DOCTOR'S CORNER

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Atopic dermatitis

- Atopic dermatitis (AD) is a chronic, relapsing inflammatory disease. Its pathogenesis involves impaired skin barrier and immune dysregulation. [1] AD has the highest disease burden based on disability-adjusted life-years among dermatological disorders and ranks 15th among all non-fatal diseases. In India, AD prevalence is increasing due to environmental changes.[2]
- AD does not have a fixed set of clinical symptoms, with severity and course influenced by environmental and genetic factors. Symptoms appear early in life in ~80% of patients, and 60% go into remission during adolescence.[2] AD often manifests with a significant symptom burden, negatively impacting patients' quality-of-life (QoL). Intense itching or pain can affect sleep quality, while more visible symptoms can cause self-consciousness and potentially social isolation, worsening patients' overall psychological and health status.[3]

Role of ceramides

- Ceramides are sphingolipids with diverse physiological roles. In the skin, ceramides and other lipids help form the stratum corneum (SC) barrier, preventing water loss and invasion of harmful substances from the environment.[4]
- In AD patients, SC ceramide amount and composition are altered, suggesting their involvement in AD pathogenesis. Ceramide-dominant emollient restores skin barrier function and are approved as adjunctive barrier repair agents for AD.[4]
- Topical ceramide-containing formulations hold significant potential for enhancing barrier functionality and help strengthen the SC structural integrity, thus improving these skin conditions.[3]

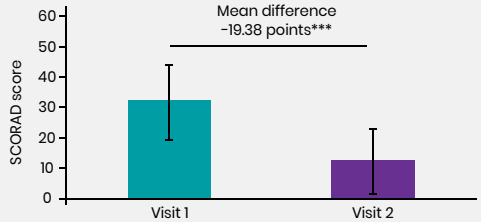
Clinical evidence

Ceramide-containing regimen reduces the symptoms of AD and improves QoL: Report from a multicenter, prospective study[3]

Abbad-Jaime de Aragon, *et al.*, conducted a multicenter, prospective study to evaluate the benefits of a 4-week ceramide-containing regimen on the symptoms and QoL of patients with AD.

- Clinical assessments like SCORAD (Scoring Atopic Dermatitis), QoL, and adherence to the treatment were evaluated at baseline and after 4 weeks.
- Significant clinical improvements after 4 weeks were reported in the SCORAD score [mean difference; 95% confidence interval (CI)] of 61.23% (-19.4 points; 17.1–21.6; p<0.001; Figure 1).

Figure 1. Mean SCORAD scores at the 1st and 2nd visit in patients with AD



***p<0.001. AD: Atopic dermatitis; SCORAD: Scoring Atopic Dermatitis.

- QoL improved in 67.2% of AD patients, with a significant proportion of patients reducing their concomitant treatments.
- Most patients adhered to the regimen, and no adverse reactions were reported.

A ceramide-containing regimen, used as monotherapy or in conjunction with existing treatments, reduced the symptoms commonly associated with AD, thereby improving patients' QoL.

References: 1. De A, Halder S, Madan A, *et al.* A comparative, multicenter, prospective, randomized study to evaluate the efficacy, safety, and delay of relapse of ceramide-based post-biotic moisturizer *versus* paraffin-based moisturizer in mild to moderate atopic dermatitis. Cureus. 2025;17(1):e76762. **2.** De A, Karekar S, Adhav C. Current burden of atopic dermatitis in India: A systematic literature review. Indian J Dermatol. 2023;68(4):487. **3.** Abbad-Jaime de Aragon C, Berna-Rico E, Prieto L, *et al.* Improving the quality of life of patients with inflammatory skin diseases: A multicenter evaluation of a ceramide-containing regimen in patients with atopic dermatitis, psoriasis and xerosis. J Dermatolog Treat. 2025;36(1):2486702. **4.** Fujii M. The pathogenic and therapeutic implications of ceramide abnormalities in atopic dermatitis. Cells. 2021;10(9):2386.

NEW TECHNOLOGY

Emerging drug delivery technologies for atopic dermatitis

- The management of atopic dermatitis (AD) includes topical corticosteroids, calcineurin inhibitors, phosphodiesterase inhibitors, and Janus kinase inhibitors in the form of gels, creams, ointments, and lotions, with systemic immunosuppressants and biologics used for severe cases.
- Long-term use of current treatments can cause adverse effects like skin thinning, atrophy, burning sensation, skin lymphomas, tolerance, and systemic side effects.
- Emerging topical nanoformulations like lipid-based nanoparticles, polymeric carriers, liposomes, cubosomes, ethosomes, and nanoemulsions enhance drug delivery, improve outcomes, and reduce toxicity, offering promising options for AD treatment.
- Table 1 presents a comparison of nano-based delivery systems and conventional treatments for AD.

