2RAs, and potential side effects. The side effects associated with PPIs are discussed separately. (See "Proton pump inhibitors: Overview of use and adverse effects in the treatment of acid related disorders", section on 'Adverse effects'.)

Repeat endoscopy for severe erosive esophagitis — Patients with severe erosive esophagitis (Los Angeles classification Grade C and D) on initial endoscopy should undergo a follow-up endoscopy after a two-month course of PPI therapy to assess healing and rule out Barrett's esophagus. Repeat endoscopy after this follow-up examination is not indicated in the absence of Barrett's esophagus unless patients have bleeding, dysphagia, or a significant change in symptoms while on effective therapy for GERD. (See "Clinical manifestations and diagnosis of gastroesophageal reflux in adults", section on 'Endoscopic findings' and "Barrett's esophagus: Surveillance and management", section on 'Surveillance'.)

SUBSEQUENT MANAGEMENT

PPI refractory symptoms — Patients who fail to respond to once-daily proton pump inhibitor (PPI) therapy are considered to have refractory reflux-like symptoms. We perform a diagnostic endoscopy along with an ambulatory esophageal pH-metry study, ideally after PPIs are stopped for at least two weeks, in patients whose reflux-like symptoms do not respond adequately to an eight-week empiric trial of PPIs [2,39]. This helps phenotype them as refractory GERD, reflux hypersensitivity, or functional heartburn [40]. The management of patients with refractory GERD is discussed separately. (See "Approach to refractory gastroesophageal reflux disease in adults", section on 'Initial assessment'.)

Duration of acid suppression

Patients with erosive esophagitis or Barrett's esophagus — Patients with erosive esophagitis or Barrett's esophagus require maintenance acid suppression with a PPI at standard dose as they are likely to have recurrent symptoms and complications if acid suppression is decreased or discontinued [31,41-44]. The rationale for continuing PPI therapy in patients with Barrett's esophagus is discussed separately. (See "Barrett's esophagus: Surveillance and management", section on 'Management of acid reflux'.)

Patients without erosive esophagitis and Barrett's esophagus — PPIs should be prescribed at the lowest dose and for the shortest duration appropriate to the condition being treated [2,41]. In patients whose classic GERD symptoms respond to an eight-week empiric trial of PPIs, an attempt should be made to discontinue treatment. In patients on PPIs for longer than six months, we taper the PPI dose before discontinuing it and use H2RAs for mild or intermittent symptoms. We discontinue acid suppression completely in asymptomatic patients. (See "Proton pump inhibitors: Overview of use and adverse effects in the treatment of acid related disorders", section on 'Discontinuing PPIs'.)

Recurrent symptoms — Approximately two-thirds of patients with nonerosive reflux disease relapse when acid suppression is discontinued. Patients with recurrent symptoms should be managed with acid suppressive therapy with the medication and dose used to previously control symptoms [42,45,46]. If necessary for symptom control, therapy may be stepped up to medications of increasing potency as with initial therapy (algorithm 1 and table 1).

- In patients with recurrent symptoms ≥3 months after discontinuing acid suppression, we use repeated eight-week courses of acid suppressive therapy.
- In patients with recurrent symptoms <3 months of discontinuing acid suppression who have not previously undergone an upper endoscopy, we perform an upper endoscopy to rule out other etiologies and complications of GERD. Patients with recurrent symptoms within three months of discontinuing acid suppression require long-term maintenance

therapy with a PPI for acid suppression. However, PPI therapy should be used at the lowest effective dose necessary to control GERD symptoms.

The role of surgery and endoscopic therapy in patients with GERD who cannot tolerate long-term PPIs or want to discontinue therapy due to concerns about long-term side effects are discussed separately. (See "Proton pump inhibitors: Overview of use and adverse effects in the treatment of acid related disorders", section on 'Adverse effects' and "Surgical treatment of gastroesophageal reflux in adults", section on 'Indications' and "Radiofrequency treatment for gastroesophageal reflux disease".)

Indications for referral — Referral to a subspecialist is warranted for patients who fail to respond to once daily PPI therapy (refractory GERD), and patients who cannot tolerate long-term PPIs or want to discontinue therapy. (See "Approach to refractory gastroesophageal reflux disease in adults" and "Surgical treatment of gastroesophageal reflux in adults" and "Radiofrequency treatment for gastroesophageal reflux disease".)

No role for empiric eradication of Helicobacter pylori — It is uncertain whether chronic acid suppression with PPIs increases the risk for atrophic gastritis in patients with *H. pylori*. Therefore, routine screening for *H. pylori* infection and empiric eradication of *H. pylori* are not recommended in patients with GERD [14].

