Generally, GERD is defined as “a condition that develops when the reflux of stomach contents causes troublesome symptoms and/or complications” and can include symptoms or mucosal damage produced by the abnormal reflux of gastric contents into the esophagus.\textsuperscript{1,2} The cardinal symptoms associated with GERD are heartburn and regurgitation. However, complications from GERD can arise even in patients who lack these typical symptoms. GERD is experienced on a weekly basis by nearly 20\% of the US population.

Generally speaking, the symptoms of GERD are due to tissue injury related to the chronic exposure of the esophagus to stomach contents particularly those of low pH and with the possibility of laxity of the lower esophageal sphincter (LES). Reflux esophagitis describes a subset of patients with symptoms of GERD who also have endoscopic or histopathologic evidence of esophageal inflammation, which should warrant a referral. Many patients with symptoms of GERD do not have esophagitis; such patients have been referred to as having nonerosive reflux disease (NERD).\textsuperscript{3}

**Pathophysiology**

GERD develops when the stomach contents are refluxed up into the esophagus and the esophageal mucosa degenerates and/or becomes chronically inflamed. The degree of inflammation depends on the frequency of reflux, the acidic concentration of the refluxed material, the length of time of exposure to the reflux material and local mucosal protective functions such as mucous and bicarbonate secretion and cellular integrity that provide intrinsic resistance to acid-induced damage.

Reflux occurs when the LES loses its tone or becomes overwhelmed by too much intraabdominal pressure. The LES is under hormonal, neurological and muscular control and is supported in its role by the acute angle of His, and the disparity between intrathoracic and intra-abdominal pressures. As inflammation of the esophagus increases, the esophagus becomes less able to exclude and eliminate the refluxed material leading to further reflux, inflammation and dysfunction. Obesity and pregnancy can predispose to developing reflux symptoms.

**Subjective Findings and History**

A well-taken history is essential in establishing a diagnosis of GERD. Classic symptoms include:

- Chest pain [substernal or epigastric], heartburn [pyrosis], regurgitation, nausea, reflux of gastric contents [waterbrash, sourbrash], recurrent pain extending to the mid-back, arms and neck with recumbency or postprandially
- Dysphagia, belching, coughing [nocturnal] and shortness of breath unrelated to exercise
• Initially, the symptoms of GERD are worse after eating large meals, bending over and on lying down, or exacerbated by emotional stress.\textsuperscript{4} Eating meals may relieve the symptoms but they return within about 30-90 minutes after meals.
• Symptoms are usually worsened by drinking coffee or caffeine-rich beverages and alleviated by using antacids.
• Chronic pharyngitis or sinusitis

\textit{Diagnostic signs may include:}
• Chronic cough
• Bronchospasm
• Odynophagia (may indicate an esophageal ulcer)
• Asthma
• Recurrent sore throat or laryngitis
• Dental enamel loss
• Subglottic stenosis
• Globus sensation (“lump in the throat”)
• Chest pain

\textit{Alarm signs include:}
• dysphagia, odynophagia, gastrointestinal bleeding, anemia, weight loss, and recurrent vomiting. Onset past age 50 (“alarm sign”, males in this age group at additional risk for Barrett’s esophagus and esophageal adenocarcinoma)

\textbf{Objective Findings}
It is neither necessary nor practical to initiate a diagnostic evaluation in every patient with heartburn. The following assessments are to be considered when symptoms are severe or there is no resolution after appropriate conservative treatment.

• X-rays with and without contrast
• GerdQ Questionnaire\textsuperscript{5}
• Endoscopy with biopsy should be done at presentation for patients with an esophageal GERD syndrome with troublesome dysphagia or to evaluate patients who have not responded to an empirical trial of twice daily PPI therapy.\textsuperscript{6}
• Helicobacter pylori testing (and subsequent treatment if conclusive)
• Esophageal intubation for manometry
• Ambulatory pH monitoring
• Acid provocation (Bernstein test)

Literature reviews suggest that about two-thirds of patients who have symptoms of GERD but have no visible endoscopic findings (ie, nonerosive reflux disease) have histologic evidence of esophageal injury.\textsuperscript{7}

\textbf{Differential Diagnosis (DDX)}
Gastritis, functional gastrointestinal disorders, esophageal strictures and tumor, esophageal spasms, infectious esophagitis, gastric ulcers, peptic ulcer disease, biliary tract disease, hiatal
hernia, lactose intolerance, pancreatitis, Plummer-Vinson Syndrome, coronary artery disease, and esophageal motor disorders. Presence, severity and duration of symptoms alone do not reliably distinguish among these disorders. Unexplained chest pain should be evaluated with an electrocardiogram (ecg) and exercise stress test prior to a gastrointestinal evaluation. The remaining elements of the DDX can be evaluated by endoscopy or biliary tract ultrasonography.

