Dermatology Practical & Conceptual

Efficacy and Safety of Guselkumab for Moderate-to-Severe Psoriasis: A Systematic Review and Meta-Analysis of Randomized Controlled Trials

Laura Ghanem[1], Antonia Moubarak[1], Jacinthe Khater[1], Ibrahim A. Yakout[2], Virginia Velasco-Tamariz[3]

1 Faculty of Medical Sciences, Lebanese University, Beirut, Lebanon

2 Faculty of Pharmacy, Zagazig University, Egypt

3 Dermatology Department, Hospital Universitario 12 de Octubre, I+12 Research Institute, Universidad Complutense, Madrid, Spain

Key words: Psoriasis, Monoclonal antibody, Interleukin-23, Guselkumab

Citation: Ghanem L, Moubarak A, Khater J, Yakout IA, Velasco-Tamariz V. Efficacy and Safety of guselkumab for Moderate-to-Severe Psoriasis: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *Dermatol Pract Concept*. 2026;16(2):6534. DOI: https://doi.org/10.5826/dpc.1602a6534

Accepted: October 13, 2025; **Published:** April 2026

Funding: None.

Competing Interests: None.

Authorship: All authors have contributed significantly to this publication.

Corresponding Author: Laura Ghanem, Faculty of Medical Sciences, Lebanese University, Beirut, Lebanon. ORCID: 0009-0009-7918-0107. E-mail: lauraghanem33@gmail.com

ABSTRACT

Introduction: Psoriasis, a chronic inflammatory skin condition, affects 125 million worldwide. Current treatments provide symptomatic relief but face limitations. Guselkumab shows promise for moderate-to-severe psoriasis.

Objective: We aimed to conduct a systematic review and meta-analysis exploring the safety and efficacy of guselkumab in moderate-to-severe psoriasis.

Methods: We searched PubMed, EMBASE, and Cochrane Library for randomized controlled trials (RCTs) comparing guselkumab to placebo in moderate-to-severe psoriasis. Primary endpoints: Investigators' Global Assessment (IGA) 0, Psoriasis Area and Severity Index (PASI) 90, and ≥1 adverse event (AE). Secondary endpoints: IGA 0/1, PASI75, PASI100, Dermatology Life Quality Index (DLQI), and ≥1 severe AE. RStudio was used for statistical analyses.

Results: We included 1607 patients from 6 RCTs. Guselkumab significantly increased odds of IGA 0 (odds ratio (OR) OR: 73.87; 95% confidence interval (CI): 32.53-167.73; P<0.00001; I^2=0.0%), and IGA 0/1 (OR) OR: 54.84; 95% CI: 24.72–121.64; P<0.00001; I^2=60.1%). Also, the OR of PASI75 (OR: 58.42; 95% CI: 23.03–148.17; P<0.001; I^2=70.0%), PASI90 (OR: 46.47; 95% CI: 14.23–151.76; P<0.001; I^2=71.7%), and PASI100 (OR: 59.27; 95% CI: 23.17–151.61; P<0.001; I^2=0.0%) were higher

with guselkumab. DLQI change was greater with guselkumab (MD: -8.46; 95% CI: -10.31 – -6.62; $P<0.01$; $I^2=77.8\%$). No significant difference in AEs and severe AEs between guselkumab and placebo (OR: 0.92; 95% CI: 0.68–1.24; $P=0.58$; $I^2=30.9\%$), (OR: 1.19; 95% CI: 0.54–2.64; $P=0.66$; $I^2=0.0\%$). Leave-one-out analysis identified PROTOSTAR as a source of heterogeneity. Subgroup analysis showed higher IGA 0 and PASI90 ORs in adults than in adolescents/children, with no dosage-based differences in PASI90 or AE.

Conclusion: This meta-analysis suggests that guselkumab does significantly improve moderate-to-severe psoriasis, without a significant increase in AEs.

Introduction

Psoriasis is a common chronic inflammatory disorder that affects around 125 million people worldwide, among whom 30% present with moderate-to-severe psoriasis symptoms [1,2]. The exact etiology is unknown, but it is hypothesized that the pathway of this autoimmune disease involves T cell lymphocyte activation. These latter infiltrate the skin and thereby stimulate the proliferation of keratinocytes, leading to the formation of thick plaques through dysregulation of keratinocyte turnover [3].

Although there is currently no definitive cure for psoriasis, various treatment strategies allow sustained control of disease signs and symptoms [4]. Many studies have focused on biological treatments targeting immune pathways involving cytokines such as tumor necrosis factor (TNF), interleukin (IL)-17, and IL-23 as potential sources of symptomatic relief and improvement of the psoriatic plaques [5,6]. Among these families, a fully human monoclonal antibody that targets the p19 of IL-23 is guselkumab [4,7]. Guselkumab (100 mg in week 0, week 4, and every eight weeks thereafter) was approved for adults by the U.S. Food and Drug Administration (FDA) in July 2017 and is also recommended by the American Academy of Dermatology (AAD) 2019 guidelines for the management of psoriasis [8,9]. While clinical trials have demonstrated its efficacy, variability in population age groups and dosage raises the need for a comprehensive analysis with a focus on age groups and dosage.

Objective

Therefore, we aimed to conduct a systematic review and meta-analysis exploring the safety and efficacy of guselkumab in moderate-to-severe psoriasis, explicitly considering subgroup analyses by age for efficacy and by dosage for both efficacy and safety outcomes, based on the availability of data.

Methods

This meta-analysis and systematic review was performed according to the Cochrane Handbook for Systematic Reviews of Interventions and reported adhering to the Preferred Reporting Items for Systematic Reviews (PRISMA) statement guidelines [10,11].

Eligibility Criteria

Studies that met the following eligibility criteria were included: i) randomized controlled trials (RCTs); ii) comparing guselkumab with placebo; iii) reporting the results in adults as well as in children (≥6 to <12 years) and adolescents (≥12 to <18 years); iv) reporting at least one clinical outcome of interest. No restriction was applied to follow-up time. We excluded studies with: i) overlapping patient populations; ii) patients with concomitant psoriatic arthritis; iii) an observational design; iv) without a placebo control group.

