

Superficial Fungal Infections

Clinicopathologic patterns of dermatophytoses and tinea versicolor

Cutaneous localization · Lesion morphology · Fungal demonstration

Dr Abu Suraih Sakhri

MBBS, MD (Pathology)

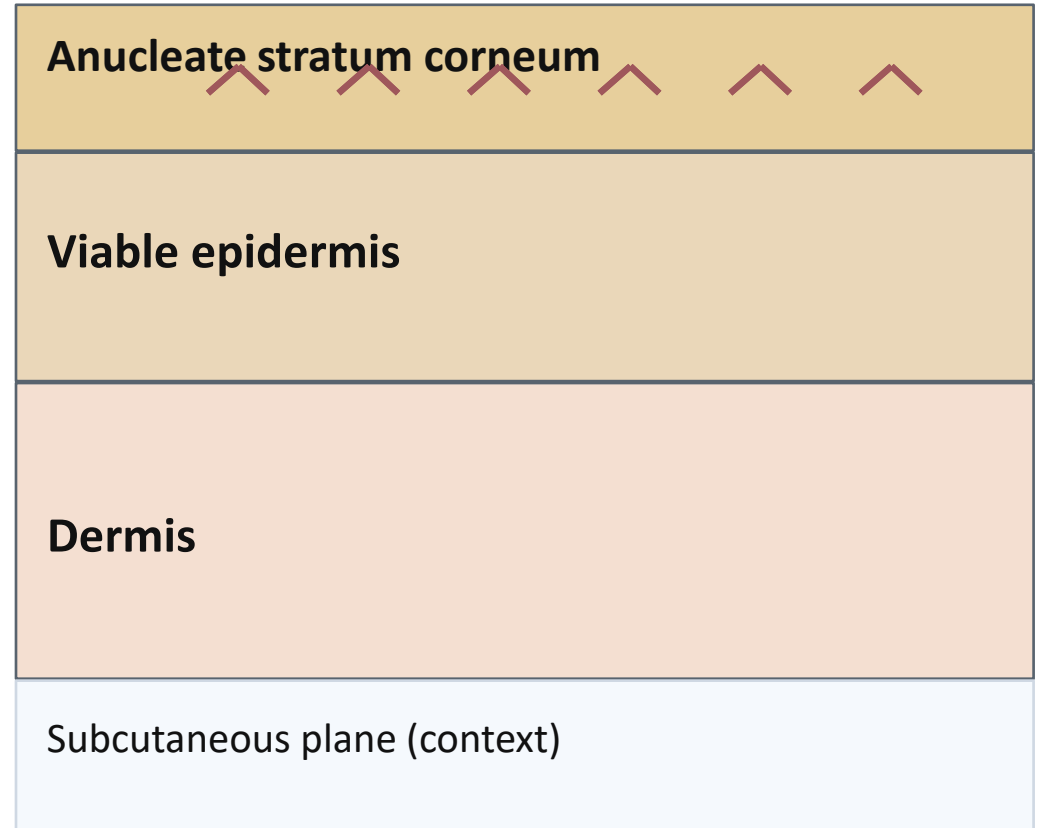
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Learning objectives

- Distinguish dermatophytoses by involved anatomic site and characteristic clinical pattern.
- Explain which tissue compartment contains organisms and how the epidermis may react.
- Interpret PAS positivity and the role of culture in identifying the fungus.
- Recognize why tinea versicolor is etiologically distinct from dermatophytoses.

The defining compartment is superficial

- Superficial mycoses with deep cutaneous fungal infections.
- Superficial infections largely involve cornified keratinized tissue; Deep infections primarily involve dermis or subcutis.
- The anatomic depth helps frame what a biopsy or scraping must demonstrate.



Schematic — not a clinical or histologic specimen

Keratinized sites link the clinical syndromes

- Superficial fungi are demonstrable in cornified lesional skin, hair, or nails.
- The affected structure determines the familiar tinea site designation.
- Organism location and the host inflammatory response are separate microscopic observations.

SKIN

Stratum
corneum

HAIR

Keratinized
shaft

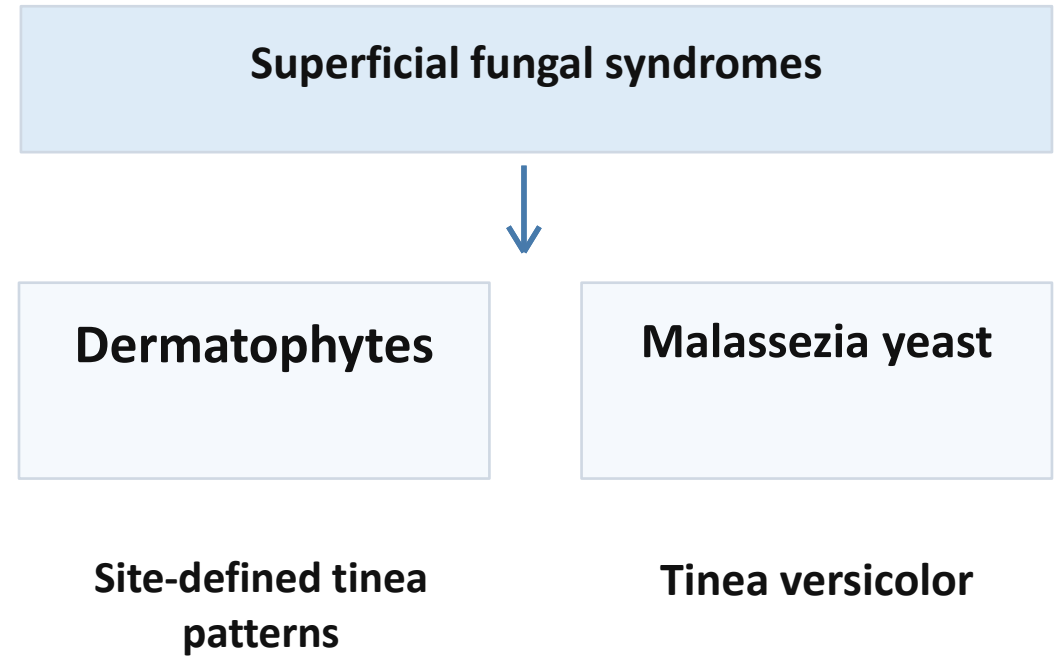
NAIL

Nail plate

Lesional sampling follows the affected keratinized structure

Dermatophytes are the principal agents

- Dermatophytes as the primary cause of superficial fungal skin infection.
- Dermatophytes may inhabit soil and animals.
- Tinea versicolor is a stated exception: Its agent is a yeast, not a dermatophyte.



Conceptual grouping — not a phylogenetic tree

Clinical names map to anatomic sites

- Capitis denotes the scalp; Barbae, the beard area; Corporis, non-specialized body skin.
- Cruris refers to the groin; Pedis to the feet.
- Onychomycosis denotes fungal nail infection; Versicolor denotes a distinctive pigmentary macular eruption.

Scalp

Capitis

Beard

Barbae

Body skin

Corporis

Groin

Cruris

Feet

Pedis

Nail

Onychomycosis

Distribution is a first diagnostic clue

- Scalp disease directs attention to capitis; Beard-area disease suggests barbae.
- Expanding body plaques suggest corporis; Moist inguinal patches suggest cruris.
- Interdigital scaling suggests pedis; Upper-trunk multicolored macules suggest versicolor.

Scalp

Capitis

Beard

Barbae

Body skin

Corporis

Groin

Cruris

Feet

Pedis

Nail

Onychomycosis

Site and morphology should be read together

Pattern	Typical site	Dominant clinical clue
Capitis	Scalp	Patchy scale ± hair loss
Corporis	Body skin	Expanding, scaly-edged plaque
Cruris	Upper inner thigh/groin	Moist erythematous patch
Pedis	Feet, often web spaces	Erythema with scale
Versicolor	Upper trunk	Variably colored fine-scaled macules

The clinical pattern is not the fungal species

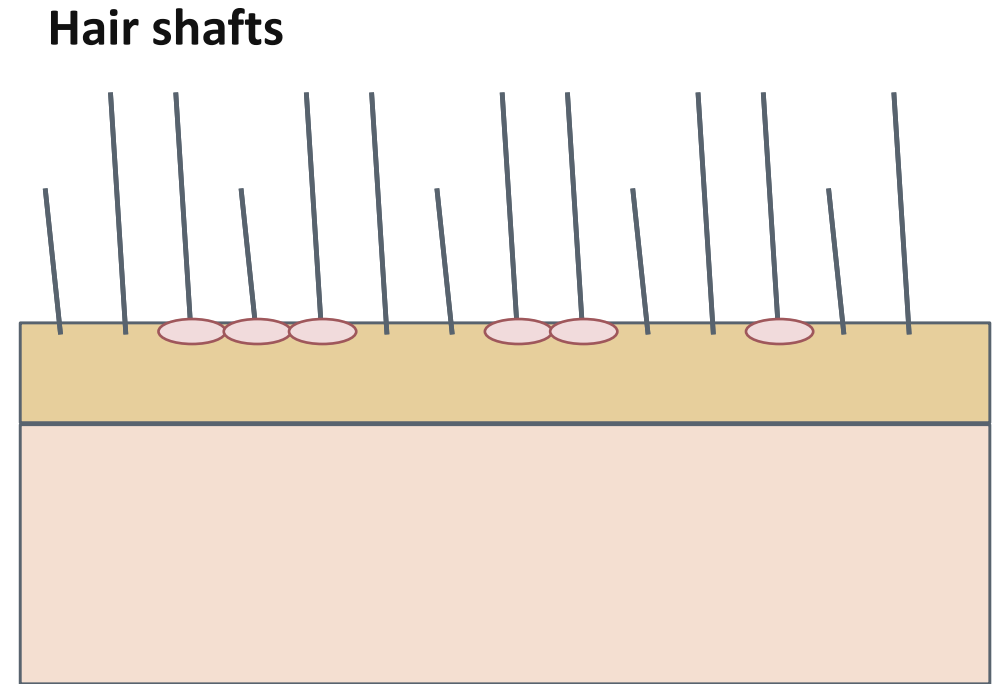
- The tinea names in this section are primarily anatomic or morphologic.
- Different appearances may share superficial tissue localization.
- Culture, rather than clinical pattern alone, usually permits identification of the offending dermatophyte species.



**Clinical → anatomic / tissue evidence →
identification**

Tinea capitis: Infection of the scalp

- Tinea capitis is dermatophytosis involving the scalp.
- Patchy scalp lesions rather than a single defining gross configuration.
- Mild erythema, scaling, and crusts may accompany hair loss.



