

H. pylori and Peptic Ulcer

National Digestive Diseases Information Clearinghouse



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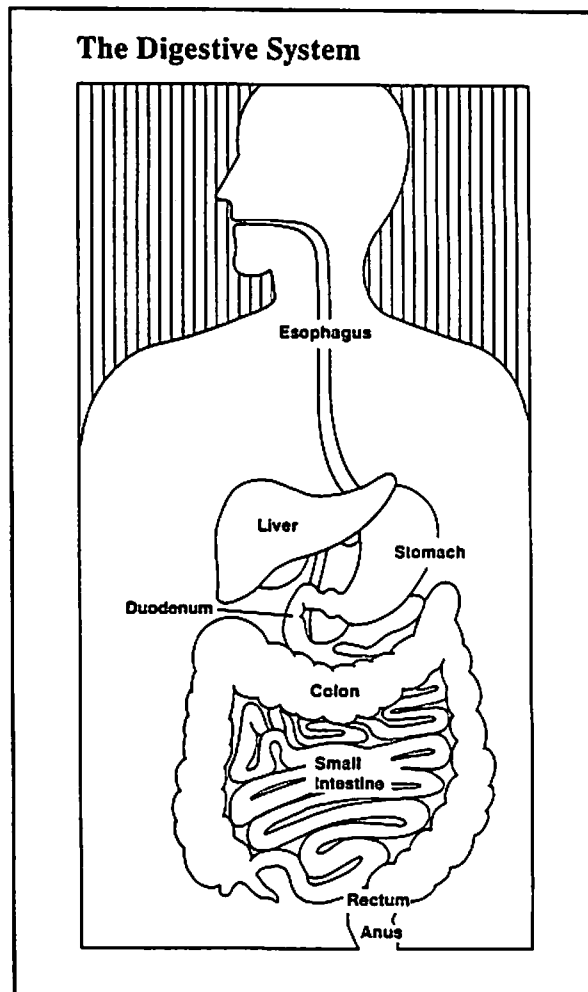
What Is a Peptic Ulcer?

A peptic ulcer is a sore on the lining of the stomach or duodenum, which is the beginning of the small intestine. Peptic ulcers are common: one in every 10 Americans develops an ulcer at some time in his or her life. The main cause of peptic ulcer is bacterial infection, but some ulcers are caused by long-term use of nonsteroidal anti-inflammatory agents (NSAIDs), like aspirin and ibuprofen. In a few cases, cancerous tumors in the stomach or pancreas can cause ulcers. Peptic ulcers are not caused by spicy food or stress.

What Is *H. pylori*?

Helicobacter pylori (*H. pylori*) is a type of bacteria. Researchers recently discovered that *H. pylori* causes almost all peptic ulcers, accounting for 80 percent of stomach ulcers and more than 90 percent of duodenal ulcers.

H. pylori infection is common in the United States: about 20 percent of people under 40 and half of people over 60 are infected with it. Most infected people, however, do not develop ulcers. Why *H. pylori* doesn't cause ulcers in every infected person is unknown. Most likely, infection depends on characteristics of the infected person, the type of *H. pylori*, and other factors yet to be discovered.



Researchers are not certain how people become infected with *H. pylori*, but they think it may be through food or water.

Researchers have found *H. pylori* in some infected people's saliva, so the bacteria may also spread through mouth-to-mouth contact such as kissing.

How Does *H. pylori* Cause a Peptic Ulcer?

H. pylori weakens the protective mucous coating of the stomach and duodenum, which allows acid to get through to the sensitive lining beneath. Both the acid and the bacteria irritate the lining and cause a sore, or ulcer.

H. pylori is able to survive in stomach acid because it secretes enzymes that neutralize the acid. This mechanism allows *H. pylori* to make its way to the "safe" area—the protective mucous lining. Once there, the bacterium's spiral shape helps it burrow through the mucous lining.

What Are the Symptoms of an Ulcer?

Pain is the most common symptom. The pain usually

- Is a dull, gnawing ache.
- Comes and goes for several days or weeks.
- Occurs 2 to 3 hours after a meal.
- Occurs in the middle of the night (when the stomach is empty).
- Is relieved by food.

Other symptoms include

- Weight loss.
- Poor appetite.
- Bloating.
- Burping.
- Nausea.
- Vomiting.

