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A Guide to the Infectious Skin Rashes of School Children

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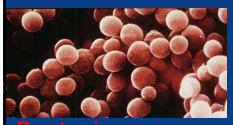
Disclosure Information

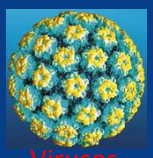
- I have no relevant financial relationships to disclose.
- I will discuss the following off label use in my presentation:
  - The use of ivermectin for treatment of scabies and lice
  - The use of candida antigen injections for warts and molluscum
  - The use of cantharidin for molluscum

Skin Infections/Infestations


Fungi

Lice



Bacteria


Viruses

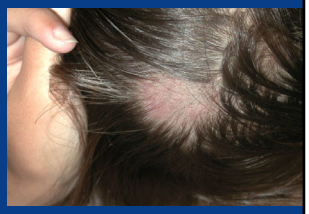

Scabies

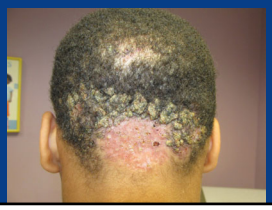
Fungal infections

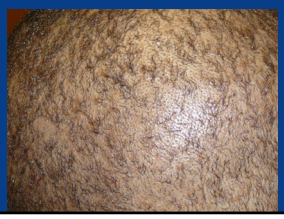
- Caused by dermatophytes—fungi that infect keratinous tissue (hair, skin, nails)
  - *Trichophyton tonsurans, rubrum, Microsporum canis,* others
- Transmitted via *close contact* with contaminated humans, soil, animals, and fomites
- Infection requires a break in the skin barrier—fissures, abrasions, macerated skin

Tinea capitis

- Variable clinical presentations
  - Round scaly plaques with alopecia
  - "Black dots"
  - Kerion (boggy mass)
  - Diffuse scale
- Lymphadenopathy





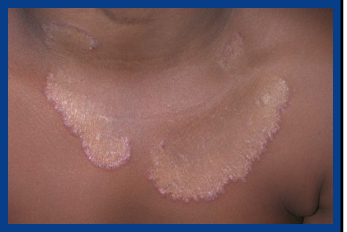


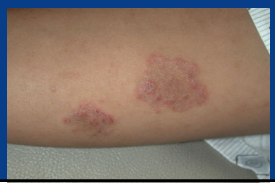
Treatment of tinea capitis

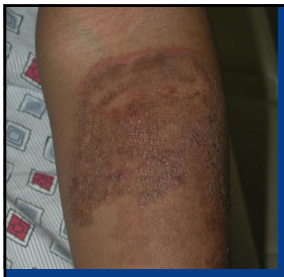
- Requires **systemic** therapy
  - Griseofulvin 20-25mg/kg/day x 8wks
  - Terbinafine x 6-8wks
- Environmental control
  - No sharing of hats, towels, pillows, combs/brushes, etc
  - Surveillance of close contacts (children) as possible reservoirs

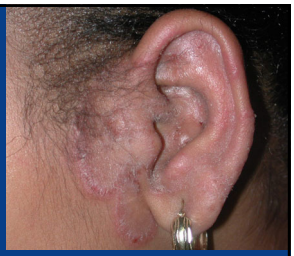
Tinea corporis ("Ringworm")

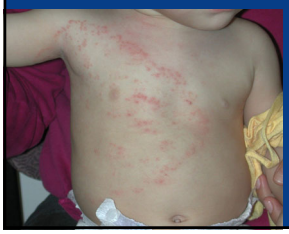
- Round, erythematous, scaly plaques
- Expand centrifugally into annular plaques
- Borders are elevated with central clearing

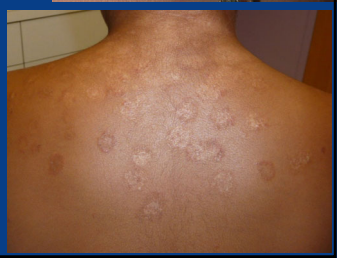










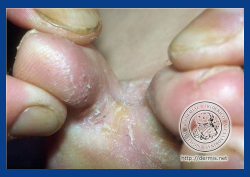


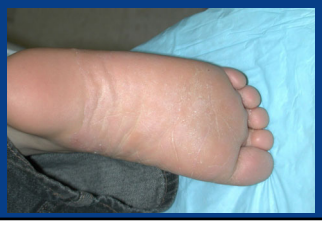
Treatment of tinea corporis

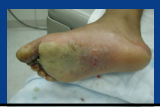
- Topical antifungal creams/gels/lotions generally effective within 2-4wks
- Indications for systemic agent (x 2-4wks):
  - Involvement of hairy area
  - Significant facial lesion (esp around eyebrow)
  - Widespread infection
  - Refractory to topical therapy

