

## Nail Fungus

Fungal infection of the nails, also known as Onychomycosis, is a common problem affecting between 2% and 14% of the population. Onychomycosis tends to run in families because of an inherited susceptibility. It is rare in children unless one or both parents are affected. Men are more likely to be affected by this condition than women. The frequency of such infections increase with age. Toenail fungus is much more common than fingernail fungus because the dark, warm, moist environment of a shoe provides an ideal environment for the fungus to grow.

The fungi that cause toenail fungus are related to those that cause ringworm, athlete's foot, and other common fungal infections. These fungi can also be confused with other conditions, such as psoriasis of the nails, nail ridges, and sometimes bacterial infections. Nail fungus is more than a cosmetic problem. It can be painful and interfere with daily activities such as walking, playing sports, writing, typing, and other activities that require manipulating small objects or repetitive finger use and as such can impact the quality of life.

### Causes

As the name implies, the disease is an infection of the nail caused by a fungus. Fungal nail infections are caused by an organism that digests the keratin found in fingernails and toenails. Fungi are small, parasitic, plant-like organisms such as molds and yeasts. Nails are naturally built to be strong barriers, and resistant to fungi and other infections. The strength of this barrier also makes nail fungus very difficult to eradicate once it is present. The two most common types of skin fungi are dermatophytes and yeast (*Candida*). Although both types infect nails, dermatophytes may be more often seen in toenails and yeast in fingernails. It may be important to identify the type of infection since the treatment could be different.

### Symptoms

The first sign of nail fungus is usually a small spreading white or yellow spot on the nail. Many people fail to seek treatment initially because the symptoms of nail fungus may appear to be nothing more than a blemish. Since nail fungus rarely heals by itself, you should see your dermatologist at the first sign because it can persist indefinitely and spread when left alone. In addition, treatment is likely to be more successful the earlier the infection is caught. Symptoms include thickening or deformity of the nail, discoloration (green, yellow, brown, or black), and separation of the nail from the nail bed. In some cases, the skin around the nail may become itchy, red, or swollen. As the infection spreads, it becomes painful, and the pain may be severe. The nail may have a foul smell of decay.

### Risk Factors

Nail fungus is more common with age because as people age, their nails begin to grow more slowly and start to thicken, making them more susceptible to attack by fungi.

Nails that are kept moist and warm have a higher risk of developing fungal infections. People who perspire heavily, work where their hands are frequently in water, wear tight socks or shoes that don't provide ventilation, or who frequent locker rooms, swimming pools, or other public bathing facilities have a higher risk of developing fungal infections.

Nail and hair salons can spread fungal infections through contaminated instruments such as scissors, nail files, and razors.

Fungal infection of the nails is also important in people who have other diseases such as diabetes, and those who have had their immune system suppressed. Patients who are HIV+, have AIDS, cancer patients, particularly those taking anti-cancer medications, and transplant patients who are also taking drugs which suppress the immune system. These individuals should practice good nail hygiene to prevent infection and be treated immediately to prevent future health problems.

### **Diagnosis**

Because the symptoms of nail fungus can mimic those of other diseases, your dermatologist will first take a medical history. The questions will help distinguish nail fungus from other conditions with similar symptoms, including psoriasis, contact dermatitis, nail bed tumors, and other nail problems.

Other conditions such as nail psoriasis or allergic reactions to nail polish, hardeners, or acrylic nails may look like fungal infections, but they are not. There are several tests that help make the correct diagnosis and your dermatologist will probably take samples from the nail in order to properly identify and treat the problem. A scraping of the nail is treated with a chemical called KOH which allows it to be examined under a microscope. Sometimes, the scrapings from under the nail can be used to culture the material to see what grows and identify it. In addition, a piece of the nail may be sent to a laboratory as a biopsy where a PAS test helps identify the fungus.

### **Treatments**

Onychomycosis is difficult to treat successfully because the toenails usually take a year to grow out normally after the fungus has been treated.

#### **Self Care:**

You cannot cure nail fungus by yourself once it occurs. But good nail hygiene may reduce your risk of developing the infection in the first place.

#### **Topical Treatments:**

There are two primary treatment methods used for nail fungus. Topical treatments (liquids, aerosol sprays, and creams) are commonly used to treat less severe cases of nail fungus because it is difficult for them to penetrate the nail. Topical treatment advantages are that they have a very low risk of side effects and are inexpensive. Topical treatment disadvantages are that in many cases they function as a treatment, not a cure. Nail fungus can reappear once treatment stops, it requires multiple applications daily for an extended period of time, treatments can cause superficial damage to surrounding skin, and topical solutions can be messy and have bad odors.

### **Oral Medications and their side effects**

Oral medicines like Itraconazole, Terbinafine, and Fluconazole are also used, and require monitoring with blood tests. These are usually avoided in patients with a history of liver disease such as hepatitis and are not given to pregnant or nursing women. These oral treatments are very safe when prescribed and monitored under the care of a dermatologist. In general, toe and fingernail fungus usually requires pills except in very mild cases.

### **Surgery**

In some cases, surgical treatment of nail fungus may be necessary. Temporary removal of part or the entire nail may reduce pain and allow topical antifungal agents to be applied directly to the underlying tissue and enhance the effectiveness of the treatment. When a nail fungus does not respond to any other treatment, permanent removal may be considered. With permanent removal, the nail plate and the nail matrix (the tissue from which the nail grows) are removed and destroyed. Permanent removal may eliminate the pain associated with a thickened nail plate, and when done correctly, prevents a deformed nail from growing back.