Treatment of Common Dermatologic Conditions

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KEYWORDS

• Dermatology treatment updates • Primary care • Topical steroids • Atopic dermatitis • Psoriasis • Alopecia • Acne rosacea • Acne vulgaris • Periorificial dermatitis • Seborrheic dermatitis • Stasis dermatitis

KEY POINTS

- Safely and appropriately prescribe topical steroids and steroid-sparing agents such as calcineurin inhibitors, retinoids, topical, and oral antimicrobials to manage common dermatologic conditions seen in primary care.
- Provide counseling about common side effects or complications of advanced dermatologic therapies such as biologics or JAK inhibitors.
- Recognize the clinical presentation of common dermatologic conditions in skin of varying degrees of pigmentation.

INTRODUCTION

Comfort in diagnosing common skin conditions is important for primary care providers and was addressed in a previous article in this journal.[1,2] Conveniently, many skin conditions will respond to similar therapies so learning how to prescribe topical and systemic medications such as steroids, steroid-sparing agents like calcineurin inhibitors, retinoids, antibiotics, and antifungals is the foundation to treating many conditions. Many newer agents such as biologics or JAK inhibitors may be prescribed by dermatologists so familiarity with the common side effects or complications of these treatments is also important in primary care. In this review, we will discuss the treatment of common forms of alopecia, facial rashes, atopic dermatitis, psoriasis, seborrheic dermatitis, and stasis dermatitis. Additionally, studies have shown that almost half of dermatologists feel they didn't have adequate training to treat skin disease in African-Americans, likely because general medicine and dermatology educational materials contain few images of darker skin tones.[3,4] In line with the recommendations

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from researchers studying these disparities, in this chapter we provide information and images that may be helpful when managing these common skin conditions in all skin types. The authors also encourage referencing the various patient-led and academic resources that focus on dermatology in skin of color which can be found with a simple internet search or in this reference.[5]

DISCUSSION

Topical Vehicles

Topical therapies are the mainstay of dermatologic treatment. Whether using corticosteroids, antimicrobials, or comedolytics, topical therapies allow a high concentration of localized medication while minimizing systemic side effects.

Providers can take advantage of the different characteristics of topical vehicles to prescribe therapies that may be more effective and safer to use on different sites of the body (**Table 1**). The choice of vehicle affects medication efficacy, which is inversely related to ease of use and can influence patient adherence (**Fig. 1**). All medications containing water require the use of preservatives, which can cause allergic contact dermatitis, so nonaqueous ointments are preferable when this is a concern. The alcohol content in gels and lotions provides drying benefits but may also cause stinging and burning if applied to open skin. Greasier medications such as ointments penetrate the hydrophobic epidermis more readily, so they are more potent but may be less cosmetically pleasing in some areas.[6]

Topical therapies are more easily applied to moist skin. Advise patients to apply a thin layer to all affected areas as over-application is not more efficacious. Daily to twice daily dosing is adequate.[7] The concept of the "fingertip unit" (FTU) can be useful in advising how much to apply based on location (**Fig. 2**).

Topical Steroids

Topical corticosteroids are the most prescribed class of topical medications. In the U.S., these are grouped by varying efficacy from class 1 (very high potency) to class 7 (low potency). Potency is based on both the class of medication and its absorption,

Table 1
Use of topical vehicles

Vehicles	Uses
Gels	Drying (high alcohol content). May cause burning sensation. Use on scalp and hairy areas.
Lotions	Cooling and sometimes drying depending upon alcohol content. Use on oozing lesions, areas with hair.
Creams	Mix of water in oil with preservatives, fragrances, emulsifiers More moisturizing than lotions Occlusion increases potency. Absorbs into skin. Use in cosmetically important and intertriginous areas.
Ointments	Lubricating and occlusive (little or no alcohol). No burning or stinging. Typically contain petrolatum and the active ingredient without added preservatives or fragrances. Most potent (self-occlusive) Use on dry, thick, hyperkeratotic lesions. Avoid use in hairy areas, intertriginous (maceration, folliculitis)
Foams/shampoos/oil	Scalp and ear canals

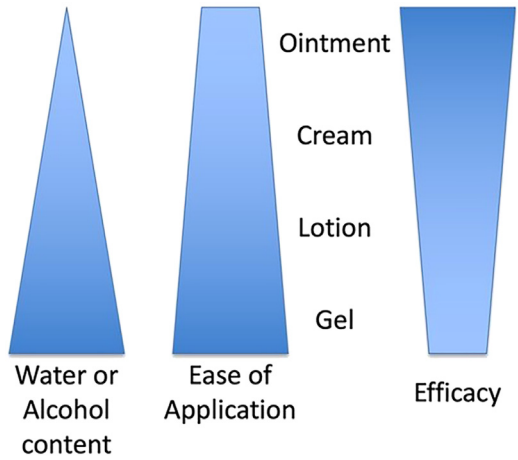


Fig. 1. Characteristics of topical vehicles. Gels contain more alcohol so have a drying effect and may be easier to use, though not as potent as ointments which have little water or alcohol and may be more difficult to use.

which is why a steroid can fall into several classes depending on the vehicle it is carried in. For example, fluocinonide 0.05% cream is class 3, while fluocinonide 0.05% ointment is class 2 due to the occlusive effect of ointments. Potency is important when considering the location of the application and the type of skin lesion (**Table 2**). More potent steroids are necessary for severe skin conditions, though in general, high-potency steroids should be avoided on the face, dorsum of hands, and intertriginous areas.

Side effects of topical corticosteroids include striae distensae (stretch marks), bruising, telangiectasias, skin fragility, and hypopigmentation. If used over extensive areas for long periods of time, there can be suppression of the hypothalamic-pituitary-adrenal axis.[6] Hypopigmentation is more likely to occur in more darkly pigmented skin; however, repigmentation typically occurs weeks to months after discontinuation. Steroid rosacea is more common with fluorinated steroids such as dexamethasone, triamcinolone, betamethasone, and beclomethasone. Ointments have little to no preservatives, fragrances, or emulsifiers, so they are the best choice if contact dermatitis is suspected.

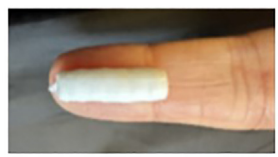
Fingertip Unit (FTU)	Location	FTU
	Face	2.5
	Trunk-Front	7
	Trunk-Back	7
	One arm	3
	One hand	1
	One leg	6
	One foot	2

Fig. 2. One FTU is a line of topical medication from a standard tube that extends along the distal phalanx of the index finger. This is equivalent to about 0.5 g of medication, which should cover one hand.

Table 2
Potency and use of topical steroids

Class	Use (Examples)	Avoid	Length of Use and Maximum Use
1* (very high potency) Clobetasol propionate 0.05% ointment or cream Betamethasone dipropionate 0.05% augmented ointment Halobetasol 0.05% ointment or cream	Thick, hyperkeratotic lesions Psoriasis Severe atopic dermatitis Lichen simplex chronicus Options for scalp treatments include foams, shampoos, sprays, solutions.	Face, dorsum of the hands, genitals, intertriginous areas	1–2 wk Not to exceed 1 mo of continuous use Not to exceed 100 g/week to reduce risk of hypothalamic pituitary axis suppression
2 (high potency) Betamethasone dipropionate 0.05% augmented cream Mometasone furoate 0.1% ointment FluocinoNIDE 0.05% ointment 3 (high potency) FluocinoNIDE 0.05% cream Triamcinolone 0.5% ointment or cream Betamethasone valerate 0.1% ointment	Same as 1	Same as 1	1–2 wk Not to exceed 1 mo of continuous use
4 (medium potency) Triamcinolone 0.1% ointment or cream Mometasone furoate 0.1% cream FluocinoLONE 0.025% ointment 5 (medium potency) Betamethasone valerate 0.1% cream Desonide 0.05% ointment FluocinoLONE 0.025% cream	Rashes Moderate atopic dermatitis Large surface areas (nonfacial)		4–5 wk Not to exceed 3 mo of continuous use
6 (low potency) Desonide 0.05% cream FluocinoLONE 0.01% cream	Facial dermatitis Intertrigo		6–7 wk Not to exceed 3 mo of continuous use
7 (low potency) Hydrocortisone 0.1% to 2.5% cream Hydrocortisone 2.5% ointment or cream Hydrocortisone 1% or lower (OTC)	Same as 6	Palms/soles (too weak to be effective on thicker skin)	6–7 wk Not to exceed 3 mo of continuous use

If topical steroids are required for maintenance therapy, consider "pulse dose" therapy to decrease side effects. For example, once a condition is under better control, topical steroids can be applied on weekends or weekdays only. In many conditions, topical calcineurin inhibitors can be used on the off days if needed. A conservative rule of thumb is that a steroid can be used for as many weeks as its class number without concern for side effects. Use of very high-potency steroids for longer than 4 weeks should be avoided both to decrease the risk of side effects and to prevent rebound symptoms upon discontinuation. If needed, gradually taper very high-potency steroids by reducing both the potency and dosing frequency at 2-week intervals until discontinuation. Only resume topical steroids after a steroid-free period of at least 1 week.

Cost can be a concern with many topical steroids. Choosing generic formulations can increase adherence but generics are not always inexpensive either. Steroid potency can be increased several-fold through occlusion, for example, by wrapping the area with plastic wrap overnight. Avoid occlusion of very high-potency steroids and when using steroids on the face, dorsal hands, or intertriginous areas.

