



**Eczema**  
**EXPO '19**  
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# Triggered: Managing contact & environmental allergies

Dr. Rupam K. Brar  
National Jewish Health, Denver, CO

# *Conflict Disclosures*

- Research Support
  - NIH - ADRN
  - Incyte

# *Objectives*

- Identify the different types of eczema
  - Atopic Dermatitis
  - Contact Dermatitis
- Identify common triggers of both types
- Learn how to minimize these triggers

# What are the different types of eczema?



# *Phenotypes of Eczema*

- Atopic Dermatitis
- Contact Dermatitis
- Dyshidrotic eczema
- Nummular eczema
- Seborrheic Dermatitis
- Stasis Dermatitis

# *Atopic Dermatitis*



# *Contact Dermatitis*



From [nationaleczema.org](http://nationaleczema.org)

# *Dyshidrotic eczema*



From [nationaleczema.org](http://nationaleczema.org)



# *Nummular Eczema*



From [nationaleczema.org](http://nationaleczema.org)

# *Seborrheic Dermatitis*



From [nationaleczema.org](http://nationaleczema.org)

# *Stasis Dermatitis*



From [nationaleczema.org](http://nationaleczema.org)

# *Atopic Dermatitis*

- What makes it atopic?
  - Tendency towards Type 1 allergies
- Atopic triad – occurs in 80% of children with AD
  - Atopic Dermatitis
  - Asthma
  - Allergic Rhinitis
- High risk of Associated Food Allergies

1. Eigenmann, PA, Sicherer, SH, Borkowski, TA, Cohen, BA, Sampson, HA. Prevalence of IgE-mediated food allergy among children with atopic dermatitis. *Pediatrics* 1998; 101: e8.
2. Eichenfield LF, Hanifin JM, Beck LA, Lemanske RF Jr, Sampson HA, Weiss ST, Leung DY Atopic dermatitis and asthma: parallels in the evolution of treatment.. *Pediatrics*. 2003;111(3):608



- Trigger via:
  - Inhalation
  - Direct Skin Contact
- Exacerbate severity
- Cause flares

## Allergens:

- House Dust Mite
- Pollens
- Dog
- Cat

<sup>1</sup> Schäfer T, Heinrich J, Wjst M, Adam H, Ring J, Wichmann HE. Association between severity of atopic eczema and degree of sensitization to aeroallergens in schoolchildren. J Allergy Clin Immunol. 1999;104(6):1280.

# House Dust Mite

- *Dermatophagoides sp.*
  - Eat skin cells, and use ambient humidity for water supply
- 1/3 of eczema pts with IgE to HDM report worsening of eczema or respiratory symptoms with exposure
- Der p 1 is major allergen
  - Comprised of fecal pellets
  - >10 µm in diameter
  - Can digest skin proteins making skin more “leaky”

# *House Dust Mite*

- Avoidance Measures:
  - Encasements for mattress, duvet, pillows
  - Wash bedding in hot water ( $>131^{\circ}\text{F}$ ) and high heat dry
  - Remove Carpeting
    - Hard flooring requires regular cleaning!
    - Sprays (e.g. tannic acid)
  - Vacuum with HEPA
  - Control Humidity

- Dog
  - No such thing as hypoallergenic dog!
  - Small particle allergen ( $<5\ \mu\text{m}$ )
  - Allergens in dander, saliva, and urine
- Cat
  - Small particle allergen ( $<5\ \mu\text{m}$ )
  - Highly buoyant
  - Allergens in dander and saliva

- Avoidance Measures:
  - Wash pets twice weekly
  - HEPA Air filtration units
  - Pet Removal
    - Allergen still persists for months after removal

- Patterns of pollination can vary
  - Spring - Trees (birch, cottonwood, oak, etc.)
  - Summer - Grasses (Timothy, Kentucky Blue, etc.)
  - Late Summer/Fall - Weeds (ragweed, sage, English plantain, etc.)
  - Winter - Mountain Cedar (in Texas)

