

DEFINITION

Cutaneous fungal infection is a superficial fungal infection of the skin.

Tinea infections cause the dermatophytes (fungi) to invade dead tissue such as the skin's stratum corneum, nails, and hair.

Tinea is classified depending on the location of the infection:

- Feet: tinea pedis (athlete's foot)
 - Interdigital - most common
 - Moccasin distribution
 - Vesicular - least common
- Groin: tinea cruris (jock itch)
- Trunk: extremities and face: tinea corporis, tinea faciale, tinea gladiatorum
- Scalp: tinea capitis
- Face and trunk, extremities: tinea versicolor caused by a yeast infection (*Pityrosporum ovale*). Also called pityriasis versicolor.

IMMEDIATE CONSULTATION REQUIRED IN THE FOLLOWING SITUATIONS

- Immunocompromised clients
- Generalized severe infection
- Bacterial secondary infection

CAUSES

The following fungi are the most common causes of tinea:

- Trichophyton - most common cause of tinea capitis
- Microsporum
- Epidermophyton
- *Trichophyton rubrum* - most common cause of tinea corporis and less commonly caused by *Trichophyton mentagrophytes*
- *Microsporum canis* - most common tinea caused by a zoophilic species and transmitted to children by domestic pets
- *Pityrosporum ovale*, also called *Malassezia furfur*, is the cause of tinea versicolor

Incubation period:

- Tinea corporis: 2-4 weeks
- Tinea pedis: 2-38 weeks

- Tinea capitis: 1-3 weeks
- Tinea cruris: 4-10 days
- Tinea versicolor: unknown

PREDISPOSING AND RISK FACTORS

The following are general risk factors for all type of tinea:

- Moisture and warmth which promote fungal growth
- Moderate risk for transmission in families and low risk for transmission in schools
- Sports with body contact such as wrestling

The following are disease-specific risk and predisposing factors:

- Tinea pedis:
 - Hyperhidrosis
 - Diabetes mellitus
 - Homeless person
 - Affects more males than females
 - Rarely seen before puberty
 - Prevalence increases with age
 - Immunosuppression
- Tinea cruris:
 - Adolescent and young adult men
 - Overweight postpubertal women who wear tight jeans and pantyhose
 - Involvement in contact sports
 - Contact with infected human or animal
- Tinea corporis:
 - Immunocompromised state
 - Diabetes mellitus
 - Exposure to infected animals
 - Exposure to other infected individuals
 - Presence of onychomycosis
- Tinea versicolor:
 - High humidity at skin surface/hyperhidrosis
 - High rate of sebum production

CUTANEOUS FUNGAL INFECTION ADULT & PEDIATRIC

- More common among age group 21-30 years of age
- Appears in summertime
- Fades during cooler months
- More common in tropical climates
- Malnutrition
- Poor personal hygiene
- Immunosuppression
- Tinea capitis
 - African American children
 - Common in children; rare in adults
 - Age group most affected is 3-7 years of age
 - Overcrowded living conditions
 - Low socioeconomic status
 - Close contact with animal
 - Large family size
 - Use of a greasy waxy substance to style hair

HISTORY AND PHYSICAL FINDINGS

Table 1

Type	History	Physical Findings
Tinea corporis	<p>Affects any smooth, non-hairy part of body</p> <p>Scaly, circular, or oval skin lesions</p> <p>Frequently itchy</p> <p>May be asymptomatic</p> <p>May have history of renal or hepatic disease or immunocompromised state</p>	<p>Lesions variable in size and range from mild erythema and scaling to severe inflammation</p> <p>Typically, a well-circumscribed circular (annular) or oval patch with plaque with:</p> <ul style="list-style-type: none"> ● Advancing, slightly raised, at times scaly, well-demarcated border ● Central clearing ● Diffuse erythema ● Accentuation of redness at outer border

