

FOURTH EDITION

# SKIN DISEASE

Diagnosis and Treatment

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FOURTH EDITION

# SKIN DISEASE

## Diagnosis and Treatment

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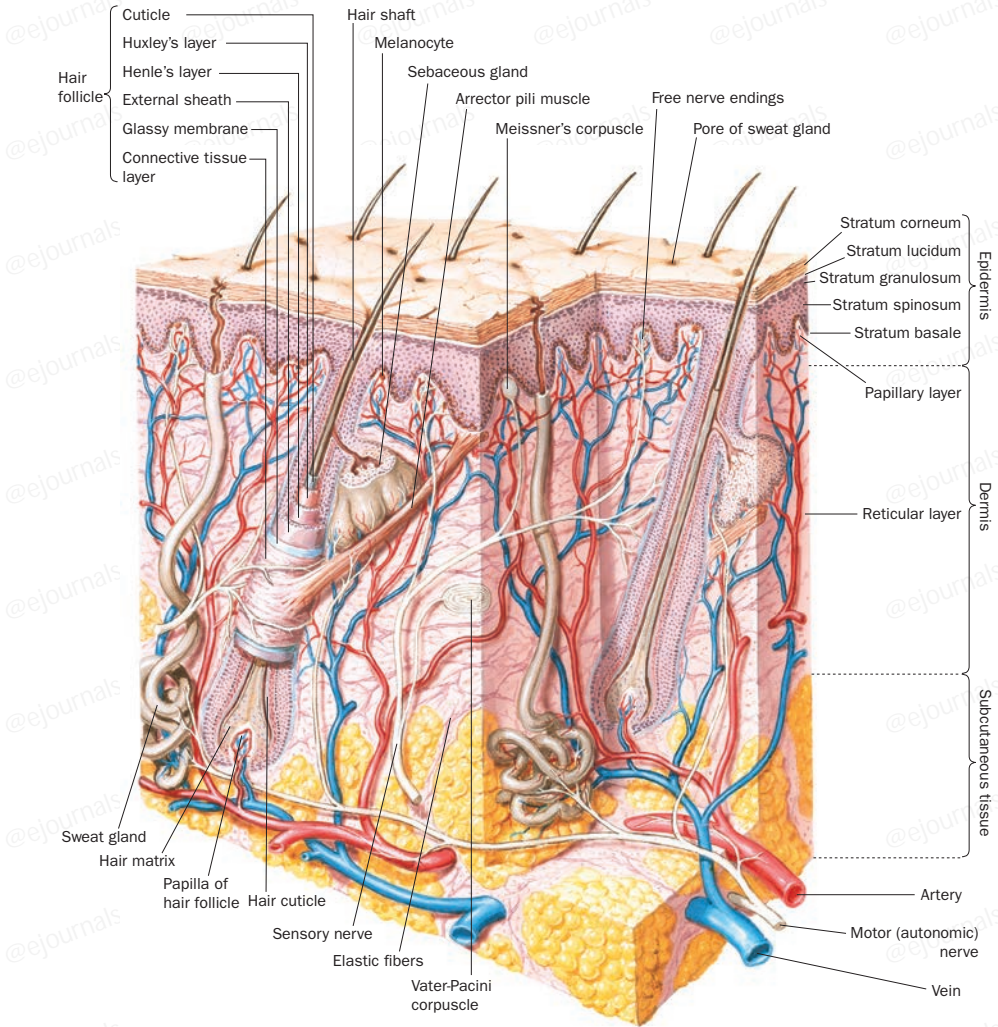
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# Topical Therapy

James G. H. Dinulos

# 1

## Basic Principles of Treatment



**Fig. 1.1** Skin anatomy. (© 1967, CIBA Pharmaceutical Company, Division of CIBA-GEIGY Corporation. Reprinted with permission from Clinical Symposia. Illustrated by Frank H. Netter, MD. All rights reserved.)



## Maintaining the Skin Barrier

- The skin assists in fluid homeostasis and protects against infections, toxins, and harmful effects of ultraviolet radiation.
- The outermost layer of the epidermis, the stratum corneum, provides this protection through an impermeable barrier made up of fatty acids, cholesterol, and ceramides cemented between tightly knit, protein-rich cornified cells.
- Keratinocytes serve skin barrier functions by contributing to the physical barrier as well as to the skin's innate immune defense (e.g., antimicrobial peptides, cytokines) and adaptive immune response.
- One goal of topical or systemic dermatologic therapy is to restore and maintain the essential functions of the skin barrier.

## Skin Cleansing

- For most individuals, full-body daily bathing is not necessary for healthy skin.
- Patients should use mild soaps and cleansers, such as Cetaphil, Dove, Keri, Oil of Olay, or CeraVe, and should avoid excessive use of exfoliating scrubs, washcloths, and brushes.
- Soaps with fragrances and antibacterial agents can be irritating.
- Patients should bathe with tepid water and avoid washing with very hot water.

