

Nordic European Countries Atopic Dermatitis (NECAD) I: Importance of Concordance With Skincare for Atopic Dermatitis

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ABSTRACT

Background: Atopic dermatitis (AD) is a chronic disease with a dysfunctional skin barrier, requiring continuous management to reduce symptoms and prevent flares. Topical treatment comprises the cornerstone of AD management. The paper's objective was to summarize current recommendations for skincare in AD, addressing challenges and possible interventions for improved concordance. Method: The *Nordic European Countries Atopic Dermatitis* (NECAD) panel of dermatologists discussed surveys, literature, and professional experiences regarding skincare in AD management. Five consensus statements were established to share general insights and suggestions to improve treatment concordance.

Results: Skincare with emollients is the recommended basis of AD management. Concordance to topical treatment is considered a significant challenge in AD. Evidence suggests that newer, more comprehensive emollients are superior to basic emollients regarding both clinical effect and convenience in patients' daily routine. Interventional tools such as evidence-based patient education, AD action plans, and closer physical and/or digital follow-up were suggested.

Conclusion: The effectiveness of topical treatment in AD is highly dependent on the type of emollient used as well as patient concordance. With increasing evidence and focus on patient education, concordance and, thus, treatment outcomes can be improved.

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INTRODUCTION

Atopic dermatitis (AD) is a chronic, relapsing skin disease presenting with inflammation, pruritus, and xerosis.^{1,2} A family history of atopy and related comorbidities such as asthma and allergic rhinitis is often seen in AD patients, particularly associated with severity and early onset.³ Generally, AD is the most common skin disease in young children, and exacerbations are common and may present lifelong.^{1,2} Flares are associated with sleep deprivation, stigmatization, social withdrawal, anxiety, and depression, and may substantially impact quality of life.⁴

The main clinical characteristics of AD typically include erythema, edema, excoriations, and xerosis.¹ However, characteristics differ depending on age and ethnicity, which

trained dermatologists can identify and distinguish, but may be challenging for other healthcare providers such as general practitioners (GPs).^{2,5}

AD is pathologically characterized by its skin barrier dysfunction, which commonly, but not exclusively, is driven by specific filaggrin gene mutations and downregulation of filaggrin and other skin barrier proteins due to inflammation.^{2,6} Xerosis is a prominent feature that leads to irritation, micro-fissures, and cracks, due to decreased amount of skin lipids in AD-affected skin and increased transepidermal water loss (TEWL). Additionally, the skin barrier dysfunction leaves the skin more susceptible to bacterial colonization, particularly *Staphylococcus aureus*, contributing to exacerbation and a higher skin infection rate.^{1,7}

External factors, ranging from climate to skin products, can significantly impact AD, either positively or negatively. In comparison to sunny, humid climates, the cold and drier Nordic climates increase the burden of AD. Skin products containing irritants and allergens can negatively affect the skin barrier, whereas specialized moisturizing products support better skin barrier function. Early microbiome alteration has also been suggested as a possible mechanism for decreasing both AD severity and risk of developing atopic comorbidities.³

Globally, AD presents with a high burden of disease for both patients and caregivers, including dermatological, pediatric, and general practice, but also families of young AD patients.^{5,8}

According to international guidelines, daily use of moisturizing skincare, with so-called emollients, is considered the basis of AD management, as it may prevent flares and reduce symptoms.⁹ Specifically, emollients with hydrophilic formula in summer and higher lipid content in winter, and gentle cleansing/bathing with no irritants, are the gold standard recommendation.¹⁰ Some studies suggest that following recommendations from the earliest possible time point may be determinant for AD-prone infants' patient journey, reducing frequency and severity of flares and intervening with the atopic march development of asthma, allergic rhinitis, or food allergies.^{11,12} Increasingly, studies indicate that emollients are not created equally and that selecting the right emollient for the individual patient is crucial. Regrettably, non-concordance to topical treatment has proven a significant challenge in AD.¹³⁻¹⁵ Patients' reasons for not using prescribed emollients range broadly from a sticky or stinging feeling to failing establishment of a daily routine or not experiencing a swift, positive effect. Treatment adherence is crucial for optimal effect, and non-concordance is a major limiting factor for positive treatment outcomes in AD.^{13,15} Although AD topical treatment adherence is understudied and proven difficult to assess and compare, studies have shown 40% adherence to as short as 5-day treatment regimens, and down to 30% adherence to 8-week treatment plans.^{13-15,16} New approaches to improve concordance may improve the AD patient journey, particularly for better distinction between non-concordance and non-response in individual patients.¹⁴

