

# Constipation and Bloating



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# Introduction

Constipation refers to the consistency of the stools and any difficulty in passing them, as well as the frequency of bowel movements. Normal bowel function ranges from one to two stools a day to one stool every three to four days. Not everyone who has infrequent stools will have other symptoms of constipation such as bloating or discomfort.

*It is not necessary to open your bowels every day.*

Constipation is common and almost one person in five over the age of 30 has constipation at some stage during their life.

Constipation in adults is a more common complaint in women than men; very severe constipation is almost exclusively a female problem.

What some people think is constipation may not be so. The medical definition of constipation is the infrequent passage of small or hard stools with or without straining. Straining and difficulty in emptying the rectum are, however, more common complaints, even if the stools are not hard. This is particularly true in elderly people and women who may have

had a difficult or complicated labour during childbirth, and may have pelvic muscle weakness.

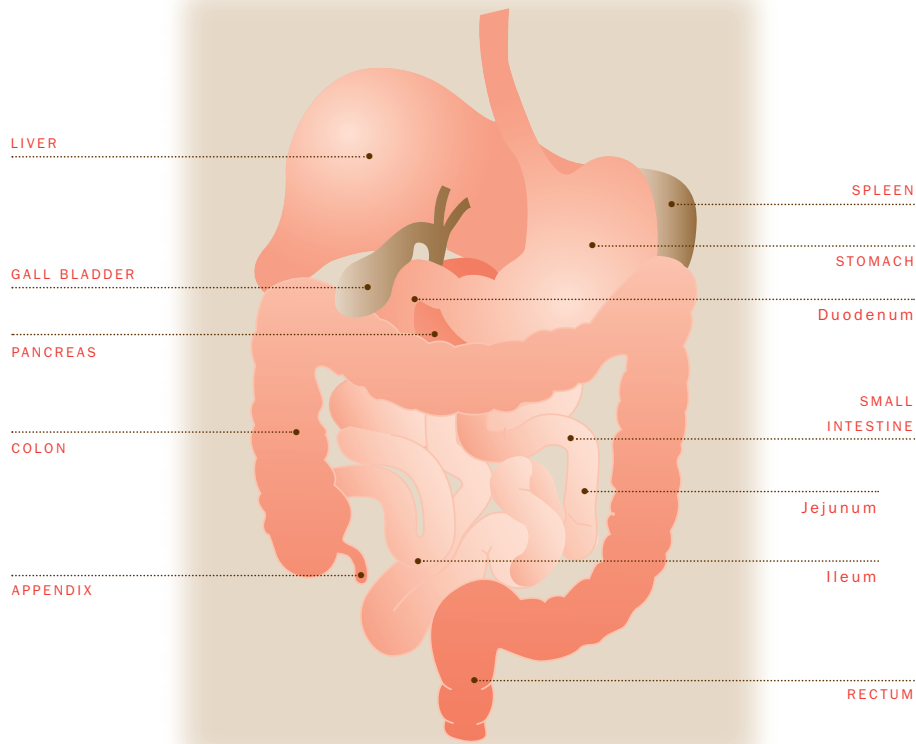
Constipation is a significant problem in communities where fibre intake is low, but is virtually unknown when the diet is high in fibre. Constipation is common among residents of nursing homes where the diet is generally low in fibre.

In communities where there have been campaigns to promote high-fibre foods such as wholemeal bread, constipation and laxative use have been substantially reduced.

The typical Australian diet does not contain the minimum recommended 30 grams of fibre needed for normal bowel movements. When fibre is increased to this level, there are few cases of constipation.



## The process of digestion



*Digestion is the process of breaking food into small components that can be absorbed by the intestine.*

It occurs in the digestive system which works day and night to churn, soften and squeeze food, using digestive juices to

break down food and release its nutrient components to provide the body with energy, essential vitamins, minerals, proteins and fatty acids.

The process of digestion starts in the mouth when an enzyme present in the saliva begins the digestion of carbohydrate. In the stomach, the gastric cells produce hydrochloric acid

and enzymes which begin digesting proteins. The stomach acts as a reservoir, releasing small amounts of food into the small intestine.

