

# Gastroesophageal Reflux (GER) and Gastroesophageal Reflux Disease (GERD) in Adults

*National Digestive Diseases Information Clearinghouse*



## What is GER?

Gastroesophageal reflux (GER) occurs when stomach contents flow back up into the esophagus—the muscular tube that carries food and liquids from the mouth to the stomach.

GER is also called acid reflux or acid regurgitation because the stomach's digestive juices contain acid. Sometimes people with GER can taste food or acidic fluid in the back of the mouth. Refluxed stomach acid that touches the lining of the esophagus can cause heartburn. Also called acid indigestion, heartburn is an uncomfortable, burning feeling in the midchest, behind the breastbone, or in the upper part of the abdomen—the area between the chest and the hips.

Occasional GER is common. People may be able to control GER by

- avoiding foods and beverages that contribute to heartburn, such as chocolate, coffee, peppermint, greasy or spicy foods, tomato products, and alcoholic beverages
- avoiding overeating
- quitting smoking
- losing weight if they are overweight
- not eating 2 to 3 hours before sleep
- taking over-the-counter medications

Read more about over-the-counter medications in the section "How is GERD treated?"

## What is GERD?

Gastroesophageal reflux disease (GERD) is a more serious, chronic—or long lasting—form of GER. GER that occurs more than twice a week for a few weeks could be GERD, which over time can lead to more serious health problems. People with suspected GERD should see a health care provider.

## What causes GERD?

Gastroesophageal reflux disease results when the lower esophageal sphincter—the muscle that acts as a valve between the esophagus and stomach—becomes weak or relaxes when it should not, causing stomach contents to rise up into the esophagus.

Abnormalities in the body such as hiatal hernias may also cause GERD. Hiatal hernias occur when the upper part of the stomach moves up into the chest. The stomach can slip through an opening found in the diaphragm. The diaphragm is the muscle wall that separates the stomach from the chest. Hiatal hernias may cause GERD because of stomach acid flowing back up through the opening; however, most produce no symptoms.

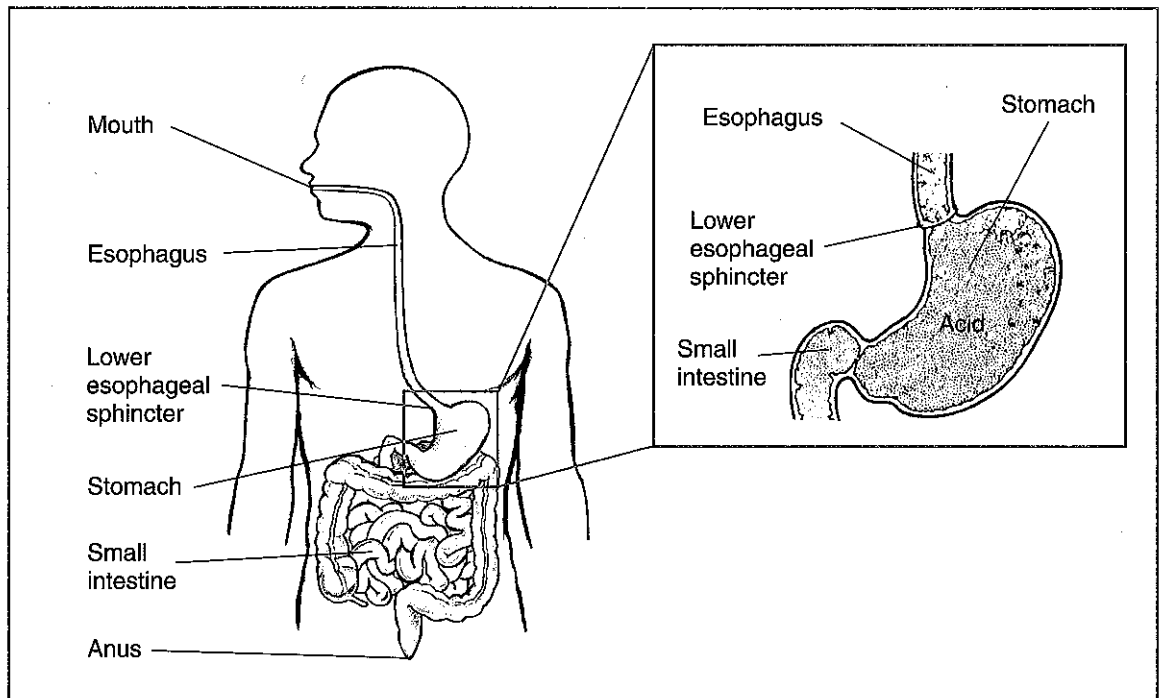
Other factors that can contribute to GERD include

- obesity
- pregnancy
- certain medications, such as asthma medications, calcium channel blockers, and many antihistamines, pain killers, sedatives, and antidepressants
- smoking, or inhaling secondhand smoke

People of all ages can develop GERD, some for unknown reasons.

