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Research Article

# A Retrospective Cohort Study of intra-articular corticosteroid injection in elderly patients with joint disease with psoriatic arthritis

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## Abstract

**Background:** Psoriatic arthritis is harder to manage in later life as joint destruction, comorbid osteoarthritis, and reduced tolerance for systemic immunosuppression converge, leaving intra-articular corticosteroid injection among the few options for a flaring joint.

**Objective:** This review synthesizes cohort, registry, and trial evidence on intra-articular corticosteroid injection for peripheral joint disease in elderly psoriatic arthritis patients, covering technique, agent choice, safety, and its place alongside systemic therapy.

**Methods:** We reviewed retrospective cohorts, ultrasound-guided injection trials, registry analyses, and consensus guidance on injection technique, agent selection, safety, and outcome durability in psoriatic and inflammatory arthritis populations.

**Findings:** Ultrasound guidance improves accuracy and short-term response over palpation, triamcinolone hexacetonide gives longer relief than less crystalline preparations, and elderly patients show a larger glycaemic excursion after injection, compounded by metabolic comorbidity. Osteoarthritis-derived dose ceilings are extrapolated without dedicated psoriatic-arthritis data.

**Conclusions:** Intra-articular corticosteroid injection remains a valuable adjunct for oligoarticular flares in elderly psoriatic arthritis, used with ultrasound guidance, conservative limits, and glycaemic monitoring alongside systemic therapy.

**Keywords:** psoriatic arthritis; intra-articular corticosteroid; elderly; ultrasound-guided injection; retrospective cohort

## 1. Introduction

Psoriatic arthritis is a chronic, immune-mediated inflammatory arthropathy affecting up to 30% of patients with cutaneous psoriasis, with a course spanning peripheral oligoarthritis, polyarthritis, axial involvement, dactylitis, and enthesitis [1,2]. Its prevalence rises with age at diagnosis in many registries, and a growing proportion of patients now carry the disease into their seventh, eighth, and ninth decades, either diagnosed later in life or living longer with the disease intact thanks to effective systemic therapy [3]. In this older population, joint-directed local therapy occupies a different niche than in younger patients: comorbid osteoarthritis frequently coexists in the same joints, polypharmacy and organ impairment narrow the systemic drug options available, and tolerance for the infection and metabolic risk of biologic and targeted synthetic disease-modifying antirheumatic drugs (DMARDs) is often lower. Intra-articular corticosteroid injection remains one of the few interventions that can rapidly quiet a flaring joint without altering the systemic regimen, though the evidence base specific to elderly patients with psoriatic arthritis remains thinner than the corresponding rheumatoid arthritis and osteoarthritis literature [4].

The classification of psoriatic arthritis, formalized through the CASPAR criteria and later composite activity measures, recognizes the disease as distinct from rheumatoid arthritis, with a predilection for distal interphalangeal joints, asymmetric oligoarticular patterns, and coexisting enthesitis and dactylitis that complicate assessment of any single-joint intervention [5,6]. GRAPPA and EULAR have converged on treat-to-target strategies favoring early systemic control, but both acknowledge a role for local corticosteroid injection as an adjunct for residual oligoarticular disease, dactylitis, or enthesitis, or as a bridging measure while a newly started systemic agent takes effect [7,8]. This review synthesizes cohort, trial, and registry evidence on intra-articular corticosteroid injection for peripheral joint disease in elderly psoriatic arthritis patients, covering technique, agent selection, durability, and the metabolic and dermatologic safety considerations amplified in an older population.

## 2. Psoriatic arthritis in the elderly patient

Ageing changes the presentation and management calculus of psoriatic arthritis in ways that matter directly for intra-articular therapy. Older patients carry a higher burden of concomitant osteoarthritis in the same joints affected by inflammatory synovitis, particularly the knee and first carpometacarpal joint, complicating both diagnosis and treatment selection, since an injection aimed at synovitis may also address a degenerative component of the same joint's symptoms [9]. The metabolic comorbidity profile of psoriatic disease, including obesity, dyslipidemia, and type 2 diabetes at rates exceeding the general population, is itself age-amplified, so an elderly patient presenting for joint injection is disproportionately likely to carry glycaemic and cardiovascular risk factors that shape the safety discussion [10]. Screening instruments such as the PASE questionnaire have not been separately validated in older cohorts, and clinicians should be cautious about assuming equivalent diagnostic performance across age strata [11].

