

Translating Atopic Dermatitis Management Guidelines Into Practice for Primary Care Providers

Lawrence F. Eichenfield, MD^a, Mark Boguniewicz, MD^b, Eric L. Simpson, MD^c, John J. Russell, MD^d, Julie K. Block, BA^e, Steven R. Feldman, MD, PhD^{f,g}, Adele R. Clark, PA-C^f, Susan Tofte, BSN, MS, FNP-C^h, Jeffrey D. Dunn, PharmD, MBAⁱ, Amy S. Paller, MD, MS^j

abstract

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.

FREE

^aDepartments of Pediatrics and Dermatology, School of Medicine, University of California, San Diego, San Diego, California; ^bDivision of Pediatric Allergy-Immunology, Department of Pediatrics, National Jewish Health and School of Medicine, University of Colorado Denver, Colorado; ^cDepartments of Dermatology, and ^dNursing, Oregon Health & Science University, Portland, Oregon; ^eDepartment of Family and Community Medicine, Sydney Kimmel Medical College, Thomas Jefferson University, Philadelphia, Pennsylvania; ^fNational Eczema Association, San Rafael, California; ^gDepartment of Dermatology, ^hPathology, and Public Health Sciences, Wake Forest Baptist Health, Winston-Salem, North Carolina; ⁱVRx, Salt Lake City, Utah; and ^jDepartments of Dermatology and Pediatrics, Feinberg School of Medicine, Northwestern University, Chicago, Illinois

Dr Eichenfield determined the agenda and faculty, served as co-chair, contributed substantially to the roundtable meeting, directed development of the manuscript text and graphical content, and critically reviewed each draft; Drs Boguniewicz, Simpson, Russell, Feldman, and Dunn, and Ms Block, Ms Clark, and Ms Tofte contributed substantially to the roundtable meeting and critically reviewed each draft of the manuscript; Dr Paller served as co-chair, contributed substantially to the roundtable meeting, directed development of the manuscript text and graphical content, and critically reviewed each draft; and all authors approved the final manuscript as submitted.

The content of this article is based on the proceedings of a roundtable meeting attended by each of the authors, held September 6, 2013, in Chicago, IL, and sponsored by Valeant Pharmaceuticals North America, LLC (Bridgegewater, NJ).

www.pediatrics.org/cgi/doi/10.1542/peds.2014-3678

DOI: 10.1542/peds.2014-3678

Accepted for publication Feb 26, 2015

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 1997–1999.¹ Among these patients, the vast majority (~67%) are reported to have mild disease² and as such may be adequately managed by their pediatrician or other primary care provider (PCP). However, the majority of pediatricians refer even their mild patients to dermatologists (~85%) and provide only initial, limited care (81%).³ 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 Allergy and Clinical Immunology (EAACI)/AAAAI Guidelines⁶ to the current 2012 European Dermatology Forum (EDF) Guidelines,^{7,8} 2012 AAAAI/ACAAI Practice Parameter Update (published in 2013),⁹ and 2014 AAD Guidelines^{10–13} (Table 1). Of particular note, the 2012 AAAAI/ACAAI Practice Parameter and EDF Guidelines include input from HCPs from both allergy/immunology and dermatology and specify that their recommendations may be useful to HCPs outside of those therapeutic

areas. The 2012 EDF Guidelines are unique in providing recommendations for monthly amounts of topical corticosteroids to prescribe and how to quantify daily amounts of topical drug for patients.

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 Guidelines^{10–13} 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 remittive 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.

TABLE 1 Recent AD Management Guidelines

Methodology (Sponsoring Organization[s], Year)	Evaluation Criteria		Treatment Recommendations			Utility	
	Diagnostic Criteria?	Severity Evaluation?	Algorithm?	Severity-Based?	Criteria to Step-Up/Down Treatment?	Usability	Applicability: Working Group Composition and/or Intended Audience
Composite of evidence with references for 9 AD management questions (AAD, 2004) ⁴	No	No	No	No	No	Treatment recommendations listed only in text Level of evidence and consensus of opinion listed separately from recommendations Guidelines "sunsetting" in 2009, but no new guidelines issued until 2014	Free from AAD, but not from journal
Review of literature rated by category of evidence and strength of recommendation (ACAAI and AAAAI, 2004) ⁵	Yes	Only for severe	Annotated linear management and treatment model	Yes	Yes	Treatment recommendations (with strength of recommendation) and algorithm details only listed in text Annotations and summary statements not integrated with algorithm	Free from AAAAI and JTF but not from journal
Review of literature (EAACI and AAAAI/PRACTALL, 2006) ⁶	Yes	No	Stepwise treatment model	Yes (but severity criteria not included)	No (and no criteria for when to use topical corticosteroids $\pm$ TCI)	Treatment and diagnosis recommendations listed only in text No level of evidence indicated	Free from 1 of 2 journals
Compilation of existing European evidence-based guidelines supplemented with new literature rated by grade of evidence and strength of recommendation (EDF, 2012) ^{7,8}	Committee decided that guidelines should strictly concentrate on therapeutic regimens and omit sections on clinical diagnosis	No	No	Yes	Yes	Treatment recommendations (with level of evidence and strength of recommendation) only listed in text Provides guidance for monthly amounts of topical corticosteroids (in grams) and how to quantify topical therapy amounts (ie, FTU)	Free from EDF and GAAPP, but not from journal

