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Eczema — the Itch That Rashes

Atopic dermatitis is a chronic, relapsing, intensely pruritic inflammatory skin disease driven by skin-barrier dysfunction and a Th2-skewed immune response. It is the cutaneous face of the atopic march.

INTEGUMENTARY · ALLERGY/IMMUNE · PEDIATRICS

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Definition & Overview

WHAT IT IS · WHY IT MATTERS

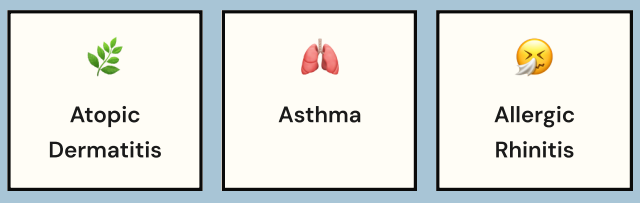
- **Chronic, relapsing-remitting inflammatory skin disease** with intense pruritus, dry skin, and an impaired epidermal barrier.
- Often called **"the itch that rashes"** — the urge to scratch is the cardinal feature; lesions follow the scratching.
- Most common in **infants and children** (often before age 5); ~60% of cases begin in the first year of life. Many improve by adolescence.
- Part of the "**atopic march**" — children with AD frequently progress to food allergy, asthma, and allergic rhinitis.
- **Not contagious.** Driven by filaggrin gene defects + Th2 cytokines (IL-4, IL-13, IL-31).

10–20%
OF CHILDREN AFFECTED

~60%
ONSET BEFORE AGE 1

IL-4 · 13 · 31
KEY TH2 CYTOKINES

The Atopic Triad



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Pathophysiology

BARRIER DEFECT → ALLERGEN ENTRY → TH2 INFLAMMATION → ITCH

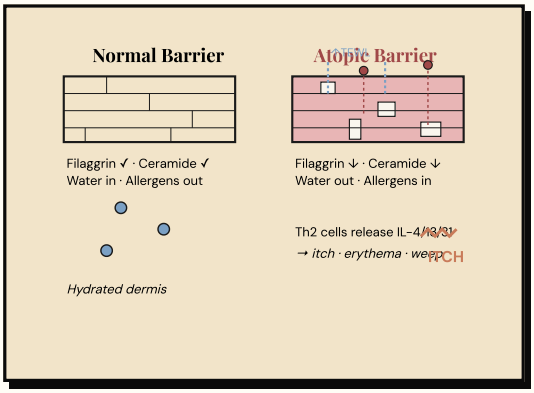
STEP 1
Filaggrin defect + ↓ ceramides → impaired skin barrier

STEP 2
↑ TEWL (transepidermal water loss) = dry, cracked skin

STEP 3
Allergen & microbe entry through compromised barrier

STEP 4
Th2 response IL-4, IL-13 (inflammation) IL-31 (itch)

STEP 5
Itch–scratch cycle Erythema · Vesicles · Lichenification



Barrier broken — itch unleashed

In healthy skin, **filaggrin** and **ceramides** seal the stratum corneum like mortar between bricks. In atopic dermatitis, filaggrin is genetically deficient and ceramides are reduced. Water escapes (high TEWL) and allergens, irritants, and Staph aureus pour in. The immune system answers with a **Th2 cytokine surge** — IL-4 and IL-13 drive inflammation, IL-31 fires up sensory nerves to produce the relentless itch. Scratching damages the barrier further, creating the self-perpetuating itch–scratch cycle.

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Signs & Symptoms

AGE-BASED DISTRIBUTION · RED-FLAG COMPLICATIONS

Distribution Changes With Age

Infant

0 – 2 YEARS

- **Cheeks, scalp, forehead**
- Extensor surfaces (outer arms, legs)
- Diaper area **usually spared** (moist, less rubbed)
- Weeping, oozing vesicles + crust
- Poor sleep, irritability

Child

2 – 12 YEARS

- **Flexor (bend) surfaces** — antecubital & popliteal fossae
- Neck, wrists, ankles
- Drier, scaly, papular
- **Lichenification** begins with chronic scratching

Adolescent/Adult

12+ YEARS

- **Hands, eyelids, neck, flexures**
- Prominent **lichenification** (thick, leathery skin)
- Post-inflammatory pigment changes
- Chronic hand dermatitis (occupational)

