College of Registered Nurses of Saskatchewan

Cutaneous Fungal Infection: Adult & Pediatric

Skin and Integumentary

Clinical Decision Tools for RNs with Additional Authorized Practice [RN(AAP)s]

Effective Date: February 1, 2022

Background

Cutaneous fungal infections are superficial fungal infections of the skin (Garnett, Winland-Brown, & Porter, 2019). Tinea infections occur when dermatophytes (fungi) invade dead tissue such as the skin's stratum corneum, nails, and hair. The infections are classified by the location of the infection, not by the causative organism, for example, tinea capitis (scalp), tinea corporis (body), tinea cruris (groin), tinea pedis (feet), or tinea versicolor, also known as pityriasis versicolor (Garnett et al., 2019).

Immediate Consultation Requirements

The RN(AAP) should seek immediate consultation from a physician/NP when any of the following circumstances exist:

- the client is diagnosed with tinea capitis (requires oral antifungal treatment),
- the client is immunocompromised,
- there is evidence of a generalized severe infection,
- there is a bacterial secondary infection, or
- the client is an infant who is less than three months of age (Interprofessional Advisory Group [IPAG], personal communication, July 19, 2019).

Predisposing and Risk Factors

Predisposing and risk factors for cutaneous fungal infections include moisture and warmth which promote fungal growth, and the following characteristics based on where the infection is located.

Please note that it is not uncommon for two (or more) tinea infections to be present in one client. Multiple infections are caused by spreading infection from one area of the body to another through scratching (Garnett et al., 2019).

Characteristics

Tinea Capitis (fungal infection of the skin of the scalp, eyebrows and eyelashes)
• age group most affected is 3-7 years of age, rare in adults; • more common in African American children; • more common in overcrowded living conditions; • more common in low socioeconomic status; • close contact with animals (e.g., cats, dogs); and/or • use of a greasy waxy substance to style hair.
Tinea Corporis (fungal infection of the arms and legs)
• immunocompromised state, • diabetes mellitus, • exposure to infected animals (e.g., cats, dogs), • exposure to other infected individuals, and/or • presence of onychomycosis.
Tinea Cruris (fungal infection of the genitals, inner thighs and buttocks)
• more common in adolescents and young adults, • overweight and postpubertal people who wear tight clothing (e.g., jeans, pantyhose), • more common in people participating in contact sports, and/or • contact with infected human or animal (e.g., cats, dogs).
Tinea Pedis (fungal infection of the foot)
• hyperhidrosis, • lower socioeconomic groups and those who use sporting/shared facilities, • rarely seen before puberty with prevalence increasing with age, • immunosuppression, and/or • diabetes mellitus.
Tinea Versicolor (fungal infection of the skin)
• malnutrition; • poor personal hygiene; • immunosuppression; • high humidity at skin surface/hyperhidrosis; • high rate of sebum production; • more common among people between 21-30 years of age; and/or • more common in the summertime and in tropical climates, and fades during cooler months.

(Garnett et al., 2019)

Health History and Physical Exam

Subjective and Objective Findings

The circumstances of cutaneous fungal infections should be determined. These include the following health history and physical findings:

Type	Subjective	Objective
Tinea capitis	• the client typically presents with complaints of an itchy scalp and a history of hair loss and scaling.	• hair is broken at the base, which leaves a black dot with hairless patches; • may present as circular, grey-white scaly hairless area, or diffuse scale with minimal hair loss; • lesions can progress to pustules, crusts, or purulent nodules resulting in permanent bald patches; • cheesy odour may be present; • occipital adenopathy may be present; • may affect eyebrows and eyelashes.
Tinea corporis	• affects any smooth, non-hairy part of the body with the client presenting with complaints of scaly, circular, or oval skin lesions accompanied by an itching or burning sensation; • client may have a history of renal or hepatic disease, or immunocompromised state; • outbreaks are common in close-contact sports (e.g., wrestling).	• lesions vary in size and appearance, from mild erythema and scaling to severe inflammation; • typically, a well-circumscribed circular (annular) or oval patch with plaque including the following is visualized: • advancing, slightly raised, and at times scaly, well-demarcated border; • central clearing; • diffuse erythema; • accentuation of redness at outer border. • mucosal involvement of lesion usually rules out dermatophytosis; • other findings may include: o erythematous papules; o pustules; o crusts;

