UW Medicine
UNIVERSITY OF WASHINGTON MEDICAL CENTER

Laparoscopic Fundoplication

A treatment for gastroesophageal reflux disease

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What is gastroesophageal reflux disease (GERD)?

Gastroesophageal reflux disease (GERD) is a condition that affects the *esophagus*, the tube that carries food from the mouth to the stomach. GERD occurs when stomach acid flows back up into the esophagus. This is called *reflux*.

GERD is the most common esophagus problem in the United States. It affects about 20% (20 out of 100) of people in the country.

What causes GERD?

GERD is often caused by problems with the *lower esophageal sphincter* (LES) muscle. This muscle acts as a valve between the esophagus and stomach. It remains closed most of the time, and only opens to let food pass into the stomach or to release gas from the stomach.

If the LES muscle is weak or damaged, it can lose its ability to close. This allows stomach acid to reflux into the esophagus.

All of these conditions can cause GERD:

- Damage to the LES or esophagus.
- A *hiatal hernia*, where part of the stomach pushes up through a large hole in the diaphragm. This keeps the LES from working well. GERD does **not** occur in every person who has a hiatal hernia.
- Too much weight and fat from obesity or pregnancy can push on the stomach. This can move or put pressure on the LES.
- Diet and lifestyle choices can make symptoms worse (see below).

What can make GERD worse?

- Eating too much spicy, fatty, or citric foods
- Eating too much caffeine and chocolate
- Eating large meals
- Eating too close to bedtime
- Using tobacco of any kind
- Wearing clothing that is tight around your waist
- Taking some medicines

What are the symptoms of GERD?

The most common symptom of GERD is *heartburn*. Heartburn is a feeling of pain behind the *sternum* (breastbone) or in the belly.

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Other symptoms include:

- Chest pain
- Bad breath and a sour taste in your mouth
- Nausea after eating
- *Regurgitation* (food or stomach acid comes up into your esophagus from your stomach)
- Burping
- Bloating
- *Dysphagia* (pain or problems when you swallow)
- Hoarseness or voice changes
- Airway problems:
  - Coughing and throat-clearing
  - Pneumonia and other lung diseases
  - Asthma

What other problems can occur with GERD?

- Over time, stomach acid can harm the sensitive lining of the esophagus. This can cause *esophagitis* (inflammation, irritation, or swelling of the esophagus), which can lead to *esophageal ulcers* (sores).
- Damage to the esophagus from stomach acid can cause scar tissue to form. This can make the esophagus more narrow and lead to problems with swallowing.
- Stomach acid can change the cell structure of the esophagus so that it becomes more like the inner lining of the stomach and intestine. This is called *Barrett's esophagus*. It is linked with a higher risk of esophageal *adenocarcinoma* (cancer), especially in older adults.
- Cancer of the larynx.
- Asthma.
- *Pulmonary aspiration*, in which secretions, food or drink, or stomach contents rise into the larynx (voice box) and lower respiratory tract.
- *Fibrosis*, a disease in which scars are formed in the lung tissues, causing serious breathing problems.

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How is GERD treated?

Your doctor may first suggest changes in diet and lifestyle to treat GERD symptoms. Medicine may also be used. Your doctor may advise surgery if these things do not work or are less effective over time.

Here are some ways to help lessen GERD symptoms:

Diet Changes

- Keep your weight in a healthy range.
- Eat smaller meals.
- Eat fewer fatty, fried, and spicy foods.
- Avoid foods such as:
  - Peppers
  - Onions
  - Citrus
  - Chocolate
  - Caffeine and carbonated drinks

See our handout "Esophageal Diet" to learn more about diet changes.

Lifestyle Changes

- Exercise more.
- Avoid wearing clothes that fit tightly around your waist.
- Eat your last meal at least 2 to 3 hours before you go to bed.
- Quit smoking. Avoid being around people who are smoking.
- Stop drinking alcohol.
- Raise the head of your bed. Use a pillow to raise your head above your chest level while sleeping.

Medicines

Your doctor may prescribe medicines to help reduce your stomach acid. These medicines either *neutralize* the acid or keep your stomach from producing them.

- **Antacids** help control mild to moderate heartburn. Your doctor may prescribe an antacid or advise you to use one you can buy without a prescription, such as TUMS, Mylanta, or Alka-Seltzer. Antacids neutralize stomach acid. But, because the stomach needs acid to work well, taking antacids too often can affect how well you digest food. They can also cause diarrhea and other side effects.

- **Histamine H2-blockers** (Ranitidine, Cimetidine, Zantac, and Tagamet) work well for mild reflux that happens from time to time. These medicines block *histamine*, a hormone that causes stomach cells to create acid. These are not as strong as *proton pump inhibitors*.
- **Proton pump inhibitors** (Nexium, Prilosec, and Prevacid) are used when GERD symptoms are moderate to severe. These are strong drugs that block the enzyme in your stomach that produces acid.
- **Mucosal protective agents** (*alginic acid* and *sucralfate suspension*) are gels or foams that coat the inside of the esophagus. This protects the esophagus from being damaged by refluxed stomach acid.