Treatment of Itching

Pruritus (itch) is described as the desire to scratch and can vary from a minor annoyance to a debilitating condition. Chronic itch in the US has been estimated to cost society about 88 billion USD/year and disproportionately affects ethnic minorities.[8,9] There are many causes of itch from the direct release of histamine with hives to less understood pathways in inflammatory skin conditions such as eczema or psoriasis, systemic causes such as liver failure, an internal malignancy such as lymphoma, or psychogenic causes. The etiology and workup for pruritus are beyond the scope of this article and have been well reviewed elsewhere.[10]

Treatment of itch will bring your patient great relief while also elevating your status in their eyes as a master clinician. While histamine is responsible for acute itch and produces a hive when injected into the skin, chronic pruritus is associated with a variety of nonhistamine mediators that are less well characterized, and treatments are numerous.

Chronic itch can be treated with many topical and systemic options. The traditional treatments, such as antihistamines, topical steroids, and topical anesthetics are still first line and are cost effective. Recent additions to this list are denoted with a "c" in **Table 3** and are universally much more expensive. Topical options include the PDE4 inhibitor, crisabarole, or the JAK inhibitor, ruxolitinib. These are generally considered very safe, although the list of side effects with oral JAK inhibitors is quite long and there is not enough data on the topical formulation to be well informed on the potential hazards. Ruxolitinib is limited to 20% BSA for atopic dermatitis and 10% BSA for vitiligo, which should reduce the risk of systemic side effects.

Many opiates cause pruritus due to action on the mu-opiate receptor, so it is not a surprise that in people who are not taking opiates, yet experience itch for other reasons, they may find that naltrexone in standard or even very low doses can be helpful. Unlike the mu-opiate receptor, the kappa-opiate receptor actually suppresses itch and its agonist, difelikefalin, is approved for renal pruritus. In 2023, Kim, and colleagues showed difelikefalin can also be helpful for the very common scapular itch diagnosis, notalgia paresthetica and though likely cost prohibitive in many instances, may provide a path to future novel treatments as well.[11] Fortunately, newer biologic drugs targeting IL-4, IL-13, and IL-31 of the Th2 pathway as well as PDE4 and JAK inhibitors can help tremendously by interfering with many of the signals of the chronic pruritus pathway. Their use is limited by cost, however, and there is no

Table 3
Medications for Pruritus and/or Atopic Dermatitis

References[67,68] and FDA Prescribing Information	Mechanism of Action	Half Life	Side Effects	Monitoring
Topicals				
Corticosteroids	Multiple		Atrophy, striae, purpura, pigment changes	
Pimecrolimus Tacrolimus	Calcineurin inhibitor		Stinging with application Malignancy risk from these topicals has been called into question[69,70]	
Crisabarole[17,c]	Phosphodiesterase-4 (PDE4) inhibitor		Mild stinging with application	
Ruxolitinib[16,c]	Janus Kinase (JAK)1/2 inhibitor		Acne. Oral JAK inhibitors carry other risks of uncertain relevance for topical. 10%–20% max Body Surface Area (BSA)	Consider pretreatment tuberculosis (TB) testing to screen for latent tuberculosis infection (LTBI)
Lidocaine	Sodium channel blockade		Safe when used on limited BSA	
Pramoxine	Sodium channel blockade		Safe when used on limited BSA	
Camphor/Menthol	Activates temperature sensitive receptors			
N-palmitoylethanolamine (N-PEA)	Endocannabinoid			
Ketamine-Lidocaine-Amitriptyline	Multiple			
Capsaicin	Desensitization of temperature sensitive receptors		Burning with application.	
Narrow Band Ultraviolet B exposure (NB-UVB)	Cutaneous immunosuppression		Skin burn, hyperpigmentation, photoaging, skin cancer	Annual skin examination for skin cancer
Systemics				
Diphenhydramine Hydroxyzine	First generation H1 blocker	4 h 20 h	Sedation, caution in older adults	

Fexofenadine Loratadine Cetirizine	Second generation H1 blocker	14.4 h 8–11 h 8.3 h	Sedation	
Selective serotinin reuptake inhibitor (SSRI)	Serotonin reuptake inhibitor	Varied	Varied	
Tricyclic Antidepressant (TCA)	Serotonin and/or norepinephrine reuptake inhibitor	Varied	Varied	
Gabapentin	Uncertain	5–7 h	Sedation	
Pregabalin	Uncertain	6.3 h	Sedation	
Naltrexone	Mu-opioid receptor competitive antagonist	4 h	Sedation	
Difelikefalin[c]	Kappa-opioid receptor agonist	23–31 h	Sedation, vomiting, diarrhea	
Dupilumab[15,c]	Anti-IL-4 receptor	10–12 wk	Conjunctivitis, facial rash	Avoid live vaccines
Tralokinumab[14,c] Lebrikizumab[a,c]	Anti-IL-13	3 wk 3 wk	Conjunctivitis	Avoid live vaccines
Nemolizumab[a,c]	Anti-IL-31 receptor	17 d		
Abrocitinib[13,c] Upadacitinib[27,c]	JAK1 inhibitor	5 h 9–14 h	Acne LTBI reactivation Lymphoma Solid tumor malignancies Nonmelanoma skin cancer (NMSC) Leukopenias Thrombosis Stroke Intestinal perforation Major Adverse Cardiovascular Event (MACE)	Pretreatment screening: TB, Human Immunodeficiency Virus (HIV), Hepatis B Virus (HBV) Hepatitis C Virus (HCV) Complete Blood Count (CBC), Liver Function Tests (LFTs) and Lipids Monitoring: CBC, LFTs (upadacitinib), lipids q3m
Baricitinib[12 b,c] Gusacitinib [a,b,c]	JAK1/2 inhibitor Pan-JAK/SYK inhibitor	12 h 7 h	Presumably similar to JAK1 inhibitors	Presumably similar to JAK1 inhibitors

A nonexhaustive list of topical and systemic approaches to treatment of pruritus and/or atopic dermatitis. Green shaded boxes are more likely to be prescribed only by dermatologists as their high costs often require extensive authorization with insurance.

[a] Not approved in US currently.

[b] Off label for atopic dermatitis.

[c] More likely to be prescribed by dermatologists as their high costs often require extensive authorization with insurance.

FDA-approved IL-31 inhibitor at the time of this publication. Many of these newer medicines may not be prescribed by generalists but their widespread use necessitates awareness of potential side effects and monitoring requirements as some carry significant risk.[12–17]

As mentioned above, the JAK inhibitors carry a long list of potential serious side effects, though the most common side effect patients describe is worsening acne, the so called "JAKne," which can be treated like typical acne.[18] Severe complications like thrombosis, stroke, major adverse coronary events (MACE), intestinal perforation, skin cancer, and solid tumor malignancies are concerns especially when treating older patients. Please see the psoriasis discussion below for a discussion about perioperative use, with live vaccinations, and use in pregnancy.

Atopic Dermatitis

Atopic dermatitis (AD) is a common condition usually starting in infancy that often improves with age but persists in many adults as well. Often described as the "itch that rashes," it is usually distributed on the cheeks in infants, progresses to the neck and flexural folds in the toddler years and persists in these areas but is often less predictably localized (ie, *atopic*) in adults (**Fig. 3**). In addition to the intense pruritus and scaly erythematous involved skin, postinflammatory hyperpigmentation (PIH) can occur in areas of intense inflammation. These changes occur in all skin types but are most pronounced in more richly melanized baseline skin and can lead to unwanted pigmentary changes even long after the rash is controlled. AD is felt to be due to a defective barrier in the stratum corneum early in life that allows irritants and microbes to penetrate the superficial skin and trigger an immune response that leads to the rash and pruritus characteristic of the disease.

Treatment of AD is usually based on 4 pillars that must all be addressed for a successful outcome: addressing dry skin, inflammation, pruritus, and infection. These are critically important to manage this chronic condition and have been well reviewed elsewhere, so we will focus on relatively recent additions to our armamentarium for the treatment of inflammation and pruritus, all of which were discussed in the pruritus section above.[19]

Topical treatments for AD have expanded from the still effective mainstays of treatments such as topical steroids and calcineurin inhibitors to include FDA approvals for a PDE4 inhibitor and a topical JAK inhibitor (see **Table 3**). As is the case for many new

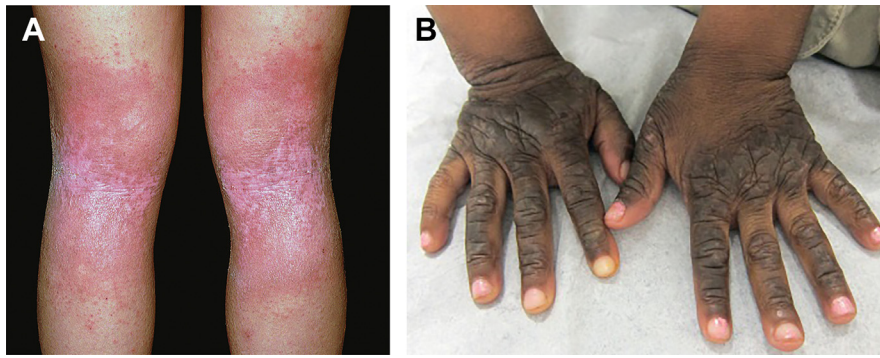


Fig. 3. (*A, B*) Ill-defined erythematous plaques with scale and varying degrees of hyperpigmentation in atopic dermatitis. ([*A*] *From* James WD et al: Andrews' diseases of the skin, ed 12, Philadelphia, 2016, Elsevier, Figure E2 [*B*] Robert G. Micheletti et al., Andrews' Diseases of the Skin Clinical Atlas, 2nd edition, 2023, Elsevier.)

medicines, cost is the biggest side effect of treatment for both creams. Systemic treatments for AD have exploded in number since the approval of the anti-IL4 antibody, dupilumab, in 2017 which is the first drug to shut down the inflammatory pathways that make atopic dermatitis miserable without broad immunosuppression. Subsequently, biologic agents targeting the similar IL13 are approved or in the pipeline and a novel anti-IL31 inhibitor is likely to be approved soon that may target the pruritus of AD more directly. A number of small molecules targeting the JAK pathway are also approved or in the pipeline for AD and some are also used for psoriasis. These oral medicines may be more appealing than the injected biologics, but they come with a longer list of potentially serious side effects as previously discussed. Please see the psoriasis discussion below for a discussion about use perioperatively, with live vaccinations, and use in pregnancy.