Search Strategy and Data Extraction

The initial search included PubMed, EMBASE, and Cochrane Library databases from inception to February 2025 using the keywords “Guselkumab”, “Tremfya”, “CNTO 1959”, “CNTO-1959”, “psoriasis”, “psoriatic”, and “chronic plaque dermatitis”. Boolean operators “OR” and “AND” were used to optimize the search results. The retrieval strategy was applied with the customization of search strings to accommodate the recommendations of each database. In addition, we explored the references of the included studies to identify additional potential articles. No language restriction was applied. The complete search strategy can be found in the Appendix S1. Study selection and data extraction were performed by two authors (LG and AM) independently. Any disagreements were resolved among the research group.

Endpoints

Our endpoints were based on different scales and measures. The Investigators’ Global Assessment (IGA) is a scale, ranging from 0 to 4. The Psoriasis Area and Severity Index (PASI) is the most common and widely used measure of assessment aiming to assess the severity and grade of the disease; it has demonstrated a strong correlation with the IGA score. The interval of this measure ranges from 0 to 72; a score higher than 10 is in concordance with moderate-to-severe psoriasis [12]. Another important and commonly used instrument of

measurement is the Dermatology Life Quality Index (DLQI), aiming to assess the burden of psoriasis on patients and its negative impact on everyday life tasks [13].

The primary endpoints were IGA0 (clear), PASI90 (90% reduction in PASI), and at least one adverse event (AE). Secondary endpoints were IGA 0/1 (clear/almost clear), PASI75 (70% reduction in PASI), PASI100 (100% reduction in PASI), DLQI change, and at least one serious AE.

Statistical Analysis

Pooled treatment effects for binary endpoints were compared using an odds ratio (OR), and continuous outcomes were compared using a mean difference (MD) with a 95% confidence interval (CI). Heterogeneity was examined with the Cochran *Q* test and I^2 statistics. For dichotomous outcomes, the Mantel-Haenszel method (MH) with restricted maximum likelihood (REML) estimation was used to model the random effects and estimate between-study heterogeneity. For continuous outcomes, the inverse-variance method (IV) with REML was applied [14]. Leave-one-out sensitivity analyses were performed for IGA0 and PASI90 to ensure the results were not dependent on a single study. In addition, for IGA0, PASI90, and at least one AE, subgroup analyses were performed based on age and dosage. We used RStudio (2024.09.1+394) for statistical analysis.

Quality Assessment

The Cochrane Collaboration's tool for assessing risk of bias in randomized trials (Rob 2) was used to assess the quality of individual RCTs [15]. Two independent authors completed the risk of bias assessment (LG and IY). Disagreements were resolved through a consensus after discussing the reasons for the discrepancy.

Results

Study Selection and Baseline Characteristics

The initial search yielded 1819 results. After removal of duplicate records and ineligible studies, 57 remained and were fully reviewed based on the inclusion criteria. Of these, a total of six RCTs were included, comprising 1607 patients (Figure 1) [5,16–20]. A total of 1130 (70.31%) were males. Only one study included pediatric patients (children and adolescents), showing a difference in age, body mass index (BMI), and duration of psoriasis from diagnosis. Moreover, three of the included RCTs used dosages different from the standard one (100 mg) [16,19,20]. Otherwise, there was no major variation among studies regarding sex, body surface area (BSA), proportion of patients with severe IGA (IGA 4), PASI score, DLQI, and guselkumab frequency of injection. Study characteristics are reported in Table 1.

Pooled Analysis of All Studies

Investigator's Global Assessment (IGA)

The OR of achieving an IGA score of 0 or 1 (clear/almost clear) was also significantly higher when receiving guselkumab in comparison to placebo (OR: 54.84; 95% CI: 24.72–121.64; $P<0.00001$; $I^2=60.1\%$; Figure 2A). Due to high heterogeneity, a leave-one-out sensitivity analysis was performed for IGA by iteratively removing one study at a time to ensure the results were not dependent on a single study. Removal of the PROTOSTAR trial yielded the heterogeneity to drop from $I^2=60.1\%$ to $I^2=0.0\%$ (Figure S1) [16].

Patients treated with guselkumab had a significantly higher likelihood of achieving IGA 0 (clear) as compared with placebo (OR: 73.87; 95% CI: 32.53–167.73; $P<0.00001$; $I^2=0.0\%$; Figure 2B). A subgroup analysis based on age revealed that adults were significantly more likely to achieve IGA 0 when taking guselkumab compared to placebo (OR: 91.40; 95% CI: 37.48–222.89; $P=0.98$; $I^2=0.0\%$; Figure S2), whereas adolescents had lower odds (OR: 22.62; 95% CI: 1.24–412.05; Figure S2), and children had the lowest odds of achieving IGA 0 (OR: 3.86; 95% CI: 0.33–45.57; Figure S2) ($P=0.049$).

Psoriasis Area and Severity Index (PASI)

Compared to placebo, guselkumab significantly improved the likelihood of achieving PASI75 (OR: 58.42; 95% CI: 23.03–148.17; $P<0.001$; $I^2=70.0\%$; Figure 3A), PASI90 (OR: 46.47; 95% CI: 14.23–151.76; $P<0.001$; $I^2=71.7\%$; Figure 3B), and PASI100 (OR: 59.27; 95% CI: 23.17–151.61; $P<0.001$; $I^2=0.0\%$; Figure 3C).

A sensitivity analysis for the PASI90 outcome showed that only the removal of the PROTOSTAR trial was able to reduce heterogeneity from 71.7% to 3.1% (Figure S3) [16].

In a subgroup analysis by age, statistically significant higher OR of achieving PASI90 with Guselkumab were observed in adults (OR: 86.44; 95% CI: 48.69–153.48; $I^2=3.1\%$; Figure S4), compared to adolescents (OR: 19.38; 95% CI: 12.26–166.501; Figure S4), and children (OR: 2.3; 95% CI: 10.37–14.611; Figure S4) ($P=0.0007$).

And with further subgroup analysis by dosage, 100 mg demonstrated a non-statistically significant superior probability of PASI90 when taking guselkumab (OR: 86.92; 95% CI: 48.70–155.13; $I^2=19.8\%$; Figure S5) compared to 30 mg and 300 mg (OR: 11.00; 95% CI: 0.37–324.52; Figure S5) and 10 mg (OR: 4.00; 95% CI: 10.21–75.66; Figure S5). The odds of achieving PASI90 with 50 mg were high but had a low study weight (OR: 307.62; 95% CI: 18.11–5224.84; Figure S5).