## Skin Bathing and Soaking

- Bleach baths ( $\frac{1}{4}$ – $\frac{1}{2}$  cup bleach added to half to full adult bath) are antimicrobial and anti-inflammatory and are useful for patients with infected eruptions, such as atopic dermatitis and stasis dermatitis. Bathe for 10 to 20 minutes twice weekly to daily. Skin should be moisturized after bathing.
- Aluminum acetate solution (e.g., Dumboro) and vinegar compresses soothe the skin when used for acute eczema and allergic contact dermatitis.
- Avoid bubble baths and fragranced bath oils because they can cause skin irritation and allergy.
- When bathing children, use soaps and shampoos at the end of the bath to minimize skin dryness.
- Apply moisturizers immediately after bathing and drying to trap in moisture.

## Skin Moisturization

- A moisturizer is a compound that serves five principal functions: repairs the skin barrier, maintains skin integrity and appearance, reduces transepidermal water loss, restores the lipid barrier's ability to hold and redistribute water, and reduces skin inflammation.
- Occlusive moisturizers, such as petrolatum, act by preventing water loss from the skin. Lanolin, mineral oil, and silicones (e.g., dimethicone) are other occlusive moisturizers.
- Humectants, such as glycerin and hyaluronic acid, function by increasing absorption of water from the air to the epidermis.
- Emollient creams and lotions soften and smooth the skin and thereby improve the skin appearance.
- Immediately after washing, the skin should be patted dry and a moisturizer applied.
- Pure petrolatum is thought to be the least irritating moisturizer.
- Thick emollients, such as petrolatum, feel "greasy" and can block follicular and eccrine openings, producing acne and miliaria in rare cases.
- Lotions spread easily on the skin, but are not as effective in preventing water loss and skin protection as petrolatum and heavier creams.
- In some patients, preservatives (e.g., isothiazolinone) in creams and lotions cause skin irritation and allergic contact dermatitis.
- Patients with sensitive skin should apply lotions free of dyes and fragrances.
- Unscented soaps and moisturizers can contain masking fragrances, producing skin allergy.
- Many creams and lotions have "antiaging" additives, such as vitamins A, C, and E, but their efficacy is not proved.
- Sunscreens are added to many creams and lotions to slow skin aging.
- Avoid applying moisturizers with sun protection factor at night.



- Keratolytic emollients containing glycolic acids (lactic acid, salicylic acid) and urea are useful to gently exfoliate the skin.
- Sarna (camphor and menthol) and Pramoxone (pramoxine and hydrocortisone) are examples of lotions with additives to decrease itch.
- Moisturizers decrease skin inflammation through barrier-enhancing properties.
- Atopiclair (2% glycyrrhetic acid and shea butter), MimyX (*N*-palmitoylethanolamine), and EpiCeram (3:1:1 ratio of ceramides, cholesterol, and free fatty acids) are nonsteroidal creams able to improve inflammatory skin conditions, such as atopic dermatitis.
- Eleteone is 70% oil in 30% water produced with “reverse emulsion” technology, affording the physiologic benefits of an ointment with the consistency of a cream.
- Promiseb and Loutrex are moisturizers with anti-inflammatory and antifungal properties that have been shown to improve inflammatory conditions, such as seborrheic dermatitis.
- Patients should check with their physician for specific skin care recommendations.

#### Examples of Lubricating Creams and Lotions

In addition to those named here, many other effective products are available.

#### Thicker Creams and Ointments

- Neutrogena Norwegian Hand Formula
- Theraplex Eczema Therapy
- Mustela Lipid-Replenishing Balm
- Vaseline petroleum jelly
- Aquaphor ointment
- Eucerin cream
- Hydrolatum

#### Lighter Creams

- Acid Mantle
- Cetaphil cream (many formulations)
- DML cream
- Moisturel cream
- Nutraplus cream
- Aveeno Eczema Therapy
- CeraVe cream
- Vanicream Moisturizing skin cream

#### Lighter Lotions

- Cetaphil lotion
- DML lotion
- Nutraderm lotion
- Curel lotion
- Aveeno lotion
- CeraVe lotion
- Vanicream Lite lotion