However, if *H. pylori* is diagnosed in the setting of GERD, eradication of *H. pylori* has been associated with an improvement of symptoms in patients with antral-predominant gastritis. The treatment of *H. pylori* in the setting of GERD is discussed separately. (See "Helicobacter pylori and gastroesophageal reflux disease".)

PREGNANCY AND LACTATION

Initial management of gastroesophageal reflux disease (GERD) in pregnancy consists of lifestyle and dietary modification (eg, elevation of the head end of the bed, avoidance of dietary triggers). In patients with persistent symptoms, pharmacologic therapy should begin with antacids, alginates, or sucralfate (1 g orally three times daily). In patients who fail to respond, similar to nonpregnant patients, histamine 2 receptor antagonists (H2RAs) and then proton pump inhibitors (PPIs) should be used to control symptoms (table 1). (See 'Mild and intermittent symptoms' above.)

Sucralfate is likely safe during pregnancy and lactation because it is poorly absorbed [47] (see 'Surface agents and alginates' above). Antacids and alginates are considered safe in pregnancy and are compatible with breastfeeding [48].

Experience with PPIs is more limited compared with H2RAs but suggests that PPIs are probably safe in pregnancy [49,50]. Limited data are available on the secretion of PPIs in breast milk. Omeprazole and pantoprazole are secreted in low concentrations in breast milk [51,52]. However, most of this is likely destroyed by gastric acid in the infant's stomach [53]. In pregnant patients with GERD symptoms despite H2RAs, we suggest the use of omeprazole, lansoprazole, or pantoprazole rather than other PPIs, as they have been more widely used in pregnancy. The safety of PPIs in pregnancy has been evaluated in several studies. A meta-analysis of seven observational studies found no significant difference in the risk for major congenital birth defects, spontaneous abortions, or preterm delivery among 1530 women exposed to PPIs during pregnancy as compared with 133,410 who were not exposed to PPIs [49]. A subsequent observational study that evaluated PPI exposure in early pregnancy also found no increase in the risk of major birth defects in 3651 infants exposed to PPIs during the first trimester, as compared with 837,317 infants who had not been exposed [50]. (See 'Proton pump inhibitors' above.)

Upper endoscopy should be performed during pregnancy only if there is a strong indication (eg, significant gastrointestinal bleeding). When possible, endoscopy should be postponed until the second trimester [54]. Obstetrical staff should be closely involved and the degree of maternal and fetal monitoring should be individualized. Recommendations for procedural sedation for endoscopy in pregnant and nursing women are discussed separately. (See "Gastrointestinal endoscopy in adults: Procedural sedation administered by endoscopists", section on 'Special populations'.)

SOCIETY GUIDELINE LINKS

Links to society and government-sponsored guidelines from selected countries and regions around the world are provided separately. (See "Society guideline links: Gastroesophageal reflux in adults".)

INFORMATION FOR PATIENTS

UpToDate offers two types of patient education materials, "The Basics" and "Beyond the Basics." The Basics patient education pieces are written in plain language, at the 5th to 6th grade reading level, and they answer the four or five key questions a patient might have about a given condition. These articles are best for patients who want a general overview and who prefer short, easy-to-read materials. Beyond the Basics patient education pieces are longer, more sophisticated, and more detailed. These articles are written at the 10th to 12th grade reading

level and are best for patients who want in-depth information and are comfortable with some medical jargon.

Here are the patient education articles that are relevant to this topic. We encourage you to print or e-mail these topics to your patients. (You can also locate patient education articles on a variety of subjects by searching on "patient info" and the keyword(s) of interest.)

- Basics topics (see "Patient education: Acid reflux and GERD in adults (The Basics)" and "Patient education: H. pylori infection (The Basics)" and "Patient education: Acid reflux and GERD during pregnancy (The Basics)")

- Beyond the Basics topics (see "Patient education: Gastroesophageal reflux disease in adults (Beyond the Basics)" and "Patient education: Helicobacter pylori infection and treatment (Beyond the Basics)")

SUMMARY AND RECOMMENDATIONS

- **Initial assessment and approach** – The optimal approach to the management of gastroesophageal reflux disease (GERD) is controversial. Our management approach to patients with GERD is based on the frequency and severity of symptoms and the presence of erosive esophagitis or Barrett's esophagus on upper endoscopy, if previously performed (algorithm 1). We suggest lifestyle and dietary modification in all patients with GERD (**Grade 2C**). (See 'Pretreatment evaluation' above and 'Lifestyle and dietary modification' above and "Clinical manifestations and diagnosis of gastroesophageal reflux in adults", section on 'Indications'.)

