Skin Problems in School Children and Adolescents: An Update

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Round Things
Border well defined, elevated, and red

Scale
Tinea Corporis (Ringworm)

- Spread by direct contact, fomites, occasionally from dogs or cats
- Treatment
  - Topical: miconazole, clotrimazole, others
  - Oral: griseofulvin, terbinafine
Tinea Corporis
- Border not elevated
- Crust, not scale
- No central clearing
Nummular Eczema

- Variant of atopic dermatitis
- Treated with an emollient and topical corticosteroid
Psoriasis

- Erythematous plaque (no central clearing)
- Thick scale

- Scalp involvement
- Sharply margined
Psoriasis

- Likely the result of a genetic predisposition and an environmental trigger (infection, trauma)
- Initial treatment is with a topical corticosteroid

Bleeding at the site of scale removal (Auspitz sign)
- Ring and incomplete central clearing
- No scale
- Border elevated and firm
Granuloma Annulare

- Cause unknown
- No treatment needed; resolves spontaneously
Erythema Migrans (Lyme Disease)

• Most common manifestation of Lyme disease (early localized stage)

• Begins as an erythematous papule or macule that enlarges to $\geq 5$ cm in diameter over days to weeks
  
  – Often develops central clearing
  
  – Center may be vesicular or necrotic

• Treated with doxycycline ($\geq 8$ yrs) or amoxicillin (<8 yrs)
Hair Loss
Hair Loss

- Acquired vs. congenital
- Localized vs. generalized
- Nonscarring vs. scarring
Tinea Capitis

- Inflammatory form
- Seborrheic form
Tinea Capitis: Treatment

• Oral medication:
  – Griseofulvin: 20 mg/kg/d of the microsize preparation for 8 weeks
  – Terbinafine: <25 kg: 125 mg/d, 25-35 kg: 187.5 mg/d, >35 kg: 250 mg/d for 4-6 weeks

• Selenium sulfide 1% or 2.5% used as a shampoo every other day for 2 weeks

• May return to school after treatment begun

• Return in 3-4 weeks to assess response to treatment
Traction

Symmetrical hair loss at sites of tension on hairs

Alopecia Areata

- Complete or nearly complete hair loss
- Scalp appears normal
Hair-Pulling Disorder

- Hemorrhage at site of pulled hairs
- Incomplete hair loss
- Within affected areas hairs are of differing lengths
Light Spots
- Reduction (not total loss) of pigmentation
- Gradual transition from normal to abnormal color
Pityriasis Alba

- Postinflammatory hypo-pigmentation
- Often becomes more apparent after sun exposure
- Treated with a low-potency topical corticosteroid
- Pigment normalizes in months
- Loss of all skin color (i.e., depigmented)
- Sharp border between normal and abnormal color
Well-defined hypopigmented macules (i.e., sharp borders)
Tinea Versicolor

- Superficial yeast infection
- Affects adolescents and young adults
- Treated with selenium sulfide topically (or fluconazole or itraconazole orally)
Seborrheic Dermatitis

- Inflammatory response to superficial yeast infection

- Treatment:
  - Scalp: antiseborrheic shampoo (e.g., selenium sulfide, zinc pyrithione)
  - Skin: low-potency topical corticosteroid or topical imidazole
A 9-year-old girl has been treated twice with permethrin for head lice. On examination you find lice and nits. What treatment might you advise?
Diagnosis

• Lice may be difficult to identify
  – Move quickly (6 – 30 cm/min)
  – Avoid light
  – May blend into surroundings
  – May be few in number (average 10)

• Viable eggs
  – Match hair color of affected individual (appear white when empty)
  – Usually located within 1 cm of scalp

Using Permethrin

• Shampoo with a nonconditioning shampoo, rinse, towel dry
• Apply permethrin for 10 minutes then rinse
• Since 20% to 30% of eggs are not killed and eggs hatch in 8-9 days (range 7-12 days) repeat treatment in:
  – 7-10 days (9 optimal based on life cycle of louse)
  – 7, 13-15 days