Table 1. Comparative account of nano-based delivery system *vs.* conventional treatments for AD

Factor	Nanoformulations	Conventional treatments
Penetration	Superior, especially for drug delivery to deeper skin layers, but can be inconsistent across patients	Limited to surface or upper layers of the skin; harder to penetrate inflamed skin
Drug release	Provides sustained and controlled release, reducing the frequency of application	Rapid drug release, requiring frequent application for sustained effects
Efficacy	Potential for targeting multiple pathways simultaneously (e.g., inflammation, barrier repair)	Often limited to single-target mechanisms (e.g., anti-inflammatory *via* corticosteroids)
Side effects	Reduced systemic side effects, but potential local irritation or toxicity if not formulated correctly	Known side effects (e.g., skin thinning with corticosteroids) are well-understood
Cost and accessibility	More expensive due to complex formulation and production processes; longer regulatory approval time	Lower cost, well-established in clinical practice, and more accessible
Long-term safety	Unknown long-term effects of nanoformulations; risk of accumulation in tissues	Long-term safety profile is well-established for conventional treatments

AD: Atopic dermatitis.

- Clinical trials of nanoformulations for AD show improved efficacy and skin absorption over conventional therapies, but challenges like inadequate evaluations, formulation instability, and the need for regulatory compliance and thorough data investigation remain.

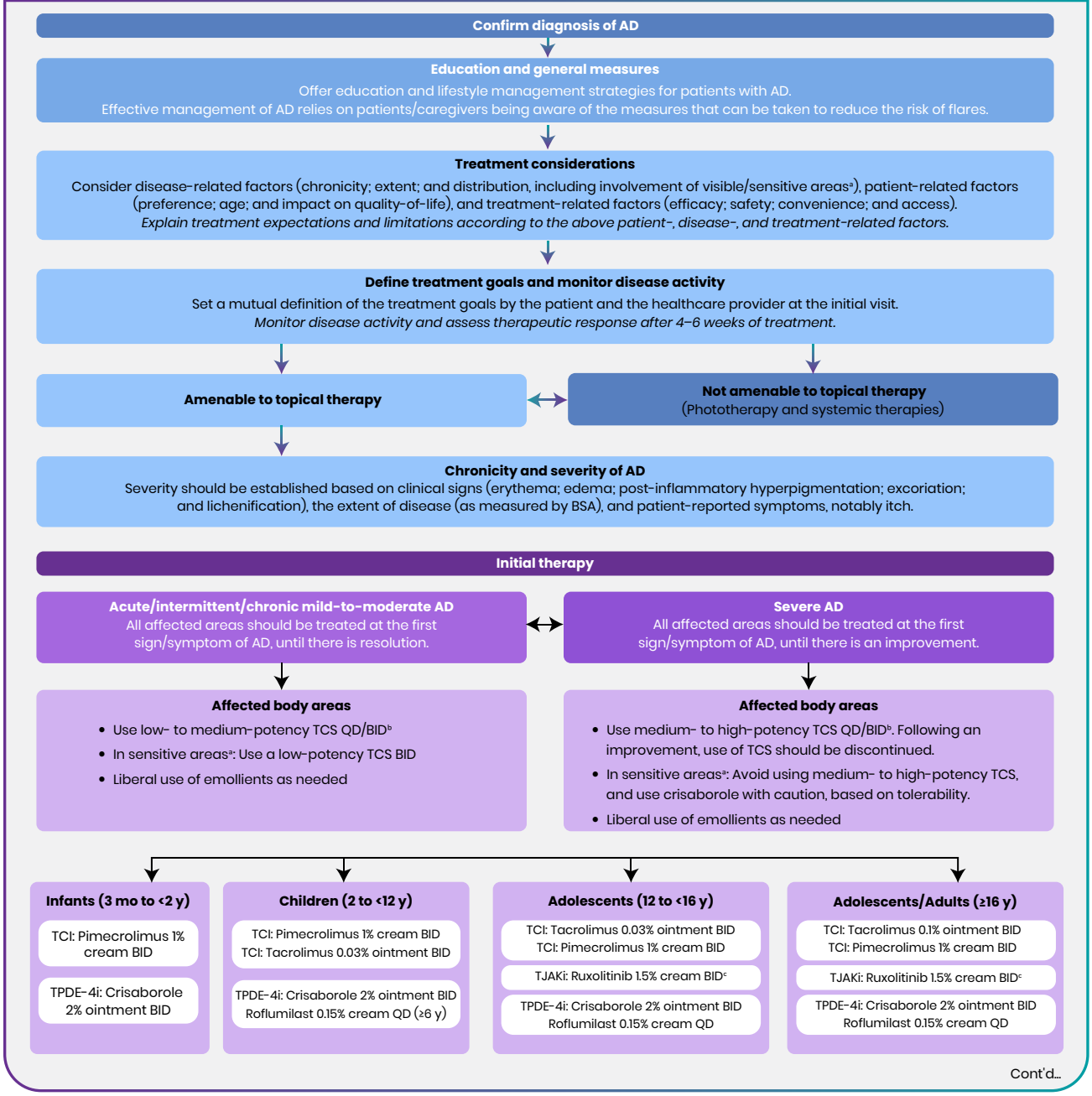
Reference: Dabhadkar M, Kulkarni M. Novel drug delivery systems in topical treatment of atopic dermatitis. Naunyn Schmiedebergs Arch Pharmacol. 2025.

