

Biologics for Knee Osteoarthritis

What the current evidence shows about PRP and related biologics

IN BRIEF

Platelet-rich plasma is the most widely studied injectable biologic for knee osteoarthritis.

Across high-quality studies, PRP generally improved reported pain and stiffness compared with a placebo injection, and no significant safety harms were reported.

It has not been shown to change the structure of the joint, such as cartilage thickness. Comparisons against hyaluronic acid, steroids and exercise are mixed rather than uniformly favorable.

The professional body whose review underpins this document does not recommend for or against PRP. It presents the evidence for clinicians to weigh.

Introduction

Platelet-rich plasma (PRP) is one of the most widely studied injectable biologic options for knee osteoarthritis. This overview summarizes what the current evidence base shows, including a technology overview from the American Academy of Orthopaedic Surgeons (AAOS), covering both encouraging findings and their limitations.

PRP compared with placebo

The AAOS technology overview examined 9 studies, 8 of them high quality, comparing PRP with placebo or saline injection across 433 patients. PRP generally showed improvement in patient-reported outcomes, including pain and stiffness scores, across most of these studies. PRP was not found to have a significant effect on cartilage thickness measured by ultrasound, or on knee strength, in the single studies examining those outcomes.[1]

PRP compared with other treatments

Against hyaluronic acid

Across 25 studies, 18 of them high quality, covering 1,777 patients, PRP showed more improvement than hyaluronic acid in the majority of high-quality studies reporting composite pain and function scores. Three high-quality studies found no difference.[1]

Against corticosteroids

Results were inconsistent. Some high-quality studies favored PRP, some found no significant difference, and one found worse outcomes with PRP on a specific pain measure.[1]

Against exercise and physical therapy

Mixed results. Some studies found PRP superior on certain outcome measures, others found no significant difference.[1]

Against bone marrow aspirate concentrate

One moderate-quality study found no statistically significant difference on most outcomes, except that PRP scored better on one pain measure. The evidence is inconclusive as to whether either is superior.[1]

Safety

The AAOS review found no significant safety harms reported for PRP compared with the other treatment modalities studied. PRP is generally considered a low-risk biologic given its autologous nature and the routine nature of venipuncture-based collection.[1]

Limitations identified by the evidence itself

- Most studies involved relatively small patient cohorts.
- PRP products and preparation methods varied significantly between studies, making direct comparison difficult.[1,2]
- Few studies assessed structural change to the joint rather than symptom-based outcomes alone.[1]
- The AAOS review states explicitly that it does not make a recommendation for or against PRP use.[1]

Evidence status

Evidence status	What this means
Established	PRP shows a favorable safety profile and generally improves patient-reported pain and symptom outcomes compared with placebo in the short to medium term, up to 12 months.[1]
Emerging	Comparative superiority over other injectable options such as hyaluronic acid and corticosteroids is suggested by some but not all high-quality studies. The picture is mixed rather than definitive.[1]
Limited	Whether PRP improves the underlying structure or function of the osteoarthritic joint, rather than symptoms alone, remains unclear. The optimal formulation and dosing schedule have not been established.[1]

Key points

- PRP shows a generally favorable safety profile and improves patient-reported pain outcomes against placebo in most high-quality studies reviewed.
- Comparisons against hyaluronic acid, corticosteroids and exercise show mixed results.
- PRP has not been shown to significantly improve cartilage structure or knee strength in the limited studies examining those outcomes.
- The AAOS does not recommend for or against PRP. It presents the evidence for clinicians to weigh.

Source verification

Claim in this document	Source	Evidence strength	Limitations
PRP against placebo improved patient-reported outcomes in most high-quality studies, with no significant cartilage or strength effect	AAOS PRP for Knee OA Technology Overview	High, systematic review of 9 studies	Literature cutoff August 2021; newer studies not included
PRP against hyaluronic acid favored PRP in most high-quality studies, with some finding no difference	AAOS Technology Overview	High, 25 studies	Same literature cutoff

Claim in this document	Source	Evidence strength	Limitations
Comparisons against corticosteroid, exercise and BMAC were mixed or inconclusive	AAOS Technology Overview	Moderate to high, varies by comparator	Small number of studies for the BMAC comparison
No significant safety harms reported against comparators	AAOS Technology Overview	High	Based on studies reviewed through 2021

References

[1] American Academy of Orthopaedic Surgeons. Platelet-Rich Plasma (PRP) for Knee Osteoarthritis, Technology Overview. Development work group: Murray M, Dubin J, Leucht P (co-chairs), Frank R, Mont M, Baria M, and contributors. Literature reviewed through August 25, 2021.

[2] Berdini M, Clementi G, Torcianti M, Del Bianco D, Cantori I, Procaccini R, Gigante A. Standardization of Platelet-Rich Plasma Preparation in Orthopedics. LabMed. 2026;3(1):8. DOI 10.3390/labmed3010008.

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