The objective of this paper was to establish and discuss 5 consensus statements addressing the importance of, and related challenges with, concordance to emollient use in AD patients, and suggesting potential interventions for improvement.

MATERIALS AND METHODS

NECAD Panel Meeting

A panel of advisors, consisting of five dermatologists from Nordic European countries and one from the UK, who treat AD patients, participated in a consensus meeting on March 8, 2025. The panel aimed to describe and discuss the importance of concordance with skincare, including wash products and

emollients, in AD management. The advisors identified risk factors associated with non-concordance with basic skincare and explored the significance of the right skincare, particularly emollients, for individual AD patients. Available Nordic market surveys were added as discussion points for the advisors.¹⁷⁻¹⁹ Working in small groups, the advisors revised draft statements based on the literature, surveys, and their own professional opinions and clinical experience. They then reconvened as a plenary group to reach consensus on 5 statements through blinded reiterations. Subsequent reviewing and editing of the manuscript took place online.

Definition of Concordance

Current medical practice encompasses a holistic approach to patient care, integrating a disease's social, psychological, and pathological aspects. Treatment adherence is essential for improving treatment outcomes. The concept of concordance respects the patient's integrity, autonomy, and self-determination, encouraging the patient to actively and equally participate in their comprehensive treatment regimen. This approach establishes a collective therapeutic alliance, based on trust and communication, fulfilling both patient and physician aspirations and expectations.²⁰

Literature Review

Prior to the meeting, the literature on concordance and current best practices on skincare in AD management was compiled. On January 8, 2025, exploratory searches were performed on PubMed and Google Scholar by reviewing titles and abstracts, then full articles, using the search terms: atopic dermatitis AND skincare OR cleansers OR emollients OR adherence OR compliance OR concordance to treatment. Selected articles included clinical guidelines, algorithms, consensus papers, systematic literature reviews, and clinical studies published in English between January 2015 and 2025. Publications in non-English or not addressing adherence/compliance/concordance with skincare for AD were excluded. Two reviewers (AA/HA) independently evaluated the search results, manually reviewing the selected publications. Database searches identified 63 records, of which 25 articles were included; see Figure 1 for the flowchart.

