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Patient information: Gas and bloating (Beyond the Basics)

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GAS AND BLOATING OVERVIEW — Some people feel that they pass too much gas or burp too frequently, both of which can be a source of embarrassment and discomfort. The average adult produces about one to three pints of gas each day, which is passed through the anus 14 to 23 times per day. Burping occasionally before or after meals is also normal.

The amount of gas produced by the body depends upon your diet and other individual factors. However, most people who complain of excessive gas do not produce more gas than the average person. Instead, they are more aware of normal amounts of gas. On the other hand, certain foods and medical conditions can cause you to make excessive amounts of gas.

This article reviews the sources of intestinal gas, conditions that increase sensitivity to gas, and measures to reduce gas production. A more detailed review of this topic is available by subscription. (See "[Intestinal gas and bloating](#)".)

SOURCES OF GAS — There are two primary sources of intestinal gas: gas that is ingested (mostly swallowed air) and gas that is produced by bacteria in the colon.

Air swallowing — Air swallowing is the major source of gas in the stomach. It is normal to swallow a small amount of air when eating and drinking and when swallowing saliva. You may swallow larger amounts of air when eating food rapidly, gulping liquids, chewing gum, or smoking.

Most swallowed air is eliminated by belching so that only a relatively small amount of air passes from the stomach into the small intestine ([figure 1](#)). Your posture may influence how much air passes to the small intestine.

- When sitting up, most swallowed air passes back up the esophagus and out of the mouth, which can cause you to belch.
- When lying down, swallowed air tends to pass into the small intestine, which can cause you to pass gas.

Belching may be voluntary or occur unintentionally. Involuntary belching is a normal process that typically occurs after eating to release air that enlarges or stretches the stomach. Belching is more common with certain foods that relax the ring-shaped muscle (sphincter) around the lower end of the esophagus where it joins the stomach. Such foods include peppermint, chocolate, and fats.

Bacterial production — The colon normally provides a home for billions of harmless bacteria, some of which support

the health of the bowel. Certain carbohydrates are incompletely digested by enzymes in the stomach and intestines, allowing bacteria to digest them. For example, cabbage, Brussels sprouts, and broccoli contain raffinose, a carbohydrate that is poorly digested. These foods tend to cause more gas and flatulence because the raffinose is digested by bacteria once it reaches the colon. The by-products of this process include odorless gases, such as carbon dioxide, hydrogen, and methane. Minor components of gas have an unpleasant odor, including trace amounts of sulfur.

Some people are not able to digest certain carbohydrates. A classic example is lactose, the major sugar contained in dairy products ([table 1](#)). Thus, consuming large amounts of lactose may lead to increased gas production, along with cramping and diarrhea (see ['Lactose intolerance'](#) below).

Certain diseases can also cause excessive bloating and gas. For example, people with diabetes or scleroderma may, over time, have slowing in the activity of the small intestine. This can lead to bacterial overgrowth within the bowel, with poor digestion of carbohydrates and other nutrients. However, even in the absence of apparent disease, some people tend to harbor large numbers of bacteria in their small bowel and are prone to develop excessive gas.

GAS AND BLOATING SYMPTOMS — Some people feel they pass an excessive amount of gas or burp too frequently. Other people notice bloating and crampy abdominal pain. You may feel this pain in areas where gas can become trapped ([figure 1](#)), such as in bends in the colon, which occur naturally in the area under the liver (upper to mid-right part of the abdomen), and in the area under the spleen (upper to mid left part of the abdomen).

SENSITIVITY TO GAS — The link between gas, belching, and the actual amount of gas in the intestines is not always clear. The vast majority of people who are bothered by gas-related symptoms do **not** have an excessive amount of gas in the intestine, but rather they have an increased sensitivity to normal amounts of gas in the intestine. This can happen in a variety of circumstances.

Irritable bowel syndrome — Many people with irritable bowel syndrome (IBS) are sensitive to normal amounts of gas. Nerves that carry messages from the bowel may be overactive in people with IBS, so that normal amounts of gas or movement in the intestines feels painful or overactive. The primary symptoms of IBS are abdominal pain and changes in bowel habits (such as diarrhea and/or constipation). Many people also complain of bloating. (See ["Patient information: Irritable bowel syndrome \(Beyond the Basics\)"](#).)