Psoriasis

Plaque psoriasis is the most common variant of psoriasis and typically develops in young adulthood (**Figs. 4** and **5**). Treatment of cutaneous plaque psoriasis with phototherapy, topical steroids, calcineurin inhibitors, calcipotriene, coal tar, and salicylic acid, as well as systemics like methotrexate and cyclosporine are all mainstays of treatment of mild to moderate psoriasis that are best-reviewed elsewhere.[20–22] They should remain first-line options for treatment as they are effective both for psoriasis and for cost control.

Two topicals have been approved more recently for plaque psoriasis. Roflumilast cream is a PDE4 inhibitor that is associated with a risk of diarrhea that is far better than its systemic cousin, apremilast, yet may limit treatment in those affected.[23] Tapinarof cream is the first approved aryl hydrocarbon receptor agonist and is well tolerated, with folliculitis and contact dermatitis being its primary side effects.[24] In addition, tapinarof is also produced by some bacteria which may make this “natural” attribute more appealing to some patients.[25]

An array of systemic agents has also been developed for psoriasis recently, from the biologic agents to the similarly expensive PDE4, JAK, and TYK inhibitors (**Table 4**). All of these are usually prescribed by dermatology but often have side effects of which generalists should be aware when comanaging these patients.

The first biologics approved for psoriasis were the TNF inhibitors in 1998. TNF inhibition poses a significant risk of reactivation and dissemination for those with LTBI so testing prior to initiation and then annually is recommended for TNF inhibitors. Pretreatment tests for HIV, HBV, and HCV are also important so that treatment can be initiated prior to starting long term immunosuppression. Newer biologics such as inhibitors of IL-17A, IL12/23, and IL23 carry similar, though likely lower risks, and all carry similar recommendations for pretreatment testing and ongoing TB monitoring.

The small molecule inhibitors to PDE4, JAK1, JAK3, and TYK2 may carry similar infectious and malignancy risks while also posing unique additional risks. JAK inhibitors may raise the risk of solid tumors and nonmelanoma skin cancers.[26,27] The JAK and TYK inhibitors carry a risk of intestinal perforation and may raise lipids, though it’s unclear if this is clinically relevant.[26–28] The TYK2 inhibitor may be associated with rhabdomyolysis as well.[28]

Given that all biologics are at least narrowly immunosuppressive, patients needing to schedule surgery are often advised to stop their biologic in advance. The guidelines of the joint American Academy of Dermatology and National Psoriasis Foundation (AAD-NPF) recommend continuing biologic medications for any surgery that will not breach contaminated tissues such as known infections or the respiratory,

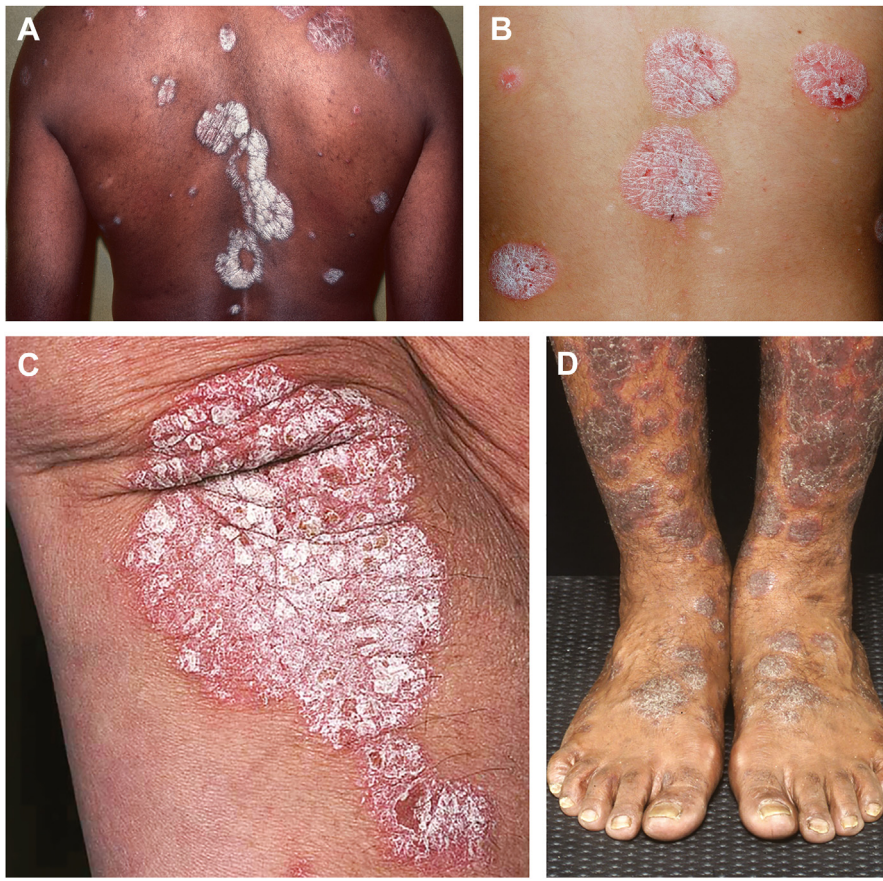


Fig. 4. (*A-D*) Note the well-defined erythematous plaques with adherent scale seen on the back and extensor surfaces predominantly. ([*A*] Robert G. Micheletti et al., Andrews' Diseases of the Skin Clinical Atlas, 2nd edition, 2023, Elsevier. [*B*] With permission from Julie V. Schaffer, MD. [*C*] *From* Ball, J.W., Dains, J.E., Flynn, J.A., Solomon, B.S., & Stewart, R.W. (2023). Seidel's guide to physical examination, (10th ed.). St. Louis: Elsevier. [*D*] Farrar, J., Garcia, P. J., Hotez, P. J., Junghanss, T., Kang, G., Lalloo, D., & White, N. J. Manson's Tropical Diseases, 24th edition, 2023 Elsevier.)

genitourinary, or intestinal tracts in which contamination with flora would be expected. Orthopedic, ophthalmic, and breast surgeries are examples of typically low risk surgeries. For higher risk surgeries, it is recommended to stop the biologic for 3 to 4 half-lives prior to surgery and restart 2 weeks postoperatively if no complications have arisen.[29] There are no clear guidelines for the small molecule inhibitors to PDE4, JAK1/3, and TYK2, yet their shorter half-lives make cessation perioperatively easier.

Live vaccines are not recommended while on any of these biologics or small molecule inhibitors. AAD-NPF recommends stopping for 2 to 3 half-lives of a biologic prior to a live vaccine and restarting 2 weeks after vaccination.[29]

TNF inhibitors are considered generally safe in pregnancy while a lack of data for the remaining IL12/23, IL17 A, IL23 inhibitor biologics and the PDE4, JAK1/3, and TYK2 inhibitors prevents recommendations for pregnancy risk.[29]

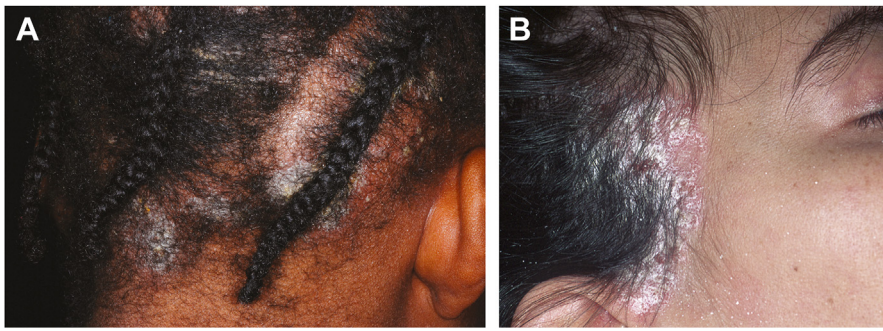


Fig. 5. (*A*, *B*) Scalp psoriasis with well-defined erythematous plaques and adherent, powdery, white, thickened scale. ([A] Amy S Paller, Anthony J. Mancini, Paller and Mancini - Hurwitz Clinical Pediatric Dermatology, 6th edition, 2021, Elsevier. [*B*] Lemmi F, Lemmi C: Physical assessment findings CD-ROM, Philadelphia, 2013, Saunders.)

Alopecia

One of the more common dermatologic complaints seen by dermatologists and primary care physicians is alopecia or hair loss. For a discussion of the numerous inflammatory, genetic, infectious, and other causes of alopecia, please see our previous article.[2] Here we will update treatments for pattern hair loss as well as pathogenesis and treatment updates for Central Centrifugal Cicatricial Alopecia (CCCA).

Pattern Hair Loss

Historically, androgenetic alopecia (AGA) or male pattern hair loss (MPHL) were used to describe the pattern of bitemporal and/or vertex recession more common in cisgender men while female pattern hair loss (FPHL) described a pattern of crown thinning without hairline recession more common in cisgender women (**Fig. 6**). As either pattern can be seen in either gender, the term pattern hair loss (PHL) has become accepted.[30]

Any discussion of treatment should include acceptance, as PHL is common. Coverup techniques can be effective and there are many nonmedical treatments for PHL such as platelet-rich plasma injection, hair transplantation, or laser/light treatment we will not discuss here as they are unlikely to be performed by a primary care clinician. Topical minoxidil and oral finasteride are both approved for PHL, and spironolactone is commonly used as an off-label treatment due to its effect on androgen levels. The only recent new addition to our treatments of PHL is low dose minoxidil (LDM) (**Table 5**).