Tinea pedis ("Athlete's foot")

- Interdigital type
  - Erythema, maceration, fissuring in web spaces
  - May be complicated by bacterial infection
    - Itch and odor
- Moccasin type
  - Diffuse scaling
- Vesiculobullous type





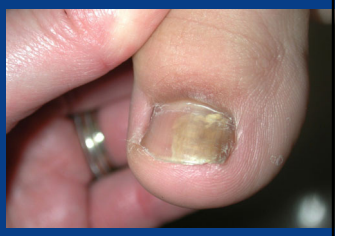


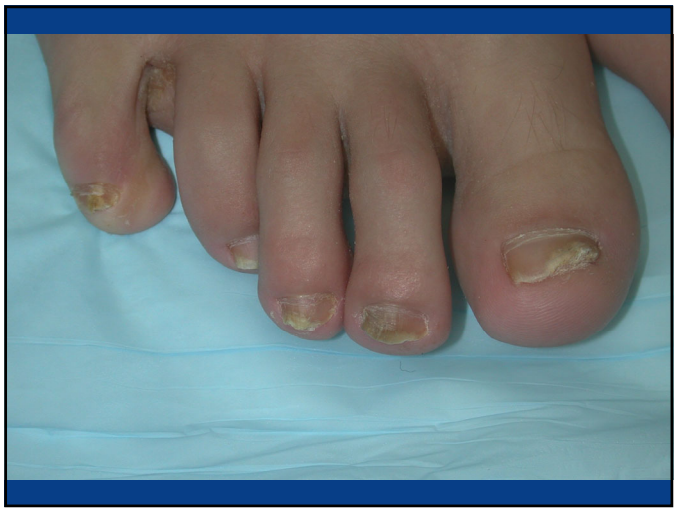
Treatment of tinea pedis

- Topical antifungal cream, gel x 4wks minimum
- Systemic agent for extensive/refractory case
- Counsel regarding foot hygiene:
  - Regular use of antifungal foot powder/shoe spray
  - Absorbent socks with frequent changes
  - Dry thoroughly between digits after bathing
  - Consider an aluminum chloride antiperspirant

Tinea unguium (Onychomycosis)

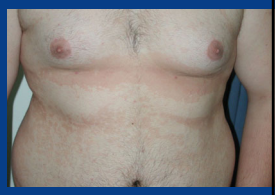
- Yellow brown discoloration of nail
- Subungual debris
- Traumatized nails are at greater risk
- Systemic therapy required x 3mo min.
  - Risk of permanent dystrophy
- *Only 50% of dystrophic nails are infected*

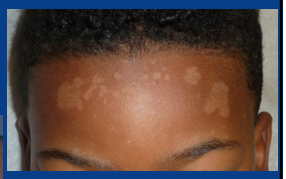


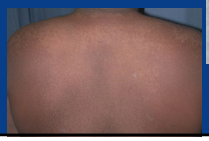


Tinea versicolor

- Salmon-colored or hypo- or hyperpigmented, finely scaling patches
- Upper trunk, neck, upper arms mostly
- *Malassezia* species inhibit tyrosinase in melanocytes causing pigment disturbance
- Represents overgrowth of normal skin flora
  - Does NOT require contact restrictions





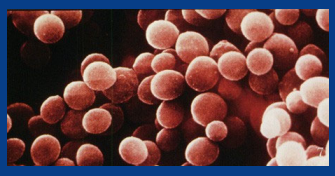


Treatment of tinea versicolor

- Topical agents are adequate for local dis
  - Selenium sulfide 2.5% lotion x10min QD x 2wks
  - Antifungal shampoos as a lather x5min QD x 3 days
  - Ketoconazole cream 2% x 2 weeks
- Systemic agents are more reliable for widespread/recurrent dis
  - -azole agents preferred
    - Itraconazole 200mg/day x 1 wk
    - Fluconazole 300mg x 1 dose, rpt in 1 wk

