

Diagnosis and Optimal Management of Atopic Dermatitis in the Pediatric Primary Care Setting

A Practical Guide and Summary of the Expert Panel Discussion

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The following is a summary of the discussion from the Expert Panel. This is not meant to be a comprehensive guide for the diagnosis and management of patients with atopic dermatitis (AD).

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1. Presentation of Atopic Dermatitis (AD)

An atopic dermatitis (AD) diagnosis is characterized by itch and poorly circumscribed redness, scaling, and induration. Cutaneous colonization with *Staphylococcus aureus* is very common.

AD is a form of eczema, characterized by a chronic or relapsing history and age-specific distribution, especially in older children, classically involving the flexors and antecubital fossa, and popliteal fossa. In infants, this regional specificity is less common, but the diaper area is usually spared. Eczema is also characterized by its lesional morphology compared to other skin disorders.

AD is typically seen in children who are otherwise healthy and growing well. A much wider differential diagnosis must be considered for children with eczema who have other extracutaneous abnormalities.

The majority of patients with AD will respond to basic skin care along with the use of adequate amounts of topical medication.

Allergy Testing

- The value of allergy testing is controversial. An estimated 80% of children with AD have elevated levels of total and allergen-specific immunoglobulin E (IgE). This biomarker correlates more with AD severity than it does to predict avoidable triggers. So, a negative test result reliably excludes allergies, but a positive test result does not necessarily predict a contributing role of that allergen to the patient's eczema. False-positive test results are a frequent source of confusion about the need for allergen avoidance.
- Allergy testing is best reserved for evaluating a suspected food allergy as a cause of poor weight or gastrointestinal symptoms, or environmental allergens as triggers of seasonal rhinitis, conjunctivitis, or asthma.

2. AD Treatments: Basic Skin Care

Bathing

Bleach baths are a commonly recommended mainstay of skin care (~1/4 cup per child's bath, 1 Tbsp per infant bath). For parents concerned about the safety of bleach baths, it is useful to compare it to a swimming pool. Other possible additives (with less supporting evidence) include vinegar or lemon juice. The goal is to hydrate and restore acidification to the skin surface.

Such baths should be about 10–15 minutes long, a minimum of 2–3 times per week.

*Please keep in mind that these are guidelines.
Every family can adopt a bathing schedule that works for them.*

Skin Care Products

Patients/families should be taught how to carefully read labels of over-the-counter products, including cleansers and emollients, because many ingredients in these products can trigger secondary contact dermatitis. Emphasize reading the ingredient list on the back of the bottle more than the front. Marketing terms such as "Natural," "For Sensitive Skin," even "Fragrance Free," do not mean anything. Look for products that have fewer ingredients. Topical allergens that can trigger secondary contact dermatitis in children include not only fragrances, the most well-known group of contact allergens, but also wool wax alcohols, the detergent cocamidopropyl betaine, and the preservative methylisochlorothiazolinone.* Botanicals have more familiar names but also carry the risk of contact allergies. Citing the risk of poison ivy as a botanical may make this point easier to understand.

*Pediatric patch test studies identified the top allergens as: Neomycin, balsam of Peru, fragrance mixes, lanolin, cocamidopropyl betaine, formaldehyde, corticosteroids, methylchlorisothiazolinone/methylisothiazolinone, propylene glycol, and benzalkonium chloride.

Other common pediatric allergens include detergents, parthenolide/compositae, nickel, cobalt, colophene, chromates, glucoside, and p-phenylenediamine, or PPD.

See also a list of top 10 allergens in children: <https://www.mdedge.com/pediatricnews/article/138037/dermatology/contact-dermatitis-children-top-10-allergens>.

Liquid cleansers have more allergens than gentle bar soaps.

The most expensive “natural” products are not necessarily the best.

Avoiding Irritants

After the bath, pat dry the skin to reduce friction.

Emollients

Use emollients liberally. The safest and most effective emollients are plain petroleum jelly or mineral/coconut oil. Optimal application frequency is 4 times a day, but applying twice a day is still useful. Work with the school nurse to keep a supply of petroleum jelly at school.

Topical Medication Dosing

Using too little medication will not be effective, but using too much increases the risk of side effects. It is more important for the patient to use a specified dose over time than for each application (eg, <45 g topical corticosteroid [TCS]/month).

Start with larger quantities and more frequent application, then taper as the skin improves. TCSs need not be applied more than once a day. Intermittent dosing is safest (eg, every other day, or 15 days per month).