Fundoplication Surgery

A surgery called *fundoplication* has been used to treat GERD for many years, with very good results. There are 2 main types of fundoplication: complete (*Nissen*) and partial (*Toupet*).

In fundoplication, the surgeon wraps the top part of the stomach around the end of the esophagus to strengthen the lower esophageal sphincter (LES). This surgery:

- Increases the pressure of the LES when it is at rest
- Restores the proper angle for the esophagus to enter the stomach
- Recreates a "1-way valve" to prevent acid reflux

If a hiatal hernia is involved in your GERD, your surgeon will also:

- Reduce the size of the hernia
- Narrow your hiatus back to normal size
- Possibly reinforce this closure with a natural (biologic) mesh to strengthen the closure

Success Rates

- At UWMC, a fundoplication is successful for more than 90% of patients (90 out of 100 patients) in treating common, long-term GERD symptoms such as heartburn and regurgitation.
- When GERD symptoms involve the airway, this surgery works well for about 70% of patients (70 out of 100 patients).

Minimally Invasive Surgery

At UWMC, surgeons do *laparoscopic* fundoplication. This is a *minimally invasive* procedure as compared to open surgery. These surgeries use different types of belly incisions:

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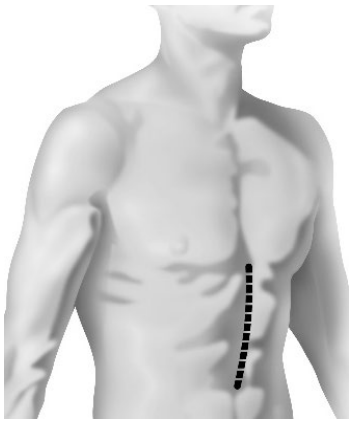
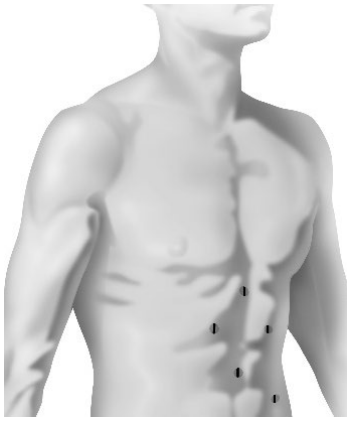
Incisions Used in Open and Laparoscopic Surgery



One long incision is used in open fundoplication surgery.



Several tiny incisions are used in laparoscopic fundoplication surgery.

- **Open surgery** uses 1 long incision
- **Laparoscopic surgery** uses several tiny incisions

Laparoscopic surgery creates less scarring than open surgery. It also needs a shorter recovery time. Most patients go home in 1 or 2 days after laparoscopic surgery. With open surgery, patients often stay in the hospital for 4 or 5 days.

UWMC surgeons are known worldwide as experts in GERD and GERD surgery. We were the first in the Pacific Northwest to do laparoscopic fundoplications, and have done about 4,000 of these surgeries. Sometimes, our surgeons need to change the plan and do an open surgery. This happens only rarely.

What Happens During Surgery

In laparoscopic fundoplication, your surgeon will use a fiber optic camera called a *laparoscope* and tiny surgical instruments. These devices are inserted into the tiny incisions. The camera lets your surgeon see inside your body and helps guide the surgery.

Problems with Fundoplication Surgery

These problems can occur with fundoplication surgery:

- Bleeding
- Infection
- Injury to other structures in the body

Side Effects of Fundoplication Surgery

These side effects can occur with fundoplication surgery:

Recurrent Reflux or Hiatal Hernia

With normal breathing, lifting, and eating, the area where fundoplication is done can stretch over time. About 80% of our patients (80 out of 100 patients) who have surgery have relief that lasts longer than 10 years, but some have *breakthrough* reflux. If reflux returns, most times it is easily controlled with medicine. Only 3% of our patients (3 out of 100 patients) need a 2nd operation for reflux that comes back.

Dysphagia

There is a chance that you may feel resistance to food going down your esophagus. Most times, you can manage this by chewing food well, and eating more slowly.

Bloating or Gas

You may have a harder time belching (burping) after fundoplication. If you eat too much or swallow too much air, you may have some bloating. Usually, swallowed air is either belched or passed as gas. Because it is harder to belch, you may have a little more gas. Tell your care provider if this becomes a problem for you.

Having Bowel Movements More Often

The stomach empties more quickly after fundoplication surgery. You may the need to have bowel movements more often. Many people with GERD find this helps their symptoms of bloating or gas.