Scalp surface: Patchy scale

Schematic — not a clinical or histologic specimen

Tinea capitis predominantly affects children

- Tinea capitis usually occurs in children.
- It is encountered only rarely in infants and adults in the cited description.
- Age and location together sharpen clinical suspicion.

Usual clinical setting

– Child with scalp changes

– Scaling or patchy lesions

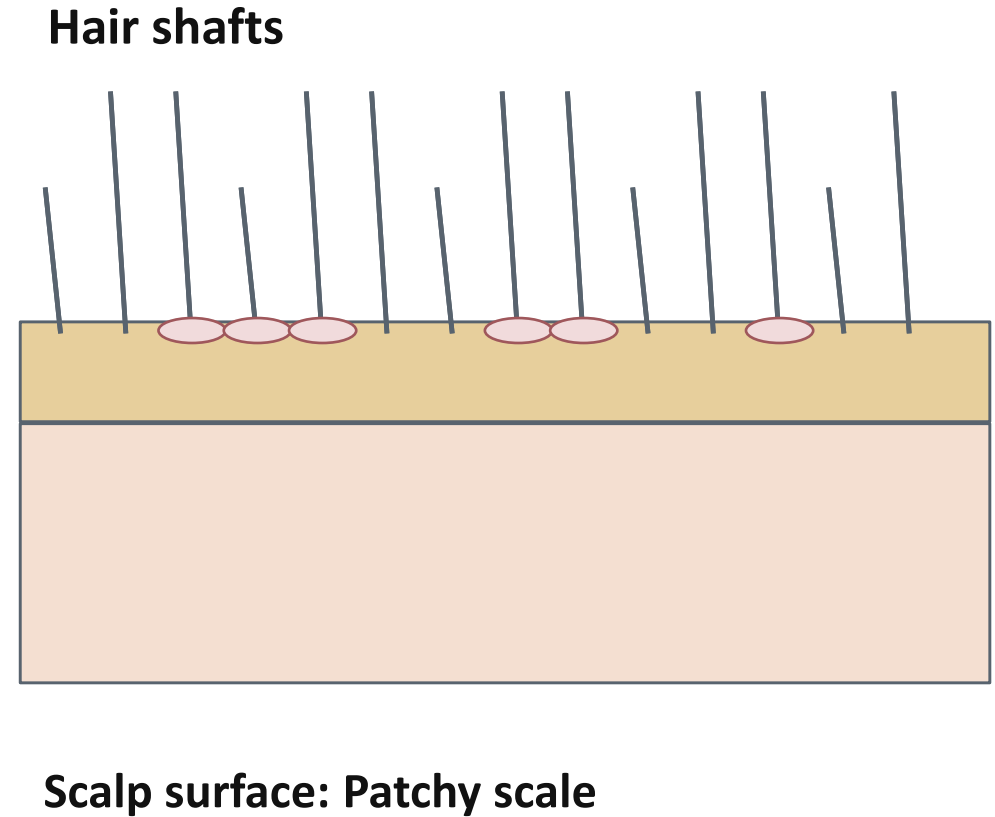
Less frequent in source

– Infant with scalp lesions

– Adult with scalp lesions

Tinea capitis: The lesion may be subtle

- The scalp patches may be asymptomatic.
- Mild redness and superficial crust can coexist with scale.
- Absence of prominent discomfort does not contradict the textbook phenotype.

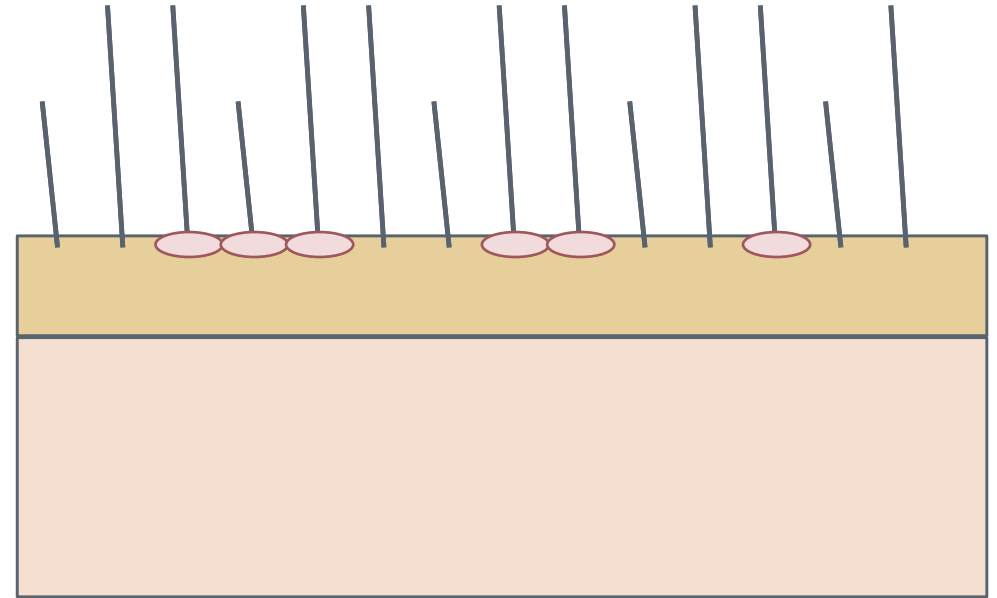


Schematic — not a clinical or histologic specimen

Scalp scale, crust, and erythema

- Scale points to involvement of the epidermal cornified layer.
- Crust formation and mild erythema are described clinical components.
- The relative prominence of each feature can vary across clinical cases.

Hair shafts

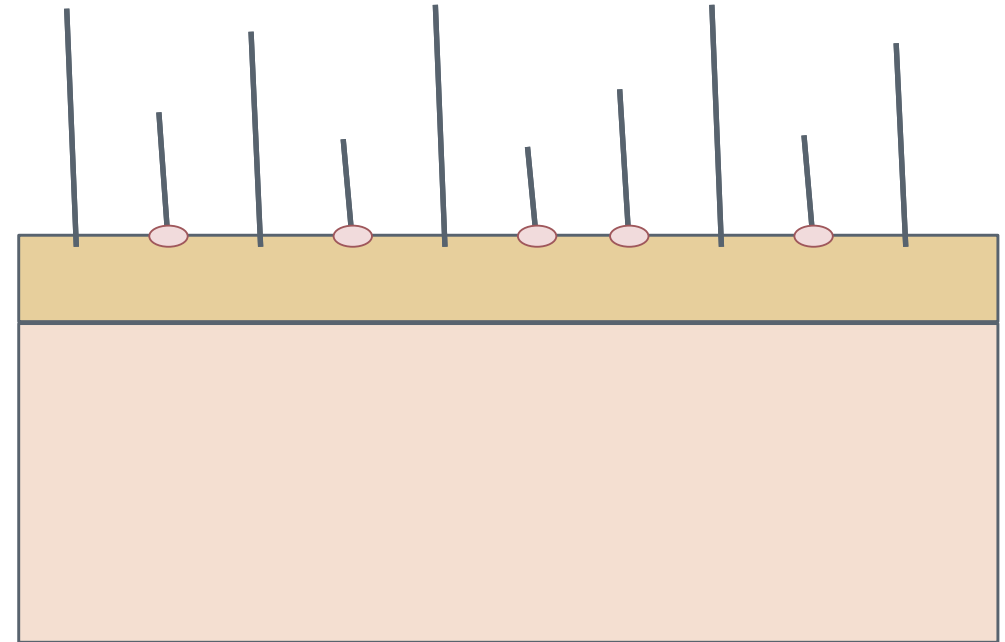


Scalp surface: Patchy scale

Schematic — not a clinical or histologic specimen

Hair loss changes the diagnostic emphasis

- Hair loss is frequent account of capitis.
- A patchy alopecic scalp lesion accompanied by scale should prompt consideration of scalp dermatophytosis.
- Inspection should encompass both scalp surface and hair-bearing region.



Patchy visible hair loss

Schematic — not a clinical or histologic specimen

Hair loss versus scale: Complementary clues

- Scale reflects the superficial cutaneous presentation.
- Alopecia reflects clinical involvement of the hair-bearing scalp.
- Neither feature alone determines the particular dermatophyte species.

Surface finding

- Fine or overt scaling
- Mild erythema
- Crust formation

Hair-related finding

- Patchy hair loss
- Hair-bearing scalp distribution
- Use both in interpretation

Teaching case: Patchy scalp alopecia

- A school-aged child has irregular patches of hair loss with overlying scale and mild redness.
- Which anatomic tinea diagnosis best fits the source phenotype?
- What feature distinguishes this presentation from a scaly plaque on non-hair-bearing body skin?

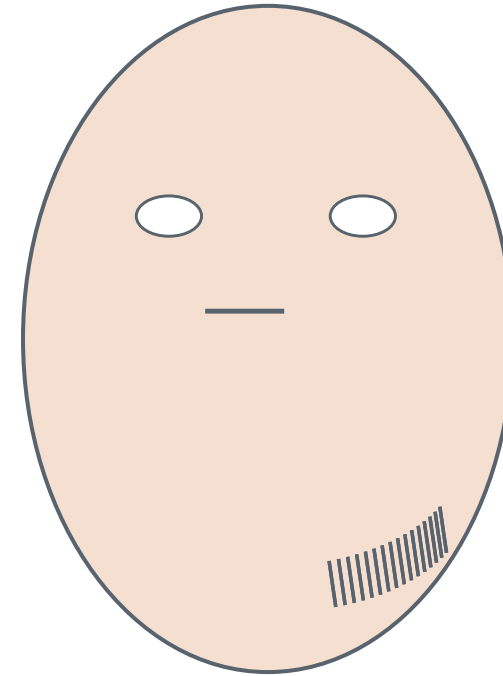
HYPOTHETICAL TEACHING CASE

A school-aged child has irregular patches of hair loss with overlying scale and mild redness.

Discuss the question and justify the distinguishing features.

Tinea barbae: The beard-area pattern

- Tinea barbae is a dermatophyte infection involving the beard region.
- It is relatively uncommon description.
- Unlike capitis, its anatomic designation is specific to the beard area.