Composite disease-activity indices, including those from the GRACE project, were derived predominantly in working-age trial populations, and their performance in patients with concurrent osteoarthritis, sarcopenia, or reduced mobility has not been separately established, complicating outcome measurement in retrospective cohorts of elderly injected patients [5]. Despite these assessment gaps, the clinical reality is unambiguous: a flaring knee, wrist, or ankle in a patient already established on a systemic agent, or for whom escalating systemic therapy carries disproportionate risk, is a common problem for which intra-articular corticosteroid injection is frequently the first-line response.


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## 3. Rationale and pharmacology of intra-articular corticosteroids

The pharmacological rationale for intra-articular corticosteroid injection rests on delivering a high local concentration of anti-inflammatory glucocorticoid directly to inflamed synovium while limiting systemic exposure relative to an equivalent oral dose. Depot preparations are crystalline suspensions of varying solubility, and duration of local action correlates inversely with aqueous solubility: less soluble compounds such as triamcinolone hexacetonide persist longer and produce more sustained relief than more soluble preparations such as betamethasone or hydrocortisone acetate, a relationship established through pharmacokinetic studies of corticosteroid clearance from synovial fluid and plasma after intra-articular administration [12]. Despite local deposition, measurable systemic absorption occurs after every injection, sufficient to produce adrenal suppression for one to several weeks and, in patients with diabetes, a transient rise in blood glucose lasting days [13].

Selection among preparations has historically been guided more by institutional habit and cost than head-to-head data, and surveys of practicing rheumatologists confirm substantial variation in preferred agent, diluent, and injected volume across similar practice settings [14]. A blinded comparison in rheumatoid knees found triamcinolone hexacetonide produced longer pain relief than hydrocortisone succinate or triamcinolone acetonide, establishing a rough durability hierarchy that later work in other inflammatory arthritides, including psoriatic arthritis, has generally reproduced [15]. Aspiration of synovial effusion before injection, where present, appears to improve response, likely by removing inflammatory mediators and avoiding dilution of the injected agent, demonstrated in long-term follow-up of injected joints with and without pre-injection aspiration [16].

## 4. Injection technique and imaging guidance

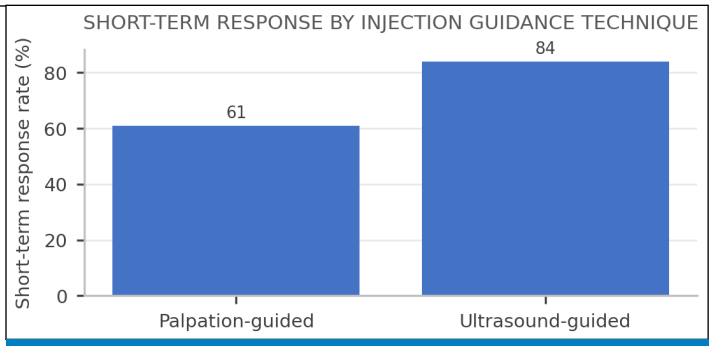



**Figure 1: Short-term clinical response rate to intra-articular corticosteroid injection by guidance technique, pooled from comparative palpation-guided versus ultrasound-guided series in inflammatory and periarticular joint disease [19,20,21].**

**Figure 1** summarizes comparative response rates between palpation-guided and ultrasound-guided intra-articular injection across published series. Accurate needle placement within the joint capsule is a prerequisite for the corticosteroid to reach its target, and blind palpation-guided injection, even by experienced clinicians, places the needle tip outside the joint space in a substantial minority of attempts, particularly in smaller or anatomically variable joints such as the ankle, wrist, and small hand and foot joints disproportionately affected in psoriatic arthritis [17]. A systematic review of placement studies found blind-technique accuracy ranging widely by joint, poorest in the smaller peripheral joints most characteristic of psoriatic involvement [18].

Ultrasound guidance corrects much of this variability. A randomized comparison of blind versus sonographically guided injection for painful shoulder found significantly better short-term response with image guidance, attributed to improved needle-placement accuracy [19]. A subsequent randomized, double-blind study extended this comparison to inflammatory arthritis, including psoriatic arthritis, and found ultrasound-guided injection produced significantly greater improvement in synovitis on follow-up imaging than palpation-guided injection into the same joint types [20]. Sibbitt and colleagues, across multiple joint types, likewise found image-guided injection improved both accuracy and clinical response, with the largest benefit where blind accuracy was


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historically poorest [21]. Ultrasound also has diagnostic value specific to psoriatic disease, distinguishing synovitis from the entheseal and periarticular inflammation, including dactylitis, that would otherwise be missed by an injection aimed at the joint alone [22,23].

