



# Common Skin Infections

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## 429 Dermatology Team (F)

Sources: Dr. Hind Al-Otaibi's lecture, 429 Dermatology Team Notes (not everything was added – only points relevant to our lecture), Toronto Notes 2011, Fitzpatrick's Color Atlas and Synopsis of Clinical Dermatology

*Italic: extra note from the lecture, or extra notes from 429 team*

Important:

- Morphology
- Source of infection
- General outlines of investigations and treatment

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Special thanks to: Norah Al-Syefi and AlBatool Al-Ammari

# 1 BACTERIAL

## 1.1 IMPETIGO

- Acute, superficial cutaneous infection
- **Organisms:** Staph. aureus (associated w/nasal or perianal carriage), group A Strep, or both
- More common in children
- **Site:** exposed areas (face, extensor surfaces, acral areas; hands and feet)
- 2 types

- Bullous:
  - Organism: Staph. aureus
  - Common in newborns and older children
  - Site: face & hands
  - Lesion: thin, fragile bullae on grossly **normal** skin



- Non-bullous: more common
  - Organisms: Staph. aureus, group A Strep
  - Lesion: vesicles or pustules on an erythematous base that **quickly turn to honey-colored crusts** ▶

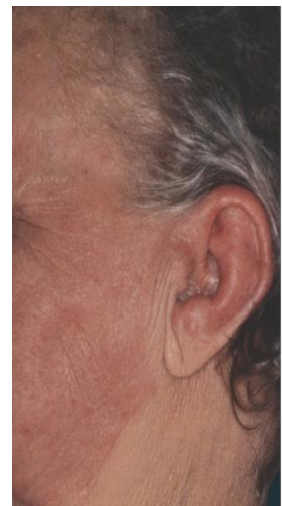


- It could be:
  - Primary: if there are no previous skin lesions
  - Secondary: if the infection occurs on top of a previous skin lesion (impetigo on top of eczema or herpes)
- Predisposing factors:
  - Warm, humid climate
  - Poor hygiene
  - Trauma
  - Insect bites
  - Immunosuppression

- Prognosis: no scarring but post-inflammatory hypo- or hyper-pigmentation can occur
- Complications ▀: acute post-streptococcal glomerulonephritis (APSGN)
  - **RARE**
  - Follows streptococcal infection (impetigo > URTI)
  - Latency period: ~10 days after pharyngitis, ~3 weeks after pyoderma (impetigo)
  - *Associated strains 49, 55, 57, 59 (follow up in 2-3 weeks if +ve)*
- Management:
  - Swab: Gram stain (will show gram +ve cocci), culture
  - Remove crust (to allow penetration of medications, and accelerate healing)
  - If localized: topical antibiotic (e.g. bactroban)
  - If **severe, bullous** or **streptococcal** in origin (risk of APSGN): systemic 1<sup>st</sup> generation cephalosporin (e.g. *cefazolin*) or penicillin for 7-10 days

## 1.2 ERYSIPELAS

- Superficial cutaneous infection (*upper dermis*) with marked lymphatic involvement
- Follows minor penetrating trauma (e.g. abrasion) or associated with chronic lymphatic dysfunction
- Common in infants, young children & the elderly
- Organism: group A Strep
- Site: face, acral areas; legs
- Lesion: sharply demarcated, edematous, erythematous plaque
  - Associated features: fever, malaise, and leukocytosis
- Management:
  - Smear/swab if discharging
  - Cold compress
  - If severe: oral (10 days) or IV antibiotics (penicillin, or erythromycin if allergic to penicillin)



## 1.3 CELLULITIS

- Deep cutaneous infection (*subcutaneous tissues involved*)
- Follows penetrating trauma (cut, abrasion or ulcer)
- Risk factors: immunocompromised, DM, HTN, obesity, venous stasis
- Organism: Strep pyogenes (group A), Staph aureus
- Site: most commonly legs
- Lesion: raised, hot, tender, **poorly demarcated**, erythematous **patch** (usually not raised) ± bullae (w/Staph infection)
  - Associated features: fever, malaise, palpable, tender **lymph nodes**, and leukocytosis
- Complications: chronic lymphedema with recurrent infections
- Management:
  - Swab and **blood culture** ▀
  - Acetaminophen
  - IV penicillinase-resistant penicillin's e.g. flucloxacillin, or 1<sup>st</sup> generation cephalosporins