## Second-Line Treatments

<table>
<thead>
<tr>
<th>Drug</th>
<th>Rx/OTC</th>
<th>Mechanism of Action</th>
<th>Cost</th>
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<tbody>
<tr>
<td>Ovide (malathion)</td>
<td>Rx</td>
<td>Neurotoxic&lt;sup&gt;1&lt;/sup&gt;</td>
<td>$132.99 for 2 oz&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>Sklice (ivermectin)</td>
<td>Rx</td>
<td>Neurotoxic&lt;sup&gt;4&lt;/sup&gt;</td>
<td>$272.67 for 4 oz&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>LiceMD (dimethicone)</td>
<td>OTC</td>
<td>- Facilitates lice removal</td>
<td>$13.99 for 4 oz&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- May block respiratory apparatus</td>
<td></td>
</tr>
<tr>
<td>Natroba (spinosad)</td>
<td>Rx</td>
<td>Neurotoxic&lt;sup&gt;4&lt;/sup&gt;</td>
<td>$178.55 for 4 oz&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>Ulesfia (benzyl alcohol)</td>
<td>Rx</td>
<td>Paralyzes respiratory apparatus&lt;sup&gt;4&lt;/sup&gt;</td>
<td>$60.58 for 8 oz&lt;sup&gt;2&lt;/sup&gt;</td>
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</tbody>
</table>

<sup>1</sup> potentially flammable  
<sup>2</sup> goodrx.com, 2/12/15  
<sup>3</sup> drugstore.com, 2/12/15  
<sup>4</sup> approved for those >6 months of age  

**Oral ivermectin**  
- 200 mcg/kg once and again in 10 days  
- NOT FDA approved  
- Don’t use <5 years, <15 kg
Treatment Facilities

• Offer treatments on site or in your home
• Treatments employ combing combined with a topical nonpesticide mousse or heat
• Cost: begins at $85
Heat for Head Lice

- Compared 6 heat-based treatment methods in 169 subjects

<table>
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<tr>
<th></th>
<th>% Louse Mortality</th>
<th>% Egg Mortality</th>
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</thead>
<tbody>
<tr>
<td>Bonnet dryer</td>
<td>10.1</td>
<td>88.8</td>
</tr>
<tr>
<td>Blow dryer</td>
<td>55.3</td>
<td>97.9</td>
</tr>
<tr>
<td>Louse Buster</td>
<td>80.1 (88.2)</td>
<td>98 (99.2)</td>
</tr>
</tbody>
</table>

- Erosion (from scratching)

- Lines of skin stress are prominent (lichenification)
Appearance

- Erythema less evident
- Eruption papular
Children and Adolescents
Adolescents

DermAtlas
Adolescents

Dyshidrotic eczema: pruritic vesicles on sides of fingers

DermAtlas
**Genetics**
- Mutations of genes coding epidermal proteins (*FLG*) and cytokines (*SPINK5*)

**Epidermal Barrier Dysfunction**
- Increased penetration of allergens and irritants; bacterial colonization
- Increased water loss, dry skin

**Immune dysregulation**
- Abnormal cellular infiltrate and cytokine production initiate and perpetuate inflammation
- Decreased antimicrobial peptides

**Staphylococcus aureus**
- Cell wall components, superantigens, and enterotoxins amplify the inflammatory response

**Avoid irritants**
- Emollient

**Breastfeeding**

**Topical steroid**

**Bleach baths**
Rash in a Line
Contact Dermatitis: Poison Ivy
Fine erythematous papules

Linear arrangement
Herpes Zoster
Lesions at sites of trauma (Koebner phenomenon)
Rash All Over
Petechiae on palate

Rash composed of fine, rough, red papules
Scarlet Fever

- Infection with strains of *Streptococcus pyogenes* that produce an erythrogenic toxin
- Begins with symptoms of streptococcal pharyngitis
  - Sore throat
  - Fever
  - Headache
  - Abdominal pain or nausea
Erythema may be less noticeable in those more deeply pigmented.

Rash often concentrated in skin flexures.
Scarlet Fever - Treatment

• Amoxicillin: 50 mg/kg (max 1 g) once daily for 10 days

• Penicillin V bid-tid for 10 days:
  – <27 kg: 250 mg; ≥27 kg: 500 mg

• Benzathine penicillin G IM once:
  – <27 kg: 600,000 units; ≥27 kg: 1.2 million units

• Azithromycin or cephalexin if penicillin allergic
Erythema Infectiosum (Fifth Disease)

- Most common manifestation of parvovirus B19 infection
- Prodromal symptoms (low-grade fever, HA, and URI symptoms) may be present
- Rash begins on the face ("slapped-cheek" appearance) with rapid spread to the trunk and extremities
- Rash resolves in 1-3 weeks but may return with sun or heat exposure, exercise
Erythema Infectiosum: Complications