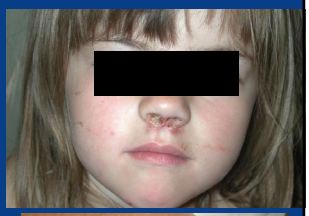
Bacterial infections

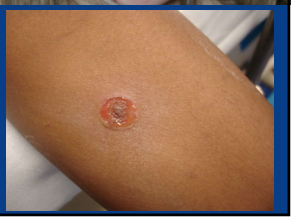
- Impetigo
- Folliculitis
- Furuncles/carbuncles

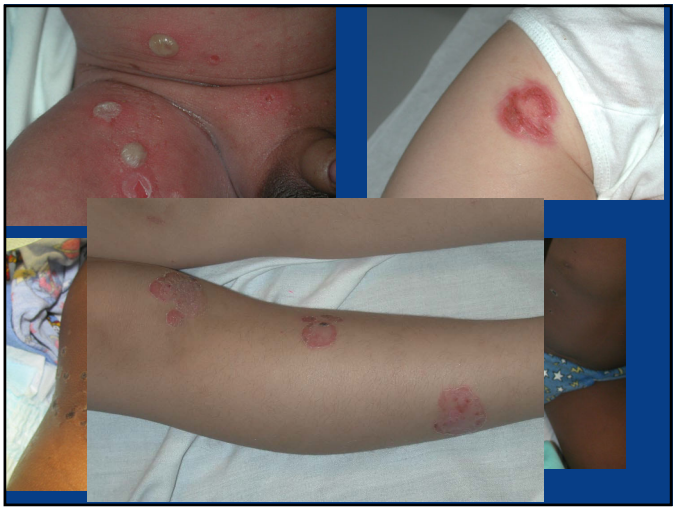


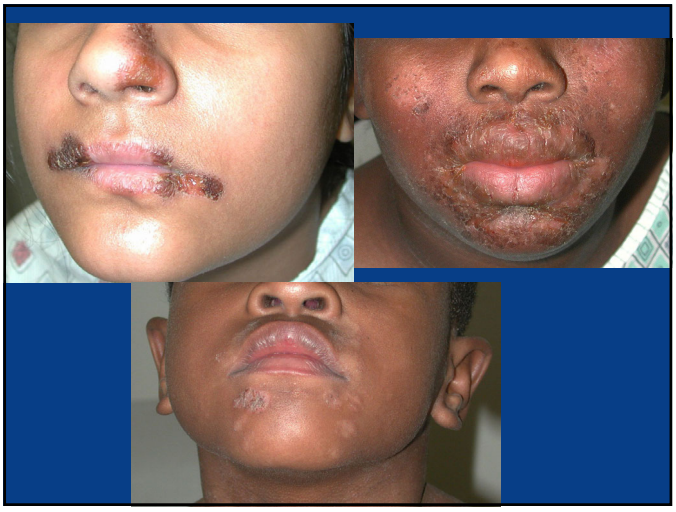
Impetigo

- *Staph aureus* and grp A beta-hemolytic *Strep* (GABHS)
- Nonbullous
  - Tiny vesicles and honey crusted plaques
- Bullous
  - Thin-roofed blisters, pustules and moist erosions with collarette of scale







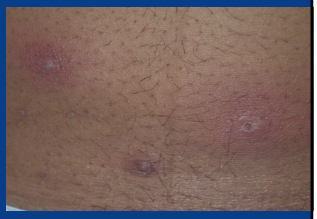


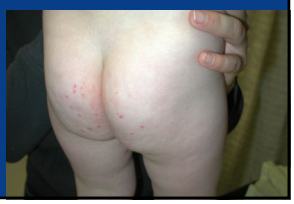
Treatment of impetigo

- Culture to document organism and sensitivities
- Local wound care:
  - Warm compresses to remove crusts
- Localized cases: Mupirocin oint TID x 10d
- Complicated cases and team outbreaks:
  - Systemic antibiotics directed by sensitivities
- Prevention of recurrent cases:
  - bleach baths weekly