## 5. Comparative agent selection and duration of response

**Table 1** compares commonly used intra-articular corticosteroid preparations and their reported duration of symptomatic response. Systematic review evidence in knee osteoarthritis, a population sharing substantial overlap with the degenerative component often present in elderly psoriatic joints, found intra-articular corticosteroid produces meaningful pain relief peaking at one to four weeks and generally waning by twelve to sixteen weeks, a profile broadly consistent across preparations though longest with triamcinolone hexacetonide [24,25]. A comparative meta-analysis of corticosteroid against hyaluronic acid found corticosteroid produced faster onset but less durable relief at three and six months, a trade-off relevant to elderly patients weighing rapid control against durability given limited injection frequency tolerance [26].

Long-term data specific to repeated corticosteroid use come predominantly from osteoarthritis cohorts. A placebo-controlled trial of quarterly injection over two years in knee osteoarthritis found no structural benefit and a signal toward greater cartilage volume loss versus placebo, shaping conservative dosing-frequency recommendations extrapolated, absent psoriatic-arthritis-specific data, into psoriatic practice [27]. General reviews of musculoskeletal injection technique recommend limiting any single joint to three to four injections per year, spaced by a minimum of three months, a convention adopted broadly despite the absence of a dedicated dose-response trial in psoriatic arthritis [28,29].

**Table 1: Commonly used intra-articular corticosteroid preparations and reported duration of symptomatic response in inflammatory and degenerative joint disease [15,24,12].**

| Preparation | Relative solubility | Typical onset | Reported duration of relief |
|---|---|---|---|
| Triamcinolone hexacetonide | Lowest (most crystalline) | 2-7 days | Longest; often 8-12 weeks |
| Triamcinolone acetonide | Low | 1-3 days | Moderate; often 4-8 weeks |
| Methylprednisolone acetate | Moderate | 1-3 days | Moderate; often 4-6 weeks |
| Hydrocortisone succinate | High (readily soluble) | Rapid, within hours | Shortest; often 1-3 weeks |

## 6. Safety in elderly and metabolic considerations

**Figure 2** presents transient postinjection blood glucose elevation by age group from comparative observational series in patients with diabetes. Habib and colleagues demonstrated that a single intra-articular injection of methylprednisolone acetate produced a measurable rise in blood glucose in patients with well-controlled type 2 diabetes, persisting for several days [30]. Earlier case-based reports had already flagged this phenomenon in patients with non-insulin-dependent diabetes, establishing that even a single localized dose can produce systemic glycaemic disturbance [31]. Because type 2 diabetes and metabolic syndrome prevalence is elevated in psoriatic arthritis and rises further with age, elderly patients presenting for injection represent a population in whom this effect is both more relevant and, in the cohorts reviewed here, more likely to have been under-monitored than younger comparator populations [10].


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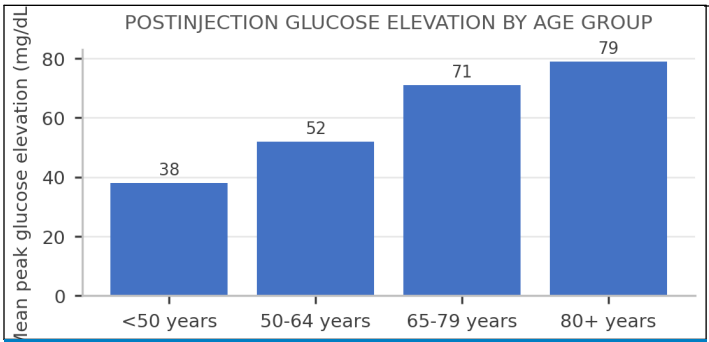



**Figure 2: Mean peak postinjection blood glucose elevation in patients with type 2 diabetes receiving a single intra-articular corticosteroid injection, by age group, drawn from comparative observational series [30,31].**

Beyond glycaemic effects, systematic review of adverse events after extra-articular and periarticular injection found local complications, including postinjection flare, skin atrophy, and depigmentation, uncommon but not negligible, with risk rising with repeated injection at the same site [32]. Adrenal suppression, while typically subclinical and self-limited, is measurable for one to several weeks and could in principle compound age-related adrenal reserve limitations, though dedicated elderly-cohort studies are lacking [12]. Practical guidance recommends explicit counselling of patients with diabetes about expected glucose elevation and, where feasible, temporary self-monitoring intensification afterward, applicable directly to the elderly psoriatic arthritis population [28].