- **Patients with mild and intermittent symptoms**

  In patients with mild and intermittent (less than two episodes per week) symptoms of GERD who are naïve to treatment and have no evidence of erosive esophagitis or Barrett's esophagus, we suggest as-needed low-dose histamine 2 receptor antagonists (H2RAs) (table 1) (**Grade 2B**). Concomitant antacids and/or sodium alginate can be used if symptoms occur less than once a week. In patients with continued symptoms, we increase the dose of H2RAs to standard dose, twice daily for a minimum of two weeks. (See 'Antacids' above and 'Overall approach' above.)

  If symptoms of GERD persist, we discontinue H2RAs and initiate once-daily proton pump inhibitors (PPIs) at a low dose (**Grade 2B**), and then increase to standard doses if required for symptom control (table 1). Once symptoms are controlled, therapy should be

continued for at least eight weeks. (See 'Histamine 2 receptor antagonist' above and 'Overall approach' above.)

- **Patients with erosive esophagitis** – In patients with erosive esophagitis, we recommend initial acid suppressive therapy with standard-dose PPI once daily (table 1) (**Grade 1A**). (See 'Overall approach' above and 'Proton pump inhibitors' above.)

- **Patients with frequent or severe symptoms** – In patients with frequent (two or more episodes per week), severe symptoms that impair quality of life or with Barrett's esophagus, we suggest initial therapy with standard-dose PPI once daily (**Grade 2B**). (See 'Overall approach' above and 'Proton pump inhibitors' above.)

- **Indications for referral** – Referral to a subspecialist is warranted for patients who fail to respond to once-daily PPI therapy and patients who cannot tolerate long-term PPIs or want to discontinue therapy. (See 'PPI refractory symptoms' above.)

- **Discontinuation of acid suppression** – We discontinue acid suppression in all patients with GERD whose symptoms resolve completely with treatment, with the exception of those with erosive esophagitis on upper endoscopy and Barrett's esophagus. (See 'Duration of acid suppression' above.)

- **Patients with recurrent symptoms** – In patients with recurrent symptoms within three months of discontinuing acid suppression, we continue long-term maintenance therapy with a PPI. However, if symptoms occur after three or more months, we use repeated eight-week courses of previously effective acid suppressive therapy (algorithm 1). (See 'Recurrent symptoms' above.)

- **Management of GERD in pregnancy** – Management consists of lifestyle and dietary modification followed by pharmacologic therapy with antacids, alginates, and sucralfate. In patients who fail to respond, similar to nonpregnant patients, H2RAs and then PPIs are used to control symptoms. (See 'Pregnancy and lactation' above and 'Mild and intermittent symptoms' above.)