Folliculitis

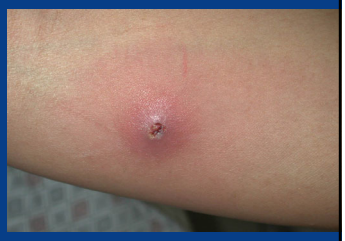
- *Staph aureus*
- Tender follicular-based pustules
- Sites of occlusion, friction, perspiration:
  - Extremities, buttocks
  - Axillae, groin
  - Face, neck, scalp (esp under equipment)





Furuncles/carbuncles "Boils"

- *Staph aureus*
- Painful, inflammatory, fluctuant nodules
- May progress to an abscess
- May coalesce into a purulent mass: carbuncle

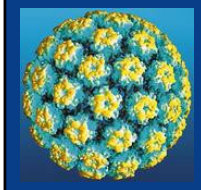


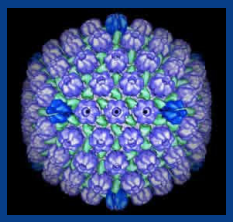
Treatment of folliculitis/furuncles

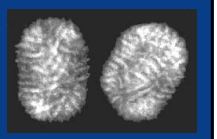
- Culture pustules/drainage when possible
- Localized folliculitis
  - Topical antibiotics and antibacterial cleansers
- Diffuse folliculitis: Oral antibiotics
- Furuncles/carbuncles:
  - Warm soaks to promote drainage
  - Incision and drainage when fluctuant
  - Oral antibiotics if systemically ill, multiple lesions, recurrent infections
- Decolonization via bleach baths weekly
- Attention to fomites and infected contacts

Viral infections

- Herpes simplex (HSV)
- Molluscum contagiosum
- Verruca (human papillomavirus, HPV)

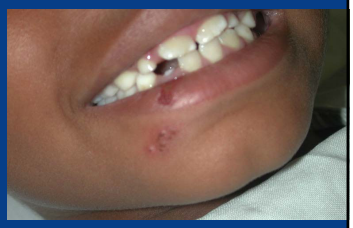


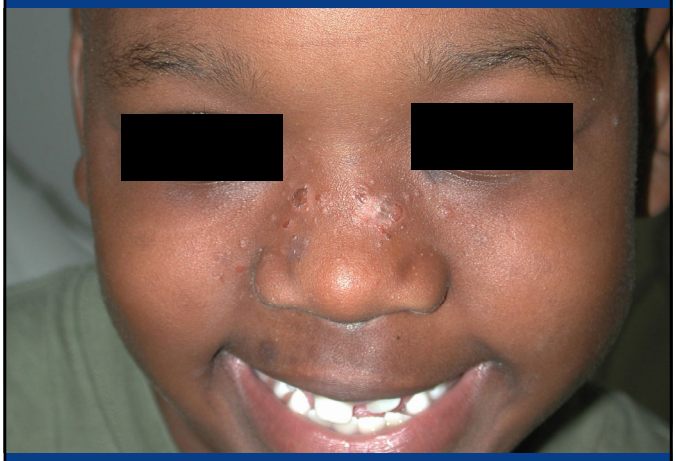


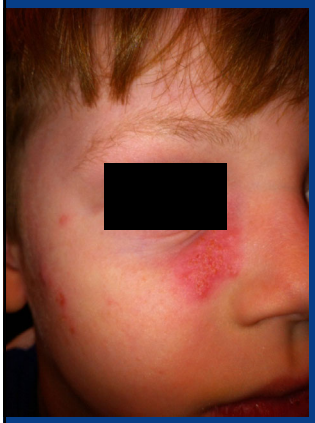


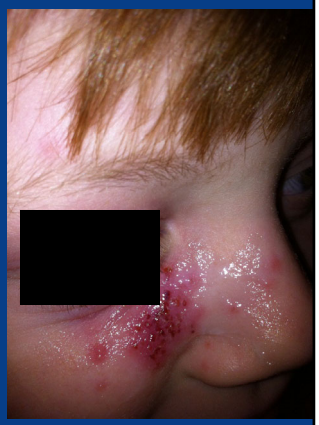
Herpes simplex
"Cold sore", "Fever blister"

- Grouped vesicles on an erythematous base
- Later becomes a moist ulcer, then crusted plaque
- Constitutional sx with primary infx
- Recurrent in same site
- Classically near lip margin
  - "ectopic" lesions can occur on any site of contact with infectious fluid from an active vesicle