		○ post-inflammatory hyperpigmentation or hypopigmentation; and • dermatophytid reactions, defined as a hypersensitivity response in one skin location to the fungal infection in another location.
Tinea cruris	• client presents with severe itching or complaints of a burning sensation to the groin area, • typically begins as erythema of crural fold and spreads outwards, • may spread onto thighs or buttocks but the labia majora or scrotum and penis are usually not affected, • may be associated with tinea pedis, • may have a history of immunosuppression or diabetes.	• unilateral or bilateral well demarcated, symmetric reddish-brown lesions, often with pustules, vesicles, and scales at borders in the groin, thigh, and buttock; • no central clearing; • scrotum and penis and labia majora are not usually affected; and • tinea pedis may also be present.
Tinea pedis	• client presents with severe itching or complaints of a burning sensation to the feet with scaling and redness, mainly between the toes; and • may have a history of immunosuppression or diabetes.	• scaling of lateral interdigital areas especially between 4th and 5th digits; • moist, whitened, macerated, cracked skin may be present; • foul odour may be present; • skin peels off easily with red, raw, tender area underneath; • one or several small blisters may be present; • sole of the foot may be involved with marked scaling noted; • secondary bacterial infection may be noted; • occasionally dermatophytid reactions may be seen as vesicles on sides of fingers and/or palms of hands.
Tinea versicolor (Pityriasis versicolor)	• client presents with a gradual onset and asymptomatic development of oval to round areas of hyper or hypopigmented macule on the back, chest, arms and occasionally the face and neck.	• light brown to salmon-coloured macules, with well-defined borders or raised fine scaly patches.

(Heer Nicol, & Huether, 2019; Garnett et al., 2019)

Differential Diagnosis

The following should be considered as part of the differential diagnosis:

Tinea Capitis	
• seborrheic dermatitis • traction alopecia • carbuncle • furuncle • alopecia areata	• trichotillomania • impetigo • head lice • psoriasis • atopic dermatitis
Tinea Corporis	
• tinea versicolor • seborrheic dermatitis • Lyme Disease • contact, atopic or allergic dermatitis • psoriasis • pityriasis rosea • nummular eczema • erythema multiforme	• granuloma annulare • discoid lupus erythematosus • sarcoidosis • leprosy • drug eruption • urticaria • herpes zoster
Tinea Cruris	
• cutaneous candidiasis • psoriasis • contact dermatitis	• keratosis follicularis • lichen simplex chronicus • seborrhea
Tinea Pedis	
• pitted keratolysis • contact dermatitis • keratodermas	• dyshidrotic eczema • friction blister • psoriasis
Tinea Versicolor	
• pityriasis rosea • vitiligo • secondary syphilis	• leprosy • tuberous sclerosis • seborrhea

(Garnett et al., 2019)

Making the Diagnosis

The diagnosis is based on history and physical findings. RN(AAP)s should suspect a tinea infection when the following are found on physical exam:

- a solitary patch of atopic dermatitis that is not responding to steroids;
- a unilateral or asymmetric rash;

- a culture from folliculitis/carbuncle/abscess is negative for bacteria or is not responding to antibacterial agents;
- a painless folliculitis/carbuncle/abscess on the scalp in an afebrile, well child;
- alopecia, with scales or short broken hairs, all broken at the same length; or
- blistering lesions, which may be due to Epidermophyton floccosum (Garnett et al., 2019).