Create an Office Expert

The office expert is essential for taking the time to convey the key patient education at an appropriate health literacy level and to provide a consistent message. The office expert can be an LPN or office assistant.

Avoid Wasted Effort

The following describes strategies that many families use, but there is no evidence to support their use in patients with AD. Families are better off focusing on the tenets of basic skin care (discussed above).

- *Avoid empiric dietary restriction* (eg, removing from the diet gluten, eggs)
- *Consider the role of multiple caregivers*, including all households where the child spends time (split-parent households, aunts/uncles, grandparents). They all need to receive the same educational messages, despite their good intentions in doing otherwise.
- *Homeopathic/natural remedies* – These may or may not be harmful, but they create a lost opportunity by not replacing them with more effective treatments for which there is evidence to support.
- *Understand OTC products* with undefined marketing terms: *Hypoallergenic, fragrance free, natural, sensitive skin*.

Topical Corticosteroids

TCSs are chosen based on potency, quantity, vehicle, and frequency. TCSs have been classified based on their potency. The safety and efficacy of only a few products have been studied in children (Table). For initial treatment, choose the potency that matches the severity of the inflammation and taper with improvement.

Ensure that the patient/family understands the importance of the vehicle (eg, ointment, cream, lotion, gel) and that dispensing errors can occur. In general, the potency of corticosteroid ointments is higher than the potency of the same active ingredient in a cream formulation. Ointments are also less likely to contain topical allergens.

Table. TCS FDA-Approved for Use in Children

Product	Potency Class	Age Group	Application Frequency	Duration (Weeks)
Clobetasol propionate 0.05% foam	1	>12 yrs	BID	2
Fluocinonide 0.1% cream	1	>12 yrs	QD-BID	2
Mometasone 0.1%	2 (cream) 4 (ointment)	>2 yrs	QD	3
Fluticasone 0.05% lotion/cream	5	>1 yr	QD-BID	4
Prednicarbate 0.1% cream/ointment	5	>1 yr	QD-BID	3
Alclometasone 0.05% cream/ointment	6	>1 yr	BID-TID	2
Fluocinolone acetonide 0.01% oil	6	>2 yrs	BID	4
Desonide 0.05% foam/gel	6	>3 mos	BID-TID	4
Hydrocortisone butyrate 0.1% cream	6	>3 mos	BID-QID	4

For short-term flare control: Apply daily for 3 to 7 days until clear; then, switch to a maintenance schedule. For long-term intermittent/maintenance use, many prescribing instructions call for “2 weeks on/2 weeks off,” which may not provide optimal control for some children. In some patients, every other day application may yield better long-term control without increasing the risk of long-term exposure to TCSs.

Corticosteroid-Sparing Agents

Corticosteroid-sparing agents are reserved for children who need AD medicines every day. Unlike TCS, these medications do not compromise skin barrier function or carry the risk of percutaneous absorption with long-term use.

Calcineurin Inhibitors (*tacrolimus, pimecrolimus*)

- Efficacy is about the same as low-potency TCS; tacrolimus may be more potent than pimecrolimus.
- Side effects are minimal, primarily stinging/burning
- Black Box warning (increased risk for developing serious infections and malignancies): Understand that data supporting this risk are largely derived from systemic exposure to oral tacrolimus; real-world registry data with long-term follow-up has not documented any increased risk with use of topical calcineurin inhibitors. A single large 2018 database analysis identified a marginal increased risk of lymphoma in patients treated with topical tacrolimus, but this analysis did not take into account the severity of disease or the type of lymphoma.¹ More severe chronic skin disease may be associated with an increased risk of T-cell lymphoma, while chronic immunosuppression is associated with an increased risk of B-cell lymphoma.

PDE4 Inhibitors (*crisaborole*)

- No Black Box warning
- Efficacy is about the same as pimecrolimus and low-potency TCS.
- Anticipatory guidance for risk of burning/stinging is important.
- It is a safe drug to use in the primary care setting.