SASKATCHEWAN REGISTERED NURSES' ASSOCIATION

RNs WITH ADDITIONAL AUTHORIZED PRACTICE
CLINICAL DECISION TOOL
DECEMBER 1, 2016

CUTANEOUS FUNGAL INFECTION ADULT & PEDIATRIC

		<p>Mucosal involvement of lesion usually rules out dermatophytosis</p> <p>Other additional findings:</p> <ul style="list-style-type: none"> • Erythematous papules • Pustules • Crust • Post-inflammatory hyperpigmentation or hypopigmentation <p>Dermatophytid reactions (ID reaction) - a hypersensitivity response in one skin location to the fungal infection in another location</p>
Tinea pedis	<p>Affects feet</p> <p>Itch severe, burning of feet</p> <p>Scaling and redness, mainly between toes</p> <p>Foul odour may be present</p> <p>Area may be moist, whitened, macerated, cracked</p> <p>Skin peels off easily with red, tender area underneath</p> <p>One or several small vesicles may be present;</p>	<p>Inspect interdigital space especially between 4th and 5th digits</p> <p>Scaling of lateral interdigital areas</p> <p>Moist, whitened, macerated, cracked skin may be present</p> <p>Skin peels off easily with red, raw, tender area underneath</p> <p>One or several small blisters may be present</p> <p>Sole of the foot may be involved with marked scaling</p> <p>Fissures may become secondarily infected (cellulitis)</p> <p>Occasionally ID reaction (a</p>

SASKATCHEWAN REGISTERED NURSES' ASSOCIATION

RNs WITH ADDITIONAL AUTHORIZED PRACTICE
CLINICAL DECISION TOOL
DECEMBER 1, 2016

CUTANEOUS FUNGAL INFECTION ADULT & PEDIATRIC

	<p>vesicles rupture leaving a "collarette" of scales May involve the sole of the foot with marked scaling (itch minimal)</p> <p>History of immunosuppression or diabetes</p>	<p>hypersensitivity response in one skin location to the fungal infection in another location) may be seen as papules on hands.</p> <p>Examine nails for onychomycosis</p> <p>Examine skin and nails of feet and hands</p>
Tinea cruris	<p>Affects groin</p> <p>Common in men</p> <p>Itch mild to severe</p> <p>Begins as erythema of crural fold</p> <p>Spreads outward</p> <p>May spread onto thighs or buttocks</p> <p>Scrotum and penis usually not affected</p> <p>Often spread by infected towels</p> <p>Often associated with tinea pedis</p> <p>Predisposing factors: excessive sweating, diabetes mellitus, friction</p>	<p>Involves crural areas and upper inner thigh</p> <p>Well demarcated, symmetric macule, often with pustules or vesicles at borders</p> <p>Scaly reddish brown lesion</p> <p>Sharply defined margin</p> <p>Central clearing absent</p> <p>Groin, thigh, buttock may be involved</p> <p>May be bilateral or unilateral</p> <p>Scrotum and penis and labia majora usually not affected</p> <p>Inspect feet for possible tinea pedis</p>

SASKATCHEWAN REGISTERED NURSES' ASSOCIATION

RNs WITH ADDITIONAL AUTHORIZED PRACTICE
CLINICAL DECISION TOOL
DECEMBER 1, 2016

CUTANEOUS FUNGAL INFECTION ADULT & PEDIATRIC

	Ask about any pet infected with skin lesions	
Tinea versicolor (Pityriasis versicolor)	Yeast infection frequently seen in young adults, less common when sebum production is reduced or absent	<p>Chronic superficial hypopigmented, light brown or salmon coloured macules, well defined borders or raised fine scaly lesions</p> <p>Commonly affects upper trunk, proximal limbs, and genitalia. Face involvement in children is common.</p> <p>Macule colour varies from light brown to white or pink, with varied intensities and hues</p>
Tinea capitis	Pruritis, history of hair loss and scaling	<p>Hair breaks off at the base and leaves black dot with hairless patches</p> <p>Also seen as circular, scaly hairless area, or diffuse scale with minimal hair loss</p> <p>Lesions can progress to pustules, crusts, or purulent nodules</p> <p>Cheesy odour may be present</p> <p>Often occipital adenopathy</p> <p>Can also affect eyebrows and eyelashes</p>

DIFFERENTIAL DIAGNOSIS

Table 2

Tinea capitis	Tinea corporis	Tinea cruris	Tinea pedis	Tinea versicolor
<ul style="list-style-type: none"> • Seborrheic dermatitis • Traction alopecia • Carbuncle • Furuncle • Alopecia areata • Trichotillomania • Impetigo • Head lice • Psoriasis • Atopic dermatitis 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Cutaneous candidiasis • Psoriasis • Contact dermatitis • Keratosis follicularis • Lichen simplex chronicus • Seborrhea 	<ul style="list-style-type: none"> • Pitted keratolysis - small pits in soles of foot that are caused by bacterial infection and not tinea, often malodorous and treatable with topical erythromycin • Contact dermatitis • Keratoderma - thickening of soles of feet, resembles tinea pedis in moccasin distribution • Dyshidrotic eczema • Friction blister • Psoriasis 	<ul style="list-style-type: none"> • Pityriasis rosea • Vitiligo • Secondary syphilis • Leprosy • Tuberculous sclerosis • Seborrhea

COMPLICATIONS

- Secondary bacterial infection (particularly with tinea pedis)
- Deep folliculitis (Majocchi's granuloma)
- Psychological stress due to social rejection
- Hair loss, inflammatory reaction, and scar tissue in tinea capitis

INVESTIGATIONS AND DIAGNOSTIC TESTS

- Testing is usually unnecessary as most cases can be diagnosed clinically.