Minoxidil is an antihypertensive that results in generalized hypertrichosis by an unknown mechanism and is commonly used as a topical preparation to encourage the growth of hairs with thicker diameter and length. LDM has the potential benefit of also lowering blood pressure. Side effects tend to be dose dependent, with hypertrichosis being by far the most common side effect, and less commonly, pedal edema and hypotension. Doses used in males are all off label, but usually 2.5-5 mg daily and in females 1.25 to 2.5 mg daily. The sex-based dosing difference is likely due to its effect on hypertrichosis, which is more often unwanted in people assigned female at birth, but it's important to work with each individual to find what dose is most appropriate for their goals.

It is worth noting that topical minoxidil, LDM, and spironolactone are classes of medicines used in primary care, and generalists should feel comfortable offering these

Table 4
Medications for psoriasis

Drug	Mechanism of Action	Half Life	Side Effects	Testing Required
Topicals				
Corticosteroids	Multiple		Atrophy, striae, purpura, pigment changes	
Pimecrolimus Tacrolimus	Calcineurin inhibitor		Stinging with application Malignancy risk from these topicals has been called into question[69,70]	
Calcipotriene	Vitamin D analog			
Salicylic acid	Comedolytic			
Coal Tar	Multiple		Staining of skin	
Roflumilast[23]	PDE4 inhibitor		Diarrhea, nausea, headache	
Tapinarof[26]	Aryl hydrocarbon receptor agonist		Folliculitis, Contact Dermatitis	
Narrow Band Ultraviolet B exposure (NB-UVB)	Cutaneous immunosuppression		Skin burn, hyperpigmentation, photoaging, skin cancer	Annual skin examination for skin cancer
Systemics				
Methotrexate	Dihydrofolate reductase inhibitor prevents T lymphocyte proliferation		Hepatotoxicity, pulmonary fibrosis, teratogenic, nausea, fatigue, hair loss	Pretreatment screening: HIV, HBV, HCV, CBC, CMP, HCG (if applicable) Monitoring: CBC, CMP, HCG (if applicable)
Cyclosporine	Calcineurin inhibitor		Hypertension, renal failure, hypomagnesemia, immunosuppression, hypertrichosis	Monitoring: Weekly blood pressure checks, CBC, Creatinine, Magnesium

Acitretin	Vitamin A analog		Hepatotoxicity, teratogenic, hypertriglyceridemia, dry skin	Monitoring: CBC, CMP, Triglycerides, HCG (if applicable)
Etanercept[a]	Tumor Necrosis Factor (TNF) inhibitor	3.5 d	LTBI reactivation	Pretreatment screening:
Adalimumab[a]		14 d	Hepatitis B reactivation	TB (skin test or interferon gamma release assay), HIV, HBV, HCV
Infliximab[a]		10 d	Invasive Fungal Infections	
Ustekinumab[a]	IL12/23 inhibitor	21 d	Lymphoma	Monitoring:
Guselkumab[a]	IL23 inhibitor	18 d	Demyelinating disease	Annual TB screening recommended. There are no other specific monitoring recommendations.
Risankizumab[a]		11 d	CHF exacerbation	
Tildrakizumab[a]		23 d		
Ixekizumab[a]	IL17 A inhibitor	13 d	Same as above and also:	
Secukinumab[a]		27 d	Inflammatory bowel disease	
Brodalumab[a]		11 d	Oral or esophageal candidiasis	
			Brodalumab specifically also carries an additional risk of suicide	
Apremilast[a]	PDE4 inhibitor	6–9 h	Diarrhea	Pretreatment screening: none
			Risk of suicide	Monitoring:
				Annual TB screening recommended. There are no other specific monitoring recommendations.
Upadacitinib[27,a]	JAK1 inhibitor	9–14 h	Acne	Pretreatment screening: TB, HIV, HBV, HCV, CBC, LFTs, and Lipids
Tofacitinib[26,a]	JAK1/3 inhibitor	3 h	LTBI reactivation	Monitoring:
			Lymphoma	CBC, LFTs, Lipids q3m
			Solid tumor malignancies	
			NMSC	
			Leukopenias	
			Intestinal perforation	
			Thrombosis	
			Stroke	
			Major adverse coronary events	

(*continued on next page*)

Table 4
(*continued*)

Drug	Mechanism of Action	Half Life	Side Effects	Testing Required
Deucravacitinib[a]	Tyrosine Kinase 2 (TYK2) inhibitor	10 h	LTBI reactivation Lymphoma Rhabdomyolysis	Pretreatment screening: TB, HIV, HBV, HCV, Creatinine, LFTs, and Triglycerides Monitoring: Triglycerides q3m, and additionally LFTs if concern for liver disease

[a] More likely to be prescribed by dermatologists as their high costs often require extensive authorization with insurance.
A nonexhaustive list of topical and systemic approaches to treatment of psoriasis.

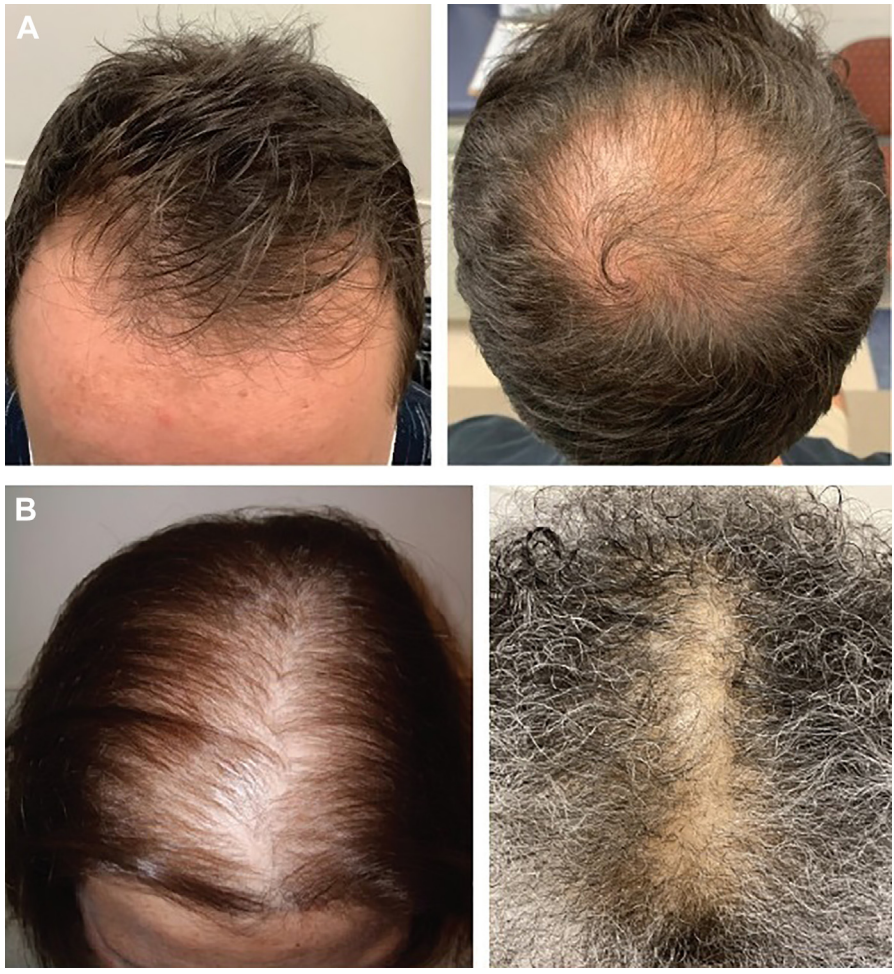


Fig. 6. Note the bitemporal recession seen in pattern hair loss (PHL) most common in cisgender and transgender men (*Upper*) or the widened partline or generalized thinning of the crown seen in PHL commonly in cisgender women (*Lower*). ([*Upper*] Murad Alam, Jeffrey S. Dover, Procedures in Cosmetic Dermatology: Hair Restoration, 1st Edition, 2022, Elsevier. [*Lower*] Murad Alam, Jeffrey S. Dover, Procedures in Cosmetic Dermatology: Hair Restoration, 1st Edition, 2022, Elsevier.)

to their patients without consultation with a dermatologist as the ratio of people with PHL to board-certified dermatologists in the US is approximately 6000:1.