Dermatology Life Quality Index (DLQI)

Patients receiving guselkumab had significantly greater change in DLQI compared to placebo (MD: -8.46; 95% CI: -10.31 – -6.62; $I^2=77.8\%$; Figure 4).

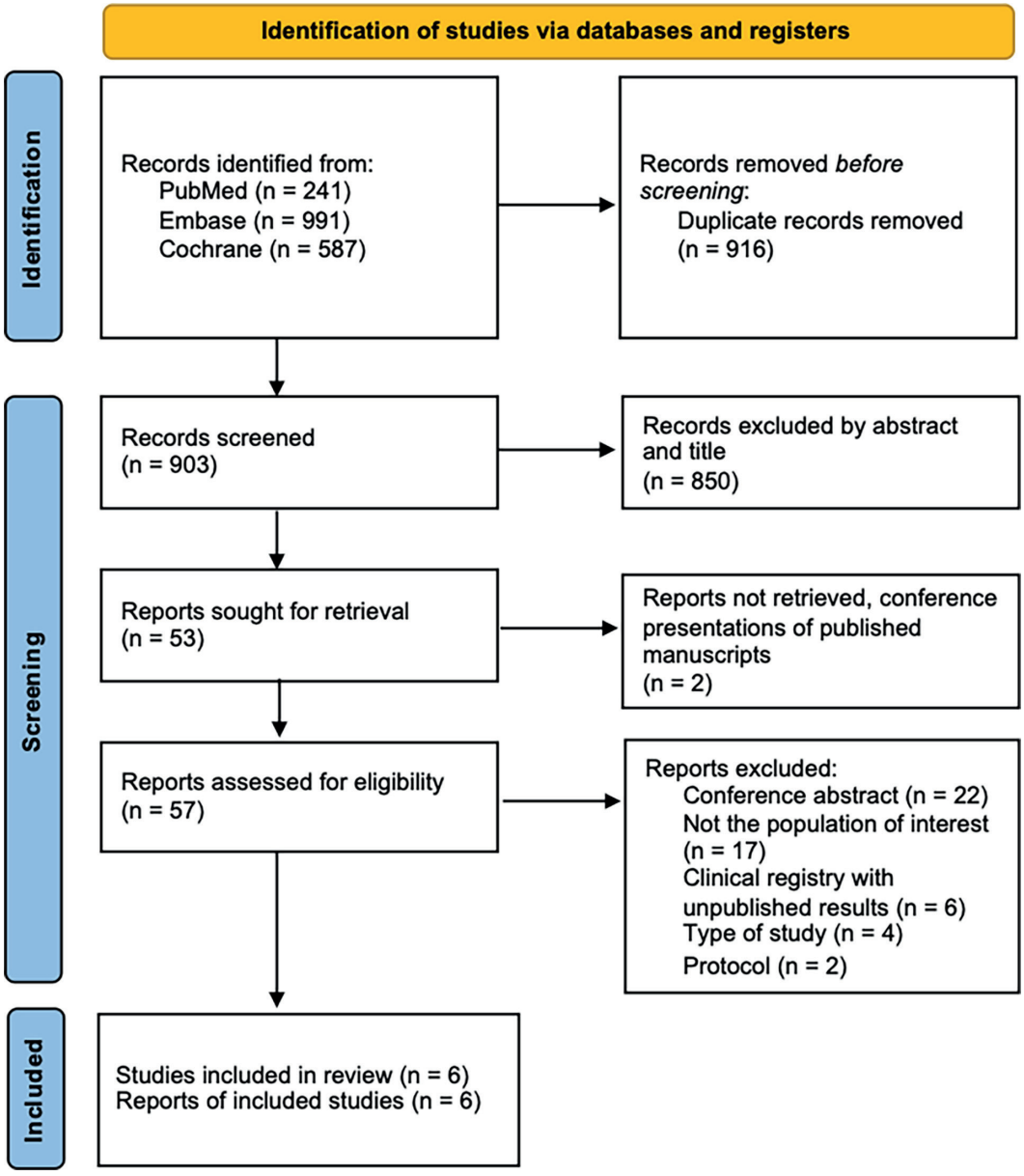

Figure 1. PRISMA flow diagram of study screening and selection.

Adverse events (AEs)

There was no significant difference in the odds of experiencing at least one AE or at least one severe AE between guselkumab and placebo (OR: 0.92; 95% CI: 0.68–1.24; I^2=30.9%; Figure 5A) and (OR: 1.19; 95% CI: 0.54–2.64; I^2=0.0%; Figure 5B), respectively.

A subgroup analysis based on dosage showed no significant difference in the occurrence of at least one AE between guselkumab and placebo with 100 mg (OR: 1.04; 95% CI: 0.84–1.30; Figure S7) compared to 50 mg (OR: 0.67; 95% CI: 0.33–1.33; Figure S6) (P=0.22).

Quality Assessment

Overall, one study was classified as being high risk because of missing outcome data due to attrition and the absence of a preregistered protocol [20]. Another was found to have some concerns, considering missing outcome data [19] (Figure S7).

Discussion

In this meta-analysis of six studies, we compared guselkumab to placebo for moderate-to-severe psoriasis. Key findings include: i) higher achievement of IGA 0/1 and IGA 0; ii) higher odds of achieving PASI75, PASI90, and PASI100; iii) higher DLQI change with guselkumab; iv) a lower incidence of AEs and serious AEs when receiving guselkumab; v) higher odds of IGA 0 and PASI90 in adults vs children/adolescents; vi) no dosage-based PASI90 or AE differences. Two recent trials support our findings. In a randomized study of 327 Chinese patients, guselkumab led to significantly higher PASI 90

