Vehicles and Formulas:

Plaque Psoriasis Review

Sarah Taylor, PharmD
Updated February 2025

Psoriasis is a chronic inflammatory condition presenting with a variety of different subtypes including pustular psoriasis, guttate psoriasis, erythrodermic psoriasis, and chronic plaque psoriasis, which is the focus of this review. Plaque psoriasis presents with scaly erythematous plaques and is characterized by hyperproliferation of the epidermis and inflammation mediated by immune related dysregulation by cytokines such as interleukins (IL), and tumor necrosis factor (TNF).[1] Treatments for management of psoriasis typically target this increased keratinization resulting from hyperproliferation, the underlying immune response, or the shortened cell turnover that contribute to the creation of psoriatic plaques.[1]

A recent cross-sectional study reported that psoriasis impacts 3% of the US adult population, corresponding to more than 7.5 million individuals.[2] Given the widespread impact, a variety of commercially available options such as corticosteroids, vitamin D analogues, calcineurin inhibitors (such as tacrolimus or pimecrolimus), retinoids, keratolytic agents (such as urea or salicylic acid), coal tar, and systemic options such as biologic agents are available for treatment management. The chosen treatment can vary depending on age of patient, total body surface area impacted, and location of plaques among other factors. Despite the myriad of available options, one global study found only 58% of treated patients to be satisfied with their current treatment, indicating a potential need for additional therapies.[3]

One simple way to potentially increase the efficacy of topical therapy is combination treatment. Combination treatment allows for the targeting of multiple underlying causative factors or can help manage adverse effects associated with a specific treatment. For example, combinations of steroids, which can decrease causative factors of psoriasis such as inflammation, are sometimes paired with keratolytic agents like urea or salicylic acid which soften the skin and may improve penetration of the steroid.[4] One double-blind investigation compared hydrocortisone 1% to hydrocortisone with 10% urea added and found the combination treatment to be better tolerated than hydrocortisone alone.[5] Another study found the addition of 10% urea to betamethasone valerate steroid cream to be more efficacious than steroid cream alone for conditions with some overlapping pathophysiology such as atopic dermatitis.[6] Similarly, the addition of 2% salicylic acid to betamethasone 0.05% was noted to improve scaling, itching, and redness compared to treatment with betamethasone alone.[7] Combinations of other active ingredients such as tazarotene, a retinoid that can normalize keratinocyte differentiation and proliferation, with steroids have also noted benefit for management of psoriasis and one study noted a reduction of local adverse events compared to tazarotene alone.[8,9] Tazarotene in combination with calcipotriene, a vitamin D analogue, has also been studied and found to be as efficacious as high potency steroid clobetasol, but this steroid free alternative may be considered for more sensitive areas such as for use on the face where high potency steroids are typically not recommended.[10] Another double-blind randomized comparative study of calcipotriene in combination with niacinamide 4% vs

calcipotriene alone found the combination to be more effective than calcipotriene monotherapy. Niacinamide, a B vitamin derivative, is thought to improve symptoms by reducing proliferation of keratinocytes.[11]

In addition to combination options, evidence suggests that alternative active pharmaceutical ingredients such as naltrexone may also play a role in topical management of psoriasis. In vitro studies of naltrexone suggest topical naltrexone may downregulate production of inflammatory cytokines associated with psoriasis, such as interleukin-6.[12] Though not yet studied specifically for psoriasis in vivo, studies on similar immune related dermatologic conditions such as atopic dermatitis have noted naltrexone 1% topical cream to significantly reduce pruritus.[13] Cyanocobalamin 0.07% has also been studied for management of psoriasis, with one randomized, controlled, intra-patient comparison study noting twice daily vitamin B12 ointment to be superior to a standard hydrating ointment for management of psoriasis. Investigators concluded that topical B12 should be considered for psoriasis of sensitive areas such as axillary areas where typically first-line options such as high potency corticosteroids are typically not recommended for use.[14] Other alternative active pharmaceutical ingredients for psoriasis include caffeine 10%, which has demonstrated efficacy topically in small double-blind, placebo-controlled trials[15] potentially due to its ability to downregulate production of inflammatory markers, and theophylline 1%, which may act similarly to caffeine and has also demonstrated efficacy compared to placebo in small trials.[16] Tofacitinib, a Janus Kinase (JAK) inhibitor that also downregulates production of inflammatory markers is approved systemically for management of psoriatic arthritis, but has recently been studied at 2% and shown promising results for topical use for plaque psoriasis as an alternative with fewer systemic adverse events compared to oral use.[17] Similarly, methotrexate, another oral agent with anti-TNF properties as well as JAK inhibition has also been studied topically for psoriasis. Studies have evaluated concentrations ranging from 0.1-1% and found low concentrations such as 0.1% to be more effective than placebo.[18,19]

Though many commercially available options exist for topical treatment of plaque psoriasis, a gap in patient satisfaction with treatment persists. Compounding allows us to offer combination treatments or alternative therapies to those unable to achieve satisfactory control on their current regimen.