TABLE 1 Continued

Methodology (Sponsoring Organization[s], Year)	Evaluation Criteria		Treatment Recommendations			Utility	
	Diagnostic Criteria?	Severity Evaluation?	Algorithm?	Severity-Based?	Criteria to Step-Up/Down Treatment?	Usability	Applicability: Working Group Composition and/or Intended Audience
Review of literature rated by category of evidence and strength of recommendation (update of ACAAI and AAAAI 2004 Practice Parameter, 2012) ⁹	Yes	Only for severe	Annotated linear management and treatment model	Yes	Yes	Treatment recommendations (with strength of recommendation) and algorithm details only listed in text as part of online supplement	"The evaluation and management of AD are an integral part of an allergist/immunologist's training and practice. It is also important for the PCP to understand the basis for effective evaluation and management..."
						Algorithm annotations and summary statements not integrated with algorithm	"Cooperation between the patient and/or the patient's guardian or guardians, the PCP, and the allergist, dermatologist, or both is important in the implementation of strategies necessary for the care of patients with chronic AD.... Even when an AD specialist is consulted, the PCP continues to play an important role in the care of patients with AD by ensuring continuity of care." In addition to allergists/immunologists, task force included psychologist and dermatologists
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) ¹⁰⁻¹³	Yes	No	No	No	No	Treatment and diagnosis recommendations listed in tables Level of evidence and strength of recommendation listed separately from recommendations Clinical questions that are new since last issuance indicated	In addition to dermatologists, working group included patient advocate and international representatives (Canada and UK) Free from AAD, but not from journal

ACAAI 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 Allergy and Clinical Immunology; EDF, European Dermatology Forum; FTU, fingertip unit; GAAPP, Global Allergy and Asthma Patient Platform; HOP, healthcare provider; JTF, AAAAI/ACAAI Joint Task Force on Practice Parameters; PRACTALL, Practical Allergy; PCP, primary care physician; TCI, topical calcineurin inhibitor.

