

# Onychomycosis

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# Pertinent Clinical Practice Guidelines

Journal of the  
American Academy  
of Dermatology

Drake LA, Dinehart SM,  
Farmer ER, et al. Guidelines  
for the care of superficial  
mycotic infections of the  
skin: onychomycosis. *J Am  
Acad Dermatol* 1996; 34:116.

Out of date; some  
information no longer current  
(not recommended)

British Journal of  
Dermatology

Roberts DT, Taylor WD, Boyle  
J. Guidelines for the  
treatment of onychomycosis.  
*British Journal of  
Dermatology* 2003; 148:402-  
410.

UpToDate, Johns  
Hopkins Guide

These other resources  
provide more relevant  
information on this topic

# Definition

Onycho < Latin < “claw, fingernail”

Mycosis < fungal infection

Onychomycosis is a fungal infection of the nail

AKA *Tinea unguium*

- Tinea = ringworm
- Unguium < Latin < nail

# Epidemiology



Most common cause of nail dystrophy

Affects 8% of general population, with higher prevalence amongst the elderly (20-30%)

Accounts for 50% of all nail problems

More common in toenails than fingernails

- Toenails grow 3x slower than fingernails → easier for fungi to set up infection

# Etiology

Fungal species responsible for causing **dermatophytes:**

- Trichophyton rubrum (71%)
- Trichophyton mentagrophytes (20%)

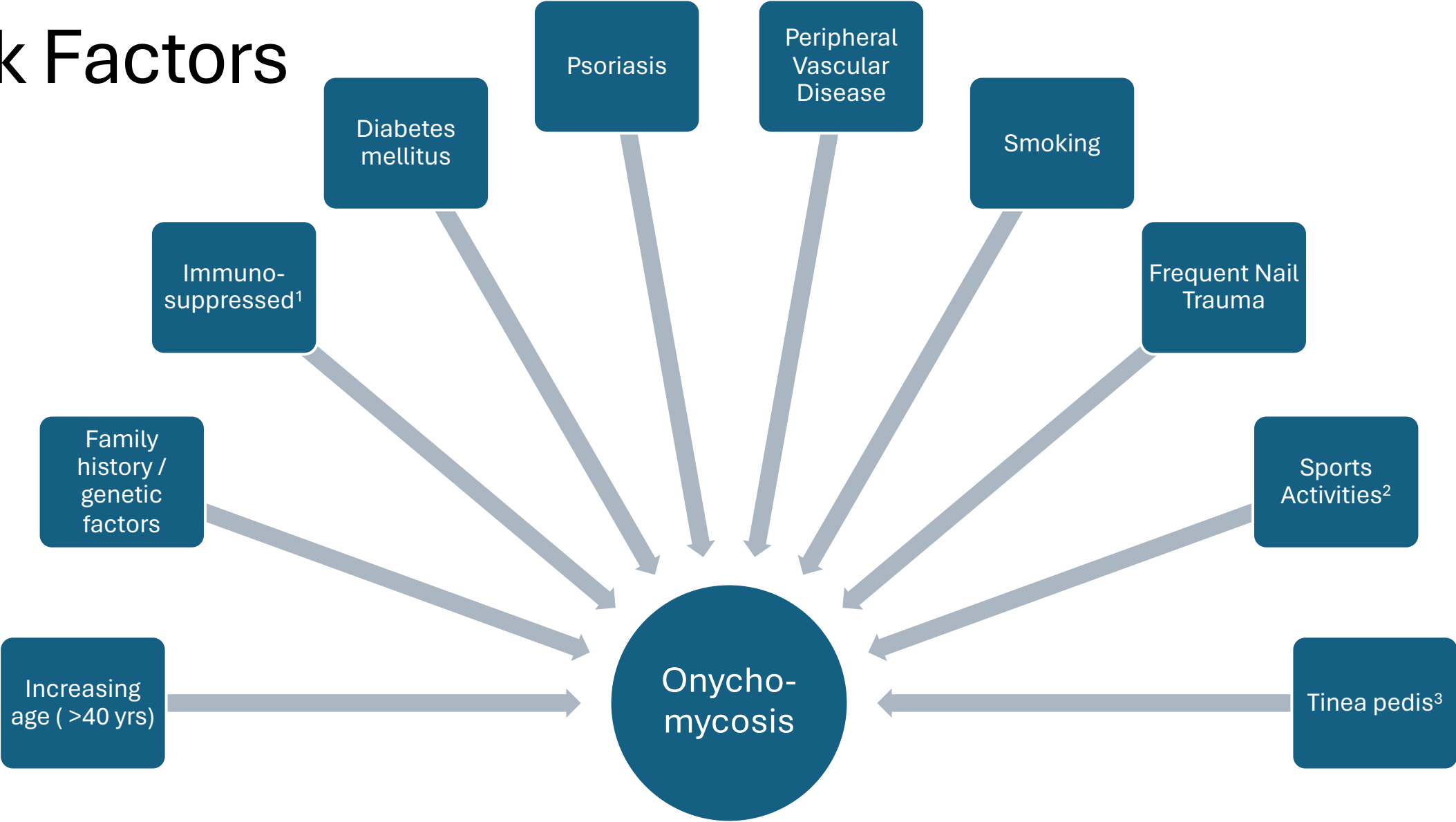
Fungal species responsible for causing **yeasts:**