Most digestion occurs in the duodenum under the action of pancreatic juice containing enzymes, and bile from the gall bladder. Enzymes break down proteins; fats are converted to fatty acids; and carbohydrates to disaccharides and monosaccharides. Most nutrients are absorbed from the duodenum and jejunum but vitamin B12 and bile acids are selectively absorbed from the ileum.

Dietary fibre and some starches escape the enzymes in the small intestine and enter the large bowel where bacteria breakdown all the soluble fibre and resistant starch, and some of the insoluble fibre.

Approximately 9 litres of fluid enters the jejunum each day. This includes five litres from foods, drinks, saliva and gastric juice plus four litres of bile, pancreatic juice and secretions from the small intestine.

Within the jejunum, 4–5 litres of the fluid is reabsorbed and another 3–4 litres is absorbed in the ileum. Approximately 1.5 litres enters the caecum through the ileo-caecal valve each day. The colon then plays a major part in fluid reabsorption and faecal volume is only 100–200 mL a day.

The large intestine consists of the colon and rectum and is a muscular tube about two metres long. Its main function is to absorb water and allow fibre to be broken down by bacteria. This produces valuable fatty acids that feed the cells in the colon. It is also normal for this process to generate gas, which may trouble some people.

The rate of movement of the residue is determined by muscular action. If there is too much action, diarrhoea occurs – if there is too little, constipation results. Normally the movement of the colon is well co-ordinated, but it is a complex system and if the rhythm is disturbed, pain and alterations in bowel habit can occur.

The rectum at the lower end of the large intestine is normally empty but regularly fills up to produce the urge to defaecate. The muscular action in the anal canal, which is connected to the rectum, prevents the involuntary passing of faeces, but it can relax long enough to allow wind to escape.



## What happens in the colon?

Within the large bowel or colon, bacteria ferment fibre, mucus and resistant starch. During this process:

- **the bacteria** grow and multiply;
- **gases** such as carbon dioxide, hydrogen and methane are produced; and
- **volatile fatty acids** (acetic, propionic and butyric acid) are generated.

### Faecal bulk

Faeces consist of approximately 75% water and 25% dry matter, made up of undigested residues plus bacteria and the debris of bacterial cells.

Dietary fibre contributes to faecal bulk in different ways.

Lignin, found particularly in wheat bran, passes through the intestine unchanged and increases faecal bulk by its physical presence and its ability to hold water. Soluble fibres, such as pectin in fruits, hemicelluloses in vegetables, and gums and mucilages in oats, seeds and some fruits increase the population of bacteria, and thus the bacterial content of faeces. Some cellulose is broken down by bacteria and increases bacterial bulk; some is undigested and absorbs water to increase faecal weight.

Resistant starch leads to increased bacterial mass and is therefore an important contributor to faecal bulk. This may be significant, especially in those whose diets are high in rice, which has been cooked in such a way that it has a high content of resistant starch.

Rice cooked by the Asian absorption method, in which only sufficient water is used to be totally absorbed by the rice, has more resistant starch than rice cooked in a large volume of water and then drained.

### Flatus

The major gases produced include:

**Nitrogen**—swallowed from air.

Most is reabsorbed in the stomach and small intestine, but about one third of the total volume of gas in the colon that is unidentified is probably nitrogen.

**Oxygen**—also swallowed and almost totally reabsorbed in the stomach and duodenum, causing anaerobic (without oxygen) conditions in the small intestine and colon.

**Carbon dioxide**—produced from the interaction between gastric hydrochloric acid, dietary fatty acids and bicarbonate from the duodenum and pancreas is present in the small intestine. The interaction of fermentable material and organic acids with bacteria in the colon also produces carbon dioxide in the colon.