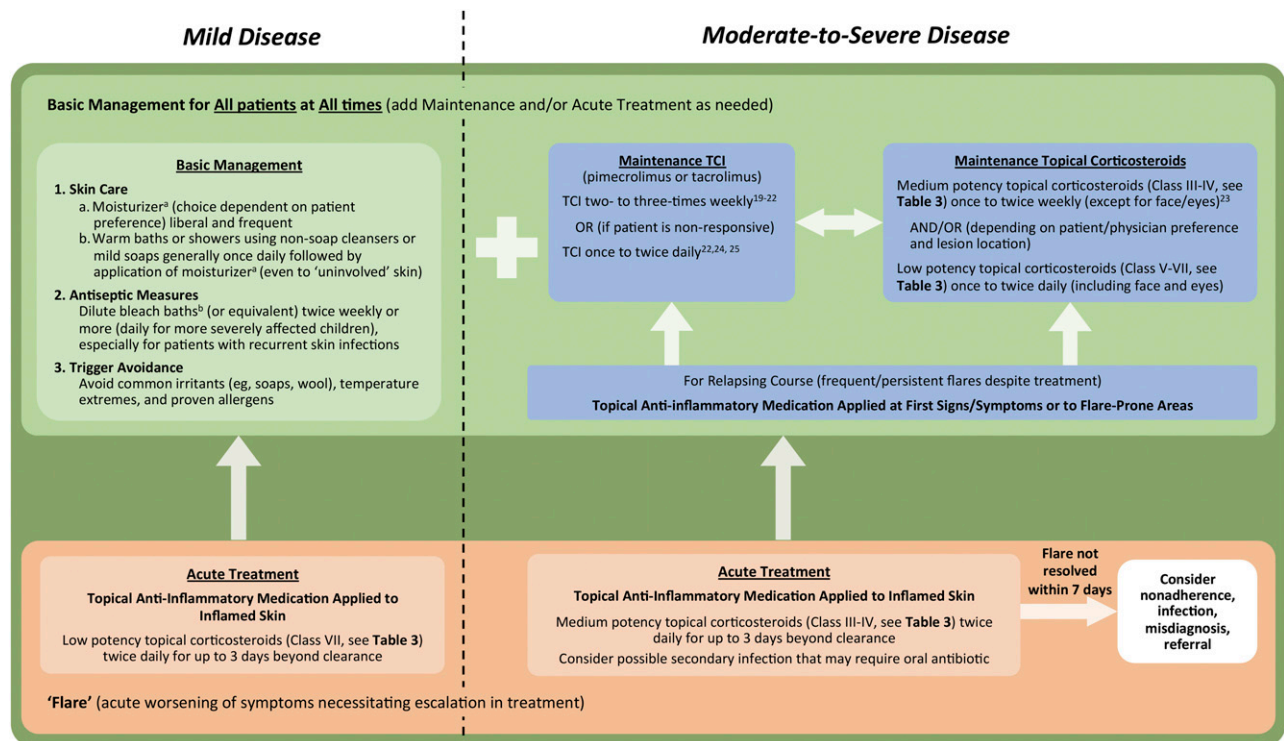


FIGURE 1

Proposed treatment model/eczema action plan for pediatricians and other primary care providers. ^aAs tolerated during flare; direct use of moisturizers on inflamed skin may be poorly tolerated; however, bland petrolatum is often tolerated when skin is inflamed. ^bApproximately 0.5 cups sodium hypochlorite per 40 gallons of water/full bathtub or 1 mL/L. 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). Tacrolimus¹⁸⁻²¹ and fluticasone²² 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.^{23,24} 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 rate²⁵); this is particularly true for sensitive skin sites, such as the face, neck, and "diaper area."¹¹ 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

Essential Features	Important Features	Associated Features
Both must be present	Add support to the diagnosis, observed in most cases of AD	Suggestive of AD, but too nonspecific to be used for defining or detecting AD in research or epidemiologic studies
1. Pruritus	1. Early age of onset	1. Atypical vascular responses (eg, facial pallor, white dermographism, delayed blanch response)
2. Eczema (acute, subacute, chronic)	2. Atopy	2. Keratosis pilaris/pityriasis alba/hyperlinear palms/ichthyosis
a. Typical morphology and age-specific patterns	a. Personal and/or family history	3. Ocular/periorbital changes
•Infants/children: facial, neck, and extensor involvement	b. IgE reactivity	4. Other regional findings (eg, perioral changes/periauricular lesions)
•Any age group: current or previous flexural lesions	3. Xerosis	5. Perifollicular accentuation/lichenification/prurigo lesions
•Sparing of the groin and axillary regions		
b. Chronic or relapsing history		
Exclusionary Conditions		
Diagnosis of AD depends on excluding conditions		
•Scabies	•Seborrheic dermatitis	•Photosensitivity dermatoses
•Psoriasis	•Contact dermatitis (irritant or allergic)	•Immune deficiency diseases
•Ichthyoses	•Cutaneous T-cell lymphoma	•Erythroderma of other causes

AD, atopic dermatitis; IgE, immunoglobulin E. Adapted from Eichenfield 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. Nonspecific 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

TABLE 3 Topical Corticosteroid Potencies, Strengths, and Formulations

Class	Strength, %	Available Formulations					
Drug		Ointment	Cream	Lotion	Foam	Solution	Gel
I. Very high potency							
Augmented betamethasone dipropionate	0.05	✓					
Clobetasol propionate	0.05	✓	✓		✓	✓	
Diflorasone diacetate	0.05	✓					
Halobetasol propionate	0.05	✓	✓				
II. High potency							
Amcinonide	0.1	✓	✓	✓			
Augmented betamethasone dipropionate	0.05		✓				
Betamethasone dipropionate	0.05	✓	✓		✓	✓	
Desoximetasone		0.25	0.25				0.05
Diflorasone diacetate	0.05		✓				
Fluocinonide	0.05	✓	✓			✓	✓
Halcinonide	0.1	✓	✓				
Mometasone furoate	0.1	✓					
Triamcinolone acetonide	0.5	✓	✓				
III–IV. Medium potency							
Betamethasone valerate	0.1	✓	✓	✓	✓		
Clocortolone pivalate	0.1		✓				
Desoximetasone	0.05		✓				
Fluocinolone acetonide	0.025	✓	✓				
Flurandrenolide	0.05	✓	✓				
Fluticasone propionate		0.005	0.05				
Mometasone furoate	0.1		✓				
Triamcinolone acetonide	0.1	✓	✓				
V. Lower-medium potency							
Hydrocortisone butyrate	0.1	✓	✓			✓	
Hydrocortisone probutate	0.1		✓				
Hydrocortisone valerate	0.2	✓	✓				
Prednicarbate	0.1		✓				
VI. Low potency							
Alclometasone dipropionate	0.05	✓	✓				
Desonide	0.05	✓	✓		✓		✓
Fluocinolone acetonide	0.01		✓			✓	
VII. Lowest potency							
Dexamethasone	0.1		✓				
Hydrocortisone	0.25, 0.5, 1	✓	✓	✓		✓	
Hydrocortisone acetate	0.5–1	✓	✓				