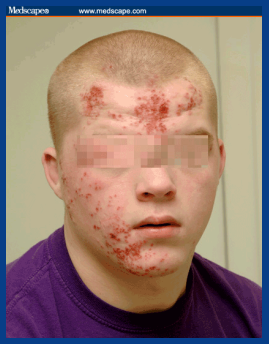


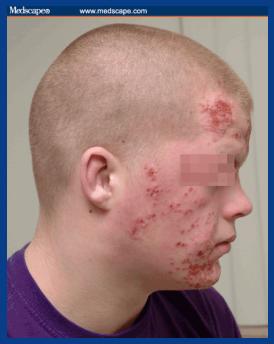




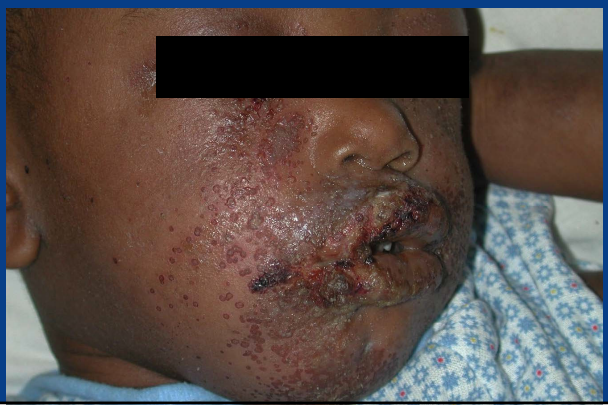
2 days later

Herpes gladiatorum





Eczema herpeticum

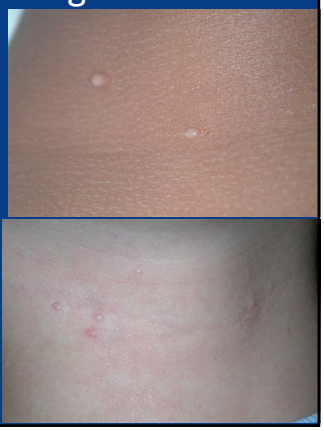


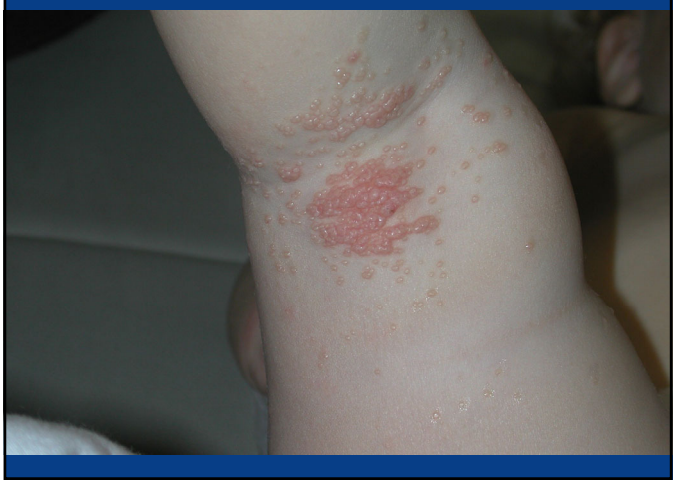
Treatment of HSV

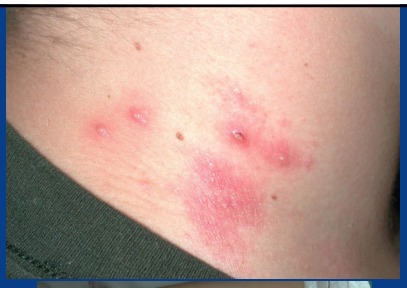
- Oral therapy with antiviral agent (acyclovir, valacyclovir)
  - Can shorten duration of active lesion
  - Can decrease likelihood of transmission
  - Most effective during prodrome or at first sign of lesion
- Expect recurrences at site of primary lesion
  - Consider daily suppressive therapy for frequent recurrences

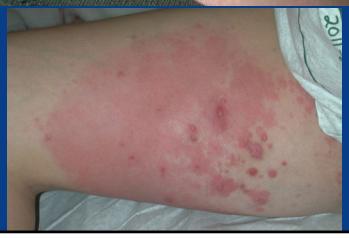
Molluscum contagiosum

- Poxvirus infection
- Asymp 1-6mm pearly papules with central dell
- Likely spread by close skin to skin contact







