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ORIGINAL ARTICLES

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The Use of Acneceuticals to Improve Acne Care: Introduction of a New Term and Review of the Literature

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ABSTRACT

Background: Acne is a multifactorial inflammatory skin condition that commonly presents to the dermatology clinic. Treatment generally involves the use of pharmaceutical agents and procedural techniques. Recently, the importance of over-the-counter skin care in acne has been recognized in many studies. This paper introduces the term acneceuticals to encompass a wide range of FDA monographed, yet non-prescription ingredients proven to alter the structure and function of acneic skin.
Methods: A panel of 8 dermatologists with an interest in acne and skin care performed a literature review of active skin care in acne. The role of acneceuticals in the treatment of acne — as monotherapy, adjunctive, and maintenance therapy — was evaluated using a modified Delphi approach. Studies were limited to in vivo human trials involving acne. Individual actives were assessed separately.
Results: The quality of evidence was moderate-to-low for many of the ingredients. Most of the actives included in the final assessment had been studied in vehicle-controlled, blinded, often comparative studies but enrolled a small number of subjects. In these studies, the acneceuticals were found to reduce lesion count, reduce sebum production, and improve efficacy of existing pharmacologic therapies.
Conclusion: Acneceuticals have demonstrated benefits in treating acne, alone or in conjunction with established pharmaceutical agents. These data allow us to make quality recommendations for our patients that should be a part of every patient encounter. The recommendations also serve as a guide for patients searching the internet for beneficial self-care products.

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INTRODUCTION

Acne is the most common cutaneous disease worldwide and the most frequent disorder to present to the dermatology practice. Although efficacious treatments exist, clinicians continue to search for better regimens with improved safety for our patients. Our patients search, too – with or without our guidance. Many patients are looking for more "natural" approaches to skin care. Selecting skincare products gives patients a satisfying sense of control that can help attenuate the psychological sequelae of acne. Unfortunately, the media and the internet abound with alternatives to prescription medications; many without efficacy and some with harmful consequences. Since delay in acne therapy is associated with an increased risk of scarring, uneducated postings can lead to permanent disfigurement. As a result, it is incumbent upon clinicians to be well-versed in routine skin care as well as active ingredients in over the counter (OTC) products that may augment care. Many clinicians fail to discuss skin care, missing an opportunity to enhance patient outcome.

Clinicians in the United States are far behind our European colleagues who have embraced the concept of what they have termed "dermocosmetics".[1-3] Dermocosmetics are defined as products with both cosmetic and active ingredients that improve cutaneous disorders. The term "acneceuticals" is thus introduced to encompass formulations with active ingredients

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that have a potential role in acne therapy, whether as first-line or adjunctive therapy. Like cosmeceuticals for anti-aging, acneceuticals fall short of being drugs; yet they contain FDA-monographed ingredients that alter the structure and function of acneic skin and have many clinical studies to substantiate their efficacy.

The most recent publication on the topic, an international consensus recommendation for the use of dermocosmetics in acne, is a comprehensive review of the topic.[4] After a thorough literature search and endeavoring to review actives with only the highest quality of in vitro and in vivo data, the authors evaluated dermocosmetics by class rather than by individual agents. They noted that studies of individual ingredients often had few, low quality studies, which made their goal of an evidence-based review unattainable.

However, patients often inquire about acneceuticals by ingredient name and a review of existing data for individual actives is worthy of assessment, even if less rigorous. Combination products are not given consideration herein, particularly proprietary formulas that are unobtainable by our patients. This review is limited to in vivo human trials in patients with acne. Benzoyl peroxide (BP) and adapalene are not included given that these are drugs, not acneceuticals. The goal of this compilation is to simplify the OTC acne landscape for prescribers as well as for patients looking to self-treat with effective and safe products.

MATERIALS AND METHODS

A scoping literature review was conducted in August 2023 on PubMed and Google Scholar and evaluated by 2 reviewers (HB, HB). Search terms were Acne AND adjunctive skincare or cosmeceuticals or dermocosmetics or barrier repair. Once the list of acneceuticals of interest was generated (see Table 1), a search was done for each active AND acne. Included studies were limited to in vitro, human and participants with acne. In September 2023, a panel of 7 dermatologists convened, and using the modified Delphi method, reviewed the data and came to consensus on which acneceuticals had sufficient data for inclusion. The goal was to provide specific evidenced-based skincare recommendations for acne therapy.

The clinician's choice of which active ingredients to review was based on knowledge of acne pathophysiology. Four central factors are thought to be most important: hyperkeratinization, hyperseborrhea and dysseborrhea, *Cutibacterium acnes* (*C. acnes*) colonization, and inflammation.[5,6] Additional studies implicate skin barrier dysfunction as a material contributor to the pathophysiology of acne. In 1995, Yamamoto and co-workers demonstrated that acne should be considered a barrier deficiency disorder alongside atopic dermatitis and psoriasis.[7] The authors found an increase in transepidermal water loss (TEWL) as well as a statistically significant reduction in ceramides, both hallmarks of barrier deficiency. Barrier dysfunction is known to be accompanied by hyperkeratosis of the follicular epithelium and therefore, Yamamoto et al postulated that barrier dysfunction could be partially responsible for comedone formation.

TABLE 1.

Proposed Mechanism of Action of Acneceuticals in Acne	
Mechanism of action	**Actives**
Keratolytic	Alpha and beta hydroxyacids Azelaic acid Retinol derivatives Bakuchiol Silymarin Sulfur
Antibacterial	Azelaic acid Niacinamide Zinc Green Tea Resveratrol Silymarin Bakuchiol Soy Probiotics Retinaldehyde Sodium hypochlorite Tea tree oil
Anti-inflammatory	Niacinamide Bakuchiol Salicylic acid Azelaic acid Linoleic acid Lactobacillus Aloe vera Green tea Cannabidiol Zinc Resveratrol Silymarin Sodium hypochlorite Tea tree oil
Sebum reduction	Niacinamide Zinc Green tea Silymarin Bakuchiol Linoleic acid Clay Soy Resveratrol
Barrier repair	Hyaluronic acid Alpha and beta hydroxy acids Glycerin Colloidal oatmeal Niacinamide Panthenol Ceramides Shea butter

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Based on these tenets of acne pathophysiology, potential therapeutic targets focus on keratolysis, inhibition of sebum production, and antibacterial and anti-inflammatory agents. More recently, the importance of barrier repair in acne care has gained traction in the literature.

Mechanism of Action

Active ingredients meeting initial consensus were divided into 5 mechanisms of action: keratolytic, anti-inflammatory, sebum control, antibacterial (preferably specifically *C. acnes*), and skin barrier repair in acne studies (see Table 1). Studies were further divided into those with data supporting use of the active as monotherapy, adjunctive therapy with established prescription agents and maintenance therapy after prescription drug discontinuation (see Tables 2-4).

Many actives had data demonstrating efficacy in acne as standalone treatments. However, it is likely that in clinical practice, combination treatment will be necessary for maximum effectiveness, selecting agents from several categories to approach acne from different directions simultaneously. Studies looking at adjunctive therapy were of 2 types: the addition of an acneceutical to prescription care to augment effectiveness and the addition of a barrier repair acneceutical to improve prescription drug tolerability and therefore adherence and efficacy. Acne medications often need to be discontinued, whether due to achievement of adequate clearance, side effects, cost, or concerns about antibiotic resistance. Maintenance or treatment transition is necessary and several acneceuticals are uniquely suited to this role — continuing improvement attained with the prescription drugs or in some cases improving outcome. Choosing an acneceutical from the list of agents having the same mechanism of action as the drug itself is expected to be the most effective: switching prescription antibiotic to an acneceutical with antibacterial activity, or retinoid to OTC keratolytic.

Keratolytics

Keratolytics are thought to work in acne by decreasing adhesion of keratinocytes in the stratum corneum, helping to remove the superficial portions of follicular plugging, reducing further occlusion. Additionally, the disruption of the stratum corneum allows other actives to penetrate more effectively, increasing their efficacy.

Acneceuticals with data supporting keratolytic activity included azelaic acid (AzA), Alpha- and Beta-hydroxy acids (AHA, BHA), retinol derivatives, bakuchiol, and sulfur.

Sebum Control

The inflammatory state of acne may be partly driven by hyperseborrhea and dysseborrhea. Decreased levels of linoleic acid, total ceramides, free sphingosine, and higher levels of inflammatory free fatty acids have been noted. This dysseborrhea has been clinically correlated with epidermal barrier dysfunction.[8,9]

Acneceuticals with data supporting sebum control include niacinamide, clay, zinc, green tea, resveratrol, silymarin, and bakuchiol. Consideration was purposely limited to those actives with data indicating reduced sebum production (sebumeter, tape stripping) as opposed to those that reduce the appearance of oiliness (eg, mattifying agents such as perlite, kaolin, calcium carbonate, bentonite, methacrylate copolymer).

TABLE 2.

Actives With Monotherapy Data	
Active	**Reference**
Azelaic acid	22-24
Bakuchiol	25
Beta hydroxy acids	16-19
Cannabidiol	27
Clay	28,29
Green Tea	32-34
Niacinamide	37-40
Probiotics	43-37
Resveratrol	48
Retinol derivatives	49-50
Silymarin	51,52
Sodium hypochlorite	55
Soy	56
Tea tree oil	57,58
Zinc	60-62

TABLE 3.

Actives as Adjunctive Therapy to Prescription Medications	
Active	**Reference**
Aloe vera and tretinoin	13
Azelaic acid and erythromycin	23
Azelaic acid and clindamycin	24
Ceramide/niacinamide with BP/clindamycin	42`
Lipohydroxy acid and BP	19
Niacinamide and BP	41,42
Salicylic acid and BP	20
Silymarin and Salicylic acid peels	53
Tea tree oil and adapalene	59
Zinc and erythromycin	63,64

TABLE 4.

Actives With Maintenance Data	
Active	**Reference**
Lipohydroxy acid	20
Hydroxy acid complex	21
Retinol derivatives	24
Salicylic acid	20,21

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Antibacterial Agents

C. acnes has an important role in the pathogenesis of acne. Although antibiotics, both topical and oral, are highly effective in the treatment of acne, eventual discontinuation results in rapid bacterial repopulation. Antibiotics also cause collateral damage on the skin and the gut, altering the normal healthy microbiome in both locations. Acneceuticals with antibacterial activity may not only be effective, but preferable to prescription antibiotics, allowing us to be good stewards of antibiotics by reducing the development of resistant microbes.

Acneceuticals with data supporting antibacterial activity include zinc, hypochlorous acid, tea tree oil (TTO), resveratrol, AzA, aloe vera, green tea, *Lactobacillus spp*, Enterococcus faecalis, and cannabidiol.

Anti-inflammatory Agents

Acne is a chronic inflammatory condition, and anti-inflammatory agents can reduce lesion number, size, and erythema. Acneceuticals with anti-inflammatory activity and demonstrated efficacy in acne include niacinamide, bakuchiol, salicyclic acid (SA), AzA, linoleic acid, zinc, soy, aloe vera, silymarin, Lactobacillus spp., green tea, and cannabidiol.

Skin Barrier Repair

Skin barrier repair in acne serves 2 distinct purposes. First is the possibility that improving the inherent barrier dysfunction in acne affects improvement in the disease. Data suggests that good quality skin care alone can result in acne improvement. We frequently see this when faced with unexpectedly good results in the vehicle arms of acne studies. Small studies have demonstrated that daily use of a facial cleanser and moisturizer can reduce acne lesions without aggravating epidermal barrier dysfunction, thereby reducing TEWL, mitigating aberrations of cutaneous pH, and fostering the growth of a diverse microbiome.[8]

Second is the ability of quality skin care to improve pharmaceutical tolerability. The acne management paradigm is built on topical retinoids and BP. In addition to having documented efficacy for acne, these ingredients can also increase cell turnover, induce stratum corneum thinning, and increase TEWL, often leading to xerosis, irritation, and even inflammation.[2,8,10] When combined with acne treatment regimens, the use of gentle cleansers, quality moisturizers, and sunscreen can improve patient comfort and patient-centered goals, including minimizing the adverse effects of dryness, irritation, and photosensitivity. Although there are many factors leading to poor compliance, skin irritation is a prominent factor.[11,12] A double-blinded, randomized study compared the outcome of an acne treatment regimen consisting of a twice-daily skincare routine in addition to a nightly combination topical agent (adapalene 0.3%/BP 2.5%).[13] Use of a ceramide-containing cleanser and moisturizer during the 12-week treatment period resulted in a statistically significant improvement in both primary endpoints: markers of skin barrier function and acne severity.

