

# Diverticular Disease

diagnosis & management



Prepared by

Professor Terry Bolin

Dr Jack Hansky

Professor Melvyn Korman

Dr Rosemary Stanton OAM

## *The process of digestion*

The process of digestion mixes and softens food, breaking it down chemically so it can be absorbed by the intestine. The whole of the digestive tract moves rhythmically day and night, churning and squeezing food and mixing it with digestive juices.

The salivary glands begin to digest starch as soon as we eat. As we swallow, muscular contractions move food down the oesophagus to the stomach.

The cells in the lining of the stomach produce hydrochloric acid and some enzymes, which begin digesting food.

In the small intestine, more enzymes plus bile from the liver (via the gall bladder) and pancreatic secretions continue the digestive process.

Together they break down fats, proteins and carbohydrates into simple nutrients which can be easily absorbed into the blood. Most of these nutrients go to the liver and are then distributed to the rest of the body to provide energy.

Dietary fibre and some starches are not digested by the enzymes in the small intestine, but pass to the large intestine where bacteria break them down to provide a further source of energy. The bacteria and any fibre which has not been broken down form faeces and are passed from the rectum.

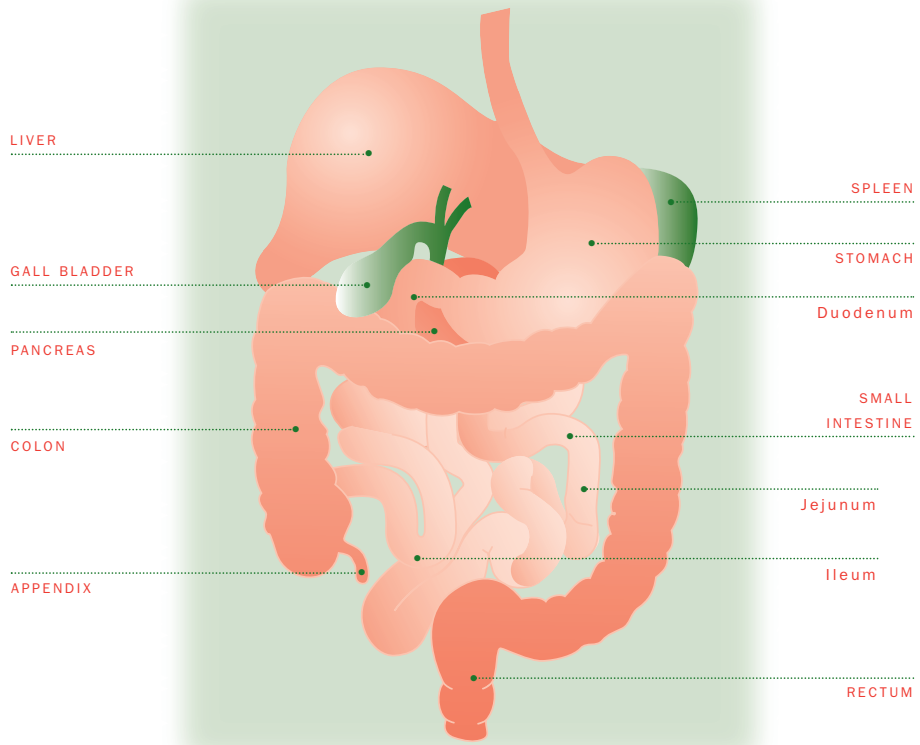
## *The digestive system*

The large intestine is a muscular tube about two metres long consisting of the colon and rectum and its main function is to absorb water and allow fibre and starch to be broken down by bacteria. This produces valuable fatty acids that nourish the cells in the colon. It is also normal for this process to generate gas, which may trouble some people. The bacteria and any food residues pass along to become faeces.

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 can relax enough to allow wind to escape.

## The digestive system



## What is diverticular disease?

Diverticular disease affects the large bowel (colon). The disease is usually confined to the sigmoid colon, which is in the lower left side of the abdomen (see *diagram*). Occasionally, it can involve the rest of the colon.

*Diverticular disease has three major features:*

### 1 The development of Diverticulae

these are small pockets or sacs that protrude beyond the wall of the bowel and vary in size from that of a pinhead to a small grape.

The sac is made up of a portion of the inner lining and the outer covering of the bowel wall but does not have the muscular layer of the normal bowel wall.

The mouth of the diverticulum is often much narrower than the rest of the diverticulum, giving it a teardrop shape.