#### Topical Formulations

- Two principal factors must be considered when choosing a topical medication: the active drug and the drug delivery system or vehicle.
- For any given topical drug to be effective, it must be administered in an adequate concentration in a vehicle that effectively delivers the active ingredient into the skin.
- Vehicles not only assist in drug delivery but also have therapeutic properties.
- Ointments are greasy emulsions (70% oil in 30% water) that help deliver medications to dry skin. Ointments increase the potency of a compound compared with the cream formulations (e.g., Elocon ointment is more potent than Elocon cream).
- Creams are oil-in-water emulsions (50% oil in 50% water). They can be cooling and are not as occlusive as ointments.
- Pastes are ointments with 20% to 50% powder, such as zinc oxide or starch (e.g., Obtundia Calamine Cream). They are more drying than ointments and are less greasy. They help dry weeping eruptions, such as poison ivy.
- Solutions and lotions are clear or milky white liquids that evaporate on the skin and thus can be drying. They are effective in delivering drugs to hairy areas, such as the scalp, arms, and legs. Patients can experience stinging when used on open wet areas or on mucous membranes.
- Gels are clear and greaseless. They dry skin on contact, leaving a thin film. They are effective for treating acne and skin disease in hairy areas. Foams are similarly greaseless.
- Foams (e.g., Olux foam) are formed by trapping gas bubbles in a liquid or solid and are especially useful for delivering drugs to hair-bearing areas.

- Tapes (e.g., Cordan tape) can be impregnated with medication and are useful to treat localized areas, such as in psoriasis and warts.
- Powders are drying and are effective in moist intertriginous areas. They are vehicles for many antifungal agents.
- Like powder, water can dry weepy rashes, and it can be effective in removing scale and treating widespread skin disease (e.g., oatmeal bath, tar bath).

### Topical Application and Dosing

- Medications should be gently massaged into the skin in one thin layer. Thicker applications do not increase skin penetration.
- One gram of cream covers an area  $10 \times 10$  cm, and ointments spread slightly further.
- The fingertip unit (FTU) is another method to assess how much cream to dispense and apply. An FTU is the amount of ointment expressed from a tube with a 5-mm diameter nozzle and applied from the distal skin crease to the tip of the index finger. In an adult, 1 FTU weighs approximately 0.5 g. The number of FTUs required to cover specific body areas is illustrated in Appendix A.
- Dosing frequency varies with the medication, but most dermatology medications are applied once or twice per day.
- The ability of a medication to penetrate the skin varies according to the anatomic site (mucous membranes > scrotum > eyelids > face > torso > extremities > palms and soles).
- Conditions producing skin breakdown allow increased drug penetration. As the epidermal barrier function improves, less percutaneous absorption occurs.
- Medications placed under occlusive dressings or body suits are more readily absorbed into the skin.

### Wet Dressings

- Wet dressings or compresses are a valuable aid in the treatment of exudative (wet) skin diseases.

1. Obtain a clean, soft cloth, such as bed sheeting or shirt material. The cloth need not be new or sterilized.
  2. Fold the cloth and cut to fit an area slightly larger than the area to be treated.
  3. Wet the folded dressings by immersing them in the solution, and wring them out to the point of sopping wet (neither running nor just damp).
  4. Place the wet dressings on the affected area. Do not pour solution on a wet dressing to keep it wet because this practice increases the concentration of the solution and may cause irritation. Remove the dressing and replace it with a new one.
  5. Leave the dressings in place for 30 minutes. Dressings may be used two to four times a day or continuously. Discontinue the use of wet dressings when the skin becomes dry. Excessive drying causes fissures.
- The temperature of the compress solution should be cool when an anti-inflammatory effect is desired and tepid when the purpose is to débride an infected, crusted lesion.
  - A wet dressing should not be covered with a towel or plastic. A towel and plastic wrap, inhibit evaporation, promote maceration, and increase skin temperature, which facilitates bacterial growth.

### Benefits of Wet Dressings

- Inflammation suppression—the evaporative cooling causes the constriction of superficial vessels, thereby decreasing erythema and the production of serum. Wet dressings soothe acute inflammatory processes, such as acute poison ivy.
- Wound débridement—the dressing macerates vesicles and crust, helping débride these materials when the dressing is removed.
- Drying—repeated cycles of wetting and drying promote drying of weeping wet lesions.



## Pediatric Considerations

- Infants have a markedly increased body surface area compared with body mass, placing them at risk for systemic side effects and toxicity from topically applied medications.
- Premature infants have compromised epidermal permeability barriers, allowing percutaneous absorption and systemic toxicity from medications and even harmless substances, such as soaps and cleaning solutions.
- Infants under warming lights and postmature infants often have dry, flaky skin with fissures and benefit from application of bland ointments and creams.
- School-aged children often overclean the back of their hands, resulting in dry, cracked skin.



**Fig. 1.2** Application of wet compresses soothes the skin and is effective in treating weeping inflammatory rashes.

## Topical Corticosteroids

### Description

- Hydrocortisone was first introduced in 1952, and since then, topical corticosteroids have been the principal medications used to treat inflammatory dermatosis. Over time, they have been proved safe and effective when used properly. In dermatology, topical corticosteroids are used for their anti-inflammatory properties.

