

## Introduction

There is nothing more embarrassing than gas. It gurgles and squelches through the intestines during pauses in conversations, sometimes squeaking like a rusty door and sometimes roaring like an express train in a tunnel.

It can get trapped by spasms causing pain and such severe bloating and distension that women (and men) can look as if they've acquired a five-month pregnancy within the space of half an hour. It can rise up in the mouth and be expelled with a cavernous belch but worst of all, it can escape downwards, either silent and deadly at five paces or with a toot or blast that instantly identifies the culprit. But where does all this gas come from?

## What gas do we produce?

During the normal course of a day, people evacuate as much as two litres of gas depending on what and how much they

eat; the type of bacteria in the colon; and the time it takes food to travel through the intestine. We produce much more than that, but gas can be absorbed during passage through the gut.

Intestinal gases are a mixture of hydrogen and carbon dioxide with variable amounts of methane and some nitrogen and an admixture of very smelly substances like hydrogen sulphide and skatoles.

## Where is intestinal gas generated?

Air can be swallowed along with food and drink. Carbon dioxide can be generated in the stomach by the combination of gastric acid and digestive secretions containing sodium bicarbonate. But these gases are normally absorbed in the small intestine.

Most intestinal gas is generated in the colon by the fermentation of carbohydrates or protein that has escaped absorption. Indeed, the colon can be thought of as a large fermenting vat of bacteria, converting sugars and starches and some protein to short chain fatty acids (mainly acetic acid, propionic and butyric acid), a little alcohol and a lot of gas.

## Gassy Symptoms

These include belching, farting, abdominal rumbling and bloating.

**Gas and wind can be very embarrassing and painful to people with Irritable Bowel Syndrome. It gurgles and squelches through the intestines during pauses in conversations, sometimes squeaking like a rusty door and sometimes like a roaring express train in a tunnel.**

- **Belching.** Belching is the venting of gas from the stomach and may generate a noise when the ring of muscle at the top of the gullet is more tense.

It is quite normal to belch up swallowed air or the carbon dioxide generated by the combination of gastric acid and alkaline saliva or bile in the stomach. It relieves a sense of pressure. Indeed, there was a time when to belch showed a person's appreciation of a good meal.

Excessive belching may indicate:

- swallowing too much air
- gastric irritation caused by the reflux of large amounts of bile into the stomach
- consumption of fizzy drinks

- bacterial overgrowth of the stomach due to suppression of acid secretion and stagnation of food. This causes smelly or eggy burps.

- **Farting.** People suffer from flatulence or farting when they pass too much wind, when it is too smelly, too noisy and when they can't control it.

It's not so much the actual expulsion of wind that is the problem, it is what it represents in our society; a lack of manners or control. So uncontrolled expulsion of gas draws attention to itself because it smells or makes a distinctive sound.

- **Why does intestinal gas smell so bad?** Most intestinal gases have no smell, but they do carry small quantities of 'rotten egg' hydrogen sulphide and highly potent volatile perfumes, such as cadaverine and putrescine, formed by the bacterial putrefaction of proteins.

- **And what produces the noise?** The expulsion of gas from the anus can generate a variety of sounds. The farty noise is produced by the walls of a relaxed anal canal behaving like a flutter valve, opening and closing as the gas escapes.

Trumpeters produce their music by exquisite control of pressure of air and the tension of their lips. Similarly, if a

person squeezes their anus to try to stop gas being expelled, any increase in abdominal pressure that might be caused, for example, by getting up from a chair or laughing, forces the gas out with a toot!

- **Abdominal Rumbles.** Abdominal gurgles, squirts and rumbles are produced by the movement of gas and liquid in the guts. High pitched gurgles are more likely to come from the small intestine, cavernous rumbles and low pitched grumbles from the stomach or colon. The medical term for such noises is borborygmi. Abdominal rumbles are not a sign of any particular disease. Neither do they necessarily indicate more gas production, merely that the gut is more active and moving the gas and liquid around.

Abdominal rumbles, or 'borborygmi', may indicate that you are hungry and your gut is limbering up for a meal. They may also be generated by emotion; a person's stomach may rumble in quiet moments when they are trying to process strong emotions.

- **Bloating.** Bloating is a sensation of increased abdominal pressure that may or may not be accompanied by abdominal swelling or distension.

It is more common in women, who often report their stomachs are relatively flat in the morning but by the evening they cannot wait to get home

to put something looser on.

Physiological studies have demonstrated several abnormalities. These include:

- an increase in intestinal gas in some, but not all people with bloating
- an increase in intestinal sensitivity, which may be responsible for the feelings of pressure
- a relaxation of the abdominal muscles accompanied by contraction of diaphragm causing the belly to protrude
- trapping of gas in the small intestine.

Bloating is more likely to occur in people who are anxious. The emotional tension can make the intestine more sensitive and encourage relief of pressure by abdominal protrusion. It goes down when people are anaesthetised or asleep.

## What is responsible for gassy symptoms?

- **Intestinal sensitivity and reactivity.** The intestines of people with IBS are often more sensitive to distension. This can mean that even modest amounts of gas production may cause symptoms of pressure and bloating.
- **Rapid Transit.** Food often travels through a sensitive small intestine gut

more quickly than usual. This often reduces the time necessary for complete absorption, increasing delivery to the colon and fermentation.

