Gas in the Digestive Tract

National Digestive Diseases Information Clearinghouse

U.S. Department of Health and Human Services

NATIONAL INSTITUTES OF HEALTH

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NATIONAL INSTITUTE OF DIABETES AND DIGESTIVE AND KIDNEY DISEASES

What is gas?

Gas is air in the digestive tract—the large, muscular tube that extends from the mouth to the anus, where the movement of muscles, along with the release of hormones and enzymes, allows for the digestion of food. Gas leaves the body when people burp through the mouth or pass gas through the anus.

Gas is primarily composed of carbon dioxide, oxygen, nitrogen, hydrogen, and sometimes methane. Flatus, gas passed through the anus, may also contain small amounts of gasses that contain sulfur. Flatus that contains more sulfur gasses has more odor.

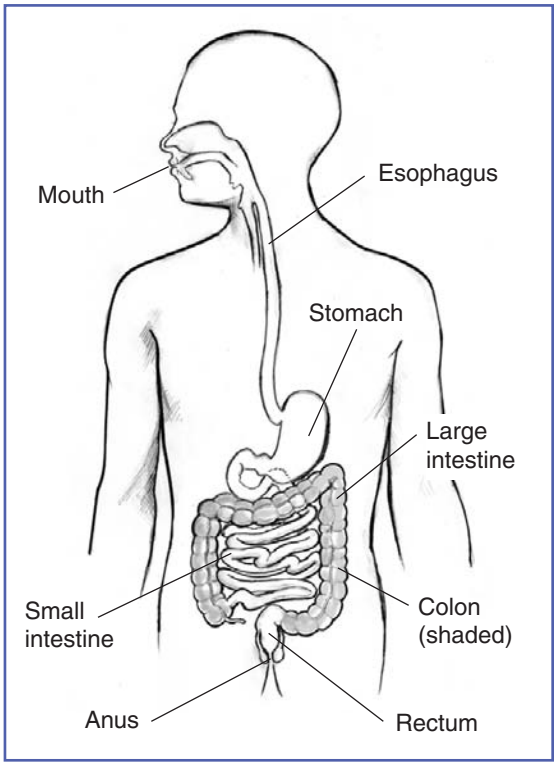
Everyone has gas. However, many people think they burp or pass gas too often and that they have too much gas. Having too much gas is rare.

What causes gas?

Gas in the digestive tract is usually caused by swallowing air and by the breakdown of certain foods in the large intestine by bacteria.

Everyone swallows a small amount of air when eating and drinking. The amount of air swallowed increases when people

- eat or drink too fast
- smoke
- chew gum
- suck on hard candy
- drink carbonated or "fizzy" drinks
- wear loose-fitting dentures



The digestive tract

Burping allows some gas to leave 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 anus.

The stomach and small intestine do not fully digest some carbohydrates—sugars, starches, and fiber found in many foods. This undigested food passes through the small intestine to the large intestine. Once there, undigested carbohydrates are broken down by bacteria in the large intestine, which release hydrogen and carbon dioxide in the

process. Other types of bacteria in the large intestine take in hydrogen gas and create methane gas or hydrogen sulfide, the most common sulfur gas in flatus.

Studies have detected methane in the breath of 30 to 62 percent of healthy adults.[1] A larger percentage of adults may produce methane in the intestines, but the levels may be too low to be detected. Research suggests that people with conditions that cause constipation are more likely to produce detectable amounts of methane.[1] More research is needed to find out the reasons for differences in methane production and to explore the relationship between methane and other health problems.

Some of the gas produced in the intestines is absorbed by the bloodstream and carried to the lungs, where it is released in the breath.

Normally, few bacteria live in the small intestine. Small intestinal bacterial overgrowth is an increase in the number of bacteria or a change in the type of bacteria in the small intestine. These bacteria can produce excess gas and may also cause diarrhea and weight loss. Small intestinal bacterial overgrowth is usually related to diseases or disorders that damage the digestive system or affect how it works, such as Crohn's disease—an inflammatory bowel disease that causes inflammation, or swelling, and irritation of any part of the gastrointestinal (GI) tract—or diabetes.

Which foods cause gas?

Most foods that contain carbohydrates can cause gas. In contrast, fats and proteins cause little gas. Foods that produce gas in one person may not cause gas in someone else, depending on how well individuals digest carbohydrates and the type of bacteria present in the intestines.