GUIDELINE UPDATE

Canadian consensus guidelines for the management of atopic dermatitis with topical therapies

A panel of 10 Canadian dermatologists conducted a systematic literature review and developed generally accepted principles, consensus statements, and a treatment algorithm (Figure 2) through an iterative consensus-based process.

Figure 2. Algorithm for the topical therapy of AD in children, adolescents, and adults



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Maintenance therapy

Maintenance therapy should continue beyond complete resolution to prevent flares and reduce the need for TCS. TCS should be limited to short-term use due to safety concerns. Twice-weekly application of a topical anti-inflammatory agent will likely reduce the incidence of flares. Ruxolitinib cream can be resumed at the first sign of recurrence and stopped 3 days after signs/symptoms have resolved.

Assess therapeutic response after 4 to 6 weeks of treatment

- **Adequate response** (Target achieved) → **Continue treatment**
- **Inadequate response** (Target not achieved)
  - **Assess patient adherence** (Re-educate and encourage adherence)
  - **Rule out other diagnoses** (e.g., infection or contact dermatitis)
  - **Reconfirm diagnosis of AD**
  - **Adjust current treatment and/or combine treatments, or switch to another treatment** (topical therapy; phototherapy; or systemic therapy)
- **Treatment-related adverse events** → **Adjust current treatment and/or combine treatments, or switch to another treatment** (topical therapy; phototherapy; or systemic therapy)

[a]Sensitive areas include the face (eyelids and perioral region), neck, axillary/inguinal region, and genital region. [b]Cochrane review has shown that QD application of TCS is as effective as BID application of TCS. [c]Ruxolitinib (1.5% cream) can be resumed at the first sign of recurrence and stopped 3 days after signs/symptoms have resolved. AD: Atopic dermatitis; BID: Twice daily; BSA: Body surface area; QD: Once daily; TCI: Topical calcineurin inhibitor; TCS: Topical corticosteroid; TJAKi: Topical Janus kinase inhibitor; TPDE-4i: Topical phosphodiesterase-4 inhibitor.

Reference: Gooderham MJ, Hong HC, Lynde C, *et al.* Canadian consensus guidelines for the management of atopic dermatitis with topical therapies. Dermatol Ther (Heidelb). 2025;15(6):1467–1485.

CONFERENCE UPDATE

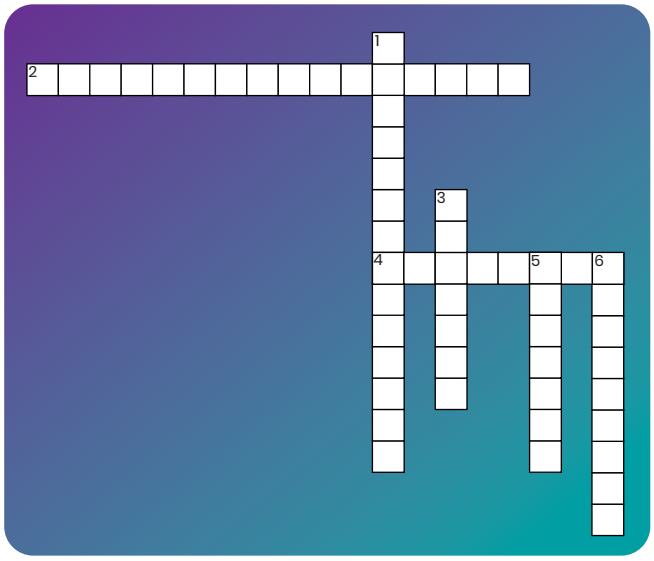
15th Georg Rajka International Symposium on Atopic Dermatitis (ISAD)

Date: October 24–26, 2025
Location: Melbourne, Australia
Website: https://isad.org/rajka-symposium/rajka-2025-15th-georg-rajka-international-symposium-on-atopic-dermatitis-melbourne?date=202507010815

Atopic Dermatitis *versus* Cutaneous T-cell Lymphoma: Challenges and Novel Insights at European Academy of Dermatology and Venereology (EADV) 2025

Date: September 20, 2025
Location: Paris, France
Website: https://www.eczemacouncil.org/index.php?option=com_jevents&task=icalevent.detail&evid=62

CROSSWORD



ACROSS

2. Emerging topical carriers enhancing drug delivery and reducing toxicity in atopic dermatitis treatment
4. A lipid that supports skin barrier function and is commonly deficient in atopic dermatitis

DOWN

1. Skin's outermost layer whose integrity is strengthened by topical ceramide formulations
3. Adverse effect caused by long-term use of corticosteroids and immunosuppressants in atopic dermatitis
5. Sensation that causes scratching and worsens skin damage in atopic dermatitis
6. A moisturizer that softens and soothes the skin; used in barrier repair

Answers:
Across: 2. Nanoformulations; 4. Ceramide
Down: 1. Stratum corneum; 3. Atrophy; 5. Itching; 6. Emollient