GASTROESOPHAGEAL REFLUX DISEASE (GERD) AND HEARTBURN

INTRODUCTION

Gastroesophageal reflux disease (GERD) is a condition where acid from the stomach flows back up (refluxes) into the esophagus, causing heartburn and irritation and sometimes damage to the lining of the esophagus. Heartburn is the primary symptom, GERD is the disease (when there is actual tissue damage). Many patients with heartburn do not have esophageal inflammation or damage – this can only be determined by direct examination internally with endoscopy.

WHAT CAUSES GERD/REFLUX?

Normally, when we eat, food travels from the mouth into the stomach through the esophagus, a tube-like structure that is approximately 10 inches long and 1 inch wide in adults. The esophagus is made of tissue and muscle layers that expand and contract to propel food to the stomach through a series of wave-like movements called peristalsis.

LES: At the lower end of the esophagus, where it joins the stomach, there is a circular ring of muscle called eh lower esophageal sphincter (LES). The LES acts like a valve, relaxing and opening after swallowing and then closing to prevent the back-up of food and acid into the esophagus. Reflux can occur if the LES is weak, stays relaxed too long, or relaxes too frequently.
Reflux: There are normal episodes of reflux that typically occur after meals and are brief and without symptoms. Acid reflux becomes GERD when a person has frequent symptoms or the esophagus becomes damaged. The amount of reflux required to cause injury varies. In general, damage to the esophagus occurs when acid refluxes frequently and the esophagus is unable to clear away the acid quickly.

Hiatal hernia: The diaphragm is a large flat muscle at the base of the lungs that contracts and relaxes as a person breathes in and out. The esophagus passes through an opening in the diaphragm called the diaphragmatic hiatus from the chest cavity into the abdomen, joining the stomach there. If there is a weakening in the diaphragm muscle at the hiatus, the stomach may be able to partially slide up into the chest, forming what is called a sliding hiatal hernia. There is no way to prevent a hiatal hernia formation. Many people have a hiatal hernia, but not all of these have actual symptoms from it.

**SYMPTOMS OF GERD/REFLUX**

The most common symptom of GERD, heartburn, is estimated to affect 10 million adults in the United States on a regular basis. Heartburn is experienced as a burning sensation in the center of the chest, which sometimes spreads to the throat; there also may be an acid taste in the throat or a sense of regurgitation. Other symptoms that may be from GERD include: non-burning chest pain, difficulty swallowing (called dysphagia), and a sense of a lump in the throat.

Symptoms outside of the esophagus can occur from GERD such as exacerbating asthma, hoarse voice, chronic cough, sore throat and others.

**MAKING THE DIAGNOSIS OF GERD/REFLUX**

GERD is primarily diagnosed based upon symptoms and the response to acid reducing treatment. Specific testing such as a direct inspection of the esophagus and upper GI tract with endoscopy is important when the diagnosis is unclear,
chronic, or if there are more serious signs or symptoms especially bleeding, weight loss, and the sensation of food getting stuck after swallowing.

Endoscopy: An upper endoscopy is commonly used to evaluate the esophagus. After being sedated, a small, flexible tube is passed into the esophagus, stomach, and small intestine. The tube has a light source and a camera that displays magnified images. Damage to the lining of these structures can be evaluated and specimens of tissue (biopsies) can be taken to determine the extent of tissue damage and assess for Barrett’s esophagus (see below).

Esophageal pH study: An esophageal pH study is the most sensitive test for the diagnosis of GERD, although it is usually reserved for patients whose diagnosis is unclear or persistent after endoscopy or a trial of treatment. There are two techniques used. One involves placement of a thin tube thru the nose into the stomach. Sensors on the devise measure acid levels (pH) in the esophagus for 24 hours at which time it is removed. This technique can also measure for abnormal reflux that occurs and is not acidic, for example, while on acid blocker therapy a patient may be refluxing/regurgitating gastric contents whose acid has been neutralized by the medication. The second technique involves clipping a small radiofrequency sensor onto the lower esophagus during an endoscopy. This device transmits acid measurement data to an external recorder worn by the patient on a belt for 48 hours. The sensor will later spontaneously detach on its own and pass thru without requiring endoscopy to remove it. With either method, the patient keeps a diary of symptoms (heartburn etc) and the data is then analyzed to determine the frequency of reflux and the relationship of reflux to symptoms.

Esophageal Manometry: Esophageal manometry involves passing a narrow tube thru the nose into the stomach that has pressure sensors on it. During the exam, the patient swallows sips of water and the equipment measures the muscle contractions of the esophagus to determine if the esophagus has normal or abnormal peristaltic movement and also to assess the pressure of the lower esophageal sphincter to determine if it is functioning properly. This test is usually
reserved for patients in whom the diagnosis is unclear after other testing or in whom reflux surgery is being considered.

**COMPLICATIONS OF GERD/REFLUX**

The vast majority of patients with GERD will not develop serious complications, particularly when reflux is adequately treated.