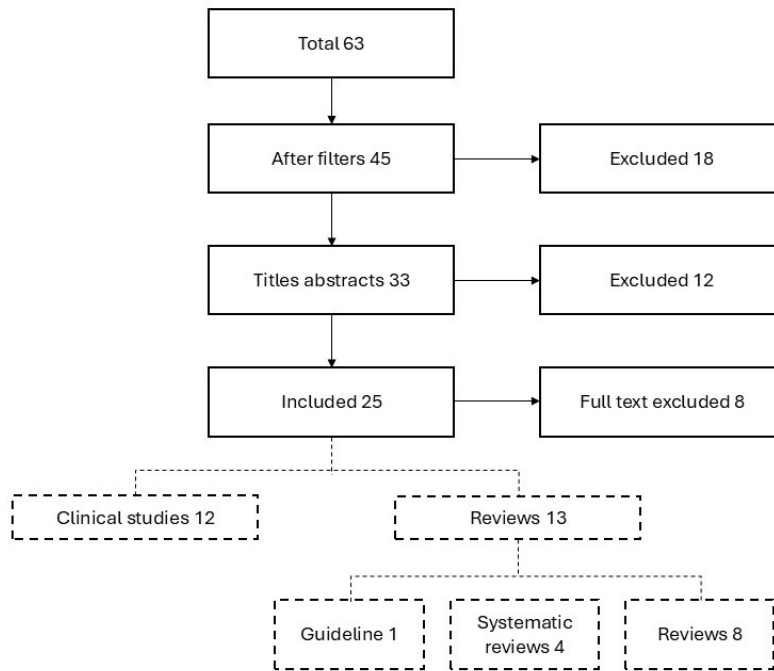
RESULTS AND DISCUSSION

Nordic Survey Insights

Surveys on the Nordics' emollient use in AD patients provided insights into the market and the experiences and options of prescribers and patients in the different Nordic countries (Table 1).¹⁷⁻¹⁹

Consensus Statements

Statement 1: *Topical medications are the mainstay of treatment, and when used as directed, they are highly effective; but poor concordance yields poor treatment outcomes and high costs.*

FIGURE 1. Flowchart of literature search.**TABLE 1.**

Survey Insights Into Nordic Countries Market, Prescribers and Patients		
Market Insights	Prescriber Insights	Patient Insights
<u>Norway / Sweden:</u> • Skincare prescription <i>or</i> recommendation. Reimbursement depends on emollient being registered as drug (OTC). <u>Finland:</u> • Skincare prescription <i>or</i> recommendation. Reimbursement depends on emollient being produced under Pharma GMP. <u>Denmark:</u> • Skincare recommendation only. No general emollient reimbursement.	<u>All Nordic countries:</u> • Skincare with emollients is a cornerstone in AD treatment • Patient education in emollient use, regardless of AD severity, is crucial • Individualized medical recommendations may improve compliance, but research evidence is scarce • Concordance challenges include vast market of products, high costs for patients and patient dissatisfaction of formulations	<u>All Nordic countries:</u> • 90% of patients report picking up prescribed emollient • ~40% of patients do not use the emollient as recommended • Poor compliance is due to one or several of the following objections: 43% greasy/sticky feeling 15% stinging upon application 23% not experiencing improvement 20% not establishing a daily routine

Abbreviations: OTC, over-the-counter (non-prescription) drug; GMP, good manufacturing practice; AD, atopic dermatitis.

Topical treatment of AD consists of a ground basis of emollients for improving skin barrier function and topical medications, mainly addressing the inflammatory component of AD. Additionally, dysbiosis in AD may require topical antibiotics, but the risk of resistance development limits their use. In combination, topical treatment is generally highly effective when used as recommended.⁹ However, non-response to topical treatment is common in AD, which is mainly believed to be due to poor concordance.¹⁴ Early intervention appears important in AD-prone infants to reduce the number and severity of flares, as

well as decrease their risk for development of AD comorbidities, including asthma, food allergies, and allergic rhinitis (Table 2).³⁻¹¹

Statement 2: *Poor concordance may be related to multiple factors comprising forgetfulness, time-consuming topical treatment, financial burden, lack of a trusting physician-patient relationship, dislike of the prescribed/recommended vehicle, poor understanding of the disease and proper application of medication or skincare.*

TABLE 2.

Topical Treatments for Atopic Dermatitis	
Severity of AD	Topical Treatment
Severe	High potency TCS + TCI + emollients
Moderate	Medium potency TCS + TCI + emollients
Mild	Low potency TCS + TCI + emollients
Controlled	TCI or TCS + emollients
Maintenance (to areas of predilection)	TCI or TCS + emollients
Long-term maintenance and prevention	Gentle wash products and emollients

Abbreviations: TCS, topical corticosteroid; TCI, topical calcineurin inhibitor.