## 1.4 FURUNCLE

- Inflammation of deep portions of hair follicle (*follicular*)
- Organism: Staph. aureus
- Lesion: deep seated **nodule** about hair follicle, erythematous base
- Management:
  - Swab: culture and gram stain
  - Antibacterial soap
  - Anti-Staph antibiotics



## 1.5 CARBUNCLE

- Infection of multiple hair follicles
- Organism: Staph. aureus
- Lesion: larger more deep seated, with **drainage through multiple points** in the skin
- Management:
  - Swab: culture and gram stain
  - Screen for carrier state (*swab nose, if +ve give bactroban*)
  - Anti-Staph antibiotics



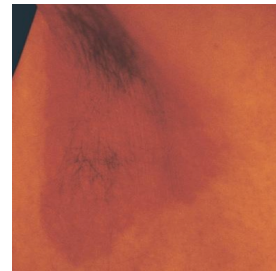
## 1.6 FOLLICULITIS

- Inflammation of hair follicle
- Organism: Staph. aureus
- Site: face, scalp, thighs, axilla & inguinal area
- Lesion: multiple small **papules** / **pustule** on an erythematous base
- Prognosis: heals without scarring but post-inflammatory hypo- or hyper-pigmentation can occur
- Management:
  - Swab: culture, gram stain
  - Antibacterial soap
  - Topical and systemic antibiotics



## 1.7 ERYTHRASMA

- Organism: corynebacterium minutissimum (*weak bacteria*)
- Site: flexor surfaces e.g. axilla, feet web spaces, groin, submammary
- Lesion: well demarcated, red-brown, asymptomatic (non-itchy) **patch**
- Risk factors:
  - Excessive sweating, obesity
  - Immunocompromised, DM
- Management:
  - Swab
  - Wood's lamp: **coral-red** fluorescence ▀
  - Topical: imidazoles (miconazole) or erythromycin
  - Oral erythromycin for 7 days



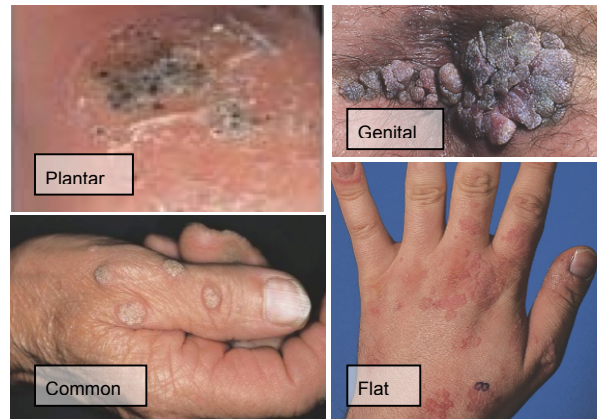


## 2 VIRAL

### 2.1 WARTS

- Virus: **DNA**, Human Papilloma Virus (HPV)
- Warts: common benign self-limited cutaneous tumors. High recurrence rate (because it is latent at the basal layer of the skin).

CLINICAL MANIFESTATIONS AND ASSOCIATED HPV TYPES		
	Frequently detected	Less frequently detected
<b>Skin lesions</b>		
• Common, palmar, plantar, myrmecial and mosaic warts	1, 2, 4	26, 27, 29, 41, 57, 60, 63, 65
• Flat warts	3, 10	28, 29
• Butcher's warts	7, 2	1, 3, 4, 10, 28
• Digital squamous cell carcinoma and Bowen's disease	16	34, 35
• Epidermodysplasia verruciformis (EV)	3, 5, 8	9, 12, 14, 15, 17, 19-25, 36-38, 46, 47, 49, 50, etc.
• EV – squamous cell carcinoma	5	8, 14, 17, 20, 47
<b>Mucosal lesions</b>		
• Condylomata acuminata	6, 11	42-44, 54, 55, 70
• High-grade intraepithelial neoplasia (including cervical condylomata plana, bowenoid papulosis, erythroplasia of Queyrat)	16	18, 31, 33-35, 39, 40, 51-59, 61, 62
• Buschke-Löwenstein tumor	6, 11	
• Recurrent respiratory papillomatosis, conjunctival papillomas	6, 11	
• Heck's disease (focal epithelial hyperplasia)	13, 32	