Acneceuticals that have specifically been shown to improve the ability of patients to tolerate acne pharmaceuticals include hyaluronic acid, alpha hydroxy acids, glycerin, panthenol, niacinamide, colloidal oatmeal, ceramides, shea butter, aloe vera, and petrolatum.

Acneceutical Data

Aloe Vera

Aloe vera as an anti-inflammatory and hydrating agent was evaluated as adjunctive therapy in a double blind, randomized, 8-week study of 60 participants with mild and moderate acne. Tretinoin 0.5% cream combined with a 50% aloe vera formulation resulted in better lesion reduction compared to tretinoin 0.5% alone.[14]

Alpha and Beta Hydroxy Acids

Hydroxy acids act as keratolytics and hydrating agents in the treatment of acne, reducing follicular obstruction and increasing absorption of coapplied ingredients. Data are most rigorous for the beta hydroxy acids, including SA and lipohydroxy (LHA). The most used alpha hydroxy acid is glycolic acid; although, in topical preparations, it is most often used in combination with other active ingredients.

Zander and Weisman reported that pads containing 0.5% and 2% SA resulted in lesion resolution in 3 small placebo-controlled studies.[15] A comparison study of 2% SA vs 10% BP cleansers in 30 participants showed superiority of the SA cleanser after 4 weeks.[16] A combination of SA-based products was effective in reducing inflammatory acne over 8 weeks without side effects.[17] LHA was as effective as 5% BP in 80 patients with mild-moderate disease.[18] LHA twice daily was also as effective as 2.5% tretinoin cream in 85 mild-moderate patients after 3 months with fewer side effects.[19]

Hydroxy acids have been evaluated extensively as ideal maintenance products after discontinuation of prescription medications. One hundred participants who improved on BP were randomized to receive either a SA/niacinamide combination cream or vehicle. Continued improvement was seen with the SA cream over 12 weeks.[20] Continued improvement was also seen with a tri-acid complex serum (glycolic acid, SA, and LHA) in 30 participants once daily for 2 months after discontinuation of prescription medications.[21]

Azelaic Acid in OTC Concentrations

AzA, in its prescription concentration of 15% and 20%, is thought to be effective in acne due to its anti-inflammatory activities, its ability to inhibit growth of *C. acnes*, and its mild keratolytic

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effects. This product is available OTC in lower concentrations with limited data supporting its use.

As monotherapy, in a small uncontrolled, 8-week study of patients with mild-to-moderate acne, once-daily application of a 10% AzA gel resulted in significant reduction in inflammatory lesions and non-inflammatory lesions.[22]

As adjunctive therapy, use of AzA 5% with erythromycin 2% was more effective than monotherapy with erythromycin 2% or 20% AzA in a randomized, double-blind, 12- week study of 147 patients with mild-to-moderate acne.[23] The combination product was better tolerated than the 20% AzA. In a similar double-blind, randomized, 12-week trial of 150 patients with mild-to-moderate disease, the combination of azelaic acid 5% and clindamycin 2% was significantly more effective than either monotherapy arm in reducing both inflammatory lesions and non-inflammatory lesions.[24]

Bakuchiol

Bakuchiol has been touted as a more tolerable retinol alternative. Although it is not structurally similar to retinoids, it does demonstrate retinol-like regulation of gene expression. Its use in acne has been based on in vitro data demonstrating anti-inflammatory, antibacterial and keratolytic activity.

As monotherapy, a small study of 13 patients with mild-to-moderate acne used a 5% formulation twice daily for 12 weeks with a significant reduction of inflammatory lesions.2[5]

As adjunctive therapy, a combination dermocosmetic containing bakuchiol was shown to improve the efficacy of adapalene 1% in a 2-month study of 111 patients.[26] An improvement in seborrhea was also noted.

Cannabidiol

Cannabidiol has been proposed for the treatment of acne due to its anti-inflammatory activity. It has also been shown to inhibit *C. acnes* growth in vitro. A small pilot study of 30 participants showed a decrease in inflammatory lesions.[27]

Clay

There are limited studies for clay masks in acne. Clay has hydrating and anti-inflammatory activity as well as data demonstrating reduced sebum production. As monotherapy, a mask used twice weekly for 4 weeks resulted in reduced acne lesion counts, decreased sebumeter values, and improved subjective oiliness in 75 adults with oily skin.[28] An open label study of 194 patients with mild acne demonstrated a 54% reduction in total lesion count after utilizing a mask 2 to 3 times/week for 6 weeks.[29]

Green Tea

Green tea has been evaluated for the treatment of acne due to its antimicrobial and anti-inflammatory activity, as well as evidence that it can reduce sebum production.

In 2 uncontrolled studies, green tea extract was shown to decrease sebum production: a split-face study of 11 men found a 27% reduction in sebumeter values after 60 days of daily use[30]; a 3% extract showed similar results in 10 participants after 8 weeks of use.[31]

As monotherapy, green tea extract was evaluated in several studies. In an uncontrolled study of 20 patients, a 2% extract resulted in a statistically significant reduction in lesion counts after 6 weeks of daily use.[32] A 1% or 5% extract was utilized in a split-face study vs vehicle in 35 patients with acne: at 8 weeks there was a significant decrease in both inflammatory and non-inflammatory lesions.[33] A comparison of 2% extract to vehicle in 60 patients resulted in a statistically significant reduction in inflammatory lesions at 8 weeks and high patient satisfaction.[34]

Linoleic Acid

A decrease in linoleic acid in surface lipids has been found in patients with acne compared to healthy controls. This is thought to be related to an alteration in the quality of sebum produced by acne patients. Linolenic acid is a potent inhibitor of 5-alpha reductase and is an anti-inflammatory that has been used in combination with many other agents in numerous studies. Recently, it has been reported that a combination cream containing linoleic acid, linolenic, and lecithin was effective in 4 patients in a case series.[35]

Niacinamide/Nicotinamide

The best studied of the acneceuticals is niacinamide. This anti-inflammatory and antimicrobial (including activity against *C. acnes*) is hydrating and has sebum-reducing activity. Niacinamide/nicotinamide has been extensively studied as monotherapy and as adjunctive therapy.

As monotherapy, Draelos et al evaluated the ability of 2% niacinamide to reduce facial sebum production in 100 participants vs vehicle for 4 weeks and in 30 split-face participants for 6 weeks.[36] In both studies there was a statistically significant reduction in sebum excretion rate by sebumeter. Three studies evaluated niacinamide 4% and 5% in comparison to clindamycin 1% or 2% with similar success at study conclusion.[37,38,39] It was also found to be comparable to 1% green tea extract.[40]

As adjunctive therapy, Kaewsanit et al evaluated the use of niacinamide 5% in a split-face study of 21 participants with mild-to-moderate acne who were treated with 2.5% BP.[41] The entire

face was treated with BP, and niacinamide was applied once daily to 1 side of the face and cream base was applied to the other. The niacinamide-treated side showed superior reduction of non-inflammatory lesions at 12 weeks and a significant decrease in sebum at 6 weeks. Another split-face study evaluated the addition of a niacinamide/ceramide cream to 1 side of the face that had been treated with 5% BP/.1% Clindamycin. The niacinamide/ceramide-treated side showed superior reduction of inflammatory and non-inflammatory lesions and sebum production, as well as superior tolerability.[42]

Probiotics

Acne lesions create an environment that facilitates the excess growth of *C. acnes*. In vitro studies have shown the ability of some bacteria to directly inhibit *C. acnes* growth. *Lactobacillus spp*, *Enterococcus faecalis*, and *Nitrosomonas eutropha* have the most data behind them.

Lactobacillus was shown in 10 participants with mild-to-moderate acne to reduce *C. acnes* and Staphylococcal taxa after 8 weeks of twice-daily application.[43] In a vehicle-controlled study of 79 patients, there was a 34% decrease of inflammatory lesions (vs control 1.7%).[43] In a randomized controlled trial vs 2.5% BP in 104 participants, reduction of total lesion count was comparable with fewer side effects in the participants treated with *Lactobacillus*.[44] Results were also similar in comparison to salicyclic acid 1% in 10 patients.[45]

A lotion containing *Enterococcus faecalis* was shown to be effective in reducing inflammatory lesions in 70 participants with mild-to-moderate disease after 8 weeks.[46]

Nitrosomonas eutropha is an ammonium oxidizing bacterium that converts ammonium into nitric oxide, known to be antimicrobial and anti-inflammatory. This probiotic was studied in a phase 2b study of 358 patients with mild-to-moderate acne for 4 weeks resulting in a 2-grade (5-point scale) improvement in investigator global assessment.[47]

Resveratrol

Resveratrol has antimicrobial and anti-inflammatory activities and some evidence suggesting it decreases sebum production. In a single-blind, vehicle controlled, split-face pilot study of 20 participants, resveratrol demonstrated a 54% (vs 6% vehicle) reduction in global improvement after 2 months.[48]

Retinol Derivatives

Retinoids such as retinol, retinal, and retinaldehyde abound in the OTC space and are used widely for anti-aging indication. Compared to prescription retinoids, OTC retinoids are far less effective in the treatment of acne. However, in their ability to act as keratolytics, they may help mild disease. Retinaldehyde has been shown to differ from the other OTC retinoids in its significant in vitro antibacterial activity and may be the most effective.[49]

A combination cream of hydrocypinocolone retinoate and retinol glycospheres was evaluated for its ability to prevent disease recurrence post-isotretinoin use. The need for additional acne treatment was only 15.38% at 12 months, but there was no control group.[50]

Silymarin

Silymarin has keratolytic, anti-inflammatory, and antioxidant activities and may also reduce sebum production.

As monotherapy, it was evaluated in 56 patients demonstrating a 45% reduction in inflammatory lesions and 43% reduction in non-inflammatory lesions after 12 weeks of use.[51] In a split-face comparison study, 1.4% silymarin cream twice daily was compared to SA 30% peels twice monthly for 3 months.[52] Treatments were equally effective.

Two studies evaluated the addition of silymarin to existing acne therapy of various types. Forty patients noted improvement in existing inflammatory and non-inflammatory lesions, as well as a reduction in sebumeter values.[51] An open label study evaluated 22 patients with mild-to-moderate acne already on therapy, in whom the addition of 0.5% serum twice daily reduced lesion count and sebum secretion after 4 weeks.[53]

Sodium Hypochlorite

Sodium hypochlorite has anti-inflammatory activity and is bacteriocidal against *C. acnes*. A study of 40 participants utilized 0.005% 3 times daily for 1 month resulting in a significant resolution of papules without irritation.[54] It was shown to be as effective in the treatment of mild-to-moderate disease as BP 5%.[55]

Soy

Soy has anti-inflammatory, antioxidant, and antimicrobial activities as well as hydrating and antiandrogenic activity. However, as monotherapy there are few studies. Ghyczy et al reported on 7 small open-label trials totaling 77 patients in whom split-face use daily for 20 days to 2 months resulted in a reduction in inflammatory lesions.[56]

Sulfur

Sulfur has been used for decades in the treatment of acne and is thought to act by keratolytic activity. This topical agent has been extensively studied in combination with resorcinol, zinc, salicyclic acid, and sodium sulfacetamide but there are no human studies of sulfur alone in the treatment of acne.

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Tea Tree Oil

TTO has anti-inflammatory and anti-bacterial activity.

Five percent TTO formulations have been studied in single- and double-blind studies in comparison to BP 5%. In a study of 119 and another of 60 participants with mild-to-moderate acne , the 2 arms showed similar improvement with more side effects in the BP 5% arm.[57,58]

As an adjunctive, a randomized comparison trial evaluated the use of 6% TTO in addition to adapalene 0.1%. A total of 100 patients were randomized to be treated with either 6% TTO or adapalene 0.1% plus 6% TTO. After 12 weeks, the patients treated with the combination had a better outcome in both inflammatory and non-inflammatory lesions.[59]

Zinc

Zinc has anti-inflammatory activities, is bacteriostatic against *C. acnes* and has been shown to decrease sebum production. It has been used both orally and topically in the treatment of acne with mixed results. The following is limited to topical alone.