Ulcers: Esophageal damage can be mild (redness) or more severe (ulcers). Ulcers are areas of inflammation appearing like a sore that burrows into the esophageal lining. It can cause pain, bleeding, and scarring.

Stricture: Damage from acid can cause the esophagus to scar and narrow, causing narrowing of the esophagus (stricture) that can cause food or pills to get stuck in the esophagus. This is treated by dilating/opening the narrowed area during endoscopy.

Lung and throat problems: Some patients reflux acid into the throat, causing inflammation of the vocal cords, a sore throat, or a hoarse voice or chronic cough. The acid can be inhaled into the lungs and cause a type of pneumonia (aspiration pneumonia) or asthma symptoms.

Barrett's esophagus: Barrett's esophagus is diagnosed when the normal cells that line the lower esophagus (squamous cells) are replaced by a different cell type (intestinal cells). This process is thought to result from chronic acid reflux irritation into the esophagus, which attempts to protect itself by changing to intestinal tissue that may be more accustomed to handling acid. During this transformation, the new intestinal-type cells may undergo precancerous or cancerous growth. As a result, patients with Barrett's esophagus are advised to have a periodic endoscopy to monitor. The risk of developing cancer in an individual patient with Barrett’s is significantly higher than those without it, but overall still low.

Esophageal cancer: There are two main types of esophageal cancer: adenocarcinoma and squamous cell carcinoma. A major risk factor for adenocarcinoma is Barrett's esophagus, discussed above. Squamous cell
carcinoma does not appear to be related to GERD and is more related to smoking and regular alcohol use. Unfortunately, adenocarcinoma of the esophagus is on the rise in the United States. Studies have shown that the rising rates of obesity is linked to higher rates of esophageal cancer.

**TREATMENT OPTIONS FOR REFLUX/GERD**

**Weight loss:** Reflux is much more common in overweight individuals and the symptom does improve with significant weight loss.

**Raise the head of the bed:** Nighttime reflux is associated with more significant GERD. Some people wake up at night with heartburn or regurgitation but many do not sense reflux while sleeping and are thus exposed to the potential deleterious effects of nightly acid exposure. Elevating the head of the bed on 4-6 inch blocks or bricks utilizes gravity to help prevent acid from refluxing.

**Avoid reflux-inducing foods:** Some foods also cause relaxation of the lower esophageal sphincter, promoting reflux. Excessive caffeine, chocolate, alcohol, peppermint, and fatty foods may contribute to reflux in some people.

**Quit smoking:** Saliva helps to neutralize refluxed acid, and smoking reduces the amount of saliva in the mouth and throat. Smoking also lowers the pressure in the lower esophageal sphincter and provokes coughing, causing frequent episodes of acid reflux in the esophagus.

**Avoid large and late meals:** Lying down with a full stomach may increase the risk of reflux. By stopping drinking and eating three or more hours before bedtime, reflux may be reduced. In addition, eating smaller meals may prevent the stomach from becoming overdistended, which can cause reflux.

**Mild symptoms:** For those with occasional heartburn, treatment can initially include the measures noted above and if needed, the use of OTC/nonprescription
medications, including antacids or acid blocking medicines (such as famotidine [Pepcid], cimetidine [Tagamet], nizatidine [Axid] and ranitidine [Zantac]).

Moderate to severe symptoms: Patients with persistent, chronic, progressive symptoms and those with documented esophagitis/GERD should follow the diet and life style changes notes above and also will usually require treatment with prescription medications. Most patients are treated with medications that decrease stomach acid production.

Medications to reduce stomach acid production:

H2 antagonists include famotidine (Pepcid), cimetidine (Tagamet), ranitidine (Zantac), and nizatidine (Axid), which and are sufficient to control symptoms in many people. These are available in OTC and prescription forms.

Proton pump inhibitors are more potent acid blockers and include omeprazole (Prilosec and Zegerid), esomeprazole (Nexium), lansoprazole (Prevacid), pantoprazole (Protonix), and rabeprazole (Aciphex). In many patients reflux is a chronic condition requiring long term use of these medications to control it.

Proton pump inhibitors are generally safe. Side effects can include: increased risk of gastrointestinal infections including C difficile, pneumonia, bone fractures, low magnesium levels, and interaction with other medications such as Plavix.

Surgical treatment: Anti-reflux surgery involves repairing the hiatal hernia and strengthening the lower esophageal sphincter. The most common surgical treatment used currently is the laparoscopic Nissen fundoplication. Patients in whom surgery is being considered typically require esophageal manometry and endoscopy to confirm the diagnosis and decide which surgical treatment will be most effective. Although the outcome of surgery is usually good, complications can occur. Examples include persistent difficulty swallowing (occurring in about 5 percent of patients), a sense of bloating and gas (known as "gas-bloat syndrome"), breakdown of the repair (1 to 2 percent of patients per year), and uncommonly, or diarrhea due to inadvertent injury to the nerves leading to the stomach and intestines. With the effectiveness of medical therapy, the role of surgery to treat reflux has significantly diminished.