



FUNGAL NAIL INFECTIONS

WHAT ARE THE AIMS OF THIS LEAFLET?

This leaflet has been written to help you understand more about fungal nail infections. It tells you what they are, what causes them, what can be done about them, and where you can find out more information about them.

WHAT IS A FUNGAL NAIL INFECTION?

Fungal nail infections are also known as dermatophytic onychomycosis, or tinea unguium. The responsible fungus is usually the same as the one causing athlete's foot (tinea pedis) – a common infection of the skin of the feet, especially between the toes. In athlete's foot the responsible fungus lives in the keratin that makes up the outer layer of the skin. When the fungus spreads to the keratin of the nails, the result is a fungal nail infection.

WHAT CAUSES FUNGAL NAIL INFECTIONS?

Fungi spreading from athlete's foot (known as 'dermatophyte fungi') cause most fungal nail infections. Less often, a nail infection is due to other types of fungi, usually yeasts (e.g. *Candida*) and moulds which do not cause athlete's foot. These other fungi tend to attack nails that are already damaged, as it is easier for the fungus to invade. Fungal infections of the toenails are very common (1 in 4 people can be affected at a given time), those of fingernails less so. Both are seen most often in the elderly, those with impaired immune systems, and in people with diabetes and with poor blood circulation in the hands and feet.

Warm, moist environments help fungi to grow and cause infection. For example, occlusive footwear, such as work boots, or socks or trainers made of synthetic

materials, can cause the feet to sweat excessively ([hyperhidrosis](#)), which increases the risk of fungal infections. Further, shared shower stalls, bathrooms or locker rooms also pose a risk of spreading fungal infections.

ARE FUNGAL NAIL INFECTIONS HEREDITARY?

No, however, in some extremely rare cases, there is a genetic risk factor and other family members can also be affected.

WHAT DO FUNGAL NAIL INFECTIONS FEEL AND LOOK LIKE?

At the start, there are usually no symptoms. Later the nails may become so thick that they hurt when they press on the inside of a shoe. They are then hard to trim. The look of an infected nail, particularly a fingernail, may cause embarrassment. The abnormal nail can damage socks and tights and may cut into the adjacent skin. The skin nearby may also have a fungal infection; it may itch, crack, form a blister or appear white, especially between the toes.

When fungi infect a nail, they usually start at its free edge, and then spread down the side of the nail towards the base of the cuticle. Eventually, the whole nail may be involved. The infected areas turn white or yellowish, and become thickened and crumbly. Less commonly, there may be white areas on the nail surface. The nails most commonly affected by fungal infections are those on the big and little toe. Sometimes, especially in those who carry out regular wet work such as cleaners, the skin around the fingernail becomes red and swollen. This is called [paronychia](#) and can allow infection to get to the nail.



HOW ARE FUNGAL NAIL INFECTIONS DIAGNOSED?

Fungal nail infections are usually diagnosed clinically. Your doctor may take a piece from the abnormal nail and send it to the laboratory to check if fungus can be seen under the microscope or grown in culture (this takes several weeks). Sometimes, repeated samples may be required. Many nail problems can look like a fungal infection – for example, the changes seen in [psoriasis](#), after a bacterial infection or an old injury – however, antifungal tablets will not help them. The right treatment may depend on knowing which fungus is causing the trouble; it can take several weeks to get culture results.

CAN FUNGAL NAIL INFECTIONS BE CURED?

Yes. However, longer treatment is required, and it may take up to a year to successfully clear fungal toenail infection. Fungal nail infections commonly recur (come back), especially on the toes. Fingernails are easier to treat.

HOW CAN FUNGAL NAIL INFECTIONS BE TREATED?

Fungal nail infections do not clear up by themselves, but not all of them need treatment. Some people with infected toenails are not bothered by them at all. In that case, they can sometimes be left alone (although the patient should remain cautious and try not to spread the infection to other parts of the body and nails or other people). On the other hand, if infected nails make a person feel embarrassed or uncomfortable, then they can be treated. It is important to treat people whose infections may cause significant health problems such as those with diabetes or immune suppression, in order to prevent potentially serious health problems.

The aim of the treatment is to get rid of the fungus: the nail will then usually return to normal. However, if the nail was abnormal before it was infected, it will be harder to

clear and may just go back to its former state. Nail infections caused by moulds and yeasts can be very resistant to treatment.

Treatment options include:

Treatments applied on the nail (topical treatments)

- Treatments applied on the nail work less well than those taken by mouth. They are most effective if the infection is treated at an early stage. The treatments used most often are amorolfine nail lacquer and tioconazole nail solution. By themselves, these treatments may not reach the deeper parts of the infected nail, though regular removal of abnormal nail material with clippers or filing can help with this. Used in combination with an antifungal remedy taken by mouth, topical treatments increase the chance of complete clearance. For toenails, they may have to be used for a period of 4 to 12 months before an effect is noted. The course of treatment is shorter for fingernail infections. The clearance rate with topical agents alone is low, approximately 15-30%. Topical treatments are safe. Local [redness](#) and irritation can occur.