## What is the gastrointestinal (GI) tract?

The GI tract is a series of hollow organs joined in a long, twisting tube from the mouth to the anus. The movement of muscles in the GI tract, along with the release of hormones and enzymes, starts the digestion of food. The upper GI tract includes the mouth, esophagus, stomach, small intestine, and duodenum, which is the first part of the small intestine.



GERD results when the lower esophageal sphincter—the muscle that acts as a valve between the esophagus and stomach—becomes weak or relaxes when it should not, causing stomach contents to rise up into the esophagus.

## What are the symptoms of GERD?

The main symptom of GERD is frequent heartburn, though some adults with GERD do not have heartburn. Other common GERD symptoms include

- a dry, chronic cough
- wheezing
- asthma and recurrent pneumonia
- nausea
- vomiting
- a sore throat, hoarseness, or laryngitis—swelling and irritation of the voice box
- difficulty swallowing or painful swallowing
- pain in the chest or the upper part of the abdomen
- dental erosion and bad breath

## How is GERD diagnosed?

A health care provider may refer people with suspected GERD to a gastroenterologist—a doctor who specializes in digestive diseases—for diagnosis and treatment.

Lifestyle changes and medications are often the first lines of treatment for suspected GERD. If symptoms improve with these treatment methods, a GERD diagnosis often does not require testing. However, to confirm a diagnosis, a person may need testing if symptoms do not improve. People with possible GERD who have trouble swallowing also may require testing.

A completely accurate test for diagnosing GERD does not exist. However, several tests can help with diagnosis:

**Upper GI series.** While a gastroenterologist does not use an upper GI series to diagnose acid reflux or GERD, the test can provide

a look at the shape of the upper GI tract. An x-ray technician performs this test at a hospital or an outpatient center, and a radiologist—a doctor who specializes in medical imaging—interprets the images. This test does not require anesthesia. No eating or drinking is allowed before the procedure, as directed by the health care staff. People should check with their gastroenterologist about what to do to prepare for an upper GI series.

During the procedure, the person will stand or sit in front of an x-ray machine and drink barium, a chalky liquid. Barium coats the esophagus, stomach, and small intestine so the radiologist and gastroenterologist can see these organs' shapes more clearly on x rays. The barium shows problems related to GERD, such as hiatal hernias. While an upper GI series cannot detect mild irritation, the test can detect esophageal strictures—narrowing of the esophagus that can result from GERD—as well as ulcers, or sores.

A person may experience bloating and nausea for a short time after the test. For several days afterward, barium liquid in the GI tract causes white or light-colored stools. A health care provider will give the person specific instructions about eating and drinking after the test.

**Upper endoscopy.** A gastroenterologist may use an upper endoscopy, also known as an esophagogastroduodenoscopy, if a person continues to have GERD symptoms despite lifestyle changes and treatment with medications. An upper endoscopy is a common test used to evaluate the severity of GERD. This procedure involves using an endoscope—a small, flexible tube with a light—to see the upper GI tract.

A gastroenterologist performs this test at a hospital or an outpatient center. The person may receive a liquid anesthetic that is gargled or sprayed on the back of the throat.

If sedation is used, a health care provider will place an intravenous (IV) needle in the person's vein.

After the person receives sedation, the gastroenterologist carefully feeds an endoscope through the mouth and down the esophagus, then into the stomach and duodenum. A small camera mounted on the endoscope transmits a video image to a monitor, allowing close examination of the intestinal lining. The gastroenterologist uses the endoscope to take a biopsy, a procedure that involves taking a small piece of esophageal tissue. A pathologist—a doctor who specializes in diagnosing diseases—will examine the tissue with a microscope and determine the extent of inflammation.

A gastroenterologist diagnoses GERD when the test shows injury to the esophagus in a person who has had moderate to severe GERD symptoms.

