



A HEALTHY KANSAS STARTS HERE

Diagnosis and Management of Ringworm

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Dermatophytes

- Ringworm is a fungal infection caused by dermatophytes
 - Require keratin for growth
 - Infections involve superficial skin, nails, and hair
- The most common species:
 - Trichophyton (hair, skin, and nails)
 - Microsporum (skin and hair)
 - Epidermophyton (skin and nails)

Transmission

- Transmission through direct contact with skin, soil, animals, or fomites
- Humans and animals may be asymptomatic carriers
- Conditions and risk factors that predispose individuals to dermatophyte infections
 - Diabetes
 - Obesity
 - Immunocompromised
 - Advanced Age

Subtypes of Dermatophyte Infections

- Tinea Corporis
- Tinea Faciei
- Tinea Pedis
- Tinea Manuum
- Tinea Cruris
- Tinea Capitis
- Tinea Barbae
- Tinea Unguium (onychomycosis)

Tinea Corporis



Common Features

- Lesions present on trunk, extremities, and face
- Range from 1-5cm, confluence can occur
- Circular, erythematous patches, with raised borders and central clearing
- Pruritic
- Leading, “active”, border may be pustular

Common Features





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Differential Diagnosis

Nummular Eczema

- Multiple, coin-shaped lesions involving extremities
- Pruritic
- Dry, exudative, crusting appearance
- Chronic and relapsing
- Respond to steroids

Differential Diagnosis



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Differential Diagnosis

Granuloma Annulare

- Related to viral infections, trauma, insect bites, vaccinations
- Involve distal extremities
- Nonpruritic
- Papular “rope-like” border
- Slow growing
- Respond to steroids

Differential Diagnosis



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Differential Diagnosis

Psoriasis

- Commonly present on knees, elbows, scalp, or gluteal cleft
- Scale-like patches with sharp margins
- Pruritic
- Family history in approximately 40% of cases
- Treatment may include steroids, retinoids, methotrexate, and/or biologics depending on severity

Differential Diagnosis



Image obtained from Weigle N, McBane S. Psoriasis. Am Fam Phys. 2013;87(9):626-633.

Differential Diagnosis

Subacute Cutaneous Lupus Erythematosus (SCLE)

- May present as part of lupus or drug reaction (PPI's, statins, anti-fungals, anti-hypertensives)
- Scaling papules that coalesce into erythematous plaques
- Involves torso, shoulders, neck, and forearms
- Nonpuritic
- Photosensitive

Differential Diagnosis



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Diagnosis

KOH Preparation

- Sensitivity varies widely based on experience
- Obtain scrapings using scalpel or glass slide
- Place scrapings on slide with 2 drops 10-20% KOH
- Heat slide and place coverslip over sample
- Observe hyphae
- False negatives commonly due to inadequate amount of sample

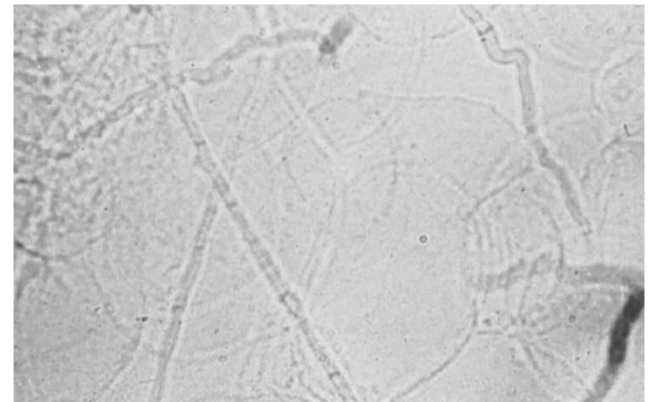


Image obtained from Ely JW, Rosenfeld S, Stone MS. Diagnosis and Management of Tinea Infections. Am Fam Phys. 2014;90(10):702-711.

Diagnosis

Fungal Culture

- More specific than KOH, thus confirmatory
- Expensive, ~\$150
- May take up to 3 weeks

Wood's Lamp

- Generally less useful
- Majority of dermatophytes present within the United States do not fluoresce

Management - Topical

AZOLES

Clotrimazole	OTC	\$	2x daily	Cream, Ointment
Econazole	Rx	\$	1x daily	Cream
Ketoconazole	Rx	\$\$	1x daily	Gel, Cream
Miconazole	OTC	\$	2x daily	Cream, Lotion, Ointment
Oxiconazole	Rx	\$\$\$	1-2x daily	Cream, Lotion
Sertaconazole	Rx	\$\$\$	2x daily	Cream
Sulconazole	Rx	\$\$\$	1-2x daily	Cream

Prepared with data from the US Food & Drug Administration (FDA) approved product information. US National Library of Medicine. Available online at: <http://dailymed.nlm.nih.gov/dailymed/about.cfm>.

\$ = <\$20

\$\$ = \$21 - \$100

\$\$\$ = >\$100

Management - Topical

ALLYLAMINES

Naftifine	Rx	\$\$	1-2x daily	Cream, Gel
Terbinafine	OTC	\$	1-2x daily	Cream, Spray solution, Gel

BENZYLAMINE

Butenafine	Rx	\$\$\$	1x daily	Cream
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OTHER

Ciclopirox	Rx	\$\$	2x daily	Cream, Gel, Solution
Tolnaftate	OTC	\$	2x daily	Cream, Powder, Aerosol liquid

Management - Systemic

- Reserved for those with extensive involvement or failure of topical therapy
 - Terbinafine: 250mg daily for 1-2 weeks
 - Itraconazole: 200mg daily for 1 week

Management Pearls

- Topical nystatin is NOT effective against dermatophyte infections
- Duration of topical therapies varies based on length of time to clinical resolution; generally about 2 weeks
- Oral ketoconazole generally not recommended due to risk of hepatotoxicity
- Combination anti-fungal and steroid preparations are available for inflammatory infections

Prevention

- Practice good hygiene
- Avoid sharing towels, bedding, clothing, or other personal items
- Have all affected pets treated by veterinarian
 - Handle pet with gloves and long sleeves
 - Vacuum loose hair
 - Bleach surfaces and bedding



Image obtained from Google Images

Summary

- Ringworm is secondary to dermatophyte infections, which are easily transmissible through contact
- Tinea Corporis involves the trunk, face, and extremities. Tinea infections involving the scalp, nails, feet require similar, yet different methods of management

Summary

- KOH preparation is the most efficient and cost-effective method of diagnosis
- Topical anti-fungals are generally adequate for treatment
- Encourage good hygiene and careful handling of unfamiliar animals

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THANK YOU



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