### 2 The bowel wall is thickened

this is due to an increase in muscle and fibrous tissue and can result in the wall of the sigmoid colon being up to six times as thick as normal.

### 3 The internal diameter of the bowel is considerably narrowed,

sometimes down to a tenth of the normal diameter. This may account for narrow ribbon-like stools that are sometimes passed.

## What causes it?

Diverticular disease occurs when the fibre content of the diet is low. In the 1960s, Dr Denis Burkitt observed that rural Africans living on a bush diet with large amounts of dietary fibre never developed diverticular disease.

However, if they moved to major cities and changed to a low-fibre, Western-type diet, diverticular disease often developed after 15 to 20 years.

The principles of physics show that, the narrower the tube, the higher the pressure inside it. This principle is probably important in the development of diverticular disease. Populations who consume a high-fibre diet have a large colonic faecal volume and colons with wide diameters. This means there is only low pressure within the colon. By contrast, in societies where much less fibre is eaten, the colonic diameter is smaller and the pressure is higher. The increased pressure within the bowel is sufficient to literally push the pockets of the bowel lining out between the thickened muscle bundles.

## What are the symptoms?

In the early stages of diverticular disease there may be no symptoms. As the disease progresses, cramping left lower abdominal discomfort may occur, especially in the morning. Diarrhoea or frequent passage of formed stools associated with some urgency is common. Some people develop frank watery diarrhoea, which often contains hard faecal pellets. The urgency associated with defaecation can be so great that incontinence may occur, particularly if the stool is liquid. Incontinence is often a problem in women who have had difficult or complicated childbirth.

**Complications can occur with more advanced diverticular disease. These include:**

- a) **Abscess.** If the mouth of a diverticulum becomes blocked, infection may occur within the pocket and result in an abscess. This usually causes persistent pain in the lower left side of the abdomen, associated with fever and either constipation or diarrhoea. Rarely, the abscess can burst into the abdominal cavity resulting in generalised inflammation (peritonitis), requiring immediate surgery.
- b) **Haemorrhage.** If the diverticulum becomes infected, the subsequent inflammation may damage small arteries

around the mouth of the diverticulum, which may cause bright red blood to pass from the rectum. The bleeding can be heavy.

- c) **Other complications,** which are now unusual because of more effective early treatment, include a diverticular abscess sticking to the bladder, ovary, vagina or other areas of the bowel. Rarely, this may result in a hole or fistula between the two organs so that faeces or air can be passed in the urine or through the vagina.

## Diagnosis

Major symptoms of diverticular disease are pain and altered bowel habit. These symptoms, and the complication of bleeding, may also occur with other diseases. To exclude conditions such as bowel polyps and cancers, inspection of the bowel is necessary. Investigation will normally include colonoscopy. A barium enema is an alternative to colonoscopy, if good quality colonoscopy is not available. Before colonoscopy, the bowel must be prepared to totally clear its contents and allow careful inspection of the entire surface. This has the advantage that any polyps found in the bowel can be removed at the same time. If diverticular abscess is suspected, it is usually treated with antibiotics and colonoscopy is delayed until the inflammation has settled in a month or two.

## Treatment

### 1 Uncomplicated diverticular disease

The most important factor in treating diverticular disease is to increase stool bulk by increasing dietary fibre and taking a bulking agent. This reduces the pressure within the colon. High-fibre foods include wholemeal bread, wholegrain cereals, legumes (dried beans, peas and lentils), vegetables, fruits (but not juices), nuts and seeds.

Many people diagnosed with diverticular disease are irritated when told to increase their fibre intake, claiming they already eat more fibre than their acquaintances. It is certainly true that some people on low-fibre diets do not develop diverticular disease and there may be a genetic susceptibility to its development. Those who are susceptible need to consume a lot more fibre than the rest of the population. A minimum of 30g of dietary fibre a day is usually required, which is considerably more than the average Australian eats. Women, in particular, may eat a variety of healthy fibre-containing foods but in relatively small quantities so their total daily intake of fibre is still inadequate.

There is a common belief that dietary fibre equates to consuming unprocessed

bran, but this upsets many people, producing bloating, excessive wind and anal discomfort. If bran is tolerated, it is a good source of fibre, but there are many good sources of fibre that are more suitable.

It used to be believed that a low-fibre diet, which contained no nuts or seeds, was important in the management of Diverticular Disease. We now realise that the opposite is true and a high-fibre diet can certainly include nuts and seeds, without these becoming lodged in the diverticular pockets and causing problems.

