Translating Atopic Dermatitis Management Guidelines Into Practice for Primary Care Providers

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Atopic dermatitis affects a substantial number of children, many of whom seek initial treatment from their pediatrician or other primary care provider. Approximately two-thirds of these patients have mild disease and can be adequately managed at the primary care level. However, recent treatment guidelines are written primarily for use by specialists and lack certain elements that would make them more useful to primary care providers. This article evaluates these recent treatment guidelines in terms of evaluation criteria, treatment recommendations, usability, accessibility, and applicability to nonspecialists and integrates them with clinical evidence to present a streamlined severity-based treatment model for the management of a majority of atopic dermatitis cases. Because each patient’s situation is unique, individualization of treatment plans is critical as is efficient communication and implementation of the plan with patients and caregivers. Specifically, practical suggestions for individualizing, optimizing, implementing, and communicating treatment plans such as choosing a moisturizer formulation, avoiding common triggers, educating patients/caregivers, providing written treatment plans, and scheduling physician follow-up are provided along with a discussion of available resources for patients/caregivers and providers.

In 2009–2011, atopic dermatitis (AD) was estimated to affect 12.5% of children (0–17 years of age) in the United States, an increase of just over 5% since 1997–1999. Among these patients, the vast majority (~67%) are reported to have mild disease and provide only initial, limited care (81%). Whether or not patients are referred to dermatology, pediatricians and family practitioners continue to play a central role in patient management for regular follow-up, maintenance treatment, ongoing patient/caregiver education, and as the first-line contact for flares and issues, such as secondary staphylococcal infection.

On September 6, 2013, a roundtable was convened to discuss challenges in AD management along with opportunities to improve it across a variety of disciplines. This roundtable was unique in that it included a patient advocate, as well as representatives from dermatology (general and pediatric), pediatric allergy-immunology, family medicine, managed care, and nursing. During the discussion, it became clear that current AD management guidelines lack certain elements that may enhance their practical utility, especially for PCPs.
including pediatricians. This article will (1) evaluate the utility of current guidelines, (2) present an integrated, PCP-specific treatment model based on current guidelines and clinical evidence, (3) give practical advice on the implementation and optimization of written, individualized treatment plans for patients, and (4) provide recommendations to improve the utility of future guidelines, all based on the meeting’s proceedings.

RECENT AD MANAGEMENT GUIDELINES

To improve utility, management guidelines should contain a concise treatment algorithm that is severity-based and not rigid (ie, allows for unique patient situations) with instructions for when to step-up or step-down treatment. Diagnostic and severity evaluation criteria should be included to provide a framework for initial and ongoing evaluation. Also, guidelines should reflect multidisciplinary input and be freely and easily accessible to all health care providers (HCPs), regardless of specialty.

With each iteration, AD management guidelines have improved according to these fundamentals from the 2004 American Academy of Dermatology’s (AAD) Guidelines4 and American College of Allergy, Asthma, and Immunology (ACAAI)/American Academy of Allergy, Asthma, and Immunology’s (AAAAI) Practice Parameters5 through the 2006 European Academy of Allergology and Clinical Immunology (EAACI)/AAAAI Guidelines6 to the current 2012 European Dermatology Forum (EDF) Guidelines,7,8 the ACAAI and AAAAI 2012 Practice Parameters,9 and the AAD 2014 Guidelines10–13 with published clinical evidence as support (Fig 1).

Making the Diagnosis

Because there is no definitive laboratory test, a diagnosis of AD is made based on a combination of clinical symptoms: pruritic dermatitis that is chronic and/or relapsing with characteristic distribution (face, neck, and extensor surfaces in infants and children; flexural folds in patients of any age). Diagnosis is often made during an acute exacerbation of skin inflammation characterized by intensely pruritic, erythematous papules and patches accompanied by dry skin (ie, xerosis), excoriations, and sometimes serous exudate. The diagnostic criteria given in the AAD guidelines (Table 2)14 provide a user-friendly set of criteria that mirror many more lengthy validated criteria.

