Supplementary Materials

Supplementary Table S1. Full database and register search strategies

Database/source	Search strategy
PubMed/MEDLINE	(("Platelet-Rich Plasma"[Mesh] OR "platelet-rich plasma"[tiab] OR "platelet rich plasma"[tiab] OR PRP[tiab] OR "leukocyte-poor platelet-rich plasma"[tiab] OR "leukocyte-rich platelet-rich plasma"[tiab] OR "autologous conditioned plasma"[tiab] OR "bone marrow aspirate concentrate"[tiab] OR BMAC[tiab] OR "bone marrow concentrate"[tiab] OR "concentrated bone marrow aspirate"[tiab]) AND (age[tiab] OR sex[tiab] OR gender[tiab] OR BMI[tiab] OR "body mass index"[tiab] OR obesity[tiab] OR diabetes[tiab] OR "metabolic syndrome"[tiab] OR comorbidity[tiab] OR smoking[tiab] OR medication*[tiab] OR platelet*[tiab] OR leukocyte*[tiab] OR neutrophil*[tiab] OR lymphocyte*[tiab] OR monocyte*[tiab] OR hemoglobin[tiab] OR hematocrit[tiab] OR inflammatory[tiab] OR CRP[tiab] OR cytokine*[tiab] OR "growth factor*"[tiab] OR donor*[tiab] OR "patient factor*"[tiab] OR predictor*[tiab] OR prognostic[tiab]) AND (composition[tiab] OR cellular[tiab] OR "cell count*"[tiab] OR concentration[tiab] OR yield[tiab] OR variability[tiab] OR "clinical outcome*"[tiab] OR response[tiab] OR responder*[tiab] OR pain[tiab] OR function[tiab] OR improvement[tiab] OR efficacy[tiab]) AND (orthop*[tiab] OR musculoskeletal[tiab] OR tendon*[tiab] OR ligament*[tiab] OR cartilage[tiab] OR osteoarthritis[tiab] OR "sports medicine"[tiab] OR knee[tiab] OR hip[tiab] OR shoulder[tiab] OR ankle[tiab] OR elbow[tiab] OR spine[tiab] OR fracture[tiab] OR nonunion[tiab] OR "Musculoskeletal Diseases"[Mesh])) Filters: English, Humans.
Embase	('platelet rich plasma'/exp OR 'platelet rich plasma':ti,ab OR prp:ti,ab OR 'leukocyte poor platelet rich plasma':ti,ab OR 'leukocyte rich platelet rich plasma':ti,ab OR 'autologous conditioned plasma':ti,ab OR 'bone marrow aspirate concentrate':ti,ab OR bmac:ti,ab OR 'bone marrow concentrate':ti,ab OR 'concentrated bone marrow aspirate':ti,ab) AND (age:ti,ab OR sex:ti,ab OR gender:ti,ab OR bmi:ti,ab OR 'body mass index':ti,ab OR obesity:ti,ab OR diabetes:ti,ab OR 'metabolic syndrome':ti,ab OR comorbidity:ti,ab OR smoking:ti,ab OR medication*:ti,ab OR platelet*:ti,ab OR leukocyte*:ti,ab OR neutrophil*:ti,ab OR lymphocyte*:ti,ab OR monocyte*:ti,ab OR hemoglobin:ti,ab OR hematocrit:ti,ab OR inflammatory:ti,ab OR crp:ti,ab OR cytokine*:ti,ab OR 'growth factor*':ti,ab OR donor*:ti,ab OR predictor*:ti,ab OR prognostic:ti,ab) AND (composition:ti,ab OR cellular:ti,ab OR 'cell count*':ti,ab OR concentration:ti,ab OR yield:ti,ab OR variability:ti,ab OR outcome*:ti,ab OR response:ti,ab OR responder*:ti,ab OR pain:ti,ab OR function:ti,ab OR efficacy:ti,ab) AND (orthopedic*:ti,ab OR orthopaedic*:ti,ab OR musculoskeletal:ti,ab OR tendon*:ti,ab OR ligament*:ti,ab OR cartilage:ti,ab OR osteoarthritis:ti,ab OR knee:ti,ab OR hip:ti,ab OR shoulder:ti,ab OR ankle:ti,ab OR elbow:ti,ab OR spine:ti,ab OR fracture:ti,ab OR nonunion:ti,ab). Limits: English, human.
Scopus	TITLE-ABS-KEY(("platelet-rich plasma" OR "platelet rich plasma" OR PRP OR "leukocyte-poor platelet-rich plasma" OR "leukocyte-rich platelet-rich plasma" OR "autologous conditioned plasma" OR "bone marrow aspirate concentrate" OR BMAC OR "bone marrow concentrate" OR "concentrated bone marrow aspirate") AND (age OR sex OR gender OR BMI OR "body mass index" OR obesity OR diabetes OR "metabolic syndrome" OR comorbidity OR smoking OR medication* OR platelet* OR leukocyte* OR neutrophil* OR lymphocyte* OR monocyte* OR hemoglobin OR hematocrit OR inflammatory OR CRP OR cytokine* OR "growth factor*" OR donor* OR predictor* OR prognostic) AND (composition OR cellular OR "cell count*" OR concentration OR yield OR variability OR outcome* OR response OR responder* OR pain OR function OR efficacy) AND (orthopedic* OR orthopaedic* OR

