

Pediatric and Adolescent Skin Issues

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Disclosure

- No real or potential conflict of interest to disclose
- No off-label, experimental or investigational use of drugs or devices will be presented.



Objectives

- Having completed the learning activities, the participant will be able to:
 - Recognize symptoms and causes of common pediatric skin issues.
 - Review the tests and exams necessary for immediate treatment, diagnosis and care.



Objectives (continued)

- Having completed the learning activities, the participant will be able to: (cont.)
 - Outline and implement followup care.
 - Become familiar with recent updates on the latest research, trials and interventions.

Pediatric Pharmacology Challenges

- Dosing often confused with adults
- Few clinical trials in children
- Off-label use is prevalent.
- Hepatic clearance awareness
- Adverse effects panel is much broader.
- Patient has difficulty communicating.

The Perils of the Modern Age

- Increasingly common heat-induced patches that develop into permanent hyperpigmentation
- Sources include heated car seats and recliners, heated popcorn bags, laptop computers, cell phones and space heaters.



Erythema Ab Igne



- Other names for this condition include
 - Toasted skin syndrome
 - *Ephelis ignealis*
 - Heat-induced dermal melanosis
 - *Livedo reticularis e calore*

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Treatment of Erythema Ab Igne

- Remove from heat source, and practice awareness
- Crushed ice behind cloth towel helps reduce swelling.
- Aloe vera with lidocaine 5% OTC as with sunburn



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Prevention and Awareness



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Cutis Marmorata



- Benign process of lacy bluish or red mottling of extremities when chilled
- Reassurance
- Can continue throughout life

Milia



- Multiple white facial papules
- Superficial keratinous "plugs" in follicles, akin to keratosis pilaris
- Transient
- Best left alone; no treatment

Miliaria Rubra

- Erythemic sweat ducts grouped on face and trunk
- Base of follicle inflamed
- Heat and humidity-fueled; need cooler air



Nevus Sebaceous of Jadassohn

- Yellow-mustard colored hairless plaque on scalp or face
- Cause thought to be overabundance of androgenic stimulation in womb
- 10% become BCC after puberty, excision highly recommended prior to age 10 years

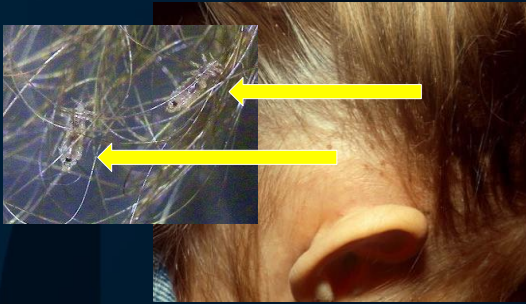
Nevus Sebaceous of Jadassohn (continued)



Pediculosis or Lice

- Clinical manifestations
 - Myriads of oval, gray-white gelatinous egg capsules attached to hair shafts of scalp, neck, and eyelashes. Check underwear seams or pubic hair, if present.
- Diagnosis
 - Clinical and microscopic

Pediculosis



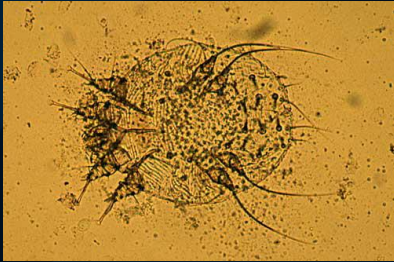
Pediculosis or Lice (continued)

- Management
 - Elimination and prevention
- Treatment
 - Mechanical removal of nits
 - Permethrin 1% crème rinse, repeat in five days for scalp (Nix®); permethrin (Elimite®) 5% cream for body
 - Boil clothes
 - Shorter hair style for stubborn cases

Scabies

- Etiology
 - *Sarcoptes scabiei* mite
- Diagnosis
 - An aggressive scrape with topical mineral oil of an unscratched papule with No. 15 blade and patient microscopy reveals mites, eggs, fecal pellets

Scabies Mite



Severe Scabies Infestation



- One hallmark of scabies is worsened itching at night.
- In addition, look between finger webbing and along waistline.
- Rarely to face

Scabies Treatment

- Management
 - Topical permethrin (Elimite®), lindane (Kwell®), or oral ivermectin
- Treat all family members.
 - Examine parents.
- Wash bedding, do not use same clothes for one week.
 - May need repeat treatment

Close-up of Scabies Infestation



Impetigo

- Superficial infection of the epidermis with honey-colored crusts and erosions common on nose, lips, or chin.
- Can arise as a primary infection of minor breaks in the skin or secondary infection of pre-existing disease state (i.e., atopic dermatitis)
- Clinical lesions are often preceded by nasal colonization with *S. aureus*.

