Targeted literature review of the benefits and limitations of current moderate-to-severe psoriasis (PsO) routes of administration

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Background

Approved advanced systemic treatments for moderate-to-severe PsO at time of research include injectable or infused biologics (inhibiting tumor necrosis factor alpha [TNF-α], interleukin [IL]-17, or IL-12 and/or IL-23), and oral small molecules (OSM; inhibiting phosphodiesterase-4 or tyrosine kinase 2).[1-3]

Biologic therapies can deliver high rates of clinical benefit, while real-world (RW) treatment pattern evidence indicates systems-level burden associated with injection/infusions, storage, and administration, as well as restricted long-term persistence.[4-27]

OSMs have historically offered improved accessibility and ease of use, with the trade-off of lower efficacy and similarly restricted long-term persistence (22% to 45% at 12 months for apremilast versus 20% to 58% for biologics).[2-3,14,28-35]

Understanding the broader value of the oral route of administration beyond efficacy and safety may support improved access and treatment adherence in moderate-to-severe PsO.

Objective

A targeted literature review (TLR) was conducted to evaluate the impact of route of administration (RoA) on patient-centered values, treatment accessibility, adherence/ persistence, economic burden and safety in moderate-to-severe PsO.

Key Takeaways

- **Patient-centered value in moderate-to-severe plaque PsO extends beyond skin clearance to RoA advantages, including accessibility, economic burden, and treatment-specific safety.**
- **Oral therapy removes barriers related to injection: pain, needle anxiety, and the need for self-injection training or HCP assistance.**
- **Additionally, at the system level, oral therapy needs no facility attendance, HCP administration time, or temperature-controlled storage and cold-chain distribution.**
- **Effective and safe oral option may address important route-related limitations of injectable/ infused therapies and thereby improve long-term outcomes in moderate-to-severe psoriasis PsO.**

Methods

- A TLR informed by Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines was conducted to identify English-language citations published between January 2015 and November 2025 in Ovid MEDLINE® and Embase.[36]
- Searches in electronic databases were supplemented with searches of grey literature sources, including congresses of associations in dermatology (American Academy of Dermatology [AAD], European Academy of Dermatology and Venereology [EADV]), rheumatology (American College of Rheumatology [ACR], European Alliance of Associations for Rheumatology [EULAR]), and health economics and outcomes research (International Society for Pharmacoeconomics and Outcomes Research [ISPOR]).
- Eligible studies evaluated approved treatments in moderate-to-severe PsO and reported outcomes for preferences, accessibility, adherence, efficacy, safety or economic burden that were attributed to the RoA.

Table 1. Eligibility Criteria

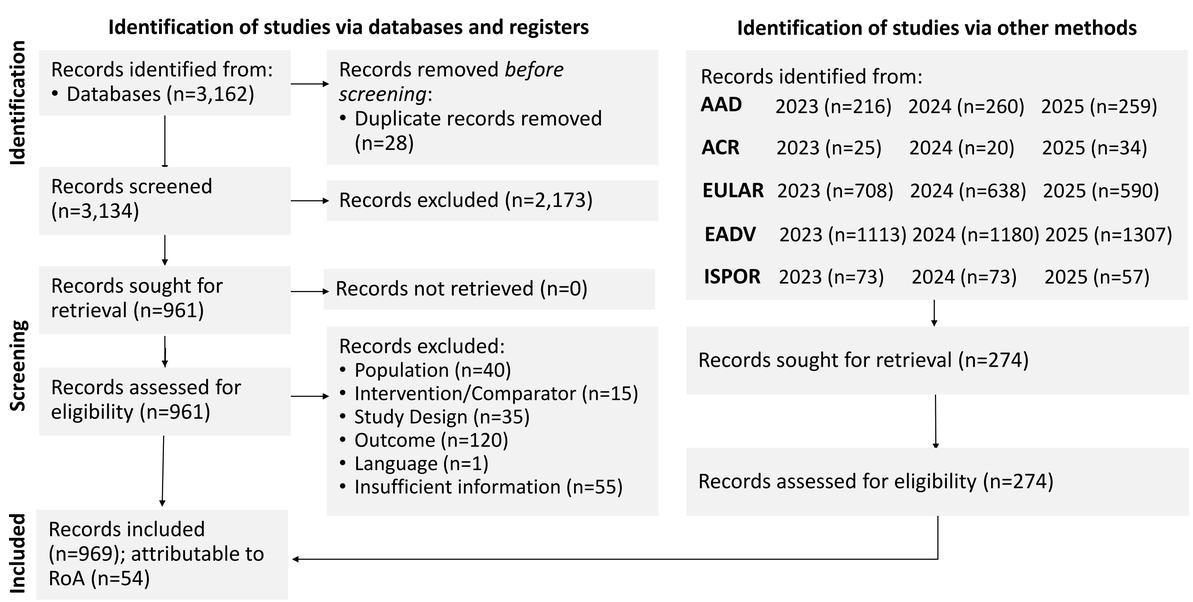
	Inclusion Criteria
Population	Adolescent and adult populations (ages ≥12 years) with moderate-to-severe plaque PsO, including high-impact site involvement (e.g., scalp, hands, feet, genital area)*
Intervention / Comparator	• Advanced oral therapies (PDE4 inhibitors, TYK2 inhibitors, oral IL-23 receptor antagonist peptides) • Injectable biologic therapies: IL-12/IL-23, IL-23 or IL-17 inhibitors, TNF-α inhibitors
Outcomes	• Accessibility, adherence, efficacy, preferences, safety or economic burden that were attributed to the RoA
Study Design	• No restrictions
Limits	• Language: English; Date: 2015-2025 for databases or 2023-2025 for conferences