As monotherapy, it was evaluated in a placebo-controlled trial of 60 patients for 8 weeks with superior outcome compared to vehicle.[60] Compared to BP 5% in 28 patients for 8 weeks, results were comparable.[61] It was found inferior to 2% TTO in an 8-week comparison trial of 40 patients.[62]

As adjunctive therapy, addition of zinc to erythromycin 4% in 60 patients for 12 weeks and erythromycin 2% for 3 weeks resulted in minimal improvement compared to erythromycin alone.[63,64]

CONCLUSION

There is a strong need for both clinician and patient education regarding skincare selection and ingredients suitable for acne care. Acneceuticals play an important supportive role in acne management. They can be used to increase the efficacy of prescription products, increase the tolerability of prescription products, and maintain or repair the skin barrier. Although beyond the scope of this paper, acne sequelae such as dyschromias may also respond to acneceuticals.

For the dermatologist to optimize outcomes, it is vital to dedicate time during initial and follow-up encounters to patient education regarding the importance of a sound skincare regimen. When combined with prescription therapy, gentle cleansers, quality moisturizers, and acne actives are capable of mitigating irritation, erythema, dryness, pruritus, and other symptoms common during the initiation phase of topical regimens. They may also have additive or synergistic effects in achieving treatment outcomes aside from maximizing adherence.

The symptoms of epidermal barrier dysfunction – erythema, pruritus, peeling, dryness – are common adverse effects of first-line acne treatment options. Without appropriate counseling and management, these symptoms may lead to regimen nonadherence, negative patient experience, and poor outcomes. Patient education regarding acneceuticals may give patients a greater sense of involvement and buy-in to their care. Given the expansive selection of commercial cleansers and moisturizers, dermatologists may be able to combat patient's choice-paralysis by providing specific recommendations as well as instruction on when and in what order to apply their skincare and prescription products.

Current limitations include the lack of robust, long-term clinical trial data especially within diverse populations. Despite the lack of rigor, data exist that support the recommendation of acneceuticals within dermatology practices. Perhaps more importantly, this provides patients with a roadmap for self-treatment and the ability to obtain efficacious and safe acne care regardless of insurance coverage.

While challenging to execute within the confines of a high-volume practice, improving patient knowledge of comprehensive acne treatments may be an effective way to maximize regimen efficacy and provide patients with the necessary tools for personalized and successful acne treatments.

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REFERENCES

1. Conforti C, Giuffrida R, Fadda S et al. Topical dermocosmetics and acne vulgaris. *Dermatol Ther.* 2021;34(1):e14436.
2. Araviiskaia E, Dreno B. The tole of topical dermocosmetics in acne vulgaris. *J Eur Acad Dermatol Venereol.* 2016;30(6):926-935.
3. Goh C, Noppakun N, Micali G et al. Meeting the challenges of acne treatment in Asian patients: A review of the role of dermocosmetics as adjunctive therapy. *J Cutan Aesthet Surg.* 2016;9(2):85-92.
4. Thiboutot D, Layton A, Traore I et al. International expert consensus recommendations for the use of dermocosmetics in acne. *J Eur Acad Dermatol Venereol.* 2024;00:1-15.
5. Kircik L. Advances in the understanding of the pathogenesis of inflammatory acne. *J Drugs Dermatol.* 2016;15(Suppl 1):s7-10.
6. Zaenglein A, Pathy A, Schlosser B et al. Guidelines of care for the management of acne vulgaris. *J Am Acad Dermatol.* 2016;74(5):945-973.
7. Yamamoto A, Takenouchi K, Ito M. Impaired water barrier function in acne vulgaris. *Arch Derm Res.* 1995;287:214-218.
8. Marson J, Bhatia N, Graber E, et al. The role of epidermal barrier dysfunction and cutaneous microbiome dysbiosis in the pathogenesis and management of acne vulgaris and rosacea. *J Drugs Dermatol.* 2022;21(9):sf3502915-sf35029114.
9. Marson J, Baldwin H. Dysbiosis, barrier dysfunction and dermatoses: A chicken and eff dilemma. *J Drugs Dermatol.* 2022;21(9):sf3502913-sf3502914.
10. Thiboutot D, Del Rosso J. Acne vulgaris and the epidermal barrier: Is acne vulgaris associated with inherent epidermal abnormalities that cause impairment of barrier functions? *J Clin Aesthet Dermatol.* 2013;6(2):18-24.
11. Goh C-L, Wu, Welsh B, et al. Expert consensus on holistic skin care routine. *J Cosmet Dermatol.* 2023;22(1):45-54.
12. Jordon L, Baldwin H. Stratum corneum abnormality and disease-affected skin strategies for successful outcomes in inflammatory acne. *J Drugs Dermatol.* 2016;15(10):1170-1173.
13. Draelos Z, Baalbaki N, Colon G, et al. Ceramide-containing adjunctive skin care for skin barrier restoration during acne vulgaris treatment. *J Drugs Dermatol.* 2023;22(6):554-558.
14. Hajiheydari Z, Saeedi M, Morteza-Semnani K, et al. Effect of aloe vera topical gel combined with tretinoin in treatment of mild and moderate acne vulgaris. *J Dermatolog Ther.* 2014;25(2):123-129.
15. Zander E and Weisman S. Treatment of acne vulgaris with salicyclic acid pads. *Clin Ther.* 1992;14(2):247-253.
16. Shalita AR. Comparison of a salicylic acid cleanser and a benzoyl peroxide wash in the treatment of acne vulgaris. *Clin Ther.* 1989;11(2):264-267.
17. Bettoli V, Micali G, Monfreeda G, et al. Effectiveness of a combination of salicylic acid-based products for the treatment of mild comedonal-papular acne. *G Ital Dermatol Venereol.* 2020;155(6):744-748.
18. Bissonnette R, Bolduc C, Seite S, et al. Randomized study comparing the efficacy and tolerability of a lipophilic hydroxy acid derivative of salicyclic acid and 5% benzoyl peroxide in the treatment of facial acne vulgaris. *J Cosmet Dermatol.* 2009;8(1):19-23.
19. Graber E, Thiboutot D, Seite S, et al. Double blind, randomized, proscpective trial comparing a lipohydroxy acid cream with tretinoin cream for acne vulgaris. *Cosmet Derm.* 2009;22(10):517-520.
20. Khammari A, Demessant-Flavigny A, Kerob D, et al. A salicylic acid-based dermocosmetic is efficacious as an adjunct to benzoyl peroxide for mild-to-moderate acne as monotherapy and as maintenance post benzoyl peroxide. *J Drugs Dermatol.* 2023;22(12):1172-1177.
21. Queille-Roussel C., Le Floc'h C, Le Dantec G, et al. Ultra-concentrated tri-acid complex serum as maintenance therapy in adult female acne. *J Eur Acad Dermatol Venereol.* 2023;00:1-2.
22. Khodaeinai E, Babaeinejad S, Amirnia M, et al. Efficacy of 10% azelaic acid gel with hydroalcoholic or alcohol-free bases in mild-to-moderate acne vulgaris, the first clinical trial. *J Med Sci.* 2014;14(2):87-91.
23. Pazoki-Toroudi H, Nassiri-Kashani M, Tabatabaie H, et al. Combination of azelaic acid 5% and erythromycin 2% in the treatment of acne vulgaris. *J Dermatol Treat.* 2010;21(3):312-316.
24. Pazoki-Toroudi H, Nilforoushzadeh M, Ajami M, et al. Combination of azelaic acid 5% and clindamycin 2% in the treatment of acne vulgaris. *Cutan Oculotoxicol.* 2011;30(4):286-291.
25. Brownell L, Geen S, Yaping E, et al. A clinical study evaluating the efficacy of topical bakuchiol (UP256) cream on facial acne. *J Drugs Dermatol.* 2021;20(3):307-310.
26. Polakova K, Fauger A, Sayag M, et al. A dermocosmetic containing bakuchiol, ginkgo biloba extract and mannitol improves the efficacy of adapalene in patients with acne vulgaris. *Clin Cosmet Invest Dermatol.* 2015;10:8:187-191.
27. Cohen G, Jakus J, Baroud S, et al. Development of an effective acne treatment based on CBD and herbal extracts. *Evid Based Complement Alternat Med.* 2023;17:4474255.
28. Zhang X, Zhang X, Tao H, et al. Comprehensive assessment of the efficacy and safety of a clay mask in oily and acne skin. *Skin Res Technol.* 2023;29(11):e13513.
29. Meier L, Stange R, Michalsen A, et al. Clay jojoba oil facial mask for lesioned skin and mild acne. *Forsch Komplementmed.* 2012;19(2):75-79.
30. Mahmood T, Akhtar N, Moldovan C. A comparison of the effects of topical green tea and lotus on facial sebum content in healthy humans. *Hippokratia.* 2013; 17:64-57.
31. Mahmood, Achtar N, Khan B, et al. Outcomes of 3% green tea emulsion on skin sebum production in male volunteers. *Bosn J Basic Med Sci.* 2010;10:260-264.
32. Elsaie M, Abdelhamid M, Elsaaiee L, et al. The efficacy to topical 2% green tea lotion in mild-to-moderate acne vulgaris. *J Drugs Dermatol.* 2019;8:358-364.

