

LOS ANGELES

## COLON AND RECTAL SURGICAL ASSOCIATES

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# GAS IN THE DIGESTIVE TRACT

Everyone has gas and eliminates it by burping or passing it through the rectum. However, many people think they have too much gas when they really have normal amounts. Most people produce about 1 to 3 pints a day and pass gas about 14 times a day.

Gas is made primarily of odorless vapors—carbon dioxide, oxygen, nitrogen, hydrogen, and sometimes methane. The unpleasant odor of flatulence comes from bacteria in the large intestine that release small amounts of gases that contain sulfur.

Although having gas is common, it can be uncomfortable and embarrassing. Understanding causes, ways to reduce symptoms, and treatment will help most people find relief.

## What Causes Gas?

Gas in the digestive tract (that is, the esophagus, stomach, small intestine, and large intestine) comes from two sources:

- Swallowed air.
- Normal breakdown of certain undigested foods by harmless bacteria naturally present in the large intestine (colon).

### *Swallowed Air*

Air swallowing (aerophagia) is a common cause of gas in the stomach. Everyone swallows small amounts of air when eating and drinking. However, eating or drinking rapidly, chewing gum, smoking, or wearing loose dentures can cause some people to take in more air.

Burping, or belching, is the way most swallowed air—which contains nitrogen, oxygen, and carbon dioxide—leaves the stomach. The remaining gas moves into the small intestine where it is partially absorbed. A small amount travels into the large intestine for release through the rectum. (The stomach also releases carbon dioxide when stomach acid and bicarbonate mix, but most of this gas is absorbed into the bloodstream and does not enter the large intestine.)

### *Breakdown of Undigested Foods*

The body does not digest and absorb some carbohydrates (the sugar, starches, and fiber found in many foods) in the small intestine because of a shortage or absence of certain enzymes.

This undigested food then passes from the small intestine into the large intestine, where harmless and normal bacteria break down the food, producing hydrogen, carbon dioxide, and, in about one-third of all people, methane. Eventually these gases exit through the rectum.

People who make methane do not necessarily pass more gas or have unique symptoms. A person who produces methane will have stools that consistently float in water. Research has not shown why some people produce methane and others do not.

Foods that produce gas in one person may not cause gas in another. Some common bacteria in the large intestine can destroy the hydrogen that other bacteria produce. The balance of the two types of bacteria may explain why some people have more gas than others.

## Which Foods Cause Gas?

Most foods that contain carbohydrates can cause gas. By contrast, fats and proteins cause little gas.

### *Sugars*

The sugars that cause gas are raffinose, lactose, fructose, and sorbitol.

**Raffinose:** Beans contain large amounts of this complex sugar. Smaller amounts are found in cabbage, brussels sprouts, broccoli, asparagus, other vegetables, and whole grains.

**Lactose:** Lactose is the natural sugar in milk. It is also found in milk products, such as cheese and ice cream, and processed foods, such as bread, cereal, and salad dressing. Many people, particularly those of African, Native American, or Asian background, have low levels of the enzyme lactase needed to digest lactose. Also, as people age, their enzyme levels decrease. As a result, over time people may experience increasing amounts of gas after eating food containing lactose.

**Fructose:** Fructose is naturally present in onions, artichokes, pears, and wheat. It is also used as a sweetener in some soft drinks and fruit drinks.

**Sorbitol:** Sorbitol is a sugar found naturally in fruits, including apples, pears, peaches, and prunes. It is also used as an artificial sweetener in many dietetic foods and sugarfree candies and gums.

### *Starches*

Most starches, including potatoes, corn, noodles, and wheat, produce gas as they are broken down in the large intestine. Rice is the only starch that does not cause gas.

### *Fiber*

Many foods contain soluble and insoluble fiber. Soluble fiber dissolves easily in water and takes on a soft, gel-like texture in the intestines. Found in oat bran, beans, peas, and most fruits, soluble fiber is not broken down until it reaches the large intestine, where digestion causes gas.

Insoluble fiber, on the other hand, passes essentially unchanged through the intestines and produces little gas. Wheat bran and some vegetables contain this kind of fiber.

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## **What are Some Symptoms and Problems of Gas?**

The most common symptoms of gas are belching, flatulence, abdominal bloating, and abdominal pain. However, not everyone experiences these symptoms. The determining factors probably are how much gas the body produces, how many fatty acids the body absorbs, and a person's sensitivity to gas in the large intestine. Chronic symptoms caused by too much gas or by a serious disease are rare.

### ***Belching***

An occasional belch during or after meals is normal and releases gas when the stomach is full of food. However, people who belch frequently may be swallowing too much air and releasing it before the air enters the stomach.

Sometimes a person with chronic belching may have an upper GI disorder, such as peptic ulcer disease, gastroesophageal reflux disease (GERD), or gastritis.

Believing that swallowing air and releasing it will relieve the discomfort of these disorders, a person may unintentionally develop a habitual cycle of belching and discomfort. Frequently, the pain continues or worsens, leading the person to believe he or she has a serious disorder.

Two rare chronic gas syndromes are associated with belching: Magenblase syndrome and gas-bloat syndrome. The Magenblase syndrome, which causes chronic belching, is characterized by severe air swallowing and an enlarged bubble of gas in the stomach following heavy meals. The resulting fullness and shortness of breath may mimic a heart attack.

Gas-bloat syndrome may occur after surgery to correct GERD. The surgery creates a one-way valve between the esophagus and stomach that allows food and gas to enter the stomach but often prevents normal belching and the ability to vomit.

### ***Flatulence***

Another common complaint is passage of too much gas through the rectum (flatulence). However, most people do not realize that passing gas 14 to 23 times a day is normal. Although rare, too much gas may be the result of severe carbohydrate malabsorption or overactive bacteria in the colon.

### ***Abdominal Bloating***

Many people believe that too much gas causes abdominal bloating. However, people who complain of bloating from gas often have normal amounts and distribution of gas. They actually may be unusually aware of gas in the digestive tract.

Doctors believe that bloating is usually the result of an intestinal motility disorder, such as IBS. Motility disorders are

characterized by abnormal movements and contractions of intestinal muscles. These disorders may give a false sensation of bloating because of increased sensitivity to gas.

Splenic-flexure syndrome is a chronic disorder that seems to be caused by trapped gas at bends (flexures) in the colon. Symptoms include bloating, muscle spasms, and upper abdominal discomfort. Splenic-flexure syndrome often accompanies IBS.

Any disease that causes intestinal obstruction, such as Crohn's disease or colon cancer, may also cause abdominal bloating. In addition, people who have had many operations, adhesions (scar tissue), or internal hernias may experience bloating or pain. Finally, eating a lot of fatty food can delay stomach emptying and cause bloating and discomfort, but not necessarily too much gas.

### ***Abdominal Pain and Discomfort***

Some people have pain when gas is present in the intestine. When gas collects on the left side of the colon, the pain can be confused with heart disease. When it collects on the right side of the colon, the pain may feel like the pain associated with gallstones or appendicitis.

### ***From Your Physician***

*"A Guide for Patients" is being given to you by your physician to help you better understand the particular digestive problem affecting you. Studies have shown that the more that a patient knows, the easier it is for the patient to cooperate with the physician and the more effective can be the prescribed treatment.*

*The information in "A Guide for Patients" has been prepared by the National Digestive Diseases Information Clearinghouse, a service of the National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health, U.S. Public Health Service.*

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