✓ Classic Findings

- **Pruritus** — cardinal symptom, often worse at night
- **Xerosis** (dry skin) — universal
- Erythematous patches, papules, vesicles, weeping
- **Lichenification** — thickened, leathery skin from chronic scratching
- Excoriations, post-inflammatory hyper- or hypopigmentation
- **Dennie-Morgan lines** (infraorbital folds)
- Keratosis pilaris, allergic shiners, pityriasis alba

! Red-Flag Complications

- **Eczema herpeticum** 🚨 — HSV superinfection: monomorphic, punched-out vesicles, fever, lymphadenopathy. *EMERGENCY.*
- **Staph aureus impetigo** — honey-crusted lesions, increased weeping
- **Erythroderma** — >90% involvement; fluid/temperature dysregulation
- **Sleep disturbance, growth delay, school absenteeism, depression**
- **Severe excoriation** with cellulitis or bacteremia

🚨 **Eczema herpeticum is a dermatologic emergency — start IV acyclovir, ophthalmology consult if periocular, and admit for monitoring. Do NOT apply topical steroids to active HSV lesions.**

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Priority Nursing Interventions

HYDRATE THE BARRIER · BREAK THE ITCH–SCRATCH CYCLE

ASSESS Severity & triggers

- Body surface area, intensity of itch, sleep loss
- Identify **triggers**: soaps, fabrics, stress, allergens, food (in young children)
- Inspect for signs of **secondary infection** — honey crust, monomorphic vesicles, fever
- Screen for atopic march: wheeze, rhinitis, food reactions

RESTORE The skin barrier

- **Lukewarm** (not hot) baths, 5–10 min
- Use fragrance-free, soap-substitute cleansers
- **Pat — do not rub — dry**
- **Moisturize within 3 minutes** of bathing ("soak and seal")
- Thick emollient/ointment preferred over lotion (more occlusive)

PROTECT From scratching & infection

- Keep nails **short and smooth**; soft cotton mittens for infants at night
- Cool compresses, wet-wrap therapy for severe flares
- Cotton clothing; **avoid wool and synthetic fabrics**
- Watch for signs of HSV (eczema herpeticum) and impetigo
- Bleach baths (¼ cup in full tub, 2×/wk) for recurrent staph colonization

ADMINISTER Anti-inflammatory therapy

- **Low-potency topical steroids** on face/folds; mid–high on trunk/limbs
- Apply steroid **before** moisturizer (or per protocol)
- Topical calcineurin inhibitors as steroid-sparing on face/eyelids
- **Sedating antihistamines** (e.g., hydroxyzine) at night for itch/sleep
- Antibiotic therapy if secondarily infected

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Pharmacology

EMOLLIENT BASE · TOPICAL → PHOTOTHERAPY → SYSTEMIC → BIOLOGIC

CLASS / STEP	DRUG EXAMPLES	ACTION	KEY NURSING / SIDE EFFECTS
Emollients (foundation)	**Petrolatum, ceramide creams, aquaphor**	Replace lipid barrier; reduce TEWL	Apply **within 3 min of bath**. Generous amounts. Ointment > cream > lotion for severe dryness. Reapply throughout day.
Topical Corticosteroids	**Hydrocortisone (low) · triamcinolone (mid) · clobetasol (high)**	Suppress Th2 inflammation	**Low potency only on face, eyelids, groin, folds.** Limit duration on thin skin → atrophy, striae. Taper with flare resolution.
Topical Calcineurin Inhibitors	**Tacrolimus (Protopic), pimecrolimus (Elidel)**	Block T-cell activation	Steroid-sparing — preferred for **face, eyelids, genitals**. Burning at site. Photosensitive — use sunscreen. Boxed warning re: theoretical malignancy.
Topical PDE-4 Inhibitor	**Crisaborole (Eucrisa)**	Inhibit phosphodiesterase-4 → ↓inflammatory cytokines	For mild–moderate AD ≥3 mo old. Burning/stinging common. Non-steroidal.
Topical JAK Inhibitor	**Ruxolitinib cream**	Block JAK1/2 signaling	Short-term use. Boxed warnings: serious infections, thrombosis, malignancy (class-effect).
Antihistamines (sedating)	**Hydroxyzine, diphenhydramine**	H1 block + sedation	For **night-time itch & sleep**. Non-sedating agents minimally helpful for itch in AD. Caution: anticholinergic effects, drowsiness next day.
Topical/Systemic Antibiotics	**Mupirocin (topical), cephalexin (oral)**	Treat Staph aureus superinfection	Use for documented infection. Bleach baths can reduce colonization without systemic abx.
Antiviral	**Acyclovir IV/PO**	HSV inhibition	**Eczema herpeticum = IV acyclovir + admit.** Ensure hydration; monitor renal function.
Phototherapy	**Narrow-band UVB**	Immunomodulation	Eye protection (goggles). Long-term skin-cancer risk.