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33. Yoon J, Kwon H, Min S, et al. Epigallocatechin-3-gallate improves acne in humans by modulating intracellular molecular targets and inhibition of P. acnes. *J Investig Dermatol.* 2013;133:429-440.
34. Sharquie F, Al-Turfi I, Al-Shimary W. Treatment of acne vulgaris with 2% topical tea lotion vs. placebo. *Saudi Med J.* 2006;27:83-85.
35. Cheng Y, Zeng X, Wang H, et al. A case series evaluating the impact of a combination treatment for acne vulgaris containing linoleic acid, linolenic acid and lecithin. *Derm Ther.* 2020;33(6):e14505.
36. Draelos Z, Matsubara A, Smiles K. The efficacy of 2% niacinamide on facial sebum production. *J Cosmet Laser Ther.* 2006;8(2):96-101.
37. Shalita A, Smith J, Parish L, et al. Topical nicotinamide compared with clindamycin gel in the treatment of inflammatory acne vulgaris. *Int J Derm.* 1995;34(6):434-437.
38. Khodaeiani E, Fouladi R, Amirnia M et al. Topical 4% nicotinamide vs. 1% clindamycin in moderate inflammatory acne vulgaris. *Int J Dermatol.* 2013;5(8).
39. Shahmoradi Z, Iraji F, Siadat A, et al. Comparison of topical 5% nicotinamide gel versus 2% clindamycin gel in the treatment of the mild-moderate acne vulgaris. *J Res Med Sci.* 2013;18:115-117.
40. Yoon J, Kwon H, Min S, et al. Epigallocatechin-3-gallate improves acne in humans by modulating intracellular molecular targets and inhibition of P. acnes. *J Investig Dermatol.* 2013;133:429-440.
41. Kaewsanit T, Chakkavittumrong P, Waranuch N. Clinical Comparison of topical 2/5% benzoyl peroxide plus 5% niacinamide to 2.5% benzoyl peroxide alone in the treatment of mild-moderate facial acne vulgaris. *J Cosmet Aesthet Dermatol.* 2021;14(6):35-41.
42. Tempark T, Shem A, Lueangarun S. Efficacy of ceramide and niacinamide-ceramide moisturizer versus hydrophilic cream in combination with topical anti–acne treatment in mild to moderate acne vulgaris. *J Cosmet Derm.* 2024;23(5):1758-1765.
43. Lebeer S, Oerlemans E, Claes I et al. Selective targeting of skin pathobionts and inflammation with topically applied Lactobacillus. *Cell Reports Med.* 2022;3(2):100521.
44. Sathikulpakdee S, Kanokrungsee S, Vitheejongjaroen P. Efficacy of probiotic-derived lotion from Lactobacillus par-acasei MSMC39-1 in mild to moderate acne vulgaris. *J Cosmet Dermatol.* 2022;21(10):5092-5097.
45. Muizzuddin M, Maher W, Sullivan M, et al. Lactobacillus plantarum versus salicylic acid 1%: physiologic effect of a probiotic on the skin. *J Cosmet Sci.* 2012;63:385-395.
46. Kang B, See J, Lee G, et al. Antimicrobial activity of enterocins from Enterococcus faecalis SL-5 against P. acnes, the causative agent in acne vulgaris and its therapeutic effect. *J Microbiol.* 2009;47:101-109.
47. Sanchez-Pellicer P, Navarro-Moratella N, Nunez-Delegido E, et al. Acne, microbiome and probiotics: the gut-skin axis. *Microorganisms.* 2022;10:1303.
48. Fabbrocini G, Staibano S, De Rosa G, et al. Resveratrol-containing gel for the treatment of acne vulgaris: a single-blind, vehicle-controlled pilot study. *Am J Cosmet Dermatol.* 2011;12(12):133-141.
49. Pechere M, Germanier L, Siegenthaler G, et al. The antibacterial activity of topical retinoids: the case of retinaldehyde. *Dermatology.* 2002;205(2):53-58.
50. Bettoli V, Zauli S, Borgher D et al. Efficacy and safety of a 12-month treatment with a combination of hydroxypina-colone retinoate and retinol glycospheres as maintenance therapy in acne patients after oral isotretinoin. *G Ital Dermatol Venereol.* 2017;152(1):12-17.
51. Draelos Z, Kerscher M, Lynch S, et al. A silymarin antioxidant serum improves facial acne alone and as part of a treat-ment regimen. *J Drugs Dermatol.* 2024;23(4):233-238.
52. Atallah D, Badran A, Makhlouf A, et al. Topical silymarin cream as a novel therapy versus salicylic acid peels in acne vulgaris: a split-face clinical trial. *J Cutan Med Surg.* 2024;28(1):26-28.
53. Kim J, Lee Y, Lee J, et al. Efficacy and safety of silymarin-containing antioxidant serum as an adjuvant treatment of mild-moderate acne vulgaris. *J Cosmet Derm.* 2023;22(2):561-568.
54. Dorostkar A, Ghahartars N, Namazi M, et al. Sodium hypochlorite 0.005% versus placebo in the treatment of mild to moderate acne: a double-blind, randomized comparison trial. *Dermatol Pract Concept.* 2021;11(3):e2021046.
55. Tirado-Sanchez A and Ponce-Olivera R. Efficacy and tolerance of super-oxidized solution in the treatment of mild-moderate inflammatory acne. *J Dermatol Treat.* 2009;20:289-292.
56. Ghyczy M, Nissen HP, Blitz H. The treatment of acne vulgaris by phosphatidyl choline from soybeans, with a high content of linoleic acid. *J Appl Cosmetol.* 1996;14:137-145.
57. Basset I, Pannowitz D, Barnet S. A comparative study of tea tree oil versus benzoyl peroxide in the treatment of acne vulgaris. *J Aust.* 1990;153:455-458.
58. Enshaieh S, Jooya A, Siadat A. The efficacy of 5% topical tea tree oil get in mild-moderate acne vulgaris. *Indian J Derm Venereol Leprol.* 2007;73:22-25.
59. Najfi-Taher R, Jafarzadeh A, Eslami-Farsani V et al. A topical gel of tea tree oil nanoemulsion containing adapalene versus adapalene marketed gel in patients with acne vulgaris. *Arch Derm Res.* 2022;314:673-679.
60. Capitanio B, Sinagra J, Weller R, et al. Randomized controlled study of a cosmetic treatment for mild acne. *Clin Exp Dermatol.* 2012;37(4):346-349.
61. Papageorgiou P and Chu A. Chloroxylenol and zinc oxide containing cream (Nels Cream) versus 5% benzoyl peroxide cream in the treatment of acne vulgaris. *Clin Exp Dermatol.* 2000;25(1):16-20.
62. Sharquie K, Noaimi A, Al-Salih M. Topical therapy of acne vulgaris using 2% tea lotion in comparison with 5% zinc sulfate solution. *Saudi Med J.* 2008;29(12):1757-1761.
63. Mohammadi S, Farajzadel S, Pardakhty A, et al. A survey to compare the efficacy of niosomal erythromycin alone ver-sus combination of erythromycin and zinc acetate in the treatment of acne vulgaris. *J Kerman U of Med Sci.* 2017;245:420-430.
64. Sayyafan M, Ramzi M, Samanpour R. Clinical assessment of topical erythromycin gel with and without zinc acetate for treating mild-moderate acne vulgaris. *J Dermatol Treat.* 2020;31(7):730-733.

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ORIGINAL ARTICLE

Journal of Drugs in Dermatology

An Algorithm Integrating Acneceuticals Into the Management of Acne Vulgaris

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ABSTRACT

Background: Acne vulgaris is a common, chronic cutaneous disorder with numerous efficacious prescription and procedural treatments. Therapy, however, is hampered by medication intolerability and compromised by non-adherence. The use of acneceuticals is an effective way to improve patient outcomes.

Methods: A panel of 5 dermatologists met for a consensus conference in October 2023 to identify a practical acne treatment and maintenance algorithm integrating acneceuticals with prescription medications and procedures.

Results: The algorithm stratifies the use of acneceuticals first as monotherapy, adjunctive therapy, or maintenance therapy and then further diverges by skin phenotype (oily or dry/sensitive) and primary lesion morphology (comedonal or inflammatory). Finally, specific acneceuticals are recommended for each phenotypic description.

Conclusion: The algorithm is intended to serve as a guideline for integrating active nonprescription skin care into prescription acne therapy, improving efficacy, tolerability, and adherence, resulting in superior patient outcomes.

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INTRODUCTION

Although many quality prescription products exist for the treatment of acne, we continue to search for ways to improve patient care. Our patients search as well, often adding or substituting internet finds for proven regimens, occasionally with deleterious consequences. It is incumbent upon clinicians to be well-versed in ways in which nonprescription active skin care ingredients can improve patient outcomes. It is the clinician's responsibility to guide patients in their quest for self-care, helping them to choose quality products, improve safety and reduce cost.

In a previous study, the results of a modified Delphi consensus meeting were reported where the term "acneceutical" was coined to encompass nonprescription formulations with ingredients efficacious in acne.[1] A thorough literature search resulted in the identification of candidate ingredients that were divided into categories based on the pathophysiology of acne: sebum inhibitors, anti-inflammatory agents, antibacterial agents, keratolytic agents, and those that repair the deficient barrier (Table 1). These candidates were vetted for those that were studied in patients with acne in double or single-blind, vehicle-controlled, or active-compared designs. Combination products and proprietary blends to which patients would not have access were omitted as were benzoyl peroxide and adapalene, viewing them as drugs, not acneceuticals.

In this paper, we present an algorithm incorporating these acneceuticals into acne management as monotherapy, adjunctive therapy (to pharmaceuticals or procedures), and maintenance therapy following discontinuation of prescription medications.

Algorithm Development

The algorithm focuses on integrating acneceuticals into an acne management and maintenance regimen. The algorithm went through numerous iterations as individual acneceuticals were evaluated for quality of data, proposed mechanism of action, and their likely role in acne care. This information guided the panel to crystallize the most salient subdivisions and branchpoints of the algorithm. The panel reviewed and edited the final algorithm in a consensus conference.

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TABLE 1.

Mechanism of Action of Acneceuticals in Acne	
Mechanism of Action	**Actives**
Keratolytic	Alpha and beta hydroxyacids Azelaic acid Retinol derivatives Bakuchiol Silymarin Sulfur
Antibacterial	Azelaic acid Niacinamide Zinc Green Tea Resveratrol Silymarin Bakuchiol Soy Probiotics Retinaldehyde Sodium hypochlorite Tea tree oil
Anti-inflammatory	Niacinamide Bakuchiol Salicylic acid Azelaic acid Linoleic acid Lactobacillus Aloe vera Green tea Cannabidiol Zinc Resveratrol Silymarin Sodium hypochlorite Tea tree oil
Sebum reduction	Niacinamide Zinc Green tea Silymarin Bakuchiol Linoleic acid Clay Soy Resveratrol
Barrier repair	Hyaluronic acid Alpha and beta hydroxy acids Glycerin Colloidal oatmeal Niacinamide Panthenol Ceramides Shea butter

The proposed use of acneceuticals was based on an understanding of acne pathophysiology. Acne pathophysiology is traditionally tied to 4 pathogenic pillars: hyperkeratinization, hyper- and dysseborrhea, *Cutibacterium acne* (*C.acnes*) colonization, and a robust inflammatory response.[2,3] Additional data implicates skin barrier impairment as a material contributor to the pathophysiology of acne.[4] Based on these tenets of acne pathophysiology, acneceuticals were chosen for inclusion if they had in vitro or in vivo data indicating mechanisms of action that included keratolysis, inhibition of sebum production, antibacterial activity (specifically against *C. acnes*) and anti-inflammatory activity as well as barrier repair. Many acneceuticals have more than one potential area of efficacy and thus are included in more than one category.

It is well documented that when composing a treatment regimen for acne, combination therapy is the most effective; in particular, utilizing drugs that approach the acne pathogenic cascade from numerous directions.[5,6] It is likely that in clinical practice, we will need to choose several acneceuticals with differing mechanisms of action to maximize efficacy.

The Algorithm (Figure 1)

First Stratification

The first stratification of the algorithm is the choice of maintenance therapy for the successfully treated patient and monotherapy, or adjunctive therapy for the patient who needs continued care.

Monotherapy

Several acneceuticals had data demonstrating efficacy in acne as standalone treatments.[1] However, just as with prescription medications, it is expected that in clinical practice, combination therapy will be most effective. Simultaneous use of actives from categories with different mechanisms of action is recommended. Most monotherapy studies were conducted on subjects with mild disease; there is little data evaluating solo agents in patients with more severe disease.[1] It is likely that the use of acneceuticals as adjuncts to prescription medications or procedures will be better suited for more advanced disease.

Adjunctive Therapy

The utilization of acneceuticals for adjunctive therapy has been studied in two ways: the addition of an acneceutical to prescription care to augment effectiveness of therapy and the addition of a barrier repair acneceutical to improve prescription drug tolerability. Acne therapy is often drying, particularly during initial use. Symptoms including itch, sting, and burn can lead to non-adherent behavior and ultimate failure of the regimen.[7-9] Barrier repair has been shown to reduce medication intolerability leading to consistent use of therapeutics and treatment success.[10]

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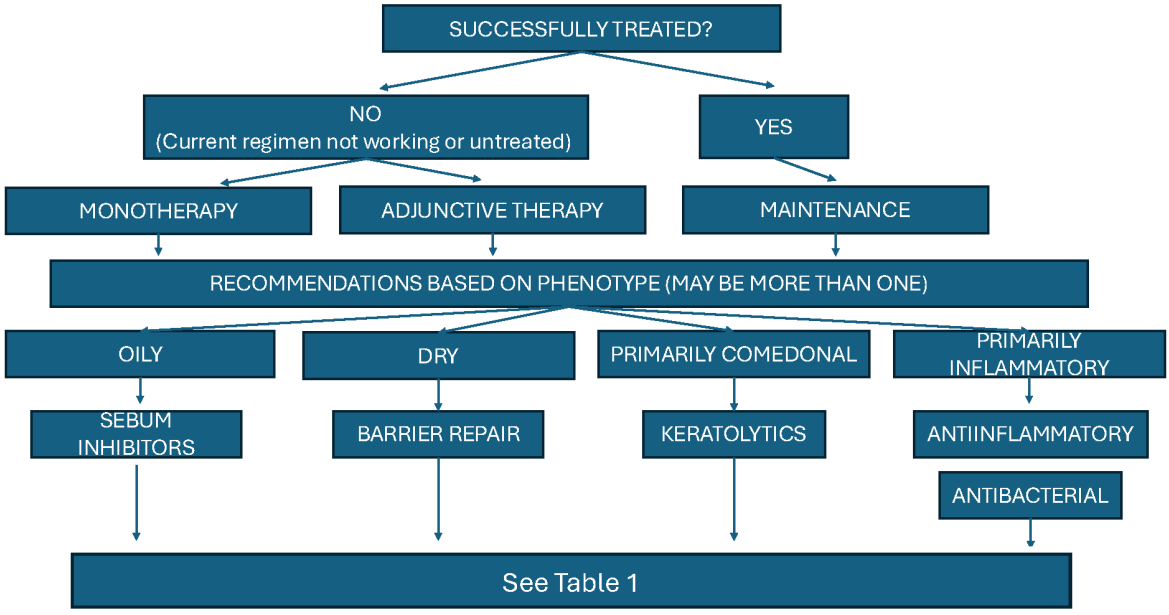
FIGURE 1. Algorithm integrating acneceuticals into the management of acne vulgaris.