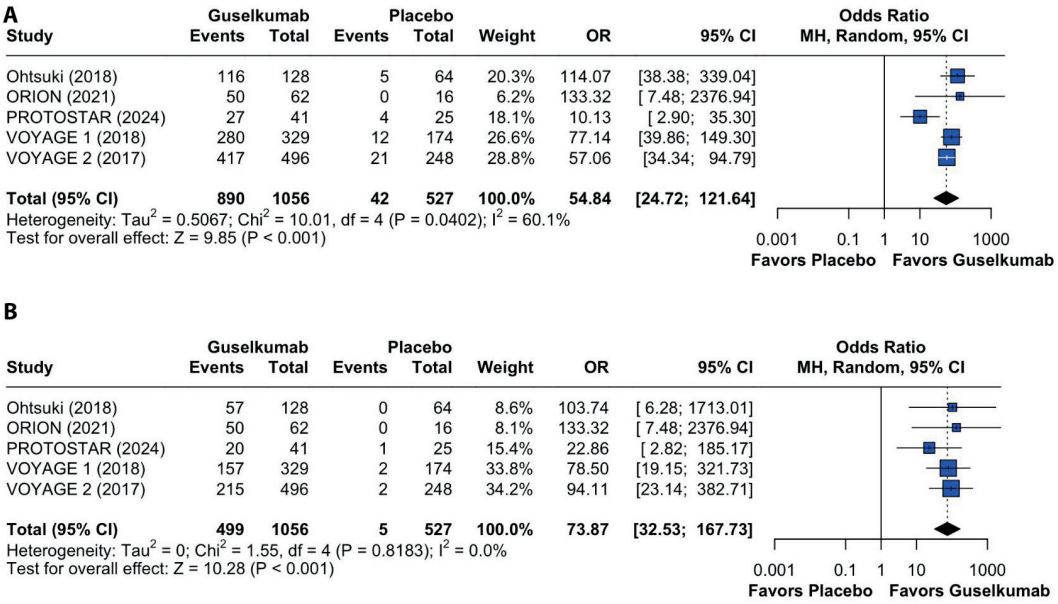

Figure 2. The odds of achieving IGA 0/1 and IGA 0 were significantly higher when taking guselkumab as compared to placebo. CI: confidence interval; MH: Mantel-Haenszel; OR: odds ratio.

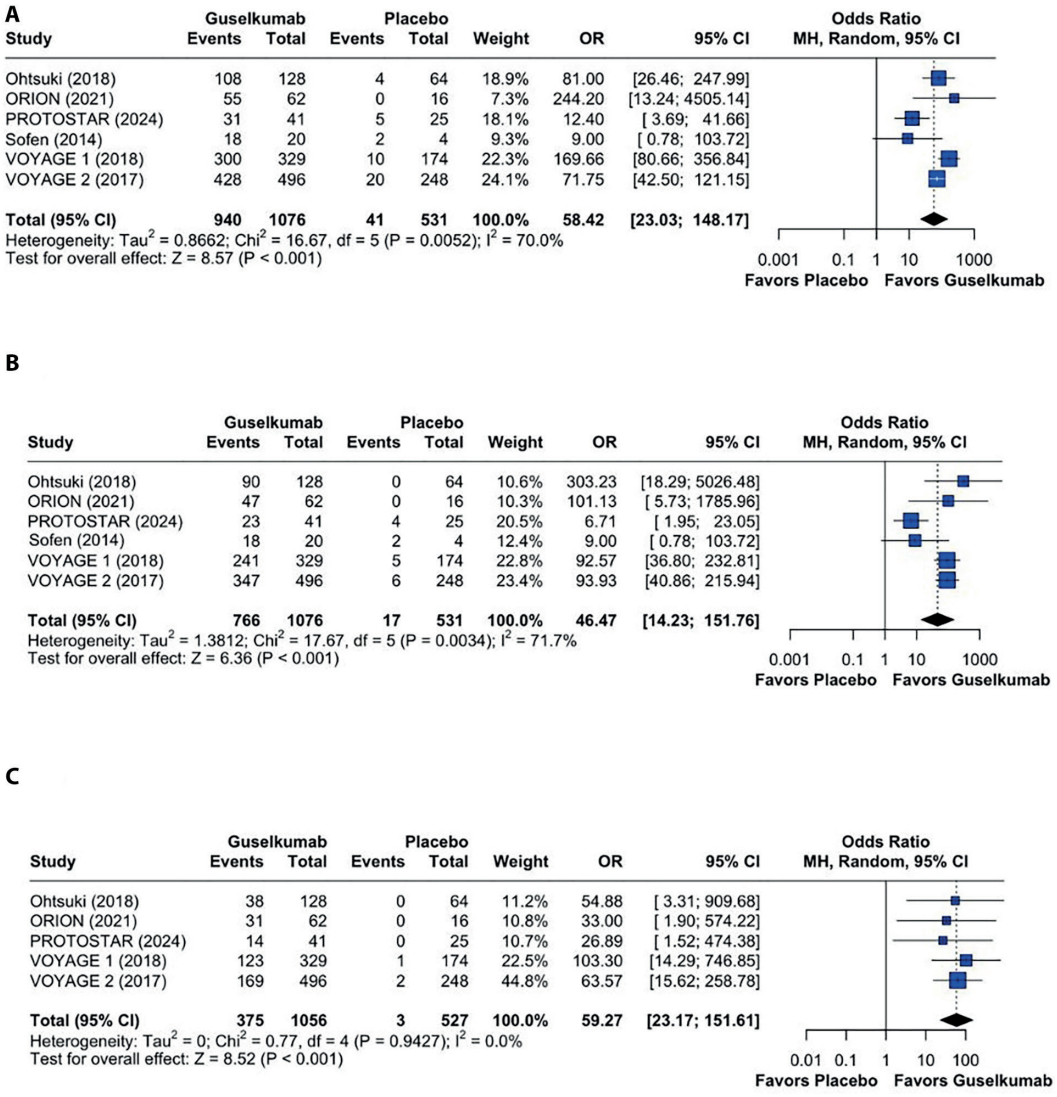

Figure 3. The odds of achieving PASI75, PASI90, and PASI100 were significantly higher when taking guselkumab as compared to placebo. CI: confidence interval; MH: Mantel-Haenszel; OR: odds ratio.

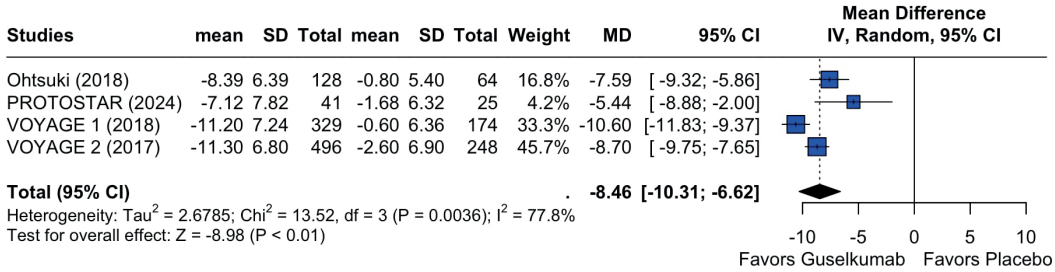

Figure 4. The change in DLQI was significantly higher when taking guselkumab as compared to placebo. CI: confidence interval; IV: inverse variance; MD: mean difference; SD: standard deviation.