- Candida albicans (5%)
- Most common in immunosuppressed
- Fingernails > Toenails

Fungal species responsible for causing **molds:**

- Non-dermatophytic molds (2%)

# Risk Factors



<sup>1</sup>HIV, s/p solid organ transplant medications; these patients are also at risk for systemic dissemination

<sup>2</sup>Swimming, for example

<sup>3</sup>"Athlete's Foot"

# Clinical Presentation

Yellow or brown

Thickened nail plate

Prominent ridges

Friable nail plate (easily cracks and breaks)

Onycho-lysis (separation of nail plate from nail bed)

Pain on walking

Surrounding skin at risk for secondary bacterial infections due to affected nails disrupting integrity of skin

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**Totally dystrophic onychomycosis**

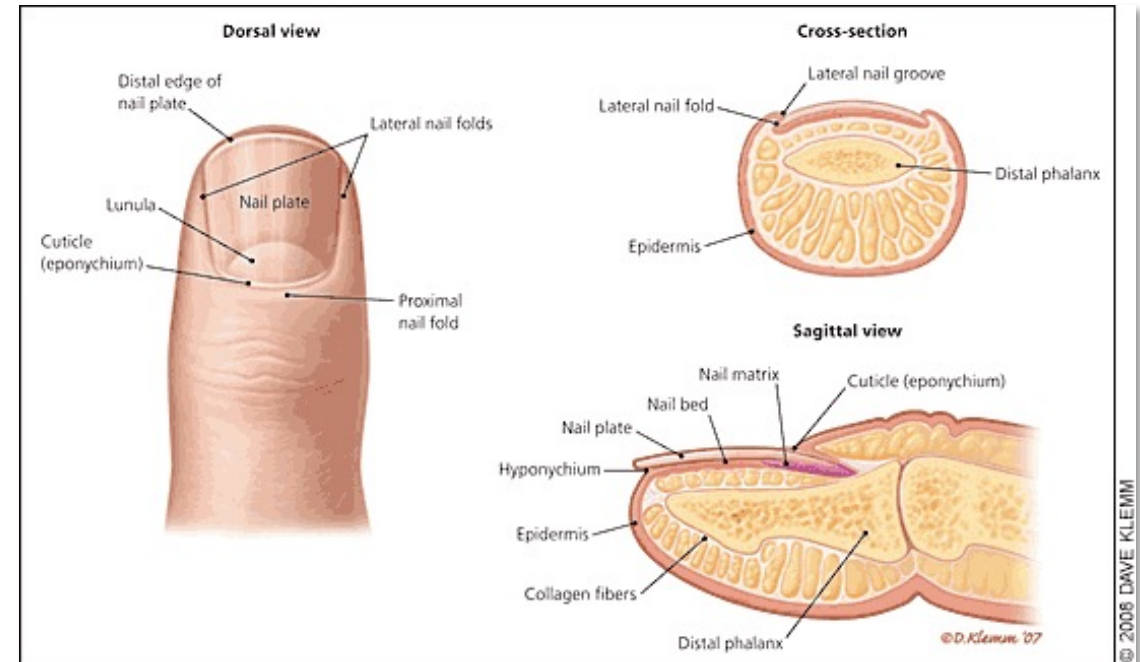


Total destruction of the nail with a ridged, hyperkeratotic nail bed is present in this patient with totally dystrophic onychomycosis.