Maintenance (Treatment Transition) Therapy

Treatment transition to alternate regimens is an inevitable necessity in acne care. Once satisfactory lesion clearance has been obtained, patients often become anxious to discontinue all or part of their therapy. As clinicians, we are aware that, with the exception of isotretinoin, acne therapy can best be described as a bandaid on the condition until acne naturally resolves; abrupt discontinuation of efficacious products results in rapid return of disease. Substitution of an appropriate acneceutical – one having the same mechanism of action as the drug itself – may aid in the transition: antibacterial for antibiotic, keratolytic for a retinoid.

Other reasons for treatment transition include cost of and access to medications and tolerability. Acneceuticals, almost without exception, are less expensive than pharmaceutical agents, are accessible to all, without the economic disparity that exists due to affordable access, available for children under the age of FDA approval and highly tolerable.

Lastly, the use of topical and oral antibiotics is associated with the development of antimicrobial resistance. The CDC warns us that antimicrobial resistance is one of the most important public health threats of our time and has called upon us to be better stewards of antibiotics.[11] Although antibiotics are highly effective in reducing *C. acnes* and thus improving inflammatory acne, durability of response is poor. Discontinuation results in inevitable recolonization of the follicle with the commensal *C. acnes* and return of disease, having brought about ecologic damage without ultimate gain. Acneceuticals, with the ability to accomplish microbiome modulation without evident antimicrobial resistance, are a readily available answer to this dilemma, allowing for continued therapy with less risk.

Second Stratification (Figure 1)

The second stratification of the algorithm involves determining the phenotypic description of the patient. Based on the mechanism of action of the acneceuticals, the panel recognized four general phenotypes (realizing that the individual patient will often fall into more than one category): oily skin vs dry/sensitive skin and comedonal vs inflammatory acne. Although acknowledging that maximizing acne therapy is best accomplished by utilizing combination therapy, the panel stratified acneceuticals by determining for which phenotype each was best suited.

Oily Skin

Oily skin patients appreciate products that reduce the appearance of shine in addition to the potential therapeutic benefits that sebum inhibition could accomplish. Sebum excretion is known to be higher in acne patients. Additionally, sebum quality is altered; linoleic acid levels are reduced and squalene concentrations increased, contributing to subclinical inflammation.[12,13] Reduction in sebum excretion is thus an important clinical and cosmetic endpoint that may be accomplished in part by the use of an acneceutical.

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Dry and Sensitive Skin

Dry and sensitive skin patients can benefit from barrier repair. Yamamoto and co-workers demonstrated that acne patients have an inherent barrier dysfunction, noting a statistically significant reduction in ceramides and increase in transepidermal water loss.[4] The deficiency was more significant in more severe disease. As barrier dysfunction is known to be accompanied by hyperkeratosis of the follicular epithelium, this suggests that acne should be added to the list of barrier deficiency disorders such as atopic dermatitis and psoriasis. Data suggest that quality skin care may result in acne improvement as monotherapy. We often see this when faced with unexpectedly good results in the vehicle arms of acne studies. Small studies have demonstrated that daily use of a mild facial cleanser and quality moisturizer can reduce acne lesions without aggravating epidermal barrier dysfunction, thereby reducing TEWL, mitigating aberrations of cutaneous pH, and fostering the growth of a diverse and healthy microbiome.[13-15]

In addition to resolving an inherent barrier deficiency, quality skin care improves pharmaceutical tolerability. The acne management paradigm is built on topical retinoids and benzoyl peroxide. Although effective acne drugs, these ingredients also increase cell turnover, induce stratum corneum thinning, and increase TEWL, often leading to xerosis, irritation, and even inflammation. When combined with acne treatment regimens, the use of gentle cleansers and quality moisturizers improves patient comfort, minimizing the adverse effects of dryness and irritation.[14,15] Although there are many factors leading to poor compliance, skin irritation is a prominent factor.[7-9] A double-blinded, randomized study compared the outcome of an acne treatment regimen consisting of a twice-daily skincare routine in addition to a nightly combination topical agent (adapalene 0.3%/BP 2.5%).[10] Use of a ceramide-containing cleanser and moisturizer during the 12-week treatment period resulted in a statistically significant improvement in both primary endpoints: markers of skin barrier function and acne severity.[10]

Primarily Comedonal Acne

Comedonal acne responds most efficiently to topical retinoids which are comedolytic, anti-comedogenic, and anti-inflammatory. Many acneceuticals that are keratolytics also have anti-inflammatory activities (alpha and beta hydroxy acids, azelaic acid, retinol derivatives, and bakuchiol) and some also aid in barrier repair (alpha and beta hydroxy acids).[1] As such, keratolytic acneceuticals may accomplish or aid in the treatment of primarily comedonal acne.

Primarily Inflammatory Acne

The papules and pustules of acne are inflammatory lesions that respond particularly well to anti-inflammatory agents. Increased colonization of *C. acnes* within the pilosebaceous unit is a fundamental cause of the inflammatory process in acne. Several acneceuticals serve the dual roles of anti-inflammatory and antibacterial agents (niacinamide, bakuchiol, zinc, green tea, cannabidiol).[1]

When utilizing acneceuticals with antibacterial activity, we are seeking agents that will modify the follicular microbiome, thereby encouraging a normal, balanced diversity to regain microbiome homeostasis. Commensal *C. acnes* plays an important role in skin health, acidifying the stratum corneum by producing free fatty acids from triglycerides and reducing colonization with pathogenic bacteria. Both the quantity and quality of follicular *C. acnes* are of clinical importance in the acne-prone follicular unit. Several phylotypes of *C. acnes* exist with an overabundance of phylotype IA1 associated with more severe acne and phylotype II associated with skin health.[12,16,17] The overarching aim of therapy is to minimize IA1 rather than to eradicate the entire *C. acnes* community. There is some data demonstrating the ability to utilize isolated phylotype II *C. acnes* as a probiotic to improve skin health.[18]

Third Stratification (Figure 1 and Table 1)

The third stratification recognizes the acneceuticals most likely to accomplish the goals of therapy: sebum reduction, barrier repair, reduction of hyperkeratinization, *C. acnes* reduction, and reduced inflammation. As mentioned previously, these acneceuticals were vetted in an earlier publication as those agents with human, in vivo, single- or double-blinded, vehicle- or comparator-controlled trials.[1] Combination therapy chosen purposefully from each therapeutic goal is likely to be the most effective.

Limitations

In vetting acneceuticals for inclusion in this paper, the authors endeavored to review actives with only the highest quality data. It cannot go without noting, however, that the rigor of nonprescription studies does not mirror that of prescription products. In many cases, studies were heterogeneous in design, differed in clinical endpoints, and had small numbers of subjects. Although data utilized to create this algorithm was not limited to any race or ethnicity, the majority of the studies either did not contain patients of varied backgrounds or did not indicate race or ethnicity. As such, it is difficult to draw definitive conclusions across diverse populations or skincare products.

CONCLUSION

Acne management focuses on the use of prescription medications and procedures that aim to target the 4 pillars of acne pathophysiology. More recently, however, our understanding of the interrelationship between acne, barrier health, and microbiome diversity has led us to examine more closely the importance of nonprescription actives (acneceuticals) as monotherapy as well as adjunctive therapy. Expert opinion and consensus papers have stressed the importance of quality skin care in acne management, but this advice has yet to make its way to treatment guidelines.

Although our pharmacologic treatments are highly efficacious, clinicians continue to search for better regimens with improved safety and tolerability. Our patients search, too – with or without our guidance. Some are looking for a more "natural" approach to skin care, others for affordable options, and still others seek the satisfying sense of control that can come from successful self-prescribing. Unfortunately, the internet is replete with recommendations that fall short of effective care and may have harmful consequences.[19] Delay in acne therapy is associated with an increased risk of acne sequelae such as dyspigmentation and scarring, and uneducated postings can lead to permanent disfigurement.[20,21] It is incumbent upon clinicians to be well-versed in the use of acneceuticals - nonprescription active skin care ingredients - which alone can treat mild acne and combined with prescription medications, optimize treatment regimens. Failure to discuss skin care at every acne visit is a missed opportunity to enhance patient outcomes.

DISCLOSURES

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REFERENCES

1. Baldwin H, Bui H, Callender V, et al. The use of acneceuticals to improve acne care: introduction of a new term and review of the literature. *J Drugs Dermatol.* 2025;24(3):

2. Kircik L. Advances in the understanding of the pathogenesis of inflammatory acne. *J Drugs Dermatol.* 2016;15(Suppl 1):s7-10.

3. Zaenglein A, Pathy A, Schlosser B et al. Guidelines of care for the management of acne vulgaris. *J Am Acad Dermatol.* 2016;74(5):945-973.

4. Yamamoto A, Takenouchi K, Ito M. Impaired water barrier function in acne vulgaris. *Arch Derm Res.* 1995;287:214-218.

5. Reynolds RV, Yeung H, Cheng CE, et al. Guidelines of care for the management of acne vulgaris. J Am Acad Dermatol. 2024;90:1006 e1-e30.

6. Corcoran L. Muller I, Layton A, et al. Systematic review of clinical practice guidelines for acne vulgaris published between January 2017 and July 2021. *Skin Health Dis.* 2023;3:e240.

7. Goh C-L Wu Y, Welsh B, et al. Expert consensus on holistic skin care routine. *J Cosmet Dermatol.* 2023;22(1):45-54.

8. Fabbrocini G, Rossi G, Thouvenin M et al. Fragility of the epidermis: Acne and post procedure lesional skin. *J Eur Acad Dermatol Venereol.* 2017;31 Suppl 6:3-18.

9. Jordan L, Baldwin H. Stratum corneum abnormality and disease- affected skin strategies for successful outcomes in inflammatory acne. *J Drugs Dermatol.* 2016;15(10):1170-1183.

10. Draelos ZD, Baalbaki N, Colon G, et al. Ceramide-containing adjunctive skin care for skin barrier restoration during acne vulgaris treatment. *J Drugs Dermatol.* 2023;22(6):554-558.

11. www:/http:cdc.gov/antimicrobial-resistance/data-research/threats/index.html, accessed 11/20/2024.

12. Downing DR, Stewart ME, Wertz PW, et al. Essential fatty acids and acne. *J Am Acad Dermatol.* 1986;14(2 Pt 1):221-225.

13. Marson J, Bhatia N, Graber E et al. The role of epidermal barrier dysfunction and cutaneous microbiome dysbiosis in the pathogenesis and management of acne vulgaris and rosacea. *J Drugs Dermatol.* 2022; Sep 1;21(9).

14. Araviiskaia E, Dreno B. The role of topical dermocosmetics in acne vulgaris. *J Eur Acad Dermatol Venereol.* 2016;30(6):926-935.

15. Thiboutot D, Del Rosso J. Acne vulgaris and the epidermal barrier: Is acne vulgaris associated with inherent epidermal abnormalities that cause impairment of barrier functions? *J Clin Aesthet Dermatol.* 2013;6(2):18-24.

16. Paugem C, Corvec S, Saint-Jean M et al. Propionibacterium acnes phylotypes and acne severity: an observational prospective study. *J Eur Acad Dermatol Venereol.* 2017;31(9)e398-e399.

17. Dagnelie MA, Corvec S, Saint-Jean M et al. Decrease in diversity of Propionibacterium acnes phyloypes in patients with severe acne on the back. *Acta Derm Venereol.* 2018;98(2):262-267.

18. Rhee MS, Alqam ML, Jones BC. Characterization of a live Cutibacterium acnes subspecies defendens strain XYCM42 and clinical assessment as a topical regimen for general skin health and cosmesis. *J Cosmet Dermatol.* 2023;22(3):1031-1045.

19. Szeto MD, Mamo A, Afrin A, Militello M, Barber C. Social media in dermatology and an overview of popular social media platforms. *Curr Dermatol Rep.* 2021;10(4):97-104.

20. Goodman G. Acne and acne scarring. The case for active and early intervention. *Aust Fam Physician.* 2006;35:503-504.

21. Layton AM, Henderson CA, Cunliffe WJ. A Clinical evaluation of acne scarring and its incidence. *Clin Exp Dermatol.* 1994;19:303-308.

