

## Patient information from the BMJ Group

# Bronchiectasis

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## Bronchiectasis

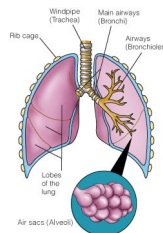
If you or your child has bronchiectasis, it means you have a lung disease which gives you breathing problems. It makes you more likely to get lots of chest infections. There's no cure, but you can take medicines and do exercises to help you breathe more easily.

We've brought together the best research about bronchiectasis and weighed up the evidence about how to treat it. You can use our information to talk to your doctor and decide which treatments are best for you.

## What is bronchiectasis?

Bronchiectasis means the airways in your lungs aren't working properly. It affects the way you breathe and makes you more likely to get chest infections.

To understand bronchiectasis, it helps to know a bit about how your lungs work.



When you breathe in, air goes into your lungs through your windpipe.

Your lungs are in the middle of your chest, behind your ribs.

They are like spongy, stretchy bags that fill up with air when you breathe in. They empty when you breathe out.

When you take a breath, air goes down your windpipe and into your lungs through a network of thin tubes (**bronchi**, which are airways in the lungs). At the end of these tubes are tiny sacs, called **alveoli**. Oxygen from the air goes into your bloodstream through blood vessels in these sacs.

The lungs make small amounts of fluid, called **mucus**. Mucus keeps your airways moist and helps get rid of dirt and germs. Tiny hairs (called **cilia**) inside your airways sweep excess mucus, dirt, and germs out of your lungs when you cough.

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If you have bronchiectasis, some of the airways in your lungs are too wide. This usually happens because the walls of the airways have been damaged. Because the airways are too wide, mucus builds up inside them. <sup>[1]</sup>

When you have a lot of mucus in your lungs, you may find it hard to cough it all out. The mucus that gets left behind can be infected by bacteria. This means you get a chest infection.

Getting a lot of chest infections can make it hard for you to breathe. You may feel very tired and unwell. Infections can also damage your lungs further. So it's important to have treatment quickly when you get a chest infection. <sup>[2]</sup> For more, see [Treating chest infections](#) .

Bronchiectasis usually happens because something has damaged your lungs. This could have been before you were born. Many people with bronchiectasis have an inherited condition called [cystic fibrosis](#) . Cystic fibrosis makes you produce too much mucus. Other people are born with a condition that means the cilia in their airways don't work properly. <sup>[3]</sup>

Most people who have inherited bronchiectasis are diagnosed when they are babies or children. But some people get it later in childhood or when they are adults. Bronchiectasis is a long-term condition that lasts for the rest of your life.

Things that can cause bronchiectasis later in life include: <sup>[3]</sup>

- Infections like [measles](#) , whooping cough, or [tuberculosis](#) (TB)
- Getting something, like a peanut, trapped in your lungs
- Having an allergy to something in the air
- Breathing in a harmful chemical in the air.

### What are the symptoms of bronchiectasis?

Bronchiectasis has some unpleasant symptoms that can make you or your child feel ill and tired. But there are treatments that can help you cope.

The main symptom of bronchiectasis is coughing up a lot of mucus (also called sputum). <sup>[3]</sup> You might cough up as much as half a litre (about a pint) of mucus in a day. <sup>[5]</sup>

The mucus may: <sup>[6]</sup>

- Be yellow or green if it is infected
- Have blood in it.

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If your mucus looks infected, it's important to see a doctor. You may need to take antibiotics to cure the infection.

If you have bronchiectasis, you may also:

- Feel breathless
- Cough up blood
- Wheeze
- Get tired because of all the coughing.

These symptoms can be alarming and make you feel unwell. It can be especially distressing watching this happening to your child. If the symptoms seem worse than usual, you should talk to your doctor.

Some of the symptoms of bronchiectasis can happen with other lung diseases. These include asthma and chronic obstructive pulmonary disease (COPD). So, your doctor will need to rule out these other conditions before diagnosing bronchiectasis.

### How is bronchiectasis diagnosed?

To find out if you have bronchiectasis, your doctor will: <sup>[3]</sup>

- Ask you about your symptoms
- Listen to your chest with a stethoscope
- Check how well your lungs are working by asking you to blow into a measuring tube called a spirometer
- Send a sample of mucus from your lungs to the laboratory to check for infection
- Do a blood test.

You may also go to hospital for tests to look at your airways. You may have: <sup>[3]</sup>

- A chest x-ray to get a general picture of your lungs
- A lung scan (usually a high-resolution CT scan) to get much more detailed pictures of your airways.