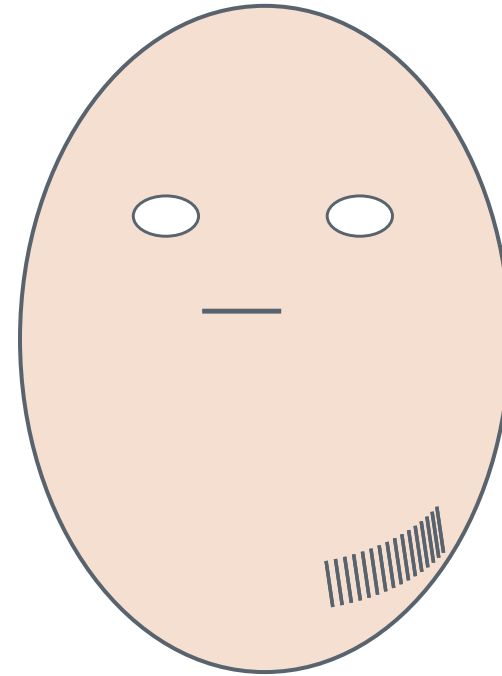


Localization: Beard-bearing skin

Schematic — not a clinical or histologic specimen

Host context in tinea barbae

- The described patient group is adult males.
- The beard region is the key localization clue.
- The textbook section gives fewer specific lesion details for barbae than for corporis or cruris.



Localization: Beard-bearing skin

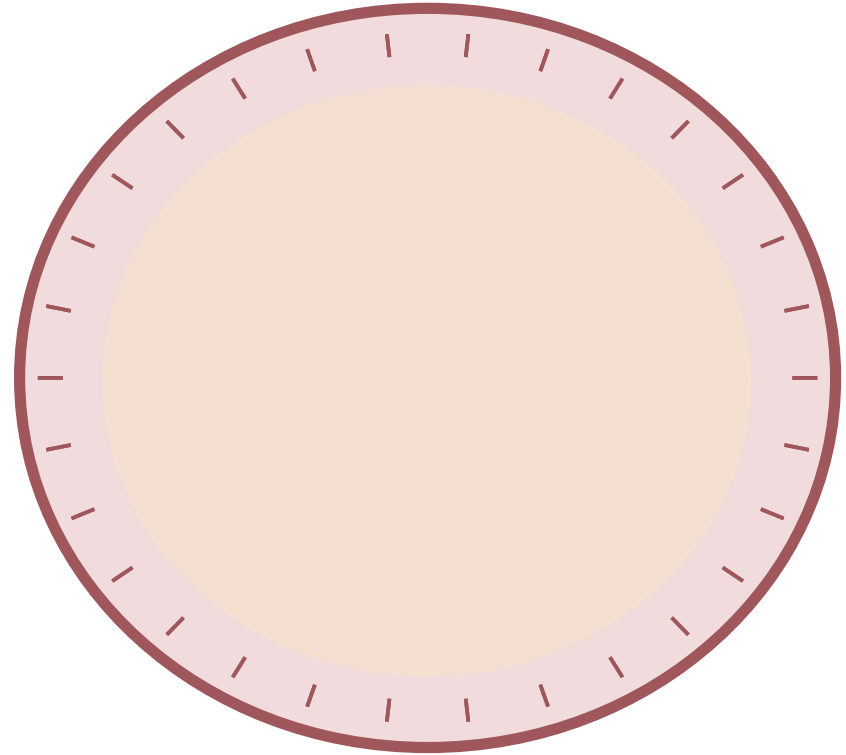
Schematic — not a clinical or histologic specimen

Capitis and barbae: Similar name, different site

Feature	Tinea capitis	Tinea barbae
Localization	Scalp	Beard area
Usual group described	Children	Adult males
Frequency in excerpt	Common childhood syndrome	Relatively uncommon
Characteristic detail	Patchy scale and hair loss	Site-based designation

Tinea corporis occurs across the lifespan

- Tinea corporis is a common superficial fungal infection of skin.
- Involvement at all ages, especially children.
- The clinical pattern is an expanding round plaque with a recognizable scaling border.

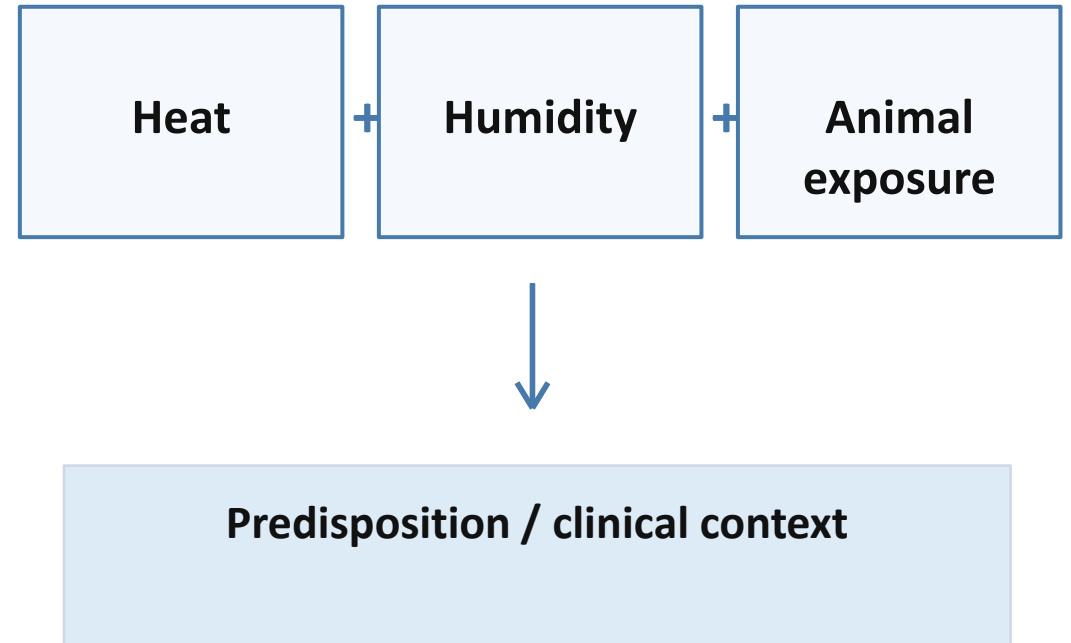


Expanding round plaque

Schematic — not a clinical or histologic specimen

Environmental factors in tinea corporis

- Excessive heat predisposes to tinea corporis.
- Humidity is another risk factor cited.
- These conditions are interpreted with skin findings rather than serving as diagnostic criteria alone.



Animal exposure is a clinical history clue

- Exposure to infected animals as a predisposing factor.
- The source also notes that dermatophytes can grow on animals and in soil.
- Exposure history is supportive but not a substitute for observing the characteristic lesion.

Soil habitat

Animal habitat

Animal
exposure:
Corporis risk

Separate habitats and exposure information; No
inferred transmission sequence

Feet and nails may coexist with corporis

- Chronic dermatophytosis of the feet or nails predisposes to tinea corporis.
- A focused examination can therefore include these additional keratinized sites.
- This relationship is clinical context; It does not identify a particular fungal species.

Chronic foot dermatophytosis



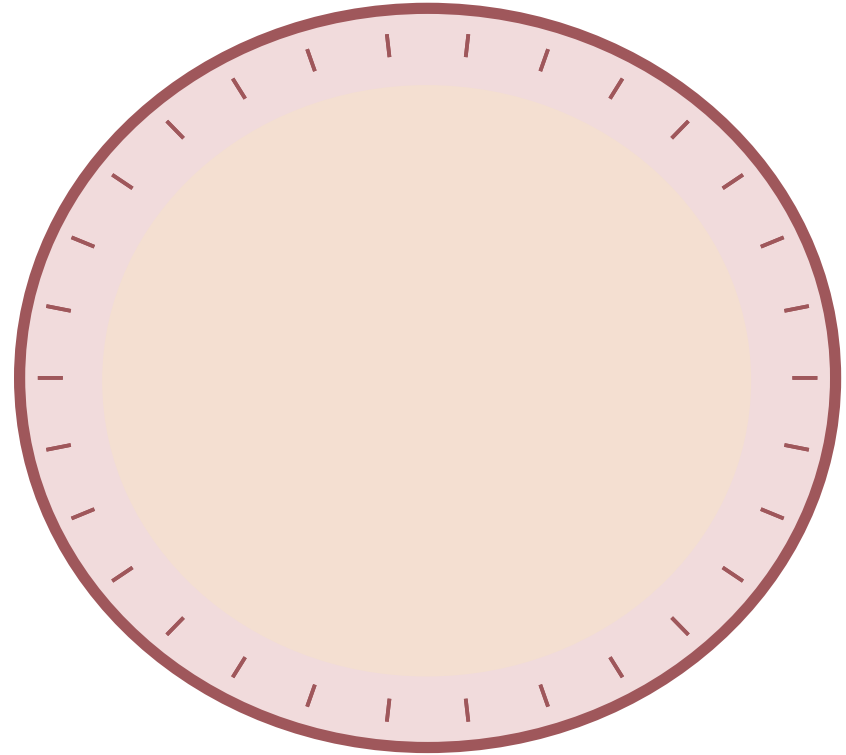
Nail involvement / onychomycosis

**Both may be associated with predisposition
to tinea corporis**

Relationship is clinical; Arrow does not establish individual transmission

Tinea corporis has an expanding plaque

- An expanding, round, slightly erythematous plaque.
- Recognition depends on overall configuration and the lesion border.
- The border is raised and scaling in the characteristic presentation.

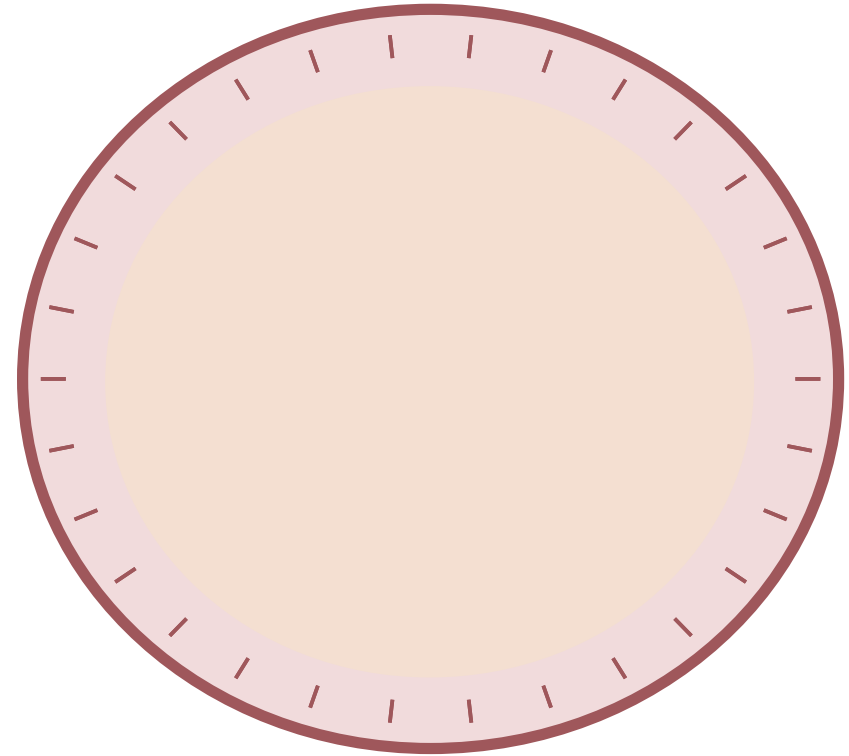


Expanding round plaque

Schematic — not a clinical or histologic specimen

The active-looking border is the key feature

- Peripheral scaling and elevation distinguish the classic corporis plaque.
- An expanding circular pattern is highly characteristic in the source account.
- A native schematic shows the described shape, not an actual patient lesion.