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Real-World Clinical Case Series Utilizing Acneceuticals as Monotherapy, Adjunctive, or Maintenance Therapy for Acne Vulgaris

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ABSTRACT

Background: Acne vulgaris is a common, multifactorial inflammatory skin disease for which there are many pharmacologic and procedural interventions. Recent publications have stressed the importance of quality skin care containing non-prescription actives (acneceuticals) in the treatment of this chronic disorder. Acne therapy is made more complicated by the diversity of presentation that includes age, gender, race, underlying skin type, product adherence, lesion morphology, and severity.

Methods: A panel of 6 dermatologists with expertise in the treatment of acne met twice for consensus conferences in March and November 2024. Discussion included the generation of 13 common disease presentations, the identification of potential cases to illustrate the presentations, and the design of 2-month case studies utilizing acneceuticals. Panelists chose new or established patients in their care who fit into the predetermined categories, provided them with the agreed-upon acneceuticals, and followed them for 2 months.

Results: Ten cases were chosen to comprise the most common therapeutic crossroads where pharmacologic or procedural interventions were not providing satisfactory control. This case study series included patients who were medication-intolerant, failing internet cures, not fully responsive to their current regimen, adult female acne patients with concomitant aging concerns, those needing maintenance therapy, and patients with issues regarding access to care.

Conclusions: Acneceuticals were found to play an important role as monotherapy, adjunctive therapy, and maintenance therapy for acne patients. The 10 cases elucidated the ability of these over-the-counter (OTC) actives to improve patient care under several clinical scenarios.

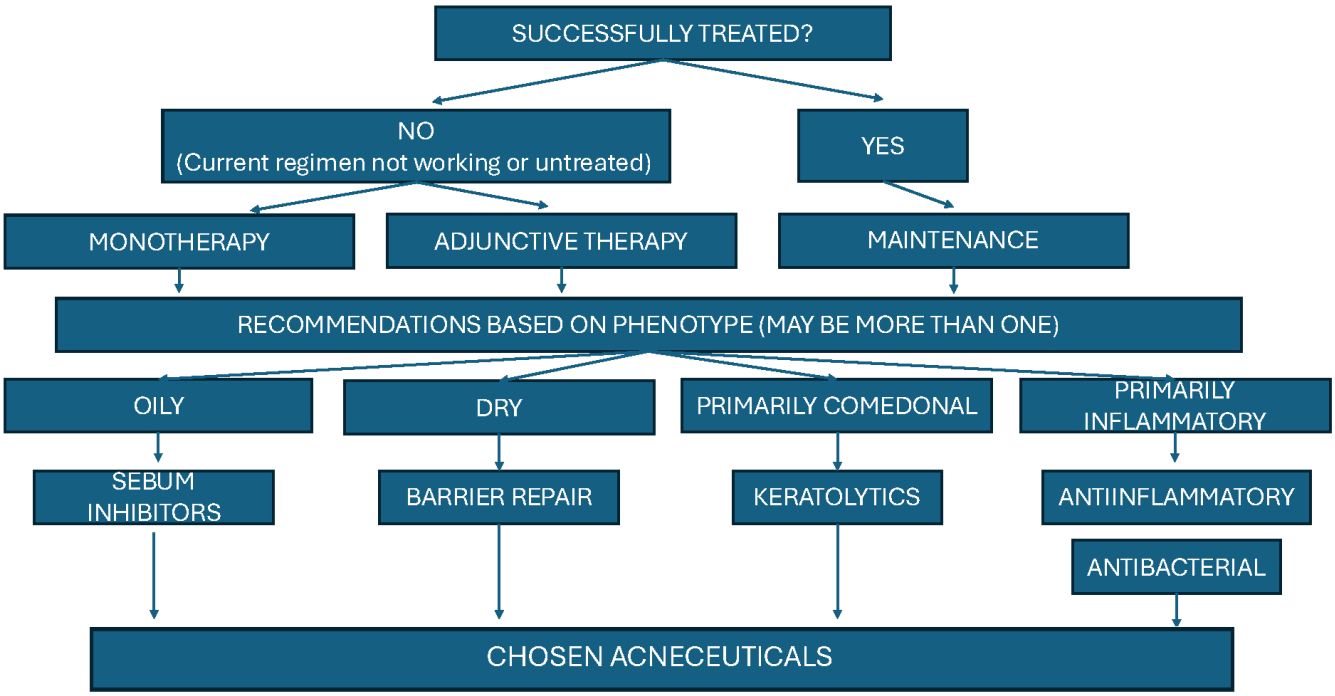
J Drugs Dermatol. 2025;24:6(Suppl 1):s19-30.

INTRODUCTION

Many quality prescription products and procedures exist for the treatment of acne vulgaris. However, they often fall short of clinician and/or patient expectations resulting in insufficient control, cutaneous intolerability, unacceptable patient cost, and delay of improvement. Clinicians, therefore, continue to search for better, more affordable therapeutic options for patients. Our patients search, too, and often find internet "cures" that are paradoxically more expensive than proven options, generally ineffective, and prolong the time to improvement with a resultant increase in acne sequelae and reduced quality of life.

In a previous review, the results of a modified Delphi consensus meeting were reported and the term "acneceutical" was introduced to describe over-the-counter (OTC) products with efficacy in the treatment of acne.[1] The term "acneceuticals" was intended to be more specific and acne-centric than the term 'dermocosmetic' referring to OTC products used in general dermatologic care. In a subsequent paper, (*An algorithm integrating acneceuticals into the management of acne vulgaris*, J Drugs Dermatol. 2025; In press), acneceuticals were incorporated into an algorithmic approach to treatment based on patient phenotype (ie, skin type and lesion morphology) and stratified by use as monotherapy, adjunctive therapy, or

FIGURE 1. Algorithm integrating acneceuticals into the management of acne vulgaris.



Modified from Baldwin H, Frey C, Hebert A, et al. An algorithm integrating acneceuticals into the management of acne vulgaris. *J Drugs Dermatol.* 2025; In print.

maintenance therapy (Figure 1). Presented herein are 10 cases in which the algorithm and previously vetted acneceuticals were applied in real-world clinical practice over a 2-month period in the care of patients with acne.

MATERIALS AND METHODS

A panel of 6 dermatologists specializing in acne care convened a meeting in March 2024. Working off of the algorithm integrating acneceuticals into acne management mentioned previously, a list of phenotypic patterns and scenarios common to clinical practice was generated. (Table 1) Acneceuticals with mechanisms of action likely to affect the desired change were then chosen for each scenario. Trial protocols/templates were determined (Table 2) and panelists were assigned scenarios that fit with their practice demographics. Each patient was provided a regimen of products provided by La Roche-Posay and tailored to their condition. Minor alterations (cleanser type, use of sunscreen) were permitted based on clinician assessment provided the intended mechanism of action of the product(s) was maintained. Concomitant new or continued use of prescription medications was left to the discretion of the treating physician.

The group reconvened in November 2024. Cases were presented, and 10 of 22 were chosen based on the absence of protocol deviations, product adherence, quality of photographs, and educational value. The panel agreed that these 10 cases represented a comprehensive collection of typical cases and important teaching points.

TABLE 1.

Phenotypes and Scenarios, Products Chosen for Case Studies, and Their Intended Mechanism of Action		
Pattern/Complaint	**Mechanism of Action**	**Products Chosen for Case Studies**
Greasy skin and acne	Sebum inhibition, Keratolytic	Mela B3 Serum®, Toleriane Purifying Foaming Face Cleanser®, Effaclar Serum®
Inherent dry/sensitive skin, "everything bothers me" Fitzpatrick 1-3 Fitzpatrick 4-6	Barrier repair	Toleriane Hydrating cleanser®, Toleriane Double Repair Moisturizer®
Inflammatory acne, retinoid intolerability Fitzpatrick 1-3 Fitzpatrick 4-6 with iatrogenic hyperpigmentation	Barrier repair/Retinoid alternative	Redermic C®, Toleriane Hydrating Cleanser®, Toleriane Double Repair Moisturizer®, +/- MelaB3®
On meds with insufficient control of comedonal lesions	Keratolytic, OTC retinoid	Effaclar serum®, Retinol B3 Serum®, Toleriane Foaming Face Cleanser®, Toleriane Double Repair Moisturizer®
On meds with insufficient control of inflammatory lesions	Antibacterial, OTC retinoid	Effaclar Duo® or Effaclar Adapalene®, Toleriane Hydrating Cleanser®, Toleriane Double Repair Moisturizer®
Adult female acne patient with concomitant aging concerns	Keratolytic, Barrier repair	Effaclar Serum®, Toleriane Hydrating Cleanser®, Toleriane Double Repair Moisturizer®
Internet "junkie" with mild to moderate combination acne	Antibacterial, Keratolytic	Effaclar Duo® +/- Effaclar Adapalene®, Toleriane Double Repair Moisturizer®, Toleriane Hydrating Cleanser®
Moderate acne requesting natural products only	Keratolytic, Retinoid	Glycolic B5 Serum®, Retinol B3 Serum®, Toleriane Hydrating Cleanser®
Doing well on therapy, looking to stop prescriptions	Keratolytic, Antibacterial for maintenance	Effaclar Duo®, Toleriane Hydrating Cleanser®, Toleriane Double Repair Moisturizer®
Bothered by PIH and scarring	Keratolytic, Retinoid, Barrier repair	Mela B3®, Toleriane Hydrating Cleanser®, Toleriane Double Repair Moisturizer®
Moderate acne, cannot afford prescriptions/dermatologist	Keratolytic, Antibacterial	Effaclar Duo®, Toleriane Double Repair Moisturizer®, Toleriane Hydrating Cleanser®

TABLE 2.

Case Study Protocol	
Patient demographics	--
Phenotypic pattern/complaint, Fitzpatrick skin type	--
Products selected and rationale for use	--
Status at baseline	--
Physician assessment:	IGA (0-4, Clear to Severe) Inflammatory and comedonal lesion counts Assessment of oily appearance or dryness of skin (5-point scale not at all to extreme).
Patient assessment:	How much does your acne bother you? 1)I am extremely bothered, 2) I am somewhat bothered, 3) I feel neutral, 4) My acne doesn't bother me much, 5) My acne doesn't bother me at all Open answer to "what about your acne bothers you most?"
Notable successes/failures with prior therapy	--
Status at follow up (2 months +/- 2 days)	Physician assessment (as above) Patient assessment (as above)
Key takeaways/treatment pearls	--

RESULTS

Case 1: Inflammatory Acne, Retinoid Intolerable

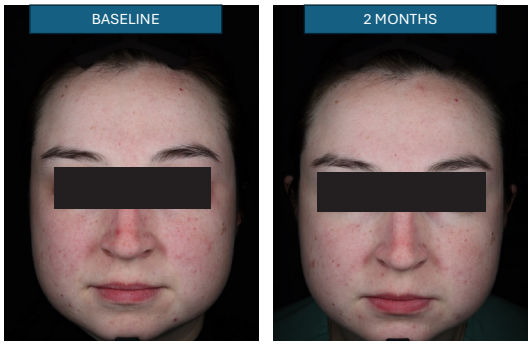
A 31-year-old fair-skinned woman with mild combination acne. Historically, she was unable to use medications including adapalene and benzoyl peroxide without intolerable side effects. Products chosen for the trial were Redermic R®(Retinol and lipo-hydroxy acid (LHA)) for its keratolytic and retinoid effects and Toleriane Hydrating Cleanser® and Double Repair Moisturizer® for barrier repair. She was able to utilize Redermic R daily without irritation resulting in clinical improvement. She planned continued use of the products in the future.