For more information on dietary fibre, see The Gut Foundation's publication, ***Dietary Fibre and Health*** (available on [www.gut.nsw.edu.au](http://www.gut.nsw.edu.au))

As well as an adequate dietary fibre intake, those with significant diverticular disease should add a bulking agent. A convenient bulking agent is some form of psyllium (eg. *Metamucil*, *Agiofibe*). With most psyllium preparations, a daily intake of two teaspoons with a glass of water each morning is usually recommended. Other bulking agents include compressed bran tablets, ispaghula husk derivatives such as *Fybogel* and sterculia-based products, such as *Normafibe* and *Alvercol*. *Movicol* is also valuable if constipation is a prominent symptom.

If there has been a past history of diverticular abscess or if left lower

abdominal pain or bowel incontinence is a problem, antispasmodics or tricyclic compounds may be required.

Mebeverine (for example *Colofac*) is an antispasmodic that is often effective in relieving pain and urgency. To be useful, it must be taken on a long-term basis three times a day. Some people take the drug only when symptoms appear because it is expensive and is not currently on the Pharmaceutical Benefit Schedule. It is unlikely to be as useful taken this way. Tricyclic compounds such as *Tryptanol* or *Amitriptyline*, were developed as antidepressants, but also have a separate effect on the muscles and nerves in the bowel and bladder. In general, tricyclic drugs are only used when mebeverine has failed to provide satisfactory relief of symptoms. Other medications such as *Buscopan* or *Merbentyl* may help.

If the predominant problem is watery diarrhoea, non-specific anti-diarrhoea tablets such as *Imodium* or *Lomotil* are often useful. Narcotic-based anti-diarrhoea compounds such as codeine should generally be avoided, although in rare cases they may be the only means of effectively controlling severe diarrhoea.

*Has microscopic colitis been excluded as the cause of diarrhoea by colonoscopy with biopsies?*

Where diarrhoea is associated with urgency resulting in incontinence, mebeverine should be tried first. If this is ineffective, a tricyclic compound is added, and if the stool is still liquid, *Imodium* may also be necessary. If incontinence still occurs when the stool is formed, it is necessary for a doctor to evaluate the anal sphincter function. Surgical repair may be useful in some cases. The passage of small quantities of clear mucus is usually associated with internal haemorrhoids rather than sphincter damage, and is treated by banding or injection.

## 2 Medical treatment of diverticular complications

Complications of diverticular disease are uncommon. The most frequent is infection in the diverticula resulting in diverticulitis—an abscess on the bowel wall. The initial treatment is appropriate antibiotics. Mild attacks can be treated with oral antibiotics but severe symptoms require hospitalisation with intravenous antibiotics. Treatment is more effective if started immediately pain, fever and altered bowel habit occur. A frequent combination used is a broad-spectrum penicillin and metronidazole. A common failing in treating diverticulitis is to stop antibiotics too soon. They should be taken for a minimum of ten days, and in serious infections may need to be taken for some weeks.

A high-fibre diet is the basis of treating uncomplicated diverticular disease but when the bowel becomes acutely inflamed and very narrowed as a result of a diverticular abscess, dietary fibre must be reduced until the inflammation settles. This will often take several weeks. A high-fibre diet can then be resumed.

Haemorrhage associated with diverticular disease can be frightening. The bleeding may be sudden and quite heavy.

Blood passed from the rectum appears to be a larger volume than it actually is, but the bleeding can be severe enough to lower blood pressure and cause fainting. A large volume haemorrhage is an emergency and blood transfusion or surgery may be needed.

### 3 Surgical treatment of complicated diverticular disease

If a diverticular abscess ruptures into the abdominal cavity, generalised infection and inflammation within the abdomen will spread quickly unless urgent surgery is carried out. When rupture occurs, there is a sudden onset of agonising lower abdominal pain. This usually happens after a day or two of worsening lower abdominal pain, fever and altered bowel habit. Emergency hospital admission is needed. Surgery may involve a temporary colostomy opening on the abdominal wall. When the infection

and inflammation has settled in one to three months, another operation will allow the affected segment of the bowel to be removed, the colostomy to be closed and normal bowel function will return.

However, surgery for haemorrhage from diverticular disease usually does not require a temporary colostomy as the affected segment of the bowel can be removed and the ends joined together in one operation.

In spite of appropriate medical treatment, a few people will suffer recurrent attacks of diverticulitis. This is unusual and may need surgical treatment which involves removing the sigmoid colon.