#### 2.1.1 CUTANEOUS WARTS

- Common wart (cutaneous):
  - Lesion: usually hyperkeratotic papule or plaque on erythematous base
  - Hand
  - Children (5-10 yrs)
  - Koebner phenomenon ▀ (located at sites of trauma)
- Plane "flat" warts (cutaneous):
  - Multiple, skin colored papules
  - Face, back of hands
- Plantar wart (site is sole of the foot):
  - *Bad prognosis*
  - Lesion: hyperkeratotic plaque with "**black dots**" (*these are thrombosed capillaries*)
  - **Painful**, *DDx: corns – difference: corns are present on points of pressure*
- Management of cutaneous warts:
  - Usually involute spontaneously
  - Mechanical: cryotherapy, electrocautery, curettage, laser
  - Topical: keratolytic salicylic acid (SA), TCA

#### 2.1.2 GENITAL WARTS:

- **Most common STD**
- **Site:** penile, vulvar skin, perianal area, mucous membranes
- **Lesion:**
  - **Condylomata acuminata:** pedunculated tumor "cauliflower like", or
  - Classic papules
- Always check sexual partner
- If child: either mother has common warts (transmitted while changing diaper etc) or sexual abuse
- Oncogenic serotypes: 16 and 18

##### Management of Genital Warts

###### (1) Cytotoxic agent

Podophyllotoxin 0.5 % solution, 0.15% cream

###### (2) Physical destruction

Trichloroacetic acid (TCA) 80-90% solution

Cryotherapy (liquid nitrogen, cryoprobe), Electrocautery

Scissors excision

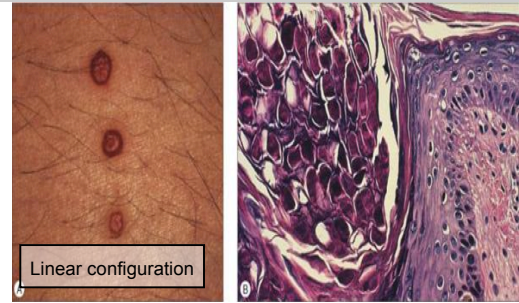
Laser vaporization (higher risk of infection)

###### (3) Immunomodulatory

Imiquimod 5% cream

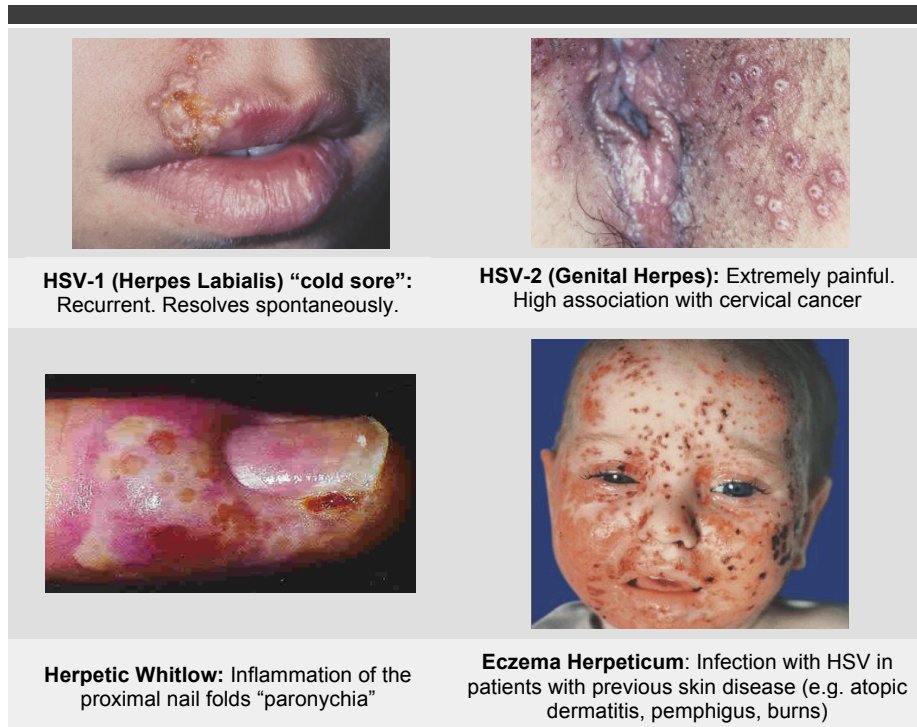
## 2.2 MOLLUSCUM CONTAGIOSUM

- Virus: Poxvirus (DNA)
- Children
- Site: face, neck
- Lesion: central punctum (umbilicated papules)
  - H/P: **Hunderson-patterson bodies**
- Management:
  - Involute spontaneously
  - *Better prognosis than warts*
  - Curettage, cryotherapy