	musculoskeletal OR tendon* OR ligament* OR cartilage OR osteoarthritis OR knee OR hip OR shoulder OR ankle OR elbow OR spine OR fracture OR nonunion)) AND (LIMIT-TO(LANGUAGE, "English")).
Web of Science	TS=(("platelet-rich plasma" OR "platelet rich plasma" OR PRP OR "leukocyte-poor platelet-rich plasma" OR "leukocyte-rich platelet-rich plasma" OR "autologous conditioned plasma" OR "bone marrow aspirate concentrate" OR BMAC OR "bone marrow concentrate" OR "concentrated bone marrow aspirate") AND (age OR sex OR gender OR BMI OR "body mass index" OR obesity OR diabetes OR "metabolic syndrome" OR comorbidity OR smoking OR medication* OR platelet* OR leukocyte* OR neutrophil* OR lymphocyte* OR monocyte* OR hemoglobin OR hematocrit OR inflammatory OR CRP OR cytokine* OR "growth factor*" OR donor* OR predictor* OR prognostic) AND (composition OR cellular OR "cell count*" OR concentration OR yield OR variability OR outcome* OR response OR responder* OR pain OR function OR efficacy) AND (orthopedic* OR orthopaedic* OR musculoskeletal OR tendon* OR ligament* OR cartilage OR osteoarthritis OR knee OR hip OR shoulder OR ankle OR elbow OR spine OR fracture OR nonunion)). Limits: English language.
Cochrane CENTRAL	("platelet-rich plasma" OR PRP OR "autologous conditioned plasma" OR "bone marrow aspirate concentrate" OR BMAC OR "bone marrow concentrate") AND (age OR sex OR BMI OR obesity OR diabetes OR smoking OR platelet OR leukocyte OR medication OR predictor OR prognostic OR donor) AND (osteoarthritis OR tendon OR ligament OR cartilage OR musculoskeletal OR orthopedic OR orthopaedic OR knee OR hip OR shoulder OR ankle).
ClinicalTrials.gov	Search terms used iteratively: "platelet-rich plasma" AND osteoarthritis; PRP AND knee; PRP AND musculoskeletal; "bone marrow aspirate concentrate" AND osteoarthritis; BMAC AND knee; "bone marrow concentrate" AND musculoskeletal. Trial records were screened for completed or published studies reporting patient/donor-factor analyses.