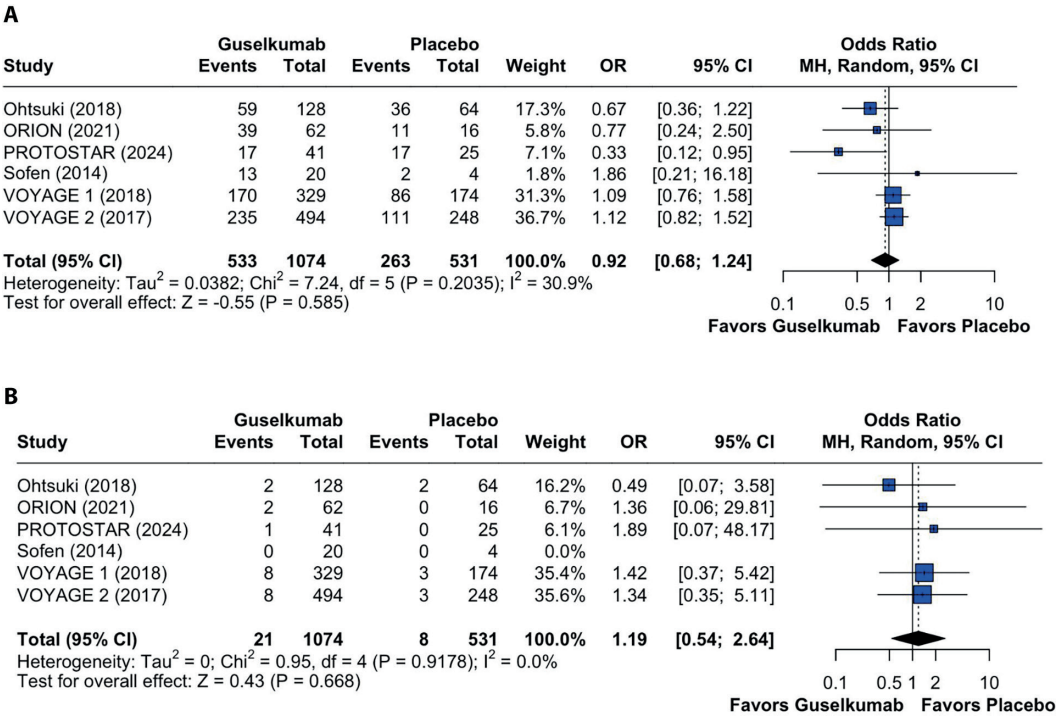

Figure 5. The odds of experiencing at least one AE or one severe AE were non-significant when taking guselkumab as compared to placebo. CI: confidence interval; MH: Mantel-Haenszel; OR: odds ratio.

and IGA 0/1 responses versus placebo at week 16, sustained through week 48, with similar and infrequent adverse events across groups [21]. Similarly, the VISIBLE trial demonstrated superior efficacy of guselkumab versus placebo across multiple endpoints, including PASI 90, IGA 0/1, and quality of life (QoL) measures, with favorable safety outcomes [22]. The SPECTREM trial further confirmed that guselkumab is effective and well-tolerated in patients with low body surface area involvement and moderate plaque psoriasis affecting high-impact sites, showing significant improvements across multiple clearance measures regardless of baseline BSA [23].

Our findings, together with real-world data from the PERSIST study, demonstrate that guselkumab is effective and well-tolerated across a broad spectrum of patients, including those with prior biologics exposure and comorbidities. The decreasing proportion of patients switching due to insufficient efficacy suggests growing clinician confidence in using guselkumab earlier in treatment. While higher BMI mildly reduced complete clearance rates, improvements were observed across all BMI categories, highlighting its effectiveness in obese patients [24]. These results support a proactive, personalized approach, including baseline cancer screening, smoking cessation, skin monitoring, multidisciplinary PsA management, and patient education on injection techniques [25]. Patients achieving clear or almost clear skin but with discordant QoL responses such as persistent itch may benefit from closer monitoring [26]. Differences in treatment discontinuation among PsA patients further underscore the need for individualized follow-up [27]. Overall, routine, targeted monitoring can help identify patient subsets who derive the greatest benefit while ensuring long-term safety.

We analyzed IGA0 and PASI by age group, showing consistent results. Guselkumab was similarly effective in adolescents (12–18 years) and adults, and efficacy was lower in

children from 6 to 12 years old [8]. In our analysis, guselkumab demonstrated statistically significant efficacy in adolescents, although the odds of achieving primary endpoints were lower than in adults. In contrast, efficacy among younger pediatric patients (6–12 years) was further reduced and did not reach statistical significance. Until recently, the safety and efficacy of guselkumab (Tremfya®) in pediatric patients (<18 years) had not been fully established, and no dosing recommendation was available. However, on 29 September 2025, the U.S. FDA approved guselkumab for use in children aged six years and older with moderate-to-severe plaque psoriasis, marking a major expansion of its therapeutic indication [28]. Nevertheless, our findings suggest that efficacy may be age-dependent, underscoring the need for ongoing post-approval studies to evaluate long-term safety, optimal dosing, and real-world effectiveness in pediatric populations.

In phase 2 and 3 trials, guselkumab was given to 3,940 patients, including 239 aged ≥65 and 19 aged ≥75. No significant safety or efficacy difference was observed, though the limited sample size in older adults prevents firm conclusions [8]. In our meta-analysis, age-based subgroup analyses were not possible due to limited data. Future trials should include older patients, given their vulnerability and comorbidities, with careful monitoring of adverse events. Data from four phase III trials (VOYAGE-1, VOYAGE-2, ECLIPSE, NAVIGATE) showed comparable efficacy and safety in older and younger patients [29]. Nonetheless, further studies are needed to confirm these findings.