## Bloating

*Bloating is a particularly common problem, especially in women.*

**Hydrogen**—produced throughout the colon as bacteria ferment fibre, resistant starch and any unabsorbed sugars (lactose or sucrose) or sugar alcohols such as sorbitol. As with all gases present in the colon, some hydrogen is reabsorbed from the colon and expired from the lungs. The remainder is used by bacteria in the colon or passed as flatus. The amount of hydrogen expired from the lungs can be measured in a breath hydrogen test to assess absorption of sugars.

**Methane**—made by methane-producing bacteria, commonly present in the left colon. These bacteria reduce carbon dioxide and hydrogen to methane, consuming five parts of gas (four hydrogen and one carbon dioxide) in the process. Not everyone produces methane. In theory, those who do should have less flatulence than those who do not. Methane can also be measured in the breath.

**Hydrogen sulphide**—produced by some bacteria that change sulphate to sulphide. It is the major cause of smelly gas.

**Acetate**—produced by bacteria from carbon dioxide and hydrogen. It is also generated when bacteria ferment soluble fibre and resistant starch.

It usually consists of distension of the lower abdomen, so that while the abdomen might be flat in the morning, by the end of the day it is distended and uncomfortable, often requiring a change of clothes to something looser. It may or may not be accompanied by constipation. The distension is frequently uncomfortable and often aggravated by high fibre foods which generate more gas. In general, most people have the same volume of gas in their bowel, but women with the complaint of bloating have a bowel that is easier to distend and this gives the appearance of containing more gas.

It appears that there may be an alteration in the sensitivity of nerve fibres in the gut wall which sense bowel distension. There may also be an abnormality of the nerve fibres controlling gut contraction, which makes it less easy to pass flatus, particularly in women. This may not be an entirely social phenomenon and results from muscular incoordination in the lower bowel. During sleep the gas is absorbed from the colon and therefore the abdomen is flatter in the morning. The complaint of cold hands or feet or hands that go 'blue' or 'white' in the cold weather is a common accompaniment of symptoms of constipation and distension.

Cold hands reflect disturbance of underlying unconscious nerve function, which affects both the circulation, and gut function.

As bloating may accompany a high fibre diet, an increase in fibre intake should be gradual to allow time for the gut to 'get used to' the increased volume of gas produced.

## Disorders connected *with a lack of dietary fibre*

The most obvious effect of dietary fibre is on stool bulk. On a Western diet, the average stool weight is about 100 to 150 grams per day. In vegetarians, this increases to about 225 grams per day. Daily faecal weight for rural Africans eating very high fibre diets may be 400 grams or more.

The amount of fibre in the diet is also correlated with intestinal transit time. On a typical low fibre Western diet transit from mouth to anus is 24–36 hours. It can be even longer, and some studies in Western society, where fibre intake is very low, have shown transit times of 60 hours. In contrast, rural Africans with a very high fibre content in their diet have transit times as low as 12 hours.

## Constipation

### *in children*

*Severe constipation  
in children is often  
associated with  
impaction of faeces in  
the rectum.*

It is more common in boys than girls. Although many children are regarded as having a behavioural disorder, half are already constipated by the age of one month suggesting the possibility of a genetic or neuro-muscular cause. Hirschsprung's Disease is due to an abnormality of the nervous supply to the bowel and is an important but uncommon cause of severe constipation in children. It is necessary to exclude this condition, as surgery may be curative. Psychological problems associated with toilet training should not be ignored. The recent observation of a particular fingerprint pattern in many children with constipation before the age of ten adds strength to the genetic theory.

## Types of *constipation*

### Simple constipation

Many people will suffer from occasional constipation throughout their life.

Travel, stress, dietary change or altered work patterns from time to time interrupt an otherwise regular bowel pattern.

Provided there are no serious accompanying symptoms (such as rectal bleeding) no investigation is required.

Recognising the cause of the change in pattern and correcting it where possible, for example making some dietary changes when travelling may be enough. Simple laxatives such as *Coloxyl* or *Nu-lax* can be used on an occasional basis.

In simple constipation, the first, and usually the only, step required is to ensure an adequate intake of dietary fibre from a wide variety of sources, including fruits and vegetables and wholegrain products. Many people who think they are eating a high-fibre diet do not reach the levels of fibre needed to prevent constipation. It may also help to drink plenty of water and have regular meals. If constipation persists, a bulking agent should also be used.