• Arthritis: 60% of adolescents and adults

• Transient aplastic crisis: in those with sickle cell disease or other hemolytic anemia

• Fetal hydrops or demise:
  – Risk: 5% if not immune
  – Refer pregnant women exposed to parvovirus B19 to their obstetrician
Pityriasis Rosea

• Clinical:
  – Patients usually well (5% have malaise, headache, sore throat)
  – Herald patch in 50-80%
  – 2-21 days later a generalized eruption occurs
  – Eruption lasts 2-12 weeks

• Treatment:
  – Antihistamine, topical corticosteroid, counterirritant (emollient with camphor or menthol) for pruritus
  – UV light
Pityriasis Rosea

Scale at trailing edge of lesion

Lesions usually oval
Aligned parallel to lines of skin stress
Pityriasis Rosea

On the back, the arrangement of lesions mimics the appearance of the branches of a fir tree.
You are evaluating a child who has fever, cough, conjunctivitis, rhinorrhea, and a generalized erythematous macular and papular rash.
Measles Cases and Outbreaks
January 1 to August 21, 2015*

188 Cases

5 Outbreaks


representing 81% of reported cases this year

U.S. Measles Cases by Year

*Provisional data reported to CDC’s National Center for Immunization and Respiratory Diseases

http://www.cdc.gov/measles/cases-outbreaks.html
2015 Measles Cases in the U.S.
January 1 to August 21, 2015

*Provisional data reported to CDC’s National Center for Immunization and Respiratory Diseases

http://www.cdc.gov/measles/cases-outbreaks.html
Measles

- Incubation: 8-12 days
- Prodrome: lasts 3-5 days, characterized by low-grade fever, cough, coryza, conjunctivitis
- Koplik spots:
  - Gray-white dots with surrounding erythema
  - Initially located adjacent to lower molars
  - Appear 2-3 days after symptoms begin (1-2 days before rash)
  - Resolve by day 2-3 of rash
Measles Exanthem

- Begins as faint macules located along the lateral aspects of neck, hairline
- Spreads within a day to face, trunk, upper extremities
- By day 2-3, rash begins to fade on face and reaches feet
Bumps
Molluscum Contagiosum

- Infection with the Molluscipox virus
- Spread by direct contact, fomites, autoinoculation
- Resolves spontaneously
- Lesions are translucent papules that may have a central umbilication
Molluscum Contagiosum

Dermatitis near lesions is common.

An enlarging, red lesion often is the result of immune activation (not infection).
Molluscum Contagiosum

Remember the Koebner phenomenon?
When Will It Go Away?

- Mean time to resolution: 13.3 months
  - Lesions present in 30% of patients at 18 months, 13% at 24 months
- In 41% of families with multiple children, one or more other children were affected

Treatment Options

- No intervention
- Cantharidin
- Cryotherapy
- Curettage
- Imiquimod
- Tretinoin
- Salicylic acid
- Topical corticosteroid if surrounding dermatitis
- Rough surface
- Thrombosed capillary
Warts

Periungual Wart

Plantar Warts

Slide Atlas of Pediatric Physical Diagnosis
Treating Common or Plantar Warts

- Keratolytic (cure rate: 75% [48% for controls])
- Cryotherapy (cure rate: 80% in 12 weeks after 2-4 treatments)
- Cantharidin
- Imiquimod (Aldara)
Using Keratolytics

• Apply medication to wart and allow to dry
• Cover with Band-Aid or tape
• In the morning (or in 24 hours) wash the area and dry
• Using an emery board or pumice stone, debride the wart
• Repeat above steps
Crusted Rashes
Crusted Impetigo

• Cause: infection with *Staphylococcus aureus*

• Clinical: erosions with a “honey-colored” crust typically located around the nares

• Treatment:
  - Topical: mupirocin (Bactroban), retapamulin (Altabax)
  - Oral: first-generation cephalosporin (e.g., cephalexin), trimethoprim-sulfamethoxazole, clindamycin
Erosion

Remnant of scale
Bullous Impetigo

- **Cause:** infection with *S. aureus* strains that produce an epidermolytic toxin
- **Clinical:** vesicles or bullae rupture leaving round or oval erosions
- **Treatment:** first-generation cephalosporin (e.g., cephalexin), trimethoprim-sulfamethoxazole, clindamycin