### Generic Versus Brand Names

- Many generic topical corticosteroid formulations are available and provide substantial financial savings for patients.
- Despite these savings, generic formulations can differ significantly from their brand-name counterparts with respect to their anti-inflammatory potency and preservative content.

### Corticosteroid Potency: Groups I to VII

- Topical corticosteroids are organized in seven groups, based on their anti-inflammatory activity (group I is the strongest; group VII is the weakest; see inside back cover for group listings).
- Throughout the book, topical corticosteroids are referred to by group number.

#### Choosing the Appropriate Strength

- The success or failure of therapy depends largely on selecting a topical corticosteroid of the correct strength.
- A few essential factors to consider include diagnosis, location, age, and financial resources of the patient.
- Certain rashes, such as nummular eczema and discoid lupus erythematosus, require group I or II corticosteroids for adequate control. Seborrheic dermatitis is responsive to groups V to VII corticosteroids.
- Dermatitis on the eyelids should be treated with groups V to VII corticosteroids. Palms and soles require groups I to III corticosteroids because the thick skin obstructs penetration and lessens efficacy.

- Patients who do not show adequate response after 2 weeks of therapy should be re-evaluated.
- By convention, topical corticosteroids are firmly massaged into the skin twice daily, although some formulations only require once-daily application.
- Concentrations reflect relative strength for a particular corticosteroid (triamcinolone 0.025%, 0.05%, 0.1%) and cannot be used to compare strengths between corticosteroids. For example, clobetasol propionate 0.05% is much more potent than hydrocortisone 1%.
- Some corticosteroids are referred to as *fluorinated* because a fluorine atom has been added to increase potency.

### Prescribing Topical Corticosteroids

#### Dosing Schedules

- These are general guidelines; specific instructions and limitations must be established for each patient.

#### Superpotent Topical Corticosteroids (Group I)

- Patients should not use more than 45 to 60 g of cream or ointment per week.
- Cyclic dosing, such as corticosteroid application for 2 weeks, followed by 1 week of rest, can limit side effects.
- Patients must be prescribed limited amounts of these superpotent corticosteroids and have close monitoring.
- Difficult-to-treat inflammatory diseases, such as plaque psoriasis and hand eczema, respond most effectively when a group I topical corticosteroid is applied twice a day for 2 weeks, followed by 1 week of rest. This schedule is repeated until the condition is well controlled.

#### Groups II to VII Topical Corticosteroids

- Groups II to VII topical corticosteroids should be applied twice each day.
- Adequate response should be seen in 2 to 6 weeks.
- Prescribing a weak group VII topical corticosteroid (hydrocortisone) for an intense inflammatory condition is a common mistake.

### Methods of Application

#### (Simple and Occlusive)

##### Simple

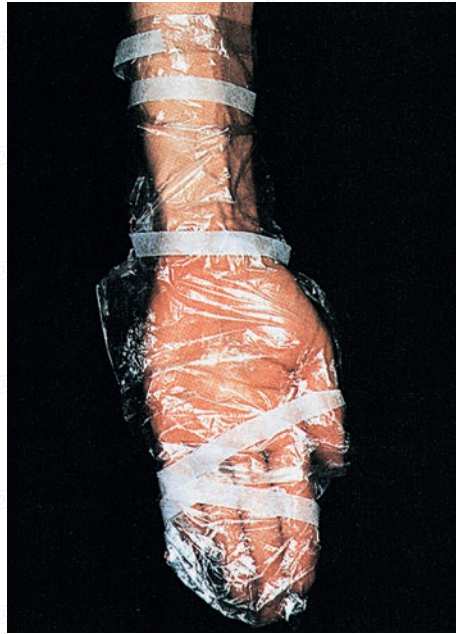
- A simple application refers to massaging a topical corticosteroid thinly into the skin without the aid of an occlusive dressing.
- Washing is not necessary before each application.
- Different skin surfaces vary in their ability to absorb topical corticosteroids.
- Eyelid dermatitis responds quickly to group VI or VII steroids. Higher potency corticosteroids should be avoided in this area.
- The skin on the palms and soles is thick, requiring groups I to III corticosteroids.
- Intertriginous areas (e.g., axilla, groin, perineum, and the inframammary region) respond quickly to groups V to VII corticosteroids because the moisture and occlusion increase percutaneous absorption.
- Topical corticosteroids are absorbed readily in inflamed skin, resulting in a rapid initial response.