In our meta-analysis, we conducted dose subgrouping for the PASI90 and AEs outcome. The maximum ORs for the 50 mg dose were presented by a single study in this subgroup, while the standard 100 mg dose was investigated in six pooled studies. All included RCTs in our analysis followed the FDA-recommended dosing schedule (guselkumab at weeks 0, 4, and every 8 weeks thereafter) [8]. The observed effect of the 50 mg dose likely reflects the dosage itself rather than dosing frequency. Although the FDA approved the 100 mg dose, our subgroup analysis suggests the 50 mg dose may offer similar efficacy with fewer adverse events. Further trials comparing both doses are warranted.

The FDA has not specified the duration of guselkumab treatment beyond the recommended dosing schedule of week 0, 4, and every 8 weeks thereafter [8]. However, a study explored the impact of different dosing schedules for guselkumab, providing valuable insights into treatment duration. Although this study did not compare guselkumab with a placebo, it assessed the long-term efficacy and safety of long-term dosing regimens. The findings suggested that patients who continued treatment beyond the standard regimen continued to have high levels of skin clearance, supporting the potential benefits of prolonged therapy [30]. Further research on the long-term run should be done to confirm this.

Palmoplantar pustulosis (PPP) is a chronic inflammatory skin disease characterized by frequent sterile pustules on the palms and soles. While it shares certain characteristics with plaque psoriasis such as familial occurrence, nail involvement, and the Koebner phenomenon, PPP is considered a distinct clinical entity. Notably, PPP has more treatment resistance and a more relapsing course than plaque psoriasis [31]. We excluded the Passeron et al. study, which assessed guselkumab in PPP, to avoid heterogeneity from differing disease pathologies. PPP patients showed only moderate responses and frequent relapses, underscoring the need for treatment approaches distinct from plaque psoriasis [32]. This approach ensures that our conclusions are more applicable to the plaque psoriasis population, acknowledging the unique challenges in managing PPP.

Several meta-analyses have contrasted the efficacy of standard treatments for chronic plaque psoriasis. For instance, a network meta-analysis noted that biologics such as infliximab, ixekizumab, bimekizumab, and risankizumab were among the most effective compared to placebo [33]. With the FDA approval of guselkumab following its demonstrated efficacy over placebo, further assessment against standard treatments is essential. Several RCTs have already made such comparisons, including a phase 2 trial showing guselkumab's superiority over adalimumab for scalp and palm/sole psoriasis, with comparable efficacy elsewhere [34]. Another trial demonstrated that a greater proportion of patients receiving guselkumab achieved PASI90 response compared to ustekinumab at week 16 (70.4% vs 46.0%) and week 40 (74.2% vs 54.5%) [35]. Despite these findings, more RCTs are required to compare guselkumab with other existing treatments across different patient populations.

This study has limitations. Firstly, there was some degree of heterogeneity, partly driven by the inclusion of one study. To address this, we performed a sensitivity analysis to assess the impact of this heterogeneity. The included RCTs had very consistent age, BMI, BSA, and duration of psoriasis since diagnosis, except for the PROTOSTAR trial [16]. This variability likely stems from the PROTOSTAR study, which included pediatric patients, whereas all other trials enrolled only adults. The limited pediatric data restrict the generalizability of our findings to younger populations. Otherwise, all the baseline characteristics were very similar among the studies, especially since all outcomes were measured at week 16, ensuring that our results were reliable and consistent for evaluating efficacy. Secondly, another limitation is the variation in baseline psoriasis severity, reflected by BSA involvement across studies, as shown in Table 1. Thirdly, in the PROTOSTAR trial, efficacy endpoints were stratified based on age groups and dosing regimens [16]. Subgroup analyses for IGA 0 and PASI90 were mostly skewed toward the 100 mg adult dose. Other subgroups had only one study, limiting

Table 1. Baseline characteristics of included studies.

Study	Follow-up (weeks)	No. of patients, N	Male, n (%)	Children*, N (%)	Age (years), mean ± SD	BMI (Kg/m^2), mean ± SD	Duration of psoriasis (years), mean ± SD	BSA (%), mean ± SD	IGA 4 (severe), N (%)	PASI, mean ± SD	DLQI (0-30), mean ± SD	SC guselkumab regimen
PROTOSTAR (2024)	16	66	36 (54.54)	20 (30.3)	13.02 ± 3.18	22.22 ± 6.14	4.81 ± 3.02	24.95 ± 14.51	15 (22.72)	19.18 ± 6.14	9.36 ± 6.78	< 70kg: 1.3 mg/kg ≥ 70kg: 100 mg at weeks 0, 4, and 12
ORION (2021)	16	78	53 (67.9)	0 (0)	46 ± 13.43	31.4 ± 6.7	18.7 ± 12.13	19.8 ± 8.88	12 (15.4)	18 ± 4.27	NR	100 mg at weeks 0, 4, and 12
VOYAGE 1 (2018)	16	503	359 (71.37)	0 (0)	44.24 ± 12.79	29.42 ± 6.46	17.79 ± 12.31	26.43 ± 16.73	120 (23.85)	21.51 ± 9.26	13.75 ± 7.35	100 mg at weeks 0, 4, and 12
VOYAGE 2 (2017)	16	744	522 (70.16)	0 (0)	43.56 ± 12.26	29.6 ± 6.52	17.9 ± 11.95	28.33 ± 16.42	172 (23.11)	21.76 ± 8.53	14.83 ± 6.99	100 mg at weeks 0, 4, and 12
Ohtsuki (2018)	16	192	145 (75.52)	0 (0)	48.74 ± 11.45	25.44 ± 4.8	14.43 ± 9.54	36.5 ± 19.96	38 (19.79)	27.41 ± 12.14	10.43 ± 7.07	50 or 100 mg at weeks 0, 4, and 12
Sofen (2014)	24	24	15 (62.5)	0 (0)	42.5 §	31.6 §	18.07 ± 29.15	35.62 ± 50.43	NR	20.67 ± 17.33	NR	10, 30, 100, or 300 mg

* Children were classified as those aged 6–12 years, while those aged 12–18 years old were classified as adolescents in PROTOSTAR study.

Abbreviations: §: median; BMI: body mass index; BSA: body surface area; DLQI: Dermatology Life Quality Index; IGA: Investigator's Global Assessment; NR: not reported; PASI: Psoriasis Area and Severity Index; PSSD: Psoriasis Symptoms and Signs Diary; SC: subcutaneous; SD: standard deviation.

statistical power. AE analyses by age were not possible, as PROTOSTAR did not stratify children and adolescents. [16]. However, PROTOSTAR's forest plot suggests pediatric patients had lower AE rates than adults, indicating this limitation likely does not affect overall conclusions. Another limitation is the lack of direct head-to-head comparisons with other IL-23 inhibitors in the literature, which limits the ability to assess relative efficacy and safety and represents an important avenue for future research.