Close-up of Impetigo



Impetigo Treatment Paradigm

- Diagnosis
 - Generally clinical by history and presentation
- Management
 - Topical mupirocin ointment or retapamulin topical (Altabax®)
 - Oral antibiotics (sulfa, cephalexin, macrolide, dicloxacillin, clindamycin)

Consider the Nares

- Applying an antibacterial topical by cotton applicator to the nares every day for three days per week a consideration in difficult cases



Pityriasis Rosea



- Self-limiting, harmless common rash that has a 6–12 week life-span
- Unknown etiology
 - Possible viral in background
- Herald patch

Pityriasis Rosea (continued)

- Diagnosis is clinical.
- Peaks at 4–6 weeks
- Treatment is supportive with OTC lotions, antihistamines and mild steroid creams
- UV light helpful



Pyogenic Granuloma

- 5–10 mm soft red papules that bleed easily when traumatized
- The result of excessive blood vessel formation in response to minor trauma
- Found on skin or mucosal surfaces
- Treatment
 - Shave with cautery, excision, but always biopsy

Close-up Pyogenic Granuloma



Pityriasis Alba



Pityriasis Alba Etiology and Treatment

- As the name suggests, it is a scaly off-white patchy condition primarily in Hispanic, Asian and Black children.
- Thought to have an eczematous background, OTC lotions and reassurance are the mainstay treatment.
- Often resolves in teen years

Erythema Toxicum

- Blotchy erythemic patches on trunk and extremities
- Result of increased eosinophils
- Benign, self-limiting, no therapy required
- Key differential and danger sign
 - Sheeting skin and fever

Erythema Toxicum (continued)



Giant Congenital "Hairy" Nevus

- Well-defined dark hairy patch ("big birthmark")
- Can involute to melanoma
- Risk potential discussion, cosmetics a challenge



Café-au-lait Spots



- French for "coffee and milk"
- Generally benign



Café-au-lait Spots (continued)

- Six or more >5 mm diameter *before* puberty, **or** >15 mm diameter *after* puberty, consider neurofibromatosis type I
- Is there epilepsy, learning disabilities, vision disorders?



Port-Wine Stain (PWS)



- Unilateral well-defined capillary malformation
- Does not involute
- Pulsed dye laser treats successfully
- Bilateral? Sturge-Weber syndrome?

Hemangioma



- Vascular malformation
- Very distressing to parents
- Often red, rubbery
- 50% resolve by age 5 y, 70% by age 7 y, 90% by age 9 y

Hemangioma Treatment

- Reassurance and continued observation an option for some parents
- Glucocorticosteroids
 - Oral, topical, and intralesional a familiar discussion
- Pulsed-dye laser surgery every 2–4 weeks until healed
- Surgical excision in dramatic cases

Propranolol for Hemangioma Tx

- Beta-blocker oral and topical off-label
- Decreases, shrinks, destroys growth molecules within days
- First-line therapy today
- Generally safe and well-tolerated

Seborrheic Dermatitis



Seborrheic Dermatitis in Teens



Seborrheic Dermatitis (continued)

- Yellow, greasy, flaking plaques on scalp or flexural areas
 - Very common as “cradle cap”
- Overgrowth of *M. furfur*
 - Often responds easily to selenium sulfide or ketoconazole shampoos

Tinea Versicolor



Tinea Versicolor Facts and Treatment

- Common yeast *M. furfur*
- Treatment is geared toward topical dandruff shampoos as body washes.
- Patient stresses about color loss.
- Observed either by light patches of scale or flat areas of hypopigmentation
- In rare cases can require oral ketoconazole 200 mg 1 PO BID once

Alopecia Areata



Alopecia Areata (continued)

- Autoimmune hair loss, generally benign and asymptomatic but for stress
 - Often one patch on scalp
 - Prior to universalis and totalis
- Remission and recurrences common
- Treatment
 - Topical, intralesional and systemic discussion

Molluscum Contagiosum

- Benign viral condition that generally affects children up to age 12 years
- Multiple treatment modalities
 - Key point is to avoid its spread.
 - Contact, soap, towels
- Often confused with intradermal nevus or keratosis pilaris

Molluscum Contagiosum



Treatment for Molluscum Contagiosum

- Liquid nitrogen
- Lidocaine injection and cautery
- Cantharidin 0.75% or 1%
- Tretinoin cream under occlusion
- Curettage
- Podofilox 0.5% gel 3 days on, 4 days off
- Observe