Includes representative examples and not all available agents. Adapted from Paller and Mancini.¹⁸

disorders³⁰ have been reported, especially among patients with AD and sleep loss.^{28–30} 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),³¹ topical antiinflammatories,^{32–34} emollients,³⁵ hypnotherapy,³⁶ and/or reducing sensory input³⁷ 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.³⁸

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).^{8,9,11} In addition, adding a small amount of bleach (sodium hypochlorite; ~0.5 cups per 40 gallons of water/full bathtub or 1 mL/L) on a twice weekly basis has been shown to reduce AD severity.³⁹ Daily use of these dilute bleach baths, or comparable sodium hypochlorite-based products while

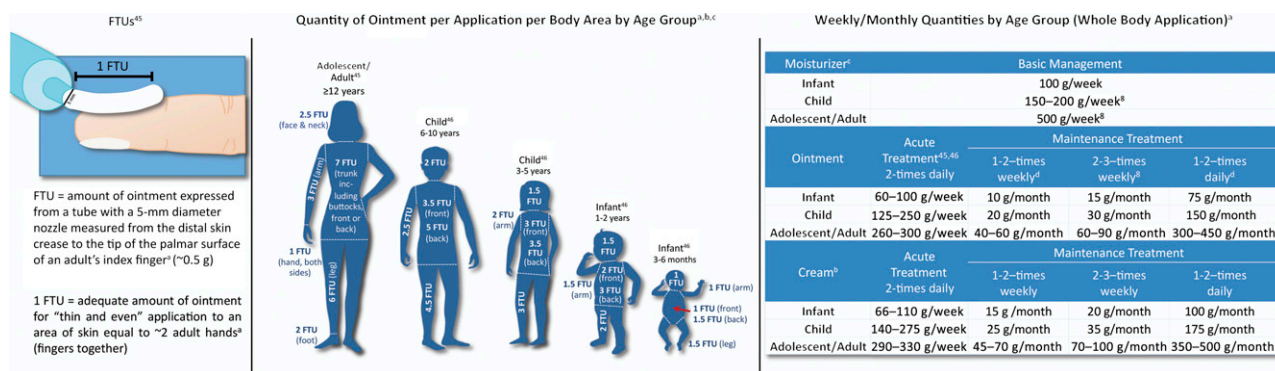


FIGURE 2

Topical application amounts. ^aMeasurements/quantities are relative to adult hand/finger sizes, regardless of age group. ^bQuantity for creams should be increased by ~10% over ointment. ^cQuantity for moisturizers may exceed the suggested values. ^dEstimated based on monthly amounts for 2 to 3 times weekly application per Ring et al.⁷ FTU, fingertip unit.

showering or otherwise washing,⁴⁰ 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 established⁴¹). 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 flares¹¹; 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.⁴² 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.⁴³

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.^{9,13} 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.⁹ 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.^{44,45} It is defined as the amount of ointment expressed from a tube with a 5-mm diameter nozzle

measured from the distal skin crease to the tip of the palmar surface of an adult's index finger. This is equal to ~0.5 g and is an amount adequate for "thin and even" application to an area of skin equal to ~2 adult hands with fingers together. The number of FTUs required to treat different body areas varies with patient age, but 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.aaafa.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/a---d/atopic-dermatitis>
- 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

All roundtable and article content was developed independent of funding source. Jennifer Jaworski, MS, a full-time employee of Prescott Medical Communications Group (Chicago, IL) assisted with preparation of the article at the direction of the authors with financial support from Valeant.

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

FINANCIAL DISCLOSURE: The authors have indicated they have no financial relationships relevant to this article to disclose.

FUNDING: Funded by Valeant Pharmaceuticals North America, LLC.

