

## Patient information from the BMJ Group

# Asthma in children

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## Asthma in children

About 1 in 10 children in the UK have asthma. Your child may need drugs to prevent asthma attacks or to treat them when they happen.

We've brought together the best research about asthma in children and weighed up the evidence about how to treat it. You can use our information to talk to your child's doctor or nurse and decide which treatments are best.

## What is asthma?

If your child has asthma, the walls lining the tubes in his or her lungs become swollen and the tubes themselves become narrow. This makes it difficult to breathe.

Even in very mild asthma, **inflammation** (swelling) occurs in the airways. Preventing inflammation in the lungs with drugs helps to keep asthma under control.

## Key points for parents whose child has asthma

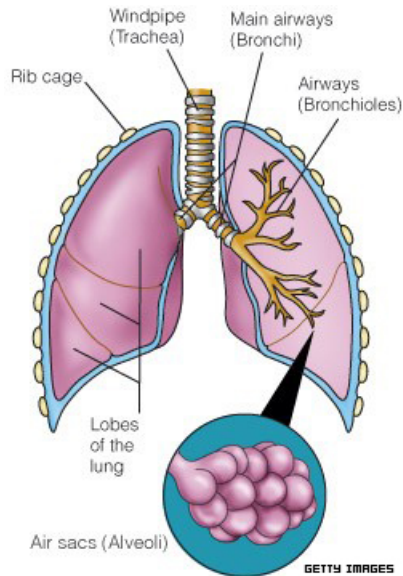
- About 1 in 10 children in the UK have asthma. <sup>[1]</sup>
- Up to three-quarters of children with asthma grow out of it. <sup>[2]</sup>
- Children with mild asthma are most likely to grow out of it. <sup>[2]</sup>
- There are lots of drugs that can help prevent symptoms and relieve them when they happen.
- You can also reduce asthma symptoms by learning what triggers your child's asthma and avoiding these if you can.

## How your lungs work

To understand what happens in asthma, it's useful to know how the lungs work and what they do.

## Asthma in children

The lungs sit in the centre of your chest, behind your ribs. Their main job is to get oxygen from the air into your body.



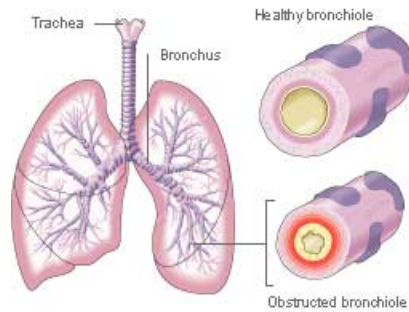
Oxygen passes into your blood through tiny air sacs in your lungs.

Your blood vessels carry oxygen from your lungs to the rest of your body. Every cell in your body needs oxygen to work.

- When you breathe in, air goes into your lungs.
- The main tube that goes from your throat to your lungs is called your windpipe (or trachea).
- Your windpipe divides into two tubes called bronchi (each individual tube is called a bronchus).
- Inside each lung, the air moves down a network of tubes called bronchioles.
- At the end of each tube are tiny sacs (called alveoli) surrounded by blood vessels.
- Oxygen in the air passes through these sacs and into the blood vessels.
- Carbon dioxide passes the other way back into your lungs. This is a waste product that you get rid of when you breathe out.

# Asthma in children

## What happens in asthma?



In asthma, tubes in the lungs (bronchioles) become narrower.

If your child has asthma, they can't always breathe normally. The tubes inside their lungs get narrower, so they can't get enough air in and out of their lungs. This can make your child gasp for breath. Or it may make them cough or wheeze.

To learn more, see [What are the symptoms of asthma in children?](#)

Three things happen in the lungs to make the air passages narrower:

- Muscles in the wall of the airways get tighter
- The walls of the airways become swollen
- Mucus is released into the airways, partially blocking them.

We're not exactly sure why some children have asthma and others don't. But two things seem to be important:

- The **genes** children inherit from their parents (asthma often runs in families)
- An infection or other things in the air. For example, your child may have first got asthma when they had a cold or chest infection. Or they may be **allergic** to certain things in the air. These things are called **allergens**. Common allergens are pollen, house dust mite droppings, mould, and bits of fur and skin from pets.

After your child has asthma symptoms once, their airways become extra-sensitive. Whenever your child comes into contact with a trigger, their **immune system** overreacts. This makes their airways swollen and causes the symptoms of asthma.

It might be that the first thing that gave your child asthma symptoms (for example, dog hair) always brings on asthma symptoms. Or you may find that other things give your child symptoms as well.

## Asthma triggers

Things that can bring on your child's asthma symptoms are called **triggers**. It's useful to know what triggers set off your child's symptoms. If your child can avoid some of these triggers, they may be able to prevent their asthma symptoms happening. The most common triggers are:

- [Allergens](#)
- [Smoke and air pollution](#)
- [Exercise](#)
- Other illnesses (such as a cold).

## Asthma and wheezing in young children

Many babies and young children get wheezy from time to time, especially if they've got a cold or are just getting over one. For children under about 5 or 6 years old, it can often be difficult for doctors to know whether wheezing is caused by asthma or a virus. Your doctor will want to be certain about what's causing the wheezing so that your child doesn't take medicines he or she doesn't need. And it's also important not to miss a case of asthma, as this can be dangerous.

Often, if a young child has had several bouts of wheezing, doctors give them a 'trial' of asthma medicines. Your doctor will check on your child every so often to make sure the treatment is the right one.

Many of the medicines used to treat asthma have not been formally tested on young children. So don't be surprised if your doctor is very careful about prescribing some drugs for your child. He or she just wants to keep a close eye on what is going on.

## Asthma: why my child?

Some children are more likely to get asthma than others. Things that increase someone's chances of getting a condition are called **risk factors**. The most important risk factor for asthma in children is having asthma in the family.

### Your child's genes

A child who has a parent or other close relative with asthma is more likely to get asthma than a child who doesn't have any close relatives with asthma. <sup>[5]</sup>

When a disease runs in a family, this means **genes** linked to the illness are passed from parents to their children. But there is no single gene that causes asthma. It happens because of a combination of many different genes. Some of these genes change the way your **immune system** works. But we don't know how these genes work together to cause asthma. <sup>[6]</sup>

## Asthma in children

If you inherit asthma from your parents, you may also inherit [eczema](#) , [hay fever](#) , or both.

### Smoking

Having **parents who smoke** also increases a child's risk of getting asthma. There's a risk from:

- Smoking during pregnancy. If a woman smokes when she's pregnant, the chance that her baby will get asthma increases by more than 50 percent <sup>[7]</sup>
- Smoking around children. Children whose parents smoke are one and a half times more likely to get asthma than children whose parents don't smoke. <sup>[4]</sup>

### Having allergies

There's a link between asthma and other allergic conditions, such as [eczema](#) and [hay fever](#) . About 1 in 3 children with eczema will go on to get asthma. <sup>[8]</sup>

### Pollution

Air pollution from traffic might make children more likely to get asthma. <sup>[9]</sup> Children who live in areas with lots of traffic pollution are more likely to develop asthma by age 8.

### Antibiotics

Some studies have found a link between being treated with antibiotics as a baby and getting asthma in later life. <sup>[8] [10] [11]</sup> But it's hard to know whether antibiotic use in babies could actually cause asthma. It might just be that when babies become wheezy, doctors may think they have a chest infection and treat them with antibiotics. So the children in the study might have been given antibiotics for a chest infection, when they really had asthma all along.

## What are the symptoms of asthma in children?

The symptoms of asthma vary enormously from child to child.

Your child may get some or all of the following.

- **A cough.** This is most common symptom of asthma in children. In many children it's the only one.
- **Wheezing.** A wheeze is a high-pitched whistling sound in your child's chest. It's the noise of the air vibrating through the air passages of the lungs. It happens when the air passages become narrower.
- **Gasping for breath.** Because your child's air passages get narrower, he or she finds it harder to get air in and out of the lungs. Your child may become breathless.

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- **A tight feeling in the chest.** This happens in part because breathing air out is often more difficult during an asthma attack. Your child's chest may feel tight and uncomfortable.

If your child has a bad asthma attack, they may not get enough oxygen into their body. This can mean they get blue lips, fingers, toes, tongue, or skin. If this happens, **it's an emergency**. You need to call 999 or get your child to hospital urgently.

Some children have mild asthma, with only occasional wheezing and coughing. Others have symptoms on most days and need to take long periods of time off school when symptoms get very bad. It's also hard to predict how long an asthma attack will last or how severe it will be. Some last just an hour or so, while others go on for days or even weeks.

### What's an asthma attack?

When your child gets asthma symptoms it's called an asthma attack. It can be mild or severe.

### Mild attacks



Using an inhaler can usually bring asthma symptoms under control.

Mild attacks are common. Your child may start to cough or get a feeling of tightness in the chest. He or she may make a whistling sound when breathing (called a wheeze). When this happens, your child should use his or her **quick-relief inhaler**. These are usually blue. They help your child's airways to open, making it easier to breathe.

## Asthma in children

If your child's medicine doesn't help or his or her symptoms get worse, you should call your doctor.

See [How can I tell when my child's asthma is getting out of control?](#)

### Severe attacks

In a severe asthma attack, symptoms become very severe very quickly. Your child will find it more and more difficult to breathe. You may also notice:

- It's hard for your child to talk
- Your child's lips or fingernails turn grey or blue
- Your child's nose opens wide to breathe
- Your child's skin is pulled in around the ribs and neck when he or she breathes
- Your child's heartbeat or pulse is very fast
- Your child finds it hard to walk.

If this happens, call 999 or go to your nearest accident and emergency department as quickly as you can.

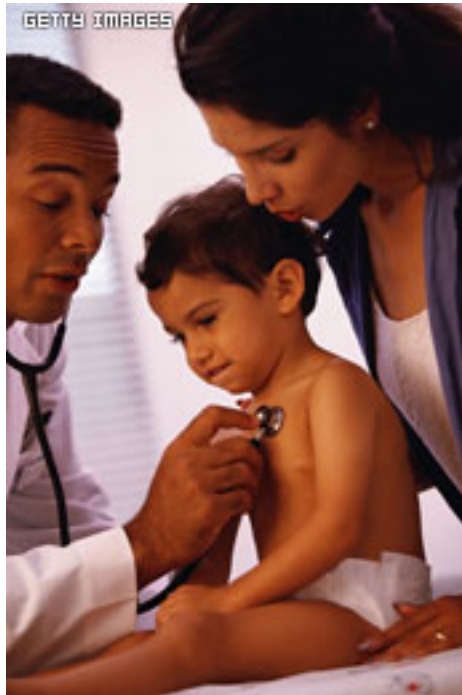
### How do doctors diagnose asthma in children?

Your GP will ask about your child's symptoms, how long he or she has had them, how often they occur, and whether you've noticed any factors that trigger the symptoms.

For example, your child's symptoms may start when he or she is running around or playing sport, or they may come on only at night.

Here's what your GP will ask you about, and look for:

## Asthma in children



Your GP may listen to your child's lungs to detect any wheezing.

- Coughing, with or without mucus
- Wheezing
- Shortness of breath
- A tight feeling in the chest
- Trouble sleeping because of symptoms
- Symptoms that get worse at night
- Symptoms that get worse after exercise, with a cold, after contact with animals, when the weather changes, or when your child walks into a smoke-filled room
- Symptoms that come and go from day to day, week to week, or month to month
- Changes in the shape of the chest caused by trying to overcome breathing problems.

Your GP will also examine your child for physical signs of asthma and other allergic diseases, such as **eczema**, and may listen to his or her chest for any wheezing.

Noisy breathing has many different causes. For example, your child may have another condition, such as a temporary infection caused by a virus. Your GP has to be sure that



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your child hasn't got any of these conditions, so don't be surprised if you're asked a lot of questions about what your child has been doing.

Because conditions like asthma, eczema, and hay fever tend to run in families, you'll probably also be asked about your own health and the health of your relatives.

Your GP may be able to diagnose asthma just from what you tell him or her. But he or she may need to carry out some tests to help decide on the right diagnosis. Your child may be given a **peak flow test** or a **spirometry test** to measure how well his or her lungs are working.

Your child may also be asked to inhale an asthma medicine. If this improves his or her symptoms, it may mean your child has asthma.

### Peak flow test

This is a simple test done by GPs and practice nurses. It can also be done at home. It is used to measure how easily your child can empty his or her lungs. Children with asthma can't breathe out as well as those without the condition, so this can help your GP make a diagnosis.



Your GP may need to carry out some tests to be certain that your child has asthma.

A **peak flow meter** is shaped like a cylinder and has a scale down one side. It's about the size of an electric toothbrush. To measure peak flow, your child will be asked to take a deep breath and breathe out as hard as he or she can into the mouthpiece of the meter. Your GP may take a reading before and after your child uses a [quick-relief inhaler](#) (which contains a drug called a **bronchodilator** that helps to open up the airways). If

## Asthma in children

your child's peak flow improves after taking the drug, it's usually a sign that he or she has asthma.

Your GP may give you a prescription for a peak flow meter, which you can get from a pharmacy, like a medicine. You can then measure your child's peak flow at home every day (or as often as your doctor suggests) and keep a diary of readings. This helps you to monitor your child's asthma and check that the medicines he or she is taking are working.

### Spirometry test

This is another test to measure how your child's lungs are working, but it provides more detailed information than the peak flow test. A spirometer is a piece of equipment used by a specialist. It consists of a mouthpiece attached by a tube to a computer with a readout.

Your child will be asked to breathe out as hard as he or she can into the mouthpiece. The spirometer will produce a graph. From the reading, your doctor will be able to tell whether your child's airways are narrowed or not. Children with asthma cannot breathe out as fast as normal, because of the narrowed airways.

If you're told your child has asthma, you might want to know how bad it is. Doctors grade asthma in children according to how often they get symptoms and what medicines they need to keep the condition under control. To learn more, see [How bad is my child's asthma?](#)

### How common is asthma in children?



About 1 in 10 children have asthma. Boys are more likely to get asthma than girls are.

## Asthma in children

The number of children with asthma has risen since the 1960s. One study in Scotland found that 10 in 100 children had asthma at the end of the 1980s, compared with only 4 in 100 in the 1960s.<sup>[13]</sup> Today, Asthma UK estimates that 1.1 million children in the UK have asthma.<sup>[14]</sup>

Why more children have asthma today than in earlier decades isn't clear. People used to blame an increase in air pollution for the rise in childhood asthma. But this seems unlikely, as many of the most polluted countries in the world, such as China and Eastern European countries, have low rates of asthma.<sup>[15]</sup>

One of the most popular explanations at the moment for the increase in asthma is the 'hygiene hypothesis'. This blames increasing asthma rates on cleaner homes, which mean that children get fewer infections than they used to. Some scientists think that childhood infections help to build up the immune system. So, since children are getting fewer infections, they have less protection against asthma.<sup>[16]</sup>

Another idea is that central heating and having more soft furnishings in homes have allowed house dust mites to multiply (dust mite droppings are one of the main allergens that trigger asthma attacks).

Here are some facts about asthma in children.

- Boys are more likely than girls to get asthma. But girls are more likely than boys to continue to have asthma as adults.<sup>[12]</sup>
- Up to 75 in 100 children with asthma grow out of it as teenagers.<sup>[2]</sup>
- In many other children, symptoms become less severe as they grow older.<sup>[17]</sup>

### **What treatments work for asthma in children?**

There is a whole range of treatments for asthma. Your doctor or practice nurse may offer your child a combination of treatments.

## Asthma in children

### Key points about treating asthma in children



Your doctor will choose treatment to suit your child.

- Asthma medicines can **treat asthma symptoms** as they happen. Your child may also need a treatment to **prevent symptoms**.
- Most asthma treatments are breathed in through an **inhaler** (a puffer). Some children might also need to take syrups or tablets from time to time. To learn more, see [How asthma in children is treated](#) .
- Inhalers used to prevent asthma attacks usually contain drugs called **corticosteroids** (often called **steroids** for short). These are not the same as the anabolic steroids used by some athletes and bodybuilders. They are very similar to natural hormones produced in the body to deal with inflammation. To learn more, see [More about steroids and asthma](#) .
- It's important for your child to use their inhaler properly. If they don't, they may not get the benefit from their medicine. To read more, see [How to take asthma drugs](#) .
- You might be able to help control your child's asthma by getting them to avoid things that trigger their symptoms. To learn more, see [Avoiding allergens](#) .

### Treatments for asthma in children

It's hard for doctors to tell if very young children or babies have asthma. Wheezing in young children could be caused by something else, such as a **virus** . So children under around 5 to 6 years old are treated slightly differently.

- [What treatments work for wheezing in babies and young children?](#) Babies and children under about 5 or 6 can be treated with an inhaler to prevent or relieve wheezing. Tablets or syrups are sometimes used too. But doctors are careful about giving drugs to very young children. [More...](#)

## Asthma in children

- [What treatments work for asthma in older children?](#) Children over about 5 or 6 can also use an inhaler to prevent or treat asthma. Children with more severe asthma may also need tablets or syrups. [More...](#)

### Treatment Group 1

#### What treatments work for wheezing in babies and young children?

It can be hard for doctors to know how to treat babies or young children who are wheezy. It's difficult to tell whether children under about 5 or 6 have asthma or not. Wheezing in young children may be caused by a virus rather than asthma.

#### Key points for treating wheezing in babies and young children

- Your doctor may give your baby or child a trial of an asthma medicine. If their symptoms improve, then they could have asthma.
- The medicines used to treat asthma are called **relievers** (they treat your child's symptoms) and **preventers** (they prevent your child getting symptoms).
- These medicines are usually breathed in through an **inhaler** so they get straight to your child's lungs, which is where they need to work.
- Relievers are usually in blue inhalers, and preventers are usually in brown, cream, red, or orange inhalers.
- Very young children may find it difficult to use asthma inhalers. Devices called **spacers** and **nebulisers** can make it easier for them to take their medicine. They make a mist of the medicine that your child breathes in through a mask. To read more, see [How to take asthma drugs](#) .

Which treatments work best? We've looked at the best research and given a rating for each treatment according to how well it works.

Some treatments are used to relieve wheezing, and others are used to prevent it. There are also extra treatments for children having a more severe attack of wheezing.

To read about treatments for older children, see [What treatments work for asthma in older children?](#)

#### Treatments for wheezing in babies and young children

##### Treatments that are likely to work

- [Quick-relief inhalers to treat wheezing](#) : The only drugs that have been studied in babies and young children are salbutamol (brand names Airomir and Ventolin) and terbutaline (brand name Bricanyl). [More...](#)

# Asthma in children

## Treatments that work, but whose harms may outweigh benefits

- [High doses of steroids from an inhaler to prevent wheezing](#) : Steroids aim to prevent wheezing by reducing inflammation in your child's lungs. When steroids are given to prevent wheezing, children usually take them using an inhaler. [More...](#)

## Treatments that are unlikely to work

- [Trying to get rid of dust mites from your home to prevent wheezing](#) : House dust mites are tiny creatures that live in soft furnishings, such as carpets, mattresses, and sofas. Their droppings are a common trigger for asthma symptoms. [More...](#)

## Treatments that need further study

- [Avoiding allergens to prevent wheezing](#) : This involves avoiding things that may trigger your child's wheezing, such as smoke, pollen, and pets. [More...](#)
- [Ipratropium from an inhaler to prevent wheezing](#) : This treatment opens up the airways in the lungs. The brand name for ipratropium is Atrovent. [More...](#)
- [Salbutamol from an inhaler to prevent wheezing](#) : Salbutamol is usually used to relieve wheezing quickly. But it has also been studied as a preventer in young children. Its brand names include Ventolin and Airomir. [More...](#)
- [Low doses of steroids from an inhaler to prevent wheezing](#) : Steroids aim to prevent wheezing by reducing inflammation in your child's lungs. When steroids are given to prevent wheezing, children usually take them using an inhaler. [More...](#)
- [Steroid tablets to treat more severe wheezing](#) : Steroid tablets or liquids are used as an emergency treatment for a more severe bout of wheezing. They're an extra treatment if a quick-relief inhaler doesn't help on its own. [More...](#)
- [High doses of steroids from an inhaler to treat more severe wheezing](#) : When steroids are given as a treatment for a more severe bout of wheezing, they're usually given as tablets. There hasn't been much research looking at steroid inhalers for young children with wheezing. [More...](#)
- [Ipratropium from an inhaler to treat more severe wheezing](#) : This treatment opens up the airways in the lungs. The brand name for ipratropium is Atrovent. [More...](#)

## Treatment Group 2

### What treatments work for asthma in older children?

There are lots of treatments for asthma. The treatments we talk about here are used for children when they are older than around 5 or 6 years old.

