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Preparedness for and Management of Conditions of the Skin

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ABSTRACT

Over one-quarter of the US population seeks treatment for a dermatologic condition each year. Studies have indicated that the general medical school curriculum places little emphasis on diseases of the skin, and physicians may be ill-prepared to diagnose and manage these conditions. A better understanding of the seven corticosteroid classes and the variety of vehicles in which they are formulated may improve patient satisfaction, patient adherence, and clinical response to treatment when managing conditions of the skin.

DERMATOLOGY IN GENERAL MEDICAL EDUCATION

Approximately 27% of the US population seeks medical care for a dermatologic problem each year¹. Encounters for skin conditions represent 4.5% of visits to Emergency Departments and comprise between 10 and 15% of visits to primary care providers^{2,3}. Medical schools offer very little dermatology training as part of the general curriculum, and most doctors in the United States receive little formal education in dermatology, perhaps making them ill-equipped to diagnose and treat basic skin conditions⁴.

A 2015 study tested the ability of US medical students to diagnose and treat common skin conditions. The average test score was 46.6%, with a score of 70% or more considered to be a passing grade⁵. Since the time when this study was conducted, the pandemic has led to even less patient contact and more virtual instruction for medical trainees. A survey of US medical students who received virtual teaching during the Covid-19 pandemic found that 43.3% felt unprepared for their clerkships and 56.7% felt unprepared for their US Medical Licensing Exams⁶.

Based on a 2020 survey of 137 accredited US medical schools, researchers found that most did not offer dedicated dermatology education to their students or require any clinical rotations in dermatology. Only 1% required a third-year clinical rotation, 12% offered a one- to four-week preclinical course dedicated to dermatology, and 36% included some dermatology lessons as part of other coursework. 62% had a dermatology elective rotation available to third- or fourth-year students⁴. Many schools in the survey expressed difficulty in incorporating dermatology into curricula due to limited time in the schedule, challenges of incorporating dermatologic education into existing courses, and lack of dermatology educators to assist.

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MANAGEMENT PRINCIPLES IN DERMATOLOGY

Patients presenting to an Emergency Department with skin complaints are most often diagnosed with infections of skin and subcutaneous tissues, followed by dermatitis and urticaria⁷. The most common skin conditions encountered in the primary care setting are dermatitis, acne vulgaris, cellulitis/abscess, verruca vulgaris, and benign skin lesions⁸. While management of skin infections will vary upon factors that include pathogen, extent of infection, and immune status of the patient, some forms of dermatitis, namely contact and atopic dermatitis, often follow more streamlined principles in the approach to treatment.

While most severe, facial, or widespread allergic contact dermatitis will require systemic treatment, most dermatologic conditions are treated with topical medications. If systemic corticosteroids are necessary, one must remember that allergic contact dermatitis is a type 4 delayed-type hypersensitivity immune response that requires approximately two weeks of medication for adequate treatment⁹. Treating for shorter durations often results in a rebound recurrence of the rash upon completion of a brief course of steroids or a methylprednisolone taper pack. While identifying and avoiding the allergen is important, proper treatment duration is also necessary in managing these patients.

Whenever prescribing topical medications for dermatologic conditions, consider the age of the patient, the skin condition being treated, the skin thickness of the anatomical area being treated, the potential for occlusion (i.e., intertriginous areas), the integrity of the involved skin, the patient's natural Fitzpatrick skin color (Type 1 through 6 ranging from pale pink to dark brown), and the presence or absence of secondary pigmentary changes and skin atrophy. Children and the elderly have thinner skin and absorb topical corticosteroids more readily than patients of

adolescence through middle-aged adulthood. Anatomical areas with thinner skin, such as the face and genitalia, are more permeable to medications and are more likely than thicker skin to absorb medication and to experience local side effects⁹. While suppression of the hypothalamic-pituitary-adrenal axis is rare, this is most likely to occur when applying large amounts of steroid for extensive periods of time to widespread surface areas in young children. Topical corticosteroids can result in hypopigmentation in all skin types but is usually more apparent in patients with darker Fitzpatrick skin tones. If this side effect occurs, one should expect gradual and at least partial repigmentation after months of discontinuing steroid use to the hypopigmented area¹⁰.

CHOOSING TOPICAL DERMATOLOGIC VEHICLES

Topical medications are available in a variety of vehicles or formulations. [Table 1] The skin condition being treated will be affected by both the medication and the vehicle through which it is applied. The more common vehicles include ointments, creams, lotions, gels, solutions, and foams, and choosing the most appropriate one can improve patient adherence and response to treatment¹¹. Ointments are excellent lubricants and the most potent vehicle to assist in drug delivery. These are more readily accepted by young children and by patients with very dry skin. Others may not prefer the greasy sensation and the potential to stain clothing and fabrics. Gels and solutions are less potent vehicles than ointments but are more potent than creams. Both are colorless and tend to dry moist lesions and oily skin. However, both contain alcohol that may result in a stinging sensation when applied to irritated, excoriated, or fissured skin, which, in turn, may reduce patient adherence. Patients with naturally oily skin may prefer one of these vehicles. Solutions are most often prescribed for hair bearing areas, such as the scalp. Creams facilitate

Table 1. Vehicle Selection for Body Sites

Vehicle	Smooth non-hairy	Thick keratotic	Hairy	Skin Folds
Ointment	+++	+++		
Cream	++	++	+	++
Lotion			++	++
Solution			+++	++
Gel			++	+
Foams		++	+++	++

less medication absorption than ointments, gels, and solutions, they are mildly hydrating, and are well accepted by most patients. Lotions are the least potent vehicle and are used primarily for their property of easily spreading over large surface areas, areas with thinner skin, and on anatomical areas with thin hair. Foams can be useful to apply to hairy areas of skin, hyperkeratotic skin, or to intertriginous skin folds, but they are expensive, less available, and formulated with fewer corticosteroid options than other vehicles.