Supplementary Table S2. QUIPS risk-of-bias judgments for 18 studies

Study	Outcome stream	P	A	F	O	C	S	Overall*
Rossi 2023 [9]	PRP composition	M	L	L	L	M	M	M
Taniguchi 2019 [10]	PRP composition	M	NA	L	L	M	M	M
Evanson 2014 [11]	PRP composition	M	NA	L	L	H	M	H
Wiciński 2023 [12]	PRP composition	M	NA	L	L	M	M	M
Karaborklu Argut 2023 [13]	PRP composition	M	NA	L	L	M	M	M
Xiong 2018 [14]	PRP composition	M	NA	L	L	M	M	M
Trevissón 2022 [15]	PRP composition	M	NA	M	L	H	H	H*
Cavallo 2023 [16]	BMAC composition	M	NA	L	L	H	M	M/H*
Huddleston 2023 [17]	BMAC composition	M	NA	L	L	M	M	M
Muthu 2023 [18]	BMAC composition	M	NA	L	L	H	M	H
Saita 2021 [19]	PRP clinical	M	M	L	L	M	L	M

Kikuchi 2021 [20]	PRP clinical	M	M	L	M	H	M	H
Alessio-Mazzola 2021 [21]	PRP clinical	M	M	L	L	M	H	H
Korpershoek 2020 [22]	PRP clinical	M	L	L	L	M	L	M
Ota 2024 [23]	PRP clinical	H	M	L	M	H	H	H
Chopin 2023 [24]	PRP clinical	M	M	M	M	H	H	H
Rasovic 2023 [25]	BMAC clinical	M	M	L	L	M	M	M
Smith 2023 [26]	BMAC clinical	M	M	L	M	H	H	H

P, study participation; A, attrition; F, prognostic-factor measurement; O, outcome measurement; C, confounding; S, statistical analysis/reporting. L, low; M, moderate; H, high; NA, not applicable. Frequency audit (n=18): participation moderate 17/high 1; attrition NA 9/low 2/moderate 7; factor measurement low 16/moderate 2; outcome measurement low 14/moderate 4; confounding moderate 10/high 8; analysis/reporting low 2/moderate 11/high 5.

Notes supporting QUIPS judgments

Rossi 2023 [9] — Repeated PRP preparations accounted for by clustered quantile regression; medication and manufacturing variation incompletely assessed.

Taniguchi 2019 [10] — n=39, narrow age range (20–49 years); multiple marker correlations, limited multivariable control.

Evanson 2014 [11] — Cross-sectional n=102; sex/age stratification, residual confounding and multiple biomarkers; full methods require confirmation.

Wiciński 2023 [12] — BMI groups n=49; assay outcomes objective but metabolic covariates and precision limited; null ≠ equivalence.

Karaborklu Argut 2023 [13] — Positive correlation WB platelets→PRP cells; confounder adjustment and joint correlations require review of full methods.

Xiong 2018 [14] — n=39, standardized collection and assays; numerous cytokine outcomes; residual behavioral/hormonal confounding.

Trevissón 2022 [15] — n=26; device cell capture, age/sex subgroups, surrogate menopause threshold >50 years; severity depends on target association.

Cavallo 2023 [16] — n=20; paired harvest-site comparison reduces within-donor confounding, but age groups differ clinically; separate age/site judgments.

Huddleston 2023 [17] — n=80; standardized site and processing, objective final MSC concentration; limited covariates and power.

Muthu 2023 [18] — n=58 with mixed clinical indications including non-MSK conditions; primarily unadjusted correlations; confounding by indication and aspiration volume.

Saita 2021 [19] — Large observational cohort (n=517); multivariable KL association; no untreated comparison for effect modification.

Kikuchi 2021 [20] — n=124; clinical outcome after ~3.3 weeks; regression but co-variables/protocol and short horizon limit clinical generality.

Alessio-Mazzola 2021 [21] — n=118; Table 4 regression coefficients/OR/CI/p internally discordant for BMI and KL; cannot trust effect estimates without clarification.

Korpershoek 2020 [22] — n=140 patients/158 knees; predefined outcome, negative findings; potential knee-level clustering is a reporting limitation.

Ota 2024 [23] — n=36 knees, 16 responders, hyperlipidemia sparse subgroup, risk of overfitting/multiple tests.

Chopin 2023 [24] — 210 knees in 197 patients; intra-patient clustering unclear; physiotherapy is likely confounded by indication; adapted responder definition.