Central centrifugal cicatricial alopecia

CCCA is a pattern of permanent scarring hair loss most common in women of African ancestry living in the United States and is often misdiagnosed as PHL. As its name suggests, it starts centrally near the vertex of the scalp and expands outward leaving behind scarring hair loss in its wake. It sometimes results in obvious scar lacking any hairs, but more commonly spares many hairs giving the clinical appearance of a thinned crown similar to PHL (Fig. 7). Originally termed "hot comb alopecia" for its

Table 5
Medications for alopecia

Drug	Dosing	Side Effects	Mechanism of Action
Minoxidil topical	2% solution for women—BID 5% solution for men—BID 5% foam for either men BID or women once daily	Local irritation is more common in the solution formulas due to propylene glycol[71] Tachycardia and presyncopal symptoms are similar to placebo[71] Hypertrichosis from accidental application to other areas.	Unknown
Minoxidil oral, low dose	1.25-5 mg daily	Hypertrichosis of facial and body hair Pedal edema Tachycardia and hypotension at higher doses	Unknown
Finasteride oral	1 mg daily	Contraindicated in pregnancy and donating blood is not recommended within 1 mo of taking finasteride. Erectile dysfunction, loss of libido in 1%–10% of males[72] Reduction in PSA may interfere with prostate cancer screening	Type II 5-alpha-reductase inhibitor
Dutasteride oral	0.5 mg daily	Similar to finasteride	Type I & II 5-alpha-reductase inhibitor
Spironolactone oral	50–200 mg daily	Gynecomastia, breast tenderness, irregular menses at higher doses Contraindicated in pregnancy Hypotension Hyperkalemia May be a banned substance for competitive athletes	Inhibits testosterone production. Competitively inhibits the androgen receptor

A nonexhaustive list of topical and systemic nonsurgical approaches to treatment of pattern hair loss.

correlation with the use of heated metal combs for hair straightening, it has been attributed to various hair care practices for decades though the actual evidence for this has been called into question as these practices are common and may result from confirmation bias.[31,32] Recently, a potentially causative mutation in PADI3 was identified in about a third of patients with CCCA that may result in hair shaft rupture and subsequent scarring inflammation.[33] CCCA differs from traction alopecia in which

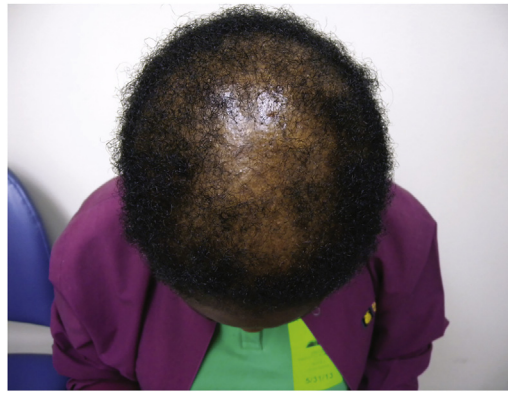


Fig. 7. Thinning of hair on the crown seen in CCCA, which can mimic Pattern Hair Loss as the inflammation and scarring present can be subtle on clinical examination. (*From* Tosti A. Diseases of Hair and Nails. In: Goldman L and Cooney KA, eds. Goldman-Cecil Medicine. Volume 1. 27th Edition. Elsevier; 2024 : 2747–2755, Figure 409.8.)

scarring occurs from tight hairstyles, often along the frontal or temporal hairlines, however, tension may play a role in CCCA as well. There are no standard recommendations for hair styling for CCCA, and specific recommendations require cultural humility and familiarity with a variety of hair care practices. Avoiding traction hairstyles and manipulation at the vertex as well as avoiding chemical treatments such as relaxers or hair dyes may be helpful as general recommendations. Initial treatment is with topical or intralesionally injected corticosteroids, systemic antibiotics such as tetracyclines, and early referral to a dermatologist to help slow progression.[32]

Facial Rashes

In this section we will discuss the treatment of acne vulgaris, acne rosacea, periorificial dermatitis, and seborrheic dermatitis.

Acne vulgaris

Acne vulgaris is the most common skin condition affecting young adults. Although most cases of acne vulgaris start in adolescence and resolve by the mid-20s, up to 50% of patients will have symptoms into later adulthood.[34] Acne vulgaris is a chronic, inflammatory condition that significantly impacts quality of life and mental health. Acute treatment followed by maintenance therapy can improve dermatologic and quality of life outcomes.

Understanding the pathogenesis of acne vulgaris helps to clarify the treatment approach. Androgen-induced increased sebum production in the pilosebaceous unit followed by abnormal keratinization leads to occlusion of the follicle, creating a microcomedone. Bacterial colonization of the hair follicle with *Cutibacterium* (formally *Propionibacterium) acnes* triggers a host immune response leading to the development of inflammatory lesions.[34,35] Areas with the highest sebaceous gland activity are most affected including the face, back, chest, shoulders, and torso.

Acne vulgaris can range in severity from mild comedonal (**Fig. 8**A) to inflammatory to severe nodulocystic (**Fig. 8**B). Regardless of the type of acne vulgaris, a topical comedolytic is necessary to address the abnormal keratinization and microcomedone formation that is a hallmark of this condition. Setting appropriate expectations for management is also important. Treatments for acne vulgaris do not address lesions

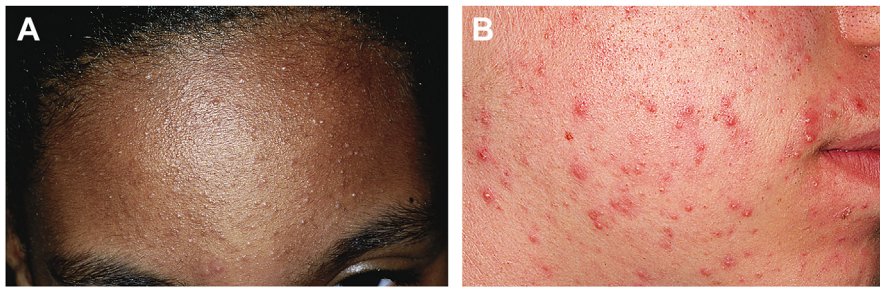


Fig. 8. (*A*) Acne vulgaris presenting predominantly as comedones (*B*) Acne vulgaris presenting as inflammatory and nodulocystic acne. ([*A*] *From* Paller AS, Mancini AJ: Hurwitz clinical pediatric dermatology, a textbook of skin disorders of childhood and adolescence, ed 5, Philadelphia, 2016, Elsevier, Figure E2. [*B*] Thomas P. Habif (2018), Skin Disease-Diagnosis & Treatment:First South Asia Edition, 1st edition, Elsevier India.)

that are already present but do prevent the development of new lesions. It takes approximately 8 weeks for a microcomedone to mature so patients should be counseled that they may not see improvement in their skin for several months. It is also important to counsel patients to apply medications to the entire location affected by acne rather than spot treatments for active lesions. For acne involving the shoulders, chest, and torso, benzoyl peroxide (BP) washes will be easiest to apply and provide both comedolytic and antiinflammatory activity.

Topical comedolytics are available over the counter or by prescription (**Table 6**.) The Global Alliance to Improve Outcomes in Acne Group recommends topical retinoids as first-line agents when possible since they are more efficacious than other comedolytics and improve penetration of other topical agents such as antibiotics.

Traditionally, topical retinoids were applied at night because tretinoin can be deactivated by light and increase the risk of photosensitivity. However, many newer formulations are more stable in light but can still cause photosensitivity. Side effects include

Table 6
Treatment of primarily comedonal acne

Comedolytic	Options	Considerations
Topical retinoids	• Tretinoin (Rx) • Tazarotene (Rx) • Adapalene (OTC and Rx) • Trifarotene (Rx)	• Tretinoin: Least expensive • Tazarotene: Most potent • Adapalene: Least irritating to skin • All may decrease post inflammatory hyperpigmentation • Avoid use during pregnancy
Benzoyl peroxide (BP)-OTC and Rx		• May bleach clothes, towels, etc
Azelaic acid-Rx		• Good for sensitive skin • May cause hypopigmentation
Salicylic acid-OTC		• Good for sensitive skin
Tea Tree oil-OTC		• May cause contact dermatitis

Abbreviations: OTC, over the counter; Rx, by prescription.

Topical comedolytic medications to be used for both initial and maintenance therapy for acne. Consider adding combined oral contraceptive and/or spironolactone in females to any treatment above.

redness, dry skin, peeling, and burning. Starting at a lower potency every few nights and titrating to the highest potency up to nightly as tolerated will improve efficacy and decrease side effects. To improve adherence, it is important to counsel patients that treatment will often trigger a pustular flare and their skin may worsen before it improves.

Retinoid formulations vary based on cost and side effects. Tretinoin is the least expensive option, tazarotene is the most potent, and adapalene is the least likely to irritate the skin and the only over-the-counter option. If cost or tolerance of retinoid side effects is a barrier, then tea tree oil, salicylic acid, and benzoyl peroxide can be used and are similarly efficacious for the treatment of comedonal acne, though also carry their own side effects (see **Table 6**). Patients with more pigmented skin are at higher risk of developing PIH and scarring, such as keloids, from acne vulgaris lesions and from skin irritation due to the products used to treat acne. Prevention is key. Slow titration of topical agents can lessen the risk of skin irritation. Since some PIH is caused by visible light, the use of iron oxide containing sunscreens can help block both UV light and visible light and prevent the progression of hyperpigmentation.[36] Different shades of iron oxide are used in many tinted sunscreens which patients may find appealing if their goal is to decrease the cosmetic appearance of PIH. To accelerate the resolution of hyperpigmentation, topical retinoids or azelaic acid can be added to acne treatment regimens.[37]

For primarily inflammatory acne, an antibiotic can be used in addition to the comedolytic (**Tables 7** and **8**). Antibiotics should not be used as monotherapy because even with primarily inflammatory acne, the base lesion is still the microcomedone which is treated with comedolytic maintenance therapy. To decrease the

Table 7
Treatment of Primarily Inflammatory Acne (mild to moderate)

Treatment	Topical Options	Considerations
Topical retinoid alone	See Table 6	
Benzoyl peroxide alone	Gel, lotion, cream, foam, wash	• May bleach clothes, towels, etc
Topical retinoid + benzoyl peroxide		• May bleach clothes, towels, etc
Topical antibiotic + benzoyl peroxide	• Clindamycin • Minocycline • Dapsone • Sulfur/sulfacetamide • Erythromycin	• Clindamycin: Least costly • Minocycline: More expensive • Dapsone: expensive. Okay with G6PD deficiency and sulfur allergy. Avoid use with BP as can cause temporary yellow-orange skin/hair discoloration. • Erythromycin: Refrigerate. Increasing rates of resistance. Not first line.
Topical retinoid + topical antibiotic + benzoyl peroxide		Most effective

Regimens to treat inflammatory acne may include monotherapy or a combination of medications with different mechanisms of action. Continue comedolytic (retinoid, BP or azelaic acid) for maintenance therapy. Add BP to decrease antibiotic resistance if antibiotics to be used longer than 2 mo. Try to discontinue antimicrobials at 3 months. Consider adding combined oral contraceptive and/or spironolactone in females to any treatment above.