Verruca Vulgaris



Treatment of Verruca Vulgaris

- Consider similar treatments as for *molluscum contagiosum*
 - Additional therapy consideration is *Candida albicans* intralesional injection.
 - CAI is novel, simple, inexpensive.
 - Often destroys untreated warts in vicinity
 - Adverse effects peeling and itching

Acanthosis Nigricans (AN)

- AN is not a disease in itself, but a symptom of underlying causes.
 - More common in females
 - Worsened by weight gain and increased glucose
- Classified as a pigmentation disorder and causes great distress
 - Favors neck, axilla, and groin

Acanthosis Nigricans



Types of AN and Treatment

- In nearly all cases, a familial trait combined with high BMI and diabetes
 - Other causes are endocrine, drug-related (OCP), and malignancy.
- Treatment
 - Generally geared toward weight loss and diet
 - Little help from urea, tretinoin, or hydroquinone

Hidradenitis Suppurativa (HS)

- Chronic scarring, painful cysts, foul odor
- Currently FDA approved= Adalimumab (Humira)
 - Dosed once per week alleviates moderate to severe HS.



Hidradenitis Suppurativa (continued)

- Onset in puberty
- Predominately affects women
- Defect of apocrine glands
- Favors axilla, groin and under breasts



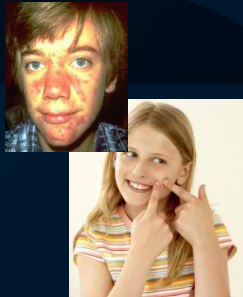
Another Treatment Option for HS

- Amoxicillin/clavulanate (Augmentin®) 875 mg 1 PO BID × 1 month, with 10 mg prednisone 1 PO q day × 1 month and daily sulfacetamide wash proves extremely effective



The Challenge of Prepubescent Acne

- Typically on nose and forehead
- Younger population without indication on product labeling
- Topical products best
- Non-compliance high

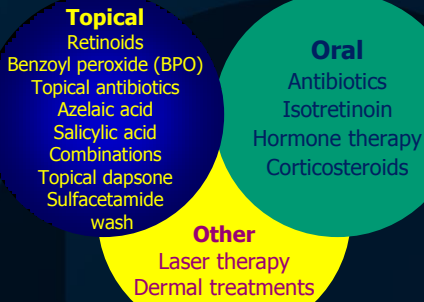


Early Acne Pearl



- Consider the advice of a pediatric endocrinologist if hirsutism, body odor, genital maturation present as the androgen excess may be the result of a deeper process.

Treatment Options Paradigm



The Skinny on Acne and Diet

- Foods that increase insulin levels magnify male hormone effect
 - Dairy products boost insulin and are high in hormones made by pregnant cows that produce milk.
 - Avoid dairy and sugar to lessen oil stimulus production.

The Evidence of Diet in Acne

- No question that diet plays a role in rosacea.
 - Research on going with acne
- Glycemic load assesses potential of food to increase blood glucose.
 - Glycemic index is measure of carbohydrate quality (i.e., the source).

Foods High in Both Glycemic Load and Carbohydrates

- Carbonated soft drinks
- Sweet corn
- Ice cream
- Mac and cheese
- Corn chips
- Popcorn
- Doughnuts
- Sports drinks
- White bread
- Cornflakes
- White rice
- Milk chocolate granola cereal bars
- Pretzels
- Baked potato

"It's Only Eczema"



A Brief Introduction to Atopic Dermatitis (AD)

- The most common chronic skin disorder seen in infants and children.
- Prevalence of this condition has risen dramatically during the last three decades.
 - Affected 7% of children circa 1960

Infant's Face with Atopic Dermatitis



A Brief Introduction to Atopic Dermatitis

- Currently, *15% to 20%* of children in the United States are expected to experience atopic dermatitis.



1933 Wise and Sulzberger

- Introduced the concept of *atopy*, "out of place" or "strange"
- They observed a connection with asthma, hay fever and food allergies.



Atopic Dermatitis Current Facts

- 80–90% of cases have the first onset at less than age 5 years.
 - About half of patients remain symptomatic as adults.
- Asthma and allergic rhinitis is observed in about 80% of cases from child through adulthood.

A Thoughtful Definition of Atopic Dermatitis

- A genetically predisposed condition manifesting as exaggerated responses (vasodilation, pruritus, bronchoconstriction, IgE production) to environmental stimuli (irritants, allergens, drugs) predominately in the integument.