Some foods that may cause gas include

- beans
- vegetables such as broccoli, cauliflower, cabbage, brussels sprouts, onions, mushrooms, artichokes, and asparagus
- fruits such as pears, apples, and peaches
- whole grains such as whole wheat and bran
- sodas; fruit drinks, especially apple juice and pear juice; and other drinks that contain high-fructose corn syrup, a sweetener made from corn
- milk and milk products such as cheese, ice cream, and yogurt
- packaged foods—such as bread, cereal, and salad dressing—that contain small amounts of lactose, a sugar found in milk and foods made with milk
- sugar-free candies and gums that contain sugar alcohols such as sorbitol, mannitol, and xylitol

What are the symptoms of gas?

The most common symptoms of gas are burping, passing gas, bloating, and abdominal pain or discomfort. However, not everyone experiences these symptoms.

Burping. Burping, or belching, once in a while, especially during and after meals, is normal. However, people who burp frequently may be swallowing too much air and releasing it before the air enters the stomach.

Some people who burp frequently may have an upper GI disorder, such as gastroesophageal reflux disease—a chronic condition in which stomach contents flow

[1]Sahakian AB, Jee SR, Pimentel M. Methane and the gastrointestinal tract. *Digestive Diseases and Sciences.* 2010;55(8):2135–43. Epub 2009 Oct 15.

back up into the esophagus. People may believe that swallowing air and releasing it will relieve the discomfort, and they may intentionally or unintentionally develop a habit of burping to relieve discomfort.

Passing gas. Passing gas around 13 to 21 times a day is normal.[2] Flatulence is excessive gas in the stomach or intestine that can cause bloating and flatus. Flatulence may be the result of problems digesting certain carbohydrates.

Bloating. Bloating is a feeling of fullness and swelling in the abdomen, the area between the chest and hips. Problems digesting carbohydrates may cause increased gas and bloating. However, bloating is not always caused by too much gas. Bloating may result from diseases that affect how gas moves through the intestines, such as rapid gastric emptying, or from diseases that cause intestinal obstruction, such as colon cancer. People who have had many operations, internal hernias, or bands of internal scar tissue called adhesions may experience bloating.

Disorders such as irritable bowel syndrome (IBS) can affect how gas moves through the intestines or increase pain sensitivity in the intestines. IBS is a functional GI disorder, meaning that the symptoms are caused by changes in how the digestive tract works. The most common symptoms of IBS are abdominal pain or discomfort, often reported as cramping, along with diarrhea, constipation, or both. IBS may give a sensation of bloating because of increased sensitivity to normal amounts of gas.

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. People may feel abdominal pain or discomfort when gas does not move through the intestines normally. People with IBS may be more sensitive to gas and feel pain when gas is present in the intestines.

How is the cause of gas found?

People can try to find the cause of gas on their own by keeping a diary of what they eat and drink and how often they burp, pass gas, or have other symptoms. A diary may help identify specific foods that cause gas.

A health care provider should be consulted if

- symptoms of gas are bothersome
- symptoms change suddenly
- new symptoms occur, especially in people older than age 40
- gas is accompanied by other symptoms, such as constipation, diarrhea, or weight loss

The health care provider will ask about dietary habits and symptoms and may ask a person to keep a food diary. Careful review of diet and the amount of burping or gas passed may help relate specific foods to symptoms and determine the severity of the problem. Recording gas symptoms can help determine whether the problem is too much gas in the intestines or increased sensitivity to normal amounts of gas.

If milk or milk products are causing gas, the health care provider may perform blood or breath tests to check for lactose intolerance, the inability or insufficient ability to digest lactose. Lactose intolerance is caused by a deficiency of the enzyme lactase, which is needed to digest lactose. The health care provider may suggest avoiding milk products for a short time to see if symptoms improve.

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[2]Gas-related complaints. The Merck Manuals Online Medical Library. www.merckmanuals.com/professional/sec02/ch008/ch008d.html. Updated October 2007. Accessed June 26, 2012.

The health care provider may perform a physical exam and order other types of diagnostic tests, depending on a person's symptoms. These tests can rule out serious health problems that may cause gas or symptoms similar to those of gas.

How is gas treated?

Gas can be treated by reducing swallowed air, making dietary changes, or taking over-the-counter or prescription medications. People who think they have too much gas can try to treat gas on their own before seeing a health care provider. Health care providers can provide advice about reducing gas and prescribe medications that may help.

Reducing swallowed air. Swallowing less air may help reduce gas, especially for people who burp frequently. A health care provider may suggest eating more slowly, avoiding gum and hard candies, or checking with a dentist to make sure dentures fit correctly.