Rasovic 2023 [25] — n=111; 12-month treated-only cohort; severity × age interaction and adjustment require full-text detail.

Smith 2023 [26] — n=92; derived clinical decision rule from case series; variable selection/optimism and external validation missing.

Supplementary Table S3. GRADE-informed certainty profile

Factor–outcome association	Studies / population units	Available estimate or result	Starting certainty	Principal reason(s) for downgrade	Final certainty
PRP composition — Baseline whole-blood platelets → final PRP platelet concentration	Rossi 2023 [9]; Karaborklu Argut 2023 [13]; 357 persons/403 preparations; 62 persons	Both positive; Rossi reports a 3.8-fold slope per unit of starting count as described by authors. This is not total administered dose.	Low (adapted)	No formal downgrade imposed; moderate confounding/reporting concerns and imperfect comparable estimates prevent upgrading	Low
PRP composition — Age → PRP platelet concentration	Rossi 2023 [9]; Xiong 2018 [14]; 357 persons/403 preparations; 39 donors	Rossi: approximately −32,666 platelets per decade; Xiong: no statistically detected group difference	Low (adapted)	−1 inconsistency/indirectness (different age comparisons and systems); effect uncertainty	Very low
PRP composition — Age → PRP growth factors	Taniguchi 2019 [10]; Evanson 2014 [11]; Xiong 2018 [14]; 39; 102; 39 donors	Taniguchi: PDGF-BB r=−0.32 and IGF-1 r=−0.39; Evanson and Xiong analyte-specific associations	Low (adapted)	−1 indirectness/inconsistency (noninterchangeable analytes and assays); small samples	Very low
PRP composition — Sex → selected PRP proteins	Taniguchi 2019 [10]; Evanson 2014 [11]; Xiong 2018 [14]; 39; 102; 39 donors	Taniguchi: no detected association; Evanson: some proteins higher in women; Xiong: selected proteins higher in men	Low (adapted)	−1 inconsistency and multiplicity with multiple different assay targets	Very low
PRP composition — Sex → PRP platelet concentration/enrichment	Rossi 2023 [9]; Xiong 2018 [14]; Trevissón 2022 [15]; 357 persons/403 preparations; 39; 26 donors	No detected difference in specified platelet metrics; Trevissón: enrichment p=0.818	Low (adapted)	−1 imprecision/indirectness; nonsignificance does not establish equivalence	Very low
PRP composition — BMI → selected PRP growth factors	Wiciński 2023 [12]; 49 persons	No significant group differences for selected growth factors	Low (adapted)	−1 serious imprecision (single small study; no equivalence testing)	Very low
BMAC composition — Age → BMAC MNC/CFU	Cavallo 2023 [16]; Muthu 2023 [18]; 20; 58 persons	Cavallo: 3.8 ± 1.8 vs 1.2 ± 0.8 $\times 10^7$ MNC/mL young vs older; Muthu age r=−0.681 MNC, r=−0.693 CFU	Low (adapted)	−1 indirectness/confounding: age groups differ by indication; Muthu combines MSK and non-MSK diagnoses; assays vary	Very low
BMAC composition — Age/sex/BMI → final MSC concentration	Huddleston 2023 [17]; 80 persons	No significant detected associations under standardized iliac-crest protocol	Low (adapted)	−1 imprecision/limited external validity (single system; does not demonstrate absence of association)	Very low
BMAC procedural — Iliac crest vs tibia → BMAC MNC/CFU-F	Cavallo 2023 [16]; 10 paired donors / 20 samples	MNC 1.2 ± 0.8 vs 0.3 ± 0.2 $\times 10^7$/mL; paired CFU-F difference at day 10 and 20	Low (adapted)	−1 serious imprecision and limited generalizability (single paired group)	Very low
BMAC procedural — Aspirated volume → BMAC cellular yield	Muthu 2023 [18]; 58 persons; mixed indications	Age-independent volume effect not isolated; volume correlations were reported (MNC	Low (adapted)	−1 serious confounding and indirectness (volume, technique and indication interrelated)	Very low

