 eaten. Eating foods that are hard to digest, irritate the digestive system or increase the acidity of stomach fluid can trigger or exacerbate heartburn. Typical food triggers for heartburn include citrus fruits, chocolate, peppermint, spearmint, tomatoes or tomato-based products, raw onions, garlic, black pepper, vinegar and fatty or spicy foods. Similarly, drinking coffee, citrus juices and caffeinated, carbonated or alcoholic beverages may also result in heartburn.9

Eating large portions of any food — even those that are not necessarily heartburn triggers — can produce symptoms. This occurs as a result of increased pressure on the LES when the stomach is full, which may lead to LES relaxation and subsequent acid reflux into the esophagus. Eating before bedtime may also trigger heartburn because the prone position makes it more difficult for food to transit through the gastrointestinal system.7,9

**Lifestyle Factors.** Numerous lifestyle factors have been identified as heartburn triggers. Generally, behaviors that increase stress, irritate the gastrointestinal tract, limit postprandial relaxation time or physically interfere with the transit of food through the digestive tract can trigger heartburn symptoms. Some of the most common lifestyle triggers are excess body weight, smoking, wearing restrictive clothing and hectic or stressful lifestyle.7

**Medical Factors.** Several medical factors also play a role in triggering heartburn, including pregnancy, hiatal hernia and a variety of medications.7,9 In pregnancy, the placenta produces progesterone, which relaxes smooth muscle tissue. Progesterone relaxes the LES, which can lead to acid reflux. Additionally, progesterone acts on smooth muscle tissue in the gastrointestinal tract, leading to a slowing of peristalsis and retention of partially digested food and stomach acid that can trigger heartburn. Later in pregnancy, the expanding fetus and uterus exert pressure on the stomach. This in turn puts pressure on the LES and can lead to leakage of stomach fluid into the esophagus.31

Hiatal hernia is a condition in which a portion of the stomach protrudes into the chest through an opening in the diaphragm. Under normal conditions, the diaphragm provides support for the LES. Displacement of the stomach can reduce this support, leading to acid reflux. Although the condition is common, especially in people older than 50, it rarely causes symptoms on its own, and not all hiatal hernia patients develop heartburn or GERD.5,12

If symptoms do arise, they may respond to changes in diet, lifestyle modification or medication. If symptoms do not resolve with these interventions, surgery to repair the hernia may be warranted.12

Some prescription medications may cause or worsen heartburn. Oral medications for asthma or chronic obstructive pulmonary disease may cause or contribute to heartburn by weakening the LES. Common medications for heart disease and hypertension (e.g., calcium channel blockers, beta blockers, alpha blockers and nitrates) may also cause LES relaxation, leading to acid reflux. Other medications that can trigger or exacerbate heartburn include nonsteroidal anti-inflammatories, muscle relaxants, bisphosphonates, benzodiazepines and opioids, as well as medications to treat cancer, Parkinson’s and other spastic conditions. As noted above, patients with GERD develop Barrett’s esophagus, a condition in which parts of the esophageal lining are replaced by tissue usually found in the intestines.13

Although the risk of developing esophageal adenocarcinoma is 30 to 125 times higher in patients with Barrett’s esophagus than patients without this condition, the risk for this cancer is still less than 1%.7

All patients with GERD face an increased risk for esophageal cancer as a result of prolonged exposure of the esophageal lining to acidic gastric fluid.17

### Table 1

**Questions for Patients With Symptoms of Heartburn or GERD**

- When did your symptoms begin?
- How long does each episode last?
- Is this the first time you have had heartburn?
- What do you usually eat at each meal? Before you feel heartburn, have you eaten a spicy or fatty meal?
- Do you drink a lot of coffee, other caffeinated beverages or alcohol? Do you smoke?
- Do you wear clothing that is tight in the chest or abdomen?
- Does the pain also appear in the chest, jaw, arm or elsewhere?
- What medications are you taking?
- Are you vomiting blood or black material?
- Do you have blood in your stools?
- Do you have black, tarry stools?
- Do other symptoms accompany your heartburn?

GERD

GERD is a potentially serious medical condition that can damage the esophagus. Without treatment, GERD may lead to significant complications. Continued irritation of the esophagus may lead to esophageal bleeding or ulceration (erosive esophagitis).9 Such damage can lead to esophageal strictures or the formation of scar tissue that narrows the esophagus and impedes swallowing. GERD may also result in achalasia, a decrease or lack of coordination in esophageal motility that is often associated with chest pain.11 Additionally, damage to the esophagus may result in dysphagia.14

Complications of GERD may affect tissues and organs other than the esophagus. The disease may cause or exacerbate several pulmonary conditions, including asthma, pneumonia, chronic cough, hoarseness and pulmonary fibrosis.12 These conditions are thought to result from reflux of stomach acid into the upper airway or larynx.15

In addition to the complications noted above, patients with GERD also are at increased risk for several serious conditions. Some patients with GERD develop Barrett’s esophagus, a condition in which parts of the esophageal lining are replaced by tissue usually found in the intestines.13

Although the risk of developing esophageal adenocarcinoma is 30 to 125 times higher in patients with Barrett’s esophagus than patients without this condition, the risk for this cancer is still less than 1%.7

All patients with GERD face an increased risk for esophageal cancer as a result of prolonged exposure of the esophageal lining to acidic gastric fluid.17

**Diagnosis**

Given the substantial health risks and quality-of-life effects associated with heartburn and GERD, it is important to diagnose and treat these conditions as early as possible in the disease process. Patients who present with heartburn symptoms should undergo a complete history and physical examination. The physical exam should assess weight, pulse, lungs and heart function. It should include an abdominal examination and potentially a rectal examination. A medical history for patients who present with heartburn symptoms should include the questions listed in Table 1.

**Red Flags**

In some situations, symptoms believed to be heartburn may be indicative of more serious medical conditions, such as peptic ulcer disease (PUD), gastric cancer, esophageal...