Making dietary changes. People may be able to reduce gas by eating less of the foods that cause gas. However, many healthy foods may cause gas, such as fruits and vegetables, whole grains, and milk products. The amount of gas caused by certain foods varies from person to person. Effective dietary changes depend on learning through trial and error which foods cause a person to have gas and how much of the offending foods one can handle.

While fat does not cause gas, limiting high-fat foods can help reduce bloating and discomfort. Less fat in the diet helps the stomach empty faster, allowing gases to move more quickly into the small intestine.

Taking over-the-counter medications. Some over-the-counter medications can help reduce gas or the symptoms associated with gas:

- Alpha-galactosidase (Beano), an over-the-counter digestive aid, contains the sugar-digesting enzyme that the body lacks to digest the sugar in beans and many vegetables. The enzyme comes in liquid and tablet form. Five drops are added per serving or one tablet is swallowed just before eating to break down the gas-producing sugars. Beano has no effect on gas caused by lactose or fiber.
- Simethicone (Gas-X, Mylanta Gas) can relieve bloating and abdominal pain or discomfort caused by gas.
- Lactase tablets or drops can help people with lactose intolerance digest milk and milk products to reduce gas. Lactase tablets are taken just before eating foods that contain lactose; lactase drops can be added to liquid milk products. Lactose-free and lactose-reduced milk and milk products are available at most grocery stores.

Taking prescription medications. Health care providers may prescribe medications to help reduce symptoms, especially for people with small intestinal bacterial overgrowth or IBS. For more information about IBS, see the *Irritable Bowel Syndrome* fact sheet from the National Digestive Diseases Information Clearinghouse at *www.digestive.niddk.nih.gov.*

Eating, Diet, and Nutrition

People's eating habits and diet affect the amount of gas they have. For example, eating and drinking too fast may increase the amount of air swallowed, and foods that contain carbohydrates may cause some people to have more gas.

Tracking eating habits and symptoms can help identify the foods that cause more gas. Avoiding or eating less of these foods may help reduce gas symptoms.

Points to Remember

- Gas is air in the digestive tract.
- Everyone has gas. However, many people think they pass gas too often and that they have too much gas. Having too much gas is rare.
- Gas in the digestive tract is usually caused by swallowing air and by the breakdown of certain foods in the large intestine by bacteria.
- Most foods that contain carbohydrates can cause gas. In contrast, fats and proteins cause little gas.
- Foods that produce gas in one person may not cause gas for someone else.
- The most common symptoms of gas are burping, passing gas, bloating, and abdominal pain or discomfort.
- Gas can be treated by reducing swallowed air, making dietary changes, or taking over-the-counter or prescription medications.

Hope through Research

The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) sponsors research into digestive conditions, including gas. Researchers are studying disorders that may cause gas symptoms, such as IBS.

The NIDDK and other components of the National Institutes of Health (NIH) are conducting clinical trials aimed at improving the diagnosis and treatment of IBS. Self Administered Cognitive Behavior Therapy for Irritable Bowel Syndrome, funded under NIH clinical trial number NCT00738920, assesses the short- and long-term efficacy of cognitive behavior therapy for IBS using two treatment delivery systems: self administered and therapist administered. Long-term project goals include development of an effective self-administered behavioral treatment program that can enhance quality of patient care, improve clinical outcomes, and decrease the economic and personal costs of IBS.

Safety Study of Probiotics in Adults with Irritable Bowel Syndrome, funded under NIH clinical trial number NCT00971711, is a phase I study of the safety and effectiveness of VSL#3 in adults with IBS. VSL#3 is a high-potency probiotic medical food that is commercially available. Acupuncture/Moxibustion for Irritable Bowel Syndrome (Acu/MoxalIBS), funded under NIH clinical trial number NCT00945074, tests the efficacy of acupuncture in combination with moxibustion for symptom improvement in adults with IBS. Moxibustion is the application of heat from a burning herb at the acupuncture point. All participants will receive moxibustion and will be assigned to one of three treatment protocols: standard acupuncture, individualized acupuncture, and sham acupuncture.

Participants in clinical trials can play a more active role in their own health care, gain access to new research treatments before they are widely available, and help others by contributing to medical research. For information about current studies, visit *www.ClinicalTrials.gov.*

For More Information

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You may also find additional information about this topic by visiting MedlinePlus at *www.medlineplus.gov.*

This publication may contain information about medications. When prepared, this publication included the most current information available. For updates or for questions about any medications, contact the U.S. Food and Drug Administration toll-free at 1–888–INFO–FDA (1–888–463–6332) or visit *www.fda.gov*. Consult your health care provider for more information.

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This publication is available at *www.digestive.niddk.nih.gov.*

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