Investigations and Diagnostic Tests

Testing is usually unnecessary as most cases can be diagnosed clinically. However, Garnett and colleagues (2019) suggest a fungal culture to confirm tinea capitis, as therapy is long-term with systemic antifungals.

Management and Interventions

Goals of Treatment

The primary goals of immediate treatment are to relieve symptoms, eradicate infection and prevent spread (Garnett et al., 2019).

Non-Pharmacological Interventions

Consider the non-pharmacological interventions, including keeping the area dry and avoiding rubbing or scratching of any lesions (Garnet et al., 2019).

Pharmacological Interventions

The pharmacological interventions recommended for the treatment of cutaneous fungal infections are in accordance with *RxFiles Drug Comparison Charts* (RxFiles Academic Detailing Program, 2021), *Antifungal Agents for Common Outpatient Paediatric Infections* (Canadian Paediatric Society, 2018), and *Fungal Skin Infections* (Garnett et al., 2019).

Tinea pedis, tinea cruris, tinea corporis, and tinea versicolor should be treated with topical antifungal agent for two-to-four-week course and continued treatment for one week following resolution of the lesions. Relapse is common in tinea pedis and typically requires treatment of the entire four weeks. A tinea infection that is resistant to topical treatment may need an oral antifungal. Topical steroids and Nystatin are not used to treat tinea infections.

Antifungal Treatment Tinea Capitis

Adult and Pediatric refer to physician/NP. Liver function tests are monitored for those on long-term oral antifungal therapy (requires physician/NP referral) (Garnet et al., 2019; Rx Files Academic Detailing Program, 2021).

Tinea Corporis

	Drug	Dose	Route	Frequency	Duration
Pediatric (≥ 3 months of age)					
	Clotrimazole 1% cream	amount to cover affected area	topical	b.i.d.	2-4 weeks
OR	Miconazole 2% cream	amount to cover affected area	topical	b.i.d.	2-4 weeks
OR	Terbinafine 1% cream	amount to cover affected area	topical	once daily	2-4 weeks
OR	Ketoconazole 2% cream	amount to cover affected area	topical	once daily	2-4 weeks
Adult (preferred treatment)					
	Clotrimazole 1% cream	amount to cover affected area	topical	b.i.d.	2-4 weeks
OR	Miconazole 2% cream	amount to cover affected area	topical	b.i.d.	2-4 weeks
OR	Terbinafine 1% cream	amount to cover affected area	topical	once daily	2-4 weeks
	Drug	**Dose**	**Route**	**Frequency**	**Duration**
Adult (alternate treatment)					
	Ketoconazole 2% cream	amount to cover affected area	topical	once daily	2-4 weeks

Tinea Cruris

	Drug	Dose	Route	Frequency	Duration
Pediatric (≥ 3 months of age)					
	Clotrimazole 1% cream	amount to cover affected area	topical	b.i.d.	2-4 weeks
OR	Miconazole 2% cream	amount to cover affected area	topical	b.i.d.	2-4 weeks

	Terbinafine 1% cream	amount to cover affected area	topical	once daily	2-4 weeks
Adult (preferred treatment)					
	Clotrimazole 1% cream	amount to cover affected area	topical	b.i.d.	2-4 weeks
OR	Miconazole 2% cream	amount to cover affected area	topical	b.i.d.	2-4 weeks
OR	Terbinafine 1% cream	amount to cover affected area	topical	once daily	2-4 weeks
Adult (alternate treatment)					
	Ketoconazole 2% cream or gel	amount to cover affected area	topical	once daily	2-4 weeks

Tinea Pedis

	Drug	Dose	Route	Frequency	Duration
Pediatric (≥ 3 months of age)					
	Clotrimazole 1% cream	amount to cover affected area	topical	b.i.d.	4 weeks
Adult (preferred treatment)					
	Terbinafine 1% cream	amount to cover affected area	topical	b.i.d.	4 weeks
Adult (alternate treatment)					
	Clotrimazole 1% cream	amount to cover affected area	topical	b.i.d.	4 weeks
OR	Miconazole 2% cream	amount to cover affected area	topical	b.i.d.	4 weeks
OR	Tolnaftate 1% cream	amount to cover affected area	topical	b.i.d.	4 weeks