Since AD is a chronic skin disease, it requires continuous, long-term management, which has proven to be a significant challenge. Poor concordance to daily emollient use is a major factor limiting treatment outcomes in AD patients. Concordance, and the lack thereof, may be related to challenges in the daily routine, significant time-consumption with application, as well as related costs, which can be substantial.^{15,20,21}

Low degree of patient knowledge and understanding of AD, and the necessary, continuous effort in topical management, may further reduce concordance. It may also be associated with suboptimal physician-patient relationships or general dislike of or objection to the prescribed products, as seen in steroid phobia.^{20,22}

Clinicians should consider patients' lifestyle, convictions, and preferences during the development of individual treatment plans.⁹ Shared decision-making is essential, as implementation of daily routines and treatment may involve the whole family, and in some cases, a psychosocial approach or intervention is required.^{20,23}

Additionally, helping patients identify products and/or ingredients to avoid can support individualized topical treatment plans. Clinicians should be able to provide information on emollients and wash products in general, to establish a good physician-patient relationship, and to prevent patients from seeking skincare information from non-scientific sources, such as retailers or social media.

Increased treatment concordance could contribute to significant cost reduction for both patients and healthcare systems, reducing the need for avoidable visits and multiple medication changes.

Statement 3: Interventions, including patient education by an atopic dermatitis educator or nurse consultation, AD written action plans, and a shorter time to the first follow-up visit, appear to improve concordance and treatment outcomes.

To improve concordance, several potential interventions may be considered and discussed. There is a strong agreement on the importance of patient education, but specific tools need to be identified.^{4,13,15} Firstly, setting aside extra time in first consultations, or providing subsequent nurse consultations for both environmental education and treatment explanation, may significantly increase patient knowledge.⁷ This can be supplemented by written information and hand-outs such as AD action plans.²⁴ Therapeutic patient education programs are important for both children and adults with AD.^{9,23} Particularly, in the beginning of new treatment regimens, closer follow-up visits may be a beneficial long-term investment, both due to "white-coat adherence" and for appropriate, timely treatment adjustment.²⁵⁻²⁷ Additionally, adequate supply and refill volumes of prescribed topicals are crucial for maintaining concordance.²³

Providing product samples may motivate patients to try different products to find a good match, depending on individual preferences. Practical tips for implementation into daily routine include, eg, placing emollients next to the patient's toothbrush. When available, informing patients that products are supported by evidence in the scientific literature can contribute to persuading patients to use emollients. Dermatologists should improve at explaining the scientific background of different emollients. Increased focus on appropriate education in providing adequate patient information on emollient use should be prioritized. This is particularly relevant for dermatologists, GPs, and nurses, given the potential for both limited consultation time and long waiting lists for dermatological consultations. In general, GPs have limited dermatology training and cannot be expected to provide adequate patient information on emollients without additional education.

Statement 4: Even in the absence of active disease, the chronic nature of AD requires ongoing basic care to maintain the skin barrier and prevent future flares

Emollients reduce the need for active treatment, preventing AD flares, and restore the skin barrier function.²⁸ Emollients should be used as part of a daily routine, and choosing the right emollient for the individual patient matters.

TABLE 3.

Key Properties of Emollients		
Property	Effect	Ingredient Examples
Occlusive barrier	Reduce transepidermal water loss	Liquid paraffin; white soft paraffin; petrolatum
Film formers	Support a protective barrier	Dimethicone
Preservatives	Preserve formulation	Propylene glycol; Phenoxyethanol
Humectants	Bind water molecules	Glycerin/glycerol; Sodium hyaluronate; Urea; Carboxylic acid
Physiologic lipids	Supply components of the stratum corneum lipid matrix	Triglycerides ceramide NP, AP, EOP ; fatty acids; Phytosphingosine; Cholesterol
Emulsifiers	Mix oil- and water-soluble ingredients	Cetomacrogol; Cetostearyl or Cetearyl or Cetyl alcohol; Ceteareth- 20; Sodium lauroyl lactylate; Multivesicular emulsion (MVE)
Vitamins	Induce skin cell turnover and ceramide production or anti-oxidant or anti-inflammatory effects	Vitamin B3 (Nicotinamide); Vitamin E (Tocopherol); Vitamin A; Vitamin C

In healthy skin, a structured lipid matrix of ceramides, cholesterol, and fatty acids creates a strong skin barrier, reducing TEWL.²⁸ In AD, this structure is disrupted, leading to increased TEWL and allowing easier penetration of irritants and allergens. Use of emollients for AD has several benefits, highly dependent on the emollient type and level.

