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

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

Prevention and Awareness
**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 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
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
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*.
Impetigo Treatment Paradigm

• Diagnosis
  – Generally clinical by history and presentation

• Management
  – Topical mupirocin ointment or retapamulin topical (Altabax™)
  – Oral antibiotics (sulfa, cephalaxin, 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

Erythema Toxicum

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

- 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 intraleisonal 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

- 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

**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
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
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 x 1 month, with 10 mg prednisone 1 PO q day x 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.

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Treatment Options Paradigm

Topical
- Retinoids
- Benzoyl peroxide (BPO)
- Topical antibiotics
- Azelaic acid
- Salicylic acid
- Combinations
- Topical dapsone
- Sulfacetamide wash

Oral
- Antibiotics
- Isotretinoin
- Hormone therapy
- Corticosteroids

Other
- Laser therapy
- Dermal treatments

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.
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
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.
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)

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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

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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

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
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.

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.
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

(continued)

• Nonsteroidal, lipid-rich, fragrance-free emulsion (Eletone®)
  – 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

(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

(continued)

• Permethrin products safest insect repellant 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
(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.

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.
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.
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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References (continued)


References (continued)


References (continued)


References (continued)


Topical Steroids Potency Chart

- [https://www.psoriasis.org/sublearn03_mild_potency](https://www.psoriasis.org/sublearn03_mild_potency)
- These are continuously updated to reflect generic and brand names.

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