

TABLE 71-5 COMMON SKIN INFECTIONS

	Clinical Features	Etiologic Agent	Treatment
Impetigo	Honey-colored crusted papules, plaques, or bullae	Group A <i>Streptococcus</i> and <i>Staphylococcus aureus</i>	Systemic or topical antistaphylococcal and antistreptococcal antibiotics
Dermatophytosis	Inflammatory or noninflammatory annular scaly plaques; may involve hair loss; groin involvement spares scrotum; hyphae on KOH preparation	<i>Trichophyton</i> , <i>Epidermophyton</i> , or <i>Microsporum</i> spp.	Topical azoles, systemic griseofulvin, terbinafine, or azoles
Candidiasis	Inflammatory papules and plaques with satellite pustules, frequently in intertriginous areas; may involve scrotum; pseudohyphae on KOH preparation	<i>Candida albicans</i> and other <i>Candida</i> spp.	Topical nystatin or azoles; systemic azoles for resistant disease
Tinea versicolor	Hyper- or hypopigmented scaly patches on trunk; characteristic mixture of hyphae and spores ("spaghetti and meatballs") on KOH preparation	<i>Malassezia furfur</i>	Topical selenium sulfide lotion or azoles

some infections, most often those inappropriately treated with mid- to high-potency topical glucocorticoids. Involvement of the groin (*tinea cruris*) is more common in males than in females. It presents as a scaling, erythematous eruption sparing the scrotum. Infection of the foot (*tinea pedis*) is the most common dermatophyte infection and is often chronic; it is characterized by variable erythema, edema, scaling, pruritus, and occasionally vesiculation. The infection may be widespread or localized but generally involves the web space between the fourth and fifth toes. Infection of the nails (*tinea unguium* or *onychomycosis*) occurs in many patients with *tinea pedis* and is characterized by opacified, thickened nails and subungual debris. The distal-lateral variant is most common. Proximal subungual onychomycosis may be a marker for HIV infection or other immunocompromised states. Dermatophyte infection of the scalp (*tinea capitis*) continues to be common, particularly affecting inner-city children but also affecting adults. The predominant organism is *Trichophyton tonsurans*, which can produce a relatively noninflammatory infection with mild scale and hair loss that is diffuse or localized. *T. tonsurans* can also cause a markedly inflammatory dermatosis with edema and nodules. This latter presentation is a *kerion*.

The diagnosis of tinea can be made from skin scrapings, nail scrapings, or hair by culture or direct microscopic examination with potassium hydroxide (KOH). Nail clippings may be sent for histologic examination with periodic acid–Schiff (PAS) stain.

TREATMENT DERMATOPHYTOSIS

Both topical and systemic therapies may be used in dermatophyte infections. Treatment depends on the site involved and the type of infection. Topical therapy is generally effective for uncomplicated tinea corporis, tinea cruris, and limited tinea pedis. Topical agents are not effective as monotherapy for tinea capitis or onychomycosis (see below). Topical imidazoles, triazoles, and allylamines may be effective therapies for dermatophyte infections, but nystatin is not active against dermatophytes. Topicals are generally applied twice daily, and treatment should continue for 1 week beyond clinical resolution of the infection. Tinea pedis often requires longer treatment courses and frequently relapses. Oral antifungal agents may be required for recalcitrant tinea pedis or tinea corporis.

Oral antifungal agents are required for dermatophyte infections involving the hair and nails and for other infections unresponsive to topical therapy. A fungal etiology should be confirmed by direct microscopic examination or by culture before oral antifungal agents are prescribed. All of the oral agents may cause hepatotoxicity. They should not be used in women who are pregnant or breast-feeding.

Griseofulvin is approved in the United States for dermatophyte infections involving the skin, hair, or nails. When griseofulvin is used, a daily dose of 500 mg microsized or 375 mg ultramicrosized, administered with a fatty meal, is adequate for most dermatophyte infections. Higher doses are required for some cases of tinea pedis and tinea capitis. Markedly inflammatory tinea capitis may result in scarring and hair loss, and systemic or topical glucocorticoids may be helpful in preventing these sequelae. The duration of griseofulvin

therapy may be 2 weeks for uncomplicated tinea corporis, 8–12 weeks for tinea capitis, or as long as 6–18 months for nail infections. Due to high relapse rates, griseofulvin is seldom used for nail infections. Common side effects of griseofulvin include gastrointestinal distress, headache, and urticaria.

Oral itraconazole is approved for onychomycosis. Itraconazole is given with food as either continuous daily therapy (200 mg/d) or pulses (200 mg bid for 1 week per month). Fingernails require 2 months of continuous therapy or two pulses. Toenails require 3 months of continuous therapy or three pulses. Itraconazole has the potential for serious interactions with other drugs requiring the P450 enzyme system for metabolism. Itraconazole should not be administered to patients with evidence of ventricular dysfunction or patients with known CHF. Terbinafine (250 mg/d) is also effective for onychomycosis, and the granule version is approved for treatment of tinea capitis. Therapy with terbinafine is continued for 6 weeks for fingernail and scalp infections and 12 weeks for toenail infections. Terbinafine has fewer interactions with other drugs than itraconazole, but caution should be used with patients who are on multiple medications. The risk/benefit ratio should be considered when an asymptomatic toenail infection is treated with systemic agents.

TINEA VERSICOLOR

Tinea versicolor is caused by a nondermatophytic, dimorphic fungus, *Malassezia furfur*, a normal inhabitant of the skin. The expression of infection is promoted by heat and humidity. The typical lesions consist of oval scaly macules, papules, and patches concentrated on the chest, shoulders, and back but only rarely on the face or distal extremities. On dark skin the lesions often appear as hypopigmented areas, while on light skin they are slightly erythematous or hyperpigmented. A KOH preparation from scaling lesions will demonstrate a confluence of short hyphae and round spores ("spaghetti and meatballs"). Lotions or shampoos containing sulfur, salicylic acid, or selenium sulfide will clear the infection if used daily for 1–2 weeks and then weekly thereafter. These preparations are irritating if left on the skin for >10 min; thus, they should be washed off completely. Treatment with some oral antifungal agents is also effective, but they do not provide lasting results and are not FDA approved for this indication. A very short course of ketoconazole has been used, as have itraconazole and fluconazole. The patient must sweat after taking the medication if it is to be effective. Griseofulvin is not effective and terbinafine is not reliably effective for tinea versicolor.

CANDIDIASIS

Candidiasis is a fungal infection caused by a related group of yeasts whose manifestations may be localized to the skin and mucous membranes or, rarely, may be systemic and life-threatening (Chap. 240). The causative organism is usually *Candida albicans*. These organisms are normal saprophytic inhabitants of the gastrointestinal tract but may overgrow due to broad-spectrum antibiotic therapy, diabetes mellitus, or immunosuppression and cause disease. Candidiasis is a