Severe Atopic Dermatitis: An Algorithm
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Atopic Dermatitis: Stepwise approach to Severe Atopic Dermatitis:

Fix the barrier

Evaluate and treat any root cause

If still recalcitrant, consider systemic therapy
**Fix The Barrier**

Atopic dermatitis and skin disease

**Emollient enhancement of the skin barrier from birth offers effective atopic dermatitis prevention**

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**Study Design:** RCT of 124 infants at high risk for Atopic Dermatitis (AD)

**Intervention:** Emollient moisturizing within the first 3 weeks and continuing for 6 months vs NO Emollient.

- USA: sunflower seed oil, Mineral Oil/Lanolin/Petrolatum or emollient cream
- UK: sunflower seed oil or paraffin
  - BOTH groups advised to avoid fragranced soap, use gentle cleansers, no bubble baths or baby wipes on the skin.

**Outcome (by age 6 months):**
- 22% of those actively moisturized developed AD
- 43% of Control group developed AD
Study Design: RCT

**Intervention:** Emollient started at 1 week

- 59 moisturized with thick Moisturizer:
  - Ingredients: Glycerin, xylitol, Behenyl alcohol, Dimethicone, squalane, jojoba oil, isostearic acid peg-60 K and metaphosphoric acid sodium hydroxide, phenoxyethanol, tocopherol, water, glyceryl stearate acid PEG-5 glyceryl carboxer.
- 59 received petrolatum but unclear if they used it.
- Children followed out for 32 weeks.

**Outcome**

**Intervention Group:**
- 19/59 in treatment arm developed AD
- 28/59 Controls
- Higher stratum corneum hydration in treatment arm
- No difference in rate of allergic sensitization to Egg
- No difference in *Staph Aureus* colonization
Step #1 Heal the skin barrier:
Emollients and washing

- Limit bathing time to 5 minutes or less (2-4 times weekly)
  - UNLESS there is a strong environmental component, then bathe daily
  - NO WASHCLOTHS
  - Moisturize within 4 minutes of bathing to retain benefit
- Use Gentle Cleansers: Dove® fragrance free Soap/Cetaphil® gentle skin cleanser/Cerave Wash
- Lubricate with thick emollients: Tell them which EXACT ONE
  - Cerave® moisturizing Cream, Aveeno® Healing ointment, Cetaphil Restoraderm®, Aveeno® eczema therapy, Vaseline ointment, Aquaphor® Ointment,

The skin is immunosuppressed in active atopic dermatitis

- Antimicrobial peptides (Cathelicidin LL37) is down regulated in atopic dermatitis
- Up to 80% of children with atopic dermatitis are colonized with Staphylococcus Aureus
- When the atopic dermatitis is treated, the antimicrobial peptides come back!
- When the atopic dermatitis is scratched, it often becomes infected!
Find the Root Cause: Major Causes of Eczema Flares

- Humidity/season changes: Affect the Barrier
- Environmental Allergies: The defective barrier allows the body to become sensitized too easily
- Infection: Remember the skin is immunosuppressed
- Contact Allergies: We put a lot of allergenic chemicals on the defective barrier
- Foods: these children are atopic so they are more likely to be allergic
- Non compliance or running out of med: only you can prevent forest fires.

When Good Skin Care is Not Enough Use the Asthma Model

Flare Plan:
- Topical steroids Daily to BID for 1-3 weeks
- Bottom Line: Once the spots are flat and just discolored, stop the medication

Maintenance Plan:
- MILD: Just Good Skin Care
- MODERATE: Topical steroid ointment or compounded medication 3-5 times per week on areas that commonly flare
- SEVERE: Use a mid Potency topical steroid either undiluted or mixed with moisturizer 3-5 times per week on areas that flare
- Bottom Line: Find the least amount needed to prevent a flare
Treatment of Atopic Dermatitis

Address any signs of infection

- Look for pustules or large erosions
- Culture the skin if it is oozing, crusted, or has pustules!!!