		r=−0.740; CFU r=−0.629)			
PRP clinical prognosis — Higher KL grade → observed PRP response/failure	Saita 2021 [19]; Alessio-Mazzola 2021 [21]; Korpershoek 2020 [22]; Chopin 2023 [24]; 517; 118; 140 people/158 knees; 197 people/210 knees	Saita aOR 0.58 (95% CI 0.45–0.75) per grade increment; Alessio qualitative association with failure; Korpershoek continuous null; Chopin responder null	High (prognostic GRADE)	−1 serious RoB; −1 inconsistency/outcome heterogeneity; −1 imprecision/indirectness (especially discordant Alessio regression)	Very low
PRP clinical prognosis — BMI → observed PRP response/failure	Saita 2021 [19]; Alessio-Mazzola 2021 [21]; Chopin 2023 [24]; 517; 118; 197 people/210 knees	Alessio qualitative failure association but adjusted regression internally discordant; Saita/Chopin no detected association	High (prognostic GRADE)	−2 serious reporting/confounding concerns; −1 inconsistency; −1 imprecision	Very low
PRP clinical context — Physiotherapy/functional restriction → PRP responder status	Chopin 2023 [24]; 197 people/210 knees	Physiotherapy aOR 0.46 (0.24–0.90); heel–buttock >35 cm aOR 0.31 (0.15–0.65)	High (prognostic GRADE)	−2 serious confounding-by-indication/reverse-causation concern; −1 imprecision (single study)	Very low
BMAC clinical prognosis — KL/age/BMI → observed BMAC symptoms/function	Rasovic 2023 [25]; 111 persons	Study-specific model results; fully comparable, adjusted factor estimates not available	High (prognostic GRADE)	−1 RoB (model/subgroup confounding); −1 imprecision; −1 indirectness of inconsistent endpoints	Very low
BMAC clinical prognosis — Baseline pain/prior surgery → responder status	Smith 2023 [26]; 92 persons	Derived clinical decision rule for pain response after BMAC; no external validation	High (prognostic GRADE)	−2 serious model-selection/optimism risk; −1 imprecision and transportability	Very low

Supplementary Table S4. Final study selection (PRISMA 2020)

The final PRISMA flow was approved by the authors and includes records identified through all six databases and registers in the Methods.

PRISMA item	**Number**
Records identified from databases and registers	7,579
Duplicate records removed	1,486
Records screened (title and abstract)	6,093
Records excluded during screening	5,954
Reports sought for retrieval	139
Reports not retrieved	4
Full-text reports assessed for eligibility	135
Full-text reports excluded, with reasons	117
Studies included in systematic review	18

Primary reasons for exclusion after full-text review

Primary reason for full-text exclusion	**Number**
No eligible patient/donor-factor–outcome analysis identified	39
Ineligible biological product (PRF or adipose-derived SVF)	39
Non-musculoskeletal clinical indication	16
Review, editorial, or publication without eligible original data	14
Animal or preclinical study	9
Total excluded reports	117

Supplementary Table S5. Data-extraction framework

Domain	**Variables extracted**

Study identification	Author, year, journal, country, funding, conflicts of interest
Design and population	Study design, prospective/retrospective status, center number, study period, indication, anatomic site, inclusion/exclusion criteria, sample size
Donor/patient variables	Age, sex, BMI, obesity, diabetes, metabolic syndrome, dyslipidemia, hypertension, smoking, medication exposure, activity level, baseline platelet count, blood count, inflammatory markers, comorbidities
PRP product variables	Preparation system, blood volume, centrifugation protocol, anticoagulant, activation, final volume, platelet count, platelet dose, leukocyte count/differential, RBC contamination, growth factors, cytokines
BMAC product variables	Harvest site, aspirate volume, processing system, final volume, total nucleated cells, mononuclear cells, CFU-F, MSC markers/concentration, platelet/RBC content, growth factors/cytokines
Clinical outcomes	Pain, function, responder status, MCID/PASS if reported, treatment failure, surgery/revision, adverse events, follow-up duration
Association data	Factor analyzed, outcome linked to factor, statistical method, unadjusted/adjusted estimate, confidence interval, p value, adjustment variables, direction of association
Review judgments	Risk-of-bias judgments, certainty domain, applicability to orthopedic/MSK practice