Table 8
Treatment of primarily Inflammatory Acne (moderate to severe)

Treatment	Options	Side Effects	Dosing
Topical retinoid + oral antibiotic + benzoyl peroxide	• Doxycycline • Minocycline • Sarecycline • Azithromycin (if allergic to tetracyclines)	• Doxycycline: pill esophagitis, GI upset, photosensitivity, contraindicated in pregnancy • Minocycline: vestibular symptoms, irreversible bluish-grey discoloration to skin, drug-induced lupus, contraindicated in pregnancy • Azithromycin: GI upset, QT prolongation in high-risk patients	• Doxycycline 100 mg po qd or bid • Minocycline 100 mg po qd or bid • Sarecycline dosing is weight based • Azithromycin 500 mg po 3 x per week x 1 mo, then 500 mg 2 x per week x 1 mo, then 500 mg weekly x 1 mo OR 500 mg on day 1 followed by 250 mg daily for 4, repeated on 1st and 15th of every month for 3 mo
Topical benzoyl peroxide + topical antibiotic + oral antibiotic			
Topical retinoid + topical antibiotic + oral antibiotic + benzoyl peroxide			

Regimens to treat inflammatory acne may include monotherapy or a combination of medications with different mechanisms of action. Continue comedolytic (retinoid, BP or azelaic acid). Add BP if antibiotics to be used longer than 2 mo. Try to discontinue antimicrobials at 3 months, continue comedolytic long term. Refer to dermatology for oral isotretinoin if severe or refractory acne. Consider adding combined oral contraceptive and/or spironolactone in females to any treatment above.

development of *C. acnes* antibiotic resistance, use of topical and oral antibiotics should be limited to patients who really need them and for the least amount of time possible, ideally no more than 3 months of therapy.[34,38,39] If topical or oral antibiotics are needed for longer than 2 months, evidence suggests that topical benzoyl peroxide should also be started because its nonspecific antimicrobial activity can prevent selective resistance at sites of application.[34,40] It is best to apply topical antibiotics and benzoyl peroxide in the morning and retinoid in the evening as benzoyl peroxide can decrease the stability of topical tretinoin. Once acne has improved, antibiotics should be discontinued and comedolytic medication should be continued for maintenance therapy.[33,38]

The anti-inflammatory rather than antibacterial properties of antibiotics are likely the most helpful effect in the treatment of acne vulgaris and acne rosacea.[40] Consequently, treatment has shifted to using topical antibiotics and/or sub-antimicrobial dose oral antibiotics. Data demonstrate that sub-antimicrobial doses are effective in treating acne with potentially less risk for antibiotic resistance.[38] Topical antibiotic options include clindamycin, minocycline, dapsone, sulfur/sulfacetamide or erythromycin, some of which are combined with a retinoid or benzoyl peroxide. Studies

have demonstrated that combination antibiotic-comedolytic medications are more effective in treating inflammatory acne than monotherapy.[40] Topical dapsone 5% is also used in the treatment of acne and is safe in patients with G6PD deficiency or sulfonamide allergies.[40,41] There have been no direct comparisons of topical dapsone to topical clindamycin or erythromycin. Some early data in India suggests that topical minocycline may be more effective than topical clindamycin.[42] The cost of topical dapsone and minocycline compared to these other agents likely outweighs any benefits of these products at this time. Due to increasing evidence of antibacterial resistance to *C acnes* with erythromycin, the other topical antibiotics are preferred. In 2020, the FDAapproved clascoterone, a topical androgen receptor inhibitor. Data from two phase 3 randomized trials demonstrated improved efficacy compared to placebo in patients with moderate to severe acne. Side effects include local skin irritation and some reports of hypothalamic-pituitary axis suppression.[43]

Oral antibiotics may be necessary to treat moderate to severe inflammatory acne (see **Table 8**). Tetracyclines such as doxycycline, minocycline, or sarecycline are mainstays of therapy. There is no difference in efficacy between doxycycline and minocycline, however because of the side effect profiles of both, doxycycline is generally recommended as the first-line agent.[40] Doxycycline side effects include gastrointestinal upset, pill esophagitis, and photosensitivity. Minocycline may cause vestibular symptoms, irreversible bluish-grey skin discoloration, and drug-induced lupus. Sarecycline has a narrower spectrum of antibiotic activity, lower propensity to promote *C acnes* resistance, and potentially less disruption of the gut microbiome. Side effects are otherwise similar to other tetracyclines.[44] Traditional dosing for doxycycline and minocycline is 100 mg once or twice daily however studies demonstrate equal or improved efficacy with sub-antimicrobial dosing regimens such as doxycycline 40 mg ER daily or 20 mg twice a day with less side effects.[45] Sarecycline dosing is weight based. For those who are allergic to tetracyclines, the macrolide azithromycin is an option. Randomized controlled trials comparing azithromycin to doxycycline, minocycline, and tetracycline demonstrate that it is at least equally effective and, in some cases, even more effective. In these studies, azithromycin was pulse-dosed; however, a recommended dosing regimen has yet to be determined.[40] Due to concerns about rising antibiotic resistance to azithromycin, tetracyclines should be used if possible, however, azithromycin is a safe option during pregnancy and breastfeeding, whereas all tetracyclines are contraindicated due to the risk of permanent teeth discoloration. Not enough data exists to determine if cephalosporins, trimethoprim-sulfamethoxazole, or fluoroquinolones are effective in the treatment of acne.[40]

Postmenarchal females with moderate to severe acne may benefit from the use of combined oral contraceptives and/or spironolactone. Spironolactone is typically dosed at 50 to 100 mg daily, where side effects are rare and evaluation of potassium levels is generally unnecessary in otherwise healthy females under the age of 45. There may be additional benefit when hormonal agents are combined with other topical therapies. Finally, patients with severe nodulocystic acne or acne that is refractory to treatment can be referred to dermatology to discuss oral isotretinoin.

Clinics Care Points: Acne Vulgaris

- A topical comedolytic such as retinoids or benzoyl peroxide should be used throughout treatment.
- Topical or oral antibiotics should be used in conjunction with a comedolytic medication, not as monotherapy.

- Patients with darkly pigmented skin are at higher risk of developing postinflammatory hyperpigmentation (PIH). The use of iron oxide sunscreen blocks visible light in addition to UV light and can help prevent the progression of PIH, while topical retinoids or azelaic acid can be used to lighten PIH.
- For acne that doesn't respond to first-line treatment, consider adding combined oral contraceptive and/or spironolactone in females

Acne rosacea

Like acne vulgaris, acne rosacea is a chronic inflammatory disorder with periods of exacerbation and remission. It typically presents in the 30-60s and affects the central face, nose, cheeks, eyelids, forehead and chin in all skin colors. Symptoms include flushing, nontransient erythema, telangiectasias, papules, pustules, nodules, cysts or sebaceous gland hypertrophy (eg, rhinophyma) (**Fig. 9**). Ocular involvement with blepharitis or conjunctivitis is present in more than 50% of patients and may be found in the absence of other skin manifestations of rosacea.[46] Rosacea appears to be due to a combination of factors including abnormalities in innate immunity, inflammatory reactions to cutaneous microorganisms, ultraviolet damage, and vascular dysfunction, although the pathogenesis is not well understood. Topical and oral therapies work well for papules and pustules but less so or not at all for flushing, redness, or telangiectasias. Patients should be counseled to avoid excessive sun exposure, that it may take 2 to 3 months of treatment before improvement is seen, and that since this is a chronic condition maintenance therapy is recommended.[47]

The topical agents ivermectin, metronidazole, and azelaic acid are first-line treatments for rosacea (**Table 9**). Randomized controlled trials demonstrate improved efficacy of topical ivermectin compared to topical metronidazole and azelaic acid, however the cost is significantly higher.[48,49] Data demonstrate that azelaic acid is at least equally and possibly more efficacious to topical metronidazole, although topical metronidazole is better tolerated and less expensive.[50] Topical minocycline 1.5% foam is effective but costly and no studies are available comparing it to other topical options.[51] Topical sulfacetamide 10%/sulfur 5% or combination benzoyl peroxide/clindamycin is also an option, however the data for efficacy is less robust. Data supporting monotherapy with topical clindamycin or erythromycin is limited and due to the potential risk of antibiotic resistance should be avoided.[40] Data is limited on whether

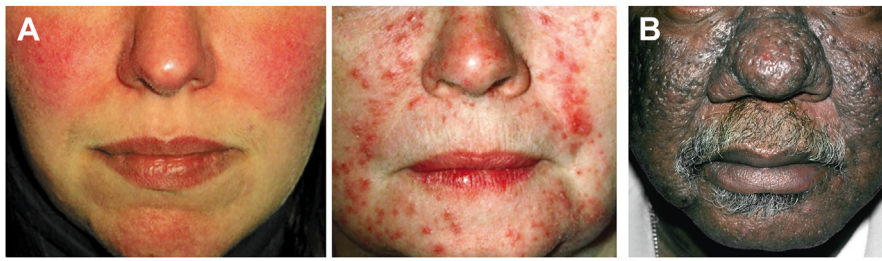


Fig. 9. (*A*) Flushing, papules and pustules seen with acne rosacea (*B*) Sebaceous gland hypertrophy of the nose, also known as rhinophyma, seen with severe acne rosacea. ((a) Richard L. Gallo, et al., Standard classification and pathophysiology of rosacea: The 2017 update by the National Rosacea Society Expert Committee, Journal of the American Academy of Dermatology, 78 (1), 2018, 148-155, https://doi.org/10.1016/j.jaad.2017.08.037. (b) *With permission from* James W, Elston D, McMahon PJ. Andrews' diseases of the skin clinical atlas. Elsevier; 2018, Figure 27.31.)