**Plan**

*Conservative treatment/management:*\(^8\)
- Weight loss \(^9,,10\)
- Identify medications that exacerbate symptoms\(^11\)
- Discontinue cigarette smoking
- Eat smaller meals
- Limit water consumption with meals
- Supplemental HCl or apple cider vinegar with meals
- Avoid bending over or lying down for 2-4 hours after meals
- Avoid bedtime snacks or meals 3 hours before bedtime.
- Avoid wearing tight clothing especially at mealtime
- Promotion of salivation by chewing gum or oral lozenges
- For those with nocturnal symptoms, consider head of the bed elevation (6”-8”)

*Dietary and other considerations:*
- **Avoid** foods that specifically effect the individual patient’s condition. This can be determined by doing an elimination diet, then challenge with high prevalence foods, based on the patient’s history. Some foods and medications that may decrease the LES tone are chocolate, caffeine, fat, spearmint/peppermint, garlic, onions, and more than small amounts of alcohol. Medications may include nicotine, progesterone [including pregnancy state], calcium-channel blockers, theophylline, opiates, benzodiazapines, and barbiturates, meperidine, beta-agonists and alpha-adrenergic antagonists,
- **Eat** more fiber-rich foods to facilitate ease of bowel movements to minimize elevations of intra-abdominal pressure
- Limit heavy lifting
- **Avoid** mucosal irritants such as aspirin, alcohol (red wine), caffeine, corticosteroids, black and red pepper, vinegar, nutmeg, cloves, bile salts, spicy food
- **Limit** foods that increase stomach acids such as sodas, orange juice, tomato juice, grapefruit juice, coffee, red peppers, niacin, protein-rich and amino acid rich foods.

*Nutritional and botanical strategies:*
- Herbs: Deglycyrrhizinated licorice extract (DGL) – chewed 20 minutes before eating, *Symphytum, Althea officinalis, Ulmus fulva, Hydrastis* or *Berberine* species, choline or phosphatidyl choline
- Probiotics
- Digestive enzymes
- D-limonene
- Mastic gum
- Glutamine
- Vitamin A
• Homeopathic remedies as appropriate.

Other therapies:
• Spinal and soft tissue manipulation (consider hiatal hernia)
• Heel drops
• Acupuncture
• Radiofrequency
• Specific breathing exercises and training

Conventional therapies,* A “step-up” or “step-down” Approach with:
• Antacids, sucralfate, histamine antagonists (H2As), proton pump inhibitors (PPIs), or cholinergic agonists
• Surgery (fundoplication)
• Radioablation
• Transient lower esophageal sphincter relaxation inhibitors (Baclofen),
• Augmentation esophageal defense mechanisms by improving esophageal clearance or enhancing epithelial repair (prokinetics),
• Modulation of sensory pathways (hypnotherapy, RPV1 nociceptor antagonists)

*Monitor and treat patients on these treatments for folic acid and vitamin B12 deficiencies, osteopenia and osteoporosis, malabsorption, hypochlohydria and other nutritional conditions.

Referral Criteria
• “Alarm signs” (see above for definition)
• Bleeding, dysphagia, or a significant change in symptoms while on effective therapy for GERD
• Suspicion for Barrett’s esophagus or esophageal adenocarcinoma (nocturnal reflux symptoms, hiatal hernia, elevated body mass index, tobacco use, and intra-abdominal distribution of fat)

Resources for Patients
The National Digestive Diseases Information Clearinghouse (NDDIC) is an information dissemination service of the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK). The NIDDK is part of the National Institutes of Health (NIH), which is part of the U.S. Department of Health and Human Services. http://digestive.niddk.nih.gov/ddiseases/pubs/gerd/

Resources for Clinicians


Clinical Pathway Feedback
CHP desires to keep our clinical pathways customarily updated. If you wish to provide additional input, please use the e-mail address listed below and identify which clinical pathway you are referencing. Thank you for taking the time to give us your comments.

Chuck Simpson, DC, CHP Vice President, Clinical Affairs: csimpson@chpgroup.com

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