Vehicle	Water Activity	Suitability for Psoriasis
Versatile	>0.6	Versatile is a smooth white to off-white vanishing cream. It contains hydrating ingredients such as vitamin E and is free of common irritants such as propylene glycol, fragrances, parabens, or dyes. Versatile also tolerates high API and solvent load, making it a good choice even for high concentration urea or coal tar preparations.
Versatile Anhydrous	<0.6	Versatile Anhydrous is a rich nonaqueous cream base that allows for extended BUD up to 180 days per current USP <795> guidelines. This vehicle tolerates high API and solvent load and contains stabilizers allowing it to be used as is with oxidation prone ingredients sometimes used in psoriasis preparations, such as tazarotene.
Cleoderm	>0.6	Cleoderm contains hyaluronic acid sodium salt, often used topically in cosmetic preparations for skin hydration. It also contains plant-based anti-inflammatory ingredients from Cleome Gynandra extract, such as rutin and hydroxycinnamic acid thought to have anti-inflammatory and antioxidant activity. Peptide anti-inflammatory ingredient palmitoyl tripeptide-8 as well as bisabolol are also key ingredients studied for their anti-inflammatory properties. Cleoderm should be considered for topical management of psoriatic lesions in sensitive areas such as the face.

Occluvan	<0.6	Occluvan is an anhydrous, preservative free ointment base that contains hydrating ingredients such as beeswax and vitamin E to support topical hydration. As an anhydrous vehicle, Occluvan allows for an extended BUD up to 180 days per current USP <795> guidelines.

Formula ID	Formula Title
FA-22858	Dapsone 5% - Tazarotene 0.1% Cream (Nourivan™ Antiox)
FA-21923	Calcipotriene 0.005% - Tazarotene 0.1% - Caffeine 0.5% - Coenzyme Q10 1% - Vitamin E Acetate 0.5% Cream (Cleoderm™)
FA-22709	Desonide 0.05% - Urea 10% Cream (Cleoderm™)
FA-22985	Pimecrolimus 1% - Urea 10% Cream (Versatile™)
FA-23830	Cyanocobalamin 0.07% Cream (Versatile™)
FA-22986	Pimecrolimus 1% - Cyanocobalamin 0.07% Cream (Cleoderm™)
FA-21628	Naltrexone HCl 1% Cream (Versatile™)
FA-23633	Coal Tar 10% - Salicylic Acid 10% - Triamcinolone Acetate 0.1% Cream (Versatile™ Anhydrous Cream)
FA-23600	Coal Tar 10% - Salicylic Acid 5% Cream (Versatile™ Anhydrous Cream
FA-22510	Tofacitinib 2% Topical Ointment (Occluvan)
FA-22803	Tacrolimus 0.03% - Urea 10% Ointment (Occluvan)
FA-12863	Betamethasone 0.05% - Salicylic Acid 10% - Coal Tar Solution 5% Topical Ointment
FA-22806	Naltrexone HCl 1% - Vitamin E 4% - Cromolyn Sodium 4% - Urea 10% Cream (Versatile™)
FA-22978	Methotrexate 0.1% Cream (Versatile™)
FA-23829	Tazarotene 0.05%, Betamethasone 0.05% Cream (Versatile™ Anhydrous Cream)
FA-23831	Calcipotriene 0.005%- Niacinamide 4% Cream (Cleoderm™)

References:

1. Reldman S. Psoriasis: Epidemiology, clinical manifestations, and diagnosis. UpToDate. Updated 11/6/2024. Accessed 2/7/2025.
2. Armstrong AW, Mehta MD, Schupp CW, Gondo GC, Bell SJ, Griffiths CEM. Psoriasis Prevalence in Adults in the United States. JAMA Dermatol. 2021;157(8):940-946. doi:10.1001/jamadermatol.2021.2007
3. Armstrong AW, Bohannan B, Mburu S, et al. Patient Perspectives on Psoriatic Disease Burden: Results from the Global Psoriasis and Beyond Survey. *Dermatology*. 2023;239(4):621-634. doi:10.1159/000528945
4. Uva L, Miguel D, Pinheiro C, et al. Mechanisms of action of topical corticosteroids in psoriasis. Int J Endocrinol. 2012;2012:561018. doi:10.1155/2012/561018
5. Drosner M. Harnstoff in Kombination mit Kortikosteroiden zur Therapie von Ekzemen [Urea in combination with corticosteroids in treating eczema]. Hautarzt. 1989;40 Suppl 9:47-50. German. PMID: 2681076.
6. Hindson C. Urea in the topical treatment of atopic eczema. Arch Dermatol. 1971;104(3):284-285. doi:10.1001/archderm.1971.04000210058010
7. Guenther LC. Fixed-dose combination therapy for psoriasis [published correction appears in Am J Clin Dermatol. 2004;5(4):279]. Am J Clin Dermatol. 2004;5(2):71-77. doi:10.2165/00128071-200405020-00001
8. Lebwohl MG, Stein Gold L, Papp K, et al. Long-term safety and efficacy of a fixed-combination halobetasol propionate 0.01%/tazarotene 0.045% lotion in moderate-to-severe plaque psoriasis: phase 3 open-label study. J Eur Acad Dermatol Venereol. 2021;35(5):1152-1160. doi:10.1111/jdv.17113

9. Lebwohl M, Breneman D, Geoffe B et al. Tazarotene 0.1% gel plus corticosteroid cream in the treatment of plaque psoriasis. JAAD. 1998; 39(4): 590-596.
10. Bowman PH, Maloney JE, Koo JY. Combination of calcipotriene (Dovonex) ointment and tazarotene (Tazorac) gel versus clobetasol ointment in the treatment of plaque psoriasis: a pilot study. J Am Acad Dermatol. 2002 Jun;46(6):907-13. doi: 10.1067/mjd.2002.120453. PMID: 12063489.
11. Siadat AH, Iraji F, Khodadadi M, Jary MK. Topical nicotinamide in combination with calcipotriol for the treatment of mild to moderate psoriasis: A double-blind, randomized, comparative study. Adv Biomed Res. 2013;2:90. Published 2013 Nov 30. doi:10.4103/2277-9175.122520
12. IP K, Song G, Banov D, Bassani A, Valdez B. In vitro evaluation of naltrexone HCl 1% topical cream in XemaTop for psoriasis. Archives of Dermatological Research. 2019; 312: 145-154.
13. Bigliardi PL, Stammer H, Jost G, Rufli T, Büchner S, Bigliardi-Qi M. Treatment of pruritus with topically applied opiate receptor antagonist. J Am Acad Dermatol. 2007 Jun;56(6):979-88. doi: 10.1016/j.jaad.2007.01.007. Epub 2007 Feb 22. PMID: 17320241.
14. Del Duca E, Farnetani F, De Carvalho N, Bottoni U, Pellacani G, Nisticò SP. Superiority of a vitamin B12-containing emollient compared to a standard emollient in the maintenance treatment of mild-to-moderate plaque psoriasis. Int J Immunopathol Pharmacol. 2017 Dec;30(4):439-444. doi: 10.1177/0394632017736674. Epub 2017 Oct 19. PMID: 29048238; PMCID: PMC5806803.
15. Vali A, Asilian A, Khalesi E, Khoddami L, Shahtalebi M, Mohammady M. Evaluation of the efficacy of topical caffeine in the treatment of psoriasis vulgaris. J Dermatolog Treat. 2005;16(4):234-7. doi: 10.1080/09546630510011801. PMID: 16249145.
16. Papakostantinou E, Xenos K, Markantonis SL, Druska S, Stratigos A, Katsambas A. Efficacy of 2 weeks' application of theophylline ointment in psoriasis vulgaris. J Dermatolog Treat. 2005;16(3):169-170. doi:10.1080/09546630510043202
17. Dehghani P, Varshosaz J, Mirian M et al. Keratinocyte exosomes for topical delivery of tofacitinib in treatment of psoriasis: an in vitro/in vivo study in animal model of psoriasis. Pharmaceutical Research. 2024; 41: 263-279.
18. Weinstein G, McCullough J, Olsen E. Topical methotrexate therapy for psoriasis. JAMA. 1989; 125(2): 227-230.
19. Chaiyabutr C, Punnakitikashem P, Silpa-archa N, Wongpraparut C, Chularojanamontri L. The anti-psoriatic efficacy and safety profile of topical and intralesional methotrexate: a literature review. Clinical, Cosmetic, and Investigational Dermatology. 2022; 15: 2253-2274.