Washington State Health Care Authority

Health Technology Assessment

Autologous Blood or Platelet-Rich Plasma Injections

Final Evidence Report: Appendices

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Autologous Blood or Platelet-Rich Plasma Injections

Provided by:

Spectrum Research, Inc.

Final Report
APPENDICES

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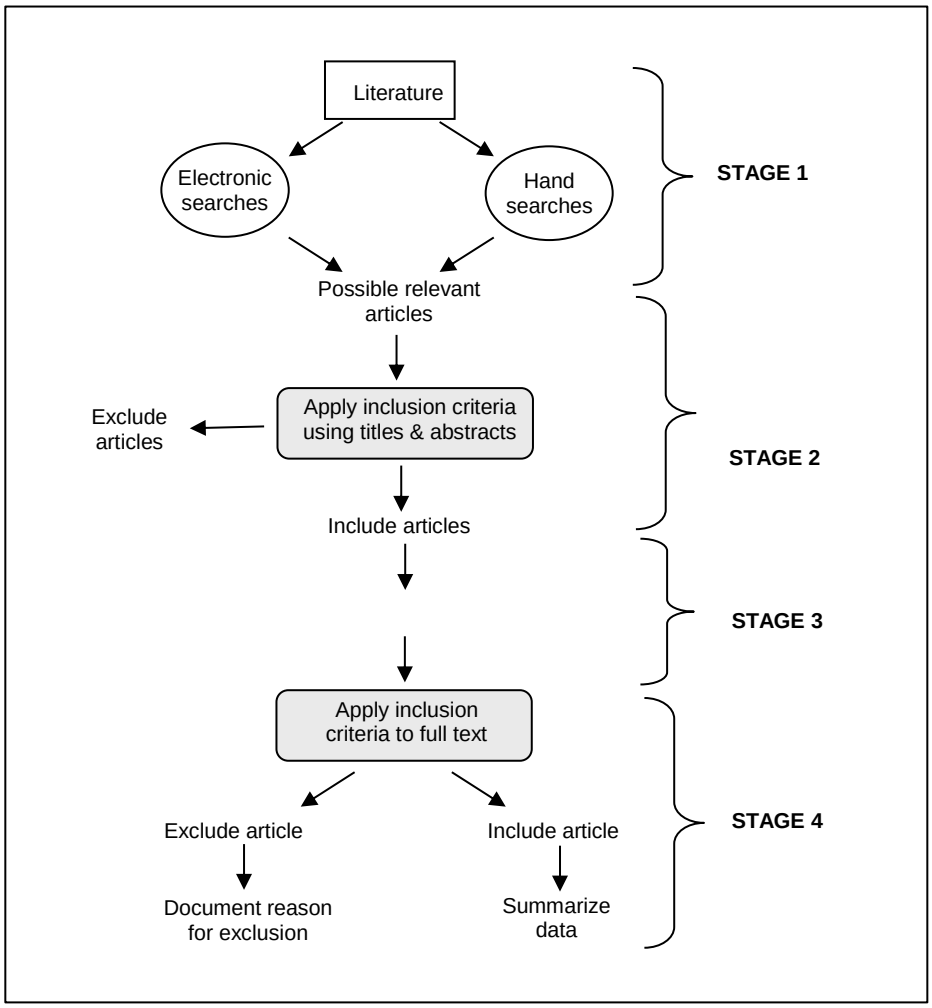

APPENDIX B. Search Strategies

Below is the search strategy for PubMed. Parallel strategies were used to search other electronic databases listed below. Keyword searches were conducted in the other listed resources.

Search strategy (PubMed)
Search period: through 11/23/2015

1.	("Blood Platelets"[Mesh]) OR ("Platelet-Rich Plasma"[Mesh] OR "Platelet Transfusion"[Mesh] OR "Platelet Count"[Mesh])	86234
2.	"Platelet concentrate" OR "Platelet-rich" OR "Platelet rich" OR "Platelet-leukocyte" OR "Platelet leukocyte" OR (platelet AND (gel* OR concentrate*) OR "buffy layer"	18715
3.	#1 OR #2	94230
4.	"Blood Component Transfusion"[Mesh] OR "Blood Transfusion, Autologous"[Mesh] OR "whole blood"[TIAB] OR "blood injection*"[TIAB] OR "autologous blood injection*"[TIAB] OR "blood injections"[TIAB]	61880
5.	#3 OR 4	146894
6.	((((((((((("Tendons"[Mesh] OR "Tendon Injuries"[Mesh]) OR "Tendinopathy"[Mesh]) OR "Tennis Elbow"[Mesh]) OR "Apoptosis"[Mesh]) OR "Fasciitis"[Mesh]) OR "Soft Tissue Injuries"[Mesh]) OR "Athletic Injuries"[Mesh]) OR "Contusions"[Mesh]) OR "Sprains and Strains"[Mesh]) OR "Muscle, Skeletal"[Mesh]) OR "Cartilage"[Mesh]) OR "Ligaments, Articular"[Mesh]) OR "Osteoarthritis"[Mesh]) OR "Low Back Pain"[Mesh]	617950
7.	((((((((((((((((((("soft tissue"[TI]) OR muscl*[TI]) OR Ligament*[TI]) OR Tendon*[TI]) OR Tendin*[TI]) OR Cartilage[TI]) OR Fasci*[TI]) OR Sport*[TI]) OR Athlet*[TI]) OR tear*[TIAB]) OR strain*[TIAB]) OR sprain*[TIAB]) OR damage*[TIAB]) OR trauma*[TIAB]) OR injur*[TIAB]) OR “low back pain”[TIAB]) OR “back pain”[TIAB]) OR lumbar[TIAB]) OR lumbo*[TIAB]) OR osteoarthritis[TIAB]) OR muscul*[TI]	2200089
8.	#6 OR #7	2545061
9.	#5 AND #8	14267
10.	#5 AND #8 Filters: Clinical Trial; Comparative Study; Controlled Clinical Trial; Guideline; Meta-Analysis; Multicenter Study; Observational Study; Practice Guideline; Pragmatic Clinical Trial; Randomized Controlled Trial; Systematic Reviews; Humans; Abstract; English	1552
11.	#10 NOT (Cadaver*[tw] OR Case Reports[Publication Type] OR Infant[mh] OR rat[tw] OR rats[tw] OR mouse[tw] OR mice[tw] OR dog[tw] or dogs[tw])	1369

Parallel strategies were used to search the Cochrane Library, EMBASE, and others listed below. Keyword searches were conducted in the other listed resources.

Electronic Database Searches

The following databases have been searched for relevant information:

Agency for Healthcare Research and Quality (AHRQ)
Cumulative Index to Nursing and Allied Health (CINAHL)
Cochrane Database of Systematic Reviews
Cochrane Registry of Clinical Trials (CENTRAL)
Cochrane Review Methodology Database
Database of Reviews of Effectiveness (Cochrane Library)
EMBASE
PubMed
Informational Network of Agencies for Health Technology Assessment (INAHTA)
NHS Economic Evaluation Database
HSTAT (Health Services/Technology Assessment Text)
EconLIT

Additional Economics, Clinical Guideline and Gray Literature Databases

AHRQ - Healthcare Cost and Utilization Project
Canadian Agency for Drugs and Technologies in Health
Centers for Medicare and Medicaid Services (CMS)
Food and Drug Administration (FDA)
Google
Institute for Clinical Systems Improvement (ICSI)
National Guideline Clearinghouse

APPENDIX C. Excluded Articles

Articles excluded as primary studies after full text review, with reason for exclusion.

	Citation	Reason for exclusion after full-text review
1.	Baltzer AW, Moser C, Jansen SA, Krauspe R. (2009) Autologous conditioned serum (Orthokine) is an effective treatment for knee osteoarthritis. *Osteoarthritis Cartilage.* 17(2):152-160.	Wrong intervention: PRP incubated
2.	Bernuzzi G, Petraglia F, Pedrini MF, et al. Use of platelet-rich plasma in the care of sports injuries: our experience with ultrasound-guided injection. Blood Transfus 2014;12 Suppl 1:s229-34.	Wrong intervention (autologous platelet concentrate, incubated at 37 degrees C for 15-30 mins).
3.	Daif ET. Autologous blood injection as a new treatment modality for chronic recurrent temporomandibular joint dislocation. Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology and Endodontology 2009;109:31-6.	Wrong comparison (both groups received autologous blood injections, Group A into the superior joint space (SJS) only and Group B into the SJS and the pericapsular tissues).
4.	Davenport KL, Campos JS, Nguyen J, Saboeiro G, Adler RS, Moley PJ. Ultrasound-Guided Intratendinous Injections With Platelet-Rich Plasma or Autologous Whole Blood for Treatment of Proximal Hamstring Tendinopathy: A Double-Blind Randomized Controlled Trial. J Ultrasound Med 2015;34:1455-63.	Wrong study design: N<10 patients per group
5.	de Vos RJ, Weir A, Tol JL, Verhaar JA, Weinans H, van Schie HT. No effects of PRP on ultrasonographic tendon structure and neovascularisation in chronic midportion Achilles tendinopathy. Br J Sports Med 2011;45:387-92.	Wrong outcome: ultrasonographic tissue characterization only
6.	Filardo G, Kon E, Di Martino A, et al. (2012) Platelet-rich plasma vs hyaluronic acid to treat knee degenerative pathology: study design and preliminary results of a randomized controlled trial. *BMC Musculoskelet Disord.* 13:229.	Preliminary report; Report of full trial used
7.	Filardo G, Kon E, Della Villa S, Vincentelli F, Fornasari PM, Marcacci M. Use of platelet-rich plasma for the treatment of refractory jumper's knee. Int Orthop 2010;34:909-15.	Wrong intervention: PRP frozen and incubated at 37degrees C to thaw
8.	Lee GW, Son JH, Kim JD, Jung GH. (2013) Is platelet-rich plasma able to enhance the results of arthroscopic microfracture in early osteoarthritis and cartilage lesion over 40 years of age? *Eur J Orthop Surg Traumatol.* 23(5):581-587.	Wrong intervention: PRP as adjunct to surgery
9.	Martin JI, Merino J, Atilano L, et al. Platelet-rich plasma (PRP) in chronic epicondylitis: study protocol for a randomized controlled trial. Trials 2013;14:410.	Wrong study design: protocol only.
10.	Maurer MA. Do plasma injections improve chronic achilles tendinopathy? American family physician2010:1272-7.	Wrong publication: summary of another (included) RCT
11.	Mishra A, Pavelko T. Treatment of chronic elbow tendinosis with buffered platelet-rich plasma. Am J Sports Med 2006;34:1774-8.	Wrong study design: N<10 patients per group
12.	Oh JH, Lhee SH, Park JY, Choi HW, Jeon SH, Eom JS. Extracorporeal Shock Wave Therapy versus Platelet-rich Plasma	Wrong publication: Korean lanuage only.