Anticipatory Guidance

Expectations for Improvement/Control

- For safety and efficacy, monitor quantities of topical medication that the patient is using.
- Remind patients about the greater importance of skin care, including avoidance of potential topical allergens, rather than avoidance of environmental allergens.
- Discuss signs that the treatment is working or not working.
- Discuss what the next option might be if the current treatment is not effective
- Stress that it might take weeks rather than days to gain symptom control
- Consider other caregivers (ie, the school nurse, extended family) as the audience for such guidance
- Discuss medication tolerance
 - Tactile aversion to ointments
 - Hypesthesia – to alleviate burning/stinging, put medication in the refrigerator before applying, or apply a thin layer of petroleum jelly before the medication
- The role of antihistamines
 - Poor sleep is one of the most common comorbidities with AD, and it can impact many aspects of the patient's life.
 - Daily use of nonsedating antihistamines is most effective for patients with coexisting hives, but antihistamines but do not relieve the itch of eczema.
 - The soporific effect of sedating antihistamines may appear to relieve eczema-associated itch, but in some children, they may trigger idiosyncratic agitation or have long-term neurodevelopmental sequelae.
 - To help with sleep, in general, it is most important to implement daily skin care.
 - Melatonin is a safe alternative to help with sleep.

- Medication risks
 - TCSs
 - Recommend defined quantities to the family: Use no more than 15 days/month or 30 g–60 g/month (depending on the size of the child)
 - Begin with potency and frequency that match the severity of the inflammation
 - If AD is not resolved, a corticosteroid-sparing agent will be the next step (with a discussion of side effects and Black Box warning, depending on the agent).

3. Differential Diagnosis

For children who have atypical skin findings or extracutaneous comorbidities, it is important to consider conditions other than AD.

- Poor growth
- Additional history: Personal or family history of frequent infections (otitis media, strep, sinusitis, pneumonia, cold sores, ringworm)
- Seasonal predilection: Coxsackievirus (CV) (spring/fall)
- Physical examination clues: Involvement and sparing (posterior auricular folds, nails, web spaces, scalp, palmoplantar, exanthem)
- Additional evaluation: Skin swabs for bacterial, fungal culture, scraping for herpes simplex virus (HSV)
- Allergy testing (patch testing for topical products, IgE levels)

AD with Infection

Also consider that these conditions can coexist with AD:

- Tinea: Posterior cervical adenopathy, scalp scale, hair thinning
- Molluscum: Pearly, dome-shaped, grouped into 2- to 3-mm papules
- Streptococcus: Acute worsening over 1 day, fever, glazed appearance, blistering, pustules, furuncles
- HSV or CV: fever, punched out 2- to 3-mm erosions and hemorrhagic crusts

AD and *Staphylococcus aureus*

- 80% to 90% of patients with AD are colonized with *S aureus*, but treatment with antibiotics does not support long-term control of AD.
- Bleach baths are a safe, effective option to help control skin infection.
- Mupirocin prophylaxis – Place in warm, moist places (eg, skin folds, nares, inguinal creases, twice a day for 5 days; repeat every 1 to 4 months); be aware that mupirocin resistance is emerging, especially with daily use to large surface areas, or use in compounded combination antibiotic/TCS products.
- Consider decolonization for other family members (use the office expert to help educate families)
- Reserve oral antibiotics for children with signs of infection: Rapid progression, pain, furuncles/boils, fever, leukocytosis (to avoid oral antibiotics, drain furuncles)

The most common causes of treatment failure are:

- Occult complex topicals (with irritants and allergens)
- Insufficient medication quantity
- Behavioral issues/resources
- Medication access
- Not AD or AD with infection
- Severe disease

Specialist options with treatment failure include:

- Diagnostic considerations
- Systemic options: Methotrexate, cyclosporine, dupilumab
- Hospitalization – Many other behavioral issues can be clarified and addressed during hospitalization.

4. Primary Care Medical Home and Referral

- AD is a chronic disease that requires consistency among all healthcare providers. Maintaining a primary care medical home is important for many reasons:
 - Primary care providers speak to context (eg, how older siblings with AD responded to treatment or similarities/differences in disease progression)
 - Ensuring that all healthcare providers agree on the diagnosis
 - Ensuring that the same messaging in anticipatory guidance is given from all healthcare providers (bathing, what products to use, appropriate topical corticosteroid use)

(When to refer - please see the “10 Warning Signs of Primary Immunodeficiency” from the Modell Foundation:
<http://downloads.info4pi.org/pdfs/10-Warning-Signs---Generic-Text--2-.pdf>)

- Take advantage of electronic health records and telehealth technology to communicate with other providers. Dermatologists like to know the reason for the referral (eg, unsure of diagnosis, poor response to treatment, family request to see a specialist, other underlying sociodemographic issues).
- Taking a good picture of the skin condition is essential (both close up and a wide shot)!