Atopic Dermatitis in Children, Popliteal Fossa



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Atopic Dermatitis in Children – Face



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Atopic Dermatitis in Children – Right Chest



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Eczema – Atopic Dermatitis

- Greek: Ekzema, from "ekzein," to break out, boil over
- Chronic, pruritic eruption that can appear anywhere on the skin



Theories in Atopic Dermatitis

- Defect of genetics or immunity?
- Dysfunction of barrier?
- Mechanical breakdown by external triggers and exposure?
- Secondary to asthma and foods?
- Outside in or inside out?
- Staph colonization?

Diagnosis of Atopic Dermatitis (AD) Major Features

- Intense pruritus
- Primarily the facial and bilateral involvement of extensors
- Chronic, relapsing
- Personal and family history
- Heavy scale, micro blisters, irregular borders

Popliteal Fossa, Atopic Dermatitis



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Topical Corticosteroids

- Important tool to gain control of AD
- 30 g covers entire skin of adult once
- Seven potency classes based on vasoconstrictor assay
 - The lower the number, the longer the use allowed
- Creams and ointments preferred as gels have drying glycol base.

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Generalized Striae



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Generalized Striae



Topical Corticosteroids (continued)

- Low potency steroid example
 - Hydrocortisone 1%
 - Desonide 0.05% creams
- Mid potency
 - Triamcinolone 0.1%.
- Super potent
 - Clobetasol 0.05%
 - Betamethasone 0.1%.

Fabric as Adjunctive Therapy

- Cotton-based clothing causes minimal irritation.
- Wool is highly irritating.
- In some studies, "antimicrobial silk" may be comparable to topical corticosteroids.
 - See www.dermasilk.co.uk

Fabric as Adjunctive Therapy (continued)



Wet Wrap Therapy

- Safe approach to relieve itching, burning and inflammation
 - Facilitates removal of scale
 - Increases penetration of topical medication in stratum corneum
- Best reserved for acute episodes

Wet Wrap in Practice



Wet Wrap Supplies

- Topical medications and moisturizers
- Comfortably warm tap water
- Basin for dampening dressings
- Gauze bandage rolls (Kerlix®), elastic bandages (Ace®), dry pajamas
- Blankets to prevent chilling

Wet Wrap Supplies (continued)



Topical Calcineurin Inhibitors (TCIs)

- Nonsteroidal milestone
 - Tacrolimus ointment 0.03%
 - Pimecrolimus cream 1%
- Strong safety profile for current length and difficult skin areas
- Boxed warning for lack of long-term (4+ years) safety data

Pimecrolimus Treatment 12-month-old Female



Baseline



Day 15

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Topical Calcineurin Inhibitors

- TCI are advantageous over steroids depending on body area, length of time required to bring control, steroid-phobic patients/parents, previous atrophic episodes, poor response to steroids, flare prevention, and lack of rebound events.

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Nonsteroidal Agents for Skin Barrier Repair

- Referred to as “medical device creams,” approved by FDA for treatment of atopic dermatitis
 - Medical device designation means that there is no active drug in the formulation.
- These products require prescription.

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Popular Medical Device Creams

- Steroid-free, paraben-free and scent-free emollient cream (Atopiclair®)
 - Contains nut oil from shea butter
- Nonsteroidal, anti-inflammatory creams (MimyX®)
 - Ingredients that mimic natural lipids in stratum corneum

Popular Medical Device Creams (continued)

- Nonsteroidal, lipid-rich, fragrance-free emulsion (Eleton®)
 - 70% oil dispersed in 30% water and provides an ointment's occlusion yet feels like a cream
- Topical nonsteroidal skin cream (EpiCeram®)
 - Removed from market 2013 but FDA-approved

Popular Medical Device Creams (continued)

- Hydrating topical lotion (Neosalus®)
 - Main ingredient is dimethicone and glycerin, in a lipid base which works to provide water occlusion.

Atopic Dermatitis

- Prevention is foundational.
- Early on, distribution is generalized.
- Pruritus first hallmark
- Increased risk of secondary impetigo, generalized herpes and varicella in severe cases

Patient Education

- Pt state they are often unclear in management of AD, or understanding their condition.
- Pt state they have little explanation of triggers or purpose of treatments.

Role of Hydration

- Fundamental concept is trigger control and proper skin care.
 - “Soak and seal” emphasizes proper cleansers, moisturizers, barrier use.
 - It is not about avoiding water, which dries upon evaporation, but immediate moisturizing.

The Bleach Bath Controversy

- On the “pro” side, ¼ cup to forty gallons (59.1 mL–151.4 L) seem to seriously lessen MRSA infections and result in clearer skin.
- On the “con” side, limited studies, can cause serious irritation to some, and odor is repulsive.