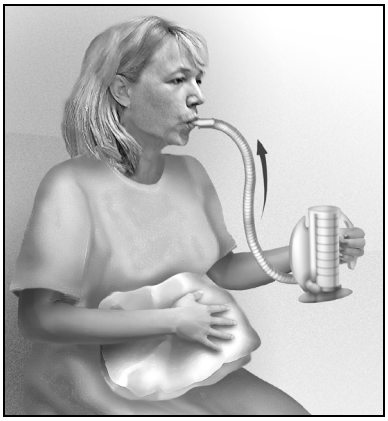
In the Hospital After Surgery

Recovery

- You will spend about 2 hours in the recovery room after surgery.
- Nurses in the recovery room will monitor your pain level and give you medicines to make you comfortable.
- Your family may be able to visit you in the recovery room after you are awake. This depends on how you are doing and the care needed by other patients in the room.
- When you wake up, you will have:
  - An **oxygen mask** over your face to supply extra oxygen. You will be switched to **nasal prongs** when your lungs are ready.
  - **An intravenous (IV) tube** to give you fluids and medicines during and after surgery.
  - **Sequential compression devices (SCDs)** on your legs. These wraps inflate with air and squeeze your legs from time to time. This improves blood flow and helps prevent blood clots.
- Some patients will have a **urinary catheter** in their bladder. This lets us monitor your urine output during and after surgery. The catheter will be removed at midnight.

On the Nursing Unit

- **Medicines:** All your medicines will be crushed or in liquid form.
- **Breathing exercises:** We will give you a device called an *incentive spirometer* to help you exercise your lungs. It is important to exercise your lungs to prevent lung infections (*pneumonia*) and other problems.



Your nurse will show you how to use the incentive spirometer to exercise your lungs.

To use the incentive spirometer:

- Sit upright in a chair or in bed. Hold the device at eye level. You can hold a pillow over your incisions for comfort.
- Place the mouthpiece in your mouth and seal your lips around it.
- Slowly breathe out fully. Then breathe in slowly, as deeply as you can, and then hold your breath as long as you can.
- Your breathing will move a ball in the device. Try to get the ball as high as you can.
- Exhale slowly through your mouth.
- Rest for few seconds and repeat. Do this 10 times every hour while you are awake.
- After you are done with your set of 10 deep breaths, be sure to cough to clear your lungs.
- If you feel dizzy at any time, stop and rest.

- **Activity:** It is important for you to get up and try to walk, even the evening of your surgery. Your nurse will help you the first few times to make sure you are steady on your feet. **Please ask your nurse to help you walk. Do not wait for someone to ask if you want to walk.**
- **Diet:** A dietitian will visit you the day after surgery to talk about the diet you will need to follow when you leave the hospital.
- **Family and friends:** Your loved ones can be important to your recovery. It's also good to have a support person to help you at home as you recover. They can help by doing things that make you more comfortable, such as fluffing your pillow, getting you a glass of water, or finding your remote control. Don't be afraid to reach out for help.

Going Home

Most patients are discharged by 11 a.m. the day after surgery. If you live more than a 2-hour drive from the hospital, we advise you to stay in the Seattle area an extra 1 or 2 nights. This extra rest time will help your recovery. You will also be nearby in case any problems occur.

Self-care and Safety at Home

For Your Safety

For 24 hours after surgery and while you are taking opioids:

- Do **not** drive or travel alone
- Do **not** drink alcohol
- Do **not** be home alone
- Do **not** be responsible for children, pets, or an adult who needs care
- Do **not** use machinery
- Do **not** sign any legal papers or make important decisions

Driving

- Do **not** drive for at least 2 weeks after surgery.
- Do **not** drive while you are taking *opioids*. These drugs affect your reaction time and your ability to make decisions.
- You may begin driving when you are sure that your reaction time is normal.

Pain Control

- You will have some pain at your incision sites. We encourage you to take acetaminophen or ibuprofen as needed to ease pain.
- Cold packs on your incisions can help ease pain.
  - If you use ice, do not place it directly on your skin. Wrap the ice in a towel first.
  - Apply ice for 20 minutes at a time, then remove it for 20 minutes.
- You will receive a prescription medicine (opioids) to help with moderate to severe pain. Use this medicine **only** if acetaminophen or ibuprofen do not control your pain.
- You may also have shoulder pain after your surgery. This is caused by the gas (*carbon dioxide*) that was used to inflate your belly during surgery. This pain usually lasts about 4 to 5 days. We advise walking, massaging the area, or using heating pads if this pain bothers you. Opioids will not ease this shoulder pain.
- Some pain medicines can make you dizzy. Ask for help when you get out of bed so that you do not fall.
- Some prescription pain medicines can cause constipation. Take the laxative as prescribed. Stop taking it if you start having loose stools.

Start walking as soon as you can after surgery.