*Mixed-population studies were eligible if results were reported for this subgroup. PDE4 inhibitors: apremilast; TYK2 inhibitors: deucravacitinib; IL-12/IL-23 inhibitors: ustekinumab; IL-23 inhibitors: guselkumab, risankizumab, tildrakizumab; IL-17 inhibitors: secukinumab, ixekizumab, brodalumab, bimekizumab; TNF-α inhibitors: adalimumab, etanercept, infliximab, certolizumab pegol. Abbreviations: IL=interleukin, PDE-4=Phosphodiesterase-4, PsO=psoriasis, TNF-α=tumor necrosis factor alpha, TYK2=tyrosine kinase 2.

Results

Searches identified 3,134 unique primary and secondary citations. Of these, 969 reported outcomes of interest and the 54 attributing these outcomes directly to the RoA were included for qualitative synthesis.

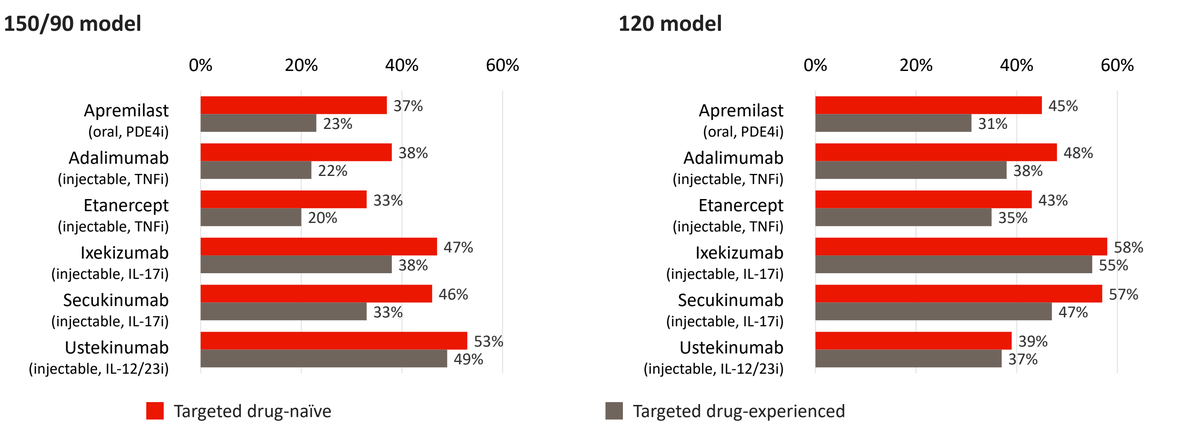
Figure 1. PRISMA-informed study selection flow diagram



Abbreviations: AAD=American Academy of Dermatology Annual Meeting; ACR=American College of Rheumatology Annual Meeting; EADV=European Academy of Dermatology and Venereology Congress; EULAR=European Alliance of Associations for Rheumatology; ISPOR=International Society for Pharmacoeconomics and Outcomes Research; n=number; PRISMA=Preferred Reporting Items for Systematic Reviews and Meta-Analyses. Source: [36]Page 2021.

