

## Patient information from the BMJ Group

# Thrush, mouth

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## Thrush, mouth

Oral thrush is an infection some people get in their mouth and throat. It's caused by a fungus called *Candida*. Thrush can make your mouth sore, but it can be easily treated with drugs. There are also things you can do to reduce your chances of getting it again.

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

## What is oral thrush?

Oral thrush is an infection that can affect almost any part of your mouth and throat.



You can get oral thrush in your mouth or in your throat.

Thrush is caused by a type of **fungus** called *Candida*.

It's normal to have a small amount of *Candida* in your body, including on your skin and in your mouth. This is usually harmless and doesn't cause any symptoms.

But sometimes thrush grows out of control and you get an infection in your mouth. You can get thrush on your tongue, your gums, on the inside of your cheeks, on the roof of your mouth, or in your throat. <sup>[1]</sup>

You can also get thrush in many other parts of your body, such as your skin or your groin. Babies can get thrush in their nappy area. And women can get thrush in their vagina. To find out more, see our article on [vaginal thrush](#) .

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## Who gets oral thrush?

Some people are more likely than others to get oral thrush. This is usually because they have another disease or are taking drug treatment that makes their immune system weak.<sup>[1]</sup> Your immune system helps your body fight off infections. When it isn't working properly, fungi that live in your body without causing any problems can grow out of control and cause infections.

People who are more likely to get oral thrush include those with:<sup>[1]</sup>

- A weak immune system from taking some medicines or having other treatments, such as anti-cancer (chemotherapy) drugs, steroids (their full name is corticosteroids), or radiotherapy
- Diseases that weaken their immune system, such as AIDS and leukaemia
- Diabetes . If you have diabetes, you have too much sugar in your blood. Thrush grows best in sweet conditions, which can happen if sugar levels in your blood and saliva are high. Oral thrush can be caused by both type 1 and type 2 diabetes.
- Asthma who take corticosteroids through an inhaler. The steroids can sometimes cause oral thrush. You can reduce the chances of this happening by rinsing your mouth out after using the inhaler, ensuring a good inhaler technique, and using a spacing device. The device makes it easier to inhale the medicine without too much of it touching your mouth and throat.
- A severe, long-term dry mouth. Thrush finds it easier to grow in a mouth where there isn't much saliva. You can get a dry mouth when you take certain drug treatments, and after radiotherapy or surgery on your neck or head.

Babies are also more likely to get oral thrush because the part of their bodies that keeps fungi and other germs under control (the immune system) is not properly developed.<sup>[2]</sup>

Oral thrush is also more common in people who:<sup>[1]</sup>

- Smoke. We don't fully understand why smokers are more likely to get oral thrush, but they tend to have more candida fungi in their mouth. The smoke also alters the defences in your mouth that normally stop thrush growing out of control
- Wear badly fitting dentures or have poor oral hygiene
- Have recently taken antibiotics to treat another infection. Antibiotics may kill friendly bacteria as well as harmful bacteria, and this can allow thrush to grow
- Have a high-carbohydrate diet

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- Have low blood levels of iron or certain vitamins, such as vitamin B-12 and folic acid .

### What are the symptoms of oral thrush?

Oral thrush usually appears as white patches in your mouth.

Your mouth might feel sore and you may get a burning feeling on your tongue.

If you have thrush in your throat, you may not be able to speak or eat properly. This can make you feel very unwell. Some people find things taste different when they have oral thrush.<sup>[3]</sup>

There are four main types of oral thrush, and they can look quite different.<sup>[4]</sup>

- The most common type of oral thrush appears as small white patches on the inside of the cheeks, throat, tongue, or gums. The patches come off if you rub them, and they may bleed.
- In another type, you get smooth red patches on the roof of your mouth, the back of your tongue, or the inside of your cheeks.
- Very occasionally oral thrush appears as raised or rough white patches on the inside of one or both cheeks. These may be small and thin or large, dense, and rough. They don't come off if you rub them. Occasionally, the patches are speckled and lumpy. This type of oral thrush can contain cells that could turn into cancer. But this is very rare.
- People who wear dentures can get redness and swelling on the roof of their mouth or around their gums where their dentures come into contact with their mouth.