- **Food.** The gassiest people in the world are those who ingest food that contain large amounts of poorly absorbed sugars that are rapidly fermented in the colon. These are collectively known as FODMAPs (Fermentable Oligosaccharides, Disaccharides, Monosaccharides and Polyols) and include several fruits and fruit juices, onions, pulses, brussels sprouts, beetroot, wheat products, and some dairy products.

Not everybody with IBS is sensitive to all of these foods and the symptoms vary according to the amount eaten, the fluctuations in sensitivity and the extent to which the sugar can be digested.

- **Lactose Intolerance.** Lactase enzyme is present at birth and breaks down lactose milk sugar to glucose and galactose, which are rapidly absorbed. About 30% of people in the UK lose their lactase enzyme shortly after weaning. If they drink milk, lactose escapes absorption in the small intestine but is fermented in the colon, generating large amounts of gas.
- **Fructose Intolerance.** The ability of people to absorb fructose can vary from person to person.

- **Coeliac or Pancreatic Disease.**

If bloating or flatulence is associated with diarrhoea, weight loss and nutritional deficiency it may suggest malabsorption due to coeliac disease or pancreatic disease. This would need to be investigated by a gastroenterologist.

## Treating Gassy Symptoms

Options include:

- diet
  - drugs
  - alterations in lifestyle and behaviour.
- **Diet**
    - Since most gas is generated by poorly absorbed starches and sugars, it would seem sensible to reduce the intake of foods that contain FODMAP. This would include cereal fibre, fruits, vegetables and pulses. Unfortunately, these are generally considered to be healthy food choices.
    - Reducing fat intake by cutting down meat and dairy products may help to reduce intestinal sensitivity and spasm.
    - If it's the offensive odour that is the problem, cutting down the amount of meat in your diet can help.
  - **Drugs.** Drugs have a limited role in the treatment of bloating and flatulence. Nevertheless, there are several products that claim to reduce intestinal gas.

- **Charcoal biscuits.** Charcoal biscuits have been used for many years; it is claimed they work by absorbing the gas onto the charcoal matrix.
- **Simethicone.** Simethicone, (*Gas-X, Phazyme, Mylicon, Flatulex, Mylanta Gas, Flatulex*). Is an inert silicon polymer that is not absorbed into the body. It is said to work by reducing the surface tension of small air bubbles, thereby allowing them to come together into larger bubbles that are more easily eliminated.
- **Beano.** BEANO contains a mixture of alpha and beta galactosidases, that break down lactose (milk sugar) and also the complex galactans in pulses to glucose and galactose, thus increasing the absorption of these sugars and reducing gas production.
- **Probiotics and Prebiotics.** By changing the composition of colonic bacteria, probiotics might lead to a reduction of flatulence in some people, but in others they might actually cause more gas. One commercially available prebiotic (Bimuno) has been shown to reduce symptoms of bloating.
- **Peppermint.** Although delayed release capsules containing peppermint (Colpermin or Mintec) may not reduce the amount of gas produced they can relax the colon, allowing more gas to be retained. They may also disguise the

odour of the intestinal gas, which is said to smell more sweetly of peppermint.

- **Antispasmodics.** Some patients with associated pain do report some relief with anti-spasmodic medications such as Mebeverine (Colofac) and Alverine (Spasmonal).
- **Changes in Lifestyle and Behaviour**
  - Avoid rushing your meal and allow sufficient time to digest your food.
  - Take smaller regular meals.
  - Try keeping a food diary, it's useful in identifying and helping avoid 'trigger foods'.
  - Take regular exercise.
  - Allow enough time to relax and unwind. Relaxation and all methods that help to build confidence are helpful for all Irritable Bowel Syndrome symptoms including those produced by gas. They reduce the sensitivity and reactivity of the colon allowing more gas to be tolerated.
  - For people who work in an enclosed office, it may be useful to take regular loo breaks or walks to expel the gas.
  - Commercially available pants and cushions containing gas absorbents may prove useful. These include Shreddies, [www.myshreddies.com/](http://www.myshreddies.com/) and GasBGon, [www.gasbgon.com](http://www.gasbgon.com).

## Further Reading

**Read NW. Bloating**, *abnormal abdominal physiology or just a lot of gas*. The Sensitive Gut ([www.thesensitivegut.com](http://www.thesensitivegut.com))  
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**Azpiroz, F and Malagelada, J (2005)**  
*Abdominal Bloating*. Gastroenterology  
129, 1060-1078

**Staudacher HM, Lomer, MCE, Anderson, JS et al (2012)** *Fermentable Carbohydrate Restriction Reduces Luminal Bifidobacteria and Gastrointestinal Symptoms in Patients with Irritable Bowel Syndrome*. J. Nutr.  
142. 1510-1518

**Silk DBA, Davis A, Vulevic J, et al (2009)**. *Clinical trial: the effects of a trans-galactooligosaccharide prebiotic on faecal microbiota and symptoms in irritable bowel syndrome*. Al. Pharm. Ther. 29. 508-518.

This Factsheet was updated in March 2016 by: **Professor Nick Read**, M.A., M.D, F.R.C.P Medical Adviser to The IBS Network. It is published as a service to those with Irritable Bowel Syndrome, and healthcare professionals by The IBS Network, the national charity supporting people living with Irritable Bowel Syndrome.