Expanding round plaque

Schematic — not a clinical or histologic specimen

Why the plaque edge matters to the examiner

- The raised scaly circumference is a more specific clue than redness alone.
- The same source separately describes macular fine-scaled versicolor lesions.
- Pattern recognition should connect shape, scale, and site.

Corporis

- Expanding round plaque
- Raised scaling edge
- Slight erythema

Versicolor

- Multiple macules
- Variable colors
- Fine peripheral scale

Teaching case: An annular plaque

- A child has a gradually enlarging round plaque on the arm, with a slightly raised scaly edge.
- Which source-described tinea pattern does this most closely match?
- Which three lesion descriptors are decisive?

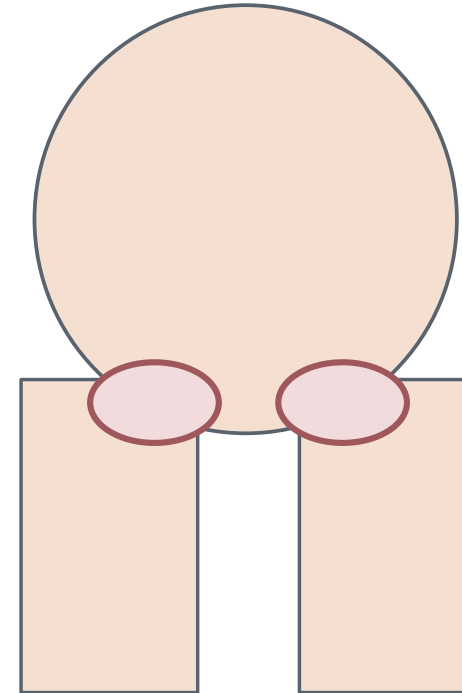
HYPOTHETICAL TEACHING CASE

A child has a gradually enlarging round plaque on the arm, with a slightly raised scaly edge.

Discuss the question and justify the distinguishing features.

Tinea cruris localizes to the inguinal region

- Cruris refers to infection of the groin and upper inner thighs.
- Initial lesions on the upper inner thighs.
- Site is essential because moist erythematous patches also occur in other settings.

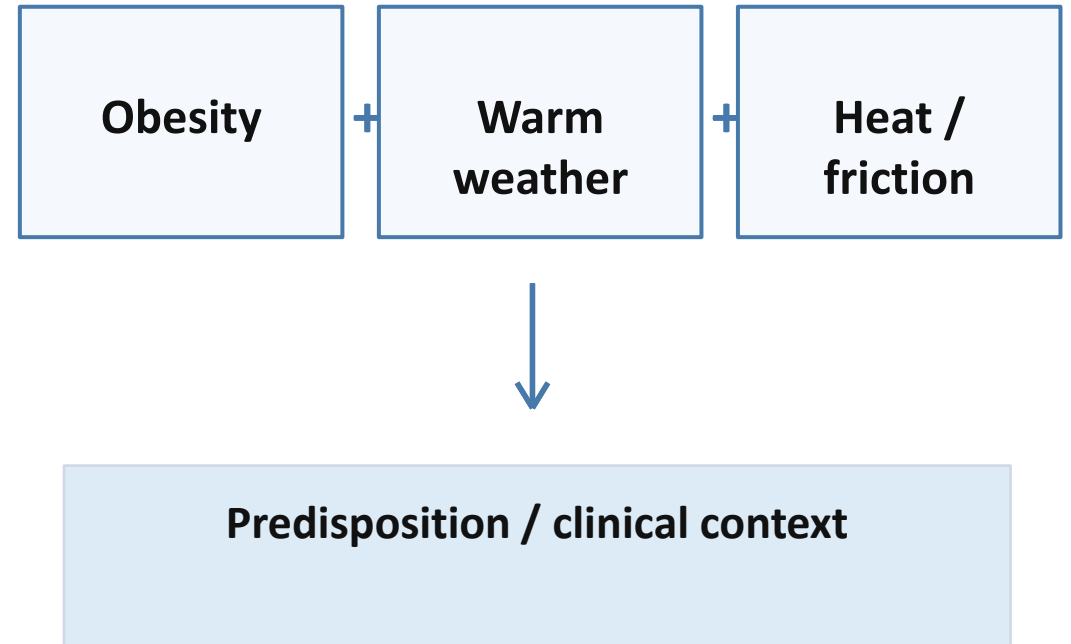


Upper inner thighs / inguinal folds

Schematic — not a clinical or histologic specimen

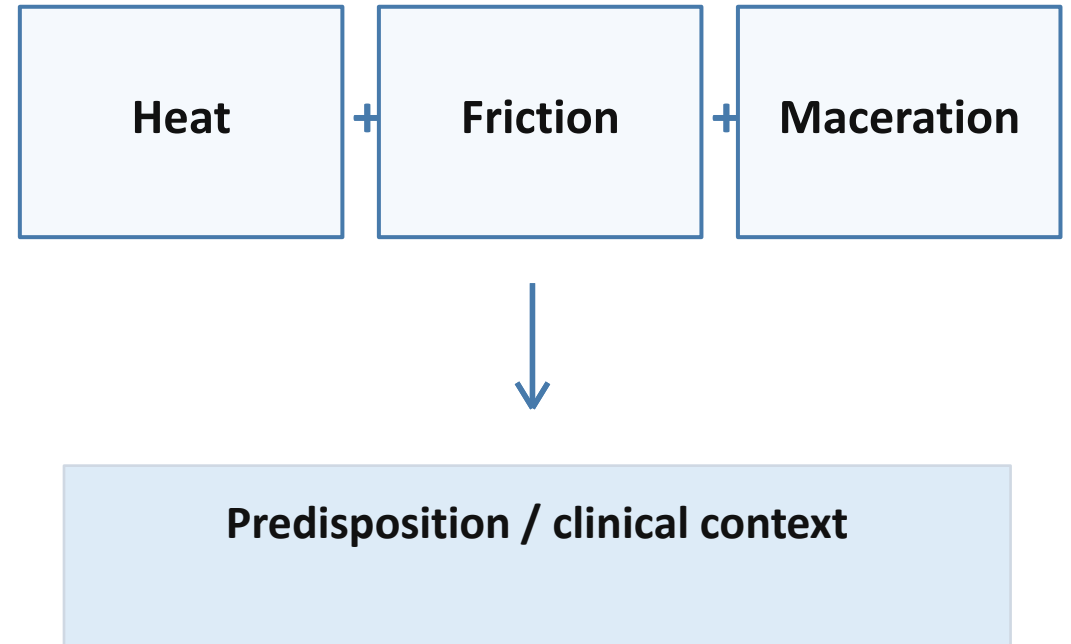
Tinea cruris: Typical clinical context

- Greater frequency in obese males.
- Warm weather is highlighted as a common circumstance.
- The associated local environment contributes to the clinical pattern.



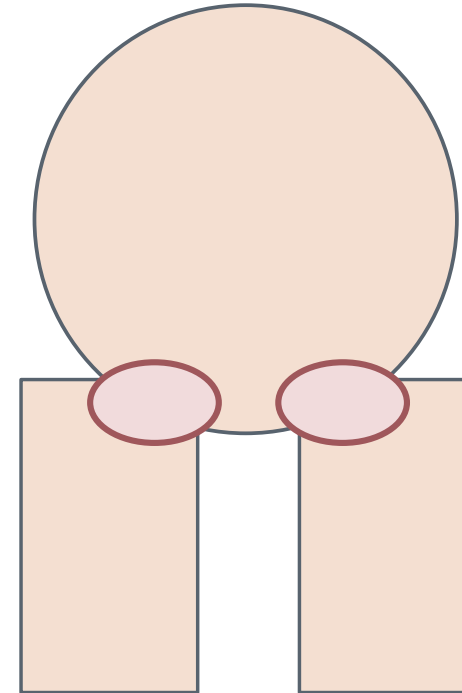
A triad predisposes to tinea cruris

- Heat, friction, and maceration are explicitly listed as predisposing factors.
- These factors are particularly relevant at opposed skin surfaces.
- The clinical picture includes moist red patches and a raised scaly margin.



Tinea cruris: Morphology of the patch

- The earliest described lesions are moist, red patches.
- Raised scaling borders remain important recognition features.
- The upper inner-thigh origin distinguishes cruris from a generic body plaque.



Upper inner thighs / inguinal folds

Schematic — not a clinical or histologic specimen

Corporis versus cruris: Location modifies the pattern

Feature	Tinea corporis	Tinea cruris
Typical location	Body skin	Inguinal region / inner thigh
Configuration	Round expanding plaque	Moist red patch
Edge	Raised and scaling	Raised and scaling
Predisposing context	Heat; humidity; animals; chronic foot/nail infection	Warm weather; heat; friction; maceration

Tinea pedis is a common exposure over a lifetime

- 30%–40% of people are affected at some point in life.
- This is a lifetime-occurrence statement, not a point-prevalence estimate.
- The commonness of pedis makes careful differentiation of its components important.