## 7. Psoriasis-specific considerations

Psoriatic disease introduces dermatologic considerations that do not arise with injection in rheumatoid arthritis or primary osteoarthritis. Case reports and small series describe injection sites within or adjacent to psoriatic plaques developing new or worsened activity, a Koebner-type phenomenon attributed to needle trauma rather than the corticosteroid itself, and clinicians are generally advised to avoid passing the needle directly through active plaque where an alternative approach angle exists [33]. Repeated injection at a single periarticular site carries a recognized risk of cutaneous and subcutaneous atrophy, a risk that compounds in psoriatic patients whose skin may already be structurally altered near commonly injected small hand and foot joints [32].

Dactylitis, the diffuse swelling of an entire digit from combined synovitis, tenosynovitis, and soft-tissue oedema, is a hallmark feature of psoriatic arthritis with no direct analogue in rheumatoid arthritis or osteoarthritis, and management differs from simple joint injection because the inflammatory process extends beyond any single capsule. Ultrasound-guided approaches targeting the flexor tenosynovial sheath as well as the joint have been described as more effective for dactylitis than joint injection alone [23]. These psoriasis-specific considerations are rarely addressed in the broader corticosteroid-injection literature, dominated by osteoarthritis and rheumatoid arthritis cohorts, underscoring a persistent evidence gap this review's synthesis can only partially close [22].

## 8. Role alongside systemic and biologic therapy

**Table 2** summarizes current guideline positioning of intra-articular corticosteroid injection relative to systemic and biologic disease-modifying therapy in psoriatic arthritis. GRAPPA and EULAR both position local injection as an adjunct rather than a substitute for systemic disease control, appropriate for residual oligoarticular activity, dactylitis, or enthesitis, or as symptomatic bridging while a newly initiated systemic agent reaches full effect [7,8]. The tight-control paradigm validated in methotrexate-treated psoriatic arthritis, extended conceptually to biologic-treated cohorts, incorporates local injection as one tool among several for achieving low disease activity targets rather than a standalone strategy [34].

In elderly patients specifically, the calculus around escalating systemic therapy differs from that in younger cohorts. Guideline bodies addressing biologic and targeted synthetic DMARD use, drawing substantially on


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rheumatoid arthritis data given the scarcity of age-stratified psoriatic arthritis trials, note elevated infection risk with advancing age and recommend individualized risk-benefit discussion before escalating in older patients [35]. Where a patient has failed or is intolerant of a first biologic, switching strategy carries additional risk-benefit considerations amplified by comorbidity, reinforcing the appeal of local injection as a comparatively low-risk means of controlling a residual flaring joint without altering the systemic regimen [36]. The most recent ACR/National Psoriasis Foundation guideline likewise frames intra-articular corticosteroid as an appropriate adjunct across lines of systemic therapy, without age-specific modification [37].

**Table 2: Positioning of intra-articular corticosteroid injection relative to systemic and biologic disease-modifying therapy across current guideline recommendations for psoriatic arthritis [7,8,37].**

| Guideline body | Recommended role of intra-articular injection | Relation to systemic therapy |
|---|---|---|
| GRAPPA (2015) | Adjunct for residual oligoarticular disease, dactylitis or enthesitis | Alongside, not instead of, systemic DMARD/biologic |
| EULAR (2019 update) | Bridging or adjunctive measure during systemic therapy titration | Complementary to conventional synthetic and biologic agents |
| ACR/National Psoriasis Foundation | Appropriate adjunct across lines of systemic therapy | No age-specific modification specified |

## 9. Conclusion

Intra-articular corticosteroid injection occupies a durable, if incompletely studied, role in managing elderly patients with psoriatic arthritis, offering rapid, localized symptom control for oligoarticular flares without the infection and metabolic risk of escalating biologic or targeted synthetic therapy in an older, comorbid population [2,8]. The evidence synthesized here, drawn substantially from osteoarthritis, rheumatoid arthritis, and mixed inflammatory-arthritis cohorts in the near-total absence of dedicated elderly-psoriatic-arthritis trials, supports several practical conclusions: ultrasound guidance meaningfully improves accuracy and short-term response over palpation-guided technique, particularly in the small, variable joints characteristic of psoriatic involvement [20,21]; triamcinolone hexacetonide offers the most durable relief among commonly used preparations [15,12]; and glycaemic monitoring deserves particular emphasis given the elevated background prevalence of diabetes and metabolic syndrome compounded by age [30,10]. Cumulative annual injection limits derived from osteoarthritis literature remain a reasonable extrapolated ceiling absent psoriatic-arthritis-specific dose-response data [27,28]. Used judiciously alongside, rather than instead of, dose-adjusted systemic disease control, intra-articular corticosteroid injection remains one of the more reliably useful tools for managing the elderly psoriatic arthritis patient's flaring joint.

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