Your dentist may discover you have oral thrush when you go for a check-up, and give you some medicine to treat it.

If you have symptoms, or the inside of your mouth looks different from usual, you will need to go to your doctor to find out if you have oral thrush, or whether something else is causing your symptoms. Your doctor will probably:

- Look inside your mouth for white or red patches
- Ask you about your symptoms.

Sometimes the doctor will take a sample from the affected part of your mouth and send it to the laboratory to test it for Candida.

If the patches in your mouth are still there after you've had medicines to get rid of oral thrush, your doctor may refer you to a specialist. The specialist may take a sample of

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tissue from the affected area (this is called a biopsy) and look at them under a microscope to see if they are normal.

### How common is oral thrush?

Oral thrush is common among certain groups of people, such as those who wear dentures, people being treated for cancer, people who have conditions such as diabetes, dry mouth, or HIV, and very young babies. But it's not at all common in the rest of the population.

Here's what we know about oral thrush in different people at risk:

- About 1 in 8 babies aged 4 weeks get oral thrush. By the time they're 10 weeks old this drops to about 1 in 20 babies <sup>[5]</sup>
- About 7 in 10 people who wear dentures get oral thrush at some time <sup>[6]</sup>
- Between 1 in 10 and 6 in 10 people who have treatment for cancer get oral thrush <sup>[7]</sup>
- Up to 1 in 2 people with HIV get oral thrush at some time <sup>[8]</sup>
- More than 9 in 10 people with advanced HIV ( AIDS ) get oral thrush. If they stop treatment the infection comes back in 1 in 2 of them within two weeks. <sup>[8]</sup>

About 4 in 10 healthy people have Candida in their mouth and don't get any problems. It's in their saliva and on the back of their tongue, but it doesn't give them oral thrush, and they don't have any symptoms. <sup>[9]</sup>

### What treatments work for oral thrush?

Oral thrush is an infection some people get in their mouth and throat. It's caused by a fungus called Candida. Thrush can make your mouth sore, but it can be easily treated with drugs.

Most people who get oral thrush get it because they have another disease or are taking drug treatment that makes their immune system weak. Babies and young children are also at risk because their immune system is not yet properly developed.

- **Antifungal drugs** are the main treatments used for oral thrush.
- You can get antifungal drugs as gels that you put on the affected patches in your mouth, mouthwashes, and tablets.
- Antifungal drugs can help prevent oral thrush if you're having treatment for cancer or you have HIV infection or AIDS.

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- They also help to get rid of oral thrush in babies, children, and people with HIV infection.

Antifungal drugs probably work for other people too. But there hasn't been very much good research in people who have oral thrush because they have **diabetes** , wear dentures, or have had a transplant.

If you smoke or take medicines that increase your risk of getting mouth thrush, you can take steps to prevent this happening. To read more, see [How to reduce your risk of oral thrush](#) .

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

### Treatment Group 1

#### Treatments for oral thrush

##### Treatments that work

- [Antifungals to treat oral thrush in children](#)
- [Antifungals to prevent oral thrush in people having cancer treatment](#)
- [Antifungals to prevent oral thrush in people who have HIV/AIDS](#)
- [Antifungals to treat oral thrush in people who have HIV/AIDS](#)

##### Treatments that are likely to work

- [Antifungals to prevent oral thrush in children](#)
- [Antifungals to treat oral thrush in people who wear dentures](#)

##### Treatments that need further study

- [Antifungals to treat oral thrush in people who are having cancer treatment](#)
- [Antifungals to prevent oral thrush in people who have had a transplant](#)
- [Keeping your dentures clean to prevent oral thrush](#)

#### What will happen to me?

If you don't have treatment for oral thrush, it can go on for months, or you can get repeat infections.

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It's especially important to have any white or red patches in your mouth checked out and treated. In a very few people, the patches can turn into cancer. They need to be treated to try to stop them turning into cancer.<sup>[10]</sup> Or these patches could be a sign of another condition that needs treatment.

In young babies, oral thrush usually clears up on its own within a few weeks.

Usually people have oral thrush because of something else. This could be because they:

- Are young (a baby or child)
- Have another illness
- Smoke
- Have badly fitting dentures
- Don't take good care of their mouth
- Take medicines that can lead to oral thrush.