POTENTIAL CONFLICT OF INTEREST: Dr Eichenfield has been a principal investigator for Astellas Pharma US, Inc, Galderma Laboratories, LP, and Stiefel Laboratories, Inc; he has received compensation for his work as a consultant for Valeant Pharmaceuticals North America, LLC, Anacor Pharmaceuticals, Inc, Galderma, Promius Pharma, LLC, and Stiefel, TopMD, Inc; Drs Boguniewicz and Simpson have received financial compensation for their work as consultants for Valeant Pharmaceuticals North America, LLC; Dr Russell has received financial compensation for his work as a consultant for Valeant Pharmaceuticals North America, LLC, as a Speakers Bureau member for SanofiPasteur US, and as an Advisory Board member for Takeda Pharmaceuticals USA, Inc; Ms Block is a salaried executive of National Eczema Association, which has received grants and sponsorship awards from a variety of industry partners including Valeant Pharmaceuticals North America, LLC (full list at: <http://nationaleczema.org/corporate-partners/>); Dr Feldman has received research, speaking and/or consulting support from a variety of companies including Valeant Pharmaceuticals North America, LLC, Astellas Pharma US, Inc, AbbVie, Inc, Advance Medical, Amgen, Inc, Anacor Pharmaceuticals, Inc, Baxter, Boehringer Ingelheim GmbH, CVS/caremark, Celgene Corporation, Eli Lilly and Company, Galderma Laboratories, LP, Informa Healthcare, Janssen Pharmaceutical, Inc, Leo Pharma, Inc, Pfizer, Inc, Merck & Co, Inc, Merz Pharma GmbH & Co KGaA, Mylan, Inc, National Biological Corp, Novartis Corporation, Qurient Co, Ltd, Stiefel Laboratories, Inc, Suncare Research Laboratories, LLC, UpToDate, Inc, and National Psoriasis Foundation, and Dr Feldman is founder and part owner of Causa Research, a company dedicated to enhancing patients' adherence to treatment; Ms Clark has been a subinvestigator for Astellas Pharma US, Inc, Medicus Pharmaceutical Corporation (now part of Valeant), Galderma Laboratories, LP, Anacor Pharmaceuticals, Inc, Stiefel Laboratories, Inc, Maruho Co, Ltd, Merz Pharma GmbH & Co KGaA, Regeneron Pharmaceuticals, Inc, and HanAll Biopharma, and she has received financial compensation for her work as a consultant for Valeant Pharmaceuticals North America, LLC; Ms Tofte has received financial compensation for her work as a consultant for Valeant Pharmaceuticals North America, LLC, and as Advisory Board member for Amgen, Inc, and Johnson & Johnson Consumer & Personal Products Worldwide; Dr Dunn has received financial compensation for his work as a consultant for Valeant Pharmaceuticals North America, LLC, and Stiefel Laboratories, Inc; Dr Paller has been a principal investigator for Anacor Pharmaceuticals, Inc, Astellas Pharma US, Inc, and TopMD, Inc, and she has received financial compensation for her work as a consultant for Valeant Pharmaceuticals North America, LLC, Anacor, Galderma Laboratories, LP, Onset Dermatologics, Promius Pharma, LLC, and Stiefel Laboratories, Inc.