## Asthma in children

Your doctor will help you decide which treatments are right for your child. The treatment your child needs will partly depend on how serious their asthma is.

### Key points about treating asthma in older children

- There are two main kinds of asthma medicine. **Relievers** can help your child's symptoms when they come on. **Preventers** can stop your child getting symptoms.
- Most asthma treatments are usually breathed in through an **inhaler** (a puffer). Breathing in the medicine lets it get straight to your child's lungs, where it's needed.
- Inhalers that **relieve** symptoms quickly contain salbutamol or terbutaline.
- Inhalers that **prevent** symptoms usually contain steroids. Many parents worry about their children taking steroids. To learn more, see [More about steroids and asthma](#).
- Relievers are usually in blue inhalers, and preventers are usually in brown, cream, red, or orange inhalers.
- It's important for your child to use their inhaler properly. If they don't, they may not get the benefit from their medicine. To read more, see [How to take asthma drugs](#). Some children may also need to take syrups or tablets. To learn more, see [How asthma in children is treated](#).
- You might be able to help control your child's asthma by getting them to avoid things that trigger their symptoms. To learn more, see [Avoiding allergens](#).

Which treatments work best? We've looked at the best research and given a rating for each treatment according to how well it works.

Some treatments are used to relieve asthma symptoms, and others are used to prevent them. There are also extra treatments for children having a very bad asthma attack. They can be given in hospital or by a GP. Some can also be given in an ambulance.

To read about treatments for younger children and babies, see [What treatments work for wheezing in babies and young children?](#)

### Treatments for asthma in older children

#### Treatments that work

- [Quick-relief inhalers to treat asthma symptoms](#) : These relax the muscles in the airways to help your child breathe more easily. They act fast but their effects last only a few hours. The common ones (with brand names) are salbutamol (Ventolin, Airomir) and terbutaline (Bricanyl). [More...](#)



## Asthma in children

- [Steroids from an inhaler to prevent asthma symptoms](#) : These drugs reduce inflammation in your child's air passages. Some steroid inhalers (and their brand names) are beclometasone, budesonide (Pulmicort), fluticasone (Flixotide), and mometasone (Asmanex). [More...](#)
- [Using spacer devices during more severe asthma attacks](#) : Spacers make it easier for children to take drugs that they breathe in. [More...](#)
- [Oxygen to treat more severe asthma attacks](#) : If your child has emergency treatment for a severe asthma attack, they may be given oxygen. This is to make sure enough oxygen gets into their lungs. [More...](#)
- [Steroid tablets to treat more severe asthma attacks](#) : If your child is having a severe asthma attack, they may be given steroids as tablets or a liquid, as well as a quick-relief inhaler. [More...](#)
- [High doses of steroids from an inhaler to treat more severe asthma attacks](#) : When steroids are used to treat a severe asthma attack, they're usually given as tablets or a liquid. But some research shows they can also help when they're breathed in from an inhaler. [More...](#)
- [Ipratropium from an inhaler to treat more severe asthma attacks](#) : If your child has a severe asthma attack and needs to be treated in hospital, they may be given ipratropium from an inhaler. Ipratropium is used together with a quick-relief inhaler in hospitals. The brand name for ipratropium is Atrovent. [More...](#)

### Treatments that are likely to work

- [Leukotriene antagonist tablets to prevent asthma symptoms](#) : These tablets reduce inflammation in your child's air passages. There are two leukotriene antagonists available in the UK. Montelukast (brand name Singulair) can be used in children over 2 years old, and zafirlukast (brand name Accolate) can be used only in children over 12 years old. [More...](#)
- [Nedocromil from an inhaler to prevent asthma symptoms](#) : This drug reduces inflammation in your child's air passages. The brand name for nedocromil is Tilade. [More...](#)
- [Salmeterol or formoterol from an inhaler as an extra treatment to prevent asthma symptoms](#) : Your child's doctor might suggest these treatments, if a steroid inhaler on its own doesn't keep your child's asthma under control. But there's a risk that salmeterol or formoterol could cause serious side effects. The brand name for salmeterol is Serevent. Brand names for formoterol include Foradil and Oxis. [More...](#)
- [Theophylline drips to treat more severe asthma attacks](#) : A drug called theophylline is sometimes given as a drip to children having very severe asthma attacks. When



## Asthma in children

it's given as a drip, a type of theophylline called aminophylline is usually used. [More...](#)

- [Salbutamol drips to treat more severe asthma attacks](#) : A drug called salbutamol is sometimes given as a drip to children having very severe asthma attacks. [More...](#)

### Treatments that are unlikely to work

- [Sodium cromoglicate from an inhaler to prevent asthma symptoms](#) : The medicine in this inhaler is meant to reduce inflammation in the air passages. One brand name is Intal. [More...](#)
- [Trying to get rid of dust mites in your home to prevent asthma symptoms](#) : House dust mites are tiny creatures that live in soft furnishings, such as carpets, mattresses, and sofas. Their droppings are a common trigger for asthma symptoms. [More...](#)

### Treatments that are likely to be ineffective or harmful

- [Theophylline tablets to prevent asthma symptoms](#) : Theophylline can have very nasty side effects. [More...](#)

### Treatments that need further study

- [Avoiding allergens to prevent asthma symptoms](#): This involves avoiding things that may trigger your child's asthma, such as smoke, pollen, and pets. [More...](#)
- [Breathing exercises to prevent asthma symptoms](#) : These are exercises designed to improve asthma by helping people to control their breathing. One of the best known breathing methods is the Buteyko breathing technique. [More...](#)
- [Increasing the dose of steroids from an inhaler to prevent asthma symptoms](#) : If your child still gets asthma symptoms while using a steroid inhaler, your doctor may suggest trying a higher dose. [More...](#)
- [Omalizumab as an extra treatment to prevent asthma symptoms](#) : Omalizumab (brand name Xolair) is a treatment for severe asthma caused by an allergy. It's recommended for people who need ongoing or frequent treatment with steroid tablets. [More...](#)
- [Leukotriene antagonist tablets as an extra treatment to prevent asthma symptoms](#) : There are two leukotriene antagonists available in the UK. Montelukast (brand name Singulair) can be used in children over 2 years old. Zafirlukast (brand name Accolate) can only be used in children over 12. [More...](#)
- [Theophylline tablets as an extra treatment to prevent asthma symptoms](#) : These tablets are not often used in the UK to try to prevent asthma. [More...](#)

## Asthma in children

- [Magnesium sulphate drips to treat more severe asthma attacks](#) : A drug called magnesium sulphate is sometimes given as a drip to children having very severe asthma attacks. [More...](#)

### What will happen to my child?

It's hard to tell whether your child will grow out of asthma, but up to 75 in 100 children with asthma do. <sup>[2]</sup>

Girls with asthma, children with severe asthma, and children who have relatives with allergic diseases are at greater risk of having asthma as an adult. <sup>[18]</sup>

A bad asthma attack may mean your child needs treatment in hospital. But it's very rare for children to die of asthma in the UK. <sup>[1]</sup>

Asthma doesn't usually stop children taking part in everyday activities, such as playing outdoors and doing sport.

### Questions to ask your doctor

If your child has been diagnosed with asthma, you may want to talk to your GP to find out more.

Here are some questions that you might want to ask.

#### Questions about the diagnosis

- How do you know for certain my child has asthma?
- Could my child's symptoms be caused by something else, such as a cold?
- Why does my child have asthma?

#### Questions about treatment

- What treatment does my child need?
- Can you explain the difference between the medicines?
- When should my child use a reliever and when should he or she use a preventer?
- Does this treatment have side effects?
- Can you show us how to use the inhaler correctly?
- Do you think my child needs a spacer or a nebuliser?

## Asthma in children

- How can I tell if my child's asthma isn't being controlled well?
- What should I do if the reliever doesn't seem to be helping my child's breathing?
- When should I take my child to the accident and emergency department?

### Questions about other things you can do

- Should my child have an allergy test?
- Is there anything I can do to prevent my child having asthma attacks?
- My child gets asthma during exercise. Should I stop him or her doing sport?
- What should I tell my child's teachers? Should the school keep medicines for my child?
- Will my child grow out of having asthma?

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## Treatments:

### Quick-relief inhalers to treat wheezing in babies and young children

In this section

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This information is for parents of a baby or young child with wheezing. It tells you about quick-relief inhalers, a treatment used for wheezing in babies and young children. It is based on the best and most up-to-date research.

#### Do they work?

Yes. Some research shows that when young children are having an attack of wheezing, a quick-relief inhaler can help to improve their symptoms.

Young children often find using a spacer device or a nebuliser easier to use than an inhaler.

#### What are they?

Children with asthma have airways that are extra-sensitive to substances called **asthma triggers**. When they breathe in an asthma trigger, the muscles around the walls of the

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airways tighten, and the passageways become narrower, making it difficult for air to get through.

Quick-relief inhalers help relax the muscles in the lungs so that the airways open up, making it easier for children to breathe.

Your doctor may call these medicines **bronchodilators**, because they **dilate** (open up) the **bronchial tubes** (airways).

Asthma medicine is often delivered through an inhaler. Inhalers that relieve wheezing quickly are usually blue.

The two inhalers that have been studied in babies and young children contain one of these drugs:

- Salbutamol (brand names are Ventolin and Airomir)
- Terbutaline (brand name Bricanyl).

Breathing in one of these drugs is a good way to make sure it gets straight to the lungs, which is where it is needed. Young children are usually given these medicines through a **spacer device attached to an inhaler**, or through a **nebuliser**. That's because it can be hard for them to use the same inhalers as older children. It can take quite a bit of coordination to press down on an inhaler and breathe in at the same time. To read more, see [How to take asthma drugs](#) .

### How can they help?

Inhaling the drug salbutamol may: <sup>[30]</sup>

- Reduce your child's wheezing
- Help your child breathe more easily and make him or her more comfortable
- Slow down your child's breathing (breathing speeds up during an asthma attack so more air gets into the blocked airways).

But using salbutamol won't help to keep your child out of hospital. A child who takes salbutamol is just as likely to be admitted to hospital with asthma as a child who takes a dummy treatment (a **placebo**). <sup>[30] [31]</sup>

Some studies have looked at the best way to give young children medicine that relieves asthma symptoms quickly. <sup>[32] [33] [34]</sup> They showed that using a **spacer device** with a mask attached works as quickly as using a **nebuliser**. But how children take their asthma drugs does not change how likely it is that they will go to hospital because of their asthma.

### How do they work?

Breathing in a drug that relieves wheezing quickly, such as salbutamol and terbutaline, helps your child breathe more easily by:

- Delivering the drug straight to your child's lungs, which is where it is needed
- Quickly relaxing the airways, which makes them wider and increases air flow
- Helping to clear sticky mucus from your child's lungs.

Both drugs work a bit like two of the body's natural chemicals, noradrenaline and adrenaline. These natural chemicals widen the lungs' airways by relaxing the muscles in their walls. Your child's airways get tight during an asthma attack because the muscles in the lungs' walls go into spasms (suddenly tighten). Quick-relief inhalers relieve the spasms by relaxing your child's airways and making them wider. <sup>[35]</sup>

### Can they be harmful?

The most common side effect of breathing in drugs that relieve wheezing quickly is a rise in how fast the heart beats. This is because the types of cells these drugs affect are in the heart as well as in the lungs. But the studies didn't mention any side effects. <sup>[30]</sup>  
<sup>[31]</sup> <sup>[32]</sup> <sup>[34]</sup>

Breathing in salbutamol or terbutaline through a nebuliser may make your child shake (have tremors), increase his or her heartbeat, and lead to low levels of **potassium** in the blood, which can be dangerous. (Your body needs potassium to balance the amount of water in your blood and body tissues, and to help your nerves, muscles, and heart work properly.) <sup>[33]</sup>

### How good is the research on quick-relief inhalers to treat wheezing in babies and young children?

There is some evidence that quick-relief drugs can help reduce wheezing in young children. <sup>[30]</sup> We also know from research that spacer devices work just as well as nebulisers. <sup>[32]</sup> <sup>[33]</sup> <sup>[34]</sup>

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## High doses of steroids from an inhaler to prevent wheezing in babies and young children

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This information is for parents of a baby or young child with wheezing. It tells you about high doses of steroids from an inhaler, a treatment used to prevent wheezing in babies and young children. It is based on the best and most up-to-date research.

### Do they work?

Yes. There's good research to show that steroids from an inhaler can help prevent asthma symptoms in babies and young children. But doctors are careful about giving this treatment, because they don't know enough about the side effects of steroids in young children.

### What are they?

#### The medicine

Steroids calm down and prevent swelling ( inflammation ) in the airways of children with asthma. Your child can breathe them in through devices called **inhalers**, **spacers**, and **nebulisers**.

Inhaled steroids are usually used to prevent wheezing and asthma attacks. Your doctor may refer to these drugs as **preventers**.

It is important to remember that the steroids used to treat asthma are not the same as the anabolic steroids used by some athletes and bodybuilders. In fact, they are similar to the steroids produced naturally by our bodies to deal with inflammation. The full name for the steroids used to treat asthma is **corticosteroids**. To learn more, see [More about steroids and asthma](#) .

It's also worth noting that when steroids are inhaled, the medicine goes directly to the lungs, where it's needed. This means your child takes a much smaller dose than they would if they took steroid tablets - even if the inhaled dose is described as 'high'.

There are several inhaled steroids used to treat asthma. They include (with brand names):

- Beclometasone (Qvar)
- Budesonide (Pulmicort)
- Fluticasone (Flixotide)
- Mometasone (Asmanex).

#### The inhaler

There are lots of different types and brands of inhalers that your child can use to breathe in this medicine. The most common type is a metered-dose inhaler (MDI). This is a small plastic device with a slot for an aerosol canister that has the steroid drug inside. Pressing the inhaler releases the exact dose of the medicine as a cloud of tiny droplets that your child slowly breathes in through his or her mouth.

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Younger children and babies cannot use an MDI on its own because it takes quite a lot of coordination to be able to breathe in and release the dose at the same time. Two other devices can help younger children take inhaled medicine: a **spacer** device, which is often used with a face mask, and a **nebuliser**. To read more, see [How to take asthma drugs](#)

### When are they given?

Your doctor may prescribe steroids from an inhaler if your child has been using a [quick-relief inhaler](#) regularly but is still getting symptoms.

### How can they help?

Breathing in high doses of steroids may help your child in the following ways: <sup>[36]</sup> <sup>[37]</sup> <sup>[38]</sup> <sup>[39]</sup>

- Your child may be less wheezy
- Your child may sleep better
- Your child may need to take other asthma treatments less often.

Young children sometimes have problems breathing in their medicine. If this happens, your doctor may suggest a higher dose of steroids to make sure your child gets enough of their treatment. <sup>[12]</sup> But as a rule, doctors prescribe the lowest dose of steroids that works. This is to reduce the chance of getting side effects.

### How do they work?

In older children and adults, steroid inhalers are very helpful in preventing symptoms. There's also some research that suggests they also work for younger children.

Children who have asthma have swollen air passages. Steroids help because they reduce swelling, which opens up the airways. They also help prevent further **inflammation**. This makes it easier for your child to breathe, and reduces wheezing.

If the airways are less inflamed, they are less likely to be extra-sensitive to **asthma triggers** such as **allergens**.

Steroids also help to reduce the amount of sticky fluid that can build up in air passages and block them.

### Can they be harmful?

Not much is known about the effects of using steroid inhalers in very young children.

In older children, a fungal infection (called thrush or candidiasis) in the throat is one of the most common problems when using a steroid inhaler. It's not usually serious.

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There has been concern among doctors that high doses of steroids can sometimes stop the adrenal glands working properly.<sup>[26] [40]</sup> Adrenal glands lie just above the kidneys. They make hormones that help the body run smoothly. For example, they help to regulate the heart and kidneys and the amount of glucose (sugar) in the blood. The reports of steroids affecting the adrenal glands have mainly involved the drug fluticasone.<sup>[26] [27]</sup>

Perhaps the biggest worry for parents comes from reports that taking steroids can stunt the growth of children. The research seems to show that steroids may slow down growth in children in the first year or two of treatment, but it's not clear if this affects their adult height. It's important to remember that asthma that isn't properly treated could also stop your child growing as quickly. To learn more, see [More about steroids and asthma](#) .

### **How good is the research on high doses of steroids from an inhaler to prevent wheezing in babies and young children?**

There is good evidence that high doses of inhaled steroids can help prevent wheezing in very young children.<sup>[37] [38] [39]</sup> But this treatment can also be harmful if taken for a long time at high doses. So doctors may not want to use them very much, especially in children who are young.

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## **Trying to get rid of dust mites in your home to prevent wheezing in babies and young children**

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[How good is the research on trying to get rid of dust mites in your home to prevent wheezing in babies and young children?](#)

This information is for parents of a baby or young child with wheezing. It tells you about trying to get rid of dust mites in your home, a treatment used to prevent wheezing and asthma. It is based on the best and most up-to-date research.

### **Does it work?**

No. Although droppings left by house dust mites are a common asthma trigger, trying to get rid of mites from your home makes no difference to asthma symptoms.

### **What is it?**

House dust mites are tiny, eight-legged creatures that live in soft furnishings, such as mattresses, pillows, and carpets. Their droppings make up part of normal household dust.

Some studies have found that people's asthma improves when they stay at high-altitude hospitals in the Alps, where dust mites can't survive. This has led some doctors to



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recommend trying to control dust mites in your home as a way of preventing asthma attacks.

There are several ways of trying to get rid of dust mites. We've listed some of them below. But remember, all these things have been tested, and they don't help to improve asthma symptoms. Some of them can be expensive or hard work, so they're probably not worth trying.

Studies on getting rid of dust mites have looked at: <sup>[41]</sup>

- Using mite-proof mattress, duvet, and pillow covers
- Washing bedding in hot water (say, 60°C) every week
- Hanging bed linen out in the sun to kill dust mites
- Using chemical sprays to kill dust mites on furniture
- Having an air filter or dehumidifier in your home
- Vacuuming regularly. Some studies looked at vacuums with special air filters
- Getting rid of soft toys, or putting them in the freezer every so often to kill dust mites
- Dusting with a damp cloth, to catch dust rather than stirring it up
- Getting rid of soft furnishings. For example, carpets were replaced with wood or linoleum floors. Curtains were replaced with blinds. In some studies, people even got rid of their sofas.

### How can it help?

It doesn't help. The research shows that trying to get rid of dust mites from your home makes no difference to asthma symptoms. <sup>[41]</sup>

In studies looking at both adults and children, measures to get rid of dust mites didn't affect people's asthma symptoms. <sup>[41]</sup> People needed to use their inhalers just as often as before.

There's also no evidence that pillows or bedding made of synthetic fabrics are any better than natural materials. <sup>[41]</sup>

It might seem strange that getting rid of mites makes no difference to people's asthma. But dust mites are very common. A mattress can contain millions of them. <sup>[42]</sup> It's likely that, no matter what you do, there will still be enough mites left to trigger asthma symptoms.

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It's also possible that killing dust mites doesn't get rid of all of their droppings. This may be another reason why trying to control dust mites doesn't help with asthma.

### How does it work?

We know that droppings from house dust mites can trigger asthma symptoms. So it makes sense that getting rid of mites should help improve your child's asthma. But, sadly, this doesn't seem to work. It only takes a fairly small number of mites to trigger asthma symptoms. Mites are so common that nothing you can do will kill enough of them to make a difference.

### Can it be harmful?

Trying to get rid of house dust mites from your home isn't likely to be harmful to your health. But measures to get rid of mites can be hard work and expensive. The research shows that they're unlikely to work, so you would be wasting your time and money.

### How good is the research on trying to get rid of dust mites in your home to prevent wheezing in babies and young children?

There's some good research showing that trying to control dust mites doesn't help improve people's asthma.

A large review of the research (a [systematic review](#)) looked at 54 studies, which included over 3,000 people.<sup>[41]</sup> As well as using mattress covers and mite-killing cleaning products, some of the people even got rid of their sofas or soft toys. But nothing helped. People's asthma symptoms stayed the same, and people needed to carry on using their inhalers in the same way as before.

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## Ipratropium from an inhaler to prevent wheezing in babies and young children

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[How good is the research on ipratropium from an inhaler to prevent wheezing in babies and young children?](#)

This information is for parents of a baby or young child with wheezing. It tells you about ipratropium from an inhaler, a treatment used to prevent wheezing in babies and young children. It is based on the best and most up-to-date research.

### Does it work?

We don't know. Ipratropium is normally used as an extra treatment for severe asthma attacks (where your child may need hospital treatment). There hasn't been much research on whether it can help prevent asthma attacks in babies and young children.