The pictures should show how much your airways have widened and how much of your lungs are affected.

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Bronchiectasis can be caused by a condition called [cystic fibrosis](#) . So you may also have a test for cystic fibrosis.

If you have bronchiectasis, it means you'll be prone to chest infections. Your doctor may want to check how well your [immune system](#) is working, to make sure the infections aren't happening because of an underlying problem with your immune system. <sup>[4]</sup>

## How common is bronchiectasis?

We don't really know how many people get bronchiectasis. There haven't been any good statistics to show how common it is.

Bronchiectasis seems to:

- Have become less common in the last 50 years
- Be more common in people living in poorer countries than in richer countries.

Bronchiectasis is now quite uncommon in Europe and the US. When it does happen, it's most often because of [cystic fibrosis](#) . <sup>[3]</sup>

Most people develop bronchiectasis in childhood, although it can start at any age.

## What treatments work for bronchiectasis?

There's no cure for bronchiectasis. But you can take medicine to control your symptoms, keep your lungs from getting worse, and help you live a normal life. You can also do exercises that strengthen your chest muscles and help you breathe more easily.

We haven't looked at treatments for bronchiectasis caused by a condition called [cystic fibrosis](#) . Cystic fibrosis is treated in a different way.

## Key points about treating bronchiectasis

- Exercises to strengthen your chest muscles can help you to breathe more freely and make it easier for you to live a normal life.
- Medicines to relax your airways and reduce the [inflammation](#) in your lungs may help you breathe more easily, but there's not much research to show this.
- You'll need to take antibiotic medicines to get rid of any chest infection. (See [Treating chest infections](#) .)

We've looked closely at the research and ranked the treatments into categories, according to whether they work.

## Treatment Group 1

### Treatments for bronchiectasis

#### Treatments that are likely to work

- [Exercises to make your chest muscles stronger](#)
- [Taking antibiotics every day](#)

#### Treatments that need further study

- [Physiotherapy to help get rid of mucus](#)
- [Medicines to open up the airways](#)
- [Medicines to make your airways less inflamed](#)
- [Medicines to break up your mucus or make it less sticky](#)
- [Medicines to make your mucus thinner](#)
- [Lung surgery that removes damaged parts of your lung](#)

### What will happen to me?

It's hard to say what will happen to you. People vary a lot in terms of the symptoms they get. Bronchiectasis doesn't go away. But some people get more symptoms than others.

If you get a chest infection, it may make your symptoms worse for a few days or more. This is sometimes called an exacerbation. Most people get exacerbations once or twice a year. But if you have severe bronchiectasis, you could have six or more a year.

You'll need to have treatment for your chest infections. You can also have treatment to help you cough up the extra mucus in your lungs.

If you get your infections treated quickly, and can cough up mucus, you will probably be able to live with your condition quite normally.

Some people get very bad bronchiectasis. If your disease is very bad, it can be life-threatening in the long term, when you get older. This is because having difficulty breathing can put a strain on the rest of your body, including your heart.<sup>[7]</sup>

But remember that everyone is an individual. No one can say what will happen to you for sure. And the better your disease is controlled, the better your chances are of living a normal life.

## Treatments:

### Exercises to make your chest muscles stronger

In this section

There's some good evidence that exercising to strengthen your chest muscles can help you breathe more easily.

If you work on the muscles in your chest that help you to breathe in and out, the muscles get stronger. It's the same as exercising your arms and legs to make those muscles stronger.

To train your chest muscles, you breathe in through a device that makes your muscles work harder. You'll be shown how to use the device by a doctor, nurse, or other health professional. You'll probably have to train 30 minutes a day, five days a week.

If you have bronchiectasis, making your chest muscles stronger may help you to breathe better.

We found one summary of the research on training the chest muscles (a [systematic review](#) ). It included two studies that looked at 43 people in total. <sup>[8]</sup>

The studies showed that training the chest muscles for eight weeks:

- Helped people with bronchiectasis to walk further than they could before
- Improved their everyday lives
- Improved their breathing.

Nobody in the studies was harmed by training their chest muscles.

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### Taking antibiotics every day

In this section

If you have bronchiectasis, you're more likely to get chest infections. Chest infections need treatment with [antibiotics](#) . To read more, see [Treating chest infections](#) .

Some doctors have looked at whether it's better to take antibiotics every day for a long period of time, rather than just taking them when you get an infection. Your doctor might recommend regular antibiotics if you're getting three or more chest infections a year. <sup>[4]</sup> But doctors won't prescribe antibiotics unless they think the treatment is really necessary. This is because antibiotics won't work as well in the future if they are used too much. This problem is called antibiotic resistance.