##### Occlusive

- Occlusive dressings (e.g., Saran Wrap) hydrate the stratum corneum and allow for enhanced corticosteroid absorption and thus for use of lower strength corticosteroids.
- Lengthy application of an occlusive dressing can produce superficial skin infection (usually *Staphylococcus aureus*) and inflamed hair follicles. If pustules develop, topical (e.g., mupirocin or retapamulin) or systemic (e.g., cephalexin, trimethoprim-sulfamethoxazole), antistaphylococcal antibiotics should be administered.
- Occlusive dressings can be used during the day for periods of up to 2 hours, or for up to 8 hours during sleep. Simple applications can be alternated with applications assisted by an occlusive dressing.

##### Method of Occlusion

- The area should be cleaned with mild soap and water. Antibacterial soaps are unnecessary.
- The topical corticosteroid is gently rubbed into the lesions, and the entire area is



**Fig. 1.3** Occlusion of the hand. A plastic bag is pulled on and pressed against the skin to expel air. Tape is wound snugly around the bag.



**Fig. 1.4** Occlusion of the arm. A plastic sheet (e.g., Saran Wrap) is wound around the extremity and secured at both ends with tape. A plastic bag with the bottom cut out may be used as a sleeve and held in place with tape or an Ace bandage.





**Fig. 1.5** Sauna suits may be used to help moisturize the skin and increase effectiveness of topical corticosteroids. They can be purchased on the Internet or from major retail stores.

covered with plastic (e.g., Saran Wrap, Handi-Wrap, plastic bags, vinyl gloves, or vinyl exercise suits).

- The dressing is secured with tape so that it is close to the skin and the ends are sealed. An airtight dressing is not necessary. The plastic may be held in place with an Ace bandage or a sock.
- The best results are obtained when the dressing remains in place for at least 2 hours. Many patients find that bedtime is the most convenient time to wear an occlusive dressing.
- More medicine is applied shortly after the dressing is removed and while the skin is still moist.
- Vinyl exercise suits are effective to occlude large body surface areas.

### Systemic Absorption

- With proper use of corticosteroids, systemic effects are rare.



**Fig. 1.6** Steroid atrophy. Long-term application of clobetasol, a group I topical steroid, caused dermal atrophy and skin fragility. Bleeding and skin tearing occurred with the slightest trauma.

- Persistent, unsupervised use of topical corticosteroids over wide areas can result in significant systemic absorption.

### Steroid–Antibiotic Mixtures

- Some products contain a combination of antibiotics and corticosteroids.
- Most corticosteroid-responsive skin diseases can be managed successfully without topical antibiotics, limiting the usefulness of these products.
- Neomycin is a common cause of allergic contact dermatitis and should be avoided.
- Antifungal–corticosteroid combinations (Mycolog, Lotrisone) are expensive and have limited uses. The topical corticosteroid betamethasone dipropionate (found in Lotrisone) is too strong for intertriginous areas and can cause permanent striae.

### Adverse Reactions

- Topical corticosteroids have the following potential side effects:
  - Allergic contact dermatitis
  - Burning, itching, irritation, dryness (largely due to the vehicle)
  - Hypertrichosis
  - Hypopigmentation
  - Miliaria and folliculitis
  - Skin breakdown
  - Glaucoma, cataracts
  - Rebound phenomenon (e.g., psoriasis becomes worse after treatment is stopped)
  - Rosacea, perioral dermatitis, acne
  - Skin atrophy with telangiectasia, stellate pseudoscars (arms), purpura, striae

- Skin blanching from acute vasoconstriction
- Systemic absorption
- Tinea incognita, impetigo incognito, scabies incognito



**Fig. 1.7** Striae. Long-term application of a group V topical steroid to the axillae produced striae. This side effect is irreversible.



**Fig. 1.8** Steroid rosacea. Numerous papules and pustules appeared on the face after stopping application of a group II topical steroid. The topical steroid had been applied daily for 12 weeks.



### Pediatric Considerations

- Topical corticosteroids have been used in children for more than 40 years and have a proven track record for safety when used correctly.
- Many parents have concerns about topical steroids. Parents should be educated about potential side effects and shown how to apply topical steroids correctly.
- Infants are more susceptible to systemic side effects because of their increased ratio of body surface to weight. Systemic side effects, such as hypothalamic–pituitary axis suppression, can occur with long-term use or when the skin barrier is compromised (acute dermatitis, premature infants).



**Fig. 1.9** Atrophy and telangiectasia after continual use of a group II topical steroid for 6 months. The atrophy may improve after the topical steroid is discontinued, but the telangiectasia often persists.





**Fig. 1.10** Steroid atrophy. Atrophy may occur on the palms and soles with long term use of superpotent topical steroids. Notice the porcelain white atrophy in the arch of the foot after 3 months of application of clobetasol.



**Fig. 1.11** Striae of the groin after long-term use of group V topical steroids for pruritus. These changes are irreversible.