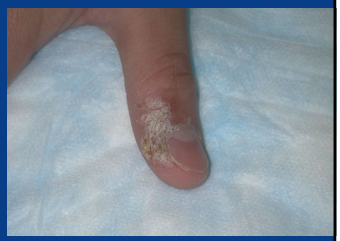


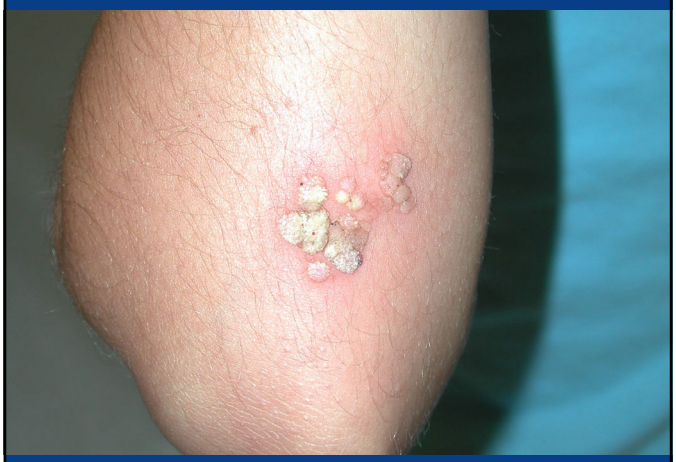
Treatment of molluscum

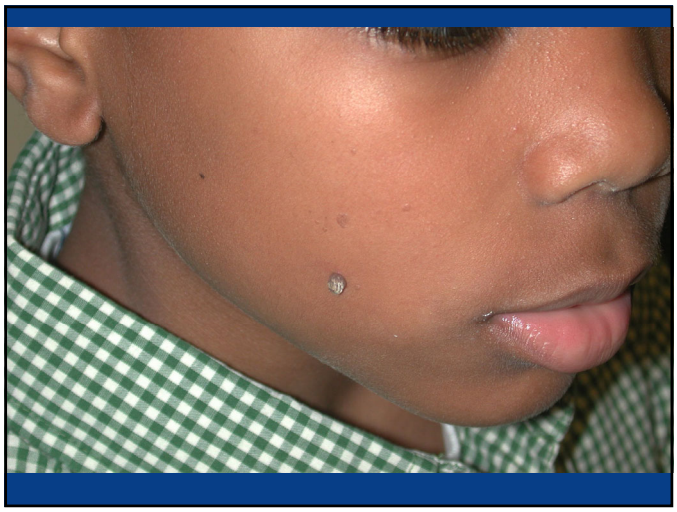
- Self-limited infection
  - Spontaneous resolution over months to years
- Interventions are predominantly destructive:
  - Cryotherapy
  - Curettage
  - Cantharidin
- "Immunomodulatory" therapy
  - Intralesional candida antigen
- Homeopathic remedies
  - Zyderm, hydrogen peroxide, apple cider vinegar, the internet's the limit!!
- Supportive measures are often best
  - Emollients and OTC hydrocortisone for surrounding dermatitis
  - Warm soaks for inflamed lesions
  - Avoid bathing sibs together
  - Avoid sharing towels

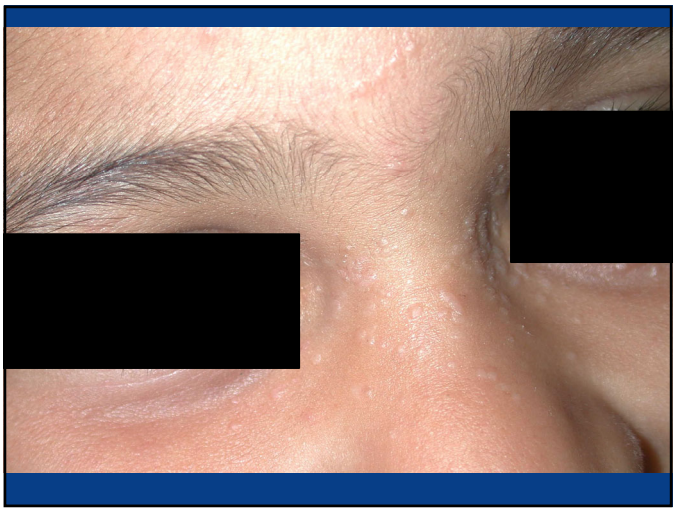
Verruca
"Warts"