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A few small studies have shown that people who take antibiotics regularly for long periods of time have improved symptoms and fewer exacerbations (flare-ups) compared with people given a dummy treatment ( placebo ).<sup>[9] [10] [11] [12]</sup>

An upset stomach is a common side effect with some antibiotics. In one study, 4 out of every 10 people taking an antibiotic called azithromycin suffered from an upset stomach.<sup>[11]</sup>

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### Physiotherapy to help get rid of mucus

In this section

Many doctors recommend that you have physiotherapy and learn exercises to help you get rid of the mucus in your lungs. But we don't know how well this works. There isn't enough evidence to say.

There are different types of exercises. You or your child might be asked to move into different positions, so that gravity helps the mucus to drain out of the lungs. The physiotherapist might tap your chest to loosen the mucus and help it start to move. Some people find it helpful to blow into a small device that helps them to loosen the mucus.

You might hear your doctor call this treatment bronchopulmonary hygiene.

If your child has bronchiectasis, a physiotherapist can show you how to help them to do the exercises at home.

We found one summary of the research (called a systematic review ) on chest physiotherapy. It included five studies that looked at 51 people in total. The studies showed that people who had chest physiotherapy were able to cough up more of the mucus from their lungs. But these studies weren't of a high quality.<sup>[13]</sup>

There hasn't been enough research to show which exercises are helpful, and good studies are needed. But doctors and physiotherapists usually recommend that you use these exercises. That's because they seem to be helpful for some people. And they don't seem to cause any harm.<sup>[13]</sup>

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### Medicines to open up the airways

In this section

You can breathe in medicines with an inhaler to open up your airways, or you can take tablets. But we don't know if either of these will help you.

It may seem strange to take medicines to make your airways wider, when the problem with bronchiectasis is that your airways are already too wide. But bronchiectasis only affects small parts of the lungs. Some people with bronchiectasis also have asthma or chronic obstructive pulmonary disease (COPD) . This can make airways in other parts

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of the lungs too narrow.<sup>[3]</sup> So taking medicines to open up the airways may help you breathe more easily.

There are several different types of medicine.

- Quick-relief inhalers, such as salbutamol (brand names Ventolin, Salamol, Easi-Breathe, Airomir) and terbutaline (Brycanyl). These work quickly when you inhale them, and last for three to four hours.
- Long-acting inhalers, such as salmeterol (Serevent) and formoterol (Foradil, Oxis). These take 15 to 30 minutes to start working, but they last up to 12 hours.
- Ipratropium inhaler (Atrovent). This works quickly and lasts for three to four hours.
- Tiotropium inhaler (Spiriva). This lasts at least 24 hours, so you only need to use it once a day.
- Theophylline tablets (Nuelin SA, Slo-Phyllin, Uniphyllin Continus). You can also get theophylline syrups and injections.

Doctors often prescribe these medicines to people with bronchiectasis. But we couldn't find any high-quality evidence that they are helpful. They are more often used for other lung conditions like asthma.

Medicines that open up the airways do have side effects.

- Quick-relief inhalers and long-acting inhalers can make your hands tremble, especially when you first use them. They may also make your heart beat abnormally.<sup>[14] [15]</sup>
- Ipratropium and tiotropium may give you a dry mouth. This happens to about 1 in 10 people who take them.<sup>[16] [17] [18] [19]</sup>
- Theophylline drugs can make you feel sick, give you headaches, and give you diarrhoea. Some people also have fits and an abnormal heartbeat. You are more likely to get these side effects if you are older.<sup>[20]</sup>
- Some research has suggested that using a tiotropium inhaler could slightly increase people's risk of a stroke. Looking at lots of studies together, researchers found that for every 1,000 people who used a tiotropium inhaler for a year, there were two extra strokes. However, early reports from a larger review of studies suggests that there is no increased risk of stroke with tiotropium.<sup>[21]</sup>

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## Medicines to make your airways less inflamed

In this section



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You can take medicines called **corticosteroids** to reduce the swelling in your airways. But we don't know if they will help you very much.

Corticosteroids are different from the drugs called anabolic steroids that some athletes and bodybuilders use. They act on the **immune system** and calm down **inflammation** in the body.

Corticosteroids come as:

- Inhaled steroids, such as beclometasone (brand names Beclazone, Qvar), budesonide (Pulmicort), and fluticasone (Flixotide)
- Steroid tablets, such as prednisolone.

