



THE FAMILY PHARMACIST

A QUICK READ FOR YOUR OTC NEED!

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OVER-THE-COUNTER AND RX TREATMENT FOR SKIN FUNGAL INFECTIONS

So you jump into bed at night and as you are trying to fall asleep that nagging itch on your neck and chest keeps you awake. It could just be dry skin due to your forced air heating system—or, it may be a fungal infection. Infections of the skin, hair, and nails by fungi are quite common. But what are fungi?

Fungi, once believed to be plants but now classified as a separate kingdom of organisms, are among some of the most prolific organisms on the planet. Fungi can be friends or foes. We can think of delicious cheese and mouth-watering mushrooms, or athlete's foot and unseemly looking nails. Fungi are everywhere. Every time we breathe we likely inhale fungal spores. The fungus is truly among us.

There are millions of species of fungi, but only about 300 of these pose a problem to humans. These disease-causing fungi are the subject of medical mycology and fungal infections are known to doctors as *mycoses*. In 2019 the Centers for Disease Control and Prevention (CDC) estimated that fungal diseases cost more than \$7.2 billion from hospitalizations and outpatient visits and they suggested that this was an underestimate of the economic burden on the healthcare system because fungal disease is underdiagnosed.

While it is a simplification for this newsletter, fungal infections in humans can be divided into two groups: those that cause *systemic disease* (affect the entire body) and those that are *superficial* (infect various parts of the skin, hair, and nails). Systemic disease caused by fungi is complicated and serious. This article is about the most common type of human fungal disease, superficial infections (also known as *cutaneous* infections). Fungal infections of the mucous membranes of the mouth and throat and vaginal infections are not discussed here. They can be complicated and require the attention of your doctor.

For the most part, superficial fungal infections are *not serious* but they can cause a great deal of discomfort, emotional distress, and self-consciousness. In these situations, modern medicines can come to the rescue and provide some relief.

In the 1960s there were only a few effective treatments available for fungal skin infections. Back then, most available therapies were simple antiseptics with some antifungal activity. I remember my father painting his toes with a purple dye to treat athlete's foot,

probably one of the antiseptics that had been in use since the early 1900s. In the 1960s, over-the-counter (OTC) standbys were Desenex,[®] Whitfield's ointment, and Absorbine Jr.[®] *Tolnaftate* came on the market in the brand name Tinactin,[®] but it required a doctor's prescription. The FDA approved tolnaftate for OTC use in 1965 making it the first modern, effective treatment for fungal skin infections widely available to the public. Many new antifungal drugs were to follow.

Over the last fifty years, there have been huge advances in the management of skin fungal disease. With few exceptions, antifungal drugs applied to the skin are safe, and serious side effects are uncommon. Also, fungi are less likely to develop resistance to drugs as bacteria do to antibiotics.

The largest group of fungi responsible for causing superficial infections in the skin, hair, and nails is called the *dermatophytes*. What makes these particular fungi so successful at making humans miserable is that they like to eat keratin. Keratin is the stuff that our skin, hair, and nails are made of. When fungi digest human keratin they cause itching and inflammation. This condition is what is commonly referred to as *ringworm*. The term is a misnomer because the classical circular rash or ring is the result of a fungus and not a worm of any kind. But I'll use the term because it is so familiar to all of us. There are numerous medical terms to describe ringworm infection depending on what part of the body is affected.

Tinea is what medical people call ringworm. It is the Latin word for a type of real worm and the word was used to describe skin fungal infections long before the true cause was understood.

"Ringworm" infections can be present just about anywhere on the body. Most of the time it is spread from person to person, but you can also get it from animals. Keeping areas like the feet and groin as clean and dry as possible is the best way to prevent superficial tinea infections.

If your doctor treats a fungal infection of the areas mentioned above, she or he may order a product only available on prescription. While prescription products work to kill fungus the same way the OTC ones do, additional properties or strengths are sometimes only available with a prescription drug. Many very effective medicines are now avail-

able for the treatment of ringworm. In most instances, these medicines bring about a complete cure if used according to direction. One exception is stubborn nail infections.

Fungal Nail Infection. Fungal infections of the nails and hairy areas do not always look like the classical ringworm rash that you see on the skin. Fingernail or toenail fungal infections are called *onychomycosis*. This condition makes the nails look thick, discolored, and brittle. Fungal infections of the nails account for one-third of all fungal skin infections and are more common in people after 60 years of age. Various fungi infect finger and toenails and may require different drugs for successful treatment. An effective therapy is to use the drug *terbinafine* in an *oral* prescription, so you will need to see your doctor. Oral terbinafine is prescribed more often by physicians (Rx) and seems to be more effective than other antifungals, cost is under ten dollars a month, and about half of patients see results after 12 weeks of daily use. There are also topicals (applied directly to the nail) prescription medicines like Jublia[®] and Penlac[®] Nail Lacquer, but these are difficult to apply and very expensive. Plus fewer than 20% of patients see results after a year of daily use.

What about OTC products for nail infections? Some OTC products promoted for fungal nail infection don't contain antifungal drugs at all, or are only slightly antifungal. These are the ones that will claim to "approve the appearance of nails" or give you "healthy-looking nails." Products like NonyX[®] Nail Gel, home remedies like tea tree oil, or Vicks VapoRub[®] won't hurt, but there is scanty evidence that they work. Stick with oral prescription medicines for nail fungal infections to get long-lasting results.