**Fig. 1.12** Steroid atrophy. Long-term daily application of clobetasol, a group I topical steroid, caused epidermal and dermal atrophy with telangiectasia. Veins can be seen through the thinned skin.



**Fig. 1.13** Application of topical corticosteroids to the face may result in rosacea, as seen in this patient.



**Fig. 1.14** Typical presentation of tinea of the groin before treatment. A fungal infection of this type typically has a sharp, scaly border and shows little tendency to spread.



**Fig. 1.15** Tinea incognito. Bizarre pattern of widespread inflammation created by applying a group II topical steroid twice daily for 3 weeks. The facial eruption is similar in appearance to the groin rash in [Fig. 1.14](#). A potassium hydroxide preparation showed numerous fungi.



# 2

## Eczema

Kathryn A. Zug

### Acute Eczematous Inflammation

#### Description

- Acute eczematous inflammation is characterized clinically by erythema, edema, and vesiculation. Weeping or oozing of acute lesions is typical. Pruritus is often severe.

#### History

- There are multiple causes of acute eczema. They include allergic contact hypersensitivity to specific plant allergens, such as poison ivy, poison oak, or poison sumac, and many other allergens.
- Nickel, topical medicaments (e.g., bacitracin, neomycin, and benzocaine), fragrances, preservatives in personal care products, occupation-associated sources, and rubber additives are also common causes of acute eczematous inflammation. Irritant dermatitis is common after repeated water, solvent, or detergent exposure and predisposes to contact allergy.
- In an “id reaction,” acute eczema with vesicles occurs at a distant site (e.g., the hands) from an active fungal infection (e.g., the feet).
- Stasis dermatitis, scabies, irritant reactions, and dyshidrotic and atopic eczema may present as an acute eczematous inflammation.

#### Skin Findings

- Findings include erythema, edema, vesiculation, and weeping. Inflammation can be moderate to intense. Tiny, clear, fluid-filled vesicles are seen on the skin surface. Bullae may develop.

#### Laboratory

- Patch testing to evaluate for delayed-type hypersensitivity should be considered if the distribution suggests a contact exposure, if the

problem is recurrent or refractory to therapy, or if there is known occupational, hobby, or other exposure to cutaneous allergens.

- Consider mineral oil preparation to evaluate for scabies, especially in eczema of new or recent onset.
- Consider scraping scale for potassium hydroxide examination to evaluate for dermatophyte fungus infection. Blood tests are almost never helpful in the evaluation of acute eczema.

#### Course and Prognosis

- If the provoking factors can be avoided, the eruption improves over 7 to 10 days, with clearing usually by 3 weeks. Recurrence may indicate allergen re-exposure.
- Excoriation predisposes to infection and causes serum, crust, and purulent material to accumulate. Excoriation can result in secondary staphylococcal infection and in aggravation and prolongation of the dermatitis.

#### Management

- Cool, wet dressings and topical steroid creams allow vasoconstriction and suppress inflammation and itching. A clean cloth is soaked in cool water or Burow’s solution and then placed on affected areas for 30 minutes. An appropriate topical steroid cream (group II or III) is then applied and rubbed in well.
- Oral corticosteroids are reserved for severe or generalized acute eczema. The dosage is approximately 0.5 to 1 mg/kg/day initially, tapering over 3 weeks. Too short a course may result in recurrence and rebound of the dermatitis.
- Oral antihistamines, such as diphenhydramine (Benadryl) and hydroxyzine (Atarax), can relieve itching, and their sedative effect may promote better sleep.



**Fig. 2.1** Acute eczema with vesicles, erythema, edema, and weeping.

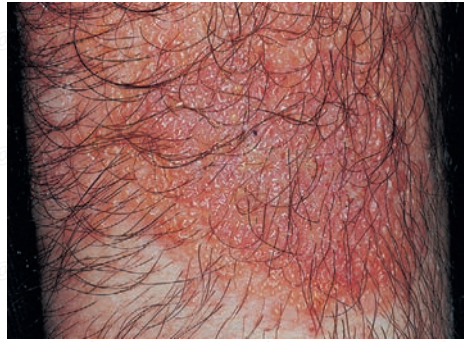


**Fig. 2.2** Acute eczematous inflammation.

- If secondary infection is suspected, an anti-*Staphylococcus aureus* antibiotic (e.g., cephalexin, dicloxacillin) is administered for 10 to 14 days.

### Pearls

- Acute eczema may be confused with acute infections, such as cellulitis; the often marked itching associated with acute eczema should help distinguish them.
- Repeated bouts of acute eczema on the face, exposed hands, or arms suggest a contact allergy that should be evaluated by patch



**Fig. 2.3** Acute eczema. Pruritic vesicles are the hallmark.



**Fig. 2.4** Acute eczematous inflammation. Vesicles and intense itching are the hallmark of acute eczema. This patient was allergic to rubber allergens in shoes.

testing. Scabies should be considered in new-onset eczema.