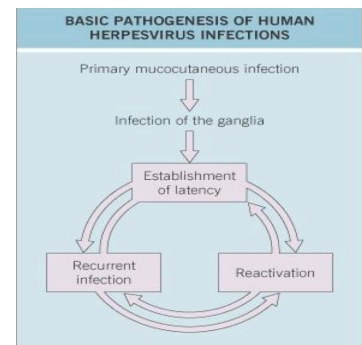


## 2.3 HERPES SIMPLEX VIRUS

- Virus: herpes simplex virus 1 & 2. *Incubation period: 7-10 days. Transmission: direct contact/asymptomatic shedding.*
- Lesion: **Grouped** small vesicles “blisters”, on erythematous base that erode within ~24 hrs ►
  - *Prodrome (before lesion appears): tingling, pruritus, pain*



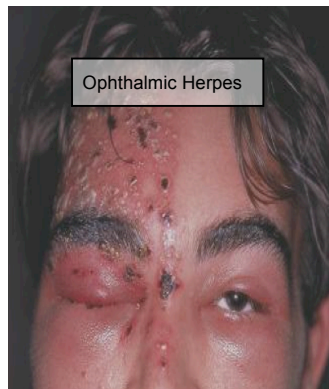
- Management:
  - Tzank Smear (not specific): shows multinucleated giant epithelial cells/viral particles
  - Serology (not specific): IgG, IgM antibodies - for screening the partner
  - Direct fluorescent antibody (DFA) – more specific
  - Viral culture: **most definitive** but not widely available
  - Always check for superimposed infections (e.g. impetigo) or concurrent STIs
  - Treatment:
    - DO NOT use topical steroids (worsen symptoms)



- *Topical antiviral*
- Oral (*more effective than topical*) or IV acyclovir for: genital, recurrent, immuno-suppressed, neonatal, eczema herpeticum

## 2.4 HERPES ZOSTER VIRUS

- Virus: chicken pox virus [*varicella zoster: primary infection causes chicken pox (usually in children), reactivation causes shingles (usually in adults/elderly)*]
- Adult, Hx of chickenpox
  - *Reactivation risk factors: immunosuppression e.g. steroids; stress*
- Lesion: dermatomal blisters. Commonest dermatomes: thoracic (spinal), trigeminal (cranial).
  - *Serious: ophthalmic herpes, Ramsay-Hunt syndrome (geniculate ganglion; could lead to facial nerve paralysis), sacral ganglia herpes*
  - *>1 dermatome: usually immunosuppressed* ▮
  - *Prodromal pain & tingling (3-5 days before eruption) and post-herpetic neuralgia* ▮ (persists for ~4 weeks)
  - *Heals with scarring*
- Management:
  - Tzank Smear: viral particles
  - Direct fluorescent antibody (DFA)
  - Treatment:
    - Analgesia ▮, drying agent
    - Acyclovir: if immunosuppressed, wide spread



Ophthalmic Herpes



T1 dermatome (?)



T10 dermatome



### 3 FUNGAL

SUPERFICIAL MYCOSES OF THE SKIN		
	Cutaneous disorder	Pathogen(s)
Minimal, if any, inflammation	Pityriasis (tinea) versicolor	<i>Malassezia furfur</i> ( <i>Pityrosporum ovale</i> )
	Tinea nigra Black piedra White piedra	<i>Exophiala werneckii</i> <i>Piedraia hortae</i> <i>Trichosporon beigeli</i>
Inflammatory response common	Tinea capitis, barbae, faciei, corporis, cruris, manuum, pedis Cutaneous candidiasis	<i>Trichophyton</i> , <i>Microsporum</i> , <i>Epidermophyton</i> spp. <i>Candida albicans</i>

Fungal infections (mycosis) could be deep or superficial:

#### 3.1 CANDIDIASIS

- Organism: *Candida albicans* (normal commensal of GIT), pathogenic in immunocompromised
- Sites:
  - **Intertrigo**: flexor surfaces & skin folds = under breast, groin, or interdigitally. “Napkin candidosis” = diaper area (toddlers & the elderly).
    - Starts as **itchy pustules** →→→ shiny, oozing, **patch**
    - “Satellite lesions” ▴: peripheral pustules (around lesion)
  - Paronychia: painful red swellings of periungual skin. Topical Rx not effective.
  - Mucous membranes: oral (thrush), urogenital and esophageal
  - Vulvovaginitis: irritation, discharge
  - Candida folliculitis
  - Generalized systemic infection
  - Chronic mucocutaneous candidiasis
- Management:
  - Swab: **KOH**
  - Alter **moist warm environment** (keep area dry w/powders etc)
  - Nystatin-containing cream
  - Imidazole (Daktarin, canastein)
  - Oral antifungal (itraconazole): if immunosuppressed, or persistent infection



## 3.2 DERMATOPHYTOSIS

Dermatophytes affect keratinized tissues: skin, hair and nails

### 3.2.1 TINEA PEDIS

- Organisms: *T. rubrum* (source: human), *T. mentagrophytes* (source: animal)
- Adult (athletes)
- Site: toe webs (interdigital) most common, instep
- Lesion:
  - Interdigital: **maceration** ▴, peeling, fissuring of toe webs
  - On sole: itchy scales (typical fungal infection)



THE FOUR MAJOR TYPES OF 'TINEA PEDIS' (INCLUDING DEMATIACEOUS AND DERMATOMYCOSES)

Type	Causative organism	Clinical features	Treatment considerations
Moccasin	<i>T. rubrum</i> <b>E. floccosum</b>	Diffuse hyperkeratosis, erythema, scaling, and fissures on one or both plantar surfaces; frequently chronic and difficult to cure*; may be associated with fungal CMI deficiency	Topical antifungal plus product with urea or lactic acid; may also require oral antifungal therapy
	<i>S. hyalinum</i> <i>S. dimidiatum</i>		
Interdigital	<i>T. mentagrophytes</i> (var. interdigitale) <i>T. rubrum</i> <i>E. floccosum</i>	Most common type; erythema, scaling, fissures, and maceration occur in the web spaces; the two lateral web spaces are most commonly affected; associated with the 'dermatophytosis complex' (fungal infection followed by bacterial invasion <sup>‡</sup> ); pruritus common; may extend to dorsum and sole of foot	Topical antifungal; may require topical or oral antibiotic if superimposed bacterial infection
	<i>S. hyalinum</i> <i>S. dimidiatum</i> <i>Candida</i> spp.		
Inflammatory (vesicular)	<i>T. mentagrophytes</i> (var. <i>mentagrophytes</i> )	Vesicles and bullae on the medial foot; associated with the dermatophytid reaction <sup>†</sup>	Topical antifungal usually sufficient
Ulcerative	<i>T. rubrum</i> <i>T. mentagrophytes</i> <i>E. floccosum</i>	Typically an exacerbation of interdigital tinea pedis; ulcers and erosions in the web spaces; commonly secondarily infected with bacteria; seen in immunocompromised and diabetic patients	Topical antifungal; may require topical or oral antibiotics if secondary bacterial infection

Dermatophytes

Non-dermatophytes



### 3.2.2 TINEA CAPITIS ▮

- Lesions: **Well circumscribed, pruritic, scaling area of hair loss**



Gray patch (commonest) - *T. audouinii*, shows **green** fluorescence under Wood's lamp



"Black dot" tinea capitis – *T. tonsurans*



Kerion – *T. verrucosum*  
Heals with scarring alopecia

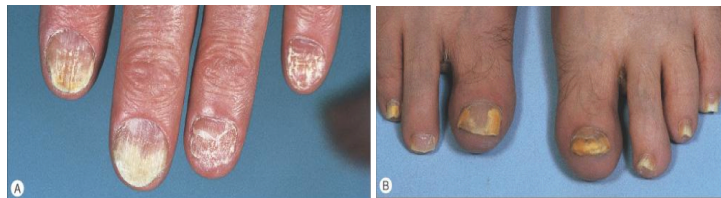


Favus – *T. schoenleinii*: thick yellow adherent crusts  
Heals with scarring alopecia