Options for therapy:
- Topical antibiotic therapy
- Oral antibiotics

Options for decolonizing:
- If chronically infected consider bleach baths
  - Bleach baths: ¼ cup regular clorox in a regular sized bath tub.
  - ½ teaspoon per gallon
  - Consider Chlorhexadine 2-4% washes
    - Never for face, be careful in young children
    - Be aware this may exacerbate the atopic dermatitis

What if they are still flaring despite your plan?
Further Testing is reasonable

- Immunodeficiency?
  - Wiskott Aldrich
    - Atopic dermatitis with easy bruising
    - Low Platelets
    - Low Mean Platelet Volume
    - Low IgM/IgG
    - High IgA/IgE
  - DOCK-8
    - Severe Viral illnesses
    - Low IgM
    - High Eosinophils
    - Low T Cell numbers
  - Hyper IgE
    - Coarse face
    - Multiple pulmonary infections and abscesses
    - High IgE and eosinophils

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Labs to Consider in Severe or Unusual Atopic Dermatitis

- CBC with Differential
- Zinc, Vitamin D
- Albumin, Pre-albumin
- Immunoglobulin Levels (IgG, IgM, IgA, IgE)
- B and T Cell markers and function to evaluate for congenital immunodeficiency
- Diptheria, pneumococcal and tetanus antibodies

What should I do for major flares?

- Treat signs of infection
- Wet wrap with low-mid-potency topical steroid
- Make sure no obvious topical or environmental contactants
- Treat locally flared areas with higher potency medication
- Systemic anti-inflammatory agents or immune modulators
- NOT Oral steroids
Wet Wrap Therapy in Children with Moderate to Severe Atopic Dermatitis in a Multidisciplinary Treatment Program

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- Wet Wrapped with triamcinolone (most commonly)
  - 10-15 minute bath
  - Apply steroid
  - Wet gauze with dry elastic over top
  - Applied for 2-4 hours
  - Mean SCORAD decrease from 50 to 15

Atopic Dermatitis has a dramatic negative effect of Quality of Life

- 60% of patients have difficulty Sleeping and with daily social activities
- 23% of children with behavioral issues (5% controls)
- Atopic care of patients with severe AD takes 2-3 hours per day for the family
- Children with AD have lower school performance and difficulties socially.

Therefore: We must balance the risks of the Medications and the Risk of not treating
Systemic Alternatives for Atopic Dermatitis in Children

- **Light Therapy:** Narrow Band UVB
- **Dupilumab?** Soon hopefully.
- **Methotrexate**
  - **Pros:** Longterm safety data in children, can maintain therapy for years, Pulmonary/Liver toxicity rare
  - **Cons:** Nausea (alleviated by Subcutaneous), potential risk of lymphoma
- **Azathioprine**
  - **Pros:** High efficacy, perhaps disease modifying
  - **Cons:** Data for Squamous Cell carcinoma, potential long term toxicity

Systemic Alternatives for Atopic Dermatitis in Children

- **Cyclosporine**
  - **Pros:** High efficacy, fast acting
  - **Cons:** A lot of blood draws, longterm toxicity, can only use for a limited time
- **Mycophenolate Mofetil**
  - **Pros:** Easy to use, little lab work
  - **Potential for longterm toxicity (lymphoma)**

FDA Alert:
- **Lymphoma and Malignancy**
  - Lymphoproliferative disease or lymphoma developed in 0.4% to 1% of patients receiving CellCept (2 g or 3 g) with other immunosuppressive agents in controlled clinical trials of renal, cardiac, and hepatic transplant patients.
  - In pediatric patients, no other malignancies besides lymphoproliferative disorder (2/148 patients) have been observed
Methotrexate Studies in Children

- 40 Children randomized to MTX or Cyclosporine (El-Khalawany et al.)
  - Showed equal decrease in SCORAD at 12 weeks
  - Equal mild side effects
- 31 children treated (Deo et al.)
  - 75% with significant benefit (more than 50% improvement)
  - Only used low dose
Goals and Objectives

Diagnostic Consideration in Severe Atopic Dermatitis?

- Humidity changes, infections, environment, nutritional deficiency, noncompliance, foods

When should I start systemic therapy?

- Remember to balance the effects of the atopic dermatitis with the side effects of the meds

How do I recognize Eczema Mimickers?

- Know the patterns of typical eczema