**Esophageal pH monitoring.** The most accurate test to detect acid reflux, esophageal pH monitoring measures the amount of liquid or acid in the esophagus as the person goes about normal activities, including eating and sleeping. A gastroenterologist performs this test at a hospital or an outpatient center as a part of an upper endoscopy. The person can remain awake during the test. Sedation is not required for the test; however, it can be used if necessary.

A gastroenterologist will pass a thin tube, called a nasogastric probe, through the person's nose or mouth to the stomach. The gastroenterologist will then pull the tube back into the esophagus, where it will be taped to the person's cheek and remain in place for 24 hours. The end of the tube in the esophagus has a small probe to measure when and how much liquid or acid comes up into the esophagus. The other end of the tube, attached to a monitor outside the body, shows the measurements taken.

This test is most useful when combined with a carefully kept diary of when, what, and how much food the person eats and GERD symptoms that result. The gastroenterologist can see correlations between symptoms and certain foods or times of day. The procedure can also help show whether reflux triggers respiratory symptoms.

**Esophageal manometry.** Esophageal manometry measures muscle contractions in the esophagus. A gastroenterologist may order this test when considering a person for anti-reflux surgery. The gastroenterologist performs this test during an office visit. A person may receive anesthetic spray on the inside of the nostrils or back of the throat. The gastroenterologist passes a soft, thin tube through the person's nose into the stomach. The person swallows as the gastroenterologist pulls the tube slowly back into the esophagus. A computer measures and records the pressure of the muscle contractions in different parts of the esophagus. The test can show if symptoms are due to a weak sphincter muscle. A health care provider can also use the test to diagnose other disorders of the esophagus that might have similar symptoms as heartburn. Most people can resume regular activity, eating, and medications right after the test.

## How is GERD treated?

Treatment for GERD may involve one or more of the following, depending on the severity of symptoms: lifestyle changes, medications, or surgery.

### Lifestyle Changes

Some people can reduce GERD symptoms by

- losing weight, if needed
- wearing loose-fitting clothing around the stomach area, as tight clothing can constrict the area and increase reflux

- remaining upright for 3 hours after meals
- raising the head of the bed 6 to 8 inches by securing wood blocks under the bedposts—just using extra pillows will not help
- avoiding smoking and being around others who are smoking

## Medications

People can purchase many GERD medications without a prescription; however, people with persistent symptoms should still see a health care provider.

**Antacids**, which include over-the-counter medications such as Alka-Seltzer, Maalox, Mylanta, Roloids, and Riopan, are a first-line approach health care providers usually recommend to relieve heartburn and other mild GERD symptoms. Antacids, however, can have side effects, including diarrhea and constipation.

**H2 blockers**, such as cimetidine (Tagamet HB), famotidine (Pepcid AC), nizatidine (Axid AR), and ranitidine (Zantac 75), decrease acid production. These medications are available in both over-the-counter and prescription strengths. H2 blockers provide short-term or on-demand relief and are effective for many people with GERD symptoms. They can also help heal the esophagus, although not as well as proton pump inhibitors (PPIs).

**PPIs** include omeprazole (Prilosec, Zegerid), lansoprazole (Prevacid), pantoprazole (Protonix), rabeprazole (Aciphex), and esomeprazole (Nexium), which are available by prescription. Omeprazole and lansoprazole also come in over-the-counter strength. PPIs are more effective than H2 blockers and can relieve symptoms and heal the esophageal lining in most people

with GERD. Health care providers most commonly prescribe PPIs for long-term management of GERD. However, studies show people who take PPIs long term or in high doses are more likely to have hip, wrist, and spinal fractures. People should take these medications on an empty stomach in order for stomach acid to activate them.

**Prokinetics**, which include bethanechol (Urecholine) and metoclopramide (Reglan), help make the stomach empty faster. However, both bethanechol and metoclopramide have side effects that often limit their use, including nausea, diarrhea, tiredness, depression, anxiety, and problems with physical movement. Prokinetics can interact with other medications, so people taking prokinetic agents should tell their health care provider about all medications they are taking.

**Antibiotics**, including one called erythromycin, have been shown to improve gastric emptying. Erythromycin has fewer side effects than bethanechol and metoclopramide; however, like all antibiotics, it can cause diarrhea.

All of these medications work in different ways, so combinations of medications may help control symptoms. People who get heartburn after eating may take antacids and H2 blockers. The antacids neutralize stomach acid, and the H2 blockers stop acid production. By the time the antacids stop working, the H2 blockers have stopped acid production.