Tinea Versicolor

	Drug	Dose	Route	Frequency	Duration
Pediatric (≥ 3 months of age)					
	Clotrimazole 1% cream	amount to cover affected area	topical	b.i.d.	2 weeks
Pediatric (≥ 2 years of age)					
	Selenium sulfide 2.5% shampoo	apply to affected area with small amount of water to lather and leave it on for 10 minutes	topical	once daily for 7-14 days and then every 2-4 weeks for prevention	2 weeks and prn
	Drug	**Dose**	**Route**	**Frequency**	**Duration**
Adult (preferred treatment)					
	Clotrimazole 1% cream	amount to cover affected area	topical	once daily	1 week and then weekly for prophylaxis
OR	Miconazole 2% cream	amount to cover affected area	topical	once daily	1 week and then weekly for prophylaxis
Adult (alternate treatment)					
	Selenium sulfide 2.5% shampoo	apply to affected area with small amount of water to lather and leave it on for 10 minutes	topical	once daily for 7-14 days and then every 2-4 weeks for prevention	2 weeks and prn
	Terbinafine 1% cream	amount to cover affected area	topical	once daily or b.i.d.	1-2 weeks
OR	Ketoconazole 2% cream or shampoo	amount to cover affected area	topical	once daily	1 weeks

Client and Caregiver Education

The RN(AAP) provides client and caregiver education as follows:

- Counsel about appropriate use of medications (dose, frequency, compliance, etc.).
- Clean and dry the area before application of topical medications and apply antifungal agents to the lesion and to 2 centimeters of the surrounding normal skin.
- Skin should not be covered after applying topical treatments.
- When using topical creams, the area should be completely dry before covering with clothes.
- Use of non-medicated powders may help absorb moisture but cornstarch or powders containing cornstarch may feed the tinea organism.
- Recommend elimination of moisture and heat, as able.
- Recommend avoidance of going barefoot in public showers and locker rooms.
- Recommend avoidance of sharing combs and hair brushes to prevent tinea capitis from spreading.
- Recommend avoidance of sharing clothing/shoes.
- Recommend avoidance of restrictive clothing, nylon underwear, prolonged wearing of a wet bathing suit or workout clothes. For example, cotton underwear absorbs moisture from the body surface which prevents fungal growth.
- Recommend proper hygiene (client should change socks frequently and avoid wearing rubber shoes).
- Advise to wash linens and clothing in hot water and dry with high heat or dry in the sun.
- Advise that skin lesions can persist weeks to months if there is significant hyperkeratosis.
- Advise that exclusion from school is not necessary, the infection is not contagious after 24 hours of treatment (Garnet et al., 2019; RxFiles Academic Detailing Program, 2021).

Monitoring and Follow-up

The RN(AAP) should recommend follow-up in two weeks to ensure improvement and resolution.

Complications

There may be complications associated with cutaneous fungal infections including secondary bacterial infections (particularly with tinea pedis), deep folliculitis, psychological stress due to appearance, and hair loss, inflammatory reaction, and scar tissue in tinea capitis (Garnett et al., 2019).

Referral

Refer to a physician/NP if client presentation is consistent with those identified in the *Immediate Consultation Requirements* section, cutaneous fungal infections are recurrent; there is no response to therapy after three weeks, if the nails become involved in tinea pedis; and/or the diagnosis is uncertain (IPAG, personal communication July 19, 2019).

References

Canadian Paediatric Society. (2018). Antifungal agents for common outpatient paediatric infections. https://www.cps.ca/en/documents/position/antifungal-agents-common-infections

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