Clinician Assessments

	IL count	Comedone #	IGA	Oily appearance	Dryness
Baseline	11	5	2 (mild)	1/5	3/5
2 months	4	3	1 (near clear)	1/5	1/5

Patient Assessments

	Bothered by acne	Comments
Baseline	Extremely	My acne doesn't ever fully go away Most OTC products cause irritation
2 months	Not much at all	I am very happy with the results. No longer dry/irritated Improvement noted within 3-4 weeks



Clinical Takeaways

- Intensive barrier repair allowed the use of Redermic R® with lesion control
- No longer needed prescription products

Case 2: Comedonal Acne, Retinoid Intolerant, Iatrogenic Hyperpigmentation in Past

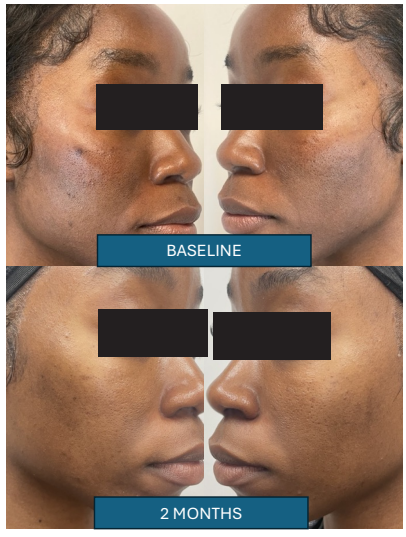
A 28-year-old woman, FST VI with mild combination acne since age 8. The use of prescription topical retinoids resulted in irritation and iatrogenic hyperpigmentation. The postacne and drug-induced hyperpigmentation as well as enlarged pores bothered her more than the active acne lesions themselves and she discontinued the use of her topical medications. Products chosen for the trial were Mela B3® (Melasyl™, lipohydroxy acid (LHA), niacinamide, retinyl palmitate, and hyaluronic acid) for its skin lightening, keratolytic, and anti-inflammatory effects, as well as Toleriane Hydrating Cleanser® and Double Repair Moisturizer® for barrier repair. She was able to use the Mela B3 twice daily without irritation. Her lesion count improved and her skin irritation, post acne and iatrogenic hyperpigmentation resolved.

Clinician Assessments

	IL count	Comedone #	IGA	Oily appearance	Dryness
Baseline	3	2	2 (Mild)	1/5	3/5
2 Months	0	2	1 (Near clear)	1/5	1/5

Patient Assessment

	Bothered by acne	Comments
Baseline	Somewhat	Bothered by texture, bumps, hyperpigmentation
2 Months	Not much at all	No active lesions, hyperpigmentation improved over 7 weeks Moisturizer is soothing and calming, produced a nice glow Feels that cleanser does not remove makeup well



Clinical Takeaways

- Hydroquinone 4% resulted in faster resolution of drug-induced hyperpigmentation in the past, but Mela B3 also treated the acne and improved the texture of the skin
- Patients who wear foundation for concealing acne lesions may prefer a cleanser that lathers

Case 3: Product Junkie, Prefers Natural Products

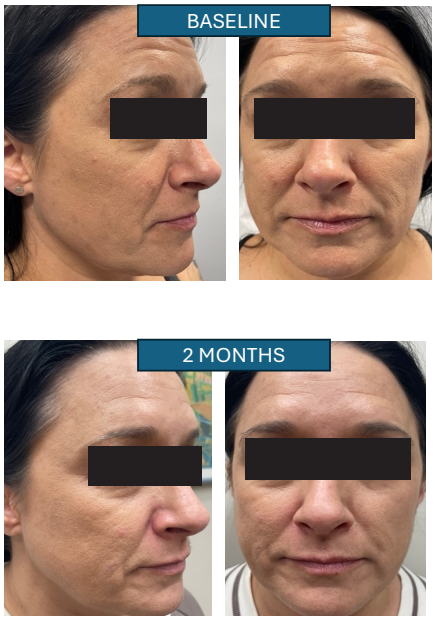
A 42-year-old FST IV woman with acne since age 20. She failed antibiotics in the past and refused repeated use. Products chosen for the trial were Glycolic B5 serum® (10% GA, LHA, tranexamic acid) and Retinol B3 serum® (Retinol, niacinamide, hyaluronic acid) for keratolytic and anti-inflammatory effects and Toleriane Hydrating Cleanser® and Double Repair Moisturizer® for barrier repair. Improvement was seen in lesion count, postacne hyperpigmentation, and skin quality.

Clinician Assessments

	IL Count	Comedone #	IGA	Oily appearance	Dryness
Baseline	3	4	2 (Mild)	2/5	1/5
2 Months	1	0	2 (Mild)	1/5	1/5

Patient Assessments

	Bothered by acne	Comments
Baseline	Somewhat	Bothered at special events
2 Months	Somewhat	Still breaking out but not as badly Worked after a few weeks Skin soft



Clinical Takeaways

- Improved comedonal lesion count
- Improved texture/tone of the skin
- Reduced oiliness
- Simplified regimen

Case 4: Adult Female Acne With Aging Issues

A 46-year-old woman with a 5-year history of mild acne, extremely sensitive skin, and signs of photoaging sought improvement in both acne and aging concerns. Products chosen for the trial were Effaclar Serum® (Salicylic acid, glycolic acid, LHA) for its keratolytic effects and Toleriane Hydrating Cleanser® and Double Repair Moisturizer® for barrier repair. At 2 months, the patient noted decreased skin sensitivity and improved skin texture, but minimal improvement in lesion counts. The clinician intended to begin spironolactone therapy moving forward.

Clinician Assessments

	IL Count	Comedone #	IGA	Oily appearance	Dryness
Baseline	6	5	2 (Mild)	1/5	3/5
2 Months	4	5	2 (Mild)	1/5	2/5

Patient Assessments

	Bothered by acne	Comments
Baseline	Somewhat	Frequent breakouts, can't find product that doesn't irritate
2 Months	Somewhat	Still breaking out but not as much. No longer irritated Worked within 2 weeks Less dry

Clinical Takeaways

- Started Effaclar® slowly due to a history of intolerance and worked up to daily use
- Plan: continue current products and add spironolactone

Case 5: Maintenance Patient

A 38-year-old black female with a 3-year history of mild combination acne on a topical retinoid and dapsone with minimal improvement. She no longer wished to use prescription medications. Products chosen for the trial were Effaclar Duo® (Benzoyl peroxide, LHA) for keratolytic and antibacterial effects and Toleriane Hydrating Cleanser® and Double Repair Moisturizer® for barrier repair. There was an improvement in lesion count and postacne hyperpigmentation.

Clinician Assessments

	IL Counts	Comedone #	IGA	Oily appearance	Dryness
Baseline	4	11	2 (Mild)	1/5	3/5
2 Months	1	6	1 (Near Clear)	1/5	2/5

Patient Assessments

	Bothered by acne	Comments
Baseline	Somewhat	Many new pimples and spots every week
2 Months	Somewhat	Fewer pimples, PIH less obvious Improved in only 3 days

Clinical Takeaways

- Able to swap acneceuticals with similar mechanisms of action for prescription products
- Improved tolerability led to regular use and reduced postinflammatory hyperpigmentation

Case 6: On Multiple Medications With Insufficient Improvement in Comedones

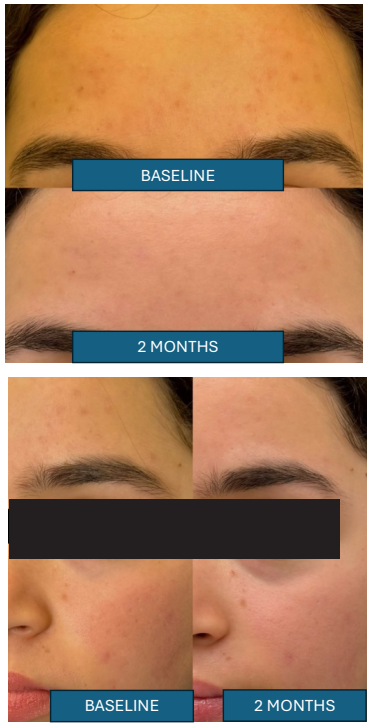
A 14-year-old girl, FST III, self-proclaimed "product junkie" with mild acne since age 8. She failed many products recommended on her social media feed, as well as oral antibiotics and prescription retinoids. She was currently on isotretinoin 30 mg daily but still had numerous comedones after 3 months on isotretinoin. Products chosen for the trial were Effaclar Serum® for its keratolytic effects and Toleriane Hydrating Cleanser® and Double Repair Moisturizer® for barrier maintenance. Isotretinoin was continued to completion. Comedone count decreased rapidly and skin hydration improved.

Clinician Assessments

	IL Counts	Comedone #	IGA	Oily appearance	Dryness
Baseline	6	5	2 (Mild)	1/5	2/5
2 Months	2	0	0 (Clear)	1/5	1/5

Patient Assessments

	Bothered by acne	Comments
Baseline	Extremely	Bothered by "everything" Inhibits self confidence Trying everything she could find on internet to no avail
2 Months	Somewhat	Improved within 1 month Addition of Effaclar helped to reduce comedones Well tolerated Afraid her acne will return



Clinical Takeaways

- Addition of Effaclar® to isotretinoin improved the comedone count
- No additional dryness or irritation

Case 7: Access to Care

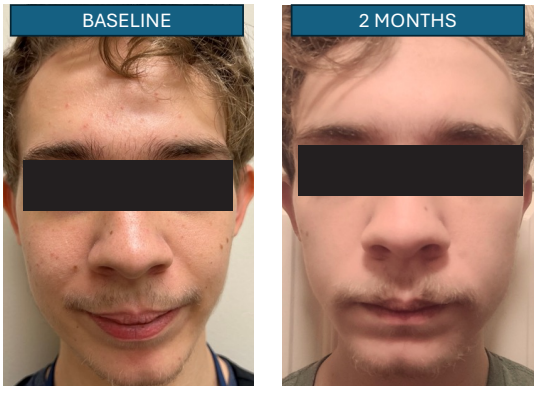
A 16-year-old boy with a 2-year history of worsening mild acne had not received dermatologic care due to a lack of insurance. He reported poor self-esteem and reduced quality of life. Products chosen for trial were Effaclar Duo® for its keratolytic and antibacterial effects and Toleriane Hydrating Cleanser® and Double Repair Moisturizer® for barrier repair. His Investigator's Global Assessment (IGA) improved rapidly to 0 (clear), and he expressed gratitude that his acne care was now "affordable and accessible."

Clinician Assessments

	IL Count	Comedone #	IGA	Oily appearance	Dryness
Baseline	6	11	2 (Mild)	2/5	1/5
2 Months	0	0	0 (Clear)	1/5	2/5

Patient Assessments

	Bothered by acne	Comments
Baseline	Somewhat	Red bumps show a lot due to pale skin Was unable to afford anything effective
2 Months	Not much	Worked really well "4 products are a lot for a 16 year old guy" Felt nice on skin/gentle



Clinical Takeaways

- Inability to afford dermatologist visits and medicines made him suffer for many years
- Acneceuticals were able to control his acne at affordable prices

Case 8: FST VI With Scarring and Postinflammatory Hyperpigmentation

A 25-year-old woman, FST VI with mild acne since age 11 with prominent scarring and postacne hyperpigmentation. She was bothered more by her acne sequelae than her active lesions. Products chosen for the trial were Mela B3® for its keratolytic, anti-inflammatory, and depigmenting effects, along with Toleriane Hydrating Cleanser® and Double Repair Moisturizer® for barrier repair. By month 2, she noted improvement in acne lesions, hyperpigmentation, and dry skin.

Clinician Assessments

	IL Counts	Comedone #	IGA	Oily Appearance	Dryness
Baseline	7	13	2 (Mild)	3/5	2/5
2 Months	2	6	2 (Mild)	1/5	1/5

Patient Assessments

	Bothered by acne	Comments
Baseline	Extremely	I work in medical field and everyone stares at me Irritated by OTC products Very unhappy about scars
2 Months	Not much	Skin soft and smooth Acne greatly improved I think barrier was part of my problem Cleanser didn't adequately remove makeup

Clinical Takeaways

- Barrier repair improved acne
- Mela B3® helped with comedones, hyperpigmentation, and the appearance of pores

Case 9: On Prescription Care With Insufficient Control Inflammatory Lesions

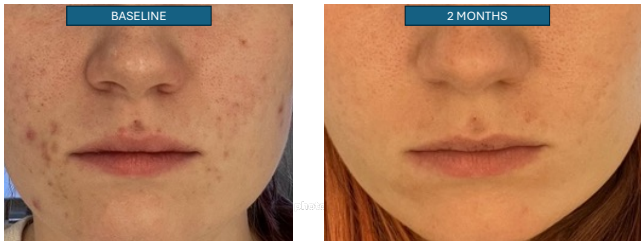
A 21-year-old college student with a 9-year history of acne. Historically, the use of topical medications was precluded by her extremely dry skin caused by chlorine exposure as a competitive swimmer. She was currently on oral sarecycline, salicylic acid cleanser, and benzoyl peroxide cleanser without complete control, specifically persistent inflammatory lesions. Benzoyl peroxide and salicylic acid cleansers were discontinued. Products chosen for the trial were Toleriane Hydrating Cleanser®, Double Repair Moisturizer® for barrier repair along with continued use of oral sarecycline and the introduction of prescription benzoyl peroxide/clindamycin/adapalene fixed combination gel. Her skin was well moisturized and she was able to tolerate the triple combination gel. Lesion count and IGA were rapidly reduced.