There isn't much evidence to show whether these drugs are helpful if you have bronchiectasis. They're more often used for other lung diseases, like asthma.

We found a review of the research that looked at six studies with 303 people who had bronchiectasis. Those who were treated with an inhaled steroid coughed up less mucus, were able to breathe out (exhale) better, and rated their quality of life as higher. People who were treated with high doses of an inhaled steroid were also less likely to feel breathless. <sup>[22]</sup> <sup>[23]</sup>

But taking a steroid didn't affect how often they had a worsening of their symptoms (an exacerbation) or how much they coughed or wheezed. We need more research to know for certain whether inhaled steroids can help.

We couldn't find any good-quality evidence about taking steroid tablets if you have bronchiectasis.

Corticosteroids do have side effects.

- You may get a yeast infection in your mouth (thrush) if you use inhaled steroids. This happens to about 1 in 10 people. <sup>[24]</sup>
- Your bones may get weaker if you use corticosteroids for a long time. This is more likely to happen with steroid tablets. <sup>[25]</sup>
- You have more chance of getting a disease called **diabetes** if you take steroid tablets for a long time. Diabetes means you can't control the amount of sugar in your bloodstream. <sup>[26]</sup>

Taking steroids for a long time can stop your body making as many of its own steroids as it normally would. <sup>[27]</sup> Don't stop taking your treatment suddenly. Your doctor will want to check on you as you stop taking the treatment. He or she is likely to gradually reduce your dose, rather than have you stop suddenly.

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If you get any troubling symptoms while you're taking steroids, see your doctor straight away.

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### Medicines to break up your mucus or make it less sticky

In this section

You can take medicines to break up the mucus in your lungs, or make it less sticky. This may make it easier to cough up. But we don't know how helpful these medicines will be for you.

We've looked at the effectiveness of two types of medicine:

- Bromhexine
- Deoxyribonuclease (rhDNase), also called dornase alfa (Pulmozyme).

There isn't much evidence about either treatment.

We found one study which looked at people whose symptoms had suddenly got worse. Taking bromhexine three times a day for two weeks improved their coughing and reduced the amount of mucus they were bringing up. <sup>[28]</sup>

We also found two studies of dornase alfa. <sup>[28]</sup> They showed that taking dornase alfa didn't make much difference. It didn't help the lungs to work better or cut the number of chest infections people got. Some people got flu-like symptoms when they took dornase alfa.

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### Medicines to make your mucus thinner

In this section

You can inhale medicines to make the mucus in your lungs thinner and easier to cough up. But we don't know how well this works.

The most commonly used treatment is a type of salt water, called hypertonic saline. You inhale it through a machine called a nebuliser, which converts the liquid into a fine mist. When you breathe the mist into your lungs, it makes the airways produce more fluid. This dilutes the mucus and makes it thinner.

We couldn't find any evidence about using this type of treatment. But your doctor may suggest it if your mucus is very thick and you are finding it hard to cough it up.

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### Lung surgery

In this section

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If parts of your lung are very badly damaged, your surgeon may advise you to have an operation to remove the worst parts. But we don't know how well this operation works. Most people with bronchiectasis won't need this operation.

Your doctor is more likely to suggest surgery if you often cough up a lot of blood and find it very hard to breathe properly.

There haven't been any good studies into this treatment. That's because not many people are suitable for this type of operation. So, we don't know how much benefit people get from surgery. It's usually recommended for people with severe damage to one part of their lungs. Surgeons don't advise it for people with bronchiectasis that has spread to large areas of their lungs.

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### Further informations:

#### Treating chest infections

If you have bronchiectasis and get a chest infection, you'll need a course of antibiotics to kill the bacteria that are probably causing it. The sooner you start the antibiotics, the better. So it's important to go to your doctor as soon as you notice:

- Any worsening of symptoms
- A change in the colour of the mucus you cough up (it becomes yellow or green).

Your doctor will probably send a sample of sputum (mucus) to the laboratory to find out which type of bacteria is causing your infection, so you can get the most effective antibiotic.

<sup>[1]</sup> Your doctor may also start your antibiotics before your mucus is tested, especially if they are pretty sure which bacteria it is.

If you or your child gets a lot of chest infections, and you know when an infection is starting, your doctor may give you antibiotics to keep at home, so you can start taking them straight away. <sup>[1]</sup> But you should still go to the doctor to get the mucus tested, to check what bacteria you have. You might need a different antibiotic.