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## What is it?

Ipratropium is usually used as an extra treatment for children who need to go to hospital for a severe asthma attack. It's given if a [quick-relief inhaler](#), such as salbutamol or terbutaline, doesn't work on its own. It helps to open up your child's airways. You may hear doctors call ipratropium a **bronchodilator**. That's because it dilates (opens up) the bronchial tubes (airways).

Researchers are also interested in whether ipratropium can help prevent wheezing in young children, but more studies need to be done.

Ipratropium comes in a form that your child breathes in, which means the medicine gets right to the lungs, which is where it is needed. The brand name for the inhaler is Atrovert. Ipratropium also comes as a liquid that is used with a **nebuliser** (see below). The brand names for this are Ipratropium Steri-Neb and Respontin.

An inhaler is a device that holds the medicine. The most common type is a metered-dose inhaler (MDI). This is a small plastic device with a slot for an aerosol canister that has the drug inside. Pressing the canister releases the exact dose of the medicine as a cloud of tiny droplets that your child slowly breathes in through his or her mouth.

Young children sometimes have trouble using an inhaler. A device called a spacer is usually used to make it easier for them. To read more, see [How to take asthma drugs](#).

## How can it help?

We don't know if it can help. There's no evidence that breathing in ipratropium can help to prevent wheezing in young children, whether the wheezing is caused by asthma or not. <sup>[43]</sup>

## How does it work?

Ipratropium quickly opens up your child's airways. It does this by relaxing the muscles that can go into spasms (tighten suddenly) when your child inhales something he or she is sensitive to (an **asthma trigger**). Having clear airways makes it easier to breathe.

Ipratropium stops a chemical called **acetylcholine** working. It latches on to cells in the airways and prevents acetylcholine from tightening up the muscles in the air passages.

## Can it be harmful?

If your child takes ipratropium, he or she may get a dry mouth, nose, and throat, as the drug can stop the body from making enough mucus in these airways. The drug may actually **increase wheezing** in some children.

In the studies we looked at, these side effects did not seem to be a problem.

### How good is the research on ipratropium from an inhaler to prevent wheezing in babies and young children?

There's no evidence that breathing in ipratropium can help prevent wheezing in very young children. <sup>[44]</sup>

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### Salbutamol from an inhaler to prevent wheezing in babies and young children

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[How good is the research on salbutamol from an inhaler to prevent wheezing in babies and young children?](#)

This information is for parents of a baby or young child with wheezing. It tells you about regular use of salbutamol from an inhaler, a treatment used to prevent wheezing in babies and young children. It is based on the best and most up-to-date research.

#### Does it work?

We're not certain. There's no evidence from the research that breathing in salbutamol every day will help to prevent your child wheezing.

#### What is it?

Salbutamol inhalers are usually used to treat asthma symptoms when they happen. They're often called **quick-relief inhalers**. Researchers have also looked at whether using one of these inhalers regularly could prevent wheezing.

Salbutamol helps relax the muscles in the lungs so that the airways open up, making it easier for children to breathe. Your doctor may call this drug a **bronchodilator**, because it **dilates** (opens up) the **bronchial tubes** (airways).

Breathing in salbutamol is a good way to take the medicine, as the drug gets straight to the lungs, which is where it's needed. Brand names for salbutamol inhalers include Ventolin and Airomir.

Young children are usually given this medicine through a **spacer** device attached to an inhaler or **nebuliser**. That's because it can be hard for them to use the same inhalers as older children. It can take quite a bit of coordination to press down on an inhaler and breathe in at the same time. To read more, see [How to take asthma drugs](#) .

#### How can it help?

Studies so far show that breathing in salbutamol every day will not prevent your young child getting wheezy. <sup>[45]</sup> <sup>[46]</sup> When doctors prescribe these inhalers, they usually suggest children only use them when they need them.

### How does it work?

Salbutamol inhalers work well to treat asthma symptoms when they happen. They help to open up the airways in your child's lungs. This makes breathing easier.

Doctors wanted to see whether using a salbutamol inhaler regularly could prevent asthma symptoms. But salbutamol inhalers don't seem to help when they're used in this way.

### Can it be harmful?

The most common side effect of salbutamol in young children is a rise in how fast the heart beats. This is because the types of cells this drug affects are in the heart as well as in the lungs. But the studies didn't report any side effects.

Your child may also get shaking (tremors) and have low levels of **potassium** in the blood, which can be dangerous. (Your body needs potassium to balance the amount of water in your blood and body tissues, and to help your nerves and muscles work properly.) But the children in the studies we looked at did not get these effects.

### How good is the research on salbutamol from an inhaler to prevent wheezing in babies and young children?

There is no good evidence that inhaling salbutamol can help prevent wheezing in very young children. Neither of the studies we found showed this treatment to be helpful. <sup>[45]</sup>  
[46]

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## Low doses of steroids from an inhaler to prevent wheezing in babies and young children

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[How good is the research on low doses of steroids from an inhaler to prevent wheezing in babies and young children?](#)

This information is for parents of a baby or young child with wheezing. It tells you about low doses of steroids from an inhaler, a treatment used to prevent wheezing in babies and young children. It is based on the best and most up-to-date research.

### Do they work?

We're not certain. Different studies say different things. We can't be sure whether breathing in low doses of steroids helps prevent young children wheezing, but it might help some symptoms. We need more research to know for certain.

Your doctor may prescribe a steroid inhaler if your child has been using a [quick-relief inhaler](#) regularly but is still getting symptoms. Doctors try to prescribe the lowest dose

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of steroids that works. Higher doses aren't used very often, as doctors think they cause too many side effects.

### What are they?

#### The medicine

Steroids calm down and prevent the swelling ( **inflammation** ) in the airways of children with asthma. Your child can breathe in the medicine through a device called an **inhaler**.

Steroid inhalers are usually used to prevent wheezing and asthma attacks. Your doctor may refer to this medicine as a **preventer**.

It is important to remember that the steroids used to treat asthma are not the same as the anabolic steroids used by some athletes and bodybuilders. In fact, they are a direct copy of steroids produced naturally by our bodies to deal with inflammation. The full name for the steroids used to treat asthma is **corticosteroids**. To learn more, see [More about steroids and asthma](#) .

It's also worth noting that when steroids are inhaled, the medicine goes directly to the lungs, where it's needed. This means your child takes a much smaller dose than they would if they took steroid tablets.

There are several steroid inhalers used to treat asthma. They include (with brand names):

- Beclometasone (Qvar)
- Budesonide (Pulmicort)
- Fluticasone (Flixotide)

#### The inhaler

There are lots of different types and brands of inhalers that your child can use to breathe in this medicine. The most common type is a metered-dose inhaler (MDI). This is a small plastic device with a slot for an aerosol canister that has the steroid drug inside. Pressing the inhaler releases the exact dose of the medicine as a cloud of tiny droplets that your child slowly breathes in through his or her mouth.

Younger children and babies cannot use an MDI on its own because it takes quite a lot of coordination to be able to breathe in and release at the same time. Two other devices can help younger children take inhaled medicine: a **spacer** device, which is often used with a face mask, and a **nebuliser**. To read more, see [How to take asthma drugs](#) .

### How can they help?

The research isn't clear on whether low doses of steroids from an inhaler help children with asthma.<sup>[37]</sup> But in some studies of children under 2 years old, a low dose of steroids helped them:<sup>[47]</sup>

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- Get less breathless
- Wheeze less during the day
- Cough less during the day.

### How do they work?

Steroid inhalers are a good way of preventing asthma symptoms. Researchers thought a dose of steroids might help young children and babies. And a lower dose might have fewer side effects. But studies looking at low doses of steroids in young children have had mixed results.

The research seems more positive for higher doses of steroids. To learn more, see [High doses of steroids from an inhaler to prevent wheezing in babies and young children](#) . But steroids can have side effects. Your doctor will probably try to prescribe the lowest dose that works for your child. <sup>[12]</sup>

### Can they be harmful?

Not much is known about the effects of using steroid inhalers in very young children.

In older children, a fungal infection (called thrush or candidiasis) in the throat is one of the most common problems of using a steroid inhaler. It's not usually serious.

Perhaps the biggest worry for parents comes from reports that taking steroids can stunt the growth of children. The research seems to show that steroids may slow down growth in children in the first year or two of treatment, but it's not clear if this affects their adult height. It's important to remember that asthma that isn't properly treated could also stop your child growing as quickly. To learn more, see [More about steroids and asthma](#) .

### How good is the research on low doses of steroids from an inhaler to prevent wheezing in babies and young children?

There is not enough good enough evidence to say whether low doses of steroids can help prevent wheezing in very young children. <sup>[37] [47] [48]</sup>

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## Steroid tablets to treat more severe wheezing in babies and young children

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[How good is the research on steroid tablets to treat more severe wheezing in babies and young children?](#)

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This information is for parents of a baby or young child with wheezing. It tells you about steroid tablets, a treatment used for more severe wheezing in babies and young children. It is based on the best and most up-to-date research.

### Do they work?

Steroid tablets are often used in hospital for babies and young children who get more severe wheezing. They're used together with other treatments. These drugs have been used for a long time, and doctors think they work. But there's not much research on them.

### What are they?

Steroids are anti-inflammatory medicines. They calm down and prevent swelling ( [inflammation](#) ) in the airways of children with asthma.

If your child is having moderate or severe asthma attacks, your doctor may prescribe the steroids as tablets or a liquid, usually for about three days, to bring his or her asthma under control.

The name for steroid tablets used to treat asthma is prednisolone (brand name Deltacortril).

Steroids used to treat asthma are not the same as anabolic steroids used by some athletes and bodybuilders. In fact, asthma steroids are a direct copy of steroids produced naturally by our bodies to deal with inflammation. To learn more, see [More about steroids and asthma](#) .

### How can they help?

If your child has a moderate to severe asthma attack and is taken to the accident and emergency department in hospital, your doctor may prescribe steroid tablets.

Often this is just one part of the treatment. Children may also be given other drugs or [oxygen](#) . This is because steroid tablets take three to four hours to work. Once your child's asthma is under control and you return home, he or she may be given steroid tablets for a few days. This is to help prevent your child having another attack.

Steroid tablets are helpful in [treating asthma attacks in older children](#) . Doctors think they also help younger children. But there's not much research on this.

### How do they work?

Children who have asthma have swollen air passages. Steroids help because they open up the airways by reducing the swelling. They also help prevent further [inflammation](#) . This makes it easier for your child to breathe, and reduces wheezing.

Steroid tablets work by getting into the cells in the lining of the airways and sticking on to specific sites in these cells (called **receptor sites**). Once inside, they stop cells from producing chemicals that cause inflammation.



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If the airways are less inflamed, they are less likely to be extra-sensitive to **asthma triggers** such as [allergens](#) .

### Can they be harmful?

Steroid tablets have side effects, which can sometimes be serious. But when steroids are used as an emergency treatment for severe asthma, they're only given for a few days. Because your child will only be taking them for a short time, it cuts the risk of side effects. <sup>[49]</sup>

If your child gets any worrying symptoms while they're taking steroids, take them to see a doctor straight away.

### How good is the research on steroid tablets to treat more severe wheezing in babies and young children?

We found just one study that looked at whether steroid tablets can help very young children who are having a bad wheezing attack. <sup>[50]</sup> The steroid tablets made no difference to the babies' symptoms. But doctors think that this treatment helps, even though there's not much research.

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## High doses of steroids from an inhaler to treat more severe wheezing in babies and young children

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[How good is the research on high doses of steroids from an inhaler to treat more severe wheezing in babies and young children?](#)

This information is for parents of a baby or young child with wheezing. It tells you about high doses of steroids from an inhaler, a treatment used for more severe wheezing in babies and young children. It is based on the best and most up-to-date research.

### Do they work?

We're not certain. More research is needed into this treatment.

### What are they?

The steroids used for asthma are anti-inflammatory medicines. They calm down and prevent [inflammation](#) in the airways. Steroids from an inhaler are often used to [prevent asthma](#) .

If children have to go to hospital because of an asthma attack, they are usually given a [quick-relief inhaler](#) . Sometimes they will be given steroids at the same time. When steroids are used like this, they're usually given as [tablets](#) or a liquid. <sup>[51]</sup> Some

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researchers have looked at whether steroids can help treat an asthma attack if they're inhaled. But steroids aren't usually used this way.

It is important to remember that the steroids used to treat asthma are not the same as the anabolic steroids used by some athletes and bodybuilders. In fact, they are a direct copy of steroids produced naturally by our bodies to deal with inflammation. The full name for the steroids used to treat asthma is **corticosteroids**. To learn more, see [More about steroids and asthma](#) .

It's also worth noting that when steroids are inhaled, the medicine goes directly to the lungs, where it's needed. This means your child takes a much smaller dose than they would if they took steroid tablets - even if the inhaled dose is described as 'high'.

### How can they help?

There is no evidence that breathing in high doses of steroids helps to relieve asthma symptoms or wheezing in very young children. <sup>[37]</sup>

### How do they work?

Steroids can help to reduce swelling in the lungs and open up the airways. They're often used to prevent asthma symptoms. Steroid tablets are also used to treat severe asthma attacks.

Some researchers have looked at whether breathing in these drugs can help young children and babies who are having an asthma attack. The research doesn't give a clear answer about whether steroids work when they're used in this way.

### Can they be harmful?

We don't know much about the side effects of inhaled steroids in very young children. If steroids are given as emergency treatment for an asthma attack, they're not usually used for very long. This may mean they're less likely to cause side effects.

In older children, a fungal infection (called thrush or **candidiasis**) in the throat is one of the most common problems when using steroid inhalers. It's not usually serious.

### How good is the research on high doses of steroids from an inhaler to treat more severe wheezing in babies and young children?

There isn't any good evidence to say whether high doses of steroids from an inhaler really help treat wheezing in young children. Although there have been some studies looking into this, the results have not been clear enough to say for certain. <sup>[37]</sup> <sup>[52]</sup>

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## Ipratropium from an inhaler to treat more severe wheezing in babies and young children

In this section  
[Does it work?](#)

# Asthma in children

[What is it?](#)

[How can it help?](#)

[How does it work?](#)

[Can it be harmful?](#)

[How good is the research on ipratropium from an inhaler to treat more severe wheezing in babies and young children?](#)

This information is for parents of a baby or young child with wheezing. It tells you about ipratropium from an inhaler, a treatment for more severe wheezing in babies and young children. It is based on the best and most up-to-date research.

## Does it work?

We don't know. There's not much research on how well this treatment works for young children.

## What is it?

Ipratropium is usually used as an extra treatment for children who need to go to hospital for a severe asthma attack. It's given if a [quick-relief inhaler](#), such as salbutamol or terbutaline, doesn't work on its own. It helps to open up your child's airways. There's some research to show that it can help older children. But we don't know if it works for young children and babies.

You may hear doctors call ipratropium a **bronchodilator**. That's because it **dilates** (opens up) the **bronchial tubes** (airways).

Ipratropium comes in a form that your child breathes in with an **inhaler**. This means the medicine gets right to the lungs, which is where it is needed. The brand name for this is Atrovert. Ipratropium also comes as a liquid that is used with a **nebuliser** (see below). The brand names for this are Ipratropium Steri-Neb and Respontin.

An inhaler is a device that holds the medicine. The most common type is a metered-dose inhaler. This is a small plastic device with a slot for an aerosol canister that has the drug inside. Pressing the canister releases the exact dose of the medicine as a cloud of tiny droplets that your child slowly breathes in through his or her mouth.

Young children sometimes have trouble using an inhaler. A device called a spacer is usually used to make it easier for them. A nebuliser can also be used. To read more, see [How to take asthma drugs](#).

## How can it help?

We don't know if it does. One study looked at children who were given ipratropium and a quick-relief drug called fenoterol.<sup>[53]</sup> Children who took both drugs were less likely to need more treatment than children who just took fenoterol.

The research found that ipratropium can help pre-school and school-age children.<sup>[54]</sup> But there's not enough research to know whether it helps very young children.

### How does it work?

Ipratropium can help to relieve asthma symptoms because it quickly opens up your child's airways. It does this by relaxing the muscles that can go into spasms (tighten suddenly) when your child breathes in something he or she is sensitive to (an **asthma trigger**). Having clear airways makes it easier to breathe.

Ipratropium stops a chemical called **acetylcholine** working. It latches on to cells in the airways and prevents acetylcholine from tightening up the muscles in the air passages.

### Can it be harmful?

If your child takes ipratropium, he or she may get a dry mouth, nose, and throat, as the drug can stop the body from making enough mucus in these airways. The drug may actually **increase wheezing** in some children. But in the studies we looked at, these effects did not seem to be a problem.

### How good is the research on ipratropium from an inhaler to treat more severe wheezing in babies and young children?

There's not much research on how well ipratropium works as a treatment for asthma attacks in babies and young children. <sup>[54]</sup>

One study looked at children who were given ipratropium and a quick-relief drug called fenoterol. <sup>[53]</sup> Children who took both drugs were less likely to need more treatment than children who just took fenoterol. But there's not enough research to know for certain that it helps.

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## Avoiding allergens to prevent wheezing in babies and young children

In this section

[Does it work?](#)

[What is it?](#)

[How can it help?](#)

[How does it work?](#)

[Can it be harmful?](#)

[How good is the research on avoiding allergens to prevent wheezing in babies and young children?](#)

This information is for parents of a baby or young child with wheezing. It tells you about avoiding allergens, a treatment used to prevent wheezing and asthma.

### Does it work?

We're not certain. There hasn't been enough research yet to know whether avoiding allergens will improve your child's wheezing and asthma.

# Asthma in children

## What is it?

There may be things in your home and outdoors that can trigger your child's asthma. <sup>[55]</sup> These are known as **allergens**. For example, you may find that being around pollen or pets brings on your child's symptoms. About 30 in 100 to 50 in 100 people with asthma also get these symptoms again six to 10 hours after they breathe in an allergen. This is a **late reaction**. <sup>[3]</sup> Staying away from allergens may help keep your child's asthma under control.

Some doctors call all asthma triggers allergens, but others group them into **allergens** and **environmental factors**.

- The most common allergens are droppings from dust mites, pollen, and flakes of skin or hair from animals.
- Environmental factors include tobacco smoke and air pollution.

## How to avoid allergens

You can take steps to avoid allergens. This may help keep your child's asthma under control. <sup>[12]</sup> <sup>[56]</sup>

- Keep your child away from the things that start their asthma attacks, such as pollen or animals.
- Don't smoke. Keep your child away from smoky places.
- Make certain your child washes their hands after touching things that trigger their asthma (a friend's dog or cat, for example).
- Remember that pet hair is hard to get rid of. It's possible to get asthma symptoms for months after a pet last lived in a house.
- Use solid or liquid cleaning products rather than sprays.
- Keep strong smells and perfumes out of your home.
- Open your windows regularly to air the rooms. But close the windows if there are exhaust fumes or smoke coming in.

As well as avoiding allergens, make sure your child takes his or her asthma medicines the way your doctor or nurse advises.

## How can it help?

There isn't much good research on avoiding allergens. <sup>[57]</sup>

## Asthma in children

Researchers have looked at whether avoiding tobacco smoke helps asthma symptoms.

- One review of studies found that pre-school children who were around a moderate amount of smoke in their home had a 30 percent higher chance of getting asthma symptoms. <sup>[58]</sup>
- Another study with 807 children found that children's asthma symptoms seemed to improve when parents smoked less around them. <sup>[59]</sup>

Dust mite droppings are a common asthma trigger. Unfortunately, research shows that trying to rid your home of dust mites is unlikely to make any difference to your child's asthma. To read more, see [Trying to get rid of dust mites in your home to prevent wheezing in babies and young children](#) .

### How does it work?

When your child breathes in an allergen, their **immune system** overreacts because it thinks the allergen is dangerous. It pumps lots of chemicals into the blood. These chemicals make your child's airways swollen and **inflamed** . The muscles in their airways also tighten, the air passages get narrower, and your child has trouble breathing. It all happens very quickly. They may also have a second reaction six to 10 hours later.

Avoiding the allergens that trigger these reactions may help keep your child's asthma under control.

### Can it be harmful?

Avoiding allergens is unlikely to be harmful. However, it may mean that your child won't be able to go to certain places if an allergen is present (for example, to a friend's house if the family has a dog).