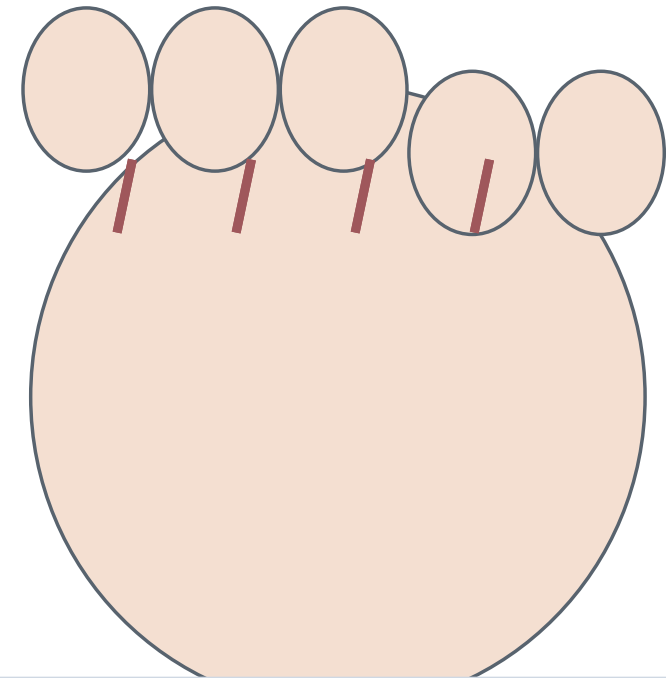
30%–40%

**Affected at some time in life
(Robbins)**

Lifetime occurrence — not point prevalence

Tinea pedis often begins in toe web spaces

- Diffuse erythema and scaling characterize the textbook presentation.
- The findings are frequently first localized to the web spaces.
- Inspection limited to plantar skin could overlook early interdigital disease.

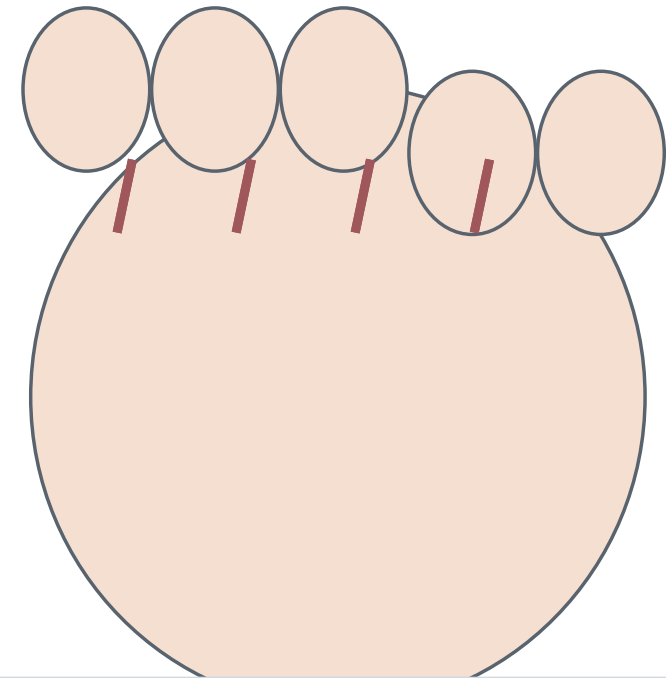


Scale often begins between toes

Schematic — not a clinical or histologic specimen

Pedis: Erythema and scaling coexist

- Erythema can accompany widespread scaling.
- The source describes the distribution as potentially diffuse.
- Clinical inflammation does not automatically reflect fungal burden alone.



Scale often begins between toes

Schematic — not a clinical or histologic specimen

Bacterial superinfection modifies tinea pedis

- Much of the inflammatory reaction to bacterial superinfection.
- The visible inflammation may therefore not be directly caused by the primary dermatophytosis.
- This distinction matters when correlating clinical inflammation with fungal histology.

Primary dermatophyte process

Variable host epidermal response

Possible bacterial superinfection

Interpret fungal localization and inflammation separately

Tinea pedis: Separate primary and secondary effects

- Primary process: Superficial dermatophyte infection in foot skin.
- Secondary process: Bacterial superinfection may account for much of the inflammation.
- The two processes should not be treated as equivalent explanations.

Primary dermatophyte process

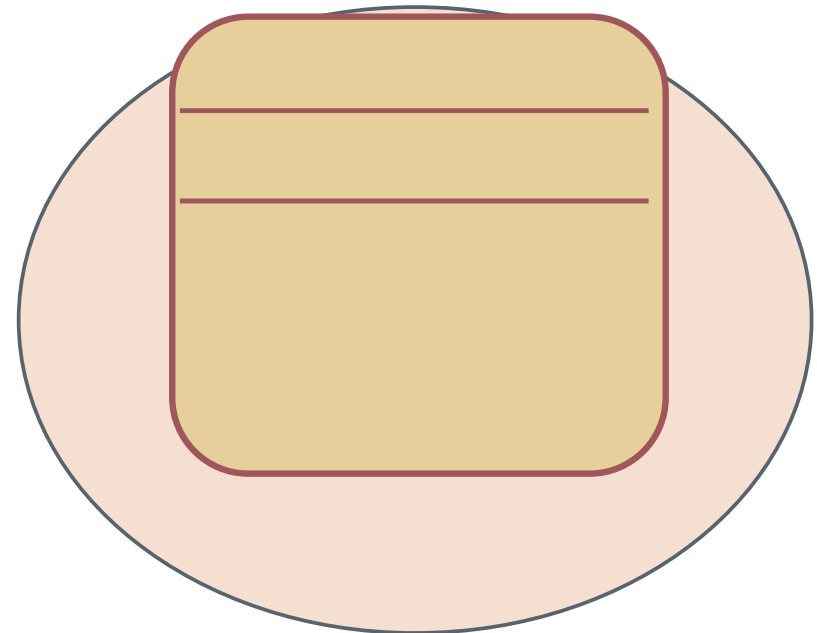
Variable host epidermal response

Possible bacterial superinfection

Interpret fungal localization and inflammation separately

Onychomycosis is infection of the nail

- Fungi may spread from tinea pedis to nails; Nail infection may also arise primarily.
- The term onychomycosis describes fungal infection of nail structures.
- Clinical alteration of the nail plate is characteristic in the cited description.

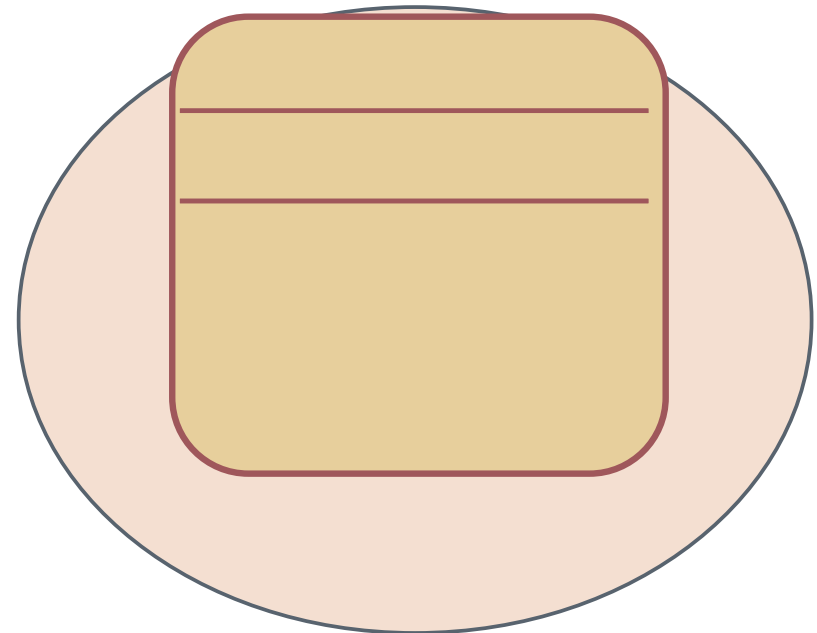


Discoloration • thickening • deformation

Schematic — not a clinical or histologic specimen

Nail discoloration is one sign

- Altered nail color in onychomycosis.
- Color change should be interpreted together with thickening or deformity.
- Nail involvement is also relevant when assessing possible associated tinea corporis.

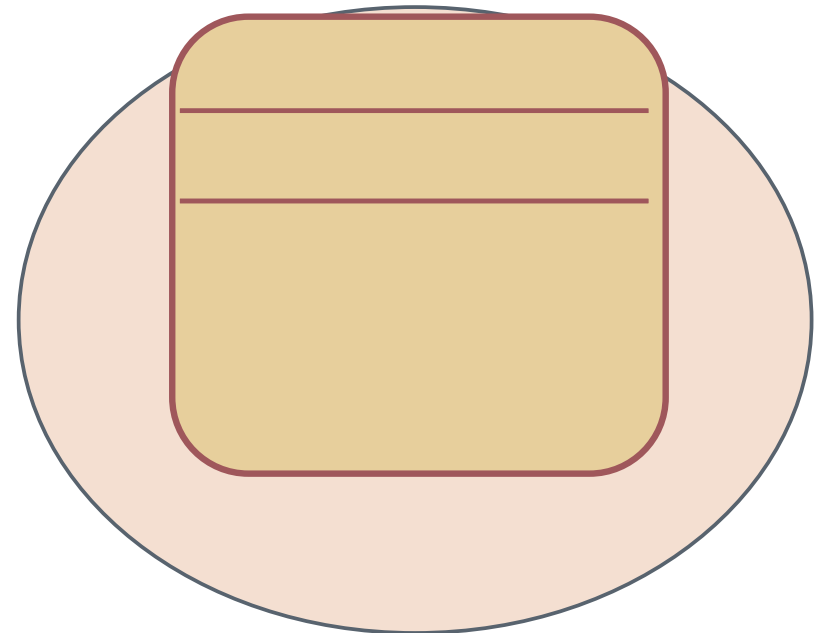


Discoloration • thickening • deformation

Schematic — not a clinical or histologic specimen

Thickening and deformity of the nail plate

- Thickening is a second characteristic nail change.
- Deformity reflects loss of the nail plate's usual shape.
- The findings are a morphologic clinical description, not species-level identification.



Discoloration • thickening • deformation

Schematic — not a clinical or histologic specimen

Foot and nail disease form a connected clinical picture

- A foot infection can extend to the nail.
- Primary infection of the nail is also possible.
- Chronic foot or nail dermatophytosis is an identified predisposing context for corporis.