## Surgery

When a person cannot manage severe GERD symptoms through medication or lifestyle changes, a health care provider may recommend surgery. A health care provider may also recommend surgery for GERD that results from a physical abnormality or

for GERD symptoms that lead to severe respiratory problems. Fundoplication is the standard surgical treatment for GERD and leads to long-term reflux control in most cases. A gastroenterologist or surgeon may also use endoscopic techniques to treat GERD. However, the success rates of endoscopic techniques are not completely known, as researchers have not tested them enough in clinical trials. People are more likely to develop complications from surgery than from medications. Anti-reflux surgery is most successful in people younger than 50.

**Fundoplication** is an operation to sew the top of the stomach around the esophagus to add pressure to the lower end of the esophagus and reduce reflux. A surgeon performs fundoplication using a laparoscope, a thin tube with a tiny video camera attached used to look inside the body. The surgeon performs the operation at a hospital or an outpatient center, and the person receives general anesthesia. People can leave the hospital or outpatient center in 1 to 3 days and return to their daily activities in 2 to 3 weeks.

**Endoscopic techniques**, such as endoscopic sewing and radiofrequency, help control GERD in a small number of people. Endoscopic sewing uses small stitches to tighten the sphincter muscle. Radiofrequency creates heat lesions that help tighten the sphincter muscle. Surgery for both techniques requires an endoscope. A surgeon performs the operation at a hospital or an outpatient center, and the person receives anesthesia. Although the devices for these procedures are approved, results may not be as good as laparoscopic surgery, and these procedures are not commonly used.

## What are the long-term complications of GERD?

Untreated GERD can sometimes cause serious complications over time, including

- esophagitis—irritation of the esophagus from refluxed stomach acid that damages the lining and causes bleeding or ulcers. Adults who have chronic esophagitis over many years are more likely to develop precancerous changes in the esophagus.
- strictures that lead to swallowing difficulties.
- respiratory problems, such as trouble breathing.
- Barrett's esophagus, a condition in which the tissue lining the esophagus is replaced by tissue similar to the lining of the intestine. A small number of people with Barrett's esophagus develop a rare yet often deadly type of cancer of the esophagus. Read more in *Barrett's Esophagus* at [www.digestive.niddk.nih.gov](http://www.digestive.niddk.nih.gov).

A health care provider should monitor a person with GERD to prevent or treat long-term complications.

## Eating, Diet, and Nutrition

People with GERD can often reduce reflux by avoiding foods and drinks that worsen symptoms. Other dietary changes that can help reduce symptoms include decreasing fat intake and eating small, frequent meals instead of three large meals. People who are overweight can talk with a health care provider about dietary changes that can help them lose weight, which may decrease GERD symptoms.

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## Points to Remember

- Gastroesophageal reflux (GER) occurs when stomach contents flow back up into the esophagus.
  - GER is also called acid reflux or acid regurgitation because the stomach's digestive juices contain acid.
  - Gastroesophageal reflux disease (GERD) is a more serious, chronic form of GER.
  - GERD results when the lower esophageal sphincter becomes weak or relaxes when it should not, causing stomach contents to rise up into the esophagus.
  - The main symptom of GERD is frequent heartburn, though some adults with GERD do not have heartburn.
  - Other common GERD symptoms include asthma or recurrent pneumonia, difficulty swallowing or painful swallowing, and pain in the chest.
  - A health care provider may refer people with suspected GERD to a gastroenterologist for diagnosis and treatment.
  - Treatment for GERD may involve one or more of the following, depending on the severity of symptoms: lifestyle changes, medications, or surgery.
  - A health care provider should monitor a person with GERD to prevent or treat long-term complications.
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## Hope through Research

The Division of Digestive Diseases and Nutrition at the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) supports basic and clinical research into GI diseases, including GER and GERD.

Clinical trials are research studies involving people. Clinical trials look at safe and effective new ways to prevent, detect, or treat disease. Researchers also use clinical trials to look at other aspects of care, such as improving the quality of life for people with chronic illnesses. To learn more about clinical trials, why they matter, and how to participate, visit the NIH Clinical Research Trials and You website at [www.nih.gov/health/clinicaltrials](http://www.nih.gov/health/clinicaltrials). For information about current studies, visit [www.ClinicalTrials.gov](http://www.ClinicalTrials.gov).

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