CHOOSING TOPICAL DERMATOLOGIC CORTICOSTEROIDS

Topical corticosteroids are subdivided into seven potency groups, with Class 1 being the most potent, and class 7 the least. [Table 2] Because of the vehicle properties as reviewed above, the identical medication delivered in different vehicles alters potency. For example, mometasone furoate 0.1% ointment is considered a Class 3 corticosteroid, while the 0.1% cream is considered Class 4. As a general principle, the more potent corticosteroid classes should be prescribed for thicker lesions, lesions with more scale, and for the more inflammatory conditions. For example, a psoriasis plaque may respond well over four to six weeks to Class 1 clobetasol propionate 0.05% ointment but may never respond to Class 7

hydrocortisone 1% cream, regardless of the duration it is applied. Conversely, a 3-year-old with atopic dermatitis may experience a good response to 1% hydrocortisone cream over 4 to 6 weeks but might develop hypopigmentation, skin atrophy, and/or striae to a Class 1 or 2 corticosteroid over the same period. This underscores the importance of communicating with patients about the proper usage of medications and arranging follow-up care to evaluate for clinical response and potential side effects. If by chance this 3-year-old is not responding adequately to 1% hydrocortisone cream, switching to the more potent hydrocortisone 1% ointment might provide a more satisfactory response over the next few weeks. If not, a Class 6 corticosteroid, such as alclometasone dipropionate 0.05% or triamcinolone acetonide 0.025% cream or ointment could be tried. When prescribing triamcinolone acetonide, be aware that it is available in various strengths and formulations and therefore categorized in different potency classes. Triamcinolone acetonide 0.025% cream, lotion, and ointment are in Class 6, the 0.1% lotion is Class 5, the 0.1% cream and ointment are Class 4, and the 0.5% ointment and cream are Class 3. One should also be vigilant when prescribing hydrocortisone to differentiate between Class 5 hydrocortisone valerate 0.2% cream and the various strengths of Class 7 hydrocortisone base creams.

Table 2. Abbreviated Topical Corticosteroid Class List

Potency Class	Corticosteroid	Vehicle	Strength
1	Betamethasone dipropionate, augmented	ointment, lotion, gel	0.05%
1	Clobetasol propionate	ointment, cream, gel, solution	0.05%
2	Betamethasone dipropionate	ointment, cream	0.05%
2	Fluocinonide	ointment, cream, gel, solution	0.05%
3	Mometasone furoate	ointment	0.1%
3	Triamcinolone acetonide	ointment, cream	0.5%
4	Triamcinolone acetonide	ointment, cream	0.1%
4	Mometasone furoate	cream, lotion, solution	0.1%
5	Desonide	ointment, gel	0.05%
5	Hydrocortisone valerate	cream	0.2%
6	Alclometasone dipropionate	ointment, cream	0.05%
6	Triamcinolone acetonide	ointment, cream, lotion	0.025%
7	Hydrocortisone base	ointment, cream, lotion, solution	2.5%
7	Hydrocortisone base	ointment, cream, lotion, solution	1%

Insurance drug formularies may influence which product providers choose in each Class when trying to prescribe medications covered by insurance plans. When prescribing specific topical medications, some plans will cover creams but not ointments, gels but not creams, and so on. Be aware that on some formularies brand names may require lower co-pays than the generic formulations, but this is the exception rather than the rule. It is therefore important to become familiar with at least two medications from each corticosteroid class to provide options for patients. Prescribing a medication on the patient's drug formulary can reduce delays in initiating therapy by decreasing the number of prescription denials and/or requests for prior authorizations.

Finally, the method and timing of corticosteroid application affects efficacy and absorption. More hydrated skin clinically responds more favorably to treatment than does dry skin. Thus, it is important to hydrate skin on a regular basis. While ointment-based emollients are very effective on dehydrated skin, moisturizing creams or lotions are also therapeutic and sometimes preferred by patients who ultimately must use what is prescribed for it to be effective. Advise patients with dermatitis to use emollients at least once daily. To improve clinical response, apply emollients and medication soon after bathing. For patients whose skin cannot tolerate daily bathing, other options include 10 to 15 minutes of submerging only the affected areas in water or covering the rash with a moistened cloth, pat dry, and then apply emollients and corticosteroid treatments.

While there are a wide variety of rashes and lesions to diagnose and manage when seeing patients with skin conditions, these basic vehicle and corticosteroid properties, as well as individual patient characteristics, are principles that are applicable to all clinical encounters. As providers become more comfortable with managing dermatologic conditions by specifically choosing and prescribing ointments vs. creams vs. lotions and so on, these same vehicle properties will apply to other less commonly used topical medications, such as topical calcineurin inhibitors, phosphodiesterase-4 (PDE4) inhibitors, vitamin D analogs, retinoids, and other topical therapies being introduced to the market.

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