Some people with severe IBS feel better when treated with medications that decrease the painful feelings coming from the intestine (such as low doses of [imipramine](#) or [nortriptyline](#)).

Functional dyspepsia — Dyspepsia is the term for recurrent or persistent pain or discomfort in the upper abdomen. Approximately 25 percent of people in the United States and other western countries experience dyspepsia. (See ["Patient information: Upset stomach \(functional dyspepsia\) in adults \(Beyond the Basics\)"](#).)

Dyspepsia can arise from various underlying conditions, the most common of which is "functional" (or "nonulcer") dyspepsia. Functional dyspepsia causes abdominal pain without an identifiable cause, probably due to an increased sensitivity to contents within the stomach.

Irritation of the anus or esophagus — People who have irritation around their anus due to hemorrhoids or other problems may also experience more discomfort when they pass gas. (See ["Patient information: Hemorrhoids \(Beyond the Basics\)"](#).)

Similarly, people who have irritation of the esophagus (esophagitis) may find burping painful. (See ["Patient information: Acid reflux \(gastroesophageal reflux disease\) in adults \(Beyond the Basics\)"](#).)

CAUSES OF INCREASED GAS — The vast majority of people who are bothered by gas do not produce excessive amounts of gas. However, there are several conditions that may lead to increased gas formation.

Swallowed air — Chronic, repeated belching can occur if you swallow large amounts of air (ie, aerophagia). Aerophagia is typically an unconscious process, and is often associated with emotional stress. Treatment focuses on decreasing air swallowing by reducing anxiety, when it is considered to be a cause, as well as on eating slowly without gulping and avoiding carbonated beverages, chewing gum, and smoking.

Foods that cause gas — Several foods contain short chain carbohydrates called FODMAPs (fermentable oligo-, di-, and monosaccharides and polyols). FODMAPs are poorly absorbed and can result in bloating and gas production ([table 2](#)). A diet that is low in FODMAPs may reduce the amount of gas you produce.

Starch and soluble fiber can also contribute increase gas. Potatoes, corn, noodles, and wheat produce gas while rice does not. Soluble fiber (found in oat bran, peas and other legumes, beans, and most fruit) also causes gas. Some laxatives contain soluble fiber and may cause gas, particularly during the first few weeks of use.

Lactose intolerance — Lactose intolerance occurs when your body has difficulty digesting lactose, the sugar found in most milk-based products ([table 1](#)). Symptoms of lactose intolerance include diarrhea, abdominal pain, and flatulence after consuming milk or milk-containing products. More detailed information about lactose intolerance is available separately.

Intolerance to food sugars — Some people are intolerant of sugars contained in certain foods. Two common examples are fructose (contained in dried fruit, honey, sucrose, onions, artichokes, and many foods and drinks that contain "high fructose corn syrup") and [sorbitol](#) (a sugar substitute contained in some sugar free candies and chewing gum).

Diseases associated with increased gas — A number of diseases can cause difficulty absorbing carbohydrates, which can lead to increased gas. This problem can occur in people with celiac disease (a disease caused by intolerance to a protein contained in wheat), short bowel syndrome, and in some rare disorders. (See "[Patient information: Celiac disease in adults \(Beyond the Basics\)](#)".)

GAS AND BLOATING DIAGNOSIS — Most people with gas and bloating do not need to have any testing. However, symptoms such as diarrhea, weight loss, abdominal pain, anemia, blood in the stool, lack of appetite, fever, or vomiting can be warning signs of a more serious problem; people with one or more of these symptoms usually require testing.

Tests may include:

- Examination of stool for blood, abnormally high levels of fat (steatorrhea), or a parasite (eg, Giardia). (See "[Patient information: Giardia \(Beyond the Basics\)](#)".)
- A lactose tolerance test, described above (see '[Lactose intolerance](#)' above).
- X-ray examination of the small intestine.
- A test to examine the inside of the stomach and/or colon (upper endoscopy, sigmoidoscopy, or colonoscopy). (See "[Patient information: Upper endoscopy \(Beyond the Basics\)](#)" and "[Patient information: Flexible sigmoidoscopy \(Beyond the Basics\)](#)" and "[Patient information: Colonoscopy \(Beyond the Basics\)](#)".)
- A blood test for celiac disease. (See "[Patient information: Celiac disease in adults \(Beyond the Basics\)](#)".)