Some people experience only very mild symptoms, or none at all.

Emergency Symptoms

If you have any of these symptoms, call your doctor right away:

- Sharp, sudden, persistent stomach pain.
- Bloody or black stools.
- Bloody vomit or vomit that looks like coffee grounds.

They could be signs of a serious problem, such as

- Perforation—when the ulcer burrows through the stomach or duodenal wall.
- Bleeding—when acid or the ulcer breaks a blood vessel.
- Obstruction—when the ulcer blocks the path of food trying to leave the stomach.

How Is an *H. pylori*-related Ulcer Diagnosed?

Diagnosing an Ulcer

To see if symptoms are caused by an ulcer, the doctor may do an upper gastrointestinal (GI) series or an endoscopy. An upper GI series is an x-ray of the esophagus, stomach, and duodenum. The patient drinks a chalky liquid called barium to make these organs and any ulcers show up more clearly on the x-ray.

An endoscopy is an exam with an endoscope, a thin, lighted tube with a tiny camera on the end. The patient is lightly sedated, and the doctor carefully eases the endoscope through the patient's mouth and down the throat to the stomach and duodenum. This allows the doctor to see the lining of the esophagus,

stomach, and duodenum. The doctor can use the endoscope to take photos of ulcers or remove a tiny piece of tissue to view under a microscope.

Diagnosing *H. pylori*

If an ulcer is found, the doctor will test the patient for *H. pylori*. This test is important because treatment for an ulcer caused by *H. pylori* is different from that for an ulcer caused by NSAIDs.

H. pylori is diagnosed through blood, breath, and tissue tests. Blood tests are most common. They detect antibodies to *H. pylori* bacteria. Blood is taken at the doctor's office through a finger stick.

Breath tests are mainly used after treatment to see if treatment worked, but they can be used in diagnosis, too. The test is called a urea breath test.

In the doctor's office, the patient drinks a solution of urea that contains a special carbon atom. If *H. pylori* is present, it breaks down the urea, releasing the carbon. The blood carries the carbon to the lungs, where the patient exhales it. The breath test is 96 percent to 98 percent accurate.

Tissue tests are usually done using tissue removed with the endoscope. There are three types:

- The rapid urease test detects the enzyme urease, which is produced by *H. pylori*.
- A histology test allows the doctor to find and examine the actual bacteria.
- A culture test involves allowing *H. pylori* to grow in the tissue sample.



H. pylori bacteria

How Are *H. pylori* Peptic Ulcers Treated?

H. pylori peptic ulcers are treated with drugs to kill the bacteria, to reduce stomach acid, and to protect the stomach lining. Antibiotics are used to kill the bacteria. Two types of acid-suppressing drugs might be used: H₂-blockers and proton pump inhibitors.

H₂-blockers work by blocking histamine, which stimulates acid secretion. They help reduce ulcer pain after a few weeks. Proton pump inhibitors suppress acid production by halting the mechanism that pumps the acid into the stomach. H₂-blockers and proton pump inhibitors have been prescribed alone for years as treatments for ulcers. But used alone, these drugs do not eradicate *H. pylori*,

and therefore do not cure *H. pylori*-related ulcers. Bismuth subsalicylate, a component of Pepto-Bismol, is used to protect the stomach lining from acid. It also kills *H. pylori*. Treatment usually involves a combination of antibiotics, acid suppressors, and stomach protectors.

At this time, the most proven effective treatment is a 2-week course of treatment called triple therapy. It involves taking two antibiotics to kill the bacteria and either an acid suppressor or stomach lining shield. Two-week triple therapy reduces ulcer symptoms, kills the bacteria, and prevents ulcer recurrence in more than 90 percent of patients.

Unfortunately, patients may find triple therapy complicated because it involves taking as many as 20 pills a day. Also, the antibiotics used in triple therapy may cause mild side effects such as nausea, vomiting, diarrhea, dark stools, metallic taste in the mouth, dizziness, headache, and yeast infections in women. (Most side effects can be treated with medication withdrawal.) Nevertheless, recent studies show that 2 weeks of triple therapy is ideal.

Early results of studies in other countries suggest that 1 week of triple therapy may be as effective as the 2-week therapy, with fewer side effects.