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**Candidal onychomycosis in a patient with chronic mucocutaneous candidiasis (CMCC)**



Graphic 71698 Version 1.0



Images from:

Goldstein AO. Onychomycosis. UpToDate. Last updated Aug 06, 2014. Accessed August 26, 2014.

American Academy of Family Physicians. <http://www.aafp.org/afp/2008/0201/p3339.html>

# Clinical Presentation: Superficial vs Subungual

## Superficial

- Only affects the surface of nail plate (not nail bed)
- Powdery, patchy, flaky white discoloration
- Superficial White Onychomycosis (SWO)

## Subungual

- Originates under the nail surface
- Affects the nail bed (underneath nail plate)
- Distal or lateral (Distolateral Subungual Onychomycosis, DLSO)
- Proximal (Proximal Subungual Onychomycosis, PSO)

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### Onychomycosis



White superficial onychomycosis caused by *T. mentagrophytes*.

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### Proximal subungual onychomycosis



Whitish discoloration originating under the surface of the proximal nail plate is present.

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### Distal subungual onychomycosis



Graphic 85579 Version 1.0

Images from:

Goldstein AO. Onychomycosis. UpToDate. Last updated Aug 06, 2014. Accessed August 26, 2014.

# Diagnosis

Presentation

Can be highly predictive by itself

KOH

Nail sample  
(scrapings from nail bed)

Fungal culture

Useful if KOH test is negative

Takes 4-6 weeks

KOH and Fungal Culture are specific, but not very sensitive

Lots of false negatives

# Treatment

Agent	Dose <sup>1,2</sup>	Duration <sup>1,2</sup>	Cure Rates <sup>1,2,3</sup>	AE / Monitoring
<b>Topical → generally ineffective</b>				
<b>Penlac (ciclopirox) 8%</b>	Apply nail lacquer soln QD-BID	48 weeks	5-20%	Contact dermatitis Nail shape or color change
<b>Systemic (PO) → not 100% effective either; recurrence is common</b>				
<b>Lamisil (terbinafine)</b>	250 mg QD	3 months	76%	Hepatotoxicity
<b>Sporonox (itraconazole)</b>	<b>Pulse therapy:</b> 200 mg BID x1wk/month	3 months	63% (Pulse)	CYP450 Inhibitors
	<b>Continuous therapy:</b> 200 mg QD		59% (Continuous)	D-D interactions
<b>Grifulvin V, Gris-PEG (griseofulvin)</b>	750-1000 mg QD 250 mg TID (Gris-PEG)	12-18 months	60%	
<b>Diflucan (fluconazole)</b>	150-300 mg QWEEK	6-12 months	48%	
<b>Noxafil (posaconazole) oral suspension</b>	200-400 mg QD	6 months	46-54%	

<sup>1</sup>Kouba DJ, Hoffmann CJ. Onychomycosis. Johns Hopkins Antibiotic Guide. Last updated Feb 26, 2012.

<sup>2</sup>Goldstein AO. Onychomycosis. UpToDate. Last updated Aug 06, 2014. Accessed August 26, 2014.

<sup>3</sup>Gupta AK, Ryder JE, Johnson AM. Cumulative meta-analysis of systemic anti-fungal agents for the treatment of onychomycosis. *Br J Dermatol.* 2004; 150(3): 537.

# Treatment, cont'd

Long duration because must wait until the infected nail grows out

## Other measures

- Trim the nail back (q6-8 weeks)
- Debride the nail bed (q6-8 weeks)
- Clip free and detached nail borders
- File down excessive thickness using emery board (qweek)
- Soften the nail plate with urea 40% cream applied nightly with occlusion, followed by filing down the nail once softened<sup>5</sup>
- Discard old shoes worn without socks

## Do nothing

- All treatments have an incomplete cure rate and require long durations of treatment

## Surgery

- Last resort
- Indicated when infection is causing patient pain and other treatments have failed
- Removal of the entire nail



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