Supplementary Table S6. PRISMA 2020 checklist

Section/topic	**Item**	**Checklist requirement**	**Location in manuscript or supplement**	**Status**
Title	1	Identify the report as a systematic review.	Title page	Reported
Abstract	2	Provide a structured abstract including objectives, eligibility criteria, information sources, risk of bias, synthesis methods, results, limitations, interpretation, and registration.	Abstract	Reported
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Introduction	Reported
Objectives	4	Provide an explicit statement of the objective or question addressed.	Introduction; Methods: Review question and conceptual framework	Reported
Eligibility criteria	5	Specify inclusion and exclusion criteria and how studies were grouped for synthesis.	Methods: Eligibility criteria; Exclusion criteria and product definitions	Reported
Information sources	6	Specify all databases, registers, websites, organisations, reference lists, and other sources searched, with date of last search.	Methods: Information sources and search strategy	Reported
Search strategy	7	Present the full search strategies for all databases and registers.	Supplementary Table 1	Reported
Selection process	8	Specify methods used to decide whether studies met inclusion criteria, including reviewer process.	Methods: Study selection	Reported
Data collection process	9	Specify methods used to collect data from reports,	Methods: Data extraction	Reported

		including reviewer process and verification.		
Data items	10a	List and define all outcomes for which data were sought.	Methods: Outcomes; Data items and effect measures	Reported
Data items	10b	List and define all other variables for which data were sought.	Methods: Data extraction; Data items and effect measures; Supplementary Table 5	Reported
Risk of bias in individual studies	11	Specify the methods used to assess risk of bias in included studies.	Methods: Risk-of-bias assessment; Supplementary Table 2	Reported
Effect measures	12	Specify the effect measures used for each outcome or association.	Methods: Data items and effect measures	Reported
Synthesis methods	13a	Describe processes used to decide which studies were eligible for each synthesis.	Methods: Data synthesis	Reported
Synthesis methods	13b	Describe methods required to prepare data for presentation or synthesis.	Methods: Data extraction; Data synthesis	Reported
Synthesis methods	13c	Describe methods used to tabulate or visually display results of individual studies and syntheses.	Methods: Data synthesis; Tables 1-4; Figures 1-2	Reported
Synthesis methods	13d	Describe methods used to synthesize results and provide rationale for chosen synthesis methods.	Methods: Data synthesis	Reported
Synthesis methods	13e	Describe methods used to explore causes of heterogeneity.	Methods: Data synthesis; Results: integrated synthesis	Reported narratively
Synthesis methods	13f	Describe sensitivity analyses conducted.	Methods: Data synthesis	Not applicable; no meta-analysis or sensitivity analysis was conducted
Reporting-bias assessment	14	Describe methods used to assess risk of bias due to missing results in a synthesis.	Methods: Reporting-bias assessment; Results: Integrated synthesis, risk of bias, and certainty of evidence	Reported qualitatively
Certainty assessment	15	Describe methods used to assess certainty of evidence for each outcome or evidence domain.	Methods: Certainty of evidence; Supplementary Table 3	Reported
Study selection	16a	Describe results of search and selection process from records to included studies.	Results: Study selection; Figure 1	Reported
Study selection	16b	Cite studies that might appear eligible but were excluded, and explain why.	Results: Study selection; Supplementary Table 4	Reported at category level
Study characteristics	17	Cite each included study and present its characteristics.	Results: Study characteristics; Table 1	Reported
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Results: Integrated synthesis, risk of bias, and certainty of evidence; Supplementary Table 2	Reported
Results of individual studies	19	Present results for all outcomes or associations for each study.	Results; Tables 2-4	Reported
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Results: PRP composition; BMAC composition; clinical response; integrated synthesis	Reported