### How good is the research on avoiding allergens to prevent wheezing in babies and young children?

There isn't enough good research to know whether avoiding allergens will help your child's asthma. <sup>[57]</sup> Some research suggests that avoiding cigarette smoke may reduce symptoms. <sup>[58]</sup> <sup>[59]</sup> Other studies have found that avoiding [dust mite droppings](#) may not. <sup>[41]</sup>

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## Quick-relief inhalers to treat asthma symptoms in older children

In this section

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[How can they help?](#)

[How do they work?](#)

[Can they be harmful?](#)

# Asthma in children

[How good is the research on quick-relief inhalers to treat asthma symptoms in older children?](#)

This information is for parents of a child who has asthma. It tells you about quick-relief inhalers, a treatment used for asthma symptoms. It is based on the best and most up-to-date research.

## Do they work?

Yes, a quick-relief inhaler is the best way to help your child's breathing when they get asthma symptoms. These inhalers are called **relievers** and are usually blue. They contain medicines such as salbutamol or terbutaline.

If your child has mild asthma, one of these inhalers may be the only treatment they need. They'll be able to use their inhaler whenever they get asthma symptoms.

## What are they?

Quick-relief inhalers (salbutamol or terbutaline) are the main treatments used to improve breathing in children with asthma. They act fast so your child should find it easier to breathe within a few minutes of using their inhaler. But their effects don't last very long.

If your child gets wheezy during exercise, a puff or two from one of these inhalers before they start may help prevent the wheezing. In general, though, quick-relief inhalers such as salbutamol or terbutaline are for treating asthma symptoms, not preventing them.

Your doctor may refer to these drugs as **bronchodilators** because they open up (**dilate**) the airways (**bronchial tubes**). You may also hear them called either **fast-acting** or **short-acting inhalers**.

Quick-relief asthma treatments such as salbutamol and terbutaline are usually breathed in through an inhaler (puffer). They also come as tablets or syrup. But they work faster as inhalers because the drug gets straight to your child's lungs, which is where it is needed.

There are many different quick-relief inhalers. The common ones are (with brand names):

- Salbutamol (Ventolin, Airomir)
- Terbutaline (Bricanyl).

These inhalers are usually blue.

Your doctor may ask you to keep a record of how often your child needs to use a quick-relief inhaler. If your child needs a quick-relief inhaler three times a week or more, they may need a preventer medicine too (probably a [steroid inhaler](#) ).

Young children usually need a spacer device attached to an inhaler or nebuliser to take their inhaled drug. That's because it can be hard for them to use the same inhalers as older children. It can take quite a bit of coordination to press down on an inhaler and breathe in at the same time. To learn more, see [How to take asthma drugs](#) .

### How can they help?

When your child gets asthma symptoms such as wheezing, a quick-relief inhaler should make their symptoms better and help them breathe more easily. Salbutamol and terbutaline inhalers work fast: usually within a few minutes. But their effects last only a few hours. <sup>[35]</sup>

### How do they work?

Quick-relief inhalers such as salbutamol and terbutaline help your child breathe more easily by:

- Delivering the drug straight to your child's lungs, which is where it is needed
- Quickly relaxing the airways, making them wider and increasing air flow
- Helping to clear sticky mucus from your child's lungs.

Both drugs work a bit like two of the body's natural chemicals, noradrenaline and adrenaline. These natural chemicals widen the lungs' airways by relaxing the muscles in their walls. Airways get tight during an asthma attack because the muscles in their walls go into spasms. Quick-relief inhalers relieve the spasms, relaxing the airways and making them wider.

### Can they be harmful?

Your child may get headaches and trembling, especially of the hands, and your child's heart may beat faster. More rarely, children taking these drugs get dizzy or light-headed.

Inhalers are less likely to cause side effects than tablets or syrup, because very little of the inhaled drug gets into your child's bloodstream. However, side effects are more likely if your child inhales a high dose. <sup>[60]</sup>

Children who use a quick-relief inhaler (salbutamol or terbutaline) can become 'high' and hyperactive. Don't be surprised, for example, if your child has trouble getting to sleep if he or she uses an inhaler just before bedtime.

### How good is the research on quick-relief inhalers to treat asthma symptoms in older children?

Quick-relief inhalers have been used to treat asthma for a long time, and doctors are certain that they work. So most of the research has looked at the best way to use these drugs.

Studies in adults have looked at whether it's better to use an inhaler regularly, or just when you need it. <sup>[61]</sup> Another study compared children who took an asthma treatment every half hour with children who breathed it in continuously through a mask. <sup>[62]</sup> The



## Asthma in children

research shows that these drugs help however they're used. Most doctors recommend that your child just uses their inhaler when they need to.

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### Steroids from an inhaler to prevent asthma symptoms in older children

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[How do they work?](#)

[Can they be harmful?](#)

[How good is the research on steroids from an inhaler to prevent asthma symptoms in older children?](#)

This information is for parents of a child who has asthma. It tells you about steroids from an inhaler, a treatment used to prevent asthma symptoms. It is based on the best and most up-to-date research.

#### Do they work?

Yes. A regular dose of steroids from an inhaler can help prevent your child's symptoms, such as wheezing and coughing, and help your child's lungs work better. It can also reduce the number of asthma attacks he or she has and make the attacks less severe.

#### What are they?

Your GP or nurse may refer to the inhaled steroid as a **preventer**. He or she will also usually advise your child to have a **reliever inhaler** to help out if symptoms get suddenly worse. For more information about relievers, see [Quick-relief inhalers to treat asthma symptoms](#) .

There are no definite rules about when a child needs a preventer inhaler. But doctors often recommend them for children who need to use their quick-relief inhaler three times a week or more, get asthma attacks, or have trouble sleeping because of their asthma. <sup>[12]</sup>

Many parents worry about giving their children steroids. It is important to remember that they are not the same as the anabolic steroids used by some athletes and bodybuilders. In fact, the steroids used to treat asthma are like **steroids** produced naturally by our bodies to deal with **inflammation** . To learn more, see [More about steroids and asthma](#) .

It's also worth noting that when steroids are inhaled, the medicine goes directly to the lungs, where it's needed. This means your child takes a much smaller dose than they would if they took steroid tablets.

Several different types of steroid inhaler are available. Examples (with brand names) include:

- Beclometasone (Qvar)

## Asthma in children

- Budesonide (Pulmicort)
- Ciclesonide (Alvesco)
- Fluticasone (Flixotide)
- Mometasone (Asmanex).

### The inhaler

There are lots of different types and brands of inhalers. The most common type is a pressurised **metered-dose inhaler** (MDI). This is a small plastic device with a hole for an aerosol canister that has the drug inside. One press on the aerosol releases the exact dose of the medicine as a puff of tiny droplets that your child slowly breathes in through his or her mouth. To learn more about how to use an MDI and other asthma devices, see [How to take asthma drugs](#) .

Your child will usually use a steroid inhaler once a day, although the dose may vary. Your GP or nurse will want to start your child on the lowest dose that works. This may take a few attempts, and your child may be given a dose that's higher than needed at first. Your doctor or nurse can then gradually reduce the dose to find the lowest dose that works. <sup>[63] [64] [65] [66]</sup>

### How can they help?

If your child uses a steroid inhaler on a regular basis (every day or every other day): <sup>[63]</sup>  
<sup>[67] [68] [69] [21] [70] [71] [72] [73]</sup>

- They are less likely to have an asthma attack
- Their lungs should work better
- They are less likely to need other asthma medicine, including their [quick-relief inhaler](#) and [steroid tablets](#) .
- Their symptoms should get better. They should cough and wheeze less.

Steroid inhalers are more effective than other medicines for controlling asthma symptoms (including [theophylline](#) , [sodium cromoglicate](#) , [nedocromil](#) , or [salmeterol](#) ). <sup>[64] [65]</sup>  
<sup>[66] [21] [22] [23] [74] [75] [76] [77] [78] [79] [80]</sup>

How well a steroid works for your child may depend on how well they can use an inhaler. Using a spacer (a device that your child fits between the inhaler and their mouth) may help make it more effective. To learn more, see [How to take asthma drugs](#) .

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Some parents wonder whether they should wait to see how their child's asthma progresses, or even to see if it stops, before starting their child on steroids. There is no good research on what happens to children who wait before starting treatment with a steroid inhaler. However, it does seem that even children with mild asthma have inflamed airways, and steroids can reduce this [inflammation](#) .

### How do they work?

Children who have asthma have [inflamed](#) air passages. Steroids help by reducing the swelling and opening up the airways. They also prevent further inflammation. This makes it easier for your child to breathe, and reduces wheezing.

Steroids do their job by getting into cells in and around the lungs' airways. Once inside, the steroids stop these cells from releasing chemicals that cause inflammation.

If the airways are less inflamed, they are less likely to be sensitive to **asthma triggers** such as pet hair or house dust mites.

Steroids also help to reduce the amount of sticky fluid (mucus) that can build up in air passages and block them.

### Can they be harmful?

A fungal infection (called thrush or candidiasis) in the throat is one of the most common downsides of taking an inhaled steroid. Around one-third of children using steroid inhalers get this at some point. In one study, between 1 in 100 and 2 in 100 children who used a steroid inhaler got an infection. <sup>[81]</sup> It happened to less than 1 in 100 children who took a dummy treatment (a [placebo](#) ).

To reduce the chance of getting this side effect, experts advise children to use a spacer device and to rinse out their mouth after using the inhaler. This may reduce the amount of drug that's left behind in the throat.

Your child may also sound a bit hoarse, as steroids can temporarily affect the vocal cords.

Perhaps the biggest worry for parents comes from reports that taking steroids can stunt the growth of children. The research seems to show that steroids may slow down growth in children in the first year or two of treatment, but it's not clear if this affects their adult height. It's important to remember that asthma that isn't properly treated could also stop your child growing as quickly. To learn more, see [More about steroids and asthma](#) .

There has been concern among doctors that, very rarely, high doses of steroids could stop your child's adrenal glands working properly. <sup>[26]</sup> <sup>[40]</sup> The adrenal glands lie just above the kidneys. They make hormones that help your body run smoothly. The hormones your adrenal glands make help to regulate your heart and kidneys and the amount of glucose (sugar) in your blood. The cases of steroids affecting someone's adrenal glands have mainly involved the drug fluticasone. The doses involved were 500 micrograms to 2,000 micrograms a day. <sup>[26]</sup> <sup>[40]</sup>

### How good is the research on steroids from an inhaler to prevent asthma symptoms in older children?

If your child has asthma, there is very good evidence that using a steroid inhaler will improve their symptoms and prevent asthma attacks. <sup>[21] [63] [70] [67] [68] [69] [71] [72] [73]</sup>

There is also good evidence that a steroid inhaler is a better 'preventer' than any other treatment available. <sup>[63] [64] [65] [66] [74] [75] [76] [77] [78] [79] [80] [82] [83] [84]</sup>

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### Using spacer devices during more severe asthma attacks in older children

In this section

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[How do they work?](#)

[Can they be harmful?](#)

[How good is the research on using spacer devices during more severe asthma attacks in older children?](#)

This information is for parents of a child who has asthma. It tells you about using spacer devices to breathe in asthma medicine. It is based on the best and most up-to-date research.

#### Do they work?

Yes. Breathing in an asthma drug using a spacer is a good way to make sure the drug gets straight into the lungs, where it's needed.

A spacer is a plastic container that fits on to an inhaler. It makes it easier for your child to breathe in their medicine. Spacers seem to work just as well as a more complicated device called a **nebuliser**.

#### What are they?

A spacer or nebuliser is used to take many different types of asthma drugs. Here we look at whether using a spacer is a good way for your child to take his or her treatments during a more severe asthma attack. To find out about other devices, see [How to take asthma drugs](#) . These treatments may include [salbutamol or terbutaline](#) , which are used to relieve symptoms quickly.

#### Spacers



# Asthma in children

Using a spacer can make it easier to breathe in asthma medicine.

A spacer is a device that helps your child to relax and breathe normally while still getting their medicine. It is a large plastic container, usually in two halves that slot together. At one end there is a mouthpiece, and at the other a hole where an inhaler fits in.

When you press the aerosol of the inhaler, a puff of drug is released into the container. Your child can then breathe it in through the mouthpiece at the other end. Here are [tips for using a spacer](#) .

A spacer gives your child more time to inhale the medicine. With a simple inhaler there is just one chance to breathe in the drug: when the aerosol is pressed down. A spacer holds the drug in a chamber so that your child can then breathe in the drug through the mouthpiece in his or her own time. With a spacer, the drug is also more likely to end up in the lungs, where it's supposed to go. With an ordinary inhaler, the medicine can stay in the throat if the inhaler isn't used correctly.

There are several different brands of spacers that fit different makes of inhalers. It is possible to fit a face mask onto some types of spacers, instead of a mouthpiece. This makes them useful for giving inhaled medicines to young children and babies.

## Nebulisers

Nebulisers are sometimes used to help children take asthma drugs. A nebuliser is a device for breaking up asthma drugs into very tiny droplets before your child breathes them in. In theory, tiny droplets can get further into the lungs than the bigger droplets that come out of an inhaler.

The nebuliser is driven by a machine. It creates a mist of medicine that your child can breathe in through a mask. Some nebulisers use regular air to create the mist, while others use oxygen from a tank. Nebulisers are bulky but allow big doses of asthma drugs to be given. Your child will not have to coordinate pressing down and breathing in to use this machine.

## How can they help?

Research has found that spacers work just as well as a nebuliser for children who are old enough to use them. <sup>[85]</sup> <sup>[86]</sup>

- Children who use a spacer are no more likely to have to be admitted to hospital during a bad asthma attack than children who use a nebuliser.
- Children who use a spacer may spend a little less time in the accident and emergency department.

## How do they work?

If your child breathes in his or her asthma drugs with a spacer (or a nebuliser), it is more likely to go directly to your child's lungs, where it is needed. Ordinary inhalers can be

## Asthma in children

tricky to use. If your child gets it wrong, the drug can end up caught in the back of their throat, not in their lungs.

Also, using an inhaler on its own can be difficult during an attack. But with a spacer attached, an ordinary inhaler can work as well as a nebuliser in delivering high doses of medicine.

### Can they be harmful?

No, using a spacer is unlikely to harm your child. In fact, spacers may reduce the side effects caused by some drugs, as they make sure that the medicine goes straight to the lungs rather than to other parts of the body.

In the studies we found, children who used a spacer were less likely than children who used a nebuliser to have a fast heartbeat. And children who used a spacer had more oxygen in their bloodstream. <sup>[85]</sup>

However, some very young children may find it difficult to use a spacer, as these devices require more coordination than nebulisers.

If your child needs high doses of a quick-relief inhaler during an attack, you should contact your doctor or go to the accident and emergency department immediately. Your child may need other treatments.

### How good is the research on using spacer devices during more severe asthma attacks in older children?

There is good evidence that children who use a spacer to take salbutamol and terbutaline during an asthma attack recover as well as children who use a nebuliser. <sup>[85]</sup> <sup>[86]</sup>

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## Oxygen to treat more severe asthma attacks in older children

In this section

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[How does it work?](#)

[Can it be harmful?](#)

[How good is the research on oxygen to treat more severe asthma attacks in older children?](#)

This information is for parents of a child who has asthma. It tells you about using oxygen, a treatment used for more severe asthma attacks. It is based on the best and most up-to-date research.

### Does it work?

Yes, if your child is having a bad asthma attack, and needs hospital treatment, they may be given oxygen. Giving your child extra oxygen to breathe helps to get enough of it to important parts of their body.

# Asthma in children

## What is it?

Oxygen is one of the gases in the air we breathe. If you can't breathe in enough oxygen, your body can't work properly.

If your child has a severe asthma attack and is taken to hospital, he or she may be given oxygen to breathe in through a mask. This is to be certain they're getting all the oxygen they need.

## How can it help?

If your child has problems breathing, being given extra oxygen to breathe can help keep their body working properly. They may be less likely to: <sup>[87]</sup>

- Be admitted to the hospital (and stay overnight)
- Need steroids and other drugs to treat the asthma attack.

## How does it work?

Children who are having a bad asthma attack can have dangerously low levels of oxygen in their blood. The body's organs, including the heart and brain, cannot work properly without enough oxygen. When doctors, nurses, or paramedics give your child extra oxygen to breathe, they are trying to increase the supply of oxygen going to important parts of the body.

## Can it be harmful?

There is no evidence that extra oxygen can harm children having an asthma attack.

## How good is the research on oxygen to treat more severe asthma attacks in older children?

It wouldn't be fair to do studies comparing children who got oxygen during an asthma attack with children who didn't. That's because doctors have known for a long time that oxygen helps children who are having difficulty breathing because of an asthma attack.

We did find one study that showed that children did better after an asthma attack if they had higher amounts of oxygen in their blood. <sup>[87]</sup>

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## Steroid tablets to treat more severe asthma attacks in older children

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[How good is the research on steroid tablets to treat more severe asthma attacks in older children?](#)

## Asthma in children

This information is for parents of a child who has asthma. It tells you about steroid tablets, a treatment used for more severe asthma attacks. It is based on the best and most up-to-date research.

### Do they work?

Yes. If your child has a more severe asthma attack, their doctor may suggest steroid tablets alongside other treatments. Steroid tablets are often given to children who get taken to hospital with severe asthma.

Steroid tablets can improve how well your child's lungs are working, help your child get better faster, and prevent further attacks. Steroid tablets may also reduce the chances that your child will need to stay in hospital.

### What are they?

Steroids are medicines that help with **inflammation**. They calm down and prevent swelling in the airways of children with asthma.

If your child is having a moderate or severe asthma attack, your doctor may prescribe steroid tablets or syrup to control the attack and help prevent another one. Treatment usually lasts for about three days. <sup>[88]</sup>

Steroid tablets can be given to your child by a GP, and may stop your child needing treatment in hospital. Or they may be started in hospital if your child's asthma is very bad.

Steroids are usually used to treat attacks alongside other treatments such as [oxygen](#) (in hospital) and [quick-relief inhalers](#) (salbutamol or terbutaline). Steroid tablets take three to four hours to work. In the meantime, the other drugs help relieve symptoms.

If your child can't take tablets or syrups for some reason, he or she may be given a steroid drip. In a drip, steroids get into the bloodstream through a needle that's put in a vein in your child's arm.

Prednisolone, hydrocortisone, and methylprednisolone are all steroids that are used to treat asthma. Steroid tablets are usually prednisolone.

It is important to remember that steroids used to treat asthma are not the anabolic steroids used by some athletes and bodybuilders. The full name for the steroids used in asthma is **corticosteroids**. These are produced naturally by our bodies to deal with inflammation.

If your child is admitted to hospital with an asthma attack, he or she may be given steroid tablets to take for a short time when he or she returns home. This helps prevent another attack.

However, if your child has very bad asthma that isn't being controlled with other treatments, they might need to take steroids on a regular basis for a longer period.



### How can they help?

Having steroid tablets or a steroid drip may: <sup>[89]</sup>

- Speed up your child's recovery and help prevent the attack from getting worse
- Reduce the chances that your child will have to be admitted to hospital
- Reduce the chances of your child having another attack in the first few weeks or months after treatment
- Reduce the amount of time your child needs to stay in hospital because of the attack.

### How do they work?

Children who have asthma have **inflamed** air passages. The swelling makes it hard for them to breathe. Steroids open up the airways by reducing the swelling. They also help stop the inflammation getting worse. This makes breathing easier, and reduces wheezing.

Steroids work by getting inside the cells in your child's airways. Once inside, they stop these cells from releasing chemicals that cause inflammation.

If the airways are less inflamed, they are less sensitive to **asthma triggers** such as cigarette smoke or pet hair.

Steroids also help to reduce excess sticky fluid (mucus) that can build up in airways and block them.

### Can they be harmful?

Steroid tablets work well, but they do have **side effects** . When steroids are used as an emergency treatment for an asthma attack, they're only given for a few days. So the chance of serious side effects is low.

Children with very bad asthma who take steroid tablets for longer periods are at higher risk of side effects. However, their risk of harm from uncontrolled asthma is greater than their risk of possible problems from steroids.

If your child gets any worrying symptoms while they're taking steroids, take them to see a doctor straight away.

### How good is the research on steroid tablets to treat more severe asthma attacks in older children?

There is reasonably good evidence that steroid tablets will help your child get over an asthma attack, and help prevent another one. Although the studies tend to have very few people in them, the results are quite consistent. <sup>[89]</sup>

# High doses of steroids from an inhaler to treat more severe asthma attacks in older children

In this section

[Do they work?](#)

[What are they?](#)

[How can they help?](#)

[How do they work?](#)

[Can they be harmful?](#)

[How good is the research on high doses of steroids from an inhaler to treat more severe asthma attacks in older children?](#)

This information is for parents of a child who has asthma. It tells you about high doses of steroids from an inhaler, a treatment for more severe asthma attacks. It is based on the best and most up-to-date research.