If this is the case, your doctor will give you advice about what to do to stop the infections coming back, such as stopping smoking and making sure your dentures fit properly. Bear in mind that if you don't have treatment for oral thrush, it can go on for months or you can get repeat infections.<sup>[11]</sup>

To learn more, see [How to reduce your risk of oral thrush](#) .

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## Treatments:

### Antifungals to treat oral thrush in children

In this section

The treatment normally used for oral thrush is **antifungal medicine**. There is good research showing that this treatment works in babies and children.

Antifungal drugs used to treat existing oral thrush include:

- Fluconazole liquid (brand name Diflucan) to swirl around your mouth and swallow, or as tablets for older children
- Miconazole gel (brand name Daktarin) to smear on infected places in your mouth
- Nystatin liquid (brand name Nystan) that you swirl around your mouth.

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There has been some good research to show that these medicines work to get rid of thrush. Miconazole and fluconazole seem to work better than nystatin. One large study found that nearly all the children with oral thrush who were otherwise healthy got rid of the infection after using miconazole gel for 12 days.<sup>[12]</sup> Only 1 in 2 children who used nystatin liquid were cured.

In another study, all the babies treated with fluconazole liquid were cured after seven days.<sup>[13]</sup> Out of those treated with nystatin, only 1 in 3 were cured.

Another large study looked at children who had oral thrush because their immune system wasn't working properly. It found that 9 in 10 children were cured after being treated with fluconazole liquid.<sup>[14]</sup> One in 2 of those treated with nystatin liquid were cured.

In studies, the most common side effects of antifungal medicines were vomiting and diarrhoea. But less than 5 in 100 children got these problems.<sup>[12]</sup> <sup>[15]</sup>

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## Antifungals to prevent oral thrush in people having cancer treatment

In this section

The treatment normally used for oral thrush is antifungal medicine. There is good research that shows that this treatment helps prevent oral thrush in people who are being treated for cancer.

If you are having treatment for cancer (chemotherapy or radiotherapy), your immune system may not work as well as it should. So the fungus that causes thrush isn't kept under control. Taking some types of **antifungal medicines** can reduce your risk of getting oral thrush.<sup>[16]</sup>

The antifungal medicines that seem to work best are:

- Fluconazole (brand name Diflucan)
- Itraconazole (brand name Sporanox)

Miconazole (brand name Daktarin) may also help. But it doesn't get taken up into the blood as well as the other drugs listed above, so they may not work as well.

You will probably be advised to take antifungal medicine for about one week after each course of anti-cancer treatment, around the time when your immune system is at its weakest.

One summary of the research (called a **systematic review**) looked at the results of 10 studies. It found that fluconazole and itraconazole reduced people's risk of getting oral thrush when they were having treatment for cancer.<sup>[16]</sup> Miconazole also worked better than not having any treatment.

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The studies didn't give much information about side effects, although problems don't seem to be common.<sup>[16]</sup> Another antifungal you may have heard of, called ketoconazole, is no longer recommended as it can cause serious liver damage.<sup>[17]</sup>

People taking a medicine called warfarin should talk to their doctor before using miconazole. When miconazole mixes with warfarin in the body it can make the blood flow too easily and cause bleeding.<sup>[18]</sup>

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## Antifungals to prevent oral thrush in people who have HIV/AIDS

In this section

Taking antifungal medicines can prevent oral thrush in people with HIV or AIDS.

Most of the studies on preventing oral thrush used the drug fluconazole (brand name Diflucan) or itraconazole (brand name Sporanox). Both of these drugs seem to work.<sup>[19]</sup> One study looking at the antifungal drug nystatin (brand name Nystan) found that it didn't help.<sup>[19]</sup>

In studies looking at nearly 600 people with AIDS who'd had oral thrush before:<sup>[19]</sup>

- 57 in 100 people who took a dummy treatment (called a placebo) got oral thrush again
- But only 33 in 100 people who took fluconazole got oral thrush again.

In another study of 374 people with AIDS who'd had oral thrush before:<sup>[20]</sup>

- 48 in 100 people who took a placebo had thrush again
- Only 25 in 100 people who took itraconazole every day for more than one year had oral thrush again.