- Human papillomavirus
- Firm, rough papules or nodules with disruption of skin markings and punctate black dots
- Hands, feet, face, extremities









Treatment of warts

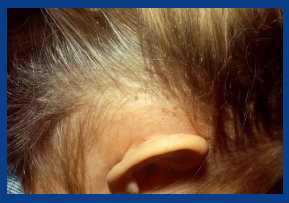
- Watchful waiting!
  - Spontaneous resolution over months to years in most children
  - Treat when patient is motivated to get rid of warts
- Approach depends on patient age, number, location, size
- No uniformly effective treatment
- Destructive, all require repetitive attempts:
  - Home-based:
    - Duct tape
    - Salicylic acid-containing topical agents
    - Freezing agents for home use (Freeze Away)
  - Office-based:
    - Cryotherapy (agents differ amongst practitioners)
    - Laser ablation
- Immunotherapy
  - Imiquimod cream
  - Veregen ointment
  - Intralesional candida antigen
- HPV vaccination

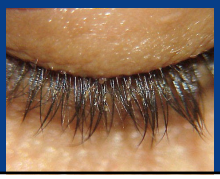
Parasites

- Lice
- Scabies

Lice
"Pediculosis"

- Scalp, body or pubic hair
- Prolonged contact with infected person or fomite
- Presents with excoriations and itch



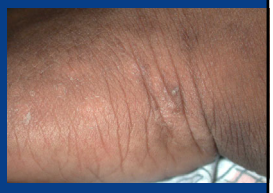


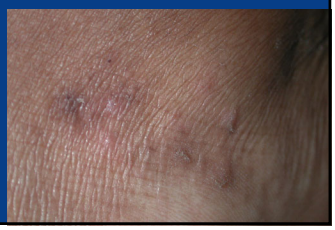
Treatment of lice

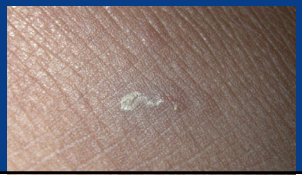
- Confirm with visualization of organisms or egg casings (nits) on hair, body, clothing
  - Best seen in hair by wet combing with fine toothed comb
- Topical agents:
  - OTC: 1% permethrin rinses, pyrethrin rinses—per CDC, nearly 100% resistance
  - Rx: malathion lotion, ivermectin lotion, benzyl alcohol lotion, spinosad cream rinse, abametapir lotion
  - Apply to dry hair (or skin) x 20min, then rinse
  - Retreat in 10-14 days
  - Eyelashes: coat with petroleum jelly
  - (Nit removal by back-combing hair is no longer advocated)
- Refractory cases:
  - Ivermectin 200mcg/kg/dose, repeat in 10 days (not for use in those <15kg)
- Environmental control
  - Treat close contacts
  - Launder/wash all personal items, combs, brushes
  - Vacuum furniture, carpets, rugs

Scabies

- Skin-skin contact, less common by fomites
- Intense itch
- Variable rash: burrows in web spaces and flexures most diagnostic







Treatment of scabies

- Confirm with microscopic visualization of mites, eggs or feces
- Permethrin 5% cream
  - Apply from neck to toes, including all "nooks and crannies"
  - Leave overnight, wash off in morning
  - Repeat in 1 week
- Alternative: Ivermectin 200microgr/kg, rpt 2wks
- Environmental control
  - Treat all family members and close contacts
  - Launder/wash all personal items
  - Items that can't be washed can be sealed in a plastic bag for a week

Guidelines re: participation in competition

NCAA Sports Medicine Handbook 2014-15

Infectious condition	Mininimal treatment for participation
Fungus on skin	3 days topical and covered
Fungus in scalp	2 wks systemic
Bacterial skin infections	3 days systemic; no new lesions x 48hrs, no active lesions at competition
Molluscum	Removal of widespread lesions; cover clusters
Herpes simplex	5 days systemic; lesions all crusted, no new blisters x 72hrs
Warts	Lesions should be covered
Parasites	Treated and cleared