Table 9
Treatment of papulopustular lesions of rosacea

Treatment[a,b]	Considerations
Topical ivermectin	Most effective. Expensive
Topical metronidazole	Well tolerated
Topical azelaic acid	May cause hypopigmentation
Topical minocycline foam	Expensive
Oral antibiotics • Doxycycline • Minocycline	• See side effect profiles in Table 8 • Use sub-antimicrobial dosing for mild-moderate disease and full dose for moderate to severe • Full dose 100 mg po QD or BID • Doxycycline DR 40 mg PO QD. Expensive • Doxycycline 20 mg PO BID • Doxycycline 25 mg/5 mL suspension 25 mg PO BID
Oral isotretinoin	Refer to dermatology if severe or refractory rosacea or development of sebaceous gland hyperplasia

[a] Combine topical and oral options for increased effectiveness. Once symptoms improve, discontinue oral antibiotics.
[b] Continue topical treatments long term for maintenance.

topical retinoids are effective in the treatment of the papulopustular lesions of rosacea.[52]

Oral antibiotics should be considered for moderate to severe rosacea not responding to topical therapies, and for ocular rosacea. The only systemic FDA-approved therapy for rosacea is once daily extended-release sub-antimicrobial dose (40 mg) doxycycline, which has been shown to have similar efficacy to doxycycline 100 mg dose regimens but with substantially fewer adverse effects, such as gastrointestinal symptoms.[52] Maintenance therapy with a topical agent should be continued long term. For severe cases, a few studies demonstrate added benefit when combining oral antibiotics with topical metronidazole and topical ivermectin.[53,54] Oral isotretinoin also may be effective. Referral to dermatology should be considered for patients with moderate to severe disease or development of focal enlargement due to sebaceous gland hypertrophy (eg, rhinophyma) to help reduce the risk of poor cosmetic outcomes.

Flushing can be a particularly bothersome symptom of rosacea. A variety of agents have been tried including clonidine, beta-blockers, antidepressants, and gabapentin but data is limited and side effects can be significant. Avoidance of triggers such as extremes of temperature, sunlight, spicy foods, and alcohol may be effective but difficult to adhere to. For patients with papulopustular rosacea, topical antibiotics may reduce facial erythema but no high-quality studies have evaluated efficacy in patients without papulopustular lesions. The topical alpha-agonists, brimonidine 0.33% gel and oxymetazoline 1% cream, can reduce fixed facial erythema and telangiectasias through transient vasoconstriction of superficial blood vessels but are costly, infrequently covered by insurance, have mixed outcomes, and do not improve papulopustular lesions.[55] Both agents are recommended for daily use and will reduce facial erythema within 30 minutes of application and peak around 3 to 6 hours after application, after which effects progressively diminish. Both agents can cause burning and contact dermatitis. Brimonidine may be more effective than oxymetazoline; however, the risk of worsening redness and rebound erythema with prolonged use is greater with brimonidine. Oxymetazoline may worsen papulopustular lesions.[52] Some

patients may consider using either of these agents on an as needed basis for special occasions.

To help reduce cost, over-the-counter oxymetazoline nasal spray can be mixed with a moisturizer and used preventatively or as needed after symptom onset. Referral to dermatology for pulsed light therapy and laser therapy can be considered for the treatment of telangiectasias and nontransient erythema.

Clinics Care Points: Acne Rosacea

- Topical metronidazole, azelaic acid, or ivermectin are first-line therapies. If suboptimal response to topical therapies, oral antibiotics such as doxycycline can be added to topical maintenance therapy. Oral isotretinoin may also be effective.
- Treatment of flushing can be challenging. Counsel patients on avoidance of triggers. Trials of topical alpha-agonists such as brimonidine and oxymetazoline may be helpful, though they may also be costly.
- Refer to dermatology early if severe presentation and/or sebaceous gland hypertrophy (eg, rhinophyma) to help reduce the risk of poor cosmetic outcomes. Dermatologists can also use pulsed light therapy and/or laser therapy to treat flushing.

Periorificial dermatitis

Periorificial dermatitis, or perioral dermatitis, typically presents with multiple small inflammatory papules around the mouth, nose or eyes often sparing the vermillion border, though can also present as scaly, hypopigmented macules and patches in darkly pigmented skin (Fig. 10). Although the name suggests an eczematous appearance, it most closely resembles an acneiform or rosacea-like eruption with or without eczematous features. Exposure to external elements likely triggers these lesions with the strongest association with topical or inhaled corticosteroids and the use of masks. Other triggers may include fluorinated toothpastes, heavy face creams, and moisturizers, especially those with a petrolatum or paraffin base, and certain cosmetics like lipsticks.[56]

The most important intervention is to discontinue the inciting agent which is called "zero therapy." Periorificial dermatitis may self-resolve within a few months if triggers can be eliminated. However, stopping the inciting agent can cause an initial flare of the rash, leading many patients to request therapy. When caused by topical steroids, tapering from a higher potency to a lower potency steroid such as hydrocortisone

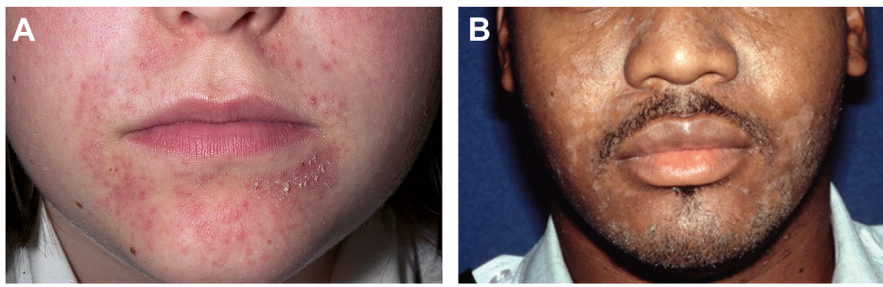


Fig. 10. (*A*) Perioral papules sparing the vermillion border in periorificial dermatitis, (*B*) Hypopigmentation due to seborrheic dermatitis. ([*A*] Habif, T. P. (2015). Clinical Dermatology: A Color Guide to Diagnosis and Therapy. Saunders. [*B*] With permission from Scott Norton, MD.)

1% over a few months and then discontinuing entirely may reduce the likelihood of a significant flare but this approach has not been well studied.[57] For mild to moderate cases, consider using topical calcineurin inhibitors. Most of the placebo controlled randomized trial data supports the use of pimecrolimus 1% cream twice a day with most benefit shown in the first few weeks of therapy.[58,59] Therapy should continue for about 4 to 8 weeks and then either be discontinued if effective or changed to a different therapy if ineffective. A less costly option would be the use of topical metronidazole or erythromycin, both of which have shown better efficacy when compared to placebo.

The use of oral tetracycline has also demonstrated efficacy in small, randomized controlled trials when compared to topical therapy.[60,61] Both groups showed improvement in lesion counts however the oral antibiotic group improved faster. There are no studies examining the efficacy of doxycycline or minocycline; however, these regimens are often tried for 8 weeks because of their advantage of fewer restrictions on timing of administration. Dosing is similar to the treatment of acne vulgaris and acne rosacea. If patients are allergic to tetracyclines, azithromycin can be used but dosing is unclear. Small, uncontrolled studies or case reports have shown some benefit with azelaic acid 20% cream, topical tetracycline, topical adapalene 0.1% gel, topical clindamycin with or without hydrocortisone 1%, and topical sulfacetamide-sulfur plus oral tetracyclines.

Clinics Care Points: Periorificial Dermatitis

- Assess for possible triggers (eg: topical or oral steroids, masks, fluorinated toothpaste) and recommend discontinuation if appropriate. If topical steroid use is a trigger, recommend tapering from higher potency to low-potency steroid use for weeks to months and counsel patients that the condition may flare before improving after discontinuing topical steroid use.
- Topical calcineurin inhibitors such as pimecrolimus may be used for 4 to 8 weeks for treatment though if cost is a concern, trial topical metronidazole or erythromycin instead.
- Oral tetracycline has been shown to be more effective than topical metronidazole. Other oral antibiotics that may be helpful include doxycycline and minocycline. Topical therapy should be continued.

Seborrheic dermatitis

Erythema accompanied by greasy looking, yellowish scale in the eyebrows, glabella, lateral nasal areas, and melolabial folds is characteristic of seborrheic dermatitis (**Fig. 11**). The mustache and beard areas, scalp, external auditory canals, chest, axilla, and groin may also be affected. Seborrheic dermatitis is a chronic, relapsing condition that flares with psychological stress, changes in weather, or lack of regular shampooing; therefore, acute treatment followed by maintenance therapy is needed.