A diagnosis of AD should only be made when other conditions have been ruled out such as irritant contact dermatitis, psoriasis, scabies, or a viral exanthem. A variety of scoring systems have been proposed for quantifying AD severity. Mild disease generally involves less body surface area, has a more remitting course, and is associated with lower intensity itch.15 Patients who can be maintained with basic management alone most often have mild disease. Patients with moderate-to-severe disease may have greater body surface area involvement with more continuous course and more severe itch.15 These patients often require more maintenance therapy.

Basic Management

Regardless of disease severity, basic management strategies should be implemented for every patient diagnosed with AD (Fig 1). These include proper skin care (ie, skin hydration and moisturizer applied to all skin), antiseptic measures (ie, dilute bleach baths), and trigger avoidance (general avoidance of irritants as identified for each patient), with acute treatment added as needed for flares (ie, acute escalation in symptoms and skin inflammation necessitating an escalation in treatment and/or medical advice16).

Acute Treatment of Flares

Depending on patient and provider preference, treatment of acute flares may be managed with topical corticosteroids of varying potency (Table 3).17 and medium potency topical corticosteroids (eg, Class III–IV) are often used for several days to a few weeks.11 Subsequent maintenance therapy then depends on the severity, as well as persistence of AD signs and symptoms.

Integrating Guidelines With Clinical Evidence

With so many AD management guidelines promulgated by different groups, there is potential for these to conflict with each other, making it difficult for HCPs to determine which guidelines are best suited for their patients. The consensus among roundtable participants was that PCPs could benefit from an integrated plan that is more straightforward and specific, accommodates the majority of the cases they encounter, and provides guidance as to when to refer to a dermatologist or allergist/immunologist. In addition, few guidelines contain a treatment model and, those that do, fail to account for the relapsing–remitting nature of AD or for the use of proactive management.

To address these gaps and provide a useful tool for pediatricians and PCPs in managing their patients with AD, we propose the following diagnostic and treatment model based on the EDF 2012 Guidelines,7,8 the ACAAI and AAAAI 2012 Practice Parameters,9 and the AAD 2014 Guidelines10–13 with published clinical evidence as support (Fig 1).

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<table>
<thead>
<tr>
<th>Methodology (Sponsoring Organization(s), Year)</th>
<th>Evaluation Criteria</th>
<th>Treatment Recommendations</th>
<th>Utility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composite of evidence with references for 9 AD management questions (AAD, 2004)</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Review of literature rated by category of evidence and strength of recommendation (ACAAI and AAAAI, 2004)</td>
<td>Yes</td>
<td>Only for severe</td>
<td>Annotated linear management and treatment model</td>
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<tr>
<td>Review of literature (EAAI and AAAAI/PRACTALL, 2006)</td>
<td>Yes</td>
<td>No</td>
<td>Stepwise treatment model</td>
</tr>
<tr>
<td>Compilation of existing European evidence-based guidelines supplemented with new literature rated by grade of evidence and strength of recommendation (EDF, 2012)</td>
<td>Committee decided that guidelines should strictly concentrate on therapeutic regimens and omit sections on clinical diagnosis</td>
<td>No</td>
<td>Yes</td>
</tr>
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<tr>
<td>Review of literature rated by category of evidence and strength of recommendation (update of ACAAI and AAAAI 2004 Practice Parameter; 2012)</td>
<td>Yes</td>
<td>Only for severe</td>
<td>Annotated linear management and treatment model</td>
</tr>
<tr>
<td>Recommendations rated by grade of evidence and strength of recommendation with references for 17 AD diagnosis and management questions (update of AAD 2004, AAD Guidelines, 2014)</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