Results of syntheses	20b	Present results of all statistical syntheses conducted.	Results: Integrated synthesis	Not applicable; no meta-analysis was performed
Results of syntheses	20c	Present results of investigations of heterogeneity.	Results: Integrated synthesis	Reported narratively
Results of syntheses	20d	Present results of sensitivity analyses.	Results: Integrated synthesis	Not applicable; no sensitivity analysis was performed
Reporting biases	21	Present assessments of risk of bias due to missing results.	Results: Integrated synthesis, risk of bias, and certainty of evidence	Reported qualitatively
Certainty of evidence	22	Present certainty of evidence for each outcome or evidence domain.	Results: Integrated synthesis, risk of bias, and certainty of evidence; Supplementary Table 3	Reported
Discussion	23a	Provide a general interpretation of results in the context of other evidence.	Discussion	Reported
Discussion	23b	Discuss limitations of the evidence included in the review.	Discussion: Limitations	Reported
Discussion	23c	Discuss limitations of the review processes.	Discussion: Limitations	Reported
Discussion	23d	Discuss implications for practice, policy, and future research.	Discussion: Clinical and research implications; Conclusions	Reported
Registration and protocol	24a	Provide registration information including registry name and registration number.	Abstract; Methods: Protocol and registration	Reported
Registration and protocol	24b	Indicate where the review protocol can be accessed.	Methods: Protocol and registration	Reported
Registration and protocol	24c	Describe and explain amendments to the protocol.	Methods: Protocol and registration	Reported; no amendments affecting eligibility, outcomes, or synthesis methods
Support	25	Describe sources of financial or non-financial support and the role of funders.	Declarations	Reported
Competing interests	26	Declare competing interests of review authors.	Declarations	Reported
Availability of data, code, and materials	27	Report availability of template forms, extracted data, analytic code, and other materials.	Ethics and data availability; Declarations; Supplementary Materials	Reported

Checklist locations refer to the accompanying revised manuscript. Final journal pagination may change during typesetting.

Supplementary Table S7. Selected source-level effect estimates

Study	**Association**	**Extracted estimate / finding**	**N**	**Caution**
Rossi 2023 [9]	Baseline platelet → PRP platelets	Positive quantile-regression association; reported ~3.8-fold gradient	403 preparations/357 people	Not total injected platelet dose; unit of regression gradient should be checked
Taniguchi 2019 [10]	Age → PDGF-BB and IGF-1	Spearman r=−0.32 and r=−0.39	39 donors	Separate growth factors
Xiong 2018 [14]	Male vs female PRP IL-1β	9.83 vs 7.71 pg/mL; p=0.008	39 donors	Multiple markers tested
Xiong 2018 [14]	Male vs female PRP TGF-β1	118.8 vs 92.8 ng/mL; p=0.002	39 donors	Not direct clinical potency

Wiciński 2023 [12]	BMI strata → selected PRP growth factors	No detected significant between-group differences	49 patients	Insufficient evidence of equivalence
Cavallo 2023 [16]	Young vs older iliac-crest BMAC MNC	3.8 ± 1.8 vs 1.2 ± 0.8 $\times 10^7$ cells/mL; p<0.0005	20 people	Indication differs by age
Cavallo 2023 [16]	Older iliac vs proximal tibial BMAC MNC	1.2 ± 0.8 vs 0.3 ± 0.2 $\times 10^7$ cells/mL; p<0.0005	10 donor-matched pairs	Harvest site procedural
Muthu 2023 [18]	Age → MNC / CFU	r=−0.681 / −0.693; p<0.001	58 patients	Unadjusted correlations
Chopin 2023 [24]	Physiotherapy ongoing → PRP response	adjusted OR 0.46 (95%CI 0.24–0.90)	197 patients/210 knees	Confounding by indication; clustering unclear
Chopin 2023 [24]	Heel-to-buttock >35 cm → PRP response	adjusted OR 0.31 (95%CI 0.15–0.65)	197 patients/210 knees	Marker of functional severity
Alessio-Mazzola 2021 [21]	BMI / KL → observed PRP failure	Study reports positive associations; adjusted OR values withheld	118 patients	Paper Table 4 self-inconsistent
Rasovic 2023 [25]	Higher OA severity → BMAC outcomes	Direction reported; harmonized adjusted effect unavailable	111 patients	Treated-only cohort

Supplementary Table S8. Full-text exclusion log (117 reports)

The bracketed numbers refer to unique references in the main manuscript bibliography [29–145]. Bibliographic details are listed only once in the main reference list. Study-specific exclusion reasons and PubMed identifiers are retained below.