There are 3 levels of emollients:

1. **Level 1:** occlusive emollient – a simple formulation that reduces TEWL, reducing dehydration.
2. **Level 2:** occlusive emollient with humectant – an enhanced formulation that additionally binds water, increasing hydration.
3. **Level 3:** occlusive emollient with humectant and physiological lipids – a comprehensive formulation that additionally restores the skin barrier.

Other key emollient properties include film formers, emulsifiers, vitamins, and preservatives. See Table 3 for an overview of the key properties of emollients.

Emulsifiers are necessary for mixing lipid- and water-soluble ingredients. An emulsifier alone may have properties that can negatively affect the skin, but additive ingredients like humectants and physiological lipids may neutralize these effects. In more newly developed emollients, “*Multivesicular Emulsion*” (MVE) technology allows for packaging of lipids without emulsifiers, decreasing the concentration of conventional emulsifiers, so that their adverse effect is reduced substantially.^{29,30}

Vitamins are widely used as emollient ingredients for a range of different, vitamin-specific properties, including skin cell turnover, anti-inflammatory, or antioxidant effects. Particularly relevant in emollients for AD is nicotinamide (vitamin B3), which contributes to restoring the skin barrier by inducing ceramide production.³¹

Preservatives are necessary in most skincare products, but they may have negative properties. For instance, propylene glycol, a good preservative, can induce stinging. Toxic ingredients, protein allergens, and haptens should be entirely avoided in skincare.

A market-available level 3 emollient based on MVE technology was investigated in 2 studies in direct comparison to level 1²⁹ and 2³⁰ emollients, respectively. The trials were double-blinded randomized controlled trials (RCTs) involving twice-daily application for 4 weeks. Overall, the level 3 emollient was shown to deliver essential skin lipids deep within the stratum corneum (SC), enhancing lipid structure.^{29,30} It was also superior in increasing SC water content, maintained better skin integrity with lower TEWL, and was more practically and cosmetically acceptable for patients.^{29,30}

Early prevention, or delay of AD onset, with daily emollient use on infants has been of particular interest.³² Trials have investigated daily use during infancy of a level 1 emollient for the prevention of AD.^{12,33} The prevalence of AD between the no emollient and the daily level 1 emollient group did not show any difference after 1 year.³³ Instead, the data suggested that the level 1 emollient group presented with an increase in food allergies, which was considered an indication that the skin barrier was susceptible to allergen penetration with basic formulations. In a 5-year follow-up study, no differences were found between groups altogether.³⁴ The use of basic level 1 emollients from birth does not prevent the development of AD, as exemplified by the BEEP trial³³ and the 5-year follow-up study using the level 1 emollient.³⁴

In contrast, an RCT on daily use of high-risk infants of level 3 emollient, from birth to two months, reduced AD incidence at 12 months,³⁵ and yet another RCT showed that twice-daily prophylactic use of level 3 ceramide-containing moisturizer may

prevent the development of food sensitization better than daily application of basic level 1 emollients used in previous trials.³⁶ The recent CASCADE AD prevention trial included daily application of three level 3 ceramide-containing emollient creams, which significantly reduced the prevalence of AD at 1 year.³⁷ The researchers suggested that daily application of the 3 ceramide-containing emollient creams may be a feasible approach in the US to reducing the AD burden.³⁷

In addition to emollients, the use of gentle, soap-free wash products in AD should also be addressed. An RCT demonstrated a positive effect on treatment outcomes in mild-to-moderate AD after 4 weeks of using a gentle ceramide-containing wash product instead of a regular soap bar, particularly when both a gentle wash product and a level 3 emollient were used.³⁸