Chronic foot dermatophytosis



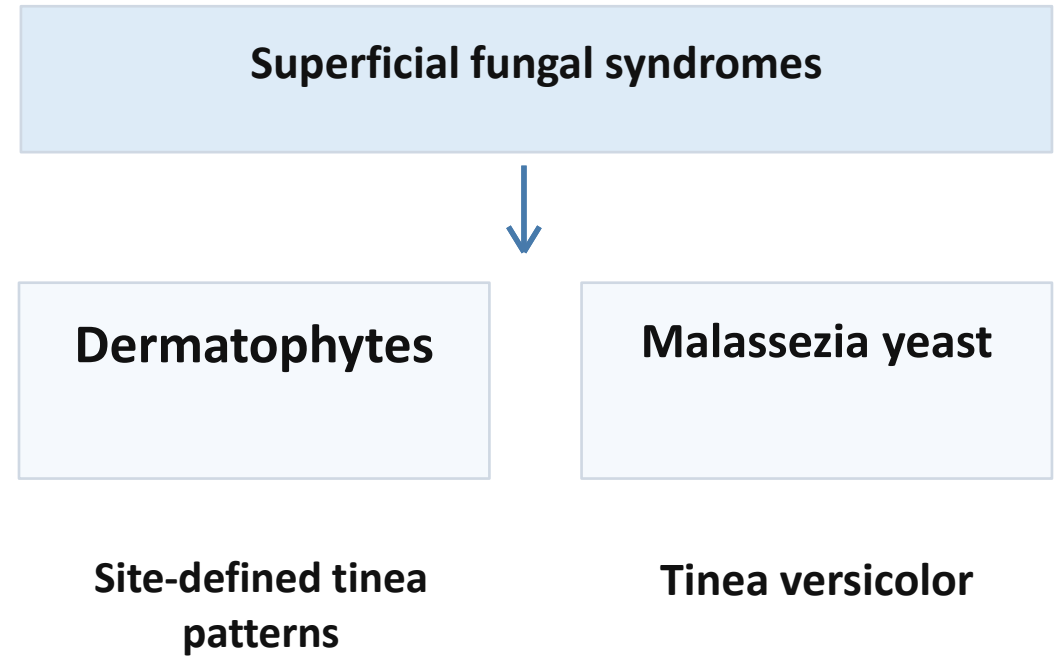
Nail involvement / onychomycosis

**Both may be associated with predisposition
to tinea corporis**

Relationship is clinical; Arrow does not establish individual transmission

Tinea versicolor has a different fungal agent

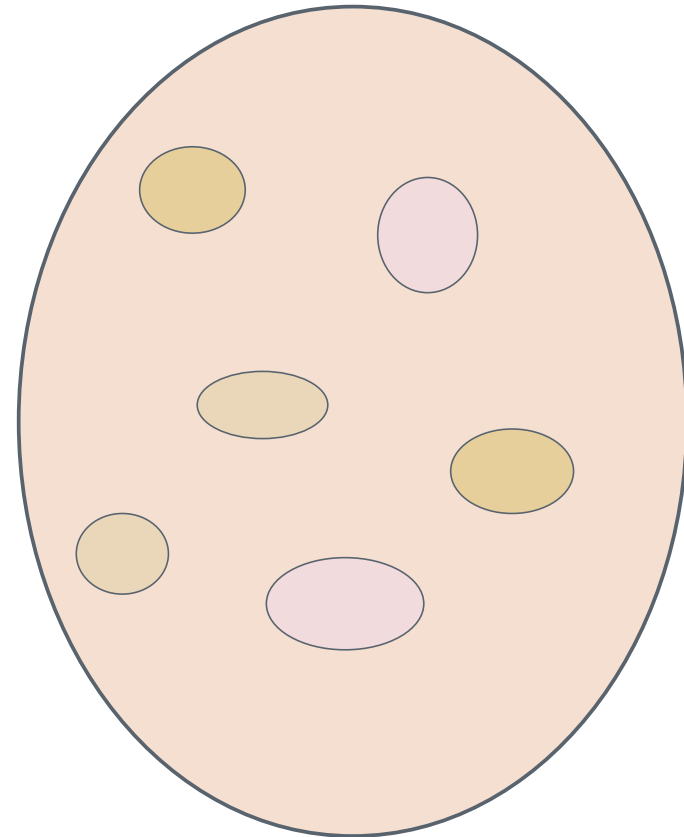
- Tinea versicolor is caused by *Malassezia* furfur.
- The agent is a yeast, explicitly not a dermatophyte.
- Grouping this condition among superficial mycoses does not make it a dermatophytosis.



Conceptual grouping — not a phylogenetic tree

Upper trunk is the classic versicolor site

- A usual location on the upper trunk.
- Lesions appear in groups rather than as one expanding annular plaque.
- Anatomic distribution and lesion shape are both useful clinical distinctions.

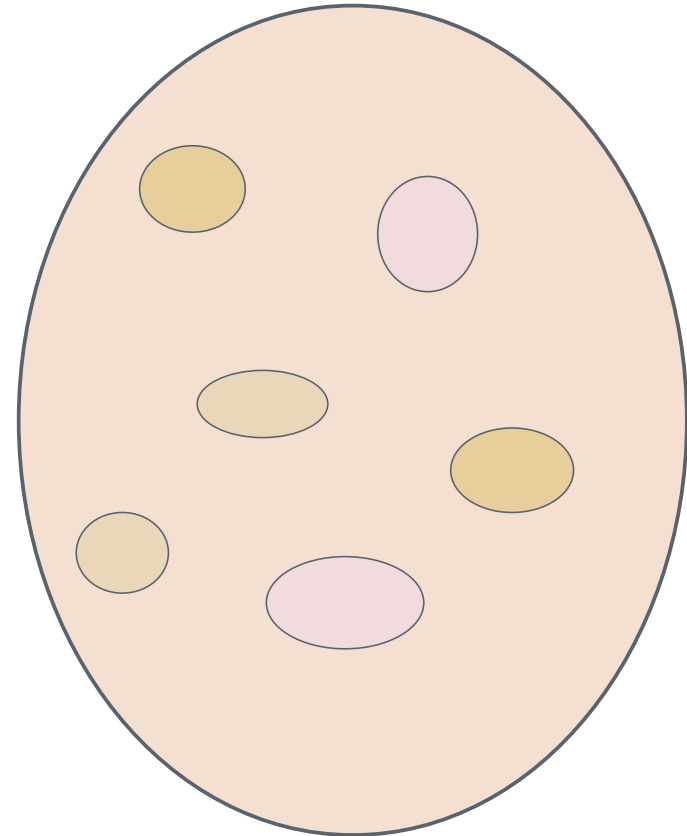


Upper trunk: Grouped macules of varied color

Schematic — not a clinical or histologic specimen

Macules of varied color define versicolor

- Individual macules vary in size and color.
- The mixture of tones produces the clinical description “versicolor.”
- These are macules rather than raised annular plaques in the source account.

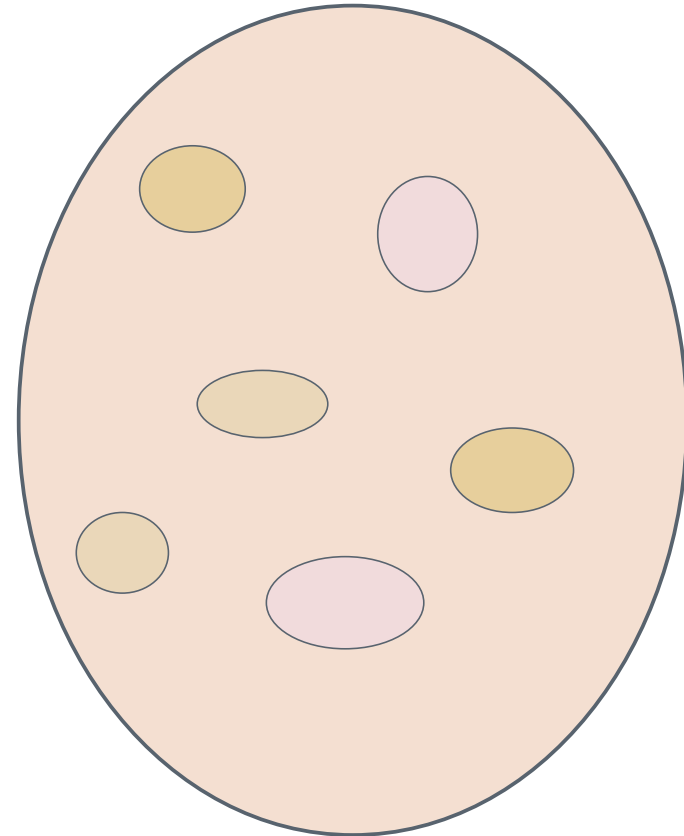


Upper trunk: Grouped macules of varied color

Schematic — not a clinical or histologic specimen

Fine peripheral scale completes the pattern

- The textbook specifically mentions a fine scale at the lesion periphery.
- Versicolor combines multiple macules, varied pigmentation, and fine scaling.
- The appearance contrasts with the elevated scaly border of tinea corporis.



Upper trunk: Grouped macules of varied color

Schematic — not a clinical or histologic specimen

Dermatophyte versus Malassezia syndromes

Feature	Dermatophytoses	Tinea versicolor
Agent category	Dermatophytes	Malassezia furfur (yeast)
Common site labels	Capitis, barbae, corporis, cruris, pedis	Upper trunk predominance
Illustrative lesion	Annular corporis plaque	Mixed-color macules
Scale feature	Often raised scaling edge in corporis/cruris	Fine peripheral scale

Histology is variable rather than pathognomonic on H&E

- The histologic appearance of dermatophytosis varies.
- Organism characteristics, host response, and bacterial superinfection all contribute.
- Routine inflammatory findings alone need not identify the infecting fungal organism.

