

**Doctor** **DERMATOLOGY**  
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### Is it ever just a simple fungal infection?

Rodney Sinclair  
Professor of Dermatology  
University of Melbourne & Epworth Hospital



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### Fungal Skin Conditions often present as a Red Scaly Rashes

- Fungus
- Eczema (syn. dermatitis)
- Psoriasis
- Pityriasis
- Lichen Planus
- Lupus
- Scabies

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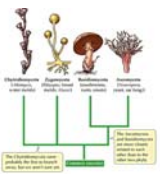
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### Red Scaly Rashes -Fungus

- Tinea
- Candida
- Pityriasis Versicolor



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Tinea corporis (Microsporum Canis)

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Tinea corporis (Trichophyton rubrum)

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Tinea pedis

- Interdigital Tinea Pedis
- Moccasin Tinea Pedis
- Vesicobullous tinea pedis

- T. Mentagraphytes
- T. Rubrum
- E. Floccosum



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Tinea cruris (jock itch)

- T. Mentagraphytes var mentagraphytes
- T. Rubrum

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Tinea Manu

- T. Mentagraphytes var interdigitale
- T. Rubrum

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Tinea capitis (Kerion)

Tinea capitis (M. canis)

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## Onychomycosis

- Tinea Ungium
- Candida

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Tinea unguium (onychomycosis)



Distal/Lateral Subungual Onychomycosis

- T. Mentagrophytes var interdigitale
- T. Rubrum

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Distal/Lateral Subungual Onychomycosis

- T. Mentagrophytes var interdigitale
- T. Rubrum

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White Superficial Onychomycosis  
- T. Mentagrophytes var interdigitale

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Total Dystrophic Onychomycosis  
- T. Mentagrophytes var interdigitale  
- T. Rubrum

Proximal Onychomycosis  
- T. Rubrum

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Tinea incognito



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Skin scrapping for microscopy and culture

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Fungal microscopy

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## Red Scaly Rashes -Fungus

- Tinea
- Candida
- Pityriasis Versicolor

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Candida intertrigo  
(syn. Thrush)

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Angular stomatitis



Erosio interdigitale  
blastomycetes

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Chronic paronychia

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## Red Scaly Rashes -Fungus

- Tinea
- Candida
- Pityriasis Versicolor

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Pityriasis Versicolor  
(syn. tinea versicolor)  
- Malassezia furfur or Pityrosporum ovale

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- Eczema
- Psoriasis
- Seborrheic Dermatitis
- Pityriasis Rosea
- Lichen planus
- Discoid Lupus
- Granuloma Annulare

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Tinea pedis

- Affects 3 of 4 adults over their lifetime
- 35% of Europeans suffer from tinea pedis at any one time
- Highly contagious
- Spread directly by skin to skin contact or indirectly form contact with contaminated surfaces such as swimming pools, showers and sports change rooms
- Infection may be transferred to other body sites
- More common in men than women. Uncommon in children
- Incidence higher in warmer and more humid climates
- Other predisposing factors include diabetes, obesity, immunosuppression, trauma, wearing occlusive footwear



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Tinea pedis

- Burning and itching lead to scratching and further damage to the skin is common.
- Co-infection with yeast (candida) and bacteria is common and leads to more severe infection.
- Common bacteria include:
  - S. Aureus
  - S. Epidermatis
  - Corynebacterium minitissimus
  - Proteus species
  - Pseudomonas species



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Tinea pedis

- Progression associated with worsening of pruritus, maceration and malodor.
- Malodor is an indication of bacterial superinfection.
- Dermatophyte population decreases with increased symptom severity and dermatophytes are frequently absent in severe cases.
- Mixed infections may respond poorly to pure antifungal agents.