- Avoidance Measures:
- Keep windows closed
- Avoid line drying
- Mind your pets
- After pollen exposures:
  - Rinse off body and hair
  - Sinus Rinse
  - Natural tears

- Diagnosis:
  - Skin prick testing
  - Total and allergen-specific IgE antibodies
  - Allergic patch tests - Not Standardized practice
- Treatment
  - 2<sup>nd</sup> generation Antihistamines (Cetirizine, Fexofenadine, Loratadine)
  - Intranasal steroid
  - Dust Mite Subcutaneous Immunotherapy



# *Contact Dermatitis*

- Inflammation of the skin due to an outside exposure
- Irritant Contact Dermatitis (ICD) - 80%
  - Immediate
- Allergic Contact Dermatitis (ACD) - 20%
  - Delayed (Type 4 allergy)
- Contact Urticaria - wheal-and-flare at site where external agent contacts the skin or mucosa

- Type IV delayed-type hypersensitivity response
  - Caused by T cells
  - The type of T cell depends on the allergen
- Caused by allergens or haptens (small molecular weight substances)
- 2 phase
  - Sensitization phase
    - introduction to the allergen (usually topical)
    - no clinical sx seen
  - Elicitation phase
    - rechallenge
    - peak dermatitis at 72 hours

<sup>1</sup> Dhingra, Kreuger, Guttman-Yasky. Molecular profiling of contact dermatitis skin identifies allergen-dependent differences in immune response. JACI 2014; 134:362-72

- Risk factors for having both AD & CD:
  - Severe and longer AD disease
  - Onset of AD before 6 months
  - IgE-mediated sensitization
  - Other contact allergies (metal salts)
- Risk factors for Children for having both AD & CD:
  - Younger age (<3 years)

## Contact Allergens

- Topical Corticosteroids
- Excipients
  - Propylene Glycol
  - Lanolin
  - Sorbitan sesquioleate
  - Balsam of Peru/Fragrance
- Preservatives
  - MCI/MI

## Their Sources

- Topical Corticosteroids
- Topical Corticosteroids & Moisturizers
- Moisturizers, Baby Wipes

- Suspect when dermatitis is unresponsive to or worsened by use of corticosteroids
- Affects 0.5%-5.8% of suspected allergic contact dermatitis
- May affect up to
  - 40% of patients with chronic venous leg ulcers
  - 22% of patients who do not respond to steroids for allergic contact dermatitis
- High Risk groups: Atopic Dermatitis, Stasis Dermatitis, Chronic Venous Leg Ulcers

Kot M, Bogaczewicz J, Krecisz B, Wozniacka A. Contact allergy in the population of patients with chronic inflammatory dermatoses and contact hypersensitivity to corticosteroids. *Postepy Dermatol Alergol*. 2017;34:253–259.

- Cortisol is ideal contact allergen
  - Low molecular weight
  - Penetrates stratum corneum
  - Highly lipophilic
- Metabolites of corticosteroids are haptens (steroid glyoxals or 21-dehydrocorticosteroids)
- Certain types of TCS are more frequent allergens
  - Nonhalogenated, nonmethylated
  - Hydrocortisone
  - Budesonide

## *Excipient Allergy*

- Excipient – inactive substance that may be the vehicle or medium for a drug or other substance
- Common Ingredients in Emollients and Topical Treatments causing CD
- Excipients
  - Propylene Glycol
  - Lanolin
  - Sorbitan sesquioleate
  - Balsam of Peru/Fragrance
- Preservatives
  - MCI/MI

# *Propylene Glycol*

- Vehicle with humectant properties
- Most common allergen in topical CS
- Sources: Moisturizers, Numerous Topical CS, Crisabarole, Pimecrolimus
  - Increases bioavailability of the drug
- Preservative in foods
  - Ice cream
  - Frostings
  - Box cake mixes, processed baked goods
  - Salad Dressings
  - Food coloring
- Found in lubricants, and personal care products (soap, shampoo, conditioner, deodorant)

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**Table 2**

Topical Corticosteroid Potencies, Strengths, and Formulations Without Propylene Glycol