Clinician Assessments

	IL Counts	Comedone#	IGA	Oily appearance	Dryness
Baseline	14	5	2 (Mild)	1/5	2/5
2 Months	2	2	1 (Near Clear)	1/5	3/5

Physician Assessments

	Bothered by acne	Comments
Baseline	Extremely	Makes me insecure Wish it would go away completely
2 Months	Not much at all	Moisturized well, less dryness after swimming Unhappy with bleaching of fabric



Clinical Takeaways

- Addition of barrier repair augmented prescription medications and improved efficacy
- Moisturizer resolved dryness from chlorine

Case 10: Over-the-Counter Acne Meds Unhelpful/ Irritating

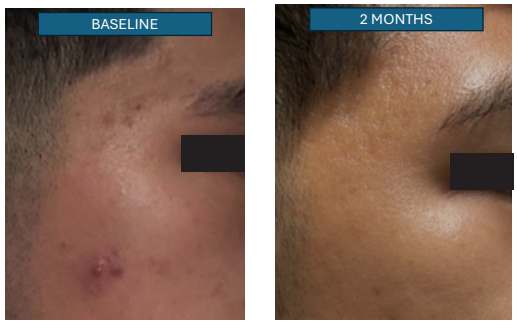
A 27-year-old Asian man with Fitzpatrick skin type IV presented with a 2-year history of mild to moderate acne. Inconsistent use of topical medications resulted in a lack of improvement. Products selected for the trial included Toleriane Hydrating Cleanser® and Double Repair Moisturizer® along with sarecycline and triple fixed combination gel. His sensitive skin improved, allowing for regular use of prescription medications. At 2 months, his lesion count improved, and his IGA score reached 0 (clear)."

Clinician Assessments

	IL Counts	Comedone#	IGA	Oily appearance	Dryness
Baseline	15	1	2 (Mild)`	1/5	4/5
2 Months	0	0	0 (Clear)	1/5	3/5

Patient Assessments

	Bothered by acne	Comments
Baseline	Very	I'm too old for acne It is embarrassing Everything bothers my skin and can't use them long enough to get better
2 Months	Not very	I'm less dry I am able to use the acne cream Improvement noted by 1 month



Clinical Takeaways

- The use of moisturizer and gentle cleansing repaired the barrier sufficiently to allow the use of prescription topical resulting in improvement

DISCUSSSION

These real-world cases demonstrated the utility of acneceuticals in the treatment of acne in many common scenarios that clinicians face on a daily basis. These cases demonstrated that the rational choice of acneceuticals, bearing in mind the pathophysiology of acne and the mode of action of the actives utilized, can result in rapid and significant improvement of acne in a variety of clinical settings.

Several key takeaways and clinical pearls became evident to the panel.

1) The use of a quality skin cleanser and moisturizer was key to good clinical outcomes. Several patients expressed that skin hydration was a major contributor to their treatment success. Nearly all patients reported that the use of the gentle cleanser and moisturizer reduced drug-related irritation, allowing consistent use of their medications and resulting in clinical improvement. The data supports both of these clinical pearls. Yamamoto and co-workers have demonstrated that there is an inherent barrier dysfunction in acne-prone skin[3] and small studies suggest that good skin care can improve acne without pharmaceutical intervention.[4-6] Additionally, the acne treatment paradigm is grounded in the use of topical retinoids and benzoyl peroxide, both of which cause barrier disruption, as demonstrated by increased transepidermal water loss. Numerous studies show that quality skin care minimizes the adverse effects of dryness and irritation,[5-7] reduces non-adherent behavior,[9-11]and improves clinical outcomes.[10]

2) Although most patients welcomed the gentle, moisturizing nature of the Toleriane Hydrating Cleanser®, several patients with oilier complexions and those who use heavy makeup remarked that they would prefer a cleanser that lathers more aggressively. These comments highlight the importance of ascertaining patient preference in skincare.

3) Acneceuticals were able to replace prescription medications when care was taken to choose actives with similar mechanisms of action (keratolytics, antibacterial agents, anti-inflammatory, sebum-inhibiting). Efficacy as adjunctive therapies as well as maintenance use was perceived as similar or better than prescription products with superior tolerability.

4) The addition of acneceuticals as adjuncts to prescription medications that were inadequate for the control of inflammatory or comedonal lesions resulted in superior outcomes in both lesion types.

5) Concomitant treatment of acne and postacne hyperpigmentation was possible without irritation or iatrogenic hyperpigmentation with acneceuticals containing keratolytics, retinols, and pigment-reducing actives.

6) The subjects appreciated the personal recommendations and holistic treatment regimens that were provided to them. They expressed that they valued professional recommendations over their personal guess, especially when shopping for quality skincare products.

7) Subjects also appreciated the simplification of their plethora of "product junkie" skincare products. Data show that regimen non-adherence is indirectly related to the number of products recommended. Primary adherence – the likelihood that the patient will not even purchase what the clinician recommends is more than 30% when two or more products are prescribed.[11] Secondary non-adherence – the likelihood that the patient will use what they bring home drops from 79% to 51% when asked to use 2 or more products a day.[12] Thus, combination acneceuticals that serve more than one purpose may be more effective.

8) Acneceuticals have several additional advantages. Many acne sufferers do not have access to health care; still others cannot afford quality medications. Many others cannot afford prescription medications. Judicious personalized acneceutical recommendations can be more affordable for our less affluent patients. Including such recommendations in online posts can reach a large audience who may be spending money on ineffective internet hype.

9) Most subjects mentioned the negative impact of their acne on their quality of life including embarrassment (particularly the adult patients and those in the medical field), loss of self-esteem, and limitation of social activities. Several subjects, at the 2-month visit, were happy with the results but voiced concerns that their acne would return. In 1997, Layton published an article entitled "Scarred for Life" which showed that even after improvement, the psychological scars of acne persisted even if no physical scars were present.[13] The panel noted that this is akin to post-traumatic stress disorder and that psychological sequelae are not limited to the treatment phase.

Limitations

The panel endeavored to pick subjects with a wide range of age, gender, race, and ethnicity, however, these subjects had the ability to come to a dermatology practice and nearly all had commercial insurance. Scenarios were chosen that were the most common in the panels' urban practices which may not be universal truths. As such, it is difficult to draw definitive conclusions across a more diverse patient population. Additionally, although the goal was a real-world approach, there may be some adherence bias introduced by presenting the patients with trade-size products. Finally, in certain cases, the combination of acneceuticals with robust prescription medications may have overestimated the effect of over-the-counter skincare on patient outcomes.

CONCLUSION

The acne management paradigm focuses on the use of prescription medications and procedures that target the 4 pillars of acne pathophysiology: hyper- and dysseborrhea, increased sebum production, *C. acnes* proliferation, and inflammation. Although these treatments are generally effective, clinicians continue to search for better regimens with improved safety and tolerability, lower cost, and more equitable access. Our patients search for this as well, often finding answers online that fall short of effective care, sometimes with harmful consequences.[14]

Previous publications have examined the use of nonprescription actives (acneceuticals) as both monotherapy and adjunctive therapy in the management of acne.[1] Actives were vetted for clinical efficacy, and an algorithmic approach was recommended, again targeting the 4 pillars of acne pathophysiology. Herein, we endeavored to utilize a real-world approach to the use of acneceuticals utilizing the algorithm in 10 clinical scenarios. In all cases, the panel of experts agreed that acneceuticals were able to improve acne and acne sequelae as monotherapy, as adjuncts to existing regimens, as concomitant therapy with prescription drugs, and as maintenance options when discontinuation of prescription medications was deemed necessary. Subject satisfaction was high, and concordant with clinician assessments. Subjects appreciated being given a complete regimen that precluded the choice paralysis many patients experience when left to their own accord in choosing skincare products.

While certainly challenging to accomplish within the confines of a high-volume practice, improving patient knowledge of comprehensive acne therapy, including non-prescription actives, is an effective way to maximize efficacy and equip patients with the necessary tools for personalized and successful acne treatments.

DISCLOSURES

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Dr Baldwin has served as an investigator, consultant, advisor, and/or speaker for Almirall, Bausch, Beiersdorf, Cutera, Galderma, Journey, Kenvue, La Roche-Posay, L'Oreal, Sanofi, SUN, and Tarsus. Dr Frey serves as an investigator, consultant, advisor, and/or speaker for Beiersdorf, Proctor and Gamble, Bubble Skincare, Kenvue, La Roche-Posay, CeraVe, and L'Oreal. Dr Hebert reports grants paid to her institution from Pfizer, Arcutis, Dermavant, Leo, Janssen, Takeda; and honoraria from Pfizer, Arcutis, Dermavant, Leo, Incyte, Galderma, Ortho Dermatologics; GSK, Regeneron Sanofi, and Ortho Dermatologics. Dr Lain serves as an investigator, consultant, advisor, and/or speaker for Almirall, Galderma, Ortho Dermatologics, L-Oreal, Beiersdorf, Pierre Fabre, Journey, Sun Pharma, and Biofrontera. Dr Rieder is a consultant for Abbvie, L'Oreal, Merz, Proctor and Gamble, UCB, and Unilever. Dr Schlesinger serves as a consultant, investigator, speaker and/or advisor for Abbvie, Almirall, Allergan, ASLAN, Arcutis, Biofrontera, Beiersdorf, Benev, Bristol-Myers Squibb, Castle Biosciences, Galderma, Eli Lilly, ExoCoBio, Incyte, Janssen, LEO, L'Oreal, Novartis, Pfizer, Regeneron, Sanofi, Sun Pharma, Takeda, UCB, and Verrica.

REFERENCES

1. Baldwin H, Bui H, Callender V., et al. The use of acneceuticals to improve acne care: introduction of a new term and review of the literature. *J Drugs Dermatol.* 2025;24(3):281-287.

2. Baldwin H, Frey C, Hebert A. An algorithm integrating acneceuticals into the management of acne vulgaris. *J Drugs Dermatol.* 2025; In press.

3. Yamamoto A, Takenouchi K, Ito M. Impaired water barrier function in acne vulgaris. *Arch Derm Res.* 1995;287:214-218.

4. Marson J, Bhatia N, Graber E et al. The role of epidermal barrier dysfunction and cutaneous microbiome dysbiosis in the pathogenesis and management of acne vulgaris and rosacea. *J Drugs Dermatol.* 2022;21-9.

5. Araviiskaia E, Dreno B. The role of topical dermocosmetics in acne vulgaris. *J Eur Acad Dermatol Venereol.* 2016;30(6):926-35.

6. Thiboutot D, Del Rosso J. Acne vulgaris and the epidermal barrier: is acne vulgaris associated with inherent epidermal abnormalities that cause impairment of barrier functions? *J Clin Aesthet Dermatol.* 2013;6(2):18-24.

7. Goh C-L Wu Y, Welsh B, et al. Expert consensus on holistic skin care routine. *J Cosmet Dermatol.* 2023;22(1):45-54.

8. Fabbrocini G, Rossi G, Thouvenin M et al. Fragility of the epidermis: acne and post procedure lesional skin. *J Eur Acad Dermatol Venereol.* 2017 31 Suppl 6:3-18.

9. Jordan L, Baldwin H. Stratum corneum abnormality and disease-affected skin strategies for successful outcomes in inflammatory acne. *J Drugs Dermatol.* 2016;15(10):1170-1183.

10. Draelos ZD, Baalbaki N, Colon G, et al. Ceramide-containing adjunctive skin care for skin barrier restoration during acne vulgaris treatment. *J Drugs Dermatol.* 2023;22(6):554-558.

11. Moradii Tuchay S, Alexander TM, Nadkarni A, et al. Interventions to increase adherence to acne treatment. Patient Prefer Adherence. 2016;10:2091-2096.

12. Osterberg L, Blaschkte T. Adherence to medication. *N Engl J Med.* 2005;253(5):487-492

13. Layton AM, Seukeran D, Cunliffe WJ. Scarred for life? *Dermatology.* 1997;195 Suppl 1:15-21.

14. Szeto MD, Mamo A, Afrin A. Social media in dermatology and an overview of popular social media platforms. *Current Dermatology Reports.* 2021;10(4):97-104.

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