

Digestive Diseases
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A service of the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), NIH

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Heartburn, Hiatal Hernia, and Gastroesophageal Reflux Disease (GERD)

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Gastroesophageal reflux disease, or GERD, occurs when the lower esophageal sphincter (LES) does not close properly and stomach contents leak back, or reflux, into the esophagus. The LES is a ring of muscle at the bottom of the esophagus that acts like a valve between the esophagus and stomach. The esophagus carries food from the mouth to the stomach.

When refluxed stomach acid touches the lining of the esophagus, it causes a burning sensation in the chest or throat called heartburn. The fluid may even be tasted in the back of the mouth, and this is called acid indigestion. Occasional heartburn is common but does not necessarily mean one has GERD. Heartburn that occurs more than twice a week may be considered GERD, and it can eventually lead to more serious health problems.

Anyone, including infants, children, and pregnant women, can have GERD.

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What are the symptoms of GERD?

The main symptoms are persistent heartburn and acid regurgitation. Some people have GERD without heartburn. Instead, they experience pain in the chest, hoarseness in the morning, or trouble swallowing. You may feel like you have food stuck in your throat or like you are choking or your throat is tight. GERD can also cause a dry cough and bad breath.

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GERD in Children

Studies* show that GERD is common and may be overlooked in infants and children. It can cause repeated vomiting, coughing, and other respiratory problems.

Children's immature digestive systems are usually to blame, and most infants grow out of GERD by the time they are 1 year old. Still, you should talk to your child's doctor if the problem occurs regularly and causes discomfort. Your doctor may recommend simple strategies for avoiding reflux, like burping the infant several times during feeding or keeping the infant in an upright position for 30 minutes after feeding. If your child is older, the doctor may recommend avoiding

- sodas that contain caffeine
- chocolate and peppermint
- spicy foods like pizza
- acidic foods like oranges and tomatoes
- fried and fatty foods

Avoiding food 2 to 3 hours before bed may also help. The doctor may recommend that the child sleep with head raised. If these changes do not work, the doctor may prescribe medicine for your child. In rare cases, a child may need surgery.

*Jung AD. Gastroesophageal reflux in infants and children. *American Family Physician*. 2001;64(11):1853–1860.

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What causes GERD?

No one knows why people get GERD. A hiatal hernia may contribute. A hiatal hernia occurs when the upper part of the stomach is above the diaphragm, the muscle wall that separates the stomach from the chest. The diaphragm helps the LES keep acid from coming up into the esophagus. When a hiatal hernia is present, it is easier for the acid to come up. In this way, a hiatal hernia can cause reflux. A hiatal hernia can happen in people of any age; many otherwise healthy people over 50 have a small one.

Other factors that may contribute to GERD include

- alcohol use
- overweight
- pregnancy
- smoking

Also, certain foods can be associated with reflux events, including

- citrus fruits
- chocolate
- drinks with caffeine
- fatty and fried foods
- garlic and onions
- mint flavorings
- spicy foods
- tomato-based foods, like spaghetti sauce, chili, and pizza

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How is GERD treated?

If you have had heartburn or any of the other symptoms for a while, you should see your doctor. You may want to visit an internist, a doctor who specializes in internal medicine, or a gastroenterologist, a doctor who treats diseases of the stomach and intestines. Depending on how severe your GERD is, treatment may involve one or more of the following lifestyle changes and medications or surgery.

Lifestyle Changes

- If you smoke, stop.
- Do not drink alcohol.
- Lose weight if needed.
- Eat small meals.
- Wear loose-fitting clothes.
- Avoid lying down for 3 hours after a meal.
- Raise the head of your bed 6 to 8 inches by putting blocks of wood under the bedposts—just using extra pillows will not help.

Medications

Your doctor may recommend over-the-counter antacids, which you can buy without a prescription, or medications that stop acid production or help the muscles that empty your stomach.

Antacids, such as Alka-Seltzer, Maalox, Mylanta, Pepto-Bismol, Roloids, and Riopan, are usually the first drugs recommended to relieve heartburn and other mild GERD symptoms. Many brands on the market use different combinations of three basic salts—magnesium, calcium, and aluminum—with hydroxide or bicarbonate ions to neutralize the acid in your stomach. Antacids, however, have side effects. Magnesium salt can lead to diarrhea, and aluminum salts can cause constipation. Aluminum and magnesium salts are often combined in a single product to balance these effects.

Calcium carbonate antacids, such as Tums, Titralac, and Alka-2, can also be a supplemental source of calcium. They can cause constipation as well.

Foaming agents, such as Gaviscon, work by covering your stomach contents with foam to prevent reflux. These drugs may help those who have no damage to the esophagus.

H₂ blockers, such as cimetidine (Tagamet HB), famotidine (Pepcid AC), nizatidine (Axid AR), and ranitidine (Zantac 75), impede acid production. They are available in prescription strength and over the counter. These drugs provide short-term relief, but over-the-counter H₂ blockers should not be used for more than a few weeks at a time. They are effective for about half of those who have GERD symptoms. Many people benefit from taking H₂ blockers at bedtime in combination with a proton pump inhibitor.

Proton pump inhibitors include omeprazole (Prilosec), lansoprazole (Prevacid), pantoprazole (Protonix), rabeprazole (Aciphex), and esomeprazole (Nexium), which are all available by prescription. Proton pump inhibitors are more effective than H₂ blockers and can relieve symptoms in almost everyone who has GERD.

Another group of drugs, **prokinetics**, helps strengthen the sphincter and makes the stomach empty faster. This group includes bethanechol (Urecholine) and metoclopramide (Reglan). Metoclopramide also improves muscle action in the digestive tract, but these drugs have frequent side effects that limit their usefulness.