Treatment persistence for advanced treatments was < 50% at 12 months for most PsO treatments assessed and varied by treatment, route of administration, prior drug exposure, and modelling approach.

Figure 2. Treatment persistence (%) at 12 months, US claims data[14]



Source: [14]Hendrix 2020 (US Truven Health MarketScan claims, 2007–2017). Values are unadjusted 12-month persistence. Persistence ends (discontinuation) at no refill of the drug, or a switch to another targeted immunomodulator, within the permissible gap between refills. Naïve and experienced refer to prior targeted drug exposure. Patient counts and reasons for switching: NR (not reported). IL-23 inhibitors and Deucravacitinib were not assessed. Note: 150/90 model: permissible gap of 150 days for ustekinumab and 90 days for all other drugs (the definition used in most prior claims studies). 120 model: 120-day gap for all drugs. A Days' supply model (gap of twice the recorded days' supply on each claim), which shows similar results for all treatments except for Ustekinumab, where it shows persistence close to the 120d, is not shown.
Other real-world studies in PsO, confirm limited adherence to advanced treatment.[47-57] These estimates are not directly comparable with the figure above. Definitions differ (claims-based refill-gap persistence vs registry/clinic drug survival, some limited to stopping for lack of effect or for safety), as do populations (biologic-naïve vs biologic-experienced, apremilast-experienced), settings (US vs European) and follow-up periods. Source: [47]Xu 2022; [48]Pinter 2025; [49]Hugo 2023; [50]Tskhvarashvili 2025; [51]Yiu 2022; [52]Caldarola 2023; [53]Herranz-Pinto 2023; [54]Bagel 2025; [55]Torres 2021; [56]Torres 2022; [57]Caldarola 2024.

Oral therapies can avoid injection-related burden and provide simpler treatment administration and logistics.

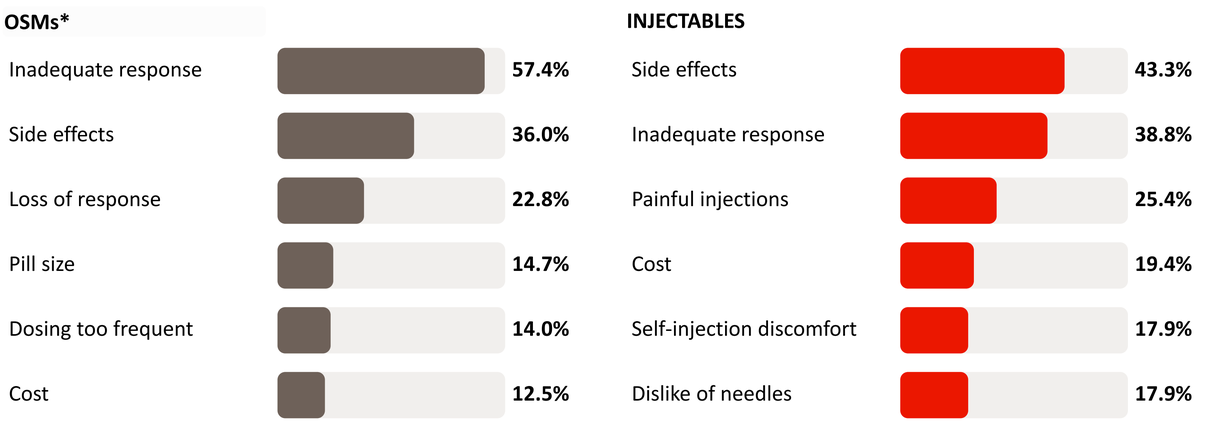
Table 2. Application considerations for oral therapies in moderate-to-severe PsO

Application–related considerations
Infusion and injection burden: Oral therapy avoids injection-related burden such as injection-site pain, injection anxiety, preparation, and discomfort.[15,17,37-41]
Healthcare practitioner time and resources: Oral therapies incur none of the clinical facility attendance or administration fees associated with infused and office-administered biologics.[21,25-27,42]
Reimbursement: Oral therapy avoids structural barriers that can limit biologic access even when covered (e.g., in Japan, biologic dispensing is restricted to accredited hospitals).[35]
Storage/logistics: Oral therapies require no refrigeration or cold-chain handling, which may simplify storage, transport, travel, and self-management.[23-24] Recent evidence published after the time of this search found that approximately 20% of biologic-naïve patients report biologic storage and home delivery as potential barriers to optimal care.[43]