Another option is 2 weeks of dual therapy. Dual therapy involves two drugs: one antibiotic and one acid suppressor. It is not as effective as triple therapy.

Two weeks of quadruple therapy, which uses two antibiotics, an acid suppressor, and a stomach lining shield, looks promising in research studies. It is also called bismuth triple therapy.

Drugs Used To Treat *H. pylori* Peptic Ulcers

Antibiotics: metronidazole, tetracycline, clarithromycin, amoxicillin.

H₂-blockers: cimetidine, ranitidine, famotidine, nizatidine.

Proton pump inhibitors: omeprazole, lansoprazole.

Stomach-lining protector: bismuth subsalicylate.

After Treatment

To be sure that treatment has killed all *H. pylori*, the doctor will do a followup endoscopy or breath test 6 to 12 months after treatment to check for the bacterium.

Can *H. pylori* Infection Be Prevented?

No one knows for sure how *H. pylori* spreads, so prevention is difficult. Researchers are trying to develop a vaccine to prevent infection.

Why Don't All Doctors Automatically Check for *H. pylori*?

Changing medical belief and practice takes time. For nearly 100 years, scientists and doctors thought that ulcers were caused by stress, spicy food, and alcohol. Treatment involved bed rest and a bland diet. Later, researchers added stomach acid to the list of causes and began treating ulcers with antacids.

Since *H. pylori* was discovered in 1982, studies conducted around the world have shown that using antibiotics to destroy *H. pylori* cured

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NSAIDs and Peptic Ulcers

A peptic ulcer is a sore that forms in the lining of the stomach or the duodenum (the beginning of the small intestine). An ulcer can cause a gnawing, burning pain in the upper abdomen; nausea; vomiting; loss of appetite; and weight loss. Most peptic ulcers are caused by infection with the bacterium *Helicobacter pylori* (*H. pylori*). But some peptic ulcers are caused by prolonged use of nonsteroidal anti-inflammatory drugs (NSAIDs)—pain relievers such as aspirin, ibuprofen, and naproxen sodium. NSAIDs cause ulcers by interfering with the stomach's ability to protect itself from acidic stomach juices.

Normally the stomach has three defenses against digestive juices: mucus that coats the stomach lining and shields it from stomach acid, the chemical bicarbonate that neutralizes stomach acid, and blood circulation to the stomach lining that aids in cell renewal and repair. NSAIDs hinder all of these protective mechanisms, and with the stomach's defenses down, digestive juices can damage the sensitive stomach lining and cause ulcers.

NSAID-induced ulcers usually heal once the person stops taking the medication. To help the healing process and relieve symptoms in the meantime, the doctor may recommend taking antacids to neutralize the acid and drugs called H₂-blockers or proton-pump inhibitors to decrease the amount of acid the stomach produces.

Medicines that protect the stomach lining also help with healing. Examples are bismuth subsalicylate, which coats the entire stomach lining, and sucralfate, which sticks to and covers the ulcer.

If a person with an NSAID ulcer also tests positive for *H. pylori*, he or she will be treated with antibiotics to kill the bacteria. Surgery may be necessary if an ulcer recurs or fails to heal, or if complications like bleeding, perforation, or obstruction develop.

Anyone taking NSAIDs who experiences symptoms of peptic ulcer should see a doctor for prompt treatment. Delaying diagnosis and treatment can lead to complications and the need for surgery.

This information is provided by the National Digestive Diseases Information Clearinghouse, a service of the National Institute of Diabetes and Digestive and Kidney Diseases.



peptic ulcers. The National Institutes of Health released a consensus statement in 1994 confirming that *H. pylori* causes peptic ulcers. Despite the evidence, however, the medical community continues to debate *H. pylori*'s role in peptic ulcers. If you have a peptic ulcer and have not been tested for *H. pylori* infection, talk to your doctor.

Points To Remember

- A peptic ulcer is a sore in the lining of the stomach or duodenum.
- Most peptic ulcers are caused by the *H. pylori* bacterium. None are caused by spicy food or stress.
- *H. pylori* may be transmitted from person to person through contaminated food and water.
- Always wash your hands after using the bathroom and before eating.
- Antibiotics are the most effective treatment for *H. pylori* peptic ulcers.

Additional Readings

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