GAS AND BLOATING TREATMENT — Several measures can help to reduce bothersome gas.

Diet recommendations — Avoid foods that appear to aggravate your symptoms. These may include milk and dairy products, certain fruits or vegetables, whole grains, artificial sweeteners, and/or carbonated beverages. Keep a record of foods and beverages to help to pinpoint which foods are bothersome ([form 1](#)).

If you are lactose intolerant, do not consume products that contain lactose ([table 1](#)) or use a lactose-digestive aid, such

as lactose-reduced milk or over-the-counter [lactase supplements](#) (eg, Lactaid tablets or liquid). Take a calcium supplement if you avoid milk products. (See "[Patient information: Calcium and vitamin D for bone health \(Beyond the Basics\)](#)".) Avoiding foods high in fructose will help if you have fructose intolerance. (See '[Intolerance to food sugars](#)' above.)

Over-the-counter medications — Try an over-the-counter product that contains [simethicone](#), such as certain antacids (eg, Maalox Anti-Gas, Mylanta Gas, Gas-X, Phazyme). Simethicone causes gas bubbles to break up and is widely used to relieve gas, although its benefit is questionable.

Try an over-the-counter product that contains [activated charcoal](#) (eg, CharcoCaps, CharcoAid). The benefit of activated charcoal is unclear, although it is reasonable to try.

Try [Beano](#)[™], an over-the-counter preparation that helps to breakdown certain complex carbohydrates. This treatment may be effective in reducing gas after eating beans or other vegetables that contain raffinose.

Try bismuth subsalicylate (eg, Pepto-Bismol) to reduce the odor of unpleasant smelling gas.

Deodorizing products — Consider a device to deodorize gas, such as underwear made from carbon fiber (eg, Under-Ease protective underwear [Under-Tec, Corp] and GasMedic underwear brief [Dairiair, LLC]). These appear to be effective but are expensive. Charcoal lined cushions or pads are also available, but may not be as effective.

WHERE TO GET MORE INFORMATION — Your healthcare provider is the best source of information for questions and concerns related to your medical problem.

This article will be updated as needed on our web site (www.uptodate.com/patients). Related topics for patients, as well as selected articles written for healthcare professionals, are also available. Some of the most relevant are listed below.

Patient level information — UpToDate offers two types of patient education materials.

The Basics — The Basics patient education pieces answer the four or five key questions a patient might have about a given condition. These articles are best for patients who want a general overview and who prefer short, easy-to-read materials.

[Patient information: Gas and bloating \(The Basics\)](#)

[Patient information: Lactose intolerance \(The Basics\)](#)

Beyond the Basics — Beyond the Basics patient education pieces are longer, more sophisticated, and more detailed. These articles are best for patients who want in-depth information and are comfortable with some medical jargon.

[Patient information: Irritable bowel syndrome \(Beyond the Basics\)](#)

[Patient information: Upset stomach \(functional dyspepsia\) in adults \(Beyond the Basics\)](#)

[Patient information: Hemorrhoids \(Beyond the Basics\)](#)

[Patient information: Acid reflux \(gastroesophageal reflux disease\) in adults \(Beyond the Basics\)](#)

[Patient information: Celiac disease in adults \(Beyond the Basics\)](#)

[Patient information: Giardia \(Beyond the Basics\)](#)

[Patient information: Upper endoscopy \(Beyond the Basics\)](#)

[Patient information: Flexible sigmoidoscopy \(Beyond the Basics\)](#)

[Patient information: Colonoscopy \(Beyond the Basics\)](#)

[Patient information: Calcium and vitamin D for bone health \(Beyond the Basics\)](#)

Professional level information — Professional level articles are designed to keep doctors and other health professionals up-to-date on the latest medical findings. These articles are thorough, long, and complex, and they contain

multiple references to the research on which they are based. Professional level articles are best for people who are comfortable with a lot of medical terminology and who want to read the same materials their doctors are reading.