CLASS / STEP	DRUG EXAMPLES	ACTION	KEY NURSING / SIDE EFFECTS
Systemic Immunosuppressant	**Cyclosporine, methotrexate, mycophenolate, azathioprine**	Broad immunosuppression	Reserved for severe disease. Monitor LFTs, CBC, BP, renal function. Limit duration of cyclosporine.
Biologic — IL-4/13 inhibitor	**Dupilumab (Dupixent)**	Block IL-4Rα → IL-4 & IL-13 pathway	Subcut injection. **Conjunctivitis** is hallmark side effect. Injection-site reactions. Approved ≥6 mo. No live vaccines.
Biologic — IL-13 inhibitor	**Tralokinumab, lebrikizumab**	Block IL-13	Conjunctivitis (less than dupilumab), URIs, injection-site reactions.
Oral JAK Inhibitor	**Upadacitinib, abrocitinib**	Block JAK1 intracellularly	**Boxed warning**: serious infections, thrombosis, MACE, malignancy. Pre-screen TB, hep B/C, lipids. Avoid live vaccines.

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NCLEX Test Traps

COMMON CONFUSIONS · PRIORITY PITFALLS

❌ **WRONG:** "Give the child a hot bath with bubble bath to soothe the itch."

✅ **RIGHT:** **Lukewarm, brief baths** with fragrance-free cleansers. Hot water + bubble bath strip lipids and worsen barrier dysfunction.

❌ **WRONG:** "Apply moisturizer after the child is fully dressed."

✅ **RIGHT:** Moisturize **within 3 minutes of bathing** — the "soak and seal" technique traps moisture in the skin.

❌ **WRONG:** "Eczema is contagious — keep the child home from school."

✅ **RIGHT:** Eczema is **not contagious**. Children should attend school; only secondary infections (impetigo, herpeticum) warrant exclusion.

❌ **WRONG:** "Apply high-potency clobetasol to a 1-year-old's face."

✅ **RIGHT:** Use **only low-potency steroids (hydrocortisone)** on face, eyelids, and folds — especially in young children. Calcineurin inhibitors are steroid-sparing alternatives.

❌ **WRONG:** "Itchy crusted lesions + fever? Just apply more hydrocortisone."

✅ **RIGHT:** **Stop the steroid; assess for infection.** Honey crust = staph impetigo (oral antibiotic). Monomorphic punched-out vesicles + fever = **eczema herpeticum → IV acyclovir, admit.**

❌ **WRONG:** "Non-sedating antihistamines (cetirizine) are best for severe nighttime itch."

✅ **RIGHT:** For **nighttime itch & sleep**, use a **sedating antihistamine** (hydroxyzine, diphenhydramine). Non-sedating agents have minimal effect on AD itch.

❌ **WRONG:** "Cotton gloves should be soaked in hot water and wrapped over wet steroid."

✅ **RIGHT:** Wet-wrap therapy uses **lukewarm** water on inner damp layer of cotton over emollient/steroid, with a dry outer layer. Hot water worsens inflammation.

❌ **WRONG:** "A patient on dupilumab develops red, itchy eyes — stop the drug immediately."

✅ **RIGHT:** **Conjunctivitis is the hallmark side effect** of dupilumab — usually manageable with artificial tears and ophthalmology follow-up. Drug rarely stopped unless severe.