Primary dermatophyte process

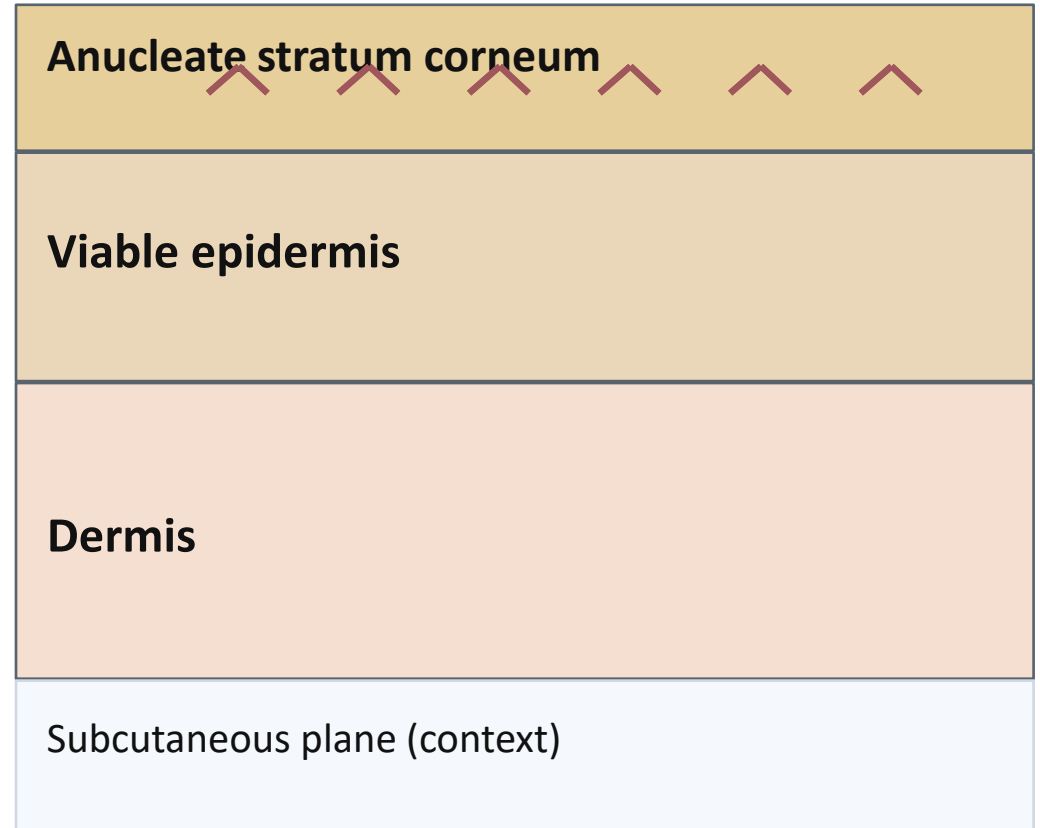
Variable host epidermal response

Possible bacterial superinfection

Interpret fungal localization and inflammation separately

The stratum corneum is the critical microscopic site

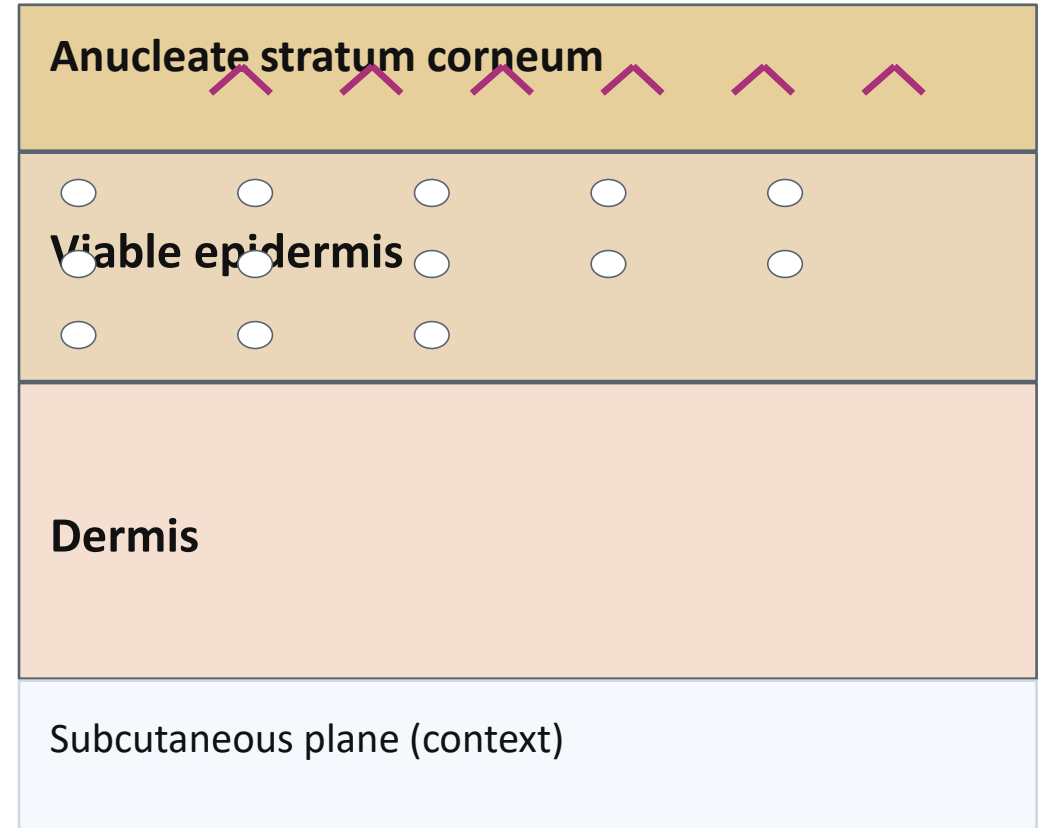
- Fungal elements are described in the anucleate cornified layer.
- The same principle extends to infected hair and nails.
- The figure's scale is conceptual; It is



Schematic — not a clinical or histologic specimen

A spongiotic reaction may accompany fungi

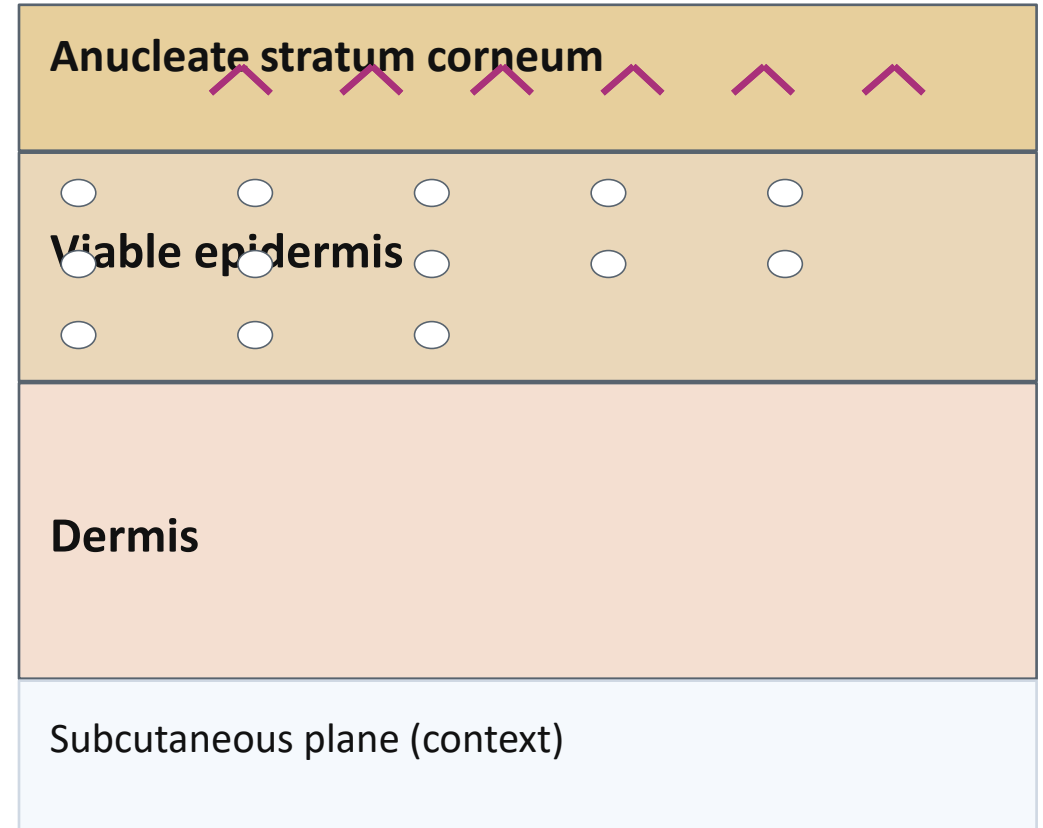
- A mild eczematous (spongiotic) dermatitis.
- Spongiosis is part of the host epidermal reaction.
- Fungal organisms must still be demonstrated to substantiate dermatophytosis.



Schematic — not a clinical or histologic specimen

Intraepidermal neutrophils may be present

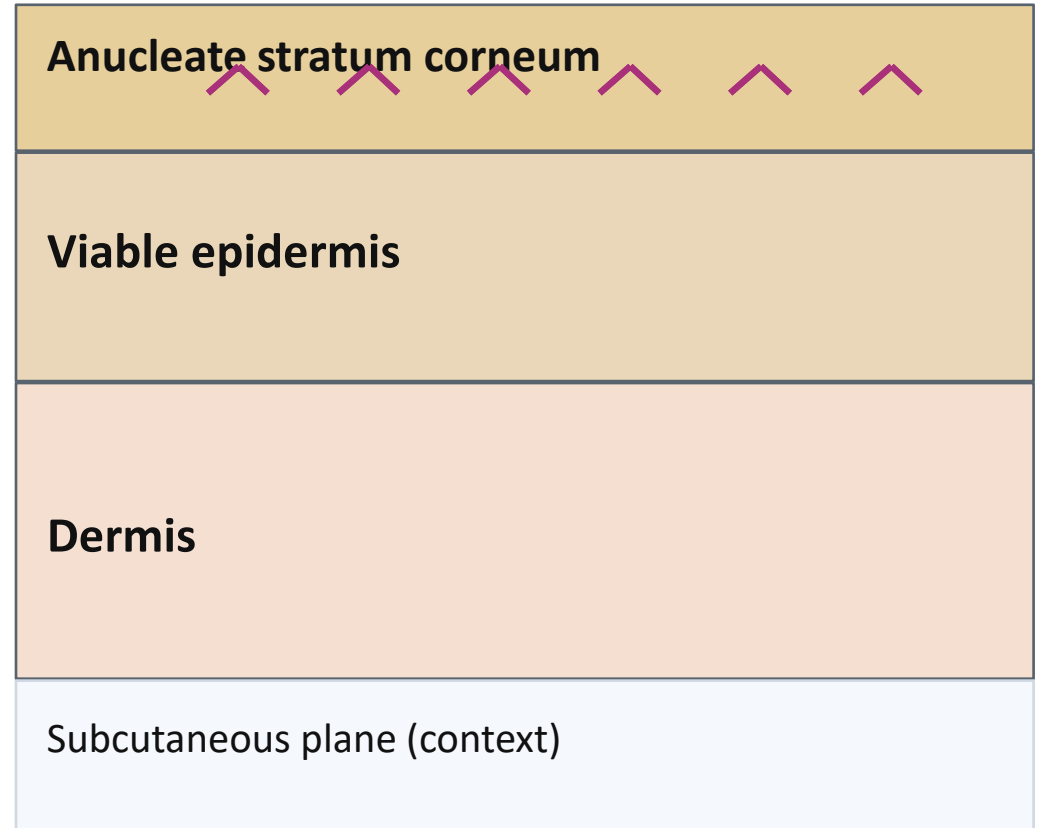
- Intraepidermal neutrophils and focal neutrophilic abscesses.
- This inflammatory pattern is not presented as uniformly present in every case.
- Evaluate the inflammatory reaction alongside fungus-specific staining.