[Clinical manifestations and diagnosis of irritable bowel syndrome in adults](#)

[Intestinal gas and bloating](#)

[Lactose intolerance](#)

[Treatment of irritable bowel syndrome in adults](#)

The following organizations also provide reliable health information.

- National Library of Medicine

(www.nlm.nih.gov/medlineplus/healthtopics.html)

- National Institute of Diabetes and Digestive and Kidney Diseases

(<http://digestive.niddk.nih.gov/ddiseases/pubs/gas/index.htm>, also available in Spanish)

- The American Gastroenterological Association

(<http://www.gastro.org/patient-center/digestive-conditions/gas-in-the-digestive-tract>)

[1-3]

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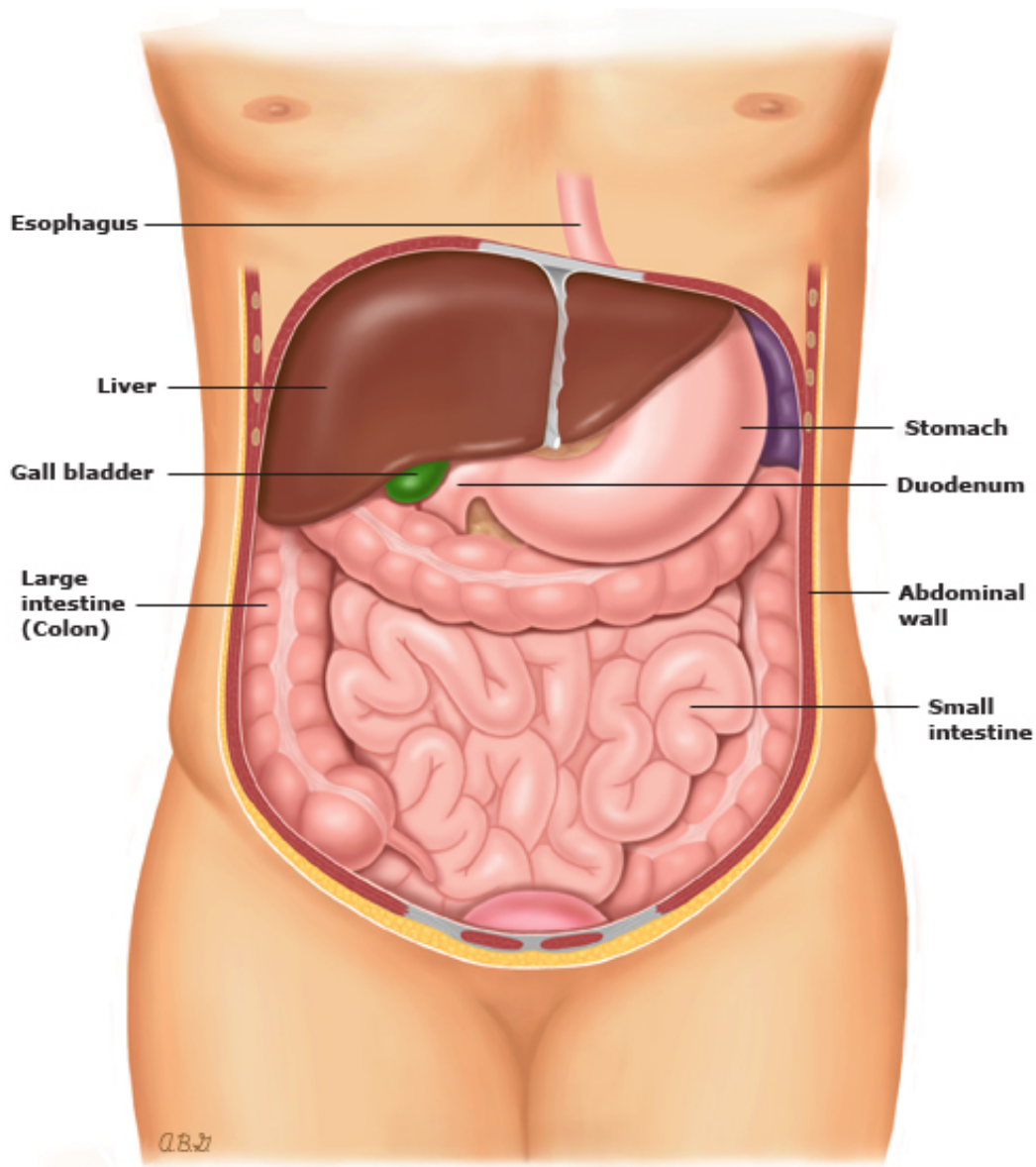
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Topic 2010 Version 8.0