- Remove all the patient's topical medications (lotions, topical over-the-counter medicaments, anti-itch preparations) and treat with topical steroids only, or with bland emollients—keep the skin care and exposures minimal and simple.
- Elevation of the legs, if they are affected, is helpful in decreasing dependent edema and dermatitis.





**Fig. 2.5** Acute eczema. Poison ivy may cause intense acute eczematous inflammation. Vesicles and blisters form on a red base. The blisters may coalesce and become very large. The itching is unbearable and is best controlled with cold wet dressings.



**Fig. 2.6** Vesicles are characteristic of the acute phase of eczematous inflammation. Itching is often intense.

## Rhus Dermatitis (Poison Ivy, Poison Oak, Poison Sumac)

### Description

- Poison ivy, poison oak, and poison sumac (plants of the Anacardiaceae family) and *Toxicodendron* species are the most common causes of allergic contact dermatitis in the United States; this problematic prototype of contact dermatitis is rarely reported in Europe, although related plants grow in Southeast Asia, Central America, and South America.
- Oleoresin (lipid-soluble portion) contains a mixture of highly allergenic catechol chemicals called *urushiols*, a term derived from the Japanese word for sap, *urushi*.

### History

- Contact with the plant's leaf, stem, or root, even in autumn and winter, results in a pruritic bullous eruption within 8 to 72 hours of exposure in a previously sensitized individual and within 12 to 21 days in an individual who has not yet been sensitized (primary sensitization).
- Primary sensitization can result from exposure to the allergenic plant. This process requires an intact immune system. After an individual has become allergic (sensitized), repeat exposure will cause the rash to occur more promptly (a process called *elicitation*).
- About half of American adults develop the rash if they are exposed; 30% to 40% require prolonged exposure to produce the dermatitis.
- About 10% to 15% of Americans do not become sensitized (allergic).

### Skin Findings

- Clinical findings vary with the quantity of oleoresin that contacts the skin, the pattern of contact, individual susceptibility, and regional variations in skin reactivity.
- Findings include pruritic, edematous, linear erythematous streaks, usually with vesicles and large bullae on exposed skin.
- Airborne particulate matter from burning the plant can result in intense, pruritic facial erythema and marked edema; the eyelids can be dramatically swollen.

- Trauma to the skin from the plant may leave a temporary black mark on the skin—a clue to exposure and a result of dried and oxidized urushiol allergen.

### Course and Prognosis

- The itchy eruption lasts from 10 days to as long as 3 weeks.
- Short courses of oral corticosteroids (e.g., dose packs) are inadequate and may result in a rebound phenomenon with prompt blistering when discontinued.
- The rash resolves completely without scarring.
- Impetigo or cellulitis may occur from scratching and secondary bacterial infection (usually *S. aureus*).
- Short-term disability and time lost from work are significant occupational problems associated with this contact dermatitis, especially among firefighters, foresters, landscapers, and outdoor workers.

### Discussion

- Poison ivy is not spread by blister fluid and is not spread from person to person.
- The allergenic oleoresin can be spread by contaminated clothing, garden tools, or animals.
- Cross-reacting allergens from other plants of the Anacardiaceae family include mango peel, the oil of raw cashew nut shells, Japanese lacquer, and ginkgo fruit pulp. Individuals sensitized to poison ivy may also react after exposure to these related plants.
- Poison ivy grows as a shrub or climbing vine. In the United States, Eastern poison oak is typically found in the Southeast, whereas Western poison oak grows typically on the West Coast, in the form of a small shrub or tree. Poison sumac prefers a moist location and is common in peat bogs and wetlands of the eastern United States and southeastern Canada.

### Management

- The skin should be washed with soap to inactivate and remove allergic oleoresin, thereby preventing further skin penetration and contamination. Washing is most



**Fig. 2.7** Poison ivy dermatitis. Classic presentation of linear vesicles in streaks suggests plant dermatitis.

effective if done within 15 minutes of exposure.