## Do they work?

Yes. Breathing in high doses of steroids can help treat moderate to severe asthma attacks. Inhaling a high dose of steroids seems to work as well as taking [steroid tablets](#) and may cause fewer side effects. However, when steroids are given as a treatment for more severe asthma attacks, they're usually given as tablets, not through an inhaler.

## What are they?

Steroids are chemicals that help by calming down and preventing the **inflammation** in the airways of children with asthma. Steroid inhalers are usually used to prevent asthma attacks. But steroids are also used as an **emergency treatment** for a severe asthma attack. They're used together with a quick-relief inhaler.

If your child needs emergency treatment for a severe asthma attack, steroids are usually given as tablets. However, high doses of steroids from an inhaler may be given:

- If your child vomits up a steroid tablet
- If your child needs a lot of emergency treatment for his or her asthma. This is because of worries about the side effects of steroid tablets. The more often your child takes them, the greater the chance of side effects. There is less chance of getting side effects when using steroids from an inhaler.

High doses of steroids from an inhaler are usually given with a spacer or a nebuliser. To read more, see [How to take asthma drugs](#) .

It is important to remember that the steroids used to treat asthma are not the same as the anabolic steroids used by some athletes and bodybuilders. The full name for steroids used in asthma is **corticosteroids**. They're similar to steroids produced naturally by our bodies to deal with inflammation. To learn more, see [More about steroids and asthma](#)

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## Asthma in children

It's also worth noting that when steroids are inhaled, the medicine goes directly to the lungs, where it's needed. This means your child takes a much smaller dose than they would if they took steroid tablets - even if the inhaled dose is described as 'high'.

### How can they help?

When steroids are used to treat an asthma attack, they're usually given as tablets. There's some research to show that steroids from an inhaler work just as well as tablets.<sup>[90]</sup> <sup>[91]</sup><sup>[92]</sup> <sup>[93]</sup> But there's not enough evidence yet for doctors to think that it would be better to switch from tablets to inhalers.

### How do they work?

Children who have asthma have **inflamed** air passages. Steroids help because they open up the airways by reducing the swelling. They also help prevent further inflammation. This makes it easier for your child to breathe, and reduces wheezing.

Inhaled steroids do their job by getting into cells in the lining of the airways. Once inside, they stop these cells from releasing chemicals that cause inflammation.

If the airways are less inflamed, they are less likely to be sensitive to asthma triggers such as cigarette smoke or house dust mites.

Steroids also help to reduce excess sticky fluid (mucus) that can build up in airways and block them.

### Can they be harmful?

Most studies we found did not mention any side effects from high doses of inhaled steroids. If steroids are given as emergency treatment for an asthma attack, they're not usually used for very long. This may mean they're less likely to cause side effects.

In one study, children given high doses of inhaled steroids were slightly more likely to get an infection called thrush (candidiasis) in the mouth than children who had steroid tablets.<sup>[91]</sup> Of the children given high doses of inhaled steroids, 8 in 100 got this kind of infection. This compared with 3 in 100 children who took tablets.

### How good is the research on high doses of steroids from an inhaler to treat more severe asthma attacks in older children?

There is reasonably good evidence that breathing in high doses of steroids from an inhaler can relieve the symptoms of an asthma attack. They can make it easier for your child to breathe, improve how well the lungs are working, and help stop your child's coughing and wheezing.<sup>[90]</sup> <sup>[91]</sup> <sup>[93]</sup>

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## Ipratropium from an inhaler to treat more severe asthma attacks in older children

# Asthma in children

In this section

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[What is it?](#)

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[How does it work?](#)

[Can it be harmful?](#)

[How good is the research on ipratropium from an inhaler to treat more severe asthma attacks in older children?](#)

This information is for parents of a child who has asthma. It tells you about ipratropium from an inhaler, a treatment for more severe asthma attacks. It is based on the best and most up-to-date research.

## Does it work?

Yes. Using ipratropium with other treatments can help children who are having a severe asthma attack.

Usually, a [quick-relief inhaler](#) will help bring your child's asthma attack under control. But if the attack is severe and this doesn't work, your child might need treatment in hospital. In hospital, your child may be given ipratropium at the same time as a quick-relief inhaler. This combination should work better than a quick-relief inhaler on its own.

## What is it?

Ipratropium is a treatment for severe asthma attacks. It's used in hospital together with quick-relief inhalers, such as salbutamol and terbutaline. Your child's doctor may suggest ipratropium if quick-relief inhalers don't work on their own.

The brand name for ipratropium is Atrovent. Your child breathes it in through an inhaler, spacer, or nebuliser. They'll probably be given several doses, 20 or 30 minutes apart. To learn more about inhalers, spacers, and nebulisers, see [How to take asthma drugs](#) ).

## How can it help?

Adding ipratropium to treatment with a quick-relief inhaler: <sup>[54]</sup>

- Can help bring the asthma attack under control
- Can improve how well your child's lungs are working and help them breathe more easily
- Can improve their symptoms enough to go home (or stay home), and reduce their chances of being admitted to hospital from the accident and emergency department.

One study shows that ipratropium works best in the early stages of an asthma attack. Once your child is getting better, adding ipratropium to their other treatments probably won't help. <sup>[94]</sup>

### How does it work?

Ipratropium and the quick-relief treatments salbutamol and terbutaline quickly open up your child's airways. During an asthma attack, the muscles in your child's airways go into spasm, making the airways narrower. Ipratropium and quick-relief treatments such as salbutamol relax the muscles, widen the airways, and make it easier for your child to breathe.

Although ipratropium and quick-relief treatments do the same thing, they do it in different ways.<sup>[35]</sup> <sup>[95]</sup> So, for some children, using both treatments together works better than using one on its own.

### Can it be harmful?

If your child takes ipratropium, he or she may get a dry mouth, nose, and throat, as the drug can stop the body from making enough mucus. The drug may increase wheezing in some children. It can also make their heart beat faster.<sup>[94]</sup>

We cannot say for certain whether taking ipratropium bromide together with a quick-relief inhaler increases the chances of side effects. Most studies found no increase in side effects, even in children who had several doses of ipratropium.<sup>[54]</sup> Some studies also found that children who take both treatments may be less likely to get nausea or shaking (tremors), compared with those who use a quick-relief inhaler alone.

Take care that your child does not spray the ipratropium inhaler into their eyes. It can cause blurred vision, and increase the pressure inside the eye.<sup>[96]</sup>

### How good is the research on ipratropium from an inhaler to treat more severe asthma attacks in older children?

There is reasonably good evidence that taking ipratropium along with salbutamol or terbutaline can help relieve an asthma attack in some children.<sup>[54]</sup> <sup>[94]</sup>

A good review of the research looked at the results of 20 separate studies.<sup>[54]</sup> It found that taking ipratropium with a quick-relief inhaler worked better than a quick-relief inhaler on its own.

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## Leukotriene antagonist tablets to prevent asthma symptoms in older children

In this section

[Do they work?](#)

[What are they?](#)

[How can they help?](#)

[How do they work?](#)

[Can they be harmful?](#)

[How good is the research on leukotriene antagonist tablets to prevent asthma symptoms in older children?](#)

## Asthma in children

This information is for parents of a child who has asthma. It tells you about leukotriene antagonist tablets, a treatment used to prevent asthma symptoms. It is based on the best and most up-to-date research.

### Do they work?

Yes. A leukotriene antagonist tablet called montelukast (brand name Singulair) can help to prevent asthma symptoms in children over 2 years old.

But these tablets may not work quite as well as [steroids from an inhaler](#) , the main treatment to prevent asthma attacks in children.

### What are they?

Leukotrienes are natural chemicals your child's body makes when he or she comes into contact with an **asthma trigger** (such as house dust mite droppings). It is these chemicals that make the muscles in the airways tighten and make your child's breathing more difficult.

Leukotrienes also help the lungs produce mucus, making your child cough and the airways in the lungs **inflamed** and swollen.

Leukotriene antagonists are drugs that prevent asthma symptoms by stopping leukotrienes from making the airways in your child's lungs inflamed.

There are two leukotriene antagonists: zafirlukast (brand name Accolate) and montelukast (brand name Singulair). Both come as tablets. Zafirlukast is not recommended for children under 12 years old. All the research in children looks at montelukast.

Your doctor or nurse may refer to this medicine as a **preventer**. These drugs are designed to be used together with other asthma treatments such as [quick-relief inhalers](#) (salbutamol or terbutaline) and sometimes [steroids from an inhaler](#) .

### How can they help?

If your child takes leukotriene antagonist tablets (the only one studied in children is montelukast), this is how they might help: <sup>[97]</sup> <sup>[98]</sup> <sup>[99]</sup> <sup>[100]</sup>

- Your child may get fewer symptoms during the day and at night
- Your child may get better scores on lung tests
- Your child may not need to use their quick-relief inhaler (salbutamol or terbutaline) so often

Montelukast doesn't seem to work as well as steroids from an inhaler. <sup>[76]</sup> <sup>[77]</sup> <sup>[78]</sup> <sup>[79]</sup>  
<sup>[80]</sup> <sup>[101]</sup>

### How do they work?

Children who have asthma have **inflamed** air passages. Leukotriene antagonists help because they open up the airways by reducing the swelling. They also help prevent further inflammation. This makes it easier for your child to breathe, and reduces wheezing.

They do their job by preventing leukotrienes from doing what they normally do. Leukotrienes are released into the blood by your child's immune system after he or she breathes in an **asthma trigger** (such as house dust mites or smoke). Leukotrienes are one of many chemicals that make the air passages swell up and breathing more difficult in children with asthma.

If the airways are less inflamed, breathing becomes easier.

Leukotriene antagonists also help to reduce the amount of sticky fluid (excess mucus) that can build up in air passages and block them.

### Can they be harmful?

Leukotriene antagonists have been linked with a condition called **Churg-Strauss syndrome**.<sup>[102]</sup> But this is very rare, and it's not completely clear whether leukotriene antagonists really cause the condition. People with Churg-Strauss syndrome get very severe asthma along with other symptoms, such as a rash, numbness in the hands and feet, and a high level of white blood cells. If it's not treated, it can lead to heart and kidney problems and very severe breathing difficulties. Treatment usually involves high-dose steroid tablets. If your child gets a rash or their asthma gets worse, **see your doctor immediately**.

Some people taking montelukast have found they get changes in their mood. In severe cases, these can be bad enough for someone to feel suicidal. In the US, the Food and Drug Administration is investigating to find out whether these mood changes were caused by montelukast.<sup>[103]</sup> If you're concerned about any thoughts or feelings your child expresses while they're taking montelukast, talk to their doctor as soon as you can.

### How good is the research on leukotriene antagonist tablets to prevent asthma symptoms in older children?

We found several good-quality studies ( **randomised controlled trials** ) showing that a leukotriene antagonist called montelukast can improve how well a child's lungs work, prevent symptoms of asthma, and reduce the amount of other drugs a child needs to control their asthma.<sup>[97] [98] [99] [100]</sup>

We also found several studies comparing montelukast tablets with [steroids from an inhaler](#) .<sup>[69] [71] [76] [77] [78] [79] [80] [104] [105] [106] [101]</sup> Overall, these studies found that montelukast doesn't work as well as inhaled steroids.

# Nedocromil from an inhaler to prevent asthma symptoms in older children

In this section

[Does it work?](#)

[What is it?](#)

[How can it help?](#)

[How does it work?](#)

[Can it be harmful?](#)

[How good is the research on nedocromil from an inhaler to prevent asthma symptoms in older children?](#)

This information is for parents of a child who has asthma. It tells you about nedocromil from an inhaler, a treatment used to prevent asthma symptoms. It is based on the best and most up-to-date research.

## Does it work?

Yes, nedocromil seems to work for many children. Taking it regularly helps improve their asthma symptoms and makes attacks less likely and less severe.

But it does not work as well as [steroids from an inhaler](#) .

## What is it?

Nedocromil is an anti-inflammatory drug that is breathed in through an inhaler. Its job is to reduce the swelling ( inflammation ) in the airways and prevent asthma symptoms. It is not designed to treat an asthma attack.

Your doctor or nurse may refer to this medicine as a **preventer**. Its brand name is Tilade.

Breathing in nedocromil is a good way to take the medicine, as the drug gets straight to the lungs, where it's needed. The most common type of inhaler is a metered-dose inhaler. This is a small plastic device with a slot for an aerosol canister that has the nedocromil inside. One press on the aerosol releases the exact dose of the medicine as a puff of tiny droplets that your child slowly breathes in through his or her mouth.

A nedocromil inhaler can be used with a spacer. To learn more, see [How to take asthma drugs](#) .

Your child may need to take nedocromil two to four times a day for a couple of weeks before it starts working properly. It may be a month or so before they get the full effects.

Your doctor might suggest a nedocromil inhaler if your child has mild or moderate asthma. But he or she will probably suggest your child tries a steroid inhaler first.

Research shows that steroids from an inhaler are better at preventing asthma symptoms than nedocromil from an inhaler.



# Asthma in children

## How can it help?

If your child is more than 5 years old and has mild to moderate asthma, this is how inhaling nedocromil each day can help: <sup>[107]</sup> <sup>[108]</sup> <sup>[109]</sup>

- It may improve asthma symptoms such as coughing and wheezing
- Your child may be less likely to wake up at night because of symptoms
- It may reduce how often your child has an asthma attack where he or she needs to use a [quick-relief inhaler](#)
- It can mean fewer emergency trips to the doctor because of asthma attacks.

Nedocromil is not as good at preventing asthma symptoms as steroids from an inhaler. <sup>[107]</sup>

## How does it work?

Nedocromil seems to help prevent swollen airways, making it easier for your child to breathe and less likely that he or she will react to asthma triggers (such as house dust mite droppings and smoke).

Experts are not exactly sure how nedocromil works to reduce swelling and sensitivity in the airways. It probably stabilises the outer layer of cells (called mast cells) in the lining of the airways, which stops them from releasing the chemicals that cause inflammation

Nedocromil also seems to stop your child's immune system from reacting suddenly to exercise, cold air, and pollution.

## Can it be harmful?

Although children in the study we looked at did not seem to get any side effects, nedocromil may irritate your child's throat, restrict the airways slightly, and cause coughing. Your child may also get headaches, nausea, and an upset stomach.

## How good is the research on nedocromil from an inhaler to prevent asthma symptoms in older children?

There is good evidence that breathing in nedocromil can help to prevent symptoms of asthma in children. <sup>[107]</sup> <sup>[108]</sup> <sup>[109]</sup> It is also likely to reduce the amount of quick-relief inhaler your child needs. But this treatment may take some time to work. It might be six weeks before you notice any benefit.

# Theophylline drips to treat more severe asthma attacks in older children

In this section

[Do they work?](#)

[What are they?](#)

[How can they help?](#)

[How do they work?](#)

[Can they be harmful?](#)

[How good is the research on theophylline drips to treat more severe asthma attacks in older children?](#)

This information is for parents of a child who has asthma. It tells you about theophylline drips, a treatment used to treat more severe asthma attacks. It is based on the best and most up-to-date research.

## Do they work?

If your child is having an asthma attack, putting theophylline into their vein with a drip might help unblock their air passages, making it easier and more comfortable to breathe. The evidence is conflicting, though, and theophylline can have some unpleasant side effects. For this reason, theophylline drips are rarely used. If they are used, it's for very bad asthma attacks where other treatments haven't helped.<sup>[12]</sup> When it's given as a drip, a version of theophylline called aminophylline is usually used.

## What are they?

Asthma attacks happen when your child's airways come into contact with an asthma trigger they are sensitive to (such as house dust mites). The airway muscles react by going into spasms, which narrows the air passages. Theophylline relaxes the muscles so that the airways open up, making it easier for your child to breathe.

Your doctor may refer to theophylline as a **bronchodilator** because it opens up (**dilates**) the airways (**bronchial tubes**).

Theophylline comes as a tablet, liquid, or drip. Here, we talk about the drip. When your child has a drip, the medicine is given through a tube directly into a vein. It is also called an IV or **intravenous infusion**.

Theophylline drips are not often used to help relieve asthma attacks because they do not work as well as some of the newer asthma drugs. If your child is having a bad attack, your doctor is more likely to prescribe a [quick-relief inhaler](#), containing either salbutamol or terbutaline (to breathe in), and steroids ([to breathe in at a high dose](#) or to [take as tablets](#)). These work for most children.

If your child is having a severe asthma attack and other treatments do not help, a theophylline drip may be a reasonable option.

## How can they help?

A theophylline drip may:<sup>[110]</sup>

## Asthma in children

- Improve how well your child's lungs work and increase the amount of oxygen that gets into the bloodstream
- Help your child's asthma get better faster than if they didn't have a theophylline drip.

### How do they work?

The purpose of theophylline drips is to help keep the airways open, making it easier for air to get into your child's lungs. Theophylline does this by relaxing the muscles in the air passages, preventing them from going into spasms and closing up when your child breathes in **asthma triggers** such as house dust mites.

Experts are not exactly sure how theophylline works. It seems to keep the muscles relaxed by stopping certain cells (called mast cells) in the lining of the air passages from releasing chemicals that cause muscles to tighten up.

### Can they be harmful?

Theophylline drips may make your child vomit or feel quite sick. About one-third of the children given this drug in studies were sick. <sup>[110]</sup>

Theophylline drips have to be given slowly and carefully. If theophylline is put into the body too fast, it can cause seizures (fits) or heart palpitations. <sup>[111]</sup>

### How good is the research on theophylline drips to treat more severe asthma attacks in older children?

The evidence is conflicting on whether theophylline is worth trying when other treatments do not relieve an asthma attack. There is no really strong evidence either way. The few studies that have been done have not had very many people in them. <sup>[110]</sup> Also, some studies were stopped because many of the children felt sick or vomited.

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## Theophylline tablets to prevent asthma symptoms in older children

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[How good is the research on theophylline tablets to prevent asthma symptoms in older children?](#)

This information is for parents of a child who has asthma. It tells you about theophylline tablets, a treatment used to prevent asthma symptoms. It is based on the best and most up-to-date research.

## Asthma in children

### Do they work?

Taking theophylline tablets might help improve how well your child's lungs work. But they can have **serious side effects**. So most doctors try other treatments first, such as [steroids from an inhaler](#) .

### What are they?

Theophylline is a drug that opens up the air passages. Asthma symptoms are triggered when your child breathes in something they are sensitive to, such as house dust mites or pet hair. The airway muscles react by going into spasms, which narrows the air passages. Theophylline helps relieve symptoms by keeping the muscles relaxed and the airways open. This makes it easier for your child to breathe.

Theophylline tablets do not start working straight away, so they should not be used to provide quick relief in an asthma attack. For quick relief, theophylline has to be injected through a drip. For more details, see [Theophylline drips to treat more severe asthma attacks](#) .

Your child may need blood tests to check that they are getting the right dose of theophylline. It can be difficult for doctors to get the dose right.

Theophylline tablets can be used alongside [steroids from an inhaler](#) in children with poorly controlled asthma, especially if night-time symptoms are a problem. To learn more, see [Theophylline tablets as an extra treatment to prevent asthma symptoms](#) . But for these children, it's more usual for doctors to prescribe a [salmeterol inhaler](#) .

### How can they help?

If your child takes theophylline: <sup>[112]</sup>

- Their lungs may work better (their lung function may improve)
- They may not need to take reliever medicines as frequently to treat asthma symptoms and attacks.

But theophylline tablets can have serious side effects. And research doesn't show that they work any better than [inhaled steroids](#) , which are a safer treatment. <sup>[64]</sup>

### How do they work?

The main job of theophylline tablets is to help keep the airways open, making it easier for air to get into your child's lungs. Theophylline does this by relaxing the muscles in the air passages, stopping them from going into spasm and closing up when your child breathes in an asthma trigger.

Experts are not exactly sure how theophylline does its job. It seems to keep the muscles relaxed by stopping certain cells (called mast cells) from releasing chemicals that cause the muscles in your child's airways to tighten up. These chemicals are called histamine

## Asthma in children

and prostaglandin. Theophylline may also stop the airways from becoming extra-sensitive to these chemicals in the first place, so the muscles are less likely to tighten up when the chemicals are released.

Theophylline tablets also seem to help control inflammation and swelling in the airways. They are not as good at this as other treatments, such as steroids from an inhaler.

### Can they be harmful?

This medicine can have side effects such as indigestion, feeling sick, or vomiting.<sup>[112]</sup> Theophylline tablets are more likely than steroid inhalers to cause headaches, stomach problems, and shaking (tremor).