GRAPHICS

Organs inside the abdomen (belly)



Graphic 64960 Version 6.0

Lactose content of different foods

Product	Lactose content (grams)
Milk (1 cup)	
Whole, 2 percent, 1 percent, skim	9-14
Buttermilk	9-12
Evaporated milk	24-28
Sweetened condensed milk	31-50
Lactaid® milk (lactose-reduced)	3
Goat's milk	11-12
Acidophilus, skim	11
Yogurt, low fat, 1 cup	4-17
Cheese, 1 ounce	
Cottage cheese (1/2 cup)	0.7-4
Cheddar (sharp)	0.4-0.6
Mozzarella (part skim, low moisture)	0.08-0.9
American (pasteurized, processed)	0.5-4
Ricotta (1/2 cup)	0.3-6
Cream cheese	0.1-0.8
Butter (1 pat)	0.04-0.5
Cream (1 tablespoon)	
Light, whipping, sour	0.4-0.6
Ice cream (1/2 cup)	2-6
Ice milk (1/2 cup)	5
Sherbet (1/2 cup)	0.6-2

Adapted from: Scrimshaw NS, Murray EB. The acceptability of milk and milk products in populations with a high prevalence of lactose intolerance. *Am J Clin Nutr* 1988; 48:1079. Copyright © 1988 American Society for Clinical Nutrition.

Graphic 55938 Version 4.0

Characteristics and sources of common FODMAPs

	Word that corresponds to letter in acronym	Compounds in this category	Foods that contain these compounds
F	Fermentable		
O	Oligosaccharides	Fructans, galacto-oligosaccharides	Wheat, barley, rye, onion, leek, white part of spring onion, garlic, shallots, artichokes, beetroot, fennel, peas, chicory, pistachio, cashews, legumes, lentils, and chickpeas
D	Disaccharides	Lactose	Milk, custard, ice cream, and yogurt
M	Monosaccharides	"Free fructose" (fructose in excess of glucose)	Apples, pears, mangoes, cherries, watermelon, asparagus, sugar snap peas, honey, high fructose corn syrup
A	And		
P	Polyols	Sorbitol, mannitol, maltitol, and xylitol	Apples, pears, apricots, cherries, nectarines, peaches, plums, watermelon, mushrooms, cauliflower, artificially sweetened chewing gum and confectionery

FODMAPs stands for "fermentable oligosaccharides, disaccharides, monosaccharides, and polyols." When you eat foods containing FODMAPs, they get fermented by bacteria in your gut. This fermentation produces gas and makes you feel gassy or bloated.

Adapted by permission from Macmillan Publishers Ltd: American Journal of Gastroenterology. Shepherd SJ, Lomer MC, Gibson PR. Short-chain carbohydrates and functional gastrointestinal disorders. Am J Gastroenterol 2013; 108:707. Copyright © 2013. www.nature.com/ajg.

Graphic 90473 Version 1.0

Diet diary

Date	Breakfast	Snack	Lunch	Snack	Dinner	Notes
<i>Example:</i> Monday 9/1	Bowl of Happy O's with 1 percent milk; banana; cup of orange juice	-	Tuna salad sandwich (Sunshine mayo, celery, Deep Fish brand tuna) on white bread (Fresh Rise Brand); Crispy brand ripple potato chips; glass of milk	Apple and string cheese (Cow's Friend brand)	4 chicken nuggets (Cluck Nuggets); applesauce (Orchard Fresh); broccoli steamed with olive oil	

Graphic 58605 Version 5.0

Disclosures

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