REFERENCES

- Jackson KD, Howie LD, Akinbami LJ. *Trends in Allergic Conditions Among Children: United States, 1997–2011. NCHS Data Brief, No. 121.* Hyattsville, MD: National Center for Health Statistics; 2013
- Silverberg JI, Simpson EL. Association between severe eczema in children and multiple comorbid conditions and increased healthcare utilization. *Pediatr Allergy Immunol.* 2013;24(5): 476–486
- Saavedra JM, Boguniewicz M, Chamlin S, et al. Patterns of clinical management of atopic dermatitis in infants and toddlers: a survey of three physician specialties in the United States. *J Pediatr.* 2013;163(6): 1747–1753
- Hanifin JM, Cooper KD, Ho VC, et al. Guidelines of care for atopic dermatitis, developed in accordance with the American Academy of Dermatology (AAD)/American Academy of Dermatology Association “Administrative Regulations for Evidence-Based Clinical Practice Guidelines”. *J Am Acad Dermatol.* 2004;50(3):391–404
- Leung DY, Nicklas RA, Li JT, et al. Disease management of atopic dermatitis: an updated practice parameter. Joint Task Force on Practice Parameters. *Ann Allergy Asthma Immunol.* 2004;93(3 suppl 2):S1–S21
- Akdis CA, Akdis M, Bieber T, et al; European Academy of Allergy; Clinical Immunology/American Academy of Allergy, Asthma and Immunology/PRACTALL Consensus Group. Diagnosis and treatment of atopic dermatitis in children and adults: European Academy of Allergy and Clinical Immunology/American Academy of Allergy, Asthma and Immunology/PRACTALL Consensus Report. *Allergy.* 2006;61(8):969–987
- Ring J, Alomar A, Bieber T, et al; European Dermatology Forum; European Academy of Dermatology and Venereology; European Task Force on Atopic Dermatitis; European Federation of Allergy; European Society of Pediatric Dermatology; Global Allergy and Asthma European Network. Guidelines for treatment of atopic eczema (atopic dermatitis) Part II. *J Eur Acad Dermatol Venereol.* 2012; 26(9):1176–1193
- Ring J, Alomar A, Bieber T, et al; European Dermatology Forum (EDF); European Academy of Dermatology and Venereology (EADV); European Federation of Allergy (EFA); European Task Force on Atopic Dermatitis (ETFAD); European Society of Pediatric Dermatology (ESPD); Global Allergy and Asthma European Network (GA2LEN). Guidelines for treatment of atopic eczema (atopic dermatitis) part I. *J Eur Acad Dermatol Venereol.* 2012;26(8): 1045–1060
- Schneider L, Tilles S, Lio P, et al Atopic dermatitis: a practice parameter update 2012. *J Allergy Clin Immunol.* 2013; 131(2):295–299
- Eichenfield LF, Tom WL, Chamlin SL, et al. Guidelines of care for the management of atopic dermatitis: section 1. Diagnosis and assessment of atopic dermatitis. *J Am Acad Dermatol.* 2014; 70(2):338–351
- Eichenfield LF, Tom WL, Berger TG, et al. Guidelines of care for the management of atopic dermatitis: section 2. Management and treatment of atopic dermatitis with topical therapies. *J Am Acad Dermatol.* 2014;71(1):116–132
- Sidbury R, Davis DM, Cohen DE, et al; Guidelines of care for the management of atopic dermatitis: section 3. Management and treatment with