MAKING THE DIAGNOSIS

Diagnoses of the following are usually made on clinical presentation:

- Tinea corporis:
 - The typical annular lesions and its presentations allow for a clinical diagnosis
- Tinea pedis:
 - Presumptive diagnosis is made based on clinical presentation
- Tinea cruris:
 - Presumptive diagnosis is made based on clinical presentation
- Tinea versicolor:
 - Characteristic lesions and the colour of the lesions
- Tinea capitis:
 - Diagnosis is usually based on history and clinical findings

When to suspect tinea infection:

- Solitary patch of "eczema" not responding to steroids
- Unilateral or asymmetric rashes
- Folliculitis not responding to antibacterial agents
- Folliculitis/carbuncle/abscess culture is negative for bacteria
- Folliculitis/carbuncle/abscess does not respond to antibacterial agents
- Non-painful folliculitis/carbuncle/abscess on scalp in afebrile well child
- Alopecia, however subtle, with scales
- Alopecia with short broken hairs, all broken at the same length
- Blistering lesions may be due to *Epidermophyton floccosum*

MANAGEMENT AND INTERVENTIONS**Goals of Treatment**

- Relieve symptoms
- Eradicate infection

Appropriate Consultation

- Consult a physician/RN(NP) if there is treatment failure.

Non-Pharmacological Interventions

- Keep area dry

Pharmacological Interventions

- For tinea pedis, tinea cruris, tinea corporis, and tinea versicolor treat with topical antifungal agent for at least 2 weeks and continue until 1 week after resolution of the lesions.
- Apply antifungal agents to the lesion and to 2 cm of the surrounding normal skin for 2-4 weeks, or 1 week after lesion disappears, unless otherwise noted.
- Relapse is common in tinea pedis and requires treatment over 4 weeks.
- A tinea infection that is resistant to topical treatment may need an oral antifungal.
- Do not use steroid or Nystatin to treat tinea infections.

Table 3

Antifungal Treatment

Category	Tinea Capitis	Tinea Corporis	Tinea Cruris	Tinea Pedis	Tinea Versicolor
Preferred Treatment for Adult	Refer to physician/RN(NP) for oral antifungal therapy as topical	Ketoconazole 2% cream once daily Or Clotrimazole	Terbinafine (Lamisil) 1% cream once daily or bid for 2-4 weeks	Terbinafine (Lamisil) 1% cream bid for 2-4 weeks	Apply selenium sulfide (2.5%) lotion or shampoo, daily to affected areas for 10-15 minutes followed by a shower, for 1-2

SASKATCHEWAN REGISTERED NURSES' ASSOCIATION

RNs WITH ADDITIONAL AUTHORIZED PRACTICE
CLINICAL DECISION TOOL
DECEMBER 1, 2016

CUTANEOUS FUNGAL INFECTION ADULT & PEDIATRIC

	antifungals are ineffective	1% cream bid Duration is 2-4 weeks	Or Clotrimazole 1% cream, lotion bid for 2 weeks		weeks
Alternate Treatment for Adult	Refer to physician/ RN(NP)	Miconazole 2% cream bid for 2-4 weeks Or Terbinafine (Lamisil) 1% cream bid for 1-2 weeks	Clotrimazole 1% cream, lotion bid for 2 weeks Or Tolnaftate 1% cream bid for 2 weeks Or Ketoconazole 2% cream, gel, once or daily or bid for 2 weeks	Tolnaftate 1% daily for 2-4 weeks Or Clotrimazole 1% cream bid for 2-4 weeks	Terbinafine hydrochloride 10 mg (1% w/w) cream bid for 1-2 weeks Or Ketoconazole 2% cream or shampoo once daily for 1 week
Treatment for Children > 3 months of age	Refer to physician/ RN(NP)	Clotrimazole 1% cream bid for 2 weeks maximum	Clotrimazole 1% cream bid for 2 weeks maximum	Clotrimazole 1% cream bid for 2 weeks maximum	Clotrimazole 1% cream bid for 2 weeks maximum Or For children ≥ 2 years of age: Selenium sulfide 2.5% shampoo (on affected skin) for 2 weeks (leave on for