NO ELIGIBLE PATIENT/DONOR-FACTOR–OUTCOME ANALYSIS IDENTIFIED (n = 39)

001. [29] Ta, C.N.; Vasudevan, R.; Mitchell, B.C.; Keller, R.A.; Kent, W.T. The Influence of Industry Affiliation on Randomized Controlled Trials of Platelet-Rich Plasma for Knee Osteoarthritis. *Am. J. Sports Med.* **2023**, *51*, 3583–3590. https://doi.org/10.1177/03635465221140917.

PRP/BMAC intervention or method comparison; no patient/donor-factor–outcome association identified in the indexed abstract.

https://pubmed.ncbi.nlm.nih.gov/36594496/

002. [30] Zhou, Y.; Li, H.; Cao, S.; Han, Y.; Shao, J.; Fu, Q.; Wang, B.; Wu, J.; Xiang, D.; Liu, Z.; et al. Clinical Efficacy of Intra-Articular Injection with P-PRP Versus that of L-PRP in Treating Knee Cartilage Lesion: A Randomized Controlled Trial. *Orthop. Surg.* **2023**, *15*, 740–749. https://doi.org/10.1111/os.13643.

PRP/BMAC intervention or method comparison; no patient/donor-factor–outcome association identified in the indexed abstract.

https://pubmed.ncbi.nlm.nih.gov/36647244/

003. [31] Liu, S.S.; Xu, L.L.; Liu, L.K.; Lu, S.J.; Cai, B. Platelet-rich plasma therapy for temporomandibular joint osteoarthritis: A randomized controlled trial. *J. Craniomaxillofac. Surg.* **2023**, *51*, 668–674. https://doi.org/10.1016/j.jcms.2023.09.014.

PRP/BMAC intervention or method comparison; no patient/donor-factor–outcome association identified in the indexed abstract.

https://pubmed.ncbi.nlm.nih.gov/37852892/

004. [32] Khasru, M.R.; Siddiq, M.A.B.; Jubery, T.A.Z.N.; Marzen, T.; Hoque, A.; Ahmed, A.Z.; Begum, M.; Chowdhury, F.R.; Salek, A.K.M.; Khan, M.M. Outcome of Intra-articular Injection of Total Stromal Cells and Platelet-Rich Plasma in Primary Knee Osteoarthritis: A Randomized Clinical Trial. *Cureus* **2023**, *15*, e34595. https://doi.org/10.7759/cureus.34595.

PRP/BMAC intervention or method comparison; no patient/donor-factor–outcome association identified in the indexed abstract.

https://pubmed.ncbi.nlm.nih.gov/36883080/

005. [33] Li, T.; Li, Y.; Li, W.; Wang, X.; Ding, Q.; Gao, J.; Zhang, Y.; Zhuang, W. Impact of autologous platelet-rich plasma therapy vs. hyaluronic acid on synovial fluid biomarkers in knee osteoarthritis: a randomized controlled clinical trial. *Front. Med.* **2023**, *10*, 1258727. https://doi.org/10.3389/fmed.2023.1258727.

PRP/BMAC intervention or method comparison; no patient/donor-factor–outcome association identified in the indexed abstract.

https://pubmed.ncbi.nlm.nih.gov/37869166/

006. [34] Parmanantham, M.; Seenappa, H.; Das, S.; Shanthappa, A.H. Comparison of Functional Outcome of Single Versus Multiple Intra-articular Platelet-Rich Plasma Injection for Early Osteoarthritis Knee. *Cureus* **2023**, *15*, e38513. https://doi.org/10.7759/cureus.38513.

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