- phototherapy and systemic agents. *J Am Acad Dermatol.* 2014;71(2):327–349
13. Sidbury R, Tom WL, Bergman JN, et al. Guidelines of care for the management of atopic dermatitis: Section 4. Prevention of disease flares and use of adjunctive therapies and approaches. *J Am Acad Dermatol.* 2014;71(6):1218–1233
 14. Eichenfield LF, Hanifin JM, Luger TA, Stevens SR, Pride HB. Consensus conference on pediatric atopic dermatitis. *J Am Acad Dermatol.* 2003; 49(6):1088–1095
 15. Rajka G, Langeland T. Grading of the severity of atopic dermatitis. *Acta Derm Venereol Suppl (Stockh).* 1989;144:13–14
 16. Langan SM, Thomas KS, Williams HC. What is meant by a “flare” in atopic dermatitis? A systematic review and proposal. *Arch Dermatol.* 2006;142(9): 1190–1196
 17. Paller AS, Mancini AJ. Eczematous eruptions in childhood. In: Paller AS, Mancini AJ, eds. *Hurwitz Clinical Pediatric Dermatology*, 4th ed, Chapter 3. St. Louis, MO: Elsevier, Inc; 2011:49
 18. Breneman D, Fleischer AB Jr, Abramovits W, et al; Tacrolimus Ointment Study Group. Intermittent therapy for flare prevention and long-term disease control in stabilized atopic dermatitis: a randomized comparison of 3-times-weekly applications of tacrolimus ointment versus vehicle. *J Am Acad Dermatol.* 2008;58(6):990–999
 19. Paller AS, Eichenfield LF, Kirsner RS, Shull T, Jaracz E, Simpson EL; US Tacrolimus Ointment Study Group. Three times weekly tacrolimus ointment reduces relapse in stabilized atopic dermatitis: a new paradigm for use. *Pediatrics.* 2008;122(6). Available at: www.pediatrics.org/cgi/content/full/122/6/e1210
 20. Thaçi D, Reitamo S, Gonzalez Ensenat MA, et al; European Tacrolimus Ointment Study Group. Proactive disease management with 0.03% tacrolimus ointment for children with atopic dermatitis: results of a randomized, multicentre, comparative study. *Br J Dermatol.* 2008;159(6):1348–1356
 21. Wollenberg A, Reitamo S, Atzori F, et al; European Tacrolimus Ointment Study Group. Proactive treatment of atopic dermatitis in adults with 0.1% tacrolimus ointment. *Allergy.* 2008;63(6): 742–750
 22. Hanifin J, Gupta AK, Rajaogopalan R. Intermittent dosing of fluticasone propionate cream for reducing the risk of relapse in atopic dermatitis patients. *Br J Dermatol.* 2002;147(3):528–537
 23. Schmitt J, von Kobyletzki L, Svensson A, Apfelbacher C. Efficacy and tolerability of proactive treatment with topical corticosteroids and calcineurin inhibitors for atopic eczema: systematic review and meta-analysis of randomized controlled trials. *Br J Dermatol.* 2011; 164(2):415–428
 24. Reitamo S, Allsopp R. Treatment with twice-weekly tacrolimus ointment in patients with moderate to severe atopic dermatitis: results from two randomized, multicentre, comparative studies. *J Dermatolog Treat.* 2010;21(1): 34–44
 25. Hengge UR, Ruzicka T, Schwartz RA, Cork MJ. Adverse effects of topical glucocorticosteroids. *J Am Acad Dermatol.* 2006;54(1):1–15, quiz 16–18
 26. Garg N, Silverberg JI. Association between childhood allergic disease, psychological comorbidity, and injury requiring medical attention. *Ann Allergy Asthma Immunol.* 2014;112(6):525–532
 27. Schmitt J, Buske-Kirschbaum A, Roessner V. Is atopic disease a risk factor for attention-deficit/hyperactivity disorder? A systematic review. *Allergy.* 2010;65(12):1506–1524
 28. Romanos M, Gerlach M, Warnke A, Schmitt J. Association of attention-deficit/hyperactivity disorder and atopic eczema modified by sleep disturbance in a large population-based sample. *J Epidemiol Community Health.* 2010;64(3):269–273
 29. Schmitt J, Chen CM, Apfelbacher C, et al; LISA-plus Study Group. Infant eczema, infant sleeping problems, and mental health at 10 years of age: the prospective birth cohort study LISApplus. *Allergy.* 2011;66(3):404–411
 30. Yaghmaie P, Koudelka CW, Simpson EL. Mental health comorbidity in patients with atopic dermatitis. *J Allergy Clin Immunol.* 2013;131(2):428–433
 31. Kelsay K. Management of sleep disturbance associated with atopic dermatitis. *J Allergy Clin Immunol.* 2006; 118(1):198–201
 32. Kaufmann R, Fölster-Holst R, Höger P, et al; CASM981CDE04-Study Group. Onset of action of pimecrolimus cream 1% in the treatment of atopic eczema in infants. *J Allergy Clin Immunol.* 2004; 114(5):1183–1188
 33. Bieber T, Vick K, Fölster-Holst R, et al. Efficacy and safety of methylprednisolone aceponate ointment 0.1% compared to tacrolimus 0.03% in children and adolescents with an acute flare of severe atopic dermatitis. *Allergy.* 2007;62(2):184–189
 34. Doss N, Kamoun MR, Dubertret L, et al. Efficacy of tacrolimus 0.03% ointment as second-line treatment for children with moderate-to-severe atopic dermatitis: evidence from a randomized, double-blind non-inferiority trial vs. fluticasone 0.005% ointment. *Pediatr Allergy Immunol.* 2010;21(2 pt 1):321–329
 35. Mason JM, Carr J, Buckley C, et al. Improved emollient use reduces atopic eczema symptoms and is cost neutral in infants: before-and-after evaluation of a multifaceted educational support programme. *BMC Dermatol.* 2013;13:7
 36. Stewart AC, Thomas SE. Hypnotherapy as a treatment for atopic dermatitis in adults and children. *Br J Dermatol.* 1995; 132(5):778–783
 37. Shani-Adir A, Rozenman D, Kessel A, Engel-Yeger B. The relationship between sensory hypersensitivity and sleep quality of children with atopic dermatitis. *Pediatr Dermatol.* 2009;26(2): 143–149
 38. Eichenfield LF, Mancini AJ. Personal Care Plan. *Semin Cutan Med Surg.* 2012;31 (3S):30–31
 39. Huang JT, Abrams M, Tlougan B, Rademaker A, Paller AS. Treatment of *Staphylococcus aureus* colonization in atopic dermatitis decreases disease severity. *Pediatrics.* 2009;123(5). Available at: www.pediatrics.org/cgi/content/full/123/5/e808
 40. Ryan C, Shaw RE, Cockerell CJ, Hand S, Ghali FE. Novel sodium hypochlorite cleanser shows clinical response and excellent acceptability in the treatment of atopic dermatitis. *Pediatr Dermatol.* 2013;30(3):308–315
 41. Fritz SA, Camins BC, Eisenstein KA, et al. Effectiveness of measures to eradicate *Staphylococcus aureus* carriage in patients with community-associated skin