When constipation does not respond to simple measures, it is important to consider other possible causes.

This will probably require examination of the colon. Some people with severe constipation will need to be referred to a gastroenterologist or colorectal surgeon with a special interest in constipation.

Motility tests and electromyography may be necessary to study muscle function.

It is best to avoid the long-term use of laxatives, particularly anthraquinone-containing laxatives as these can cause serious damage to nerve fibres in the colon. In younger people if a high fibre diet and simple laxatives do not help, specialist evaluation is advisable.

For elderly people, acceptable laxatives for long-term use include, *PLAIN Coloxyl*, *Lactulose*, *Sorbilax* and *Nu-lax*.

For Australians of all ages, and especially women, constipation is so common that everyone needs to know how to achieve a high-fibre intake with minimal use of laxatives.



## Longstanding constipation

There is increasing evidence that constipation exists because of a combination of poor muscular contraction, abnormalities of gut hormones, or both. This may cause a slow gut transit time, which can be measured by swallowing radio-opaque markers and then having a plain x-ray of the abdomen.

In those who have anal sphincter dysfunction or disturbance of pelvic floor muscles, the major problem is in evacuating the rectum.

Many people have a life-long pattern of sluggish bowel habit with movements every two or three days. Provided there is an adequate dietary intake of fibre and no other symptoms, no action is required. Increasing age may however accentuate the sluggish bowel pattern. If there are any accompanying symptoms, particularly rectal bleeding, colonoscopy should be undertaken. Occasionally, general diseases which cause constipation but have a very slow onset may be responsible, such as underactivity of the thyroid. Check the diet to ensure that there is at least 30 grams of fibre a day and use a bulking agent such as a psyllium preparation like *Agiofibe* or *Metamucil*. If this is not enough, simple laxatives such as *PLAIN Coloxyl* or *Nu-Lax* can be used as required. Other bulking agents include ispaghula husk derivatives (eg. *Fybogel*) and sterculia-based products

(eg. *Normafibe* and *Alvercol*).

*Movicol* is also valuable if constipation is a prominent symptom.

## Constipation of sudden onset

There is usually, but not always, a definite cause for the sudden onset of constipation. Some of the facts discussed under *Simple constipation* may be relevant. Drugs are an important cause. Analgesics, especially *Panadol/codeine* preparations such as *Panadeine* may cause severe constipation even in small doses. Other important drug causes include antidepressants, tranquillisers and iron preparations. General diseases associated with constipation include thyroid deficiency, depression and autoimmune disorders. Diseases of the colon causing the sudden onset of constipation include diverticulitis and bowel cancer. Sudden constipation in adults always requires investigation. This will usually include colonoscopy to rule out the serious causes above. After colonoscopy follow the usual measures of increasing fibre, taking bulking supplements and using simple laxatives.

Many women relate the onset of constipation to uncomplicated surgery such as hysterectomy or appendectomy, or it may follow a normal pregnancy. In teenage years, the excessive use of laxatives for weight loss may be the trigger.

## Severe constipation

Women in the 20–30 age group most commonly experience some constipation. Many have a history of constipation extending back to childhood. Severe constipation in infancy or early childhood may be due to Hirschsprung's Disease. Many women with severe constipation may not have a bowel motion for two to three weeks. Occasionally, similar severe constipation develops in men or older women.

Severe constipation in women is usually accompanied by abdominal distension which gets worse as the day progresses, excessive wind and grumbly abdominal pain. The colon may be wider and much longer than normal (megacolon). Colonoscopy can be performed to exclude other colonic diseases.

Treatment may be difficult. Large quantities of fibre, particularly unprocessed bran are not helpful, increasing bloating and wind. Some sufferers who have megacolon feel better on a reduced fibre diet. Those with megacolon are very susceptible to the toxic effects of anthraquinone-containing laxatives so these must be absolutely avoided. These include all senna and cascara preparations, *Ford Pills*, *Peritone* and many herbal preparations commonly used for constipation. Using large

amounts of such products may lead to total colonic paralysis, requiring surgical removal of the colon.