If your child gets too much of the drug, there's a chance he or she could get serious heart palpitations or have a seizure (fit).<sup>[113]</sup>

### How good is the research on theophylline tablets to prevent asthma symptoms in older children?

We found one good-quality study (a randomised controlled trial) showing that theophylline may help children's lungs work better and prevent asthma attacks.<sup>[112]</sup> However, we also found another good study showing that theophylline doesn't work any better than [steroids from an inhaler](#), which are a safer treatment.<sup>[64]</sup> For this reason, doctors usually recommend using inhaled steroids first.

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## Sodium cromoglicate from an inhaler to prevent asthma symptoms in older children

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[Can it be harmful?](#)

[How good is the research on sodium cromoglicate from an inhaler to prevent asthma symptoms in older children?](#)

This information is for parents of a child who has asthma. It tells you about sodium cromoglicate from an inhaler, a treatment used to prevent asthma symptoms. It is based on the best and most up-to-date research.

### Does it work?

Not very well. The research on sodium cromoglicate has found that it doesn't help children with asthma, or only helps a small amount. [Steroids from an inhaler](#) are usually a better treatment for preventing asthma. Your child's doctor may recommend sodium cromoglicate if steroids don't help or aren't suitable for some reason.

### What is it?

Sodium cromoglicate is an anti-inflammatory medicine that is breathed in through an inhaler to help keep asthma symptoms at bay. Its job is to prevent the swelling ( inflammation ) in the airways to keep asthma under long-term control. It isn't designed to treat an asthma attack.

Your doctor or nurse may refer to this medicine as a **preventer**. One brand is Intal.

Breathing in sodium cromoglicate is a good way to take the drug, as it gets straight to the lungs, where it's needed. Sodium cromoglicate comes in a dry powder inhaler called a Spinhaler.

Sodium cromoglicate is generally prescribed for children with relatively mild asthma. Your doctor may suggest trying this treatment if your child needs their [quick-relief inhaler](#) more than once a day. But your doctor will probably recommend that your child tries [steroids from an inhaler](#) first. <sup>[12]</sup>

### How can it help?

If your child gets asthma symptoms often, a sodium cromoglicate inhaler might improve their symptoms a little. <sup>[114]</sup>

Most children find that steroid inhalers work better than sodium cromoglicate inhalers.

### How does it work?

Sodium cromoglicate seems to calm down and prevent swollen airways, making it easier for your child to breathe and less likely that he or she will react to asthma triggers (such as house dust mites and smoke).

Experts are not exactly sure how sodium cromoglicate works. They think that it probably stabilises the outer layer of cells, called mast cells, in the lining of the airways. This stops them from releasing the chemicals that cause inflammation .

### Can it be harmful?

Not many children in the studies got side effects. And the side effects children did get weren't usually serious. They included coughing, a bad taste in the mouth, irritation around the mouth, and a sore throat.

### How good is the research on sodium cromoglicate from an inhaler to prevent asthma symptoms in older children?

The research on sodium cromoglicate is mixed. <sup>[114]</sup> Some research says it doesn't help any more than a pretend treatment (a placebo ). Some says that it only helps a little bit. There's reasonably good research showing that sodium cromoglicate does not work as well as [steroids from an inhaler](#) at preventing asthma symptoms.

# Trying to get rid of dust mites in your home to prevent asthma symptoms in older children

In this section

[Does it work?](#)

[What is it?](#)

[How can it help?](#)

[How does it work?](#)

[Can it be harmful?](#)

[How good is the research on trying to get rid of dust mites in your home to prevent asthma symptoms in older children?](#)

This information is for parents of a child who has asthma. It tells you about trying to get rid of dust mites in your home, a treatment used to prevent asthma symptoms. It is based on the best and most up-to-date research.

## Does it work?

No. Although droppings left by house dust mites are a common asthma trigger, trying to get rid of mites from your home doesn't make any difference.

## What is it?

House dust mites are tiny, eight-legged creatures that live in soft furnishings, such as mattresses, pillows, and carpets. Their droppings make up part of normal household dust.

Some studies have found that people's asthma improves when they stay at high-altitude hospitals in the Alps, where dust mites can't survive. This has led some doctors to recommend trying to control dust mites in your home as a way of preventing asthma attacks.

There are several ways of trying to get rid of dust mites. We've listed some of them below. But remember, all these things have been tested, and they don't help to improve asthma symptoms. Some of them can be expensive or hard work, so they're probably not worth trying.

Studies on getting rid of dust mites have looked at: <sup>[41]</sup>

- Using mite-proof mattress, duvet, and pillow covers
- Washing bedding in hot water (say 60°C) every week
- Hanging bed linen out in the sun to kill dust mites
- Using chemical sprays to kill dust mites on furniture
- Having an air filter or dehumidifier in your home
- Vacuuming regularly. Some studies looked at vacuums with special air filters

## Asthma in children

- Getting rid of soft toys, or putting them in the freezer every so often to kill dust mites
- Dusting with a damp cloth, to catch dust rather than stirring it up
- Getting rid of soft furnishings. For example, carpets were replaced with wood or linoleum floors. Curtains were replaced with blinds. In some studies, people even got rid of their sofas.

### How can it help?

It doesn't help. The research shows that trying to get rid of dust mites from your home makes no difference to asthma symptoms. <sup>[41]</sup>

In studies looking at both adults and children, measures to get rid of dust mites didn't affect people's asthma symptoms. <sup>[41]</sup> People needed to use their inhalers just as often as before.

There's also no evidence that pillows or bedding made of synthetic fabrics are any better than natural materials. <sup>[41]</sup>

It might seem strange that getting rid of mites makes no difference to people's asthma. But dust mites are very common. A mattress can contain millions of them. <sup>[42]</sup> It's likely that, no matter what you do, there will still be enough mites left to trigger asthma symptoms.

It's also possible that killing dust mites doesn't get rid of all of their droppings. This may be another reason why trying to control dust mites doesn't help with asthma.

### How does it work?

We know that droppings from house dust mites can trigger asthma symptoms. So it makes sense that getting rid of mites should help improve your child's asthma. But, sadly, this doesn't seem to work. It only takes a fairly small number of mites to trigger asthma symptoms. Mites are so common that nothing you can do will kill enough of them to make a difference.

### Can it be harmful?

Trying to get rid of house dust mites from your home isn't likely to be harmful to your health. But measures to get rid of mites can be hard work and expensive. The research shows that they're unlikely to work, so you would be wasting your time and money.

### How good is the research on trying to get rid of dust mites in your home to prevent asthma symptoms in older children?

There's some good research showing that trying to control dust mites doesn't help improve people's asthma.



## Asthma in children

A large review of the research (a [systematic review](#) ) looked at 54 studies that included over 3,000 people.<sup>[41]</sup> As well as using mattress covers and mite-killing cleaning products, some of the people even got rid of their sofas or soft toys. But nothing helped. People's asthma symptoms stayed the same, and people needed to carry on using their inhalers in the same way as before.

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### Increasing the dose of steroids from an inhaler to prevent asthma symptoms in older children

In this section

[Does it work?](#)

[What is it?](#)

[How can it help?](#)

[How does it work?](#)

[Can it be harmful?](#)

[How good is the research on increasing the dose of steroids from an inhaler to prevent asthma symptoms in older children?](#)

This information is for parents of a child who has asthma. It tells you about increasing the dose of steroids from an inhaler, a treatment used to prevent asthma symptoms. It is based on the best and most up-to-date research.

#### Does it work?

We're not certain. There isn't enough research to give a clear answer. Inhaled steroids are one of the best treatments to help prevent asthma attacks and improve how well the lungs work. But if your child still has poorly controlled asthma, we don't know whether increasing their dose of inhaled steroids will help.

#### What is it?

Steroids calm down and prevent swelling ( [inflammation](#) ) in the airways of children with asthma. To prevent asthma symptoms, steroids are usually breathed in (inhaled) through an inhaler. Breathing in the medicine is a good way of making sure it gets straight to the lungs, where it's needed. To learn more, see [How to take asthma drugs](#) .

If your child's asthma is not under control even though he or she regularly uses a steroid inhaler, your doctor or nurse may suggest that you increase the amount of medicine he or she takes. This may mean your child takes a larger dose of inhaled medicine, or takes it more often.

Many parents worry about giving their children steroids. It is important to remember that the steroids used to treat asthma are not the same type as the anabolic steroids used by some athletes and bodybuilders. In fact, they are a direct copy of corticosteroids produced naturally by our bodies to deal with inflammation. To learn more, see [More about steroids and asthma](#) .

It's also worth noting that when steroids are inhaled, the medicine goes directly to the lungs, where it's needed. This means your child takes a much smaller dose than they would if they took steroid tablets - even if the inhaled dose is described as 'high'.

## Asthma in children

Several different types of inhaled steroids are available, including (with brand names):

- Beclometasone (Qvar)
- Budesonide (Pulmicort)
- Fluticasone (Flixotide)
- Mometasone (Asmanex).

These inhalers are usually brown, cream, red, or orange.

### How can it help?

We know that taking steroids regularly from an inhaler helps to prevent asthma symptoms. To read more, see [Steroids from an inhaler to prevent asthma symptoms](#) . But we don't know whether increasing the dose has any additional benefits. Studies so far suggest that it doesn't help. <sup>[115]</sup> <sup>[116]</sup>

Some research suggests that [adding salmeterol or formoterol from an inhaler](#) works better than increasing the dose of steroids. <sup>[117]</sup> <sup>[118]</sup> <sup>[119]</sup>

How well a steroid works for your child may depend on how well he or she can use an inhaler.

### How does it work?

Steroids from an inhaler are a good way of preventing asthma symptoms. But some children still get asthma symptoms even when they use their steroid inhaler regularly. So researchers have looked at whether a higher dose works better than an ordinary dose.

### Can it be harmful?

The main concern with steroids is their effect on children's growth. In one study, the growth of children who were given high doses of inhaled steroids was slower than that of children taking on an ordinary dose. <sup>[115]</sup> For more about steroids and growth, see [More about steroids and asthma](#) .

There has been concern among doctors that, very rarely, high doses of steroids could stop the adrenal glands working properly. <sup>[26]</sup> <sup>[120]</sup> The adrenal glands lie just above the kidneys. They make hormones that help the body run smoothly. The hormones your adrenal glands make help to regulate your heart and kidneys and the amount of glucose (sugar) in your blood. The cases of steroids affecting someone's adrenal glands have mainly involved the drug fluticasone. The doses involved were 500 micrograms to 2,000 micrograms a day. <sup>[26]</sup> <sup>[27]</sup>

### How good is the research on increasing the dose of steroids from an inhaler to prevent asthma symptoms in older children?

Not many studies have looked at whether a higher dose of steroids from an inhaler helps to prevent asthma symptoms any better than the normal dose. So far, the research suggests that raising the dose doesn't help. <sup>[115]</sup> <sup>[116]</sup> One study looked at 177 children between 6 years old and 16 years old. <sup>[115]</sup> It found that higher doses of steroids didn't help any more than the normal dose.

A summary of studies (a [systematic review](#)) plus two additional studies also suggest that [adding salmeterol or formoterol from an inhaler](#) works better than increasing the dose of steroids. <sup>[117]</sup> <sup>[118]</sup> <sup>[119]</sup>

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### Salmeterol or formoterol from an inhaler as an extra treatment to prevent asthma symptoms in older children

In this section

[Do they work?](#)

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[How can they help?](#)

[How do they work?](#)

[Can they be harmful?](#)

[How good is the research on salmeterol or formoterol from an inhaler as an extra treatment to prevent asthma symptoms in older children?](#)

This information is for parents of a child who has asthma. It tells you about taking salmeterol or formoterol from an inhaler, as an extra treatment to prevent asthma symptoms. It is based on the best and most up-to-date research.

#### Do they work?

Yes. Research shows that using a salmeterol or formoterol inhaler as well as a [steroid inhaler](#) is likely to help children control their asthma.

Salmeterol and formoterol aren't usually used on their own to prevent or control asthma symptoms. They tend to be used as an extra treatment for children who are already using a steroid inhaler. <sup>[12]</sup> <sup>[60]</sup> That's because salmeterol and formoterol can actually **make asthma symptoms worse** if they're used on their own. <sup>[121]</sup>

#### What are they?

Salmeterol and formoterol inhalers help relax the muscles in the airways. This opens them up and makes it easier for your child to breathe. Your child's doctor might suggest these treatments if a steroid inhaler on its own doesn't keep your child's asthma under control. <sup>[12]</sup>

Salmeterol and formoterol are long-acting drugs used to prevent asthma symptoms. They take about half an hour to work, and the effects last for about 12 hours. Your child

## Asthma in children

**shouldn't use these drugs to treat an asthma attack.** Your child should have a [quick-relief inhaler](#) to use when he or she gets symptoms.

Your doctor may call salmeterol or formoterol **bronchodilators** because they dilate (open up) the bronchial tubes (airways). You may also hear these drugs called **long-acting beta-2 agonists**.

The brand name for salmeterol is Serevent. Brand names for formoterol include Foradil and Oxis. Your child takes them using an inhaler. But these drugs shouldn't be used on their own to help control asthma symptoms. <sup>[12]</sup> <sup>[60]</sup> Children should carry on taking their [inhaled steroids](#). Your child's doctor may also prescribe a single inhaler that combines both a steroid and a long-acting beta-2 agonist.

If these drugs don't seem to be working as well as they used to, your child should see their doctor or practice nurse. <sup>[60]</sup> It could be a sign that their asthma is getting worse.

### How can they help?

If a steroid inhaler is not controlling your child's asthma, adding a salmeterol or formoterol inhaler is likely to help. Research shows that these medicines may help your child breathe better. <sup>[117]</sup> Studies also suggest that using a salmeterol or formoterol inhaler in addition to a steroid inhaler can help children control their asthma symptoms better than just increasing the dose of their steroid inhaler. <sup>[118]</sup> <sup>[119]</sup>

### How do they work?

Salmeterol and formoterol are designed to help control asthma symptoms by keeping the airways open, making it easier for your child to breathe. They work by relaxing the muscle in the lining of the air passages that can go into spasm when your child comes into contact with an asthma trigger.

Salmeterol and formoterol inhalers may also help symptoms by clearing any sticky fluid (excess mucus) that might be blocking your child's airways.

These treatments may also help stop the airways reacting to triggers such as house dust mite droppings and exercise.

### Can they be harmful?

Although taking salmeterol or formoterol might mean your child has fewer asthma attacks, there's a danger that the attacks they do get could be more severe. <sup>[122]</sup> A severe asthma attack could even be fatal.

One study looked at about 26,000 people. <sup>[123]</sup> Half of them took salmeterol as well as their usual asthma treatment. In this study, 13 of the 13,000 people died while taking salmeterol. This compared with 3 in 13,000 people who were taking a dummy treatment (a placebo). Other studies have also found a risk, which seems to be higher among children than adults. <sup>[124]</sup>

## Asthma in children

Because of these risks, salmeterol and formoterol are only recommended if a steroid inhaler hasn't helped your child. Your doctor might suggest them as an extra treatment if your child is already using a steroid inhaler.<sup>[12]</sup> <sup>[60]</sup> They shouldn't be the only treatment your child uses.

Salmeterol and formoterol inhalers can cause shaking (especially in the hands), headaches, a rapid heartbeat, low levels of potassium in the blood (which can lead to a dangerous disturbance of the heart's rhythm), and sleep and behaviour problems. But children didn't get these side effects in the studies we looked at.

### How good is the research on salmeterol or formoterol from an inhaler as an extra treatment to prevent asthma symptoms in older children?

We found a summary of the research (a [systematic review](#)) that looked at 16 studies with more than 4,600 children.<sup>[117]</sup> The review found that adding a salmeterol or formoterol inhaler to [inhaled steroids](#) can help children's lungs work better. Combining these treatments also seems to help children control their asthma symptoms better than simply increasing the dose of their steroid inhaler.<sup>[118]</sup> <sup>[119]</sup>

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## Theophylline tablets as an extra treatment to prevent asthma symptoms in older children

In this section

[Do they work?](#)

[What are they?](#)

[How can they help?](#)

[How do they work?](#)

[Can they be harmful?](#)

[How good is the research on theophylline tablets as an extra treatment to prevent asthma symptoms in older children?](#)

This information is for parents of children who have asthma. It tells you about theophylline tablets as an extra treatment to prevent asthma symptoms. It is based on the best and most up-to-date research.

### Do they work?

There's not enough research to say whether taking theophylline tablets at the same time as another treatment can help to prevent asthma symptoms. We do know that theophylline tablets can make children feel sick and give them headaches.

### What are they?

Theophylline tablets are sometimes used as an extra treatment for children who still get bad asthma despite treatment with [steroids from an inhaler](#).

Children with asthma have airways that are sensitive to certain substances (called triggers). When they breathe in an asthma trigger, the muscles around the walls of the airways go into spasm and the passageways become narrower, making it difficult for air

## Asthma in children

to get through. The main job of theophylline is to relax the muscles so the airways open up, making it easier for your child to breathe.

Your doctor may call these types of drugs **bronchodilators** because they open up (**dilate**) the airways (**bronchial tubes**).

The job of theophylline tablets is to keep your child's asthma symptoms, such as coughing and wheezing, under long-term control. The medicine does not start working straight away, so it should not be used to provide quick relief in an asthma attack. However, theophylline is not used very often now because of side effects.

Your child may need blood tests to check that he or she is getting the right dose.

Your doctor will usually prescribe theophylline alongside other asthma treatments, such as [steroids from an inhaler](#) and a [quick-relief inhaler](#). But occasionally it can be given on its own: for example, if your child has problems using an inhaler so cannot take steroids from an inhaler.

### How can they help?

In one study, theophylline tablets helped to: <sup>[125]</sup>

- Increase the number of days when children had no symptoms
- Reduce the amount of other treatments they need, such as quick-relief inhalers, inhaled steroids, or steroid tablets.

But another study found that theophylline tablets didn't reduce the amount of other medicines children needed. Also, theophylline didn't reduce the number of times children got asthma symptoms. <sup>[126]</sup> We need more research to say whether theophylline tablets are useful. But we do know that they can cause side effects.

### How do they work?

#### They open up the airways

The main job of theophylline is to help keep the airways open, making it easier for air to get into your child's lungs. It does this by relaxing the muscles in the air passages, stopping them from going into spasms, and closing up when your child comes into contact with an asthma trigger.

Experts are not exactly sure how theophylline does its job. It seems to keep the muscles relaxed by stopping certain cells (called **mast cells**) in the lining of the air passages from releasing chemicals that cause muscles to tighten up. These chemicals are called **histamine** and **prostaglandin**. Theophylline may also stop the airways from becoming sensitive to these chemicals in the first place, so the muscles are less likely to tighten up when the chemicals are released.

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Theophylline also seems to help control **inflammation** and swelling in the airways. It is not as good at this as other treatments, such as [steroids from an inhaler](#) .

### Can they be harmful?

Theophylline tablets may make your child feel sick or vomit and give him or her headaches. <sup>[127]</sup>

A disadvantage of theophylline is that it is difficult to get the dose right. <sup>[127]</sup> This means that your child may need to have regular blood tests to check the levels of the drug in his or her blood. Too much theophylline can cause serious side effects, such as **seizures** (fits) and heart **palpitations** .

### How good is the research on theophylline tablets as an extra treatment to prevent asthma symptoms in older children?

There isn't very good evidence that theophylline tablets help children who still have asthma symptoms despite taking [inhaled steroids](#) . The studies that have been done have mixed results and didn't last very long. <sup>[125]</sup> <sup>[126]</sup> We need more research to say for certain whether adding theophylline tablets is helpful.

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## Leukotriene antagonist tablets as an extra treatment to prevent asthma symptoms in older children

In this section

[Do they work?](#)

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[How can they help?](#)

[How do they work?](#)

[Can they be harmful?](#)

[How good is the research on leukotriene antagonist tablets as an extra treatment to prevent asthma symptoms in older children?](#)

This information is for parents of children who have asthma. It tells you about using leukotriene antagonist tablets as an extra treatment to prevent asthma symptoms. It is based on the best and most up-to-date research.

### Do they work?

We're not certain. There isn't enough research to know whether adding these tablets will help if your child still has asthma symptoms or asthma attacks despite taking other treatments (including [steroids from an inhaler](#) ).

### What are they?

Leukotrienes are natural chemicals that your child's body makes when he or she breathes in an asthma trigger, such as the droppings of house dust mites. Leukotrienes make the muscles in the airways tighten and make your child's breathing more difficult.

Leukotrienes also help the lungs produce mucus, making your child cough and the airways in the lungs **inflamed** .



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Leukotriene antagonists can help prevent asthma symptoms by stopping the leukotrienes tightening the muscles in your child's airways.