You usually take antibiotics as pills. You'll probably take them two or three times a day for two weeks. <sup>[4]</sup> If someone is very ill or antibiotics haven't been helping, doctors sometimes give antibiotics as a drip (called an intravenous infusion or IV).

#### Glossary:

##### alveoli

Alveoli are tiny sacs in your lungs that fill up with air when you breathe in. Your alveoli are where gases (such as oxygen and carbon dioxide) are exchanged between your blood and the air you breathe.

##### cystic fibrosis

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Cystic fibrosis is a disease people are born with that gives them problems with their lungs and bowels. The main results are breathing and digestive problems.

## measles

Measles is a childhood infection caused by a virus. It makes you break out in a rash all over your body. It also gives you swollen glands and flu symptoms, like tiredness and fever. Sometimes it can cause worse problems, like an infection in your lungs or voice box. The measles, mumps and rubella (MMR) vaccine protects children from getting measles.

## tuberculosis

Tuberculosis (also known as TB) is an infection caused by certain bacteria. The most common type of tuberculosis affects your lungs. This can give cause chest pain, tiredness and a severe cough.

## intravenous infusion

When a medicine or a fluid, such as blood, is fed directly into a vein, it's called an intravenous infusion (or IV). To give you an intravenous infusion, a nurse, technician or a doctor places a narrow plastic tube into a vein (usually in your arm) using a needle. The needle is then removed and the fluid is infused (or dripped) through the tube into the vein.

## asthma

Asthma is a disease of the lungs. It makes you wheeze, cough and feel short of breath. Asthma attacks are caused by inflammation and narrowing of your airways, which makes it hard for air to pass in and out of your lungs.

## chronic obstructive pulmonary disease (COPD)

Chronic obstructive pulmonary disease (COPD) is an illness that causes coughing and difficulty breathing. Most of the people who get it have smoked for a long time. COPD can include both emphysema, which is the breakdown of air sacs (alveoli) in your lungs, and chronic bronchitis, which is a recurrent, long-lasting cough that brings up phlegm.

## spirometry

Spirometry is a measurement of how well your lungs are working. Spirometry measures the speed and amount a person can breathe out. If you're having breathing problems, spirometry helps your doctor to diagnose the cause.

## X-ray

X-rays are pictures taken of the inside of your body. They are made by passing small amounts of radiation through your body and then onto film.

## CT scan

A CT scan is a type of X-ray. It takes several detailed pictures of the inside of your body from different angles. CT stands for computed tomography. It is also called a CAT scan (computed axial tomography).

## immune system

Your immune system is made up of the parts of your body that fight infection. When bacteria or viruses get into your body, it's your immune system that kills them. Antibodies and white blood cells are part of your immune system. They travel in your blood and attack bacteria, viruses and other things that could damage your body.

## inflammation

Inflammation is when your skin or some other part of your body becomes red, swollen, hot, and sore. Inflammation happens because your body is trying to protect you from germs, from something that's in your body and could harm you (like a splinter) or from things that cause allergies (these things are called allergens). Inflammation is one of the ways in which your body heals an infection or an injury.

## systematic reviews

A systematic review is a thorough look through published research on a particular topic. Only studies that have been carried out to a high standard are included. A systematic review may or may not include a meta-analysis, which is when the results from individual studies are put together.

## antibiotics

These medicines are used to help your immune system fight infection. There are a number of different types of antibiotics that work in different ways to get rid of bacteria, parasites, and other infectious agents. Antibiotics do not work against viruses.

## placebo

A placebo is a 'pretend' or dummy treatment that contains no active substances. A placebo is often given to half the people taking part in medical research trials, for comparison with the 'real' treatment. It is made to look and taste identical to the drug treatment being tested, so that people in the studies do not know if they are getting the placebo or the 'real' treatment. Researchers often talk about the 'placebo effect'. This is where patients feel better after having a placebo treatment because they expect to feel better. Tests may indicate that they actually are better. In the same way, people can also get side effects after having a placebo treatment. Drug treatments can also have a 'placebo effect'. This is why, to get a true picture of how well a drug works, it is important to compare it against a placebo treatment.

## stroke

You have a stroke when the blood supply to a part of your brain is cut off. This damages your brain and can cause symptoms like weakness or numbness on one side of your body. You may also find it hard to speak if you've had a stroke.

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## diabetes

Diabetes is a condition that causes too much sugar (glucose) to circulate in the blood. It happens when the body stops making a hormone called insulin (type 1 diabetes) or when insulin stops working (type 2 diabetes).

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