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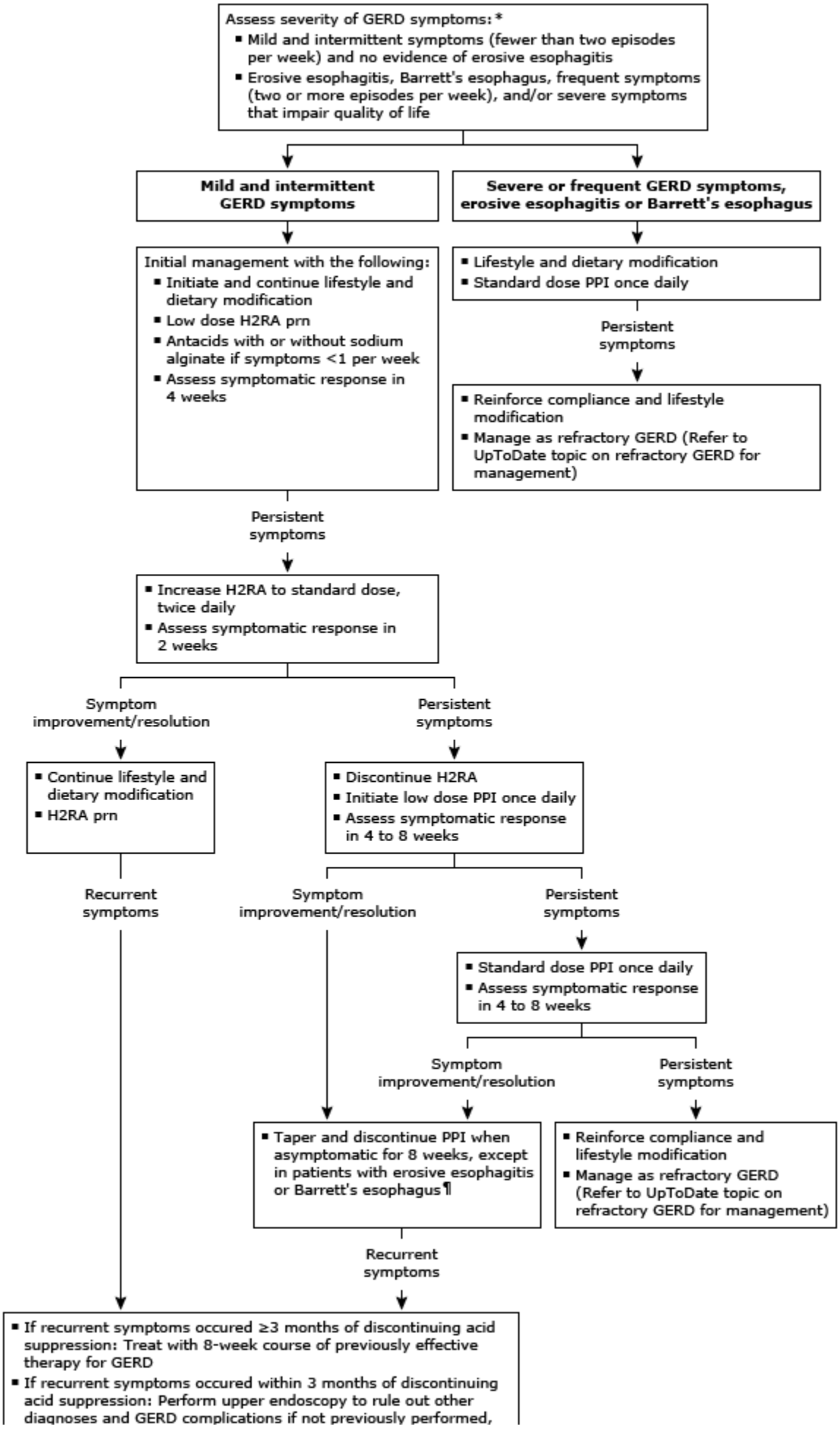
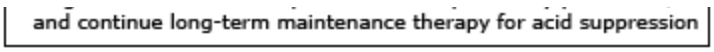
Topic 2258 Version 53.0

GRAPHICS

Approach to the initial management of patients with GERD


Assess severity of GERD symptoms: *
Mild and intermittent symptoms (fewer than two episodes per week) and no evidence of erosive esophagitis
Erosive esophagitis, Barrett's esophagus, frequent symptoms (two or more episodes per week), and/or severe symptoms that impair quality of life
Mild and intermittent GERD symptoms
Severe or frequent GERD symptoms, erosive esophagitis or Barrett's esophagus
Initial management with the following:
Initiate and continue lifestyle and dietary modification
Low dose H2RA prn
Antacids with or without sodium alginate if symptoms <1 per week
Assess symptomatic response in 4 weeks
Lifestyle and dietary modification
Standard dose PPI once daily
Persistent symptoms
Reinforce compliance and lifestyle modification
Manage as refractory GERD (Refer to UpToDate topic on refractory GERD for management)
Persistent symptoms
Increase H2RA to standard dose, twice daily
Assess symptomatic response in 2 weeks
Symptom improvement/resolution
Persistent symptoms
Continue lifestyle and dietary modification
H2RA prn
Discontinue H2RA
Initiate low dose PPI once daily
Assess symptomatic response in 4 to 8 weeks
Recurrent symptoms
Symptom improvement/resolution
Persistent symptoms
Standard dose PPI once daily
Assess symptomatic response in 4 to 8 weeks
Symptom improvement/resolution
Persistent symptoms
Taper and discontinue PPI when asymptomatic for 8 weeks, except in patients with erosive esophagitis or Barrett's esophagus¶
Reinforce compliance and lifestyle modification
Manage as refractory GERD (Refer to UpToDate topic on refractory GERD for management)
Recurrent symptoms
If recurrent symptoms occured ≥3 months of discontinuing acid suppression: Treat with 8-week course of previously effective therapy for GERD
If recurrent symptoms occured within 3 months of discontinuing acid suppression: Perform upper endoscopy to rule out other diagnoses and GERD complications if not previously performed,



* Upper endoscopy is not required in the presence of typical GERD symptoms of heartburn or regurgitation. We recommend an upper endoscopy if the diagnosis of GERD is unclear and to evaluate alarm features or abnormal imaging if not performed within the last three months. Upper endoscopy should also be performed to screen for Barrett's esophagus in patients with risk factors. Refer to UpToDate content on management of GERD.

¶ Patients with erosive esophagitis or Barrett's esophagus should remain on maintenance acid suppression with a PPI, as they are likely to have recurrent symptoms and complications if acid suppression is decreased or discontinued.