**Class I: Superpotent/very high potency**

Betamethasone dipropionate (ointment)  
Diflorasone diacetate, 0.05% (ointment)  
Flurandrenolide, 0.05% (Cordran Tape)  
Desoximetasone, 0.25% (spray)

**Class II: Potent/high potency**

Betamethasone dipropionate, 0.05% (cream)  
Desoximetasone, 0.25% (cream)  
Desoximetasone, 0.05% (gel)  
Diflorasone diacetate, 0.05% (ointment)  
Halcinonide, 0.1% (ointment, solution)  
Amcinonide 0.1% ointment

**Class III: Upper midstrength/medium potency**

Betamethasone valerate, 0.12% (Luxiq foam)  
Betamethasone valerate, 0.1% (ointment)  
Triamcinolone acetonide, 0.5% (ointment)

**Class IV: Midstrength/medium potency**

Desoximetasone, 0.05% (cream, ointment)  
Fluocinolone acetonide, 0.03% (Synalar ointment)  
Triamcinolone acetonide, 0.1% (Aristocort cream)  
Triamcinolone acetonide, 0.1% ointment  
Flurandrenolide, 0.05% (ointment)

**Class V: Lower midstrength/lower-medium potency**

Desonide, 0.05% (ointment, Tridesilon cream)  
Hydrocortisone butyrate, 0.1% (cream, ointment)  
Triamcinolone acetonide, 0.025% (ointment)  
Flurandrenolide, 0.05% (Cordran lotion)

**Class VI: Mild/low potency**

Fluocinolone acetonide, 0.01% (oil)  
Desonide, 0.05% (Verdeso foam)

**Class VII: Least potent/lowest potency**

Hydrocortisone 2.5% (Hytone ointment, Lacticare lotion, Nutricort lotion)  
Hydrocortisone 1% (Hytone ointment, Cortizone 10 Maximum)

# *Sorbitan sesquioleate*

- Found in 28% of TCS
- Second most common excipient allergen in TCS
- Prevalence 0.8% in one study
- Cross-reactive with polysorbates and monostearate

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## *Balsam of Peru*

- Resin from bark of *Myroxylon pereirae* tree
- Complex blend of over 400 chemicals
- Includes vanilla, cinnamon, benzoate, eugenol groups
- Source: fluocinolone oil, cosmetics, perfumes, toothpaste, flavoring agents, lozenges, spices
- Cross-reacts with fragrance, tomato and cinnamon
- Can cause contact urticaria

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## *Fragrance*

- 90% are synthetic compounds
- Fragrance mix 1 is #3 cause of contact allergy
- Fragrance mix 1 – isoeugenol, eugenol, cinnamic aldehyde, cinnamic alcohol, hydroxycitronellal, geraniol, a-amyl cinnamic aldehyde and oak moss absolute
- Fragrance mix 2 -citronellol, hydroxyisohexyl 3-cyclohexene carboxaldehyde (Lyrál), hexyl cinnamal, citral, coumarin, and farnesol
- Rash occurs on neck, face, axilla, hands, and behind the ears
- Can also have cheilitis or stomatitis from “cinnamon” flavored chewing gums, toothpaste and mouthwash
- Source: Fluocinolone oil

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# *Methylisothiazolinone*

- Methylisothiazolinone/Methylchloroisothiazolinone (MI/MCI), “Kathon CG”
- Biocidal preservatives
- Source: bubble solutions, bubble baths, soaps, and cosmetics product
- Baby wipes leading to contact diaper dermatitis and facial dermatitis

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- Diagnosis: Patch testing
- Treatment
  - Avoidance of Offending Allergen
    - Read labels carefully!
    - ACDS Contact Allergen Management Program (CAMP) database
  - Topical Corticosteroids
  - Topical Calcineurin Inhibitors
  - ? Dupilumab
  - Oral Prednisone (rare)
    - Not for AD!

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*THANK YOU!*

QUESTIONS:

[brark@njhealth.org](mailto:brark@njhealth.org)

1-800-222-LUNG