	Citation	Reason for exclusion after full-text review
	Injection for the Treatment of Lateral Epicondylitis: A Prospective Randomized Clinical Trial. Journal of the Korean Society for Surgery of the Hand2011:241-6.	
13.	Omar A, Ibrahim M, Ahmed A, Said M. Local injection of autologous platelet rich plasma and corticosteroid in treatment of lateral epicondylitis and plantar fasciitis: randomized clinical trial. The Egyptian Rheumatologist 2012;34:43-9.	Wrong intervention: PRP incubated at +200degrees C.
14.	Podesta L, Crow SA, Volkmer D, Bert T, Yocum LA. Treatment of partial ulnar collateral ligament tears in the elbow with platelet-rich plasma. Am J Sports Med 2013;41:1689-94.	Wrong study design (case series not designed specifically to evaluated safety/ complications [they do report complications (last paragraph of results) but the primary purpose was to report the clinical outcome, i.e., return to play and function]
15.	Shiple BJ. How effective are injection treatments for lateral epicondylitis? Clin J Sport Med 2013;23:502-3.	Wrong study design: comment.
16.	Wolf JM, Ozer K, Scott F, Gordon MJ, Williams AE. Comparison of autologous blood, corticosteroid, and saline injection in the treatment of lateral epicondylitis: a prospective, randomized, controlled multicenter study. J Hand Surg Am 2011;36:1269-72.	Wrong study design: N<10 patients per group
17.	Wright-Carpenter T, Klein P, Schaferhoff P, Appell HJ, Mir LM, Wehling P. Treatment of muscle injuries by local administration of autologous conditioned serum: a pilot study on sportsmen with muscle strains. Int J Sports Med 2004;25:588-93.	Wrong intervention (autologous conditioned serum, incubated at 37 degrees C).

APPENDIX D. Class of Evidence, Strength of Evidence, and QHES Determination

Each study is rated against pre-set criteria that resulted in a Risk of Bias (RoB) assessment and presented in a table. The criteria are listed in the Tables below.

Definition of the risk of bias for studies on therapy*

Risk of Bias	Studies of Therapy*	
	Study Design	**Criteria***
Low risk: Study adheres to commonly held tenets of high quality design, execution and avoidance of bias	Good quality RCT	• Random sequence generation • Statement of allocation concealment • Intent-to-treat analysis • Blind or independent assessment for primary outcome(s) • Co-interventions applied equally • F/U rate of 80%+ and <10% difference in F/U between groups • Controlling for possible confounding‡
Moderately low risk: Study has potential for some bias; study does not meet all criteria for class I, but deficiencies not likely to invalidate results or introduce significant bias	Moderate quality RCT	• Violation of one or two of the criteria for good quality RCT
	Good quality cohort	• Blind or independent assessment for primary outcome(s) • Co-interventions applied equally • F/U rate of 80%+ and <10% difference in F/U between groups • Controlling for possible confounding‡
Moderately High risk: Study has significant flaws in design and/or execution that increase potential for bias that may invalidate study results	Poor quality RCT	• Violation of three or more of the criteria for good quality RCT
	Moderate or poor quality cohort	• Violation of any of the criteria for good quality cohort
	Case-control	• Any case-control design
High risk: Study has significant potential for bias; lack of comparison group precludes direct assessment of important outcomes	Case series	• Any case series design

* Additional domains evaluated in studies performing a formal test of interaction for subgroup modification (i.e., HTE) based on recommendations from Oxman and Guyatt[3]:
  - Is the subgroup variable a characteristic specified at baseline or after randomization? (subgroup hypotheses should be developed a priori)
  - Did the hypothesis precede rather than follow the analysis and include a hypothesized direction that was subsequently confirmed?
  - Was the subgroup hypothesis one of a smaller number tested?

† Outcome assessment is independent of healthcare personnel judgment. Reliable data are data such as mortality or re-operation.

‡ Authors must provide a description of robust baseline characteristics, and control for those that are unequally distributed between treatment groups.

Determination of Overall Strength of Evidence

Following the assessment of the quality of each individual study included in the report, an overall "strength of evidence" for the relevant question or topic is determined. Methods for determining the overall strength of evidence are variable across the literature and are most applicable to evaluation of therapeutic studies.

SRI's method incorporates the primary domains of quality (CoE), quantity of studies and consistency of results across studies as described by AHRQ.

The following four possible levels and their definition will be reported:

- **High** – High confidence that the evidence reflects the true effect. Further research is very unlikely to change our confidence in the estimate of effect.
- **Moderate** - Moderate confidence that the evidence reflects the true effect. Further research may change our confidence in the estimate of effect and may change the estimate.
- **Low** - Low confidence that the evidence reflects the true effect. Further research is likely to change the confidence in the estimate of effect and likely to change the estimate.
- **Insufficient** – Evidence either is unavailable or does not permit a conclusion.

All AHRQ "required" and "additional" domains (risk of bias, consistency, directness, precision, publication bias) are assessed. Bodies of evidence consisting of RCTs were initially considered as High strength of evidence, while those comprised of nonrandomized studies began as Low strength of evidence. The strength of evidence could be downgraded based on the limitations described above. There are also situations where the nonrandomized studies could be upgraded, including the presence of plausible unmeasured confounding and bias that would decrease an observed effect or increase an effect if none was observed, and large magnitude of effect (strength of association).

Example methodology outline for determining overall strength of evidence (SoE):

All AHRQ "required" and "additional" domains* are assessed. Only those that influence the baseline grade are listed in table.

Baseline strength: Risk of bias (including control of confounding) is accounted for in the individual article evaluations. HIGH = majority of articles RCTs. LOW = majority of articles cohort studies.

DOWNGRADE: Inconsistency** of results (1 or 2); Indirectness of evidence (1 or 2); Imprecision of effect estimates (1 or 2); Sub-group analyses not stated *a priori* and no test for interaction (2)

UPGRADE: Large magnitude of effect (1 or 2); Dose response gradient (1)

Outcome	Strength of Evidence	Conclusions & Comments	Baseline	DOWNGRADE	UPGRADE
Outcome	**HIGH**	Summary of findings	**HIGH** RCTs	**NO** consistent, direct, and precise estimates	**NO**
Outcome	**MODERATE**	Summary of findings	**LOW** Cohort studies	**NO** consistent, direct, and precise estimates	**YES** Large effect
Outcome	**LOW**	Summary of findings	**HIGH** RCTs	**YES (2)** Inconsistent Indirect	**NO**

*Required domains: risk of bias, consistency, directness, precision. Plausible confounding that would decrease observed effect is accounted for in our baseline risk of bias assessment through individual article evaluation. Additional domains: dose-response, strength of association, publication bias.

**Single study = "consistency unknown", not downgraded

Assessment of Economic Studies

Full formal economic analyses evaluate both costs and clinical outcomes of two or more alternative interventions. The four primary types are cost minimization analysis (CMA), cost-utility analysis (CUA), cost-effectiveness analysis (CEA), and cost-benefit analyses (CBA). Each employs different methodologies, potentially complicating critical appraisal, but some common criteria can be assessed across studies.

No standard, universally accepted method of critical appraisal of economic analyses is currently in use. A number of checklists [Canadian, BMJ, AMA] are available to facilitate critique of such studies. The Quality of Health Economic Studies (QHES) instrument developed by Ofman, et al[2]. QHES embodies the primary components relevant for critical appraisal of economic studies[1,2]. It also incorporates a weighted scoring process and which was used as one factor to assess included economic studies. This tool has not yet undergone extensive evaluation for broader use but provides a valuable starting point for critique.

In addition to assessment of criteria in the QHES, other factors are important in critical appraisal of studies from an epidemiologic perspective to assist in evaluation of generalizability and potential sources of study bias.

Such factors include:

- Are the interventions applied to similar populations (e.g., with respect to age, gender, medical conditions, etc.)? To what extent are the populations for each intervention comparable and are differences considered or accounted for? To what extent are population characteristics consistent with "real world" applications of the comparators?
- Are the sample sizes adequate so as to provide a reasonable representation of individuals to whom the technology would be applied?
- What types of studies form the basis for the data used in the analyses? Data (e.g., complication rates) from randomized controlled trials or well-conducted, methodologically rigorous cohort studies for data collection are generally of highest quality compared with case series or studies with historical cohorts.
- Were the interventions applied in a comparable manner (e.g., similar protocols, follow-up procedures, evaluation of outcomes, etc.)?
- How were the data and/or patients selected or sampled (e.g., a random selection of claims for the intervention from a given year/source or all claims)? What specific inclusion/exclusion criteria or processes were used?
- Were the outcomes and consequences of the interventions being compared comparable for each? (e.g., were all of the relevant consequences/complications for each intervention considered or do they primarily reflect those for one intervention?)

Assessment of the overall strength of evidence for formal economic analyses does not appear to be documented in the literature.

REFERENCES

1. Chiou CF, Hay JW, Wallace JF, et al. Development and validation of a grading system for the quality of cost-effectiveness studies. Med Care 2003;41:32-44.
2. Ofman JJ, Sullivan SD, Neumann PJ, et al. Examining the value and quality of health economic analyses: implications of utilizing the QHES. J Manag Care Pharm 2003;9:53-61.
3. Oxman AD, Guyatt GH. A consumer's guide to subgroup analyses. Ann Intern Med 1992;116:78-84.

APPENDIX E. Study quality: Risk of bias evaluation

Appendix Table E1. Elbow Epicondylitis: Risk of bias evaluation

Study year	Random sequence generation*	Statement of concealment*	Intention to treat*	Blind assessment	Co-interventions applied equally	Complete F/U of ≥80%	<10% difference in F/U between groups	Controlling for confounding	Risk of Bias
RCTs									
Arik 2014	Unclear	Unclear	Yes	No	Yes	Yes (100%)	Yes	Yes	Mod High
Behera 2015	Unclear	Unclear	Yes	Yes	Yes	Yes (96%)	No (100% vs. 90%)	No	Mod High
Creaney 2011	Unclear	Unclear	Yes	Yes	Yes	Yes (86.7%)	Yes (88% vs. 86%)	Unclear	Mod High
Dojode 2012	Yes	Unclear	Unclear	No	Yes	Unclear	Unclear	Yes	Mod High
Gautam 2015	Unclear	Unclear	Unclear	No	Yes	Unclear	Unclear	Unclear	Mod High
Gosens 2011/ Peerboom 2010	Yes	Yes	Yes	Yes	Yes	Yes (94%)	Yes (94% vs. 94%)	No	Mod Low
Jindal 2013	No	Unclear	Yes	No	Yes	Unclear	Unclear	Yes	Mod High
Kazemi 2010	No	Unclear	Yes	No	Yes	Yes (100%)	Yes	Yes	Mod High
Krogh 2013	Yes	Yes	Yes	Yes	Yes	Yes (100% at 3 mos.)	Yes	No (PRP vs. steroid) Yes (PRP vs. saline	Mod Low (PRP vs steroid) Low (PRP vs. saline)
Lebiedzinski 2015	Yes	Yes	No	No	Yes	Yes (83%)	Yes (83% vs 82%)	No	Mod High
Mishra 2014	Yes	Unclear	No	Yes	Yes	Yes (3 mos: 83% 6 mos: 88% (119 of the 136 enrolled in 24-wk protocol)	3 mos.- yes (87% vs. 79%) 6 mos.: unclear (NR)	Unclear	Mod High

Study year	Random sequence generation*	Statement of concealment*	Intention to treat*	Blind assessment	Co-interventions applied equally	Complete F/U of ≥80%	<10% difference in F/U between groups	Controlling for confounding	Risk of Bias
Ozturan 2010	Unclear	Unclear	No	No	Yes (ABI vs. steroid) No (ABI vs. shock wave	Yes (95%)	No (ABI vs. steroid: 90% vs. 100%) Yes (ABI vs. shock wave: 90% vs. 95%)	Yes	Mod High
Raeissadat 2014 "Is"	Yes	Yes	No	Yes (MMCPIE) Unclear (VAS)	Yes	Yes (95%)	Yes (94% vs. 97%)	Yes	Mod Low
Raeissadat 2014 "Effect"	Yes	Yes	No	Yes (MMCPIE) Unclear (VAS)	Yes	Yes (89%)	Yes (87% vs. 91%)	Yes	Mod Low
Singh 2013	No	Unclear	Unclear	No	Yes	Unclear	Unclear	Yes	Mod High
Stenhouse 2013	Yes	Unclear	Yes	Unclear	Yes	Yes (89%)	Yes (87% vs. 92%)	No	Mod High
Thanasas 2011	Yes	Unclear	Yes	No	Yes	Yes (96%)	Yes (100% vs. 93%)	Yes	Mod Low
Yadav 2015	Unclear	Unclear	Yes	Unclear	Yes	Yes (92%)	Unclear	No	Mod High
Cohort Studies									
Ford 2014	NA	NA	NA	No	Yes	Unclear	Unclear	No	Mod High
Tetschke 2015	NA	NA	NA	No	Yes	Yes (84%)	Yes (87% vs. 84%)	No	Mod High
Tonk 2013	NA	NA	NA	No	Yes	Unclear	Unclear	No	Mod High