The only new therapy for the treatment of seborrheic dermatitis, is the addition of roflumilast foam, a PDE4 inhibitor described for psoriasis, previously (**Table 10**). For acute treatment, either topical low-potency corticosteroids or topical calcineurin inhibitors may be used once or twice a day until symptoms resolve. These will rapidly improve the inflammation but are not appropriate for maintenance use. Two doses of oral fluconazole separated by a week can temporarily clear the skin quickly but is not appropriate as maintenance therapy due to the risk of liver dysfunction and drug interactions. For maintenance therapy of facial symptoms, intermittent use of topical antifungal creams or antifungal/antiseborrheal shampoos to wash the face can be effective though are slower to show initial benefit. In more heavily pigmented skin,

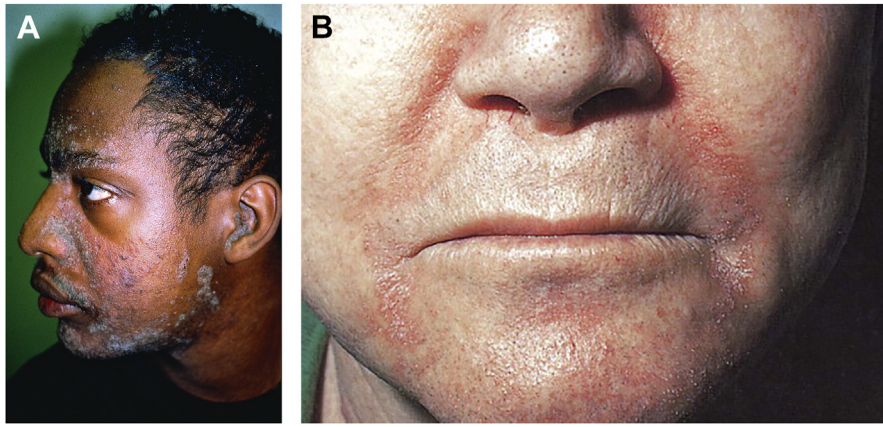


Fig. 11. (*A*) Discolored, scaly plaques with or without erythema can be seen in seborrheic dermatitis, (*B*) Discolored, scaly plaques with or without erythema can be seen in seborrheic dermatitis. (*From*: (A) James WD et al: Andrews' diseases of the skin, ed 12, Philadelphia, 2016, Elsevier, figure E3(B) Morse SA, Holmes KK, Ballard RC, Moreland AA: Atlas of Sexually Transmitted Diseases and AIDS, 4th ed, Philadelphia, Saunders Elsevier, 2010, p 9, see Fig. 1.24.).

SD may cause hypopigmentation that typically resolves with treatment, though pimecrolimus can treat both SD and hypopigmentation.[62] For scalp symptoms, antifungal shampoos are effective and rotating between different active ingredients with each shampooing is usually even more effective. For those who wash their hair less often, ketoconazole foam or roflumilast foam can be applied to the scalp and left in, though patients should also be counseled that infrequent hair washing can lead to product build-up that leads to scalp irritation which exacerbates SD symptoms.[63] Compared to natural hairstyles, use of hair extensions may also contribute to scalp irritation and inflammation that leads to SD.[63] Over-the-counter antidandruff shampoos can be used but these often contain sodium lauryl sulfate which can be irritating and cause hair breakage, further damaging hair that has undergone heat or chemical relaxer treatments.[63,64]

CLINICS CARE POINTS: SEBORRHEIC DERMATITIS

- For treatment of acute episodes, topical low-potency corticosteroids or calcineurin inhibitors can be used until symptoms resolve. Alternatively, 2 doses of oral fluconazole can also clear acute symptoms.
- Maintenance therapy options include antifungal creams or shampoos and antidandruff shampoos.
- Pimecrolimus can treat both SD and associated hypopigmentation.
- For those who wash their hair less often, ketoconazole foam or roflumilast foam can be applied and left on the scalp though patients should also be counseled that product build-up may irritate the scalp and exacerbate SD symptoms.

Stasis Dermatitis

Stasis dermatitis is a common complication of chronic lower extremity edema. When this chronic edema acutely worsens, the skin can become red and scaly with serous

Table 10
Treatment of seborrheic dermatitis

Medication	Formulation	Side Effects
Hydrocortisone, topical	2.5% cream BID PRN flares	Steroid atrophy, pigment changes, telangiectasias, purpura, acne, rosacea, perioral dermatitis
Desonide, topical	0.05% cream BID PRN flares	Same as above
Triamcinolone, topical	0.1% cream for 1 week PRN flares	Same as above
Pimecrolimus, topical	1% cream BID PRN flares	Stinging or burning with application May help treat hypopigmentation associated with SD
Roflumilast, topical	0.3% foam daily	Nasopharyngitis, nausea, and headache. Foam is flammable. High cost
Ciclopirox, topical	0.77% cream BID or 1% shampoo with each hair washing or alternating with another similar shampoo	
Fluconazole, Oral	400 mg PO weekly for 2 wk	Drug interactions
Zinc Pyrithione, topical	1% shampoo with each hair washing or alternating with another similar shampoo	
Selenium Sulfide, topical	1%–2.5% shampoo with each hair washing or alternating with another similar shampoo	
Ketoconazole, topical	2% cream or foam BID or 1%–2% shampoo with each hair washing or alternating with another similar shampoo	
Salicylic acid, topical	3% shampoo with each hair washing or alternating with another similar shampoo	

drainage and crust (dried serum) and can mimic cellulitis or erysipelas. In stasis dermatitis, erythema involves only the leg, respecting the anatomic boundaries of the ankle and knee, typically only on the lower half of the shin and calf (**Fig. 12**). The bilateral nature of the skin changes coupled with the slow development of symptoms over weeks rather than hours or days suggests dermatitis rather than cellulitis. Pruritis is usually the predominant complaint in dermatitis.

The prevention of dermatitis is important and can be achieved by gentle cleansing, treatment of xerosis with emollients, leg elevation, and the use of compression stockings (at least 20–30 mm Hg or use two 15–20 mm Hg worn on top of each other). A 2012 Cochrane review demonstrated that horse chestnut extract dosed at 300 mg twice a day (50 mg escin-active component) may decrease leg volume and circumference at ankle and calf through venoconstriction. Side effects are rare but may cause an increase in bleeding, gastrointestinal symptoms and worsen kidney disease.[65] Micronized purified flavonoid fraction (MPFF-diosmiplex) dosed at 450 mg micronized purified Diosmin twice a day in conjunction with compression demonstrated improved healing of venous ulcers (<10 mm in size), edema and pain compared to placebo with minimal side effects.[66]

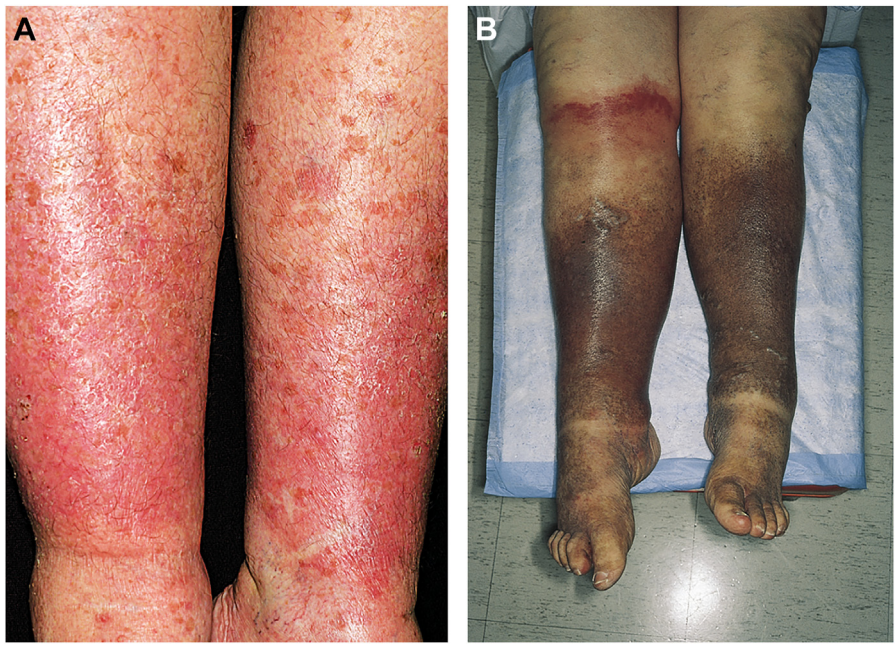


Fig. 12. (*A*) Erythema and scaling of the skin over the lower legs seen with stasis dermatitis, (*B*) Erythema and scaling of the skin over the lower legs seen with stasis dermatitis. ([*A*] *From* Swartz MH. Textbook of Physical Diagnosis. 4th ed. Philadelphia: Elsevier; 2001, Figure 3.27 [*B*] Thomas P. Habif et al., Skin Disease: Diagnosis and Treatment, 4th Edition, 2018, Elsevier.)

Once statis dermatitis develops, acute inflammation can be treated using a moderate potency topical corticosteroid such as triamcinolone 0.1% ointment applied twice a day to the affected areas. Systemic treatment with a short course of prednisone can be helpful in severe cases. Exudative eczematous changes can be addressed by applying wet dressings saturated with tap water or saline and covered with light, air permeable, dry cotton to the legs for 2 to 3 hours up to three times per day followed by the application of emollients. Wet dressings may be used in conjunction with topical corticosteroids to increase penetration and absorption.

SUMMARY

Patients often present to primary care providers with dermatologic complaints. When considering topical therapies, it is important to remember that the vehicle also carries therapeutic benefits and potential side effects. Many common dermatologic conditions will respond to similar medications including topical steroids, steroid-sparing agents such as topical calcineurin inhibitors, retinoids, antifungal medications, and antibiotics. Although most of the newer biologic agents and JAK inhibitors are typically prescribed by dermatologists, familiarity with the common side effects or complications of these treatments is important for primary care clinicians caring for these patients long term. Recognizing when conditions are chronic and require maintenance therapy provides better long-term outcomes, and discontinuing therapies when no longer indicated reduces adverse events. We hope to have provided useful approaches for treatment of conditions commonly encountered in the primary care setting.

DISCLOSURE

The authors have no conflicts of interest to report including no financial conflicts of interest.

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