A combination of suitable laxatives is required for severe constipation and any single agent usually stops working after a few weeks or months. Suitable combinations include one or more of the wetting agents listed below plus one or more of the stimulants.

Wetting agents which make the stool softer include *PLAIN Coloxyl*, *Duphalac* and *Sorbilax*.

Stimulants which encourage muscular activity of the bowel include, *Nu-lax*, *Durolax*, *Agarol*, *Epsom salts* (magnesium sulphate) and magnesium citrate.

In extreme cases surgery may be required but this should only be done by a colorectal surgeon with a special expertise in this area, and only after full investigation.



## An approach to constipation

**How long has constipation been present?**

Long duration and under 40 years of age—check dietary fibre intake.

Over 40 years of age, particularly if constipation is recent, or if dietary or life-style changes fail, make sure colon cancer is excluded.

**Do you eat enough fibre? What do you eat for breakfast, lunch and dinner?**

You should eat as least 30 grams of fibre per day; check your fibre intake with a fibre counter. You may also need a bulking supplement.

**Do you have pain on passing a motion?**

This could be due to a fissure or complicated haemorrhoids.

**Have you had any bleeding from the bowel?**

Consider colon cancer, if over 40 years of age.

**Do you have a family history of colon polyps or cancer?**

If yes, a colonoscopy from age 40 is vital.

**What medications are you taking?** *Laxatives, opioids, antidepressants, analgesics, aluminium containing antacids, iron supplements, some heart and blood pressure medication.*



Discuss their possible relationship with your doctor.

## Travel tips

Food on airlines and in hotels often lacks dietary fibre. Try to find a high-fibre cereal, or take your own. Fruit is usually available and wholegrain breads are becoming more common. When eating out, ask for extra vegetables or consider vegetarian dishes as an entrée or main course.

**A high fibre diet might include:**

<i>Breakfast</i>	<i>Fibre (grams)</i>
Bowl of wholegrain cereal (eg. bran flakes, rolled oats, wheat biscuits, natural muesli, soy and linseed cereals)	4 – 11 (depending on cereal chosen)
Fresh fruit, (eg. bananas)	2 – 3
Milk preferably low fat	0
2 slices of wholemeal toast	5
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<i>Morning tea</i>	
1 piece of fruit	3
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<i>Lunch</i>	
Sandwich with wholemeal bread, chicken and salad	7
Piece of fruit	3
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<i>Afternoon tea</i>	
1 piece of fruit	3
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<i>Dinner</i>	
Large serve vegetables	5
Potato	2
Fish, chicken or lean meat	0
Fruit salad or apple crumble	4
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<i>Total fibre</i>	<i>37 – 45 grams</i>

For those who follow naturopathic remedies, it is important to also check with an Accredited Practising Dietitian that the diet is adequate. (Telephone the **Dietitians Association of Australia on 1800 812 942** for contact details).

**A guide to fibre:**

<i>Food</i>		<i>Dietary fibre (g)</i>
Bread, white	2 slices	2
Bread, wholemeal	2 slices	4 – 6
Bread, multigrain or soy and linseed	2 slices	3 – 8
Breakfast cereal, high-fibre (eg. bran cereal)	average serve	10
Breakfast cereal, medium-fibre (eg. Weet Bix)	2	4
Breakfast cereal, low-fibre (eg. Rice Bubbles)	average serve	0
Fruit (eg. apple, banana)	average piece	3
Legumes (eg. chick peas)	1 cup cooked	9
Nuts or peanut butter	1 tablespoon	3
Pasta, cooked	1 cup	3
Pasta, wholemeal, cooked,	1 cup	9
Rice, white, cooked	1 cup	2
Rice, brown, cooked	1 cup	4
Seeds (eg. sunflower)	1 tablespoon	2
Vegetables, cooked	1 cup	2 – 8
Vegetables, raw	1 cup	1 – 3