There are two leukotriene antagonists: zafirlukast (brand name Accolate) and montelukast (brand name Singulair). Both are tablets. Zafirlukast is not recommended for children under 12 years old. All the research in children looks at montelukast.

Your doctor or nurse may refer to these drugs as **preventers**. These drugs are designed to be used together with other asthma treatments, including [steroids from an inhaler](#) and [quick-relief inhalers](#) (salbutamol or terbutaline). Leukotriene antagonist tablets **should not be used to treat an asthma attack**.

### How can they help?

There isn't enough research to know whether leukotriene antagonist tablets will help if your child still has bad asthma despite taking other treatments. One summary of studies found that using these tablets along with a steroid inhaler may not work better than just using the steroid inhaler on its own, or increasing its dose. <sup>[128]</sup> However, there haven't been enough good studies to know for certain.

### How do they work?

Children who have asthma have **inflamed** air passages. Leukotriene antagonists can open up the airways by reducing the swelling. They can also help prevent further inflammation. This can make it easier for your child to breathe, and reduces wheezing.

The antagonists do their job by preventing **leukotrienes** from making your child's air passages swell up. Leukotrienes are released into the blood by your child's immune system after he or she breathes in an **asthma trigger** (such as house dust mites or smoke). Leukotrienes are just one of many chemicals that make breathing more difficult in children with asthma.

If the airways are less inflamed and swollen, breathing becomes easier.

Leukotriene antagonists can also help to reduce the amount of mucus that can build up in air passages and block them.

However, taking leukotriene antagonist tablets as an extra treatment may not provide an added benefit.

### Can they be harmful?

Side effects of leukotriene antagonists include a headache, an upset stomach or tummy pain, and feeling thirsty. <sup>[102]</sup>

Leukotriene antagonists have been linked with a condition called Churg-Strauss syndrome. <sup>[102]</sup> But this is **very rare**, and it's not completely clear whether leukotriene antagonists really cause the condition. Someone with Churg-Strauss syndrome gets very severe asthma along with other symptoms, such as a rash or numbness in their hands and feet.



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Their body also makes too many white blood cells. White blood cells usually fight disease, but if you have Churg-Strauss syndrome, they make a mistake and attack your body's own tissues instead. If Churg-Strauss syndrome is not treated, it can lead to heart and kidney problems and very severe breathing difficulties. Treatment usually involves high-dose steroid tablets. If your child gets a rash, or their asthma gets worse, **see your doctor immediately**.

Some people taking montelukast have found they get changes in their mood. In severe cases, these can be bad enough for someone to feel suicidal. In the US, the Food and Drug Administration is investigating to find out whether these mood changes were caused by montelukast.<sup>[103]</sup> If you're concerned about any thoughts or feelings your child expresses while they're taking montelukast, talk to their doctor as soon as you can.

### How good is the research on leukotriene antagonist tablets as an extra treatment to prevent asthma symptoms in older children?

There isn't much research on taking leukotriene antagonist tablets as an extra treatment to prevent asthma symptoms. We found one summary of the research (a [systematic review](#)) that included five studies looking at school-aged children with asthma. It suggested that adding these tablets may not work better than using a steroid inhaler on its own, or increasing the dose of the steroid inhaler.<sup>[128]</sup> However, there haven't been enough good studies to know for certain.

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## Salbutamol drips to treat more severe asthma attacks in older children

In this section

[Do they work?](#)

[What are they?](#)

[How can they help?](#)

[How do they work?](#)

[Can they be harmful?](#)

[How good is the research on salbutamol drips to treat more severe asthma attacks in older children?](#)

This information is for parents of a child who has asthma. It tells you about salbutamol drips, a treatment used for more severe asthma attacks. It is based on the best and most up-to-date research.

### Do they work?

If your child is having a severe asthma attack, putting salbutamol into their vein with a drip might help relax the muscles in their air passages, making it easier and more comfortable to breathe. Salbutamol drips can have side effects and are only used for very bad asthma attacks when other treatments have not helped.<sup>[57]</sup>

### What are they?

A salbutamol drip is a treatment for a severe asthma attack.<sup>[129]</sup> It may be given to your child if their inhaler does not seem to be helping to stop the attack.

## Asthma in children

Asthma attacks happen when your child's airways come into contact with an asthma trigger they are sensitive to (such as house dust mites). The airway muscles go into spasms, which narrows the air passages.

Salbutamol works by relaxing the muscles so that the airways open up, making it easier for your child to breathe. Your doctor may call this drug a bronchodilator, because it dilates (opens up) the bronchial tubes (airways).

Salbutamol can be breathed in with an inhaler or given as a drip. Here, we talk about the drip which means the medicine is given through a tube directly into your child's vein. It is also called an intravenous infusion or IV. The salbutamol travels through your child's bloodstream to their lungs. Giving the medicine in this way means that it can reach the airways even if the air passages are very narrowed because of a severe asthma attack.

If your child is having a bad asthma attack and other treatments do not help, the doctor may decide to give salbutamol as a drip.

### How can they help?

Compared with children who did not have a salbutamol drip, adding a salbutamol drip to an inhaler may: <sup>[129]</sup> <sup>[130]</sup>

- Help bring your child's asthma attack under control
- Reduce the time it takes your child to recover from an asthma attack
- Improve how well your child's lungs are working and help them breathe more easily.

### How do they work?

Salbutamol drips can open your child's airways during an asthma attack, helping your child breathe more easily.

Salbutamol works like two of the body's natural chemicals, noradrenaline and adrenaline, by relaxing the muscles in the walls of the airways. Airways can get tight during an asthma attack because the muscles in their walls go into spasms. Salbutamol drips can relieve the spasms, relaxing the airways and making them wider.

### Can they be harmful?

The most common side effect of salbutamol in children is a rise in how fast the heart beats. This is because the types of cells this drug affects are in the heart as well as in the lungs.

Your child may also get shaking (tremors) and have low levels of potassium in the blood, which can be dangerous. (Your body needs potassium to balance the amount of water in your blood and body tissues, and to help your nerves and muscles work properly.)

The children in the studies we looked at did not get serious side effects. <sup>[130]</sup> <sup>[131]</sup> <sup>[132]</sup>

### How good is the research on salbutamol drips to treat more severe asthma attacks in older children?

There is good evidence that adding a salbutamol drip to an inhaler is a more effective treatment for severe asthma attacks than not having a salbutamol drip. <sup>[132]</sup> <sup>[131]</sup> <sup>[133]</sup>

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### Magnesium sulphate drips to treat more severe asthma attacks in older children

In this section

[Do they work?](#)

[What are they?](#)

[How can they help?](#)

[How do they work?](#)

[Can they be harmful?](#)

[How good is the research on magnesium sulphate drips to treat more severe asthma attacks in older children?](#)

This information is for parents of a child who has asthma. It tells you about magnesium sulphate drips, a treatment used for more severe asthma attacks. It is based on the best and most up-to-date research.

#### Do they work?

We don't know. If your child is having a severe asthma attack, putting magnesium sulphate into their vein with a drip may help them breathe more easily. However, there isn't enough research to know for certain.

#### What are they?

Magnesium is a mineral that you get from food. It does many different jobs in your body, and it can widen the airways in your lungs.

When magnesium sulphate is used to treat asthma it is usually given as a drip, which means the medicine is given through a tube directly into your child's vein (also called an intravenous infusion or IV). The magnesium travels through your child's bloodstream to their lungs.

Doctors might try magnesium sulphate if your child is having a bad asthma attack and other treatments haven't worked. <sup>[134]</sup> <sup>[135]</sup>

#### How can they help?

There isn't much research on using magnesium sulphate drips in children. More studies are needed. In reviews of the research, adding a magnesium sulphate drip to an inhaler helped some children with severe asthma symptoms breathe better compared with children who did not have a magnesium sulphate drip. <sup>[134]</sup> <sup>[135]</sup>

### How do they work?

Magnesium helps to widen the air passages in your child's lungs. This lets air get in and out of your child's lungs more easily. So breathing is easier for them. But no one knows exactly how it works. <sup>[135]</sup>

### Can they be harmful?

There isn't much research on the side effects of using magnesium sulphate drips in children. More studies are needed. Studies so far have not found any serious side effects. <sup>[135]</sup>

### How good is the research on magnesium sulphate drips to treat more severe asthma attacks in older children?

There isn't much research looking at using magnesium sulphate drips in children. We found two reviews of the research which showed that adding a magnesium sulphate drip to an inhaler helped some children with severe asthma symptoms breathe better compared with children who did not have a magnesium sulphate drip. <sup>[135]</sup> <sup>[134]</sup> But we need more research to know how well magnesium sulphate works compared with other treatments.

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## Avoiding allergens to prevent asthma symptoms in older children

In this section

[Does it work?](#)

[What is it?](#)

[How can it help?](#)

[How does it work?](#)

[Can it be harmful?](#)

[How good is the research on avoiding allergens to prevent asthma symptoms in older children?](#)

This information is for parents of a child who has asthma. It tells you about avoiding allergens, a treatment used to prevent asthma symptoms.

### Does it work?

We're not certain. There hasn't been enough research yet to know whether avoiding allergens will improve your child's asthma.

### What is it?

There may be things in your home and outdoors that can trigger your child's asthma. <sup>[55]</sup> These are known as **allergens**. For example, you may find that being around pollen or pets brings on your child's symptoms. About 30 in 100 to 50 in 100 people with asthma also get these symptoms again six to 10 hours after they breathe in an allergen. This is a **late reaction**. <sup>[3]</sup> Staying away from allergens may help keep your child's asthma under control.

## Asthma in children

Some doctors call all asthma triggers allergens, but others group them into **allergens** and **environmental factors**.

- The most common allergens are droppings from dust mites, pollen, and flakes of skin or hair from animals.
- Environmental factors include tobacco smoke and air pollution.

### How to avoid allergens

You can take steps to avoid allergens. This may help keep your child's asthma under control. <sup>[12]</sup> <sup>[56]</sup>

- Keep your child away from the things that start their asthma attacks, such as pollen or animals.
- Don't smoke. Keep your child away from smoky places.
- Make certain your child washes their hands after touching things that trigger their asthma (a friend's dog or cat, for example).
- Remember that pet hair is hard to get rid of. It's possible to get asthma symptoms for months after a pet last lived in a house.
- Use solid or liquid cleaning products rather than sprays.
- Keep strong smells and perfumes out of your home.
- Open your windows regularly to air the rooms. But close the windows if there are exhaust fumes or smoke coming in.

As well as avoiding allergens, make sure your child takes his or her asthma medicines the way your doctor or nurse advises.

### How can it help?

There isn't much good research on avoiding allergens. <sup>[57]</sup>

Researchers have looked at whether avoiding tobacco smoke helps asthma symptoms.

- One review of studies found that pre-school children who were around a moderate amount of smoke in their home had a 30 percent higher chance of getting asthma symptoms. <sup>[58]</sup>
- Another study with 807 children found that children's asthma symptoms seemed to improve when parents smoked less around them. <sup>[59]</sup>

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Dust mite droppings are a common asthma trigger. Unfortunately, research shows that trying to rid your home of dust mites is unlikely to make any difference to your child's asthma. To read more, see [Trying to get rid of dust mites in your home to prevent asthma symptoms](#).

### How does it work?

When your child breathes in an allergen, their **immune system** overreacts because it thinks the allergen is dangerous. It pumps lots of chemicals into the blood. These chemicals make your child's airways swollen and **inflamed**. The muscles in their airways also tighten, the air passages get narrower, and your child has trouble breathing. It all happens very quickly. They may also have a second reaction six to 10 hours later.

Avoiding the allergens that trigger these reactions may help keep your child's asthma under control.

### Can it be harmful?

Avoiding allergens is unlikely to be harmful. However, it may mean that your child won't be able to go to certain places if an allergen is present (for example, to a friend's house if the family has a dog).

### How good is the research on avoiding allergens to prevent asthma symptoms in older children?

There isn't enough good research to know whether avoiding allergens will help your child's asthma.<sup>[57]</sup> Some research suggests that avoiding cigarette smoke may reduce symptoms.<sup>[58]</sup> <sup>[59]</sup> Other studies have found that avoiding [dust mite droppings](#) may not.  
[41]

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## Breathing exercises to prevent asthma symptoms in older children

In this section

[Do they work?](#)

[What are they?](#)

[How can they help?](#)

[How do they work?](#)

[Can it be harmful?](#)

[How good is the research on breathing exercises to prevent asthma symptoms in older children?](#)

This information is for parents of a child who has asthma. It tells you about breathing exercises, a treatment used for asthma.

### Do they work?

We're not certain. There hasn't been enough research yet to know whether these exercises will improve your child's asthma.

### What are they?

The **Buteyko breathing technique** is one of the best-known breathing methods for asthma. People also use other techniques, such as ones from yoga, or physiotherapy techniques, such as the **Papworth method**.

### Buteyko breathing

The Buteyko method is named after its founder, Konstantin Pavlovich Buteyko, a Russian doctor who developed the technique more than 50 years ago.

Buteyko breathing is based on the idea that asthma and other diseases are caused by breathing that is too fast or too deep (called overbreathing or hyperventilation). Some people think that overbreathing can mean you have too little carbon dioxide in your blood, which causes problems throughout your body, including asthma.

People usually learn the Buteyko method through classes, which last four or five days. Special classes are offered for children with asthma and their parents.

The Buteyko breathing technique teaches people:

- To breathe through their nose, not their mouth
- Ways to clear their nose to help with breathing
- Ways to keep their mouth closed to encourage nose breathing (this can involve wearing tape over the mouth when sleeping)
- How to check whether they are overbreathing
- Ways to stop overbreathing by doing breath-holding exercises
- Lifestyle changes to help reduce overbreathing, such as eating less and doing less stressful exercises.

### Other breathing exercises

Since the 1960s, physiotherapists have used a set of breathing exercises called the Papworth method to treat asthma. These exercises teach people to avoid breathing too quickly or deeply, and to match their breathing to how hard they're working.

People are also taught to breathe from their diaphragm, and take in air through their nose instead of their mouth. The breathing exercises are combined with relaxation techniques, and tapes or CDs can be used to practise at home.

### How can they help?

We don't know whether breathing exercises work, because not enough research has been done.<sup>[136]</sup> Also, we didn't find any studies that looked at using breathing exercises

## Asthma in children

for children with asthma. But we did find some research that looked at using this treatment in adults. Some of the results are promising, but we need more studies to know for certain how well breathing exercises work.

In one study, 39 people with asthma were given either Buteyko training or general asthma and relaxation training. It found that those who had Buteyko training needed their inhalers less often than the group who had general asthma education. The Buteyko group also seemed to have a slightly better quality of life, although the difference between the groups wasn't that big. <sup>[137]</sup>

Another study looked at using a video to teach Buteyko breathing to people with asthma. The study included 36 people who watched either a training video on Buteyko breathing or a training video that didn't cover Buteyko breathing. Those who watched the Buteyko breathing video used less of their quick-relief inhaler and rated their quality of life higher than those who watched the other video. <sup>[138]</sup>

A third study compared Buteyko breathing with a device that mimics a breathing technique from pranayama, which is a type of yoga that concentrates on the breath. People who used Buteyko breathing had a drop in asthma symptoms, and they used their quick-relief inhaler less often. There was no real change in the group using the pranayama device. <sup>[139]</sup>

One study looking at the Papworth method found that it helped people have fewer asthma symptoms in the year after their treatment. <sup>[140]</sup> However, there was no improvement in how well people's lungs worked. This suggests that the exercises helped people cope with asthma symptoms, but didn't affect the physical cause of their asthma.

### How do they work?

Buteyko breathing and the Papworth method focus on helping people to avoid breathing too quickly or deeply. But it's not entirely clear how this might help.

Buteyko breathing is based on the idea that many people breathe too fast or too deeply, which means that they get too little carbon dioxide in their body. The theory is that having too little carbon dioxide for a long time disrupts the balance of chemicals in the body. Dr Buteyko thought this could stop a child's immune system working properly, and cause it to overreact to allergens, such as pet fur.

### Can it be harmful?

These breathing exercises are unlikely to be harmful. But remember that there has not been a lot of research on these treatments. Your child **shouldn't stop using his or her usual asthma medicines.**



### How good is the research on breathing exercises to prevent asthma symptoms in older children?

We didn't find much research looking at breathing exercises for treating asthma. Most of the studies have been small and looked only at adults.<sup>[136]</sup> So we don't yet know whether these exercises are likely to be helpful for children.

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### Omalizumab as an extra treatment to prevent asthma symptoms in older children

In this section

[Does it work?](#)

[What is it?](#)

[How can it help?](#)

[How does it work?](#)

[Can it be harmful?](#)

[How good is the research on omalizumab as an extra treatment to prevent asthma symptoms in older children?](#)

This information is for parents of a child who has asthma. It tells you about using omalizumab as an extra treatment to prevent asthma symptoms. It is based on the best and most up-to-date research.

#### Does it work?

We don't know. If your child is taking other treatments (such as [steroids from an inhaler](#) ) but still has asthma symptoms or asthma attacks, adding omalizumab injections might help prevent serious flare-ups. But we need more studies to be certain.

#### What is it?

Omalizumab (brand name Xolair) is a treatment for severe asthma that is caused by an allergy. It's recommended for people who need ongoing or frequent treatment with [steroid tablets](#) . It is used only by specialists, and recommended only for children aged 6 years and older.<sup>[141]</sup>

Omalizumab is given as an injection just under the skin every few weeks.

#### How can it help?

Two studies found that adding omalizumab to inhaled steroids didn't improve children's asthma symptoms.<sup>[142]</sup> <sup>[143]</sup> However, it did lower their risk of having serious asthma flare-ups. Children having omalizumab injections also used a lower steroid dose compared with children given dummy ( placebo ) injections instead. However, we need more research to confirm these findings.

#### How does it work?

Omalizumab works by blocking the action of a substance called IgE, stopping it from attaching to particular white blood cells. This prevents the release of substances that cause inflammation in the lungs.

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Preventing inflammation means the airway does not become so swollen and constricted, reducing asthma symptoms.

### Can it be harmful?

Some people get pain and redness at the point they've had the injection. You may also get pain in the joints, tiredness, and ear pain.

Omalizumab can cause a severe allergic reaction, usually within two hours of an injection, but sometimes 24 hours or more later. However, this is rare.

There is also a possibility that omalizumab may increase the risk of heart disease and stroke. This is being looked at in a big research study.<sup>[144]</sup>

### How good is the research on omalizumab as an extra treatment to prevent asthma symptoms in older children?

There hasn't been much research on adding omalizumab to other treatments to prevent asthma symptoms. We found two good-quality studies ( randomised controlled trials ) that looked at children already taking [steroids from an inhaler](#) .<sup>[142]</sup> <sup>[143]</sup> Some were given omalizumab injections, while others had dummy ( placebo ) injections. The children having omalizumab were less likely to have serious asthma flare-ups. One study also found that children taking omalizumab used lower steroid doses overall.<sup>[143]</sup> However, there was no difference between the groups in asthma symptoms.

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### Further informations:

#### Allergens that trigger symptoms

Most children with asthma get symptoms when their immune system overreacts to things in the air.<sup>[3]</sup> These things are called **allergens**.

The most common allergens are:

- House dust mite droppings
- Pollen
- Flakes of skin or hair from animals.

To read more about house dust mites, see [Trying to get rid of dust mites in your home to prevent asthma symptoms](#) .

When your child breathes in an allergen, their immune system **overreacts** in case the allergen is dangerous. It pumps lots of chemicals into the blood. These chemicals make your child's airways swollen and inflamed . The muscles in the airways also tighten, the

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air passages get narrower, and your child has trouble breathing. It all happens very quickly.

About 30 in 100 to 50 in 100 people with asthma get these symptoms again six to 10 hours after they breathe in an allergen. This is called a **late reaction**.<sup>[3]</sup>

### Smoke and air pollution

Breathing in other people's smoke can cause asthma in children.<sup>[4]</sup> And smoke can also trigger an asthma attack (when symptoms suddenly get worse).

Tobacco smoke contains many different chemicals. Some of these chemicals can make the tubes in your child's lungs swollen or narrower. Some children get asthma symptoms when they go into a smoky room.

Air pollution probably doesn't cause asthma. But it can make symptoms worse. These are some of the chemicals that can cause asthma symptoms:

- Nitrogen dioxide (NO<sub>2</sub>)
- Ozone
- Sulphur dioxide (SO<sub>2</sub>).

If there are warnings that air pollution is bad in your area, you may want your child to stay inside.

Some children get an asthma attack when they breathe in **cold air**.<sup>[5]</sup> This may happen when your child goes outside in cold weather.

### Exercise and asthma

Many children with asthma find that their symptoms are worse when they exercise. Doctors call this exercise-induced asthma.