Because drugs work in different ways, combinations of drugs may help control

symptoms. People who get heartburn after eating may take both antacids and H₂ blockers. The antacids work first to neutralize the acid in the stomach, while the H₂ blockers act on acid production. By the time the antacid stops working, the H₂ blocker will have stopped acid production. Your doctor is the best source of information on how to use medications for GERD.

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What if symptoms persist?

If your heartburn does not improve with lifestyle changes or drugs, you may need additional tests.

- A **barium swallow radiograph** uses x rays to help spot abnormalities such as a hiatal hernia and severe inflammation of the esophagus. With this test, you drink a solution and then x rays are taken. Mild irritation will not appear on this test, although narrowing of the esophagus—called stricture—ulcers, hiatal hernia, and other problems will.
- **Upper endoscopy** is more accurate than a barium swallow radiograph and may be performed in a hospital or a doctor's office. The doctor will spray your throat to numb it and slide down a thin, flexible plastic tube called an endoscope. A tiny camera in the endoscope allows the doctor to see the surface of the esophagus and to search for abnormalities. If you have had moderate to severe symptoms and this procedure reveals injury to the esophagus, usually no other tests are needed to confirm GERD.

The doctor may use tiny tweezers (forceps) in the endoscope to remove a small piece of tissue for biopsy. A biopsy viewed under a microscope can reveal damage caused by acid reflux and rule out other problems if no infecting organisms or abnormal growths are found.

- In an ambulatory **pH monitoring examination**, the doctor puts a tiny tube into the esophagus that will stay there for 24 hours. While you go about your normal activities, it measures when and how much acid comes up into your esophagus. This test is useful in people with GERD symptoms but no esophageal damage. The procedure is also helpful in detecting whether respiratory symptoms, including wheezing and coughing, are triggered by reflux.

Surgery

Surgery is an option when medicine and lifestyle changes do not work. Surgery may also be a reasonable alternative to a lifetime of drugs and discomfort.

Fundoplication, usually a specific variation called Nissen fundoplication, is the standard surgical treatment for GERD. The upper part of the stomach is wrapped around the LES to strengthen the sphincter and prevent acid reflux and to repair a hiatal hernia.

This fundoplication procedure may be done using a **laparoscope** and requires only tiny incisions in the abdomen. To perform the fundoplication, surgeons use small instruments that hold a tiny camera. Laparoscopic fundoplication has been used safely and effectively in people of all ages, even babies. When performed by experienced surgeons, the procedure is reported to be as good as standard fundoplication. Furthermore, people can leave the hospital in 1 to 3 days and return to work in 2 to 3 weeks.

In 2000, the U.S. Food and Drug Administration (FDA) approved two endoscopic devices to treat chronic heartburn. The Bard EndoCinch system puts stitches in the LES to create little pleats that help strengthen the muscle. The Stretta system uses electrodes to create tiny cuts on the LES. When the cuts heal, the scar tissue helps toughen the muscle. The long-term effects of these two procedures are unknown.

Implant

Recently the FDA approved an implant that may help people with GERD who wish to avoid surgery. Enteryx is a solution that becomes spongy and reinforces the LES to keep stomach acid from flowing into the esophagus. It is injected during endoscopy. The implant is approved for people who have GERD and who require and respond to proton pump inhibitors. The long-term effects of the implant are unknown.

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What are the long-term complications of GERD?

Sometimes GERD can cause serious complications. Inflammation of the esophagus from stomach acid causes bleeding or ulcers. In addition, scars from tissue damage can narrow the esophagus and make swallowing difficult. Some people develop Barrett's esophagus, where cells in the esophageal lining take on an abnormal shape and color, which over time can lead to cancer.

Also, studies have shown that asthma, chronic cough, and pulmonary fibrosis may be aggravated or even caused by GERD.

For information about Barrett's esophagus, please see the [Barrett's Esophagus](#) fact sheet from the National Institute of Diabetes and Digestive and Kidney Diseases.

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Points to Remember

- Heartburn, also called acid indigestion, is the most common symptom of GERD. Anyone experiencing heartburn twice a week or more may have GERD.
- You can have GERD without having heartburn. Your symptoms could be excessive clearing of the throat, problems swallowing, the feeling that food is stuck in your throat, burning in the mouth, or pain in the chest.
- In infants and children, GERD may cause repeated vomiting, coughing, and other respiratory problems. Most babies grow out of GERD by their first birthday.
- If you have been using antacids for more than 2 weeks, it is time to see a doctor. Most doctors can treat GERD. Or you may want to visit an internist—a doctor who specializes in internal medicine—or a gastroenterologist—a doctor who treats diseases of the stomach and intestines.
- Doctors usually recommend lifestyle and dietary changes to relieve heartburn. Many people with GERD also need medication. Surgery may be an option.

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Hope Through Research

No one knows why some people who have heartburn develop GERD. Several factors may be involved, and research is under way on many levels. Risk factors—what makes some people get GERD but not others—are being explored, as is GERD's role in other conditions such as asthma and bronchitis.

The role of hiatal hernia in GERD continues to be debated and explored. It is a complex topic because some people have a hiatal hernia without having reflux, while others have reflux without having a hernia.

Much research is needed into the role of the bacterium *Helicobacter pylori*. Our ability to eliminate *H. pylori* has been responsible for reduced rates of peptic ulcer disease and some gastric cancers. At the same time, GERD, Barrett's esophagus, and cancers of the esophagus have increased. Researchers wonder whether having *H. pylori* helps prevent GERD and other diseases. Future treatment will be greatly affected by the results of this research.

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Publications produced by the clearinghouse are carefully reviewed by both NIDDK scientists and outside experts. This fact sheet was reviewed by G. Richard Locke, M.D., Mayo Clinic; and Joel Richter, M.D., Cleveland Clinic Foundation.

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