Opioid Refills

If your pain is still strong and you need a refill for opioids, call us. Before we can refill your prescription, one of our providers must assess you, either over the phone or in person.

If our providers approve a refill:

- We cannot send an opioid prescription to your pharmacy. You **must** take it to your pharmacy in person.
- To get the prescription, you can either pick it up at the hospital, or you can ask us to mail it to you. If you want us to mail you the prescription, call us several days before you will need your refill.

Medicines

- **For 4 to 6 weeks after surgery, all of your medicines must be crushed or in a liquid form.** Do **not** swallow whole pills during this time. We will give you a pill crusher before you go home. Call your pharmacy if you have questions about crushing any of your pills.
- **Do NOT take any antacids**. If your GERD symptoms return, call your surgeon's office. Write your surgeon's office phone number in the "Questions" box on page 12.
- Take all of the medicines you received at discharge as prescribed. One of these medicines will help prevent nausea and vomiting. It is important not to vomit in the first few weeks after your surgery. Follow the written instructions that come with your medicines.
- You may resume all of your other usual medicines, unless your provider tells you not to.

Activity

- For 6 weeks, do **not** lift anything that weighs more than 15 pounds. (A gallon of water weighs almost 9 pounds.)
- For 6 weeks, avoid strenuous activities, especially those that use your belly muscles. Slowly increase your activity as you heal.
- It is important to walk. Start walking as soon as you can after surgery. Walk 3 to 4 times a day, at least 1 mile total. Increase how far you walk as you recover.
- You may resume sexual activity 2 weeks after your surgery, as long as you follow all activity precautions.
- Let pain be your guide! If something causes you pain, stop doing it. Try it again another day.

Dressing and Skin Care

- Remove your gauze and Tegaderm dressings 48 hours after your surgery.
- You will have white strips of tape called Steri-Strips under your dressings. Do **not** peel them off. They will fall off in 1 or 2 weeks.

Showering

- You may shower the day after surgery. The Tegaderm dressing is plastic and will repel water.
- Once you remove your dressings, it is OK to shower and get the Steri-Strips wet. Gently pat the Steri-Strips dry after showering. Do **not** rub them dry.
- Do **not** take a bath, go swimming, sit in a hot tub, or soak your incisions until they are fully healed.

Diet and Nutrition

- Follow your dietitian's instructions on what foods you can eat at home after your surgery. Read the handout your dietitian gave you. Call the dietitian if you have questions.
- In the hospital, you will be on a liquid diet after your surgery. When you leave the hospital, you will start a soft esophageal diet. You will continue on a soft diet for 4 to 6 weeks. This will help keep food from getting stuck in the area where your surgery was done.

  During this time, try eating soft foods like mashed potatoes, eggs, cottage cheese, and thick soups.
- You will transition to a regular diet in 4 to 6 weeks. When you start eating regular foods:
  - Eat 5 to 6 small meals a day instead of 3 large meals.
  - Take small bites, chew them well, and eat slowly.
  - Stop when you are full.
- Do **not** drink carbonated liquids or use straws to drink fluids.
- Most patients lose about 10 pounds after this surgery. You will gain this weight back unless you try not to.

Bowel Movements

- You may have *diarrhea* (loose stools) after surgery due to the changes in your diet. This usually goes away in a few days.

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Call your PCP if you have any of the symptoms listed on this page.

- Call the clinic if you have diarrhea for more than 3 days.
- Do **not** take any medicines for diarrhea unless your surgeon's team says it is OK.

When to Call Your Doctor

Call your primary care provider (PCP) if you have any of these symptoms in the 7 days after surgery:

- Cannot swallow foods or can only handle liquids
- Cannot keep fluids down
- Problems swallowing
- Vomiting even if you are taking medicines to prevent nausea
- Your vomit is green, bloody, or looks like coffee grounds
- Chest pain or shortness of breath
- Severe, ongoing pain that is not eased by pain medicine and rest
- Back or shoulder pain that does not go away
- You feel very full and your belly is swollen
- You cannot have a bowel movement
- You have diarrhea
- Your stools are black or tarry
- Dizziness or fainting when you stand up
- New or increased weakness, numbness, or tingling
- One of your legs or arms feels warm, tender, painful, swollen, or red
- Increased bleeding from your incisions
- Any sign of infection around your incisions:
  - Fever higher than 100.5°F (37.8°C)
  - Shaking or chills
  - Increase in drainage, or drainage that is thick or smelly
  - Redness or swelling
  - Increased pain or tenderness at or near the incision sites

Questions?

Your questions are important. Call your doctor or healthcare provider if you have questions or concerns.

Your surgeon's office:

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Weekdays from 8 a.m. to 5 p.m., call 206.598.4477 and press 8 when you hear the recording.

After hours and on weekends and holidays, call 206.598.6190 and ask to page the Surgery O team.

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