Conclusion

In conclusion, this systematic review and meta-analysis demonstrate that guselkumab significantly improves moderate-to-severe psoriasis without increasing adverse effects, supporting its favorable efficacy-safety balance among available biologic options. Although our analysis did not include direct head-to-head comparisons with other IL-23 inhibitors, current evidence indicates that guselkumab is a reliable treatment option within this therapeutic class. Further research is warranted to establish its optimal positioning in clinical practice and to expand evidence in underrepresented populations, particularly pediatric and older patients, who may have distinct efficacy and safety considerations. Additionally, studies evaluating alternative dosing regimens, such as the 50 mg dose, are needed to optimize individualized treatment strategies.

Abbreviations: AAD: American Academy of Dermatology; BSA: body surface area; CI: confidence interval; DLQI: Dermatology Life Quality Index; FDA: Food and Drug Administration; IGA: Investigator's Global Assessment; IL: interleukin; IV: inverse variance; MD: mean difference; MH: Mantel-Haenszel; OR: odds ratio; PASI: Psoriasis Area and Severity Index; PPP: palmoplantar pustulosis; PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses; RCT: randomized controlled trial; REML: restricted maximum likelihood; SD: standard deviation; TNF: tumor necrosis factor.

References

1. Bu J, Ding R, Zhou L, Chen X, Shen E. Epidemiology of Psoriasis and Comorbid Diseases: A Narrative Review. *Front Immunol*. 2022;13:880201. DOI:10.3389/fimmu.2022.880201
2. Menter A, Bhutani T, Ehst B, Elewski B, Jacobson A. Narrative Review of the Emerging Therapeutic Role of Brodalumab in Difficult-to-Treat Psoriasis. *Dermatol Ther (Heidelb)*. 2022; 12(6):1289-1302. DOI:10.1007/s13555-022-00746-6
3. Nair PA, Badri T. Psoriasis. In: *StatPearls*. StatPearls Publishing; 2025. Accessed October 5, 2025. http://www.ncbi.nlm.nih.gov/books/NBK448194/
4. Kim WB, Jerome D, Yeung J. Diagnosis and management of psoriasis. *Can Fam Physician*. 2017;63(4):278-285.
5. Papp KA, Merola JF, Gottlieb AB, et al. Dual neutralization of both interleukin 17A and interleukin 17F with bimekizumab in patients with psoriasis: Results from BE ABLE 1, a 12-week randomized, double-blinded, placebo-controlled phase 2b trial. *Journal of the American Academy of Dermatology*. 2018;79(2):277-286.e10. DOI:10.1016/j.jaad.2018.03.037
6. Armstrong AW, Puig L, Joshi A, et al. Comparison of Biologics and Oral Treatments for Plaque Psoriasis: A Meta-analysis. *JAMA Dermatology*. 2020;156(3):258-269. DOI:10.1001/jamadermatol.2019.4029
7. Kerut CK, Wagner MJ, Daniel CP, et al. Guselkumab, a Novel Monoclonal Antibody Inhibitor of the p19 Subunit of IL-23, for Psoriatic Arthritis and Plaque Psoriasis: A Review of Its Mechanism, Use, and Clinical Effectiveness. *Cureus*. 2023;15(12):e51405. DOI:10.7759/cureus.51405
8. 761061s009lbl.pdf. Accessed February 17, 2025. https://www.accessdata.fda.gov/drugsatfda_docs/label/2020/761061s009lbl.pdf
9. Menter A, Strober BE, Kaplan DH, et al. Joint AAD-NPF guidelines of care for the management and treatment of psoriasis with biologics. *Journal of the American Academy of Dermatology*. 2019;80(4):1029-1072. DOI:10.1016/j.jaad.2018.11.057
10. Chapter 10: Analysing data and undertaking meta-analyses | Cochrane. Accessed April 23, 2026. https://www.cochrane.org/authors/handbooks-and-manuals/handbook/current/chapter-10
11. Page MJ, Moher D, Bossuyt PM, et al. PRISMA 2020 explanation and elaboration: updated guidance and exemplars for reporting systematic reviews. *BMJ*. 2021;372:n160. DOI:10.1136/bmj.n160
12. *Clinical Review Report: Guselkumab (Tremfya): (Janssen Inc.): Indication: For the Treatment of Adult Patients with Moderate-to-Severe Plaque Psoriasis Who Are Candidates for Systemic Therapy or Phototherapy*. Canadian Agency for Drugs and Technologies in Health; 2018. Accessed October 5, 2025. http://www.ncbi.nlm.nih.gov/books/NBK534047/
13. Krueger G, Koo J, Lebwohl M, Menter A, Stern RS, Rolstad T. The impact of psoriasis on quality of life: results of a 1998 National Psoriasis Foundation patient-membership survey. *Arch Dermatol*. 2001;137(3):280-284.
14. Deeks JJ, Higgins JP, Altman DG, Group on behalf of the CSM. Analysing data and undertaking meta-analyses. In: *Cochrane Handbook for Systematic Reviews of Interventions*. John Wiley & Sons, Ltd; 2019:241-284. DOI:10.1002/9781119536604.ch10
15. Sterne JAC, Savović J, Page MJ, et al. RoB 2: a revised tool for assessing risk of bias in randomised trials. *BMJ*. 2019;366:l4898. DOI:10.1136/bmj.l4898
16. Prajapati VH, Seyger MMB, Wilsmann-Theis D, et al. Guselkumab for the treatment of moderate-to-severe plaque psoriasis in pediatric patients: results of the phase 3, randomized, placebo-controlled PROTOSTAR study. *Br J Dermatol*. Published online December 21, 2024:ljae502. DOI:10.1093/bjd/ljae502
17. Ferris LK, Ott E, Jiang J, et al. Efficacy and safety of guselkumab, administered with a novel patient-controlled injector (One-Press), for moderate-to-severe psoriasis: results from the phase 3 ORION study. *J Dermatolog Treat*. 2020;31(2): 152-159. DOI:10.1080/09546634.2019.1587145
18. Reich K, Armstrong AW, Foley P, et al. Efficacy and safety of guselkumab, an anti-interleukin-23 monoclonal antibody, compared with adalimumab for the treatment of patients with moderate to severe psoriasis with randomized withdrawal and retreatment:

Results from the phase III, double-blind, placebo- and active comparator-controlled VOYAGE 2 trial. *J Am Acad Dermatol*. 2017;76(3):418-431. DOI:10.1016/j.jaad.2016.11.042
19. Ohtsuki M, Kubo H, Morishima H, Goto R, Zheng R, Nakagawa H. Guselkumab, an anti-interleukin-23 monoclonal antibody, for the treatment of moderate to severe plaque-type psoriasis in Japanese patients: Efficacy and safety results from a phase 3, randomized, double-blind, placebo-controlled study. *J Dermatol*. 2018;45(9):1053-1062. DOI:10.1111/1346-8138.14504
20. Sofen H, Smith S, Matheson RT, et al. Guselkumab (an IL-23-specific mAb) demonstrates clinical and molecular response in patients with moderate-to-severe psoriasis. *J Allergy Clin Immunol*. 2014;133(4):1032-1040. DOI:10.1016/j.jaci.2014.01.025
21. Huang K, Geng S, Tao X, et al. Efficacy and safety of guselkumab in Chinese patients with moderate-to-severe plaque psoriasis: A randomized, double-blind, placebo-controlled trial. *Chin Med J (Engl)*. Published online September 8, 2025. DOI:10.1097/CM9.0000000000003771
22. Alexis A, McMichael A, Soung J, et al. Guselkumab for Moderate to Severe Psoriasis Across All Skin Tones: Cohort A of the VISIBLE Randomized Clinical Trial. *JAMA Dermatol*. 2025;161(9):901-911. DOI:10.1001/jamadermatol.2025.1836
23. Stein Gold L, Gottlieb AB, Armstrong AW, et al. SPECTREM Phase 3b Clinical Trial Results Through Week 16: Guselkumab Efficacy and Safety for the Treatment of Low Body Surface Area, Moderate Psoriasis With High-Impact Site Involvement. *Br J Dermatol*. Published online August 28, 2025:ljaf327. DOI:10.1093/bjd/ljaf327
24. Gerdes S, Asadullah K, Hoffmann M, et al. Real-world evidence from the non-interventional, prospective, German multicentre PERSIST study of patients with psoriasis after 1 year of treatment with guselkumab. *Journal of the European Academy of Dermatology and Venereology*. 2022;36(9):1568-1577. DOI:10.1111/jdv.18218
25. Mortato E, Talamonti M, Marcelli L, et al. Long-Term Real-World Effectiveness and Drug Survival of Guselkumab in Patients with Psoriasis: A 5-Year Retrospective Study. *Psoriasis (Auckl)*. 2025;15:455-469. DOI:10.2147/PTT.S533005
26. Puig L, Costanzo A, de Jong EMGJ, et al. Progression of Quality of Life in Patients with Plaque Psoriasis Who Achieved Three or More Years of Complete Skin Clearance with Guselkumab Treatment: a Post hoc Analysis of the VOYAGE 1 Clinical Trial. *Dermatol Ther (Heidelb)*. 2024;14(9):2539-2558. DOI:10.1007/s13555-024-01245-6
27. Mortato E, Talamonti M, Marcelli L, et al. Predictive Factors for Super Responder Status and Long-Term Effectiveness of Guselkumab in Psoriasis: A Multicenter Retrospective Study. *Dermatol Ther (Heidelb)*. 2025;15(5):1239-1250. DOI:10.1007/s13555-025-01394-2
28. U.S. FDA approves TREMFYA® (guselkumab) for the treatment of pediatric plaque psoriasis and active psoriatic arthritis, marking a first and only approval for an IL-23 inhibitor. JNJ.com. September 29, 2025. Accessed October 5, 2025. https://www.jnj.com/media-center/press-releases/u-s-fda-approves-tremfya-guselkumab-for-the-treatment-of-pediatric-plaque-psoriasis-and-active-psoriatic-arthritis-marking-a-first-and-only-approval-for-an-il-23-inhibitor
29. Ruggiero A, Fabbrocini G, Cinelli E, Ocampo Garza SS, Camela E, Megna M. Anti-interleukin-23 for psoriasis in elderly patients: guselkumab, risankizumab and tildrakizumab in real-world practice. *Clin Exp Dermatol*. 2022;47(3):561-567. DOI:10.1111/ced.14979
30. Eyerich K, Asadullah K, Pinter A, et al. Noninferiority of 16-Week vs 8-Week Guselkumab Dosing in Super Responders for Maintaining Control of Psoriasis: The GUIDE Randomized Clinical Trial. *JAMA Dermatol*. 2024;160(9):953-963. DOI:10.1001/jamadermatol.2024.2463
31. Yamamoto T. Similarity and difference between palmoplantar pustulosis and pustular psoriasis. *J Dermatol*. 2021;48(6):750-760. DOI:10.1111/1346-8138.15826
32. Passeron T, Carrascosa JM, Warren RB, et al. A Phase IIIb, Multicentre, Interventional, Randomised, Placebo-Controlled Clinical Trial Investigating the Efficacy and Safety of Guselkumab for the Treatment of Nonpustular Palmoplantar Psoriasis (G-PLUS). *Dermatologic Therapy*. 2023;2023(1):9967747. DOI:10.1155/2023/9967747
33. Sbidian E, Chaimani A, Garcia-Doval I, et al. Systemic pharmacological treatments for chronic plaque psoriasis: a network meta-analysis. *Cochrane Database Syst Rev*. 2022;5(5):CD011535. DOI:10.1002/14651858.CD011535.pub5
34. Gordon KB, Duffin KC, Bissonnette R, et al. A Phase 2 Trial of Guselkumab versus Adalimumab for Plaque Psoriasis. *N Engl J Med*. 2015;373(2):136-144. DOI:10.1056/NEJMoa1501646
35. Diels J, Thilakarathne P, Cameron C, McElligott S, Schubert A, Puig L. Adjusted treatment COMPArisons between guSelkumab and uStekinumab for treatment of moderate-to-severe plaque psoriasis: the COMPASS analysis. *Br J Dermatol*. 2020;183(2):276-284. DOI:10.1111/bjd.18634