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## Antifungals to treat oral thrush in people who have HIV/AIDS

In this section

Antifungal medicines work well to get rid of oral thrush in people who have HIV that has not progressed to AIDS.

These are the antifungal medicines most often used in people with HIV:

- Fluconazole mouthwash (brand name Diflucan)
- Itraconazole liquid (brand name Sporanox)



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- Nystatin liquid for rinsing your mouth (brand name Nystan).

We found several good studies (called **randomised controlled trials**) that showed that some antifungal mouthwashes are just as good as tablets in treating oral thrush in people with HIV. <sup>[21]</sup> <sup>[22]</sup> <sup>[23]</sup> <sup>[24]</sup> <sup>[25]</sup>

In most studies, about three-quarters of people who took antifungal medicines got rid of their oral thrush. <sup>[23]</sup> <sup>[24]</sup> <sup>[25]</sup> One study in about 170 people found that fluconazole worked better than nystatin. <sup>[19]</sup>

The most common side effects of antifungal treatment in people with HIV infection or AIDS were nausea, vomiting, diarrhoea, headache, and rashes. These problems were not usually serious.

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## Antifungals to prevent oral thrush in children

In this section

The best treatment to prevent oral thrush in children who have a weak **immune system** seems to be a drug called fluconazole (brand name Diflucan). This comes as an orange-flavoured liquid that children swirl in their mouth and then swallow. Fluconazole can also be given as tablets or through a tube directly into the vein (drip).

One large study of more than 500 children aged 6 months to 17 years whose immune system wasn't working properly found: <sup>[26]</sup>

- About 1 in 100 children who took fluconazole got mouth thrush
- About 6 in 100 who took the antifungal medicine nystatin got oral thrush.

These medicines can have side effects, such as an upset stomach.

- In one study, 3 in 100 children who took fluconazole stopped treatment because of side effects. <sup>[26]</sup>
- About 1 in 100 children who took nystatin stopped treatment. <sup>[26]</sup>

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## Antifungals to treat oral thrush in people who wear dentures

In this section

There hasn't been much research on treatments for oral thrush in people who wear dentures.

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If you have thrush in the roof of your mouth where your dentures go, you may be offered antifungal medicines to try to get rid of it. You may be given tablets to swallow, a gel to smear on the infected area, or products to put on your dentures.

A few small studies suggest that antifungal medicines might help people with dentures get rid of thrush in their mouths. <sup>[27]</sup> <sup>[28]</sup> But the research isn't very good quality.

- Taking the antifungal medicines nystatin (brand name Nystan) or fluconazole tablets or liquid (brand name Diflucan) may help to get rid of oral thrush if you wear dentures. <sup>[27]</sup> <sup>[28]</sup>
- One small study found that about 1 in 4 people taking fluconazole tablets were cured or had improved after four weeks. <sup>[28]</sup> None of the people taking a dummy treatment (called a placebo) improved.

The studies are too small to tell us much about side effects. In one study, 4 in 100 people taking fluconazole tablets got some kind of problem. <sup>[29]</sup> Side effects included diarrhoea and a bitter taste in people's mouths. Occasionally, fluconazole can cause liver problems.

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## Antifungals to treat oral thrush in people who are having cancer treatment

In this section

If you already have oral thrush because you're having treatment for cancer, you will probably be offered antifungal medicines to get rid of it.

There's some research to show that antifungal medicines can cure oral thrush for people being treated for cancer. There is evidence in favour of the drugs ketoconazole and clotrimazole. But the studies are poor quality, so it's hard to rely on what they say. <sup>[16]</sup>

However, ketoconazole is no longer recommended as it can cause serious liver damage. <sup>[17]</sup>

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## Antifungals to prevent oral thrush in people who have had a transplant

In this section

Antifungal medicine is used to treat oral thrush in people who have had a transplant. But there isn't much research on this treatment in people who have had a transplant.

This treatment **needs further study**.

You may be offered antifungal medicines to prevent oral thrush after an organ or bone marrow transplant. You're more at risk of getting oral thrush after a transplant, because

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the drugs you need to take to stop your body rejecting your transplant make your immune system weaker. But we don't know if antifungal medicines will help, as the studies so far have been small.