Laparoscopic (key hole) surgery may be possible, with rapid recovery time and only three to five days in hospital.

## *Common myths & fallacies*

### 1 I must not eat nuts or foods containing seeds because I have diverticular disease.

This is a myth that originated before diverticular disease was fully understood. Nuts and seeds are high in fibre and will not block the diverticulae or cause infection.

**2 I need to have a colonoscopy every few years because of the risk of cancer in diverticular disease.**

Diverticular disease does not increase the risk of bowel cancer. Regular colonoscopy is not required in the treatment of diverticular disease.

**3 My doctor has given me an antidepressant and must believe I am depressed, but I know my bowel symptoms are real.**

Tricyclic antidepressants have an effect on the nerves and muscles in the wall of the bowel, which is separate from their antidepressant effect.

**4 I am reluctant to have surgery for my diverticular disease because I may wind up with a bag.**

Most diverticular disease can be controlled medically, but where severe or repeated complications occur, surgery is indicated. A permanent colostomy and bag is almost never required in the treatment of diverticular disease.

**5 I only need to take antibiotics for a few days when I get an attack of diverticulitis because my symptoms settle quickly.**

In genuine attacks of diverticulitis, antibiotics should be taken for a minimum of one week and generally longer. One of the most common causes of repeated attacks of diverticulitis is inadequate antibiotic treatment of the first attack. After multiple attacks

of diverticulitis, the inflamed bowel may stick to other parts of the bowel, ovary, bladder or other organ, resulting in episodes of pain in the lower left side of the abdomen. If there is no fever or alteration in bowel habit, the pain may simply be due to past inflammation and does not require antibiotics.

### *Dietary principles*

Most people with diverticular disease do not have any complications. Treatment is to follow a high-fibre diet and use bulking supplements. Medication to relieve bowel cramps may occasionally be needed.

*A good healthy diet is essential for everyone.  
The best pattern is to:*

**Eat most**

of fruits, vegetables, wholemeal breads and cereals (preferably wholegrain), legumes, seeds and nuts

**Eat moderately**

of lean meat, chicken, fish, milk, cheese, yoghurt, eggs

**Eat least**

fatty, salty and sugary food

## Dietary fibre

A high-fibre diet helps most people with diverticular disease. Many people mistakenly think a high-fibre diet means adding some bran at breakfast and including a salad. This is not enough and unprocessed bran may make the problem worse.

### *High-fibre foods include:*

wholemeal bread

wholegrain cereals

legumes (dried beans, peas and lentils)

fruits (but not juices)

nuts and seeds

vegetables (cooked vegetables often have more fibre than salads)

By eating more dietary fibre, you may find constipation and abdominal pain improve, but initially, you may have more bloating. Unprocessed bran is the most common culprit in this regard, especially if it has been finely milled to produce small flakes. Eating this type of bran may cause more problems than it fixes and it is better to have other food sources of fibre.

*Some windy foods, which cause problems for some people, include:*

**lactose in milk**, especially fat-reduced fortified milk or ice cream

**cabbage, Brussels sprouts**, cauliflower legumes (dried beans and peas)

**sorbitol and mannitol** (in some low kilojoule foods)—check the label

Bulking supplements made from natural plant products are often a useful addition to a high-fibre diet. These include *Fybogel* (ispaghula husk), *Agiofibe* and *Metamucil* (psyllium) or *Normafibe* (sterculia).

Ample fluids and regular exercise are also important parts of a healthy lifestyle.

A high fibre diet and bulking supplements are as valuable for treating diarrhoea as they are for constipation.

## 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 <i>(depending on cereal chosen)</i>
Fresh fruit, (eg. bananas)	2 – 3
Milk preferably low fat	0
2 slices of wholemeal toast	5
<i>Morning tea</i>	
1 piece of fruit	3
<i>Lunch</i>	
Sandwich with wholemeal bread, chicken and salad	7
Piece of fruit	3
<i>Afternoon tea</i>	
2 rye crispbread with cottage cheese	2
<i>Dinner</i>	
Large serve vegetables	5
Potato	2
Fish, chicken or lean meat	0
Fruit salad or apple crumble	4
<i>Total fibre</i>	<i>37 – 45 grams</i>

For more details on dietary fibre, see The Gut Foundation's booklet  
***Dietary Fibre and Health.***

## A guide to fibre

<i>Food</i>		<i>Fibre (grams)</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