

# Smoking and Your Digestive System

*National Digestive Diseases Information Clearinghouse*



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Digestive  
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Cigarette smoking causes many life-threatening diseases, including lung cancer, colon cancer, emphysema, and heart disease. Each year more than 400,000 Americans die from cigarette smoking. One in every five deaths in the United States is smoking related. Estimates show that about one-third of all adults smoke. Adult men seem to be smoking less, but women and teenagers of both sexes seem to be smoking more. Smoking affects the entire body, including the digestive system.

## What are the harmful effects of smoking on my digestive system?

Smoking can harm all parts of the digestive system, contributing to such common disorders as heartburn and peptic ulcers. Smoking increases the risk of Crohn's disease, and possibly gallstones, which form when liquid stored in the gallbladder hardens into pieces of stone-like material. Smoking also damages the liver.

## Heartburn

Heartburn is common with more than 50 million Americans having it at least once a month and about 15 million having it daily.

Heartburn is a symptom of a syndrome called gastroesophageal reflux (GER). GER is when the natural acidic juices in the stomach flow backwards into the esophagus—the tube that connects the mouth to the stomach. Acidic juices are made by the stomach to help break down food. The stomach is naturally protected from acidic juices, but the esophagus does not have the same protection. Normally, a muscular valve at the lower end of the esophagus, called the lower esophageal sphincter (LES), keeps the acids in the stomach and out of the esophagus. Smoking, however, weakens the LES, which allows stomach acid to flow into the esophagus. When stomach acid comes in contact with the esophagus, the inner lining can become injured or damaged.



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## 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 10 Americans develops an ulcer at some time in his or her life. One 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 (Advil). In a few cases, cancerous tumors in the stomach or pancreas can cause ulcers. Peptic ulcers are not caused by stress or eating spicy food, but these can make ulcers worse.

Research has shown that people who smoke cigarettes are more likely to develop an ulcer. If people with an ulcer keep smoking, their ulcer may not heal; or it may take longer than usual to heal. People have a better chance of their ulcer healing if they stop smoking compared to treating their ulcer with medication while still smoking. Smoking also increases people's risk of infection from a bacterium called *Helicobacter pylori* and increases the risk of ulceration from alcohol and over-the-counter pain relievers.

Stomach acid also plays a part in producing ulcers. Normally, stomach acid is absorbed by the food we eat. The acid that is not absorbed by food enters the duodenum and is quickly neutralized by sodium bicarbonate, a salt-like substance made by the pancreas—an organ located next to the duodenum that aids in digestion. Some studies show that smoking reduces the amount of bicarbonate in the body, which causes problems in the neutralization of acid in the duodenum. Other studies suggest that cigarette smoking may increase the amount of acid secreted by the stomach over time.

## Liver Disease

The liver is an important organ that has many tasks. The liver is responsible for processing drugs, alcohol, and other toxins and removing them from the body. Research shows that smoking harms the liver's ability to process such substances. In some cases, if the liver has been damaged from cigarette smoking, the dose of medication necessary to treat an illness may be affected. Research also suggests that smoking can worsen liver disease caused by drinking too much alcohol.

## Crohn's Disease

Crohn's disease causes swelling deep in the lining of the intestine. The disease, which causes pain and diarrhea, most often affects the small intestine, but it can occur anywhere in the digestive tract. Research shows that current and former smokers have a higher risk of developing Crohn's disease than nonsmokers. Among people with Crohn's disease, smoking is linked with a higher rate of relapse, repeat surgery, and the need for drug therapy. Women have a higher risk of relapsing and needing surgery and treatment than men whether they are current or former smokers. Why smoking increases the risk of Crohn's disease is unknown, but some researchers believe that smoking might lower the intestines' defenses, decrease blood flow to the intestines, or cause immune system changes that result in inflammation.

## Gallstones

Several studies show that smoking may increase the risk of developing gallstones and that the risk may be higher for women. However, research results on this topic are not consistent and more study is needed.

## Can the damage be reversed?

Some of the effects of smoking on the digestive system appear to be of short duration. For example, the effect of smoking on the pancreas's bicarbonate production does not appear to last. Within a half-hour after smoking, the production of bicarbonate returns to normal. The effects of smoking on how the liver handles drugs also disappear when a person stops smoking. However, people who no longer smoke still remain at risk for Crohn's disease.

## For More Information

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Publications produced by the Clearinghouse are carefully reviewed by both NIDDK scientists and outside experts.

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