Schematic — not a clinical or histologic specimen

PAS highlights fungal elements

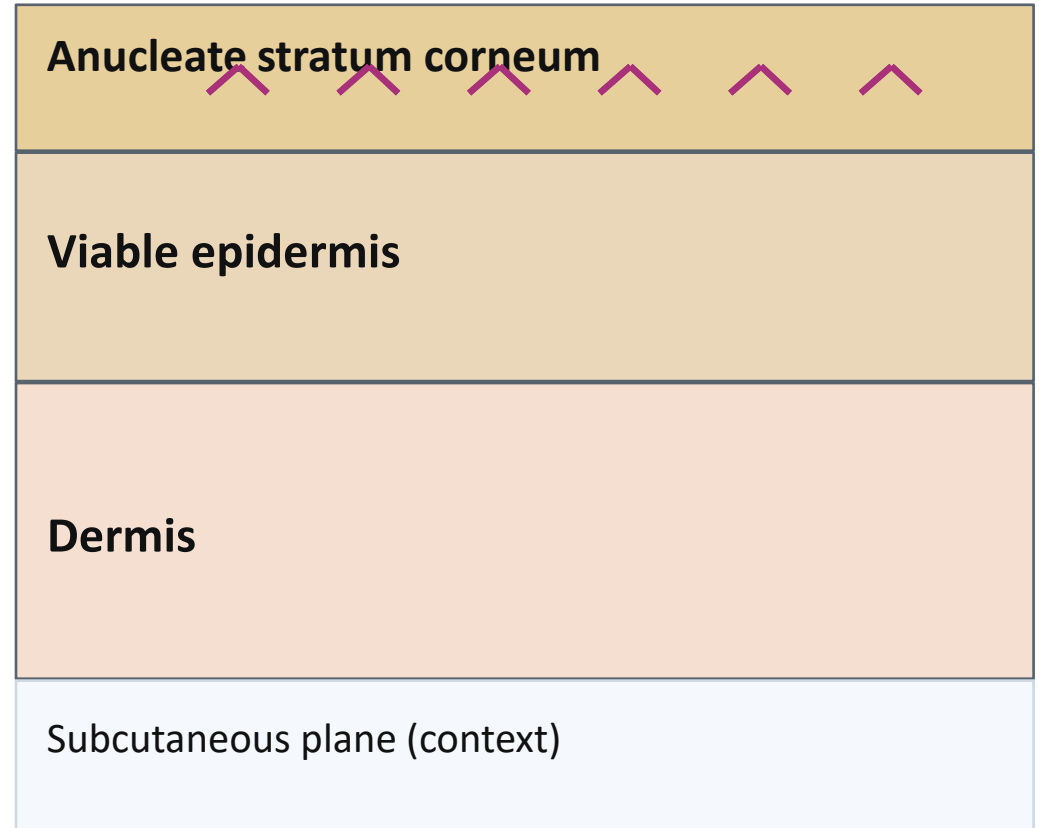
- Fungal cell-wall polysaccharides account for strong periodic acid–Schiff staining.
- Bright pink to red fungal structures.
- PAS visualizes fungal material and supports its identification in cornified tissue.



Schematic — not a clinical or histologic specimen

PAS-positive hyphae within the cornified layer

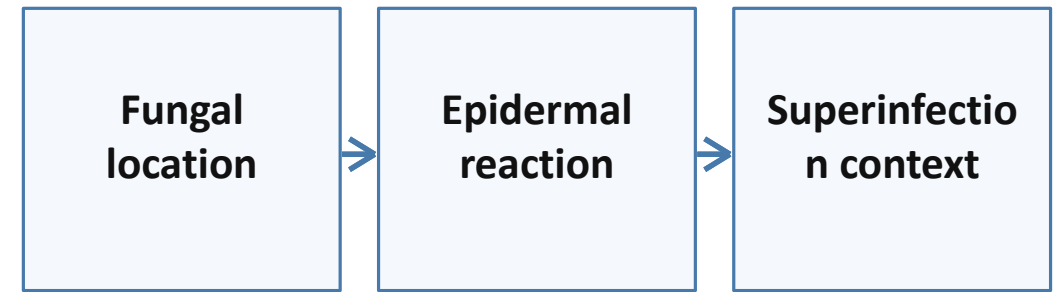
- Figure 25.39's caption specifically describes red hyphae within the stratum corneum.
- The relevant finding is both the staining reaction and its anatomic location.
- The vector diagram is an original schematic, not the printed textbook photomicrograph.



Schematic — not a clinical or histologic specimen

Read tissue location before inflammatory intensity

- Observe where fungal structures are found within the keratinized compartment.
- Then assess epidermal spongiosis and neutrophilic involvement.
- Finally consider whether secondary bacterial infection contributes to the pattern.



Clinical → anatomic / tissue evidence →
identification

Diagnostic material can come from several sites

- Scrapings from lesional cornified skin are appropriate specimens in the source account.
- Involved hair or nail material can also contain fungi.
- The specimen must correspond to the involved clinical structure.

SKIN

Stratum
corneum

HAIR

Keratinized
shaft

NAIL

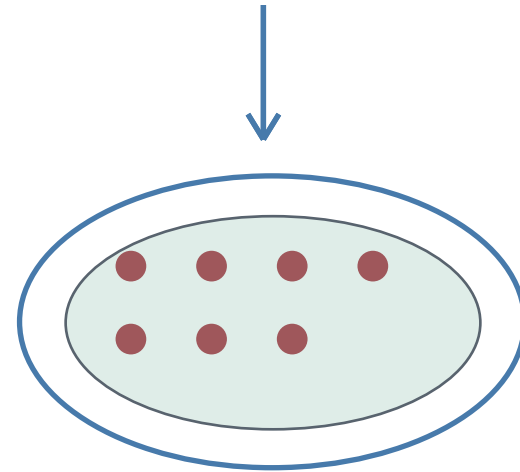
Nail plate

Lesional sampling follows the affected keratinized structure

Culture can identify the offending species

- Culture of scraped material usually permits species identification.
- The clinical syndrome itself principally identifies a site and recognizable phenotype.
- Species attribution should not be inferred from a lesion schematic or PAS positivity alone.

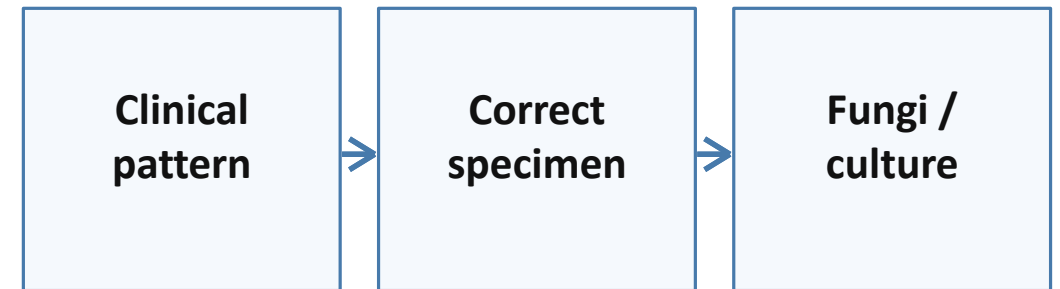
Lesional scale / hair / nail



Culture: Species identification

Diagnostic logic: Clinic to specimen to organism

- Recognize an anatomic pattern and its key lesion morphology.
- Sample the affected cornified skin, hair, or nail.
- Use tissue observation or special staining to demonstrate fungi; Culture can establish species.



**Clinical → anatomic / tissue evidence →
identification**

Nearby bacterial infection is a separate diagnosis

- Impetigo is a superficial bacterial skin infection discussed adjacent to this section.
- Its morphology emphasizes neutrophils and subcorneal pustules rather than PAS-highlighted hyphae.
- Do not merge the neighboring impetigo passage into dermatophytosis histology.

Dermatophytosis

- Fungi in cornified skin
- PAS highlights hyphae
- Variable spongiosis/neutrophils

Impetigo

- Superficial bacterial infection
- Subcorneal neutrophilic pustule
- Crust and bacterial organisms

Teaching case: A histology interpretation

- A skin biopsy shows mild spongiosis and focal epidermal neutrophils.
- PAS highlights red fungal hyphae in the anucleate surface keratin.
- Which finding establishes superficial fungal localization, and which findings reflect host response?

HYPOTHETICAL TEACHING CASE

A skin biopsy shows mild spongiosis and focal epidermal neutrophils.

Discuss the question and justify the distinguishing features.

Teaching case: Four distributions

- Child with patchy scalp scale and hair loss; Adult with an inner-thigh moist red scaly patch.
- Another patient has toe-web scaling; Another has clustered varied-color macules of the upper trunk.
- Assign the correct source-described tinea label to each distribution.

HYPOTHETICAL TEACHING CASE

Child with patchy scalp scale and hair loss; Adult with an inner-thigh moist red scaly patch.

Discuss the question and justify the distinguishing features.

Integrated clinical comparison

Entity	Where?	Most characteristic clue
Capitis	Scalp	Scale, crust, frequent hair loss
Barbae	Beard area	Adult male; uncommon
Corporis	Body skin	Expanding round plaque; scaly rim
Cruris	Groin / upper inner thigh	Moist red patch; scaly edge
Pedis	Feet / toe webs	Diffuse erythema and scale
Onychomycosis	Nails	Discolored, thickened, distorted plate
Versicolor	Upper trunk	Varied-color fine-scaled macules

Integrated microscopic comparison

Question	Finding or source-based answer
Where is the fungus?	Anucleate cornified layer; hair or nails may also be involved
What may H&E show?	Mild spongiotic dermatitis and intraepidermal neutrophils
Why PAS?	Fungal walls stain bright pink to red
How identify species?	Culture of lesional material usually permits identification
Why can inflammation vary?	Organism, host response and bacterial superinfection

High-yield diagnostic synthesis

- Site establishes the tinea label; Lesion morphology refines clinical recognition.
- Dermatophytes cause the principal site-defined syndromes; *Malassezia furfur* causes versicolor.
- PAS-positive hyphae in surface keratin and culture address organism localization and identity.
- Inflammation, particularly in pedis, may be modified by bacterial superinfection.

Site and phenotype

Examine involved keratin

Demonstrate fungal elements

Primary source and visual integrity

- Robbins, Cotran & Kumar: Pathologic Basis of Disease, 11th edition.
- Clinical and histologic information is derived from the supplied skin-chapter section.
- All scientific diagrams in this lecture are editable schematics, not observed specimens.