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Patient & Family Education

BATH · BARRIER · BEHAVIOR

Bath & Skin Routine

- Lukewarm baths, 5–10 minutes
- Fragrance-free, soap-free cleanser
- Pat — never rub — dry
- Apply emollient within 3 minutes
- Reapply moisturizer multiple times/day
- Bleach baths 2×/week if recurrent infection

Avoid Triggers

- Wool, synthetic, tight clothing → soft cotton
- Harsh detergents, dryer sheets, fragrances
- Overheating & sweating
- Pet dander, dust mites (encase bedding)
- Known food allergens (only if confirmed)
- Stress (older children, adults)

Family Coaching

- Keep nails short, smooth; mittens at night for infants
- It's **not contagious**
- Atopic march: watch for asthma/allergies
- Use steroids **only on inflamed skin** as prescribed
- Seek care for fever + worsening rash (rule out herpeticum)
- Support sleep — itch keeps families up; ask for help

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Memory Boosters

MNEMONICS · PATTERN RECOGNITION

"SOAK & SEAL"

Bath & Moisturize

- **SOAK** — Lukewarm bath, 5–10 min
- **S**oap-free, fragrance-free cleanser
- **SEAL** — Pat dry, apply emollient within 3 min
- Trap moisture in the skin with thick ointment
- Reapply moisturizer throughout the day

"ITCH" — Cardinal cues

I · T · C · H

- **I**tch (pruritus) — the cardinal symptom
- **T**opical steroids & emollients = mainstays
- **C**ontagious? NO — but watch for infection
- **H**SV → eczema herpeticum = emergency

"FLEX vs EXTEND"

- Eczema (children): **FLEXOR** — inside elbow, behind knee
- Psoriasis: **EXTENSOR** — outside elbow, front of knee
- Eczema itch is **severe**; psoriasis itch is mild
- Eczema scale = thin/weepy; psoriasis = thick/silvery
- Eczema starts in infancy; psoriasis in teen/young adult

The Atopic March 🎼

- **1st step:** Atopic dermatitis (infancy)
- **2nd step:** Food allergy (eggs, milk, peanut)
- **3rd step:** Asthma (toddler/preschool)
- **4th step:** Allergic rhinitis (school age)
- Early skin care may slow the march

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NCJMM Clinical Judgment

NEXT GENERATION NCLEX · SIX-STEP MODEL

SCENARIO

A 4-year-old child with a long history of moderate atopic dermatitis is brought to the urgent care by a parent. The parent reports that the child's eczema flared 5 days ago after a family member had a "cold sore." Since yesterday, the rash has spread rapidly on the cheeks, neck, and chest with **clusters of small, identical, dome-shaped vesicles with central depressions**. The child has a fever of 39.2°C (102.6°F), is irritable, refusing fluids, and has tender cervical lymphadenopathy. Vital signs: HR 132, RR 28, SpO_2 97%, BP 92/58. The child cries when the rash is touched and has not slept in two days.

STEP 1

Recognize Cues

Pre-existing AD + **monomorphic, umbilicated vesicles** + fever + HSV-exposed family member + lymphadenopathy + tachycardia + poor fluid intake. Pain disproportionate to typical AD flare.

STEP 2

Analyze Cues

Classic picture of **eczema herpeticum** — HSV superinfection on barrier-compromised AD skin. Risk of viremia, keratoconjunctivitis if periocular, and bacterial superinfection. Dehydration developing.

STEP 3

Prioritize Hypotheses

#1 Eczema herpeticum — life- and sight-threatening; demands urgent antiviral therapy. #2 Bacterial superinfection (staph impetigo). #3 Severe AD flare alone. #4 Dehydration from fever and refusing fluids.

STEP 4

Generate Solutions

Admit. Start **IV acyclovir**. Send HSV PCR & viral cultures. Hold topical steroids on affected areas. IV fluids for dehydration. Ophthalmology consult if periocular. Dermatology & pediatric ID consult. Pain control. Isolate from immunocompromised contacts and newborns.

STEP 5

Take Action

Establish IV access; administer first dose acyclovir; bolus isotonic fluids. Maintain strict hand hygiene. Educate parent on diagnosis, the rationale for IV antivirals, the need to **discontinue topical steroids on infected skin**, and contact precautions during shedding.

STEP 6

Evaluate Outcomes

Fever down within 48–72 h, vesicles crusting and not spreading, child feeding/sleeping again, hydration normalized, no eye involvement. Plan for transition to oral acyclovir, restart emollient routine, and resume topical anti-inflammatory therapy **only after lesions are healed**.