In one study (called a randomised controlled trial ) of 143 people who had had a liver transplant: <sup>[30]</sup>

- About 1 in 10 of those who took fluconazole (brand name Diflucan) got oral thrush
- About 2 in 10 who took nystatin (brand name Nystan) got oral thrush.

But we don't know how many would have got oral thrush if they hadn't taken any drugs.

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### Keeping your dentures clean to prevent oral thrush

In this section

People who wear dentures are advised to keep them clean, just as they would real teeth. But we don't know which cleaning method is most likely to prevent oral thrush, or to help people get rid of the infection. This treatment needs further study.

Studies that have tested different ways of soaking or scrubbing dentures were too small to give clear results.

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### Further informations:

#### How to reduce your risk of oral thrush

There are things you can do to avoid getting oral thrush.

- If you smoke, the best thing to do is to stop. You can have treatment to help you give up. To find out more, see our information on [Smoking](#) .
- If you use a steroid inhaler to prevent asthma attacks, you can reduce your risk of getting oral thrush by rinsing your mouth out with water and brushing your teeth after using your inhaler. You can also use a device called a spacer to reduce the amount of steroid that stays in your mouth and throat. To find out more, see our information on [asthma in adults](#) or [asthma in children](#) .
- If you wear dentures, make sure that they fit you properly. Your gums may shrink and the shape of your mouth may change as you get older, so your dentures stop fitting as well as they once did. You can have regular dental check-ups to make sure your dentures still fit you properly. Candida can grow on the surface of the dentures, so always keep your dentures clean, especially the surface that's in contact with the roof of your mouth. Leave your dentures out at night so that the lining of your mouth has a chance to recover.

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- If you have **diabetes**, your blood sugar needs to be kept under control to reduce your risk of oral thrush. This means testing your blood sugar levels and taking your diabetes medicine correctly. To find out more, see our article on [Diabetes](#).
- If you have asthma and you take medicine called corticosteroids through an inhaler, the medicine can sometimes cause oral thrush. You can reduce the chances of this happening by rinsing your mouth out after using the inhaler, ensuring a good inhaler technique, and using a spacing device. The device makes it easier to inhale the medicine without too much of it touching your mouth and throat.
- If you got oral thrush after taking **antibiotics**, be sure to tell your doctor if you need antibiotics again. Your doctor may be able to prescribe an antibiotic that is less likely to increase your risk of getting oral thrush.
- If low iron or vitamin levels could be making you prone to mouth thrush, ask your doctor about changing what you eat or taking supplements.
- Try to eat a balanced diet with plenty of fresh fruit and vegetables, and reduce the amount of refined carbohydrates that you eat, such as biscuits and sweets.

### Glossary:

#### **fungus**

A fungus is an organism that is sometimes considered to be a type of plant. A fungus lives by feeding on other organisms. The mushrooms we eat in salads are fungi, but so are candida and cryptococcus, which can cause infections in people's bodies.

#### **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.

#### **radiotherapy**

This is also called radiation therapy. It is a treatment that uses high-energy X-rays to kill cancer cells. It's most often used for tumours that are hard to treat with surgery alone. You won't feel any pain during this treatment, but you may get some side effects afterwards.

#### **AIDS**

AIDS stands for acquired immunodeficiency syndrome. People who are infected with the human immunodeficiency virus (HIV) get AIDS when the virus has destroyed most of their immune system. When people have AIDS, their body isn't able to fight infections. So even common infections, such as colds, can cause serious problems.

#### **leukaemia**

Leukaemia is a type of cancer that affects your body's production of white blood cells. White blood cells are important for fighting infections. So, if you have leukaemia, you are more likely to catch an infectious disease.

#### **diabetes**

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

#### **antibiotics**

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

#### **folic acid**

This is a type of B vitamin found naturally in plants, liver and yeast. It is important for making red blood cells and other tissues.

#### **HIV**

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HIV stands for human immunodeficiency virus. It's the virus that causes AIDS. It makes you ill by damaging cells called CD4 cells. Your body needs these cells to fight infections. You can get HIV by sharing needles for injecting drugs, or by having sex without a condom with someone who has the virus.

## 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.

## placebo

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

## 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.

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## Thrush, mouth

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