### 3.2.3 OTHER

#### Tinea Ungum

*T. rubrum*, *T. mentagrophytes*



#### Tinea Manuum





### Tinea Corporis

Trunk

*T. rubrum*

Annular, itchy, active border ►



### Tinea Cruris

Groin, pubic regions, and thighs



#### 3.2.4 MANAGEMENT

- Education
- Scraping, hair plug, or nail clippings: **KOH** (hyphae) and culture
- Wood's light (*T. audouinii* > green fluorescence)
- Topical (terbinafine, daktarin)
- Oral (Griseofulvin, terbinafine, itraconazole): extensive, hair, nail

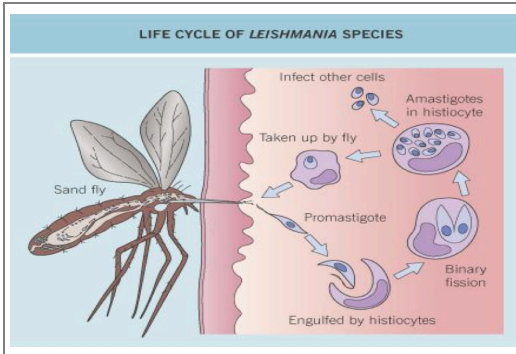
#### 3.3 PITYRIASIS VERSICOLOR

- Organism has 2 forms: *Malassezia furfur* (hyphae) and *pityrosporum orbiculare* (yeast)
- Site: trunk
- Lesions: asymptomatic (no itch), **well-demarcated patches**
  - Yellowish-brown (in white skin)
  - Hypo-pigmented (in dark skin)
- Management:
  - Wood's lamp ► (**coppery-orange** fluorescence)
  - Scraping: *KOH*, *culture*
  - Topical imidazole (nizoral)
  - Recurrence ►



## 4 PROTOZOAL: LESHMANIASIS

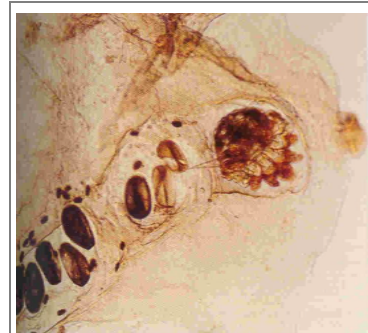
- Transmission: sand fly
- Site: exposed areas e.g. face, legs
- Lesion: painful papule/nodule → ulcer (*deep with elevated borders*) → scar ▮
- Management:
  - Leishmanin test, **biopsy** (*Lieshman-Donovan bodies*)
  - **Pentavalent antimony local injection** ▮
  - Systemic pentavalent antimony
  - Cryotherapy



## 5 INFESTATIONS

### 5.1 SCABIES

- Causative agent: mite "sarcoptes scabiei"
- Sites: finger webs, **flexor of the wrist**, **axillae**, areolae, **umbilicus**, lower abdomen and scrotum
- Lesion:
  - **Linear burrow** ▮ (primary lesion: due to mite activity)
  - *Secondary lesion: small urticarial crusted papules, eczematous plaques, excoriations* (immune reaction)
  - Severe and persistent itch
  - Worse after bathing and at night
  - Secondary infection (pustule, crust) ▮
- Management:
  - Dx:
    - **India ink** ▮ or gentian violet then removed by alcohol to identify the burrows
    - A drop of mineral oil on the lesion then scraped away with a surgical blade
    - Demonstration of the mite under the microscope
  - Treatment of family members and contact even if asymptomatic ▮⊕
  - Washing clothing and bed linen
  - Permethrin 5% cream ▮ (1<sup>st</sup> line)
  - Lindane (gamma benzene hexachloride)
  - Crotamiton cream for 5 days
  - Sulfur preparation



## 5.2 PEDICULOSIS CAPITIS

- Head louse (*pediculus humanus var capitis*)
- Common in school children
- Severe **itching** of the scalp
  - Post-cervical LN, secondary impetigo, **nits** (*presence confirms Dx - differentiate from dandruff by vibration test > nits are firmly attached to hair, unlike dandruff*)
- Management:
  - Examination of other family members and treated simultaneously (**IF** symptomatic) ►
  - Identification of the nit or adult head louse
  - **Combing** with a metal nit comb (*nits are not affected by topical Rx*)
  - Permethrin cream/shampoo 1% and 5% for 10 min then rinsed off
  - Malathion 0.5% lotion
  - Lindan (neurotoxic – not used anymore)