					1 hour)
--	--	--	--	--	---------

Client and Caregiver Education

- Recommend elimination of moisture and heat.
- Suggest to client/caregiver to modify use of socks and footwear.
- Recommend avoidance of restrictive clothing, nylon underwear, prolonged wearing of wet bathing suit or work clothes.
- Counsel client/caregiver about appropriate use of medications (dose, frequency, compliance, etc.).
- Recommend proper hygiene (client should change socks frequently and avoid wearing rubber shoes).
- Exclusion from school is not necessary.
- Cotton underwear absorbs moisture from the body surface which prevents fungal growth.
- Avoid sharing clothing.
- Skin should not be covered after applying topical treatments.
- When using topical creams, the area should be completely dry before covering with clothes.

Prevention:

- Avoid going barefoot in public showers and locker rooms.
- Keep feet dry and clean, use clean socks and shoes that allow feet to get fresh air.
- Exclusion period from school not necessary.
- Avoid sharing combs and hair brushes to prevent tinea capitis from spreading.

Monitoring and Follow-Up

- Follow-up in 2 weeks to ensure resolution.
- Skin lesion can persist weeks to months if there is significant hyperkeratosis.
- Liver function tests are monitored for those on long-term oral antifungal therapy.

Referral

Refer to a physician/RN(NP) if:

- fungal infections are recurrent.
- client develops any immunosuppression or diabetes.

- there is no response to therapy after 3 weeks or if the nails become involved in tinea pedis.
- ID reaction not responding to treatment.
- the infection is severe and extensive.
- diagnosis is uncertain.
- tinea capitis.

DOCUMENTATION

- As per employer policy

REFERENCES

Beikert, F. C., Anastasiadou, Z., Fritzen, B., Frank, U., & Augustin, M. (2013). Topical treatment of tinea pedis using 6% coriander oil in unguentum leniens: A randomized, controlled, comparative pilot study. *Dermatology*, 226(1). doi: 10.1159/000346641

Bhat, S., & Mittal, S. (2013, November 11). *Tinea versicolor*. Retrieved from <http://www.essentialevidenceplus.com>

Dobash, G., Rideout, B., & Frost, M. (2013, October 28). *Fungal skin infections*. Retrieved from <http://www.essentialevidenceplus.com>

Health Canada. (2011). *First Nations & Inuit health: Clinical practice guidelines for nurses in primary care*. Ottawa, ON: Author. Retrieved from <http://www.hc-sc.gc.ca>

Rx Files Academic Detailing Program. (2014). *Rx Files: Drug comparison charts*. Saskatoon, SK: Saskatoon Health Region.

Tinea. (2013, February 1). Retrieved from <http://www.pemsoft.com>

Tinea capitis. (2012, July 26). Retrieved from <https://dynamed.ebscohost.com>

Tinea corporis. (2013, November 12). Retrieved from <https://dynamed.ebscohost.com>

Tinea cruris. (2013, March 30). Retrieved from <https://dynamed.ebscohost.com>

SASKATCHEWAN REGISTERED NURSES' ASSOCIATION

RNs WITH ADDITIONAL AUTHORIZED PRACTICE
CLINICAL DECISION TOOL
DECEMBER 1, 2016

CUTANEOUS FUNGAL INFECTION ADULT & PEDIATRIC

Tinea pedis. (2014, January 2). Retrieved from <https://dynamed.ebscohost.com>

Tinea versicolor. (2012, October 24). Retrieved from <https://dynamed.ebscohost.com>

Ziemkowski, P.J. (2013, October 28). *Tinea capitis and barbae*. Retrieved from <http://www.essentialevidenceplus.com>

NOTICE OF INTENDED USE OF THIS CLINICAL DECISION TOOL

This SRNA Clinical Decision Tool (CDT) exists solely for use in Saskatchewan by an RN with additional authorized practice as granted by the SRNA. The CDT is current as of the date of its publication and updated every three years or as needed. A member must notify the SRNA if there has been a change in best practice regarding the CDT. This CDT does not relieve the RN with additional practice qualifications from exercising sound professional RN judgment and responsibility to deliver safe, competent, ethical and culturally appropriate RN services. The RN must consult a physician/RN(NP) when clients' needs necessitate deviation from the CDT. While the SRNA has made every effort to ensure the CDT provides accurate and expert information and guidance, it is impossible to predict the circumstances in which it may be used. Accordingly, to the extent permitted by law, the SRNA shall not be held liable to any person or entity with respect to any loss or damage caused by what is contained or left out of this CDT.

SRNA © This CDT is to be reproduced only with the authorization of the SRNA.