Treatment by mouth (oral treatments)

Before starting on tablets, the doctor should send a piece of the nail to the laboratory to check that the diagnosis of a fungal infection is confirmed.

- *Griseofulvin* has been used for many years and is the only one of the three medicines licensed for use in children. It is only absorbed fully if taken with fatty foods (e.g. dairy products and milk), and long courses of treatment are usually needed (6 to 9 months for fingernails, and up to 18 months for toenails). Even so, only about three quarters of infected fingernails and one third of infected



toenails will clear up. Relapses are common.

- **Terbinafine** and **itraconazole** have largely taken over from griseofulvin now. They work better and quicker although only about 50% of nail infections are cleared. Terbinafine should be considered as first line treatment for dermatophyte fungi (the ones that cause athlete's foot). It is taken daily for 6 weeks for fingernail infections and for 12-16 weeks for toenail infections.
- **Itraconazole** is effective in treating dermatophytes too; it is also useful for treating other fungi such as yeasts. It is often given in bursts – for one week in every month – because it is deposited into the cuticle of the nail and continues to be effective for a few weeks. Two of these weekly courses, taken 21 days apart, are usually enough for fingernail infections and three for toenail infections.
- **Fluconazole** can be effective for Candida fungal infections. It is currently not licensed for fungal nail infections. It appears to be less effective than itraconazole and terbinafine but remains an alternative if someone is not able to tolerate these two medications.

Other treatments

- Laser treatments, [photodynamic therapy](#) may be helpful but are less effective than the topical and systemic treatments listed above. These treatment options are not currently available on the NHS.
- Herbal products are promoted for fungal nail infection, but there is no good evidence that they are safe or more effective than standard treatments.

ARE THERE ANY SIDE EFFECTS FROM THE TREATMENTS?

Oral treatments are more likely to cause side effects than topical ones.

Griseofulvin can cause some mild side effects such as feeling sick, diarrhoea, headache, feeling sleepy or drowsy. Although griseofulvin is the only licensed treatment in children, many dermatologists may use terbinafine, as it is much more effective.

Terbinafine rarely causes a potentially very severe allergic reaction and can make some skin conditions worse. Rarely, it can affect the sense of taste permanently.

Itraconazole cannot be taken by people who are already taking some medicines. Your doctor will advise you about that.

Both terbinafine and itraconazole can affect the liver. Because of this, your doctor may arrange blood tests to check your liver function before and during treatment.

HOW WILL I KNOW IF THE TREATMENT IS WORKING?

The new nail will grow slowly outwards from its base, and it may be 6 months to a year after the treatment has finished before the nails look normal again. Fingernail infections clear up more quickly and completely than toenail ones; it can take 18 months for a toenail infection to grow out completely.

Surgical removal of nails

Sometimes very thick nails that are not likely to respond to tablets alone may have to be removed by surgeons under a local anaesthetic. However, this is rarely performed since cure rates are not high enough to justify the discomfort of the surgery.



SELF-CARE (WHAT CAN I DO?)

- Keep your nails short, dry, and clean. Stick to one nail clipper for the infected nails and another for the normal ones.
- In addition to your nails the affected skin (e.g. athlete's foot) must be treated with antifungal cream as well.
- Avoid cutting the cuticle, either yourself or by a chiropodist or podiatrist or a manicurist, since this increases the risk of nail damage and infection.
- For toenail fungal infection:
 - Wear well-fitting shoes, without high heels or narrow toes.
 - Keep your feet dry, wear cotton socks, change them daily, and use 'breathable' shoes. Normal laundry in hot water clears most of the affected socks, but it can be made more effective if an antifungal spray can be used before laundry. Other clothes would not be infected by laundry with or without antifungal spray.
 - Maintain good foot hygiene, including treating any athlete's foot.
 - Wear clean shower shoes when using a communal shower.
 - Be meticulous with the hygiene of affected feet.
 - Consider seeking treatment from a podiatrist if thickened toenails cause discomfort when walking.

WHERE CAN I GET MORE INFORMATION?

Links to other Internet sites:

Web links to detailed leaflets:

<https://www.nhs.uk/conditions/fungal-nail-infection/>

<https://patient.info/doctor/fungal-nail-infections-pro>

<http://www.dermnetnz.org/fungal/onycho-mycosis.html>

<https://cks.nice.org.uk/topics/fungal-nail-infection/>

This leaflet aims to provide accurate information about the subject and is a consensus of the views held by representatives of the British Association of Dermatologists: individual patient circumstances may differ, which might alter both the advice and course of therapy given to you by your doctor.

This leaflet has been assessed for readability by the British Association of Dermatologists' Patient Information Lay Review Panel

BRITISH ASSOCIATION OF
DERMATOLOGISTS
PATIENT INFORMATION LEAFLET
PRODUCED | AUGUST 2004
UPDATED | APRIL 2010, MARCH 2014,
JULY 2017, JUNE 2023
NEXT REVIEW DATE | JUNE 2026