- Exposed clothing and tools should be cleansed with soapy water.
- Short, cool tub baths, with or without colloidal oatmeal (Aveeno), are soothing for itching and swelling.
- Calamine lotion controls itching, but prolonged use can lead to excessive drying.
- Oral antihistamines (hydroxyzine and diphenhydramine) may control itching. They are sedating and may be best used at night to reduce nighttime scratching and promote rest, thus offering relief from the stress of intense itch, which often interferes with sleep.
- Cool, wet dressings made with tap water or Burow's solution are highly effective during the acute blistering stage. They are applied for 15 to 30 minutes several times a day for 1 to 4 days until blistering and severe itching are controlled. Cool, wet tap-water dressings are very useful for severe facial or eyelid edema.
- A medium-potency topical steroid (groups II–V) should be generously applied after the wet dressing. If the periorbital skin is involved, a weaker topical steroid (groups VI–VII) is advised for a specified limited duration (twice daily for 7 days).
- The immunomodulatory topical therapies, pimecrolimus (Elidel) and tacrolimus (Protopic), are not advised for acute allergic contact dermatitis to poison ivy, given their



**Fig. 2.8** Edema, erosions from large bullae, and vesicles on this limb affected by a severe contact allergy to poison ivy. Itch rather than pain fits with allergy and not infection.

cost, the amount often required, and delay of efficacy compared with topical steroids.

- A course of oral corticosteroids for severe, widespread inflammation is started at 0.5 to 1 mg/kg/day and is slowly tapered over 3 weeks.
- A barrier cream, IvyBlock, contains quaternium-18 bentonite that can be successful in preventing the dermatitis or reducing the severity of reactions. However, it is essential that it be applied at least 15 minutes before anticipated exposure.
- Poison ivy oleoresin in capsules and an injectable form for hyposensitization have been removed from the market as a result of side effects and incomplete efficacy. There are no means available currently for desensitization to poison ivy.





**Fig. 2.9** Poison ivy dermatitis. Intense erythema, vesicles, and itching are intolerable. Cold tap-water compresses are soothing. Severe poison ivy dermatitis may require systemic treatment.



**Fig. 2.10** Poison ivy dermatitis occurs at site of contact with the allergenic oil of the plant. Plant leaf used as toilet wipe resulted in rash in gluteal cleft. Spread of oil from hands to genital skin is not uncommon, and the result is very uncomfortable.



**Fig. 2.11** Poison ivy plant. Note the leaves of three and small berries.

## Pearls

- The classic presentation of poisonous plant contact dermatitis is variably sized vesicles and bullae appearing in a linear distribution on exposed skin.
- Generally, repeated exposure over short periods of time (i.e., the summer months) results in increasingly severe bouts of the dermatitis.
- Oral ingestion of raw or incompletely roasted cashews can cause an internal–external reaction—a sudden erythematous pruritic dermatitis in a characteristic distribution on the buttocks, upper inner thighs, and axillary vault in individuals sensitized to urushiol.
- Poison ivy, poison oak, or poison sumac can involve wide areas. The decision to use oral or topical steroids depends on the severity of the symptoms, age of the patient, and potential for short-term adverse reactions anticipated through review of the medical history.
- Short courses of low-dose systemic corticosteroids are inadequate treatment for severe, generalized cases of poison ivy.



**Fig. 2.12** Poison ivy with severe, intense, acute eczematous inflammation and large confluent blisters. Many blisters have ruptured. The serum that leaks onto the skin does not spread poison ivy. Cool wet compresses applied for 30 minutes several times a day help to control the inflammation.



**Fig. 2.13** Large bulla of poison ivy can become blood filled.

## Subacute Eczematous Inflammation (Subacute Eczema)

### Description

- This eczematous inflammation consists of itchy, red, and scaling patches, papules, and plaques in various configurations.

### History

- This subacute condition may evolve from acute (vesicular) eczema.
- This is the most common clinical manifestation of atopic dermatitis. It may also represent contact allergy.
- Patients complain of dermatitis that has been present longer than 1 week.
- Itching is variable; it can be moderate to severe or rather mild.
- The condition resolves without scarring when provoking or contributing aggravating factors are removed. It may require treatment to resolve.



**Fig. 2.14** Subacute eczema of the ear with erythema, scaling, and crusting.

- Excoriation and repeated exposure to aggravating conditions (water, detergents, irritants, or other common irritants or allergens) convert this condition to a chronic process.

### Skin Findings

- Erythema and scaling occur in various patterns.
- Often there are indistinct borders.
- Redness may be faint or intense.

### Etiology and Clinical Presentation

- Contact allergy, contact irritation, atopic dermatitis, scabies, stasis dermatitis, nummular eczema, fingertip eczema, and fungal infections may present as subacute eczema.
- If there is not a strong atopic history, search for new cutaneous irritant or allergen exposures. Stress can aggravate and contribute to this problem but is not a common sole cause.

### Treatment

#### *Steroids and Other Nonsteroid Topical Prescription Therapies*

- Groups II to V steroid creams twice a day with or without plastic occlusion are administered. Occlusion hastens resolution while increasing absorption of topical steroid. Duration of occlusion should be specified (2–8 hours) and limited (3–10 days).



**Fig. 2.15** Erythema and scaling with indistinct borders are characteristic. Vesicles may never appear. This is often the initial presentation in the winter in atopic patients.