- and soft-tissue infections: a randomized trial. *Infect Control Hosp Epidemiol*. 2011; 32(9):872–880
42. Krakowski AC, Eichenfield LF, Dohil MA. Management of atopic dermatitis in the pediatric population. *Pediatrics*. 2008; 122(4):812–824. Available at: <http://pediatrics.aappublications.org/content/122/4/812>
 43. Nicol NH, Boguniewicz M, Strand M, Klennert MD. Wet wrap therapy in children with moderate to severe atopic dermatitis in a multidisciplinary treatment program. *J Allergy Clin Immunol Pract*. 2014;2(4):400–406
 44. Long CC, Finlay AY. The finger-tip unit—a new practical measure. *Clin Exp Dermatol*. 1991;16(6):444–447
 45. Long CC, Mills CM, Finlay AY. A practical guide to topical therapy in children. *Br J Dermatol*. 1998;138(2):293–296
 46. Luersen K, Davis SA, Kaplan SG, Abel TD, Winchester WW, Feldman SR. Sticker charts: a method for improving adherence to treatment of chronic diseases in children. *Pediatr Dermatol*. 2012;29(4):403–408

MORE PERILS OF ONLINE DATING: *My friends range in age from their mid-20s to mid-70s. While many are in long-term committed relationships, quite a few are looking for partners - either because they have yet to meet the right person, or are now divorced or widowed. Almost all of those looking for a partner have used online dating services. My younger friends have grown up with these tools and are appropriately skeptical of what may be posted, but my older friends and acquaintances seem to be more accepting and trusting. Unfortunately that can be problematic. As reported in The New York Times (Your Money: July 17, 2015), criminals are targeting somewhat older women (generally those in their 50s and 60s) on dating sites. Typically, the criminals hack into a dormant account and pose as someone from the United States who is now traveling overseas. The constant attention is initially quite flattering and fills a void in the woman's life. However, the swindler soon begins to ask for money for various reasons ranging from hospitalization, identify theft, or business deals. The victims wind up sending money and do not realize the problem until huge sums have been lost. In Vermont, the victims on average have lost \$40,000 to \$100,000 dollars. One woman lost more than \$200,000 dollars. The issue is such a problem that the Vermont State Legislature may pass a bill requiring online dating services to notify members of suspicious activity on their accounts. The AARP recommends that dating sites employ more sophisticated algorithms to detect suspicious patterns and that dating site members use search engines to learn if the profile image they are viewing is used on multiple web sites with different names. Regrettably, many victims are so embarrassed that they do not report the losses to their family or friends. Recovering the money is extremely challenging as these types of criminals use false email accounts and many are based in West Africa. The best approach is to prevent such losses. While it should be self-apparent, one should be extremely cautious about sending money to someone you have never actually met.*

Noted by WVR, MD

Translating Atopic Dermatitis Management Guidelines Into Practice for Primary Care Providers

Lawrence F. Eichenfield, Mark Boguniewicz, Eric L. Simpson, John J. Russell, Julie K. Block, Steven R. Feldman, Adele R. Clark, Susan Tofte, Jeffrey D. Dunn and Amy S. Paller

Pediatrics 2015;136;554; originally published online August 3, 2015;

DOI: 10.1542/peds.2014-3678

Updated Information & Services

including high resolution figures, can be found at:
<http://pediatrics.aappublications.org/content/136/3/554.full.html>

References

This article cites 44 articles, 4 of which can be accessed free at:
<http://pediatrics.aappublications.org/content/136/3/554.full.html#ref-list-1>

Subspecialty Collections

This article, along with others on similar topics, appears in the following collection(s):
Dermatology
http://pediatrics.aappublications.org/cgi/collection/dermatology_sub

Permissions & Licensing

Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at:
<http://pediatrics.aappublications.org/site/misc/Permissions.xhtml>

Reprints

Information about ordering reprints can be found online:
<http://pediatrics.aappublications.org/site/misc/reprints.xhtml>

PEDIATRICS is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. PEDIATRICS is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2015 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 0031-4005. Online ISSN: 1098-4275.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™



PEDIATRICS®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

Translating Atopic Dermatitis Management Guidelines Into Practice for Primary Care Providers

Lawrence F. Eichenfield, Mark Boguniewicz, Eric L. Simpson, John J. Russell, Julie K. Block, Steven R. Feldman, Adele R. Clark, Susan Tofte, Jeffrey D. Dunn and Amy S. Paller

Pediatrics 2015;136;554; originally published online August 3, 2015;
DOI: 10.1542/peds.2014-3678

The online version of this article, along with updated information and services, is
located on the World Wide Web at:

<http://pediatrics.aappublications.org/content/136/3/554.full.html>

PEDIATRICS is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. PEDIATRICS is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2015 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 0031-4005. Online ISSN: 1098-4275.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™