Graphic 116964 Version 3.0

Treatment of gastroesophageal reflux disease in adults

Medication	Low dose (oral)	Standard dose (oral)
Histamine 2 receptor antagonists*		
Famotidine	10 mg twice daily¶	20 mg twice daily$^{\Delta}$
Nizatidine	75 mg twice daily◇	150 mg twice daily
Cimetidine§	200 mg twice daily¶	400 mg twice daily$^{\Delta}$
Proton pump inhibitors		
Omeprazole	10 mg daily	20 mg daily¶
Lansoprazole	15 mg daily¶	30 mg daily
Esomeprazole	10 mg daily¥	20 mg daily¶
Pantoprazole	20 mg daily¶	40 mg daily
Dexlansoprazole	Not available	30 mg daily$^{\Delta}$
Rabeprazole	10 mg daily¥	20 mg daily

GERD: gastroesophageal reflux disease; US: United States.

* Histamine 2 receptor antagonists require dose adjustment in the setting of renal insufficiency.

¶ Available without a prescription (over the counter) in the US.

Δ The daily dose for erosive esophagitis with symptoms of GERD in the US prescribing information is up to twice the standard dose shown in this table.

◇ Strength not available in US. Available elsewhere.

§ Significant drug interactions can occur. When initiating or altering drug therapy, use of a drug interactions database, such as Lexicomp drug interactions, is advised. Other histamine 2 receptor antagonists with more favorable adverse effect profiles and fewer drug interactions (eg, famotidine) are generally preferred.

¥ Dose strength limited to certain dosage forms (eg, granules for oral suspension or sprinkle capsule). Consult local product availability.

Prepared with data from:

1. *Kahrilas PJ, et al. American Gastroenterological Association Medical Position Statement on the management of gastroesophageal reflux disease. Gastroenterology 2008; 135:1383.*
2. *Anon. American Gastroenterological Association Institute Technical Review on the Management of Gastroesophageal Reflux Disease. Gastroenterology 2008; 135:1392.*

Graphic 89545 Version 9.0

Contributor Disclosures

Peter J Kahrilas, MD Patent Holder: Medtronic [FLIP panometry methods and technology]. Consultant/Advisory Boards: Ironwood [Irritable bowel]; Johnson & Johnson [Anti-reflux surgery]; Reckitt [Reflux disease]. Speaker's Bureau: Phathom [Reflux disease, H. pylori]. All of the relevant financial relationships listed have been mitigated. **Nicholas J Talley, MD, PhD** Patent Holder: Australian Provisional Patent [Diagnostic marker for functional gastrointestinal disorders]; Biomarkers of irritable bowel syndrome [Irritable bowel syndrome]; Mayo Clinic [Dysphagia questionnaire]; Mayo Clinic [Bowel Disease questionnaire]; Nepean Dyspepsia Index [Dyspepsia]; Nestec [Irritable bowel syndrome]; Singapore Provisional Patent [BDNF Tissue Repair Pathway]. Grant/Research/Clinical Trial Support: Alimetry [Gastric mapping device research collaboration]; Allakos [Gastric eosinophilic disease]; AstraZeneca [Eosinophilic gastritis, eosinophilic gastroenteritis]; Intrinsic Medicine [Bowel syndrome with constipation]; NHMRC Centre for Research Excellence in Digestive Health [NHMRC Investigator grant]. Consultant/Advisory Boards: Adelphi Values [Functional dyspepsia]; Allakos [Gastric eosinophilic disease, AK002]; AstraZeneca [Eosinophilic gastritis, eosinophilic gastroenteritis]; AusEE [Eosinophilic gut diseases]; Bayer [Inflammatory bowel syndrome]; BluMaiden [Microbiome Ad Board]; Comvita Mānuka Honey [Digestive health]; Dr Falk Pharma [Eosinophilia]; GlaxoSmithKline Australia [Educational speaker eosinophilic gut disease]; Glutagen [Celiac disease]; International Foundation for Functional Gastrointestinal Disorders [Advisory board, functional GI disorders]; Intrinsic Medicine [Human milk oligosaccharide]; IsoThrive [Esophageal microbiome]; Planet Innovation [Gas capsule, inflammatory bowel syndrome]; Progenity Inc [Intestinal capsule]; Rose Pharma [IBS]; Viscera Labs [Inflammatory bowel syndrome, diarrhea]. Other Financial Interest: Elsevier textbook royalties [Medical education]. All of the relevant financial relationships listed have been mitigated. **Shilpa Grover, MD, MPH, AGAF** No relevant financial relationship(s) with ineligible companies to disclose.

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Conflict of interest policy

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