

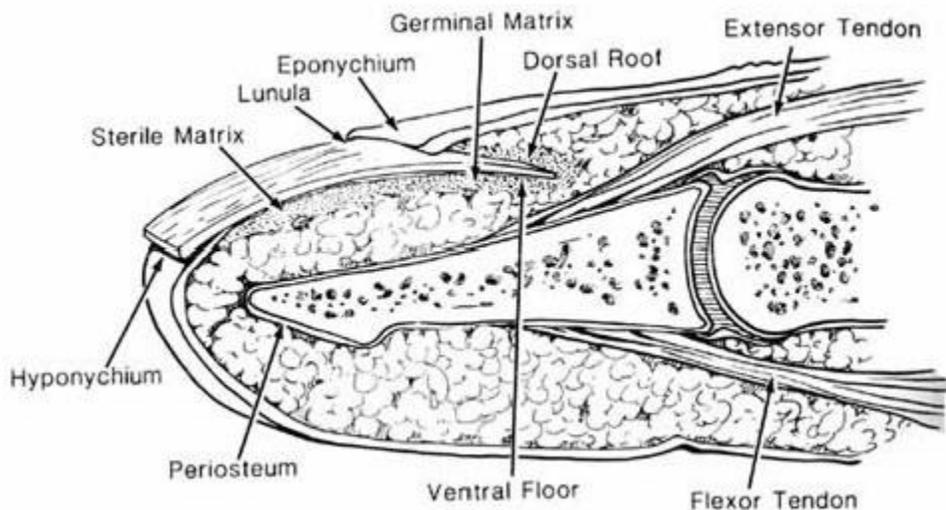
# Fingernail Fungus Infections

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Nail fungus infection is a condition called onychomycosis ("onycho" refers to the nail, and "mycosis" means fungus). It is fairly common, with about 12 million Americans being affected. We all have a variety of microorganisms, including bacteria and fungi, growing in and on our bodies. Some of these are absolutely essential to our health (for instance, the bacteria in our intestines that assist in digestion). Others may cause illness (infection) whenever they invade us, or only if they multiply rapidly and out of control. Fungal infections are caused by fungi, which are microscopic plants.

We all have fungus growing on our skin, particularly on our feet, where the condition is called "athlete's foot." Fungus loves the growth conditions of damp, moist, and lots of food, and the skin of our feet is the perfect location (the "food" is the dead skin cells that are sloughed off by the millions every day). Other common fungal infections include mold-like fungi (dermatophytes, causing tinea infections) and yeast-like fungi (such as *Candida*). Tinea infections include jock itch, ringworm, and tinea capitis. *Candida* (yeast is the spore form of fungus) infections include diaper rash, oral thrush, cutaneous candidiasis, and some cases of genital rashes. The fungus is usually not a problem, since our immune system fights back and the fungus stays on the outside of our bodies. Fungus is a problem when there is a breakdown in our defenses.

The fingertip is a highly specialized structure, with many specialized features.



The illustration above shows the anatomy of the fingertip. There are also additional specialized tissues just around the nail, in order to help fight nail fungus infections. In terms of evolution, this should make sense. Originally, nails were claws, and animals would get dirt forced under and

around their claws as they dug, fought, etc. The nail area developed many specialized defenses against the invasion of bacteria and fungus.

Nail bed infections usually start when there is some breakdown in the body's defenses, such as an immune system illness, fingertip crush, nail fold laceration, etc. The fungus may get a start because of a bacterial infection.

The fungus, typically caused by a species of Trichophyton fungus, feeds on keratin, the protective outer layer of nails, hair and skin. If the fungus gets some advantage over our fingertip defenses, it may start growing on the keratin of the skin under the nail plate (the part that you trim with a fingernail clipper). There is a buildup of organic waste material and the body can react with over-production of keratin, both of which forces the nail to separate from the nail bed. This causes the typical yellow color under the nail and partial nail separation. It can also result in the thickened, distorted nail plate. Sometimes, the soft tissues around the nail will be just a bit red and tender.

Eventually, the entire nail separates, resulting in partially destroyed, yellow nail.

## **Treatment**

Once fungus gets into the nails, it is very difficult to treat, but if you are persistent you can beat it. My choice is to treat it with topical ointments, but I want to review the alternatives so you understand why this is my choice. Some kind of treatment is necessary, as it will not go away by itself, so don't just ignore it.

Fungal infections of finger nails can be treated by taking pills called griseofulvin. The pills must be taken for six months to one year and have side effects. These include headaches, nausea, and rare reversible liver damage or blood disorders. You can not drink alcohol if you are taking griseofulvin. A course of treatment costs approximately \$350 and has a 50-70% chance of curing the condition.

A new medication, terbinafine, is now available for the treatment of toe and finger nail fungal infections. Terbinafine is taken once a day for 6 to 12 weeks. This medication has fewer side effects than griseofulvin, but there still is the possibility of side effects. A 12 week course of treatment costs \$500 and has a 50-70% chance of curing the condition.

So what do I recommend? I suggest that you try topical ointment. It is slower; takes more work on your part, and needs to be done over a very long period of time (six months to a year) and may need to be done periodically in the future.

Lotrimin cream is available without a prescription at your local drug store, or I can write you a prescription. Clean your fingernails (and toenails, too, if you want) every day. Don't push up the cuticle and do not wear false nails. Do not clean the nail area with solvents (fingernail polish remover, for instance). Rub some of the Lotrimin into the nail area, especially under the nail plate. Squoosh it around (do you mind if I make up a word?) so that it gets under the nail as far as possible. It can't help fight the fungus under the nail if you don't get it in there!

If we can make the environment hostile enough for the fungus, our body's natural ability to heal itself and fight off the fungus will win the day. Don't be discouraged if you don't see instant results: you won't. It will take a few months before you see much of a change.

In severe cases, removal of the hard part of the nail, called the nail plate does three things. First the nail itself is almost a foreign body; anti inflammatory cells cannot get into the dead area of the nail so by removing it, you allow the bodies resources to get to the live tissue. Second, it allows a more thorough exposure of the anti-fungal cream to the area. Third, a nail fungus likes a moist environment and removing the nails, prevents water and moisture from getting trapped beneath the nail.

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