Skin and Hair Fungal Infection. A search at the drug store for an antifungal cream, ointment, or solution will almost always take you to the "Foot Health" section of OTC drugs. That's because athlete's foot and jock itch are the most common types of skin fungal infection. While these products are labeled for the treatment of athlete's foot and jock itch, they work to kill most any skin fungus. Bayer makes OTC Lotrimin[®] for Ringworm and

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promotes it for fungus on the body, but it has the same effective ingredient (*clotrimazole*) found in many products for athlete's foot and jock itch.

OTC skin and hair fungal medicines are available as creams, ointments, solutions, powders, gels, sprays, and shampoos. That's because one formulation may work better than another on certain body areas. For example, a liquid solution is easier to apply on hairy parts of the body than a cream or ointment. The scalp is also prone to dandruff-causing fungi. One effective OTC shampoo for this condition is Nizoral® Antidandruff Shampoo available in drugstores (see the table).

For antifungal medicines, the list below is alphabetized by the generic name of the chemical ingredient used in the brand name examples. There are many generics on the market so if you want to save money, this chart may help you get the best price by going with the same ingredient in the generic OTC product. Read the "Product Information" or "Drug Facts" on the package to find the *active ingredient*.

In summary, if you are concerned about a skin, hair, or nail condition that may be related to a fungus, it's safe to try one of the OTC products found in drug stores. Many fungal skin infections are self-treatable. Stay with the newer antifungals: *terbinafine*, *butenafine*, and generic ingredients ending with "azole." If you don't see improvement in a couple of weeks, it's time to see your primary care physician or dermatologist.

Generic Ingredient	Brand Name	Notes	
<i>butenafine</i>	Lotrimin Ultra® Cream	Lotrimin is labeled for athlete's foot and jock itch, but it works for most ringworm infection. <i>Butenafine</i> is only available OTC as this brand.	OTC
<i>ciclopirox</i>	Penlac®	Paint-on product prescribed for nail infection: Low 8% cure rate. This may be prescribed when a patient can't take the oral medicine. Expensive.	Rx
<i>clotrimazole</i>	Lotrimin® for Ringworm Cream	Any <i>clotrimazole</i> cream product can also be used for athlete's foot and jock itch, even though Lotrimin "for Ringworm" is marketed for body ringworm.	OTC
<i>clotrimazole</i>	Lotrimin® AF Cream	AF stand for athlete's foot. The same ingredient, <i>clotrimazole</i> , can be used for any ringworm infection. Available as <i>clotrimazole</i> generic.	OTC
<i>efinaconazole</i>	Jublia®	Applied to the nails with a brush applicator and may take a year to see improvement. Expensive. Complete nail infection cure rate is only 17%.	Rx
<i>ketoconazole</i>	Nizoral® Cream	Effective for athlete's foot, jock itch, most body ringworm. Also to treat a skin condition called pityriasis	Rx
<i>ketoconazole</i>	Nizoral® Antidandruff Shampoo	Effective in treating dandruff caused by certain fungi found on the scalp. Check with your physician if you don't get results in a couple of weeks. This is sometimes used in combination with an oral antifungal medicine available from your doctor, like <i>terbinafine</i> .	OTC
<i>miconazole</i>	Lotrimin® AF Powder Spray, Liquid Spray, deodorant Powder Spray	Aerosol powders are used for ringworm on skin and for athlete's foot. The liquid spray is best for jock itch.	OTC
<i>miconazole</i>	Tineacide® Fungal Cream	Tineacide® is marketed for athlete's foot, however, <i>miconazole</i> is effective for most ringworm infections.	OTC
<i>miconazole</i>	Micatin® Antifungal Cream	Effective for athlete's foot, jock itch, and body ringworm	OTC
<i>tea tree oil 100%</i>	Various brands available	Tea tree oil may improve nail appearance. Using it twice daily for six months showed a fungus cure only 18% of the time.	OTC
<i>terbinafine</i>	Lamisil® Cream	Effective for most ringworm infections. Widely available as a generic.	OTC
<i>terbinafine oral</i>	Tablets available only as generic	<i>Terbinafine</i> by mouth is more effective for nail infections. Topical medicines can't reach fungi deep in the nail. Also effective for athlete's foot, body ringworm, and jock itch. See your doctor.	Rx
<i>terbinafine</i>	Lamisil AT® Cream	Effective for athlete's foot, jock itch, and skin fungal infections.	OTC
<i>tolnaftate</i>	Lotrimin® AF Athlete's Foot Daily Prevention Foot Powder (non-aerosol)	The powder is labeled for athlete's foot because it also absorbs moisture from sweaty feet. <i>Tolnaftate</i> is an effective antifungal.	OTC
<i>tolnaftate</i>	Odor Eaters® Spray Powder	Spray powder is another effective choice for athlete's foot.	OTC
<i>tolnaftate</i>	FungiNail® Ointment, Liquid, Pen	Despite the name, it is marketed for athlete's foot. But it only treats fungus on the skin <i>around</i> the nail, it doesn't reach the fungus in the nail.	OTC
<i>tolnaftate</i>	Opti-Nail® 2-in-1 Fungal Nail Repair	Primarily improves the appearance of the nail and kills fungus <i>around</i> the nail. Largely cosmetic.	OTC
<i>undecylenic acid</i>	CVS Antifungal Liquid	This is an older and less effective antifungal ingredient. Stay with the newer antifungals: <i>terbinafine</i> , <i>butenafine</i> , and generics ingredients ending with "azole"	OTC
<i>urea 40%</i>	Various brands available online (Amazon, etc.)	High percentage urea creams are effective as "exfoliants" to remove dead or damaged skin, but are only effective to cure fungi 20% of the time. And, it may take as long as two years to see results.	OTC
<i>urea</i>	Kerasal® Fungal Nail Renewal	Could make the nail look better, but may not contain enough urea to cure any of the fungal infection.	OTC