An appropriately formulated mild wash product can be kind to the skin and effectively kill organisms such as COVID. An in vitro study showed that cholesterol and ceramide lipids facilitate fusion, suggesting that targeting these lipids could be effective against SARS-CoV-2, impeding the virus entry into the host cell.³⁹

There is a lack of awareness of the choice of emollient level, despite the continuous development in emollients from simple to more comprehensive formulations. For example, in the UK, the majority of reimbursed emollients are level 1, while some available level 3 emollients are currently non-reimbursable.^{29,30} The addition of further evidence with clinical trials may support specific recommendations on level 3 emollients, potentially justifying reimbursement of more comprehensive emollients for AD, specifically. To address this challenge, a study was conducted to investigate the effectiveness of comprehensive level 3 emollient formulations compared to basic level 1 formulations. The increasing evidence may support the additive benefits of recommending level 3 emollients and gentle, soap-free wash products for AD patients. It is expected that in April 2026, a ceramide-containing level 3 emollient will be reimbursed on the UK National Health Service (NHS).

Conclusively, an ideal emollient formulation is safe, effective, cost-effective, free from unnecessary additives, fragrance, and other sensitizing agents, optimizes SC lipid and water content, while being pleasant and acceptable to use for optimal patient satisfaction and concordance.

Statement 5. *Methods investigated to augment concordance with baseline skincare involved education, reminders, and frequent communication with patients given the following recommendations:*

- a) Daily use of emollients, liberally and frequently as baseline treatment to delay flares and reduce symptoms*
- b) Skincare such as gentle wash products and emollients should not contain irritants and have a skin physiological pH (4-6)*

To increase concordance with treatment recommendations, interventional tools for patient education are needed and should be prioritized.^{13,15,24} Patient education should be provided in-clinic, in writing (eg, as AD action plans), and repeated at close follow-up visits, particularly at the beginning of treatment regimens.^{16,26,27} Nurses are an excellent source of patient education as they can provide product information and give practical advice on application and routines.⁷ Key education points to discuss with patients include the properties of an emollient and its role in AD management, specifically, and how to apply it correctly and in appropriate amounts.²³ Follow-up with patients should include noting the used quantity per week. In some cases, this can reveal underuse, which may explain suboptimal effect, while in severe AD cases, overuse of TCS may indicate a need for treatment change, including escalating to systemic treatment.²³ Inspired by other fields in medicine, patient education and actions plans could potentially be integrated in digital platforms such as educational applications, making it easy and available to patients to get continuous reminders of their treatment plan, and providing them with additional “on-the-go” follow-up and advice.^{13,15,25}

Skincare products, including both emollients and mild emollient wash products, should be gentle, soap-free, not containing irritants, and approximate the physiological skin pH. However, while pH has gained increased focus, there is a lack of consideration of acid strength and buffering capacity in skincare products. Acidic products can shift the skin pH, which the skin’s natural buffer systems will adjust accordingly. A functioning buffer system will keep the pH of skin optimal, crucial for ceramide synthesis, which requires a somewhat acidic environment. If the buffer system is weak, the pH of the skin will be unstable and dysfunctional. Considering the acidic buffering properties of a skincare product is more important than the pH in itself.

Limitations

The paper focuses on emollients for AD patients and their concordance with emollient use. The brief discussion of topical treatments is limited to current practice in Nordic European countries and therefore does not include topical phosphodiesterase 4 (PDE 4) inhibitors and Janus kinase (JAK) inhibitors.

CONCLUSION

Topical treatment is the cornerstone of AD management, but its effectiveness is highly dependent on long-term concordance. Studies suggest that the specific emollient properties are determinant, both regarding clinical effect and practicalities supporting concordance to a daily routine. Skincare recommendations need to be evidence-based, and increasing number of studies are showing that level 3 emollients are superior to less comprehensive formulations. Interventions, including patient education and more intelligent follow-up, have the potential to improve concordance and, thus, treatment outcomes.

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