The Bleach Bath Controversy (continued)

- The American Academy of Dermatology, multiple experts in eczema recommend
- Exact mechanism is unknown.
- Not uncommon



Cleansers

- Limit soaps because of fattening products (lanolin) that can prove irritating.
- Look for
 - Dye and fragrance-free
 - Neutral pH labeling
- Pt should not scrub with washcloth.

Moisturizers and their Vehicles

- Ointments and oils seal-in hydration best, but conclusiveness traps sweat which irritates, or fungus which grows.
- Lotions and creams can have drying effect because of water-base.
- Gels are often alcohol-based.

Recommended Moisturizer Application Preparation

- First, hydrate the skin.
 - Remember, we are going to “soak and seal.”
- Second, follow the “3-minute rule.”
 - Apply moisturizer within 3 minutes after water hydration and towel pat.
- Third, use wooden tongue depressor to avoid cross-contamination.

Recommended Moisturizers

- One pound (0.45 kg) jar availabilities include
 - Topical emollients
 - Aquaphor®, CeraVe®, Cetaphil®, Eucerin®, Vanicream®
 - Dimethicone
 - Aveeno®

Recommended Moisturizers (continued)

- Petroleum jelly (Vaseline®)
 - A good occluder, does not provide moisturizing features
- Topical emollient (Cetaphil's® Restoraderm) has both ceramides **and** fillagrin.

An Extra Word

- Topical emollient (Vanicream®) line
 - Notable for being lanolin-, dye-, perfume-, fragrance-, paraben-, and alcohol-free
- Lanolin-free products
 - Topical emollients (Eucerin®, Moisturel®, Curel®, Nivea®, Theraderm®, Wondra®, and Keri®)

Irritants

- Alcohol-based hand gels
- Repeated washing of hands
- Strong soaps, detergents, disinfectants, and home remedies
- Occupational settings
- Residual laundry detergents

Irritants (continued)

- Look for labeling that is “dermatologist recommended,” as it is often fragrance-free and with less foaming detergents.



Irritants

- Use liquid detergents, add second rinse cycle
- New clothing can require wash or dry.
- Cleaned clothing can require airing.
- Sunscreens
- Stress and psychosocial factors

Irritants (continued)

- Weather and seasons
 - Heating options in home settings
- Environmental changes of humidity, temperature and heat
- Sports participation with occlusive padding or clothing

Irritant Management

- Swimming hydrates skin
 - Chlorinated pools have been observed as helpful as bleach baths.
- Consider whole house humidifiers
 - Optimal setting at 40–60% humidity

Irritant Management (continued)

- Permethrin products safest insect repellent when applied to clothing, though they bind for up to 6 weeks even with laundering
- Zinc oxide ointment is a preservative-free sunblock, as are new clothing types with weave.

Lichen Simplex Chronicus

- The prolonged result of scratching
 - Itch control important as scratching induces proinflammatory cytokines which promote further pruritus,
- In adults
 - Intralesional triamcinolone suspension injections or steroid occlusion very helpful

Lichen Simplex Chronicus Observed on Areola



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Lichen Simplex Chronicus (continued)

- Keep the nails as short as practically possible.
- Prescription steroid, protective barrier, and flexible adhesive (Cordran®) tape very effective as it can be cut to tailor specific areas.

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The Role of Histamines

- A substance that dilates blood vessels and makes them abnormally permeable
- *Histamine* is part of the body's natural allergic response to substances such as pollens, foods, medicines, or venom.

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Classic Hives



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The Role of Antihistamines

- **Antihistamines** work to prevent the abnormal *or exaggerated* release of histamine from certain cells (mast cells), thereby blocking the potential serious allergic reaction.
- There are two major types of histamines: H1 and H2.

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Dermatographism



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Sedating Antihistamines

- Hydroxyzine, diphenhydramine
 - Remain useful in calming the patient through the night, when pruritus may be worse
- Doxepin hydrochloride
 - Blocks **both** H1 and H2, and is a tricyclic antidepressant at higher milligrams.
- Remember these products are anticholinergics.

Diphenhydramine Caution

- Multiple studies show that while effective in sedating, it is not effective in pruritus relief, unless the problem is positively histamine mediated.
- Not often used in dermatology circles
- Known as diphenhydramine (Benadryl®)

Methylprednisolone Dose Pack (Medrol® Dosepak) Thoughts

- The six day taper is often too short.
- Initial starting dose is often too low.
- Too expensive, better in loose pill form
- Begin at 40 mg/d for adults for one week then 20 mg/d

End of Presentation
Thank you for your time and attention.

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Topical Steroids Potency Chart

- https://www.psoriasis.org/sublearn03_mild_potency
- <http://www.the-dermatologist.com/files/docs/DrugGuide1006.pdf>
- These are continuously updated to reflect generic and brand names.

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