Evidence gap: Direct psoriasis-specific evidence demonstrating improved travel, medication transportation, or self-management with oral versus biologic therapies remains limited. Abbreviations: HCP=healthcare provider, PsO=psoriasis, SC=subcutaneous. Sources: [15]Lebwohl 2016, [17]Kuang 2024, [21]Colombo 2018, [23]Larney 2025, [24]Oldani 2025, [25]Zargaran 2021, [26]Chastek 2016, [27]Barbieri 2020, [35]Komine 2023, [37]Grace 2020, [38]Daudén 2020, [39]Olivares-Guerrero 2025, [40]Verardi 2024, [41]Chabra 2024, [42]Cortesi 2023, [43]Bewley 2026.

Reasons for discontinuation differ by route: efficacy-related reasons predominated for OSMs, while route, dosing frequency and injection fear drove biologic discontinuation and switching.

Figure 3. Patient-reported reasons for discontinuing prior OSMs and injectable PsO therapies



*OSMs include apremilast, deucravacitinib, or others. Multiple reasons per respondent (not additive); the merged injection category shows the range of three reported categories. Loss of response = discontinued owing to waning response. Source: [58]Stein Gold 2025.

An effective and well-tolerated oral therapy can reduce route-related barriers that could affect treatment acceptance or continuation.

Table 3. Patient-centered value themes associated with route of administration in moderate-to-severe PsO

Choice	Treatment Experience	Injection Avoidance
Route of administration accounted for between 15% to 29% of relative importance in treatment choice.[20,22,35]	In a US survey, 66.5% were willing to start a new once-daily oral treatment; 65.0% expected less anxiety than with injections or infusions.[44]	Over one-third of patients with high needle fear were willing to reduce efficacy by 25% to avoid injections.[18,20]
With comparable efficacy and safety, once-daily oral treatment was favored over biweekly injection (87.1% vs 12.9%).[17]	Patients reported satisfaction and convenience with oral apremilast, whereas injection pain and self-injection anxiety reduced satisfaction with biologics.[31,34,41,45]	Fear of injections and needle concerns limited biologic use, including among biologic-naïve and Black patients in the US.[15-16,18-19,33,46]

Abbreviations: HCP=healthcare provider, PsO=psoriasis. Sources: [15]Lebwohl 2016, [16]Thai 2023, [17]Kuang 2024, [18]Smith 2024, [19]Bhutani 2024, [20]Feldman 2017, [22]Alcusky 2017, [31]da Silva Burger 2025, [33]Melendez 2025, [34]Klein 2022, [35]Komine 2023, [41]Chabra 2024, [44]Armstrong 2024, [45]Brunasso 2024, [46]Takeshita 2019.

Oral therapies incur no per-dose HCP administration/monitoring resource use and costs.

Table 4. Estimated maintenance administration costs in PsO by route of administration

	Cost per administration	Annual cost per patient
Oral therapies†		
BID[59] or QD[60]	$0	$0
Subcutaneous injections		
SC Q2W[61,62] or Q12W[63-65] *HCP-administered for ~4–5% of patients[66,67]**	$24 – $29 (USD, 2018)[68]	$4.16 – $6.28 (~4.3 injections/year) $24.96 – $37.70 (26 injections/year)
Intravenous infusions		
IV Q8W[69]	$82.5 USD[70]– €385 Euros[71]	$536.25 USD – €2,502.50 Euros (6.5 infusions/year)

†Assumes no administration or HCP cost attributable to the oral route. *Annual SC range assumes blended estimate weights by the share of SC patients needing HCP administration. Abbreviations: BID=twice daily; HCP=healthcare provider, IV=intravenous, PsO=psoriasis, QD=once daily; SC=subcutaneous. Sources: [59-65] Prescribing information, [66]Gardulf 2004 (non-PsO proxy), [67]Hoffmann 2010 (non-PsO proxy), [68]Carrico 2020, [69]Prescribing information, [70]Strand 2016 (non-PsO proxy), [71]Purmonen 2018 (non-PsO proxy).

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