



Managing fungal skin infections in the pharmacy

Lynda Steyn, BPharm
Amazeza Information Services

Millions of species of fungi exist and are present in the soil, on plants, on household surfaces, as well as on the skin. Only about 300 of these species can cause a fungal infection of the skin.

What is a fungal skin infection?

Normally, the fungi living on the skin do not cause any problems, but under certain circumstances they may start multiplying faster than usual and cause infection. Fungal skin infections can occur anywhere on the body, but most often involve the skin, hair, and nails.

A fungal infection of the skin may be suspected if a red, scaly, or irritated rash appears on an area of the skin where a fungal infection would typically thrive e.g. in moist warm environments, where there typically is not much airflow, such as in the folds of skin, feet, and the groin.

Who is more at risk of developing a fungal skin infection?

People more at risk of developing a fungal skin infection include those who:

- Sweat heavily
- Live in a warm, or humid environment
- Are in contact with infected animals
- Are obese
- Are immunosuppressed
- Are diabetic
- Have poor personal hygiene

Also, people having extended contact with bedding, or tight, sweaty clothes, are more likely to get a fungal skin infection.

Which fungi are most likely to cause a skin infection?

Common fungi causing skin infections include:

- dermatophytes, or
- yeast (e.g. Candida).

Dermatophytes cause a fungal infection known as tinea. Dermatophytes need keratin, a protein found in the skin, hair, and nails to survive. These fungal infections are mostly transmitted from person to person, or from animal to person, and to a lesser extent, via the soil or contaminated materials. Tinea infections are named according to the part of the body infected, for example:

Tinea pedis (the foot) – also known as “athlete’s foot”

Tinea pedis typically occurs between the toes and presents as red, scaly, or peeling skin. In severe cases, the skin may also blister or crack. The patient often feels an itchy or burning sensation between the toes or on the soles of the feet. The skin between the pinky toe (fifth toe) and the one next to it (the fourth toe) is most commonly affected and, in some cases, the heel and the sole of the foot may also be affected.

Tinea corporis (the body) – also known as “body ringworm”

Tinea corporis typically occurs on the body and the limbs. It presents as a red, raised rash in the form of a ring (hence the name, ringworm), with normal looking skin on the inside of the ring. This rash can spread and is very often itchy. This rash may spread to another person with close contact.

Tinea cruris (groin) – also known as “jock itch”

This fungal infection, most commonly occurring in adolescent boys and men, affects the groin and thighs. An itchy, red rash usually starts in the groin area, sometimes spreading to buttocks and abdomen. Skin may also appear scaly, and the outer border of the rash may be darker and raised.

The most common source of jock itch is from the patient's own athlete's foot infection.

Tinea capitis (scalp)

A scaly, red rash typically appears on the scalp, causing bald patches. *Tinea capitis* most commonly affects children, and rarely affects adults.

Tinea unguium (nail) – also known as *onychomycosis*

The affected nails become thick, yellow, and brittle. Sometimes the nail also becomes separated from the nail bed. *Tinea unguium* is very often associated with *tinea pedis*.

Tinea versicolor – also known as *pityriasis versicolor*

An overgrowth of fungus normally present in the skin leads to small, discoloured, oval patches to appear on the skin. These discoloured patches may be lighter or darker than the normal tone of skin and typically appear on the back, chest, and upper arms. The patches may be itchy, and scaly or flaky. *Tinea versicolor* is more likely to occur in warm, wet climates. Skin exposure to the sun may make *tinea versicolor* more visible.

Yeast infections (cutaneous candidiasis) of the skin are caused by a type of fungus known as *Candida*. *Candida* is present naturally on the skin and inside the body. An overgrowth and infection can occur if a patient is on antibiotics, corticosteroids, diabetic, obese, or immunosuppressed.

Moist, warm, creased areas, such as the armpits, groin and under the breasts are common areas for cutaneous candidiasis. The nappy area in babies is also commonly affected by candida.

A rash with pimple-like bumps that itches and burns, is often a sign of a yeast infection. Patches of the rash may ooze a clear liquid.

Preventing fungal infections

General tips for preventing fungal skin infections include:

- Maintaining good hygiene practices.
- Avoiding the sharing of towels and other personal care items.
- Drying well after bathing, showering, or swimming.
- Wearing clothes or shoes that are not restrictive (or non-breathable).
- Wearing sandals or slippers in public areas such as gym showers and around public swimming pools.
- Avoiding direct contact with pets that have signs of a fungal skin infection, such as loss of fur or scratching. They should be taken to the vet for treatment.

Topical treatment options

Many topical agents are available over-the-counter (OTC) in the form of ointments, creams, powders, shampoos, and aerosols.

Infection	Medication*	Management
<i>Tinea pedis</i> (athlete's foot) Topical antifungal agents are preferred	Clotrimazole Ketoconazole Miconazole Terbinafine Tolnaftate Econazole Bifonazole Undecanoate	<ul style="list-style-type: none"> • May need to refer patient to the doctor if infection is extensive, or if patient is immunosuppressed Advice to patient: <ul style="list-style-type: none"> • Athlete's foot can spread to other parts of the body • Consider nonocclusive shoes, absorbent socks, and an antifungal foot powder to control extra moisture • Frequently change socks and carefully dry skin between toes after a bath or shower
<i>Tinea corporis</i> (ringworm) Topical antifungal agents are preferred	Clotrimazole Ketoconazole Miconazole Terbinafine Econazole	<ul style="list-style-type: none"> • Responds well to topical therapy Advice to patient: <ul style="list-style-type: none"> • Ringworm is highly contagious • Close contact with others should be avoided until the infection is completely cleared
<i>Tinea cruris</i> (jock itch) Topical antifungal agents are preferred	Clotrimazole Ketoconazole Miconazole Terbinafine Econazole	<ul style="list-style-type: none"> • Responds well to topical therapy • It is essential that the patient's athlete's foot (if applicable) is also treated to prevent the recurrence of jock itch
<i>Tinea versicolor</i>	Clotrimazole Miconazole Terbinafine Selenium sulfide Ketoconazole Econazole	<ul style="list-style-type: none"> • Mild cases usually respond well to topical therapy • More severe cases may need to be referred to the doctor Advice to patient: <ul style="list-style-type: none"> • Skin discolouration may persist for weeks or months even after successful treatment • <i>Tinea versicolor</i> may recur, especially if the weather is warm and humid
<i>Tinea capitis</i> (scalp)	Refer to doctor for oral therapy	<ul style="list-style-type: none"> • Additional therapy with antifungal shampoos containing selenium or ketoconazole at least twice a week may be recommended
<i>Tinea unguium</i> (nail)	Refer to doctor for oral therapy Topical: Amorolfine (Loceryl® 5% nail lacquer)	<ul style="list-style-type: none"> • Does not respond well to topical therapy • A combination of topical therapy and oral therapy can improve cure rate
<i>Candida</i> (yeast) skin infections	Clotrimazole Miconazole Ketoconazole Terbinafine Econazole	<ul style="list-style-type: none"> • Responds well to topical therapy • Nappy rash can be treated with topical clotrimazole or miconazole

*All preparations should be used as per manufacturer's instructions. Side-effects of topical treatments are rare, but may include local irritation, burning, itching, and dryness of skin.

If not treated effectively, fungal infections may spread. Most fungal infections respond well to OTC topical fungal treatments. However, patients who are not responding to topical therapy, or are immunosuppressed or diabetic, should be referred to a doctor. Patients with suspected fungal infections of the nail or scalp should also be referred to a doctor, as these patients often need to be treated with oral antifungals.

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