It's more likely to happen if your child exercises in cold and windy conditions.<sup>[5]</sup> <sup>[6]</sup> So your child is more likely to get symptoms if they're skiing or ice skating than if they're swimming in a heated pool. Some children get symptoms when they leave their home on a cold day.<sup>[5]</sup>

Your child is less likely to get asthma when exercising if their asthma is well controlled with the right treatment. Using a [reliever inhaler](#) (the blue one) before exercise can prevent these symptoms.

### How can I tell when my child's asthma is getting out of control?

You should **see your GP** if: <sup>[12]</sup>

- Your child is waking up at night more than usual with asthma symptoms
- The blue inhaler (reliever) you use to treat your child's symptoms quickly doesn't help their breathing for very long, or doesn't help at all.

You should **call 999 or go to the accident and emergency department of your local hospital** if: <sup>[12]</sup>

- It's hard for your child to talk because of asthma
- Your child cannot eat or drink because of asthma
- Your child is breathing very quickly
- Your child's neck muscles are straining and moving quickly
- Your child's heartbeat or pulse is very fast
- Your child finds it hard to walk
- Your child's lips or fingernails turn grey or blue
- Your child is exhausted
- Your child seems agitated or confused and is losing consciousness (blacking out).

At least once a year, your child's GP, or a practice nurse with special training in asthma, should check that your child's asthma is under control.

They may ask you these types of questions about your child's symptoms: <sup>[12]</sup>

- Has your child had difficulty sleeping because of their asthma symptoms (including coughing)?
- Has your child had any symptoms during the day (coughing, wheezing, chest tightness, or breathlessness)?
- Has your child's asthma stopped any activities (going to school, for example)?

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Depending on your answers, they may decide to change your child's treatment.

### How bad is my child's asthma?

There is no formal way of grading asthma in children in the UK. But your GP may describe your child's asthma as 'mild' or 'severe' depending on how often your child gets symptoms and how bad these symptoms are. For example, if your child has mild asthma, he or she might get symptoms more than once a week, but not every day. If your child's asthma is more severe, he or she may get symptoms most days and sometimes at night.

Some children have what doctors call **brittle** or **difficult to treat** asthma. These children need to take high doses of preventer drugs (usually steroids), and they also often need to use a reliever (the blue inhaler). These children's symptoms may also get very bad quite suddenly, and they may need to be treated in hospital.

Your GP may also talk about how bad your child's asthma is according to the treatments needed to control it.<sup>[12]</sup> Doctors talk about **steps**. Each step shows what treatment your child needs to control his or her asthma. Asthma that is Step 1 needs the fewest treatments. Asthma that is Step 5 needs the most treatments.

This is what the different steps mean:

Step	Medicines needed to control asthma
Step 1	Your child sometimes needs to use a reliever (usually in a blue inhaler).
Step 2	Your child needs to use a preventer treatment (usually a low-dose steroid in an inhaler) as well as a reliever (usually in a blue inhaler).
Step 3	Your child needs an extra treatment on top of the steroid inhalers in Step 2. This is usually a medicine called salmeterol or formoterol from an inhaler.
Step 4	Your child needs a higher dose of inhaled steroid as well as Step 3 treatments.
Step 5	Your child needs to take steroid tablets regularly. He or she should be seen by a hospital doctor who specialises in asthma in children (called a respiratory paediatrician).

Doctors in the UK use the **stepwise** approach to treating asthma.<sup>[12]</sup> They talk about 'stepping up' treatment when they increase the dose or the number of treatments your child needs. If your child's asthma is under control, your GP may reduce the dose or take some treatments away. This is called 'stepping down'. Your GP will always try to give your child the smallest amount of treatments that keep his or her asthma under control.

### How asthma in children is treated

Every child's asthma is different. So the medicine your child takes may well be different from what another child takes. <sup>[12]</sup>

The treatment your child has depends on:

- How often they get symptoms
- How bad their symptoms are
- How well the treatments have worked.

### Most children with asthma use an inhaler

Your child will probably have an [inhaler](#) to use when they get symptoms. This is called a reliever and it's usually in a blue canister. It contains a drug called salbutamol or terbutaline.

- Your child will usually need two, three, or four puffs on the inhaler to relieve their symptoms.
- Your child should carry this inhaler with them all the time.
- If your child gets symptoms less than once a week, this may be all the treatment they need.
- To learn about how to use an inhaler and other devices for taking asthma drugs, see [How to take asthma drugs](#) .

### If your child gets symptoms three times a week or more

- They will probably have a [steroid inhaler](#) . This is a preventer. It usually comes in a brown, cream, red, or orange inhaler. It helps your child's lungs work better so they don't get so many asthma symptoms.
- Your child will usually use this inhaler once or twice a day.
- The dose of steroids your child needs will depend on how often they get symptoms and how bad these are.

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### If your child has tried using two inhalers but is still getting symptoms

- They can try another treatment called [salmeterol](#) . This may help to better control your child's symptoms. Your child must use this type of inhaler only with a steroid inhaler. Using it on its own can be dangerous.
- Or your child can take tablets to help prevent symptoms. Your child may be prescribed [leukotriene antagonists](#) or [theophylline tablets](#) . They should keep using their steroid inhaler while they're taking these tablets.
- If these don't help, your child may be given a higher dose of steroids to breathe in through an inhaler.

### Changing your child's treatment

- Your GP or practice nurse will usually see your child at least once a year to check that their asthma is under control.
- If your child's symptoms don't happen often, they may be able to take a lower dose of their medicine. And if they've been getting symptoms often, they may need a higher dose. Doctors call this the 'stepwise' approach to treating asthma. If your child needs a higher dose, it's called 'stepping up'. If they can control their asthma with a lower dose, it's called 'stepping down'. To learn more, see [How bad is my child's asthma?](#)
- Doctors and nurses try to treat asthma with the lowest dose of each medicine. The lower the dose, the less likely your child is to get side effects.

### How to take asthma drugs

Many asthma drugs come in inhalers. This allows the drugs to go straight to your child's lungs, where they need to work.

There are several different types of inhalers and devices for taking asthma drugs. Your GP or practice nurse will help you find the most suitable device for your child and show you how to use it.

The most common inhaler for asthma drugs is called a **metered-dose inhaler** (or MDI for short). Most people try this type of inhaler first. If it's too difficult to use, they then try other devices.

#### Using a metered-dose inhaler (MDI)

Some children will be able to use an inhaler on their own. Others will need some help.

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- Take off the cap and shake the inhaler.
- Your child should stand up and breathe out.
- Put the mouthpiece in your child's mouth. Ask them to keep their chin up.
- Ask your child to breathe in slowly. As they start to breathe in, push down on the top of the inhaler and tell them to keep breathing in slowly.
- Ask your child to close their mouth and hold their breath for 10 seconds.
- Your child can then breathe out.

If your child finds it difficult to use an inhaler, your GP or nurse may suggest they use a different type of inhaler or an extra piece of equipment. We describe these below.

### Dry powder devices

Some asthma drugs come as a dry powder. The brand names for some of these devices include the Turbohaler, Accuhaler, Diskhaler, and Rotahaler. They may also be called dry powder inhalers. They work in a similar way to MDIs. But instead of the medicine coming in an aerosol can, it comes in a small capsule, a disk, or a compartment inside the inhaler. Your child may have to load the capsules into the device before they use it. Or you may have to do this for them if they can't manage it.

The drug is released from a dry powder device when your child breathes in. This makes these devices easier to use than MDIs because your child doesn't need to be able to breathe in and press the aerosol down at the same time. Most children find them easy to use, although they do need to breathe in the drug quite quickly. Very young children, those under 5, may not be able to do this. An MDI with a spacer may be more suitable for these children.

Some dry powder devices have a dose counter so you see how many doses your child has taken and when you need to get a new inhaler.

One summary of the research found little or no evidence that dry powder devices work any better than regular inhalers (MDIs) for children with asthma.<sup>[19]</sup> But your child may find a dry powder device easier to use. And the important thing is that the asthma medicine gets into your child's lungs.

### Breath-activated MDIs

These devices work a bit like dry powder inhalers, but they use an aerosol. They are easy to use, as the drug is released as your child breathes in. Your child doesn't have to be able to breathe in and press the aerosol down at the same time, which they do with an MDI. However, your child needs to hold their breath for about 10 seconds, or as long



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as they can, after taking the medicine. Some young children may not be able to do this and may be better off using an MDI with a spacer device.

### Spacer devices

A spacer is a device that helps your child to breathe in their inhaler drugs. It is a large plastic container, usually in two halves that slot together. At one end there is a mouthpiece, and at the other a hole where the inhaler fits in. The container has a one-way valve, so when you press the aerosol, a puff of drug is released and stored in the empty space in the container.

A spacer **gives your child more time to inhale their medicine**. With a simple inhaler, there is just one chance to breathe in the drug: when the aerosol is pressed down. A spacer holds the drug in a chamber so that your child can then breathe in the medicine through the mouthpiece in their own time. With a spacer, the drug is also more likely to end up in the lungs, where it's supposed to go. With an ordinary inhaler, the medicine can stay in the throat if the inhaler isn't used correctly.

There are several different brands of spacers that fit different makes of inhalers. Very young children can use a face mask that fits onto the spacers.

### Here are some tips on using a spacer.

- Encourage your child to start breathing in as soon as possible after they have pressed the inhaler, otherwise less of the medicine will reach their lungs. Taking and holding several long, deep breaths for each puff works best. If this is not possible, then slow, deep breathing is better than fast, shallow breathing.
- If your child cannot breathe in through a mouthpiece, you may need to attach a face mask to the spacer.
- Make sure you shake the inhaler between puffs.
- Put only one puff of medicine in the spacer at a time. If you put in more than one puff, the droplets of the spray stick together and coat the sides, so your child might get **less medicine**.
- Wash the spacer with washing-up liquid and leave it to dry without rinsing or wiping it. This stops the inside from becoming too static, which makes the medicine stick to the sides. But the spacer only needs to be washed occasionally.
- Many parents find it difficult to get their child to use a spacer properly. Try to turn it into an activity that is fun. Decorate it, show your child how to use it, and practise counting while they breathe in.

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## Nebulisers

Nebulisers are sometimes used to help children take asthma drugs. Or your doctor might give you one to use at home to help your child take asthma medicines. A nebuliser is a device driven by a machine. It creates a mist of the drug that your child can breathe in through a mask. Nebulisers are bulky but can allow much bigger doses of medicine to be given. Your child will not have to coordinate pressing and breathing to use this machine.

If you're using a nebuliser at home, be sure to carefully follow the instructions on proper use and cleaning.

## What are CFC-free inhalers?

Inhalers used nowadays are called 'CFC-free'. CFC stands for chlorofluorocarbon. It is a chemical that was used to help push the medicine out of the inhaler. However, makers of asthma inhalers do not use CFCs now because they damage the environment. They're using other chemicals instead. Eventually all asthma inhalers will be CFC-free. These inhalers work just the same as those that contain CFCs. But your child's medicine may taste slightly different.

## More about steroids and asthma

Many parents worry about giving their children steroids because of the side effects linked to these drugs. For example, you may have heard that these drugs can stop your child growing normally. Here we look at the research and answer some commonly asked questions.

### Why has my child been given steroids?

- Steroids are **the most effective treatment there is** for controlling inflammation in the lungs. Inflammation, or swelling in the lungs, causes asthma.
- Steroids help to prevent asthma attacks.
- Steroid tablets or syrups are sometimes used in hospital to treat severe asthma attacks, and for a few days afterwards.
- Asthma that isn't properly treated can be very serious and even affect your child's growth.

### What are steroids?

Steroids are a group of medicines that are used to treat conditions where there is inflammation or swelling. In asthma they are used to reduce swelling in the airways in the lungs. The airways become inflamed and swollen in people with asthma, making it harder to breathe.

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It's important to remember that the medicines used to treat your child's asthma are **not the same** as the anabolic steroids used by some athletes and bodybuilders to build up muscles. The full name for the steroids used in asthma is corticosteroids. Corticosteroids used for asthma are very similar to certain natural hormones produced in the body to deal with inflammation.

### How do children take steroids?

Most children take steroids through an inhaler once or twice a day. Some children use a spacer device to help them take their steroids. To learn more, see [How to take asthma drugs](#).

If your child's asthma becomes very bad, he or she may need to take a course of [steroid tablets](#) as well, usually for one or two weeks. Some children with very bad asthma need to take steroid tablets for a few months at a time. [High doses of steroids from an inhaler](#) or steroid drips are sometimes used to treat emergency asthma attacks.

Names of some of the steroids used to treat asthma include beclometasone (brand name Qvar), budesonide (Pulmicort), and fluticasone (Flixotide).

If your child has tried other treatments and still gets asthma symptoms, their doctor may suggest steroids taken as tablets or as a liquid. But doctors try to use these at the lowest dose and for the shortest time. That's because taking steroids as tablets or as a liquid may cause more side effects.

Children are sometimes started on steroids during a bad asthma attack, and given them for a few days afterwards. When they're used like this, steroids are given as tablets or a liquid. Occasionally they're given as a drip (an intravenous infusion or IV). They're not usually given through an inhaler.

### Will steroids make my child short?

Research suggests that steroids from an inhaler may slow down growth in children in the first year or two of treatment. But it's not clear whether your child's final adult height will be affected. Some studies suggest not. <sup>[20]</sup> <sup>[21]</sup> <sup>[22]</sup> <sup>[23]</sup> <sup>[24]</sup> <sup>[25]</sup>

For example, in one study, the growth of 300 children taking steroids was compared with that of 600 children not taking these medicines. <sup>[23]</sup> Children who had been taking steroids were, on average, 1.1 centimetres (about half an inch) shorter than the other group after five years. But at the end of the study, the children taking steroids were growing just as quickly as those not taking any, and they were all expected to reach their full adult height. <sup>[23]</sup>

In a study where the children were monitored until they had finished growing, all of those treated with steroids reached the height that they were predicted to grow to. Their predicted height was based on how tall their parents were. <sup>[24]</sup>

## Asthma in children

However, another study found that children who took steroids from an inhaler were about 1.2 centimetres shorter, on average, when they reached adulthood, compared with those who didn't take inhaled steroids. Higher doses of steroids seemed more likely to affect the children's height. <sup>[25]</sup>

### Are there any other side effects linked to steroids?

The most common side effect of taking steroids from an inhaler is a sore mouth due to an infection called oral thrush. You may also hear this called candidiasis. To reduce the chances of this infection, experts advise children to use a spacer device and to rinse out their mouth after taking their medicine. This helps to get more of the medicine into their lungs, and less ends up in the mouth and throat.

Another common problem is sounding a bit hoarse because steroids can affect the vocal cords. Steroid tablets may make your child feel hungrier than usual, so try to encourage normal eating habits to avoid weight gain.

Steroids used to treat asthma will usually not change the way your child behaves. Aggression is linked to anabolic steroids but not the types of steroids used to treat asthma.

There has been concern among doctors that, very rarely, high doses of steroids could stop your adrenal glands working properly. <sup>[26]</sup> <sup>[27]</sup> Your adrenal glands lie just above your kidneys. They make hormones that help your body run smoothly. The hormones your adrenal glands make help to regulate your heart and kidneys and the amount of glucose (sugar) in your blood. The cases of steroids affecting someone's adrenal glands have mainly involved the drug fluticasone. The doses involved were 500 micrograms to 2,000 micrograms a day. <sup>[26]</sup> <sup>[27]</sup>

### What dose works best?

Experts say that people with asthma should take the smallest dose of steroids that keeps their symptoms under control. So if your child hasn't had any problems with asthma for a few months, it may be possible to reduce the amount of steroids he or she is taking.

There seems to be no point in increasing your child's dose of steroids from an inhaler if a standard dose isn't working. One study has shown that children taking four puffs of beclometasone a day (400 micrograms in total) were no better off than children taking two puffs. <sup>[28]</sup>

### Is there something my child can take instead of steroids?

There are other drugs that work like inhaled steroids to control asthma symptoms in children. For example, [sodium cromoglicate](#), [nedocromil](#), and [theophylline tablets](#) can also be used to prevent asthma attacks. But none of these are as good as steroids from an inhaler at keeping asthma under control.

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### What questions should I ask my doctor?

- Is my child on the lowest dose of steroids that works?
- Should my child have a spacer device to help him or her take the medicine?
- Is this the best way for my child to take his or her steroids?
- Does my child have to take steroids even when his or her asthma isn't bad?
- How long will my child have to take steroids for?
- Is my child growing normally?

### What can I do to help my child?

- Remember that untreated or badly controlled asthma can stunt your child's growth.
- Make sure your child uses a spacer device to take his or her steroids. This helps get more of the drug into the lungs, where it is needed, and less stays in the mouth and throat.
- Make sure your child rinses out his or her mouth after taking steroids, to wash out any unused medicine.
- Make sure your doctor checks your child's height regularly. <sup>[29]</sup>
- Ask if your child is on the smallest dose of steroids that will keep his or her asthma under control.

### Tips for using a spacer

Encourage your child to start breathing in as soon as possible after he or she has pressed the inhaler. Otherwise less of the medicine will reach his or her lungs. Taking and holding several long, deep breaths for each puff works best. If this is not possible, then slow, deep breathing is better than fast, shallow breathing.

If your child cannot breathe in through a mouthpiece, you may need to attach a face mask to the spacer.

Make sure you shake the inhaler between puffs.

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Only put one puff of medicine into the spacer at a time. If you put in more than one puff, the droplets of the spray stick together and coat the sides, so your child might get less medicine.

Wash the spacer with washing-up liquid and leave it to dry without rinsing or wiping it. This stops the inside from becoming too static, which makes the medicine stick to the sides. But the spacer only needs to be washed occasionally.

Many parents find it difficult to get their child to use a spacer properly. Try to turn it into an activity that is fun. Decorate it, show them how to use it, or practise counting while they breathe in.

## Glossary:

### 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.

### genes

Your genes are the parts of your cells that contain instructions for how your body works. Genes are found on chromosomes, structures that sit in the nucleus at the middle of each of your cells. You have 23 pairs of chromosomes in your normal cells, each of which has thousands of genes. You get one set of chromosomes, and all of the genes that are on them, from each of your parents.

### allergic reaction

You have an allergic reaction when your immune system overreacts to a substance that is normally harmless. You can be allergic to particles in the air you are breathing, like pollen (which causes hay fever) or to chemicals on your skin, like detergents (which can cause a rash). People can also have an allergic reaction to drugs, like penicillin.

### 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.

### eczema

Eczema is a very itchy rash. It may be dark and bumpy and release fluid. Scratching makes it worse. You can get eczema anywhere on your body, but it is most common on the wrists, the insides of the elbows and the backs of the knees. If you have asthma or allergies you are more likely to get eczema than someone who doesn't have these conditions.

### hay fever

You get hay fever when your immune system reacts too strongly to pollen or mould. Your doctor may call it seasonal allergic rhinitis. The most common symptoms are sneezing, a runny or blocked nose, and red, itchy eyes. You may also cough or wheeze.

### hormones

Hormones are chemicals that are made in certain parts of the body. They travel through the bloodstream and have an effect on other parts of the body. For example, the female sex hormone oestrogen is made in a woman's ovaries. Oestrogen has many different effects on a woman's body. It makes the breasts grow at puberty and helps control periods. It is also needed to get pregnant.

### 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.

### viruses

Viruses are microbes (tiny organisms) that need the cells of humans or other animals to exist. They use the machinery of cells to reproduce. Then they spread to other cells in the body.

### 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.

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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.

## allergen

If you have an allergy to something, your body overreacts when you come into contact with it. The thing you are allergic to is called an allergen. Most allergens are harmless to most people. But if you're allergic to something, your body's system for fighting infection (your immune system) is too sensitive to that allergen. It triggers changes that are called allergic reactions. For example, pollen is an allergen for some people. If you're allergic to pollen, you'll sneeze and have runny eyes when pollen is in the air.

## adrenal glands

You have two adrenal glands. They are on top of your kidneys. Your adrenal glands make hormones that help control your blood pressure, how fast your heart beats and the way your body uses food.

## 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.

## randomised controlled trials

Randomised controlled trials are medical studies designed to test whether a treatment works. Patients are split into groups. One group is given the treatment being tested (for example, an antidepressant drug) while another group (called the comparison or control group) is given an alternative treatment. This could be a different type of drug or a dummy treatment (a placebo). Researchers then compare the effects of the different treatments.

## palpitations

A palpitation is when you feel like your heart is beating very fast.

## seizure

A seizure (or fit) is when there is too much electrical activity in your brain, which results in muscle twitching and other symptoms.

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