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### Topical Treatment of Tinea Pedis

- The vast majority of cases of Tinea pedis can be treated with OTC antifungals in the pharmacy.
- Available as cream, spray, gel or powder.
- Main classes:
  - Allylamines – terbinafine, naftidine
  - Azole – miconazole, bifonazole, clotrimazole, ketoconazole
  - Nystatin
  - Whitfield’ ointment
  - Amorolfine

Apply to affected area and also to normal surrounding skin 2 cm beyond affected area

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### Topical Treatment of Tinea Pedis

- Mild cases can be managed with an anti-dermatophyte treatment
- Moderate to severe cases require broad spectrum agent with activity against dermatophytes, candida and bacteria
- Severe cases with malodour require antibacterial treatment
- Combination of antifungal agent with an anti-inflammatory agent such as 1% hydrocortisone provides more rapid relief

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### Topical Treatment of Tinea Pedis

- Azoles
  - Clotrimazole and bifonazole are broad spectrum antifungals with fungicidal activity against dermatophytes and yeast
  - Clotrimazole and bifonazole also have activity against gram positive bacteria
  - Bifonazole has anti-inflammatory activity equivalent to 1% hydrocortisone
  - Bifonazole retained in skin up to 48 hours and once daily application sufficient
  - Clotrimazole combined with 1% hydrocortisone has superior anti-inflammatory activity to bifonazole
  - Ketoconazole and econazole broad spectrum antifungal activity but weaker antibacterial activity

Generic name	Spectrum of activity	Grading	Anti-inflammatory in AF	Treatment regimes in AF	Key
Clotrimazole	Dermatophytes	+++	+	2-3 times daily Should be continued for at least 1 month to prevent reinfection	+++ Strong activity ++ Moderate activity + Mild activity - No activity
	Yeasts	+++			
	Gram-positive bacteria	+++			
Clotrimazole plus hydrocortisone	Dermatophytes	+++	+++	Twice daily Should not be used for more than 7 days	
	Yeasts	+++			
	Gram-positive bacteria	+++			
Bifonazole	Dermatophytes	+++	++	Once daily for 3 weeks	
	Yeasts	+++			

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### Topical Treatment of Tinea Pedis

- Allylamines
  - Terbinafine and Naftidine fungicidal against dermatophytes, but only fungistatic against *Candida albicans*
  - Naftidine has poor in vitro activity against *Candida* species
  - Single dose terbinafine effective against mild cases of athlete's foot
  - Terbinafine less effective against moderate to severe cases with bacterial superinfection

Generic name	Spectrum of activity	Grading	Anti-inflammatory in AF	Treatment regimen in AF	Key
Terbinafine	Dermatophytes Yeasts Gram-positive bacteria	+++ + -	+++	Once daily for 1 week	+++ Strong activity ++ Moderate activity + Mild activity - No activity
Naftidine	Dermatophytes Yeasts Gram-positive bacteria	+++ + +	+++	Once daily for 1 month	
Butenafine	Dermatophytes Yeasts	+++ +++	+	Once daily for 1 month or twice daily for 1 week	

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### Treatment of Fungal Disease

- Conservative management
  - Identifying triggers
  - Identify associated fungal and bacterial disease
- Induction of remission
  - Miconazole plus hydrocortisone
- Maintenance treatment
  - Bifonazole

No known resistance to Azole antifungals

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STUDY

### Factors Influencing Coexistence of Toenail Onychomycosis With Tinea Pedis and Other Dermatomycoses

*A Survey of 2761 Patients*

Jacub C. Szpytowski, MD, PhD; Adam Reich, MD, PhD; Emilia Garkowska, PhD; Marzena Kallig, MD; Eugeniusz Baran, MD, PhD, for the Onychomycosis Epidemiology Study Group

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### Onychomycosis

- Szepietowski et al
  - 2671 patients with onychomycosis
  - 1181 (42%) had concomitant fungal skin infection
    - Tinea pedis 933 (333.8%)
    - Fingernail onychomycosis (7.4%)
    - Tinea cruris (4.2%)
    - Tinea mannum (1.6%)
    - Tinea capitis (0.5%)

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### Is it ever just a simple fungal infection?

Fungus is near universal in our environment

- Why now?
- Why there?
- What else is there with it?
- Where else is it?
- What else should I be doing?
  - Hyperhidrosis
  - Laundry detergent

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