*Domains assessed for RCTs only

"Unclear" indicates no information was provided unless otherwise noted below

Reasons for No credit (or unclear credit if for reason other than no info provided):

- Arik: there was a clear statement that physician who evaluated outcomes was not blinded (nor were patients)
- Behera: differences in percentage of males between groups (20% vs. 44%) were not controlled for
- Creaney: randomization by sealed envelopes (no other info provided); limited baseline characteristics reported (age, sex, baseline PRTEE score) duration of pain NR
- Dojode: no clear statement of loss to follow-up; patients not blinded to treatment, outcomes were patient-reported (VAS, Nirschl)

- Gautam: no clear statement of loss to follow-up; specified only that assessor was blind to ultrasonographic readings, did not mention for other outcomes; baseline differences between groups in Oxford Elbow Score were not controlled for, limited baseline characteristics reported (baseline pain and function)
- Gosens: baseline imbalances in DASH scores not controlled for (54.3 vs. 43.3)
- Jindal: randomization by alternate allocation; patients not blinded to treatment, outcomes were patient-reported (VAS, Nirschl)
- Kazemi: randomization by alternate allocation; patients not blinded to treatment, outcomes were patient-reported (VAS, Nirschl, qDASH)
- Krogh: 100% f/u through 3 months (6 & 12 month data excluded due to high loss to f/u (i.e., ≥50% loss); in steroid group, the mean duration of symptoms was approximately twice as long as the PRP group and this difference was not controlled for; other baseline imbalances in % male (45% vs. 55%) and % of patients with previous glucocorticoid treatment for epicondylitis (60% vs. 50%)- these differences were not controlled for
- Lebiedzinski: one patient excluded from analysis – unclear whether this was b/c they were lost to f/u or because they had previous operative procedures of the elbow; clear statement that patients and researchers were not blinded; differences between groups in % female (47% vs. 74%) were not controlled for; duration of pain at baseline NR
- Mishra: intent to treat- no credit because one patient excluded from all analyses after randomization due to blood draw failure; 88% follow-up at 6 months based on the complete f/u of 119 of the 136 enrolled in the 24-wk protocol (the 136 patients was a subset of the 231 randomized); most baseline characteristics not reported (i.e., age, sex, duration of pain)
- Ozturan: patients excluded from analysis after randomization was performed; patients in autologous blood and steroid injections allowed repeat procedures if pain did not "improve significantly", but those in the shock wave therapy were not; patients not blinded to treatment, outcomes were patient-reported (VAS)
- Raessidat "Is": patients excluded from analysis after randomization was performed; unclear whether patients were blinded, and some outcomes (VAS) were patient-reported
- Raessidat "Effect": patients excluded from analysis after randomization was performed; unclear whether patients were blinded, and some outcomes (VAS) were patient-reported
- Singh: randomization performed by alternate allocation; patients not blinded to treatment, outcomes were patient-reported (PRTEE)
- Stenhouse: baseline imbalances not controlled for: % male (53% vs. 39%), baseline VAS (8.1 vs. 6.9), baseline MMCPIE (11.1 vs. 22.9)
- Yadav: baseline characteristics were only reported for patients w/ complete follow-up rather than for groups as randomized; baseline imbalances in % male not controlled for (33% vs. 23%)
- Thanasas: patients were not blinded, and both pain and function outcomes (VAS, Liverpool) were patient-reported
- Ford: Blinding not possible (PRP injections vs. surgery); no explicit statement that either (a) factors that could affect outcomes were evaluated as potential confounders or (b) specific factors were controlled for
- Tetschke: Blinding not possible (PRP injections vs. laser therapy); Note that % f/u calculated using the 61 originally included patients as the denominator; no explicit statement that either (a) factors that could affect outcomes were evaluated as potential confounders or (b) specific factors were controlled for.
- Tonk: Patients knew their treatment, and assessed their own outcome (Nirschl score); No explicit statement that either (a) factors that could affect outcomes were evaluated as potential confounders or (b) specific factors were controlled for

Appendix Table E2. Achilles Tendinopathy: Risk of bias evaluation

Study year	Random sequence generation*	Statement of concealment*	Intention to treat*	Blind assessment	Co-interventions applied equally	Complete F/U of ≥80%	<10% difference in F/U between groups	Controlling for confounding	Risk of Bias
RCTs									
Bell 2013	Yes	Yes	Yes	Yes	Yes	Yes (94%)	Yes (96% vs. 93%)	No	Mod Low
De Jonge 2011/ De Vos 2010	Yes	Yes	Yes	Yes	Yes	Yes (3, 6, 12 mos.: 100%)	Yes	Yes	Low
Kearney 2013	Yes	Yes	Yes	No	Yes	Yes (95%)	No (90% vs. 100%)	No	Mod High
Pearson 2012	Yes	Yes	Yes	No	Yes	No (70%)	Yes (70% vs. 70%)	Yes	Mod Low

*Domains assessed for RCTs only

Unclear: no information provided unless otherwise noted below

Reasons for No credit (or unclear credit if for reason other than no info provided):

- Bell: Percent males (62% vs. 44%) and mean duration of symptoms 23 ± 33 vs. 39 ± 85 months) was imbalanced for ABI vs. DN; these differences were not controlled for. The difference in symptom duration appeared to be attributed to a higher percentage of patients in the DN group with symptom duration >100 months (n=NR) (mean duration of symptoms in those with duration ≤100 months was 15 ± 17 vs. 18 ± 20).
- Kearney: statement that neither patients nor treatment providers were blind to treatment allocation (and outcomes were patient-reported); baseline imbalance in EQ-5D score was not controlled for
- Pearson: clear statement that patients nor providers were blind to treatment (and outcomes were patient-reported)

Appendix Table E3. Patellar Tendinopathy: Risk of bias evaluation

Study year	Random sequence generation*	Statement of concealment*	Intention to treat*	Blind assessment	Co-interventions applied equally	Complete F/U of ≥80%	<10% difference in F/U between groups	Controlling for confounding	Risk of Bias
RCTs									
Dragoo 2013	Yes	Yes	No	Yes	Yes	3 mos.: Yes (91%) 6 mos.: No (74%)	3 mos.: Yes (90% vs. 92%) 6 mos.: No (80% vs. 69%)	No	Mod Low (3 mos.) Mod High (6 mos.)
Vetrano 2013	Yes	Unclear	Yes	No	Yes	Yes (96%)	Yes (96% vs. 96%)	Yes	Mod Low

*Domains assessed for RCTs only

Unclear: no information provided unless otherwise noted below

Reasons for No credit (or unclear credit if for reason other than no info provided):

- Dragoo: No credit for ITT- one patient in the dry needling group declined treatment and was excluded from all analyses, and for the 6 month analysis although the authors stated that an ITT analysis was performed for the 6-month data, only the data from the per-protocol analysis was reported; baseline differences between groups in age were not controlled for
- Vetrano: although investigator evaluating outcomes was blinded, the patients were not and all outcomes of interest were patient-reported

Appendix Table E4. Rotator cuff tendinopathy: Risk of bias evaluation

Study year	Random sequence generation*	Statement of concealment*	Intention to treat*	Blind assessment	Co-interventions applied equally	Complete F/U of ≥80%	<10% difference in F/U between groups	Controlling for confounding	Risk of Bias
RCTs									
Kesikburun 2013	Yes	Yes	Yes	Yes	Yes	Yes (98%)	Yes (100% vs. 95%)	Yes	Low
Rha 2012	Yes	Unclear	Yes	Yes	Yes	3 mos.: Yes (82%) 6 mos.: No (77%)	3 mos.: Yes (80% vs. 84%) 6 mos.: Yes (80% vs. 74%)	Yes	Mod Low
Cohort Studies									
Von Wehren 2015	NA	NA	NA	No	Yes	No (78%)	No (84% vs. 72%)	No	Mod High

"Unclear" indicates no information was provided unless otherwise noted below
Reasons for No credit (or unclear credit if for reason other than no info provided):

- Rha: allocation concealed with sealed numbered envelopes but no mention was made that the envelopes were opaque
- Von Wehren: Bind assessment: all outcomes of interest are patient-reported but due to the study design, patients were not blinded to the injection received; authors do not provide a robust set of baseline demographics; no indication that any controlling for potential confounder was done.

Appendix Table E5. Plantar fasciitis: Risk of bias evaluation

Study year	Random sequence generation*	Statement of concealment*	Intention to treat*	Blind assessment	Co-interventions applied equally	Complete F/U of ≥80%	<10% difference in F/U between groups	Controlling for confounding	Risk of Bias
RCTs									
Chew 2013	Yes	Unclear	Unclear	Function (AOFAS): Yes Pain (VAS): No	Yes	Yes (83%)	Yes (79% vs. 89% vs. 81%	No	Mod High
Jain 2015	Yes	Unclear	Unclear	No	Yes	Unclear	Unclear	Unclear	Mod High
Kalaci 2009	Unclear	Unclear	No	Yes	Yes	Unclear	Unclear	No	Mod High
Kim 2014	Unclear	Unclear	Yes	Yes	Yes	Yes (95%)	No (90% vs. 100%)	No	Mod High
Kiter 2006	Yes	Unclear	Yes	Function (AOFAS): Yes Pain (VAS): No	Yes	Yes (98%)	Yes (100% vs. 100% vs. 93%)	Unclear	Mod High
Lee 2007	Yes	Unclear	Yes	No	Yes	Yes (95%)	Yes (91% vs. 100%)	Unclear	Mod High
Monto 2014	Unclear	Unclear	Unclear	Yes	Yes	Unclear	Unclear	No	Mod High
Tiwari 2013	Unclear	Unclear	Unclear	No	Yes	Unclear	Unclear	Unclear	Mod High
Cohort Studies									
Aksahin 2012	NA	NA	NA	Yes	Yes	Unclear	Unclear	No	Mod High
Say 2014	NA	NA	NA	Unclear	Yes	Unclear	Unclear	No	Mod High
Shetty 2014	NA	NA	NA	No	Unclear	Unclear	Unclear	No	Mod High

*Domains assessed for RCTs only
Unclear: no information provided unless otherwise noted below
Reasons for No credit (or unclear credit if for reason other than no info provided):

- Chew: Patients were not blind to treatment so patient-reported outcome (VAS) not blinded; median pain duration different between PRP and ESWT groups (12 vs. 18 mos.), higher baseline AOFAS scale score in conventional treatment group than PRP group (72 vs. 65, which are considered fair vs. poor according to the paper), and the difference was not controlled for
- Jain: Patients were not blind to treatment so patient-reported outcome (VAS) not blinded
- Kalaci: The study stated that "two additional groups of patients were formed and also included in this study. Peppering was used with saline in one group and with autologous blood injections in the other. However these attempts were discontinued after a few patients because the procedure was too painful." No information was otherwise given on these groups, including whether the treated patients were then excluded or re-allocated to a different group. Baseline differences between groups in the following: duration of foot pain between ABI and anesthetic group (8 ± 13 vs. 12 ± 21 mos.), weight between ABI and both control groups (73 (ABI) vs. 83 vs. 88 kg), and BMI between ABI and both control groups (28 (ABI) vs. 30 vs. 32)
- Kim: Patients randomized according to even vs. odd "sequence numbers"; the primary outcome (FFI) was patient-reported and patients were blind to treatment received; imbalances in baseline FFI total scores between groups that were not controlled for (152 vs. 133)
- Kiter: Patients were not blind to treatment so patient-reported outcome (VAS) not blinded
- Lee: Patients were not blind to treatment so patient-reported outcome (VAS) not blinded; baseline data did not include the 3 ABI patients lost to f/u
- Monto: Mean baseline AOFAS score was different between groups (37 vs. 52), and the difference was not controlled for
- Tiwari: Patients were not blind to treatment so patient-reported outcome (VAS) not blinded
- Aksahin: No explicit statement that either (a) factors that could affect outcomes were evaluated as potential confounders or (b) specific factors were controlled for
- Say: No explicit statement that either (a) factors that could affect outcomes were evaluated as potential confounders or (b) specific factors were controlled for
- Shetty: Statement that no blinding was possible; no explicit statement that either (a) factors that could affect outcomes were evaluated as potential confounders or (b) specific factors were controlled for

Appendix Table E6. Acute muscle injuries: Risk of bias evaluation

Study year	Random sequence generation*	Statement of concealment*	Intention to treat*	Blind assessment	Co-interventions applied equally	Complete F/U of ≥80%	<10% difference in F/U between groups	Controlling for confounding	Risk of Bias
RCTs									
Bubnov 2013	Unclear	Unclear	Unclear	No	Yes	Unclear	Unclear	Unclear	Mod High
Hamid 2014	Yes	Yes	Yes	Yes- return to sports No- BPI-SF	Yes	Yes (86%)	Yes (86% vs. 86%)	Yes	Mod Low
Hamilton 2015	Yes	Unclear	Yes	Yes	Yes	Yes (2 mos.: 85%, 6 mos.: 92%)	Yes (2 mos.: 83% vs. 87%) No (6 mos.: 87% vs. 97%)	Yes	Mod Low
Reurink 2015	Yes	Yes	Yes	Yes	Yes	Yes 2.5 mos.: 100%, 12 mos.: 91%)	Yes (2.5 mos.: 100% vs. 100%; 12 mos.: 90% vs. 92%)	Yes	Low

"Unclear" indicates no information was provided unless otherwise noted below

Reasons for No credit (or unclear credit if for reason other than no info provided):

- Bubnov patients were not blinded to the treatment received; no mention of blinded assessment for clinical reported outcomes.
- Hamid: no credit for BPI-SF (patient-reported; patients were not blinded to treatment)
- Hamilton: Allocation concealment ensured by "each patient receiv[ing] a unique research number and this number along with the identifying code was stored in a secure location for the duration of the study"- but how this was ensured was not reported.

Appendix Table E7. Ankle sprain: Risk of bias evaluation

Study year	Random sequence generation*	Statement of concealment*	Intention to treat*	Blind assessment	Co-interventions applied equally	Complete F/U of ≥80%	<10% difference in F/U between groups	Controlling for confounding	Risk of Bias
RCTs									
Rowden 2015	Unclear	Unclear	Yes	Yes	No	Unclear	Unclear	Unclear	Mod High

"Unclear" indicates no information was provided unless otherwise noted below

Reasons for No credit (or unclear credit if for reason other than no info provided):

- Rowden: baseline characteristics not reported for the patients randomized who withdrew after randomization; lack of robust baseline data

Appendix Table E8. Osteochondral lesion of the talus: Risk of bias evaluation

Study year	Random sequence generation*	Statement of concealment*	Intention to treat*	Blind assessment	Co-interventions applied equally	Complete F/U of ≥80%	<10% difference in F/U between groups	Controlling for confounding	Risk of Bias
RCTs									
Mei-Dan 2012	No	Unclear	Yes	No	Yes	Yes (91%)	Yes (94% vs. 88%)	No	Mod High

"Unclear" indicates no information was provided unless otherwise noted below

Reasons for No credit (or unclear credit if for reason other than no info provided):

- Mei-Dan: Patients allocated in sequential blocks of five according to order of presentation; no blinding performed for patients or investigators; differences in baseline VAS pain between groups not controlled for (4.1 vs. 5.6)

Appendix Table E9. Temporomandibular joint dislocation: Risk of bias evaluation

Study year	Random sequence generation*	Statement of concealment*	Intention to treat*	Blind assessment	Co-interventions applied equally	Complete F/U of ≥80%	<10% difference in F/U between groups	Controlling for confounding	Risk of Bias
RCTs									
Hegab 2013	Yes	Yes	Yes	Unclear	Yes	Unclear	Unclear	Unclear	Mod High

"Unclear" indicates no information was provided unless otherwise noted below

Reasons for No credit (or unclear credit if for reason other than no info provided):

- Hegab: robust set of baseline characteristics not reported

Appendix Table E10. Achilles tendon acute tear: Risk of bias evaluation

Study year	Random sequence generation*	Statement of concealment*	Intention to treat*	Blind assessment	Co-interventions applied equally	Complete F/U of ≥80%	<10% difference in F/U between groups	Controlling for confounding	Risk of Bias
Cohort studies									
Kaniki 2014	NA	NA	NA	No	Yes	No (69%)	Yes (81% vs. 57%)	No	Mod High

*Domains assessed for RCTs only
Unclear: no information provided unless otherwise noted below
Reasons for No credit (or unclear credit if for reason other than no info provided):

- Kaniki: Patients were not blind to treatment so patient-reported outcome (VAS) not blinded; no explicit statement that either (a) factors that could affect outcomes were evaluated as potential confounders or (b) specific factors were controlled for

Appendix Table E11. Knee Osteoarthritis (OA) PRP vs. HA: Risk of bias and class of evidence

Study year	Random sequence generation*	Statement of concealment*	Intention to treat*	Blind assessment	Co-interventions applied equally	Complete F/U of ≥80%	<10% difference in F/U between groups	Controlling for confounding	Risk of Bias
RCTs									
Cerza 2012	Unclear	Unclear	Yes	No- WOMAC	Yes	Yes (100%)	Yes (100% vs. 100%)	Yes	Mod High
Raeissadat 2015	Yes	No	No	No- SF-36, PCS-36, MCS-36, WOMAC	Yes	Yes (86.8%)	Yes (88.5% vs. 84.93%)	No	Mod High
Filardo 2015	Yes	Yes	Yes	Yes	Yes	Yes (95.3%)	Yes (97.9% vs. 92.7%)	Yes	Low
Gormeli 2015	Yes	No	No	Yes	Yes	Yes (89.1%)	Yes (91.2% vs. 84.8%)	Yes	Mod Low
Sanchez 2012	Yes	Yes	No	Yes	Yes	Yes (86.9%)	Yes (88.8% vs. 85.05%)	Yes	Mod Low
Vaquerizo 2013	Yes	Yes	Yes	Yes	Yes	Yes (93.75%)	Yes (88.76% vs. 83.3%)	Yes	Low
Observational Studies									
Kon 2011	-	-	-	Unclear	Yes	Unclear	Unclear	Yes	Mod High
Sanchez 2008	-	-	-	Unclear†	Yes	Unclear	Unclear	Yes	Mod High

Study year	Random sequence generation*	Statement of concealment*	Intention to treat*	Blind assessment	Co-interventions applied equally	Complete F/U of ≥80%	<10% difference in F/U between groups	Controlling for confounding	Risk of Bias
Say 2013	-	-	-	Unclear	Yes	Unclear	Unclear	Yes	Mod High
Spakova 2012	-	-	-	Unclear	Yes	Unclear	Unclear	Yes	Mod High

MCS-36: Mental component summary score of the SF-36; PCS-36: Physical component summary score of the SF-36; SF-36: Short form-36; WOMAC: Western Ontario and McMaster Osteoarthritis Index

"Unclear" indicates no information was provided unless otherwise noted below.

* Criteria applicable only to RCTs.

Reasons for No credit (or Unclear credit if for reason other than no info provided):

- Cerza: Clinicians were not blinded, and authors did not indicate if patients were blinded.
- Raeissadat: Did not indicate if group assignment via random numbers table was concealed, so no credit for statement of concealment was given. Patients (n=14) were excluded from final analysis after randomization for consuming NSAIDs (n=10) or undergoing total knee arthroplasty (n=4), so no credit for intention to treat analysis was given. Authors indicate study was not blind, so no credit for blind assessment was given. Baseline age, sex, WOMAC: Pain, WOMAC: Function, and WOMAC: Total were significantly ($p < 0.05$) different between groups but authors did not adjust for these variables in final analysis, so no credit for controlling for confounding was given.
- Gormeli: Did not indicate if random group assignment via computer-derived protocol was concealed, so no credit for statement of concealment was given. Patients (n=4) were excluded from final analysis after randomization for not receiving allocated intervention, so no credit for intention to treat analysis was given.
- Sanchez 2012: Patients (n=16) were excluded from final analysis after randomization for consuming NSAIDs (n=7), having corticosteroid infiltrations (n=6), and undergoing surgical procedures (n=2), so no credit for intention to treat analysis was given.
- Sanchez 2008: It is unclear if the patient was blinded; primary outcomes of interest are patient-reported WOMAC scores, so unclear credit given for blind assessment.

Appendix Table E12. Knee Osteoarthritis (OA) PRP vs. Saline: Risk of bias and class of evidence

Study year	Random sequence generation*	Statement of concealment*	Intention to treat*	Blind assessment	Co-interventions applied equally	Complete F/U of ≥80%	<10% difference in F/U between groups	Controlling for confounding	Risk of Bias
RCTs									
Patel 2013	Yes	No	No	Yes	Yes	Yes (94.8%)	Yes (98% vs. 88.5%)	Yes	Mod Low
Gormeli 2015†	Yes	No	No	Yes	Yes	Yes (90.4%)	Yes (91.2% vs. 88.8%)	Yes	Mod Low

"Unclear" indicates no information was provided unless otherwise noted below
* Criteria applicable only to RCTs.
† Gormeli was also included in the PRP vs. HA comparator group.
Reasons for No credit (or Unclear credit if for reason other than no info provided):

- Patel: Did not indicate if group assignment via computer-derived random charts was concealed, so no credit for statement of concealment was given. Patients (n=3) were excluded from final analysis after randomization for not receiving allocated intervention, so no credit for intention to treat analysis was given.
- Gormeli: Did not indicate if random group assignment via computer-derived protocol was concealed, so no credit for statement of concealment was given. Patients (n=4) were excluded from final analysis after randomization for not receiving allocated intervention, so no credit for intention to treat analysis was given.

Appendix Table E13. Knee Osteoarthritis (OA) PRP vs. TENS + Exercise (Angoorani) or Exercise Alone (Rayegani): Risk of bias and class of evidence

Study year	Random sequence generation*	Statement of concealment*	Intention to treat*	Blind assessment	Co-interventions applied equally	Complete F/U of ≥80%	<10% difference in F/U between groups	Controlling for confounding	Risk of Bias
RCTs									
Angoorani 2014	Yes	Unclear	Yes	No- KOOS, VAS, time to feel pain	Yes	Yes (92.5%)	Yes (96.2% vs. 88.8%)	Yes	Mod Low
Rayegani 2014	Yes	No	Yes	No- WOMAC, SF-36	Yes	Yes (93.8%)	Yes (96.8% vs. 93.9%)	Yes	Mod Low

"Unclear" indicates no information was provided unless otherwise noted below.
* Criteria applicable only to RCTs.
Reasons for No credit (or Unclear credit if for reason other than no info provided):

- Angoorani: Authors indicate that the study was not blinded, so no credit for blind assessment was given.
- Rayegani: Did not indicate if group assignment via random numbers table was concealed, so no credit for statement of concealment was given. Authors indicate that the study was not blinded, so no credit for blind assessment was given.

Appendix Table E14. Knee Osteoarthritis (OA) PRP vs. CS: Risk of bias and class of evidence

Study year	Random sequence generation*	Statement of concealment*	Intention to treat*	Blind assessment	Co-interventions applied equally	Complete F/U of ≥80%	<10% difference in F/U between groups	Controlling for confounding	Risk of Bias
RCTs									
Forogh 2015	Yes	Yes	No	Yes	Yes	Yes (81.3%)	No (95.8% vs. 66.7%)	Yes	Mod Low

"Unclear" indicates no information was provided unless otherwise noted below.
* Criteria applicable only to RCTs.
Reasons for No credit (or Unclear credit if for reason other than no info provided):

- Patients (n=7) were excluded from final analysis after randomization for being diagnosed with and L3/L4 radiculopathy (n=1) or undergoing PT or acupuncture (n=6), so no credit for intention to treat analysis was given.

Appendix Table E15. Hip Osteoarthritis (OA): Risk of bias and class of evidence

Study year	Random sequence generation*	Statement of concealment*	Intention to treat*	Blind assessment	Co-interventions applied equally	Complete F/U of ≥80%	<10% difference in F/U between groups	Controlling for confounding	Risk of Bias
RCTs									
Battaglia 2013	Yes	No	Yes	No- Harris Hip Score, VAS	Yes	Yes (96.1%)	Yes (96.1% vs. 96.1%)	Yes	Mod Low

VAS: Visual analog scale
"Unclear" indicates no information was provided unless otherwise noted below
* Criteria applicable only to RCTs.
Reasons for No credit (or Unclear credit if for reason other than no info provided):

- Did not indicate if group assignment via Research Randomizer System as concealed, so no credit for statement of concealment was given. Patients and physicians were not blinded during the entire study course, so no credit for blind assessment was given.

Appendix Table E16. TMJ Osteoarthritis (OA): Risk of bias and class of evidence

Study year	Random sequence generation*	Statement of concealment*	Intention to treat*	Blind assessment	Co-interventions applied equally	Complete F/U of ≥80%	<10% difference in F/U between groups	Controlling for confounding	Risk of Bias
RCTs									
Hegab 2015	Unclear	Yes	Unclear	No	Unclear	Unclear	Unclear	Yes	Mod High

"Unclear" indicates no information was provided unless otherwise noted below
* Criteria applicable only to RCTs
Reasons for No credit (or Unclear credit if for reason other than no info provided):

- Patients were blinded, but clinicians were not. Primary outcomes were clinician measured maximum voluntary mouth opening and patient reported VAS for pain; thus blinding for assessment of both primary outcomes was not done
- Limited detail of when patient exclusions were made, refusal to participate was encountered relative to randomization or in which groups loss to follow- up occurred precluding determination of intention to treat analysis, and follow-up.
- NSAIDs were forbidden in the PRP group post-injection; no NSAID consumption restrictions were indicated for the HA group.

APPENDIX F. Study Characteristics and Patient Demographics Summary Tables

Appendix Table F1. Elbow epicondylitis RCTs comparing PRP to ABI: Study and Patient Characteristics

	Creaney 2011		Raeissadat 2014a "platelet"		Raeissadat 2014b "effect"		Thanasas 2011	
	PRP (n = 80)	ABI (n = 70)	PRP (n = 32)	ABI (n = 30)	PRP (n = 22)	ABI (n = 20)	PRP (n = 14)	ABI (n = 14)
Patient demographics								
Males, %	57%	56%	26%	20%	25%	15%	33%	21%
Age, years; mean ± SD	53	48	43 ± 6	44 ± 7	47 ± 6.3	45 ± 8.7	36 (34 to 55)*	37 (29 to 52)*
Minimum duration of symptoms	≥6 mos.		>3 mos.		>3 mos.		≥3 mos.	
Mean duration of symptoms, mos.; mean ± SD	NR		15 ± 3 mos.		15 ± 3 mos.		5 (3 to 12)* mos.	5 (3 to 14)* mos.
Previously failed conservative therapy	Yes (including physical therapy exercises but not: steroid injection, DN or blood injection)		Not required		Not required		Not required	
VAS pain (0-10 (worst)), mean ± SD	NR	NR	7.1 ± 2.1	6.8 ± 1.5	7.2 ± 1.4	6.8 ± 1.7	6.1 ± 1.3†	6.0 ± 1.3†
PRTEE (0-100 worst), mean ± SD	45.8 ± 17.6†	52.5 ± 17.1†	NR	NR	NR	NR	NR	NR
MMCPIE score (0 to 100 (best)), mean ± SD	NR	NR	53.9 ± 16.0	48.8 ± 18.0	58.4 ± 15.1	50.9 ± 20.4	NR	NR
Liverpool elbow score (0 to 10 (best)) mean ± SD	NR	NR	NR	NR	NR	NR	7.0 ± 0.3†	7.0 ± 0.6†
Procedural characteristics								
Patient blinded to treatment received	Yes		Unclear		Unclear		No	
Peppering technique used	No	No	Yes	Yes	Yes	Yes	Yes	Yes
PRP/ABI volume injected	1.5 mL	NR	2 mL	2 mL	2 mL	2 mL	3 mL	3 mL
Platelet concentration,	6.5×10^7	2.3×10^7	$1.2 \times 10^9 \pm 2.5$	$2.5 \times 10^8 \pm$	$9.9 \times 10^8 \pm$	$2.2 \times 10^8 \pm$	1.3×10^6	2.4×10^5

	Creaney 2011		Raeissadat 2014a "platelet"		Raeissadat 2014b "effect"		Thanasas 2011	
	PRP (n = 80)	ABI (n = 70)	PRP (n = 32)	ABI (n = 30)	PRP (n = 22)	ABI (n = 20)	PRP (n = 14)	ABI (n = 14)
platelets/mL; mean ± SD			x 10^8	5.3 x 10^7	4.3 x 10^7	2.3 x 10^7		
Activating agent used	NR	NR	None	NR	NR	NR	None	NR
Local anesthetic used	Bupivacaine‡		Lidocaine 1%		Lidocaine 1%		None	
Other injectate	None		Anticoagulant	None	Anticoagulant	None	Anticoagulant	None
Imaging guidance	Ultrasound		NR		NR		Ultrasound	
Repeat injections/procedures	2 injections total over 1 mos.		None		None		None	
Cross-over (timing)	0%	0%	0%	0%	0%	0%	0%	0%
Co-interventions	Paracetamol as needed, avoid anti-inflammatory drugs		Paracetamol as needed; tennis elbow strap, elbow splint, eccentric loading exercises (5 weeks)		Paracetamol as needed; tennis elbow strap, elbow splint, eccentric loading exercises (5 weeks)		Paracetamol for pain, stretching and eccentric loading exercise program (5 weeks)	
Length (%) f/u								
Short-term	NR		NR		2 mos. (89%)		3 mos. (100%)	
Intermediate-term	6 mos. (87%)		NR		NR		6 mos. (96%)	
Long-term	NR		12 mos. (95%)		NR		NR	
Country	UK		Iran		Iran		Greece	
Funding	None		NR		University		NR	
Risk of bias	Moderately High		Moderately Low		Moderately Low		Moderately Low	

PRTEE: Patient-related tennis elbow evaluation; PPT: pain-pressure threshold; Visual Analog Scale
*Range
†SD calculated using study-reported 95% CI
‡Concentration NR

Appendix Table F2. Elbow epicondylitis RCTs comparing PRP to Conservative Control (Steroid): Study and Patient Characteristics (1-5 of 8 trials)

	Gautam 2015		Gosens 2011 / Peerbooms 2010		Krogh 2013		Yadav 2015		Lebiedzinski 2015	
	PRP (n = 15)	Steroid (n = 15)	PRP (n = 51)	Steroid (n = 49)	PRP (n = 20)	Steroid (n =20)	PRP (n = 30)	Steroid (n = 30)	PRP (n = 53)	Steroid (n = 46)
Patient demographics										
Males, %	NR	NR	48%	44%	45%	55%	33%	23%	53%	26%
Age, years; mean ± SD	NR	NR	47 ± 9	47 ± 8	48 ± 7	44 ± 9	37	37	47 (25-67)§	54 (21-96)§
Minimum duration of symptoms	>6 mos.		≥6 mos.		>3 mos.		NR		≥1.5 mos.	
Mean duration of symptoms, mos.; mean ± SD	NR	NR	NR	NR	18 ± 36	36 ± 54	2.2	1.9	NR	NR
Previous episodes	NR	NR	NR	NR	60%†	50%†	NR	NR	NR	NR
Previously failed conservative therapy	Yes (oral medication or non-invasive treatment (not described))		Yes (physical therapy, steroid injections, or cast immobilization)		Not required		Not required		Not required	
VAS pain (0-10 (worst)), mean ± SD	7.1 ± 0.8	7.0 ± 0.8	69.0 ± 15.9*	66.2 ± 14.0*	NR	NR	7.6	7.7	NR	NR
PRTEE pain (0-50 (worst)), mean ± SD	NR	NR	NR	NR	27.5 ± 7.5	28.0 ± 8.0	NR	NR	NR	NR
PRTEE function (0-100 (worst)), mean ± SD	NR	NR	NR	NR	51.5 ± 19.1	51.1 ± 22.3	NR	NR	NR	NR
MMCPIE score (0 to 100 (best)), mean ± SD	56.1 ± 6.9	56.8 ± 5.4	NR	NR	NR	NR	NR	NR	NR	NR
DASH (0-100 (worst)), mean ± SD	69.7 ± 6.1	67.5 ± 6.9	54.3 ± 19.5	43.3 ± 16.1	NR	NR	88‡	88‡	53.2 ± 15.5	58.6 ± 14.8
Oxford elbow score (1-100 (best)), mean ± SD	27.4 ± 3.9	31.2 ± 4.1	NR	NR	NR	NR	NR	NR	NR	NR
Procedural characteristics										
Patient blinded to treatment received	Unclear		Yes		Yes		Unclear		No	
Peppering technique used	Yes	Yes	Yes	Yes	Yes	No			NR	NR

	Gautam 2015		Gosens 2011 / Peerbooms 2010		Krogh 2013		Yadav 2015		Lebiedzinski 2015	
	PRP (n = 15)	Steroid (n = 15)	PRP (n = 51)	Steroid (n = 49)	PRP (n = 20)	Steroid (n =20)	PRP (n = 30)	Steroid (n = 30)	PRP (n = 53)	Steroid (n = 46)
PRP volume injected	2 mL	-	3 mL	-	NR	-	1 mL	-	Unclear	-
Platelets/mL; mean ± SD	NR	-	NR	-	8x blood	-	1.0 x 10^9	-	NR	-
Activating agent used	NR	-	None	-	NR	-	NR	-	NR	-
Local anesthetic used	No		Bupivacaine 0.5%		None	Lidocaine (10 mg/mL)	None		1% lignocaine	
Other injectate	None	MPSS 80 mg	$NaHCO_3$ 8.4%; epinephrine 1:200,000	TAC 40 mg; epinephrine 1:200,000	$NaHCO_3$ 8.4%	TAC 40 mg	None	MPSS 40 mg	None	Diprophos‡‡
Imaging guidance	None		None		Ultrasound		NR		None	
Repeat injections/procedures	None		4% (2/51)	14% (7/49)	None		None		None	
Cross-over (timing)	0%	0%	4% (timing NR)	12% (timing NR)	0%	0%	0%	0%	0%	0%
Co-interventions	Paracetamol as needed proscribed massage and hot formentation		Acetominophen as needed; stretching (2 weeks) followed by eccentric muscle and tendon strengthening. return to ADL and sports as tolerated at 4 weeks		Minimal use of arm, a return to ADL after 3-4 days, acetominophen, stretching and training program prescribed		Paracetamol for pain (up to 1 week)		NR	
Length (%) f/u										
Short-term	3 mos. (NR)		3 mos. (NR)		3 mos. (100%)		3 mos. (92%)		1.5 mos. (NR)	
Intermediate-term	6 mos. (NR)		6 mos. (NR)		6 mos. (43%)§§		-		6 mos. (NR)	
Long-term	-		24 mos. (94%)		12 mos. (27%)§§		-		12 mos. (83%)	
Country	India		Netherlands		Denmark		India		Poland	
Funding	NR		Industry**		Industry††		None		None	
Risk of bias	Moderately High		Moderately Low		Moderately Low		Moderately High		Moderately High	

DASH: Disabilities of the Arm, Shoulder, and Hand (questionnaire); MMCPIE: Modified Mayo Clinic Performance Index for the Elbow; MPSS: methylprednisolone; $NaHCO_3$: sodium bicarbonate; NR: Not reported; PRTEE: Patient-related tennis elbow evaluation; PRP: Platelet Rich Plasma; SD: Standard Deviation; TAC: triamcinolone; VAS: Visual Analog Scale
*VAS pain score 0-100 instead of 0-10
†Previous glucocorticoid treatment for epicondylitis
‡qDASH (quick DASH), which uses the same scale as DASH.
§Range; the authors found no correlation between age and follow-up DASH score (only assessed irrespective of treatment group)
** Biomet, Dordecht, The Netherlands
††Danish Rheumatism Association, Biomet Biologics, Region Hospital (Silkeborg, Denmark)
‡‡Diprophosos (Schering-Plough): 1 ml injected, consisting of 6.43 mg betamethasoni dipropionas and 2.63 mg of betamethasoni natrii phosphas
§§Data excluded due to high loss to follow-up

Appendix Table F3. Elbow epicondylitis RCTs comparing PRP to Conservative Control (DN or Local Anesthetic): Study and Patient Characteristics (5-8 of 8 trials)

	Mishra 2014		Behera 2015		Stenhouse 2012	
	LR-PRP (n =116)	LA (n = 114)	LP-PRP (n = 15)	LA (n = 10)	PRP + DN (n=15)	DN (n=13)
Patient demographics						
Males, %	NR	NR	20%	44%	53%	39%
Age, years; mean	48	47	38	37	53	48
Minimum duration of symptoms	≥3 mos.		>3 mos.		≥6 mos.	
Mean duration of symptoms, mean	NR	NR	12.1 mos.	10.3 mos.	18.9 ± 17.8 mos.	22.2 ± 14.5 mos.
Previous epicondylitis episodes	NR	NR	NR	NR	NR	NR
Previously failed conservative therapy	Yes (steroid injections, NSAIDS, or physical therapy)		Yes (for >3 months, further details NR)		Yes (including PT and steroid injections, further details NR)	
VAS pain (0-100 (worst)), mean	NR	NR	75.3	75.6	8.1 ± 1.2	6.9 ± 2.2
PRTEE function (0-100 (worst)	54.2	57.7	NR	NR	NR	NR
MMCPIE score (0 to 100 (best)), mean ± SD	NR	NR	63.2	61.4	NR	NR
Nirschl score (1-7 (worst)), mean			5.1	5.3	NR	NR
Nirschl score (NR-80 (best)), mean‡					11.1 ± 14.3‡	22.9 ± 19.1‡
Procedural characteristics						
Patient blinded to treatment received	Yes		Yes		No	
Peppering technique used?	Yes	Yes	Yes (5-6 passes described)		Yes	Yes
PRP volume injected	2-3 mL	-	3 mL	-	2 ml	-
Platelet concentration, platelets/mL; mean	5x whole blood	-	6-8 x 10^8	-	6 x 10^8	-
Activating agent used	None	-	Yes (type NR)	-	NR	
Local anesthetic used	0.5% bupivacaine		None	Bupivacaine	1% lignocaine	
Other injectate	Anticoagulant, $NaHCO_3$ 8.4%, epinephrine	None	0.5 mL saline		None	None
Imaging guidance	None		Ultrasonography		Ultrasound	
Repeat injections/procedures	None	None	NR	NR	2 injections in one month	2 injections in one month
Cross-over (timing)	0%	0%	0%	0%	0%	0%
Co-interventions	NR		Rest (2 days), wrist extensor stretching (for 4 weeks), wrist extensor strengthening/ exercise (from 4 weeks-3		None	

	Mishra 2014		Behera 2015		Stenhouse 2012	
	LR-PRP (n =116)	LA (n = 114)	LP-PRP (n = 15)	LA (n = 10)	PRP + DN (n=15)	DN (n=13)
			mos.) Return to all activity after 4 mos.			
Length (%) f/u						
Short-term	3 mos. (83%)		3 mos. (96%)		2 mos. (NR)	
Intermediate-term	6 mos. (88%)*		6 mos. (96%)		6 mos. (89%)	
Long-term	-		12 mos. (96%)		-	
Country	United States		India		United Kingdom	
Funding	Industry (multiple)†		NR		No competing interests, funding NR	
Risk of bias	Moderately High		Moderately High		Moderately High	

LA: Local anesthetic; LP: leukocyte-poor; LR: leukocyte-rich; MMCPIE: Modified Mayo Clinic Performance Index for the Elbow; NR: Not Reported; PRP: Platelet rich plasma; PRTEE: Patient-related tennis elbow evaluation; SD: Standard deviation; VAS: Visual analog scale

*Among patients who enrolled in the extension of the protocol (136 patients out of 231 originally randomized)

†Biomet, ThermoGenesis, Auxilium, DePuy, Rerring Pharmaceuticals, Biomemetic, Pfsizer, Smith & Nephew, Zimmer, Wyeth

‡Stenhouse reported a Nirschl scoring system that had a maximum score of 80 (minimum NR), where higher scores are better

Appendix Table F4. Elbow epicondylitis cohort studies comparing PRP to Conservative Control (low level laser therapy): Study and Patient Characteristics

	Tetschke 2015 (Prospective cohort study)		Tonk 2014 (Prospective cohort study)	
	PRP (n = 26)	Laser (n = 26)	PRP (n = 39)	Laser (n = 42)
Patient demographics				
Males, %	46%	35%	51%	24%
Age, years; mean	52 ± 10	53 ± 13	41 ± 13	40 ± 9
Minimum duration of symptoms, mos.	≥3 mos.	≥3 mos.	≥0.25 mos.	≥0.25 mos.
Mean duration of symptoms, mos.; mean ± SD	NR	NR	37.3 (units NR)	46.4 (units NR)
Subacute symptoms, %	NR	NR	72%	52%
Chronic symptoms, %	NR	NR	28%	48%
Previous steroid injection for epicondylitis episodes, %	NR	NR	NR	NR
Previously failed conservative therapy	Yes (physical or medical therapy)		Yes (brace, NSAIDs, cold therapy for 1 week prior to enrollment)	
VAS (0-10 (worst)), mean ± SD	3.3 ± 1.5	4.4 ± 1.6	NR	NR
DASH (0-100 (worst)), mean ± SD	27.9 ± 18.1	35.4 ± 17.0	NR	NR
Tenderness, %	NR	NR	NR	NR
Pain with wrist extension	NR	NR	NR	NR
Nirschl pain (1-7 (worst)), mean ± SD	NR	NR	5.28 ± 0.83	5.24 ± 0.76
Elbow disability, %	NR	NR	48%	56%
Elbow swelling, %	NR	NR	8%	5%
Procedural characteristics				
Patient blinded to treatment received	No		No	
Peppering technique used?	NR		Yes	
PRP volume injected	3-5 mL	-	3 mL	-
Platelet concentration, platelets/mL; mean ± SD	NR	-	5X whole blood	-
Activating agent used	NR	-	None	-
Local anesthetic used	NR	-	Xylocaine 3%	-
Other injectate	NR	-	Anticoagulant	-

	Tetschke 2015 (Prospective cohort study)		Tonk 2014 (Prospective cohort study)	
	PRP (n = 26)	Laser (n = 26)	PRP (n = 39)	Laser (n = 42)
Imaging guidance	NR	-	None	-
Comparator treatment details	-	Low level laser radiation therapy (using an 830-nm infrared laser with a dose of 7 J/cm^2) followed by myofascial manipulation	-	Low level laser radiation therapy (using a 904-nm infrared laser; radiation dose NR), 5 minutes per session
Repeat injections/procedures	3 injections over 3 weeks	12 sessions over 6 weeks	None	Sessions (number NR) performed over 10 days
Cross-over (timing)	NR	NR	NR	NR
Co-interventions	Standard physiotherapy		Brace, NSAIDs, cold therapy (1 week); stretching and strengthening at 2 weeks, return to ADL at 3 weeks	
Length (%) f/u				
Short-term	2 mos. (83%)		3 mos. (NR)	
Intermediate-term	6 mos. (83%)		6 mos. (NR)	
Long-term	12 mos. (83%)		12 mos. (NR)	
Country	Germany		India	
Funding	None		None	
Risk of bias	Moderately High		Moderately High	

DASH: Disabilities of the Arm, Shoulder, and Hand; NR: Not reported; PRP: Platelet-Rich Plasma; SD: Standard Deviation; VAS: Visual Analog Scale

Appendix Table F5. Elbow epicondylitis cohort study comparing PRP to Surgery: Study and Patient Characteristics

	Ford 2015 (Retrospective cohort study)	
	PRP (n = 28)	Surgery (n = 50)
Patient demographics		
Males, %	32%	51%
Age, years; mean	45 ± 10	45 ± 8
Minimum duration of symptoms, mos.	≥3 mos.	≥3 mos.
Mean duration of symptoms, mos.; mean ± SD	6.8 ± 1.7*	6.7 ± 1.2*
Previous steroid injection for epicondylitis episodes, %	30%	56%
Previously failed conservative therapy	Yes (physical therapy, bracing, NSAIDs, and/or steroid injections)	
VAS (0-10 (worst)), mean ± SD	6.5 ± 2.5	6.4 ± 2.1
DASH (0-100 (worst)), mean ± SD	NR	NR
Tenderness, %	93%	98%
Pain with wrist extension	96%	98%
Nirschl pain (1-7 (worst)), mean ± SD	NR	NR
Procedural characteristics		
Patient blinded to treatment received	No	
Peppering technique used?	Yes	-
PRP volume injected	3-4 mL	-
Platelet concentration, platelets/mL; mean ± SD	NR	-
Activating agent used	NR	-
Local anesthetic used	1% Lidocaine	1% Lidocaine
Other injectate	Anticoagulant	-
Imaging guidance	NR	-
Comparator treatment details	-	Surgical release of extensor tendon origin with decortication to bleeding bone
Repeat injections/procedures	7% patients	6% patients
Cross-over (timing)	7% (unclear)	0%
Co-interventions	NSAIDs (for 2 weeks)	

Length (%) f/u	
Short-term	NR
Intermediate-term	NR
Long-term	Mean 10-12 mos. (NR)†
Country	United States
Funding	NR
Risk of bias	Moderately High

DASH: Disabilities of the Arm, Shoulder, and Hand; NR: Not reported; PRP: Platelet-Rich Plasma; SD: Standard Deviation; VAS: Visual Analog Scale
*Duration of symptoms to time of first office visit
†Mean duration follow-up was: PRP group, 10.4 months (range 3-44 months); surgery group, 11.6 months (range 3-91 months).

Appendix Table F6. Elbow epicondylitis RCTs comparing ABI to Conservative Control (Steroid): Study and Patient Characteristics (1-3 of 6 trials)

	Arik 2014		Dojode 2012		Jindal 2013	
	ABI (n = 40)	Steroid (n = 40)	ABI (n = 30)	Steroid (n = 30)	ABI (n = 25)	Steroid (n = 25)
Patient demographics						
Males, %	27%	25%	43%	58%	56%	68%
Age, years; mean ± SD	44 ± 8	47 ± 8	43 (22 to 67)*	42 (17 to 62)*	39 ± 7	
Minimum duration of symptoms	NR	NR	NR	NR	NR	NR
Mean duration of symptoms. (mos.); mean ± SD	4 ± 2	5 ± 4	2.5 (0.5 to 12.3)*	2.0 (0.3 to 9.0)*	1.3 ± 0.5	1.0 ± 0.5
Previous episodes, %	NR	NR	NR	NR	NR	NR
Previously failed conservative therapy	Not required		Not required (no steroid inj. in prior 3 mos.)		No (untreated)	
VAS pain (0-10 (worst)), mean ± SD	6.9 ± 1.2	6.8 ± 1.3	7.7 ± 1.3	7.5 ± 1.3	5.9 ± 1.8	6.2 ± 1.6
PRTEE (0-100 worst), mean (95% CI)	66.7 ± 12.8	62.2 ± 15.6	NR	NR	NR	NR
Nirschl score (0 to 7 (worst)); mean ± SD	NR	NR	5.4 ± 1.1	5.2 ± 1.0	4.5 ± 1.2	4.8 ± 0.9
Procedural characteristics						
Patient blinded to treatment received	No		No		No	
Peppering technique used?	NR	NR	NR	NR	NR	NR
ABI volume injected	2 mL	-	2 mL	-	2 mL	-
Platelet concentration, mean ± SD	NR	-	NR	-	NR	-
Activating agent used	NR	-	NR	-	NR	-
Local anesthetic used	2% prilocaine hydrochloride		0.5% bupivacaine		2% lignocaine	
Other injectate	None	MPSS (1 ml 40 mg)	None	MPSS (80 mg)	None	MPSS (40 mg)
Imaging guidance	NR		NR		NR	
Repeat injections/procedures	None		None		None	
Cross-over (timing)	0%		NR		0%	
Co-interventions	Abstain from heavy work		Rest limb (3 days)		Rest, stretching exercises	
Length (%) f/u						
Short-term	3 mos. (100%)		3 mos. (NR)		1.5 mos. (NR)	
Intermediate-term	6 mos. (100%)		6 mos. (NR)		-	
Long-term	-		-		-	
Country	Turkey		India		India	
Funding	NR		None		NR	
Risk of bias	Moderately High		Moderately High		Moderately High	

ABI: Autologous blood injection; MPSS: methylprednisolone; NR: Not reported; PRTEE: Patient-related tennis elbow evaluation; SD: Standard deviation; VAS: Visual analog scale
*Range

Appendix Table F7. Elbow epicondylitis RCTs comparing ABI to Conservative Control (Steroid): Study and Patient Characteristics (4-6 of 6 trials)

	Kazemi 2010		Ozturan 2010			Singh 2013	
	ABI (n = 30)	Steroid (n = 30)	ABI (n = 20)	Steroid (n = 20)	ESWT (n=20)	ABI (n = 30)	Steroid (n = 30)
Patient demographics							
Males, %	23%	13%	39%	50%	42%	40%	53%
Age, years; mean ± SD	47 ± 11	47 ± 10	44 ± 9	46 ± 8	47 ± 9	35 ± 7	33 ± 6
Minimum duration of symptoms	NR		>6 mos.			NR	
Mean duration of symptoms, (mos.); mean ± SD	NR (85% had symptoms >2 mos.)§		10 ± 2.7	9.5 ± 3.1	9.6 ± 2.7	7 ± 2	7 ± 3
Previous episodes, %	NR	NR	33%	35%	42%	NR	
Previously failed conservative therapy	Not required (no steroid injections within prior 3 mos.)		Not required (no steroid injections or physical therapy within prior 3 mos.)			No (untreated)	
VAS pain (0-10 (worst)), mean ± SD	6.1 ± 1.7*	5.6 ± 1.6*	75.0 ± 12.9**	77 ± 14.1**	77.8 ± 13.6**	NR	
PRTEE (0-100 (worst)), mean (95% CI)	NR	NR	NR	NR	NR	72.8 ± 7.0	73.2 ± 8.2
Nirschl score (0 to 7 (worst)); mean ± SD	2.8 ± 0.5†	3.1 ± 0.6†	NR			NR	
Limb function (VAS pain-free function questionnaire, 0-9 (worst)), mean ± SD	6.1 ± 1.7*	5.6 ± 1.6*	NR			NR	
qDASH (0-100 (worst)), mean ± SD	54.6 ± 15.1	52.3 ± 19.3	NR			NR	
Upper extremity functional scale (0-80 (worst)), mean ± SD	NR		47.2 ± 10.3	46.6 ± 10.9	49.9 ± 9.6	NR	
Procedural characteristics							
Patient blinded to treatment received	No		No			No	
Peppering technique used?	NR	NR	Yes (5 passes)		-	NR	NR
ABI volume injected	2 mL	-	2 mL	-	-	2 mL	-
Platelet concentration, mean ± SD	NR	-	NR	-	-	NR	-
Activating agent used	NR	-	NR	-	-	NR	-
Local anesthetic used	2% lidocaine		Prilocaine‡			2% lignocaine	
Other injectate	None	MPSS 20 mg	None	MPSS‡	-	None	MPSS‡
Imaging guidance	None		NR		-	None	
Repeat injections/procedures	None		2nd injection if VAS decrease <50%		1x/week for 3 weeks	NR	
Cross-over (timing)	0%		0%			0%	
Co-interventions	Avoid pain-provoking activities (48 hours), return to ADL gradually; proscribed brace, physiotherapy, analgesic medication		Acetaminophen as needed (24-48 hours)			Rest	

	Kazemi 2010		Ozturan 2010			Singh 2013	
	ABI (n = 30)	Steroid (n = 30)	ABI (n = 20)	Steroid (n = 20)	ESWT (n=20)	ABI (n = 30)	Steroid (n = 30)
Length (%) f/u							
Short-term	2 mos. (100%)		3 mos. (95%)			3 mos. (NR)	
Intermediate-term	NR		6 mos. (95%)			NR	
Long-term	NR		12 mos. (95%)			NR	
Country	Iran		Turkey			India	
Funding	NR		NR			NR	
Risk of bias	Moderately High		Moderately High			Moderately High	

ABI: Autologous blood injection; NR: Not reported; PPT: Pain pressure threshold; PRTEE: Patient-related tennis elbow evaluation; qDASH: Quick questionnaire for Disabilities of the Arm, Shoulder, and Hand; SD: Standard deviation; VAS: Visual analog scale

*VAS was 0-9 scale, not standard 0-10 scale

†Modified Nirschl score, 5 point scale 0-4 (worst)

‡Concentration/dose NR

§Kazemi: duration of symptoms:

- ≤1 mos.: 3%
- >1 to ≤2 mos.: 12%
- >2 mos.: 85%

** VAS pain score 0-100 instead of 0-10

Appendix Table F8. Achilles Tendinopathy RCTs comparing PRP to Conservative Control: Study and Patient Characteristics

	De Jonge 2011		Kearney 2013	
	PRP (n=27)	Saline (n=27)	PRP (n=10)	Exercise (n=10)
Patient demographics				
Males, %	52%	52	40%	30%
Age, years; mean ± SD	49 ± 8	50 ± 9	48	49
Minimum duration of symptoms	≥2 mos.	≥2 mos.	≥3 mos.	≥3 mos.
Mean duration of symptoms, mos.; mean (range)	9 (6-20)*	7 (4-26)*	31 (9-156)	28 (8-144)
Recurrent injury, %	NR	NR	0%	0%
Sports participation at recreational (vs. competitive) level	73%	87%	NR	NR
Sports activity ceased, %	55%	42%	NR	NR
Previously failed conservative therapy	Not required (no prior PRP injections, no prior eccentric exercise program)		Yes (details NR)	
VISA-A function (0-100% (best)), mean ± SD	46.7 ± 16.2**	52.6 ± 19.0**	41 ± 16	36 ± 21
EQ-5D QoL (0-1 (best))	NR	NR	0.56 ± 0.32	0.75 ± 0.14
EQ-5D VAS health state (0-100 (best))	NR	NR	67 ± 21	61 ± 23
Procedural characteristics				
Patient blinded to treatment received	Yes†		No	
Peppering technique used?	NR	NR	Yes	-
PRP volume injected	4 ml	-	3.5 ml	-
Platelet concentration/ml, mean ± SD	NR	-	NR	-
Activating agent used	No	-	No	-
Local anesthetic used	0.5% marcaine		NR	-
Other injectate	Anticoagulant, buffer	Saline (4 ml)	Anticoagulant	-
Imaging guidance	Ultrasound		NR	-
Repeat injections/procedures	NR	NR	NR	-
Cross-over (timing)	0%	0%	0%	0%
Control intervention	-	-	-	Eccentric loading program (2x/day for 12 weeks)
Co-interventions	Standard rehabilitation program, acetaminophen if needed.		Gradual return to ADL and sports	-
Length (%) f/u				
Short-term	3 mos. (100%)		3 mos. (95%)§	

Intermediate-term	6 mos. (100%)	6 mos. (95%)§
Long-term	12 mos. (100%)	NR
Country	Netherlands	United Kingdom
Funding	Industry‡	Research Grant
Risk of bias	Low	Moderately High

ADL: activities of daily living; VISA-A: Victorian Institute of Sports Assessment-Achilles

*Median (IQR)

†Blood withdrawn from all patients, statement that patients were blinded to treatment allocation

‡Biomet Biologics provided funding and plasma separation kits

§Differential loss to follow-up between PRP vs. exercise groups: 90% vs. 100%

**Slight baseline imbalance (better function in the control group) was controlled for by doing adjusted analysis in change from baseline scores

Appendix Table F9. Achilles Tendinopathy RCTs comparing ABI to Conservative Control: Study and Patient Characteristics

	Bell 2013		Pearson 2012	
	ABI (n=26)	DN (n=27)	ABI + exercise (n=20 tendons)	Exercise (n=20 tendons)
Patient demographics				
Males, %	62%	44%	40%	35%
Age, years; mean ± SD	51 ± 11	47 ± 10	49 ± 9	51 ± 7
Minimum duration of symptoms	≥3 mos.	≥3 mos.	≥3 mos.	≥3 mos.
Mean duration of symptoms, mos.; mean ± SD	23 ± 33*	39 ± 85*	13 ± 10	9 ± 10
Recurrent injury, %	0%	0%	NR	NR
Sports participation at elite level	NR	NR	0%	0%
No sports participation (pre-injury)	28%	4%	NR	NR
Previously failed conservative therapy	Not required (no prior injection therapy, no limit on prior eccentric exercise therapy)		Not required (no injection therapy within prior 3 months)	
VISA-A function (0-100% (best)), mean ± SD	58.1 ± 17.2	57.3 ± 12.7	54 ± 26	52 ± 25
Procedural characteristics				
Patient blinded to treatment received	Yes†		No	
Peppering technique used?	Yes (3 passes)	Yes (same technique as ABI group)	NR	NR
ABI volume injected	1 ml per pass (3 passes)	-	3 ml	-
Local anesthetic used	None		1% lignocaine	-
Other injectate	-	-	-	-
Imaging guidance	None		None	-
Repeat injections/procedures	2 injections total over 1 mos.	2 procedures total over 1 mos.	10 tendons received 2nd injection at 1.5 mos.‡	-
Cross-over (timing)	0%	0%	0%	0%
Control intervention	-	Same technique as ABI	(see exercise group)	Alfredson eccentric exercises
Co-interventions	Eccentric exercise program		NA	

	(≤12 weeks)	
Length (%) f/u		
Short-term	3 mos. (94%)	3 mos. (70%)
Intermediate-term	6 mos. (94%)	NR
Long-term	NR	NR
Country	New Zealand	New Zealand
Funding	None	NR
Risk of bias	Moderately Low	Moderately Low

VISA-A: Victorian Institute of Sports Assessment-Achilles
*Duration of symptoms in those with duration ≤100 months (n=NR) for ABI vs. DN: 15 ± 17 vs. 18 ± 20 months
†Blood withdrawn from all patients, statement that patients were blinded to treatment allocation
‡Repeat injections offered to patients who had continued symptoms and inadequate improvement

Appendix Table F10. Patellar Tendinopathy RCTs comparing PRP to Conservative Control: Study and Patient Characteristics

	Dragoo 2013		**Vetrano 2013**	
	LR-PRP + DN (n=10)	DN (n=13)	PRP (n=23)	ESWT (n=23)
Patient demographics				
Males, %	89%	100%	87%	74%
Age, years; mean ± SD	28 ± 8	40 ± 14	26.9 ± 9.1 vs.	26.8 ± 8.5
Minimum duration of symptoms	>1.5 mos.	>1.5 mos.	≥6 mos.	≥6 mos.
Mean duration of symptoms, mos.; mean ± SD	NR	NR	19 ± 19	18 ± 20
Recurrent injury, %	NR	NR	NR	NR
Previously failed conservative therapy	Varied (required failure of 6 weeks eccentric exercise and physical therapy; no history of injection or surgery)		Not required (any previous therapy had to be completed >12 weeks prior)	
VAS pain (0-10 (worst)), mean ± SD	4.1 ± 1.5	3.0 ± 2.3	6.6 ± 1.8	6.3 ± 2.0
Lysholm knee function (0-100 (best)), mean ± SD	58.3 ± 14.5	48.5 ± 16.5	NR	NR
VISA-P function (0-100 (best)), mean ± SD	41.0 ± 14.3	47.4 ± 18.0	55.3 ± 14.3	56.1 ± 19.9

Blazina Stage 0-2 (no to minimal pain with activity), %	NR	NR	43%	61%
Tegner activity (0-10 (best)), mean ± SD	3.7 ± 2.5	4.0 ± 2.1	NR	NR
SF-12 QoL (0-100 (best)), mean ± SD	49.2 ± 3.7	40.0 ± 7.5	NR	NR
Procedural characteristics				
Patient blinded to treatment received	Yes*		No	
Peppering technique used?	Yes (10 passes)	Yes (10 passes)	NR	-
PRP volume injected	6 ml	-	2 ml	
Platelet concentration/ml, mean ± SD	NR	-	0.9-1.1 x 10^9	-
Activating agent used	NR	-	No	-
Local anesthetic used	0.25% bupivicaine		No	-
Other injectate	Epinephrine (1/100,000)		None	-
Imaging guidance	Ultrasound		Ultrasound, color Doppler	-
Repeat injections/procedures	No	No	2 injections total	3 sessions total
Cross-over (timing)	0%	23% (3 mos.)	NR	NR
Co-interventions	Eccentric exercises (strength, flexibility, cardiovascular)		Stretching and strengthening exercises	
Length (%) f/u				
Short-term	3 mos. (91%)		2 mos. (96%)	
Intermediate-term	6 mos. (74%)		6 mos. (96%)	
Long-term	NR		12 mos. (96%)	
Country	USA		Italy	
Funding	University		NR	
Risk of bias	Moderately Low (Short-term) Moderately High (Intermediate-term)		Moderately Low	

DN: dry needling; ESWT: extracorporeal shock wave therapy; LR: leukocyte-rich; VISA-P: VISA-patellar

*Blood withdrawn from all patients; patients blindfolded during procedure

Appendix Table F11. Rotator Cuff Tendinopathy RCTs and cohort studies comparing PRP to Conservative Control: Study and Patient Characteristics

	Kesikburun 2013 (RCT)		Rha 2012 (RCT)		Von Wehren 2015 (Retrospective cohort study)	
	PRP (n=20)	Saline (n=20)	PRP* (n=20)	DN (n=19)	PRP (n = 25)	Steroid (n = 25)
Patient demographics						
Males, %	35%	30%	45%	42%	48%	56%
Age, years; mean ± SD	46 ± 12	51 ± 11	52 ± 10	54 ± 12	53 ± 14	55 ± 10
Minimum duration of symptoms	≥3 mos.	≥3 mos.	≥6 mos.	≥6 mos.	≥3 mos.	≥3 mos.
Mean duration of symptoms, mos.; mean ± SD	8.5 (3 to 36)†	10.0 (2 to 48)†	9.6 ± 3.6	9.2 ± 3.2	NR	NR
Recurrent injury, %	NR	NR	NR	NR	NR	NR
Severity of injury	Tendinosis or partial tear on MRI		Tendinosis or partial tear (<1.0 cm) on sonography		Partial tear on MRI	
Previously failed conservative therapy	Not required (no steroid injections within 6 weeks; no NSAIDs within 1 week)		Yes (failed ≥3 months conservative therapy (details NR))		Not required (no prior steroid injection or ESWT)	
VAS pain with Neer impingement sign (0-100 (worst)), median (range)	80 (60 to 100)†	90 (60 to 100)†	NR	NR	NR	NR
VAS pain (0-100 (worst), mean ± SD‡	NR	NR	24.4 ± 7.2	24.6 ± 7.0	NR	NR
SPADI pain and disability (0-100 (worst)), mean ± SD‡	77.5 (31.6 to 96.2)†	78.2 (33.6 to 100.0)†	62.3 ± 18.3	62.8 ± 18.3	NR	NR
VAS disability (0-100 (worst), mean ± SD‡	NR	NR	38.0 ± 11.2	38.3 ± 11.3	NR	NR
WORC QoL (0-100% (best)), median (range)	34.6 (5.0 to 65.7)	29.9 (0.0 to 55.2)	NR	NR	NR	NR
Partial rupture/tendinopathy grade 0-2, %	NR	NR	NR	NR	0%	0%
CMS (0-100(best)), mean ± SD	NR	NR	NR	NR	66.2 ± 21.1	69.9 ± 19.5
SST score (0-100(best)), mean ± SD	NR	NR	NR	NR	6.5 ± 3.1	5.8 ± 3.2
Procedural characteristics						
Patient blinded to treatment received	Yes§		Yes§			
Peppering technique used?	NR	NR	Yes (40-50 passes)	Yes (40-50 passes)	NR	NR

PRP volume injected	5 ml	-	3 ml	-	Unclear	-
Platelet concentration/ml, mean ± SD	$1.0 \pm 0.3 \times 10^9$	-	NR	-	NR	-
Activating agent used	No	-	No	-	NR	-
Local anesthetic used	1% lidocaine		0.5% lidocaine		None	None
Other injectate	Anticoagulant	Saline (5 ml)	Anticoagulant	-	Anticoagulant	Triamcinolone acetonide, 40 mg
Imaging guidance	Ultrasound		Ultrasound		None	None
Repeat injections/procedures	NR	NR	2 injections total	2 sessions total	3 weekly injections over 3 weeks	3 weekly injections over 3 weeks
Cross-over (timing)	0%	0%	0%	0%	0%	0%
Co-interventions	Standard rehabilitation program, acetaminophen and cold compression as needed, exercise program (6 weeks).		Exercise program, acetaminophen or hydrocordone as needed		Reduced ADL, suspended sports (4 weeks), NSAIDS proscribed for 6 mos.	
Length (%) f/u						
Short-term	3 mos. (98%)		3 mos. (82%)		3 mos. (NR)	
Intermediate-term	6 mos. (98%)		6 mos. (77%)		6 mos. (78%)	
Long-term	12 mos. (98%)		NR		-	
Country	Turkey		South Korea		Switzerland	
Funding	NR		Korea Research Grant		NR	
Risk of bias	Low		Moderately Low		Moderately High	

DN: dry needling CMS: Constant-Murley Score; NR: Not reported; SD: Standard Deviation; SST: Simple Shoulder Test

*PRP performed using same technique used for dry needling

†Median (range)

‡SD calculated from study-reported SE

§Blood withdrawn from all patients, statement that patients were blinded to treatment allocation

Appendix Table F12. Plantar Fasciitis RCTs comparing PRP to Conservative Control (Steroid): Study and Patient Characteristics (Studies 1-3 of 5)

	Jain 2015 (N=46)*		Monto 2014		Tiwari 2013	
	PRP (n=30 heels)	**Steroid** (n=30 heels)	**PRP** (n=20)	**Steroid** (n=20)	**PRP** (n=30)	**Steroid** (n=30)
Patient demographics						
Males, %	33%	36%	40%	45%	NR	NR
Age, years; mean (range)	56 (31-79)		51 (21-67)	59 (24-74)	NR (30-85)	
Minimum duration of pain	≥12 mos.		≥4 mos.		NR	
Duration of pain, months; mean ± SD	NR	NR	5.7 (range, 4-26)	5.4 (range, 4-24)	6 ± 20.6†	
Lesions per patient; mean (lesions/patients)	1.3 (30/24)	1.4 (30/22)	NR	NR	NR	NR
Previously failed conservative therapy	Yes (cushioned insoles, eccentric exercise and physical therapy)		Yes (variety of conservative support and bracing measures and NSAIDs required for a minimum of 4-6 weeks each)		Not required (no steroid injection within 6 mos.)	
Previous steroid injection ≤6 mos., %	NR	NR	NR	NR	0%	0%
VAS pain (0-10 (worst)), mean ± SD	8.3 ± 1.0	8.3 ± 2.0	NR	NR	5.9 ± 0.8	6.0 ± 0.9
Roles–Maudsley Score (1-4 (worst)), mean ± SD	3.7 ± 0.5	3.6 ± 0.6	NR	NR	NR	NR
AOFAS Ankle and Hindfoot score (0-100 (best)), mean ± SD	58.6 ± 15.8	56.7 ± 16.3	37 (range, 30-56)	52 (range, 56-90)	NR	NR
Procedural characteristics						
Patient blinded to treatment received	No		No		No	
Peppering technique used?	Yes	Yes	NR	NR	NR	NR
Total volume injected	2.5 ml	NR	3 ml	NR	5 ml	NR
Steroid injected	-	Triamcinolone 40 mg	-	Depo-Medrol cortisone 40 mg	-	MPSS 40 mg
Platelet concentration; mean ± SD (µL)	NR	-	NR	-	NR	-
Activating agent used	NR	-	No	-	NR	-
Local anesthetic used	NR	Bupivacaine (dose NR)	6 ml Bupivacaine 0.5%		Xylocaine 2% (ml NR)	

Other injectate	Sodium citrate; sodium bicarbonate 8.4%	No	Sodium citrate	No	Citrate dextrose	No
Imaging guidance	No	No	Ultrasound		NR	NR
Repeat injections/procedures	NR	NR	No		NR	NR
Cross-over (timing)	NR	NR	NR	NR	NR	NR
Co-interventions	Eccentric stretching program and cushioned insoles		Cam walker brace for 2 wks., eccentric stretching program, no NSAIDs for first 2 wks. and discouraged during follow-up period		Rest for 24 hrs. postinjection, paracetamol for pain, NSAIDs discouraged	
Length (%) f/u						
Short-term	3 mos. (NR)		3 mos. (NR)		3 mos. (NR)	
Intermediate-term	6 mos. (NR)		6 mos. (NR)		6 mos. (NR)	