AAAAI indicates American Academy of Allergy, Asthma and Immunology; AAD, American Academy of Dermatology; ACAAI, American College of Allergy, Asthma and Immunology; AD, atopic dermatitis; EAACI, European Academy of Allergology and Clinical Immunology; EDF, European Dermatology Forum; FTU, fingertip unit; GAAPP, Global Allergy and Asthma Patient Platform; HCP, healthcare provider; JTF, AAAAI/ACAAI Joint Task Force on Practice Parameters; PRACTALL, Practical Allergy; PCP, primary care physician; TCI, topical calcineurin inhibitor.
Maintenance Therapy for Mild Disease

After the initial flare has been controlled, many patients with mild or more episodic AD will be able to maintain disease control with basic treatment as described above: moisturizers, proper skin care, etc, intermittently returning to acute topical corticosteroid treatment as needed for flares. The use of moisturizers alone as maintenance therapy, without a topical antiinflammatory, is usually sufficient for mild AD. Patients whose symptoms are not well controlled with basic treatment are considered to have moderate-to-severe disease.

Maintenance Therapy for Moderate-to-Severe Disease

Patients with moderate-to-severe AD may require “proactive”/maintenance therapy regularly applied to normal appearing skin in flare-prone areas and/or applied at first signs or symptoms of a flare with tacrolimus or pimecrolimus (topical calcineurin inhibitors [TCIs]) or medium potency topical corticosteroids (eg, Class III–IV, see Table 3; except for face and eyes). Tacrolimus and fluticasone have each been studied in long-term clinical trials of 2- to 3-times weekly application. Alternatively, a patient may be prescribed once to twice daily TCI (pimecrolimus or tacrolimus); clinical trials of this scenario have also been conducted. Although it has not been studied, low potency topical corticosteroids (Class V–VII; see Table 3), applied locally once to twice daily to areas prone to recurrence, is used by many patients to maintain disease control. The choice of TCI versus topical corticosteroids for maintenance therapy depends on patient/caregiver and provider preference, access to medications (including formulary status and cost of medication), lesion location (topical corticosteroid use in sensitive skin areas such as the face and eyes should be limited), and the effectiveness and tolerability observed with a particular agent. Furthermore, for long-term use, it is important to use the lowest potency topical corticosteroid that is effective to minimize the risk of adverse effects (skin atrophy, telangiectasia, striae, glaucoma, rebound flare, topical corticosteroid addiction/withdrawal, tachyphylaxis, Cushing disease, adrenocortical suppression, decreased growth rate); this is particularly true for sensitive skin sites, such as the face, neck, and “diaper area.” Failure to adequately suppress skin inflammation not only perpetuates discomfort but also leads to continued scratching and an increased risk for infection.

Optimizing and Individualizing Treatment Plans

When designing a treatment plan for a specific patient, a provider should...
TABLE 2 Diagnostic Criteria

<table>
<thead>
<tr>
<th>Essential Features</th>
<th>Important Features</th>
<th>Associated Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Both must be present</td>
<td>Add support to the diagnosis, observed in most cases of AD</td>
<td>Suggestive of AD, but too nonspecific to be used for defining or detecting AD in research or epidemiologic studies</td>
</tr>
<tr>
<td>1. Pruritus</td>
<td>1. Early age of onset</td>
<td>1. Atypical vascular responses (eg, facial pallor, white dermographism, delayed blanch response)</td>
</tr>
<tr>
<td>2. Eczema (acute, subacute, chronic)</td>
<td>2. Atopy</td>
<td>2. Keratosis pilaris/pytiriasis alba/hyperlinear palms/ichthyosis</td>
</tr>
<tr>
<td>a. Typical morphology and age-specific patterns</td>
<td>a. Personal and/or family history</td>
<td>3. Ocular/periorbital changes</td>
</tr>
<tr>
<td>• Infants/children: facial, neck, and extensor involvement</td>
<td>b. IgE reactivity</td>
<td>4. Other regional findings (eg, perioral changes/periauricular lesions)</td>
</tr>
<tr>
<td>• Any age group: current or previous flexural lesions</td>
<td>3. Xerosis</td>
<td>5. Perifollicular accentuation/lichenification/prurigo lesions</td>
</tr>
<tr>
<td>• Sparing of the groin and axillary regions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Chronic or relapsing history</td>
<td></td>
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</tbody>
</table>

Exclusionary Conditions

Diagnosis of AD depends on excluding conditions
• Scabies
• Psoriasis
• Ichthyoses
• Seborrheic dermatitis
• Contact dermatitis (irritant or allergic)
• Cutaneous T-cell lymphoma
• Photosensitivity dermatoses
• Immune deficiency diseases
• Erythroderma of other causes

AD, atopic dermatitis; IgE, immunoglobulin E. Adapted from Eichenfeld et al.14

tailor it based on patient age, previous treatment failures, who is providing care (for children/infants), lesion location (topical corticosteroid use must be limited in potency and duration of application for sensitive skin areas), patient’s insurance and financial resources to get medications, patient/family lifestyle (ie, time for baths and moisturizer/topical antiinflammatory application), and patient preferences (look/feel of ointments versus creams). Patient/caregiver preferences are especially important when selecting a moisturizer formulation because xerosis is the central feature of AD. Lotions contain preservatives, fragrances, and other chemicals, which may cause allergic or irritant reactions. Lotions have a high water content and, especially for more severely xerotic patients, may be drying; moisturizer ointments with higher oil content and no preservatives may be preferable.9,11 The choice of moisturizer should be based on patient preference/tolerance for the occlusiveness of ointments and oils versus creams or lotions. Similar considerations should be made for patient/caregiver preferences for formulation of topical antiinflammatories, as well as consideration for the cost of medication. It should be noted that different formulations of the same topical corticosteroid, even the same concentration of topical corticosteroid, may have different potencies, for example mometasone furoate 0.1% ointment is high potency (Class II), whereas mometasone furoate 0.1% cream is medium potency (Class III–IV; Table 3).

Determination of patient-specific AD triggers is challenging, but if these triggers can be identified, avoidance may lead to longer intervals between flares and even complete disease clearance in some cases. Non-specific triggers may include harsh soaps, detergents, wool, and other abrasive fabrics, tight-fitting clothing, certain chemicals (eg, formaldehyde used for fabric sizing), airborne irritants (tobacco smoke, air pollution), and extremes or transitions in temperature and humidity. Rarely, allergies can be triggers of dermatitis, and food and environmental allergies are more common in children with AD than in those without.13 Sensitization for food and environmental allergens can be identified by using skin prick or specific IgE tests, and contact allergy may be assessed through patch testing. However, providers should not suggest routine testing in the search for “causes” of AD, because the predictive value of positive tests is low, and often true clinical allergies may be irrelevant as AD triggers (eg, may cause a reaction such as urticaria, or itch, without necessarily flaring AD).9,13 “Relevant” allergens differ by age group: young children are more likely to have food allergy (although the minority of infants and children who show reactivity through prick or blood testing have true clinical allergy), whereas older children and adults are more likely to have sensitivity to aeroallergens.9,13 Many patients experience sleep disturbance, especially during flares, which not only negatively affects quality of life, but may also increase the risk of hyperactivity–impulsivity and other mental health disorders. Positive associations between AD and attention-deficit/hyperactivity disorder,26–30 anxiety disorders,26,30 depression,30 and autism spectrum
disorders have been reported, especially among patients with AD and sleep loss. In patients who have a major complaint of sleep loss or who have risk factors for 1 or more of these mental health comorbidities, antihistamines (hydroxyzine or doxepin), topical antiinflammatories, emollients, hypnotherapy, and/or reducing sensory input may be beneficial.

Finally, all treatment plans should include scheduled follow-up (telephone call, office visit, etc), optimally within 1 to 2 weeks after the initial visit, to assess treatment adherence and patient/caregiver satisfaction and comfort level with the plan. Early follow-up may lead to better adherence and better treatment outcomes.

TREATMENT PLAN IMPLEMENTATION AND COMMUNICATION WITH PATIENTS AND CAREGIVERS

Written Treatment Plan

Incorporating instructions into a written plan (similar to what is commonly implemented for asthma patients) regarding when to apply moisturizers and topical medications, when to step-up or step-down treatment, when to seek medical advice, what triggers to avoid, etc, is critical to ensuring good long-term treatment adherence. The current conversion to electronic medical records presents an opportunity to automate plan creation. In addition, treatment plan handouts are freely available for duplication and distribution to patients and/or caregivers.

Patient and Caregiver Education

It is important for patients, caregivers, and family members to understand the chronic relapsing–remitting nature of AD and how the implementation of a written treatment plan, including proper skin care, antiseptic measures, trigger avoidance, and pharmacologic treatment, can help to extend periods of remission. The process of patient/caregiver education should start with the initial plan development and continue through each follow-up visit (especially when the treatment plan has been modified) with the physician, nurse, or other medical staff to ensure that the current treatment plan is well understood. Additionally, time spent on education affords the physician (or other HCP) the opportunity to correct any misconceptions patients and/or caregivers may have and to proactively address any potential insurance or dispensing issues, if required.

Patients/caregivers should be instructed on proper skin care, including skin hydration with warm soaking baths or showers, immediately followed by application to damp skin of an adequate amount of moisturizer (Fig 2). Daily use of these dilute bleach baths, or comparable sodium hypochlorite-based products while...
showering or otherwise washing may be needed as part of maintenance therapy for moderate to severely affected children (although the effect of managing bacterial colonization alone on recurrent infection has not been established). The technique can be modified for more local soaking or compressing for maintenance of areas that more often show secondary infection or for patients with current infection who cannot tolerate bathing. Proper skin care will also help reduce exposure and/or impact of certain AD triggers by increasing the patient’s threshold for skin irritation.

Wet-wrap therapy (WWT; with or without topical corticosteroids) may reduce disease severity, especially for patients with moderate-to-severe AD during flares; however, WWT can be time-consuming and complicated. Patients/caregivers should be instructed in the application of loose, wetted (soaked in warm water, then wrung out until slightly damp) tubular bandages, gauze, or cotton clothing over topical corticosteroid or moisturizer, followed by a dry outer layer of similar material (never plastic wrap), which may be worn for several hours to 24 hours and repeated for several days to 2 weeks. Care should be taken during WWT, especially when using medium-to-high potency topical corticosteroids, due to increased risk of topical corticosteroid penetration and infection. For complete step-by-step directions, see Nicol et al.

Patients/caregivers should be advised to avoid nonspecific irritants by using mild soaps or soap-free cleansers, wearing “smooth”/nonirritating clothing that is loose-fitting, and avoiding detergents and fabric softeners with fragrances. In addition, exposure to aeroallergens (molds, dust mites, pollen, animal dander, airborne irritants), and extremes in temperature and humidity may be avoided, or minimized through the use of air conditioning and/or air filters.

Patients/caregivers should also be instructed on avoidance strategies for AD triggers specific to them (ie, foods, contact and aero-allergens) as determined through plan optimization and individualization (above).

It is also critically important to instruct patients/caregivers on the quantity of topical medication and moisturizer to use for each application and the total quantity expected to be consumed per week or month (Fig 2). The fingertip unit (FTU) has been developed as a helpful tool for quantitatively describing for patients/caregivers the amount of topical medication to be used. FTUs are measured relative to adult hand/finger sizes, regardless of age group. FTUs are measured relative to adult hands/fingers regardless of age (Fig 2). Providers may also find it helpful to prescribe specific amounts of a topical agent to be used over the course of 1 week or month to ensure proper use of topical corticosteroids, TCIs, and/or moisturizer (Fig 2). Asking patients/caregivers to bring their partially used bottles/tubes into the office during their next visit may be helpful in assessing adherence (although the possibility of medication “dumping” should be kept in mind). Despite proper instruction, some patients/caregivers may still not apply adequate amounts of topical corticosteroids because of a fear of side effects (ie, “steroid phobia”). Making patients/caregivers aware of the signs of skin atrophy (eg, increased transparency and shininess of the skin; striae) and explaining that mild cutaneous side effects are reversible with time (but striae are not) may allay some of these fears and increase adherence.

Written plans and patient/caregiver education have the potential to...
improve treatment adherence, which is a major determinant of treatment success. There are a number of additional strategies pediatricians and PCPs can use to improve adherence among their patients, including engaging patient and caregivers in discussions about previous medications/experiences, suggesting support from groups such as the National Eczema Association (NEA; http://nationaleczema.org), addressing side effects proactively, positive reinforcement, frequent follow-up visits, accessing managed care compliance and care management programs, and, in the most noncompliant patients, applying medications in the office. Sticker charts may be a particularly useful tool for improving adherence among pediatric patients.46 Many patients/caregivers may wish to discuss complementary and alternative therapies; these should be reviewed in an open-minded way, although at this time there is limited clinical data supporting their use.13 Consideration of referral to a child psychologist is appropriate in cases where behavioral support beyond patient and caregiver education is needed. The NEA is a valuable resource for patient/caregiver education and support. Educational brochures are available for distribution by providers. Regarding skin care products, NEA maintains a list that have satisfied the NEA Seal of Acceptance criteria for sensitivity, safety, and toxicity, as well as ingredients, content, and formulation. In addition, providers may find it helpful to form cooperative groups of HCPs within their practice or local area to facilitate coordination of care, information sharing, and pooling of resources.

Patients/caregivers as well as pediatricians and other PCPs may find the following Web sites to be helpful resources:
- NEA: http://nationaleczema.org
- AD information from the Asthma and Allergy Foundation of America: http://www.aafa.org/display.cfm?id=9&sub=23&cont=325
- The Eczema Center at Rady Children’s Hospital San Diego: http://eczemacenter.org
- Northwestern Multidisciplinary Eczema Center: http://eczema.nm.org
- The Pediatric Atopic Dermatitis Program at National Jewish Health: http://www.nationaljewish.org/programs/pediatric/atopic-dermatitis
- AD information from the AAD: http://www.aad.org/dermatology-a-to-z/diseases-and-treatments/ad/
- AD information from the National Institute of Arthritis and Musculoskeletal and Skin Diseases: http://www.niams.nih.gov/Health_Info/Atopic_Dermatitis

**CONCLUSIONS**

Pediatricians and other PCPs play a central role in the management of AD, be it by referring patients with moderate-to-severe AD for specialized care, providing ongoing maintenance care after evaluation by specialists, or managing patients with mild or more episodic AD themselves. The treatment model proposed in this article is designed specifically for use by pediatricians and other PCPs and includes basic management measures (skin care, antiseptic measures, and trigger avoidance) to be used regardless of AD severity, acute treatment of flares with low or medium potency topical corticosteroids depending on severity of the flare, and maintenance treatment with TCI and/or topical corticosteroids for patients with moderate-to-severe disease. Because the course of AD varies from patient to patient, it is critical to design treatment plans based on patients’/caregivers’ individual preferences and needs including patient age, family lifestyle, preference for topical treatment formulation, and pattern of lesions and flares. Patient and caregiver education should include a written treatment plan and instruction on trigger avoidance and correct topical treatment application. Treatment plans should be continually optimized and refined during regular follow-ups.

**ACKNOWLEDGMENTS**

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**ABBREVIATIONS**

AAAAI: American Academy of Allergy, Asthma and Immunology
AAD: American Academy of Dermatology
ACAAI: American College of Allergy, Asthma and Immunology
AD: atopic dermatitis
EDF: European Dermatology Forum
FTU: fingertip unit
HCP: healthcare provider
NEA: National Eczema Association
PCP: primary care provider
TCI: topical calcineurin inhibitor
WWT: wet-wrap therapy
REFERENCES


41. Fritz SA, Camins BC, Eisenstein KA, et al. Effectiveness of measures to eradicate Staphylococcus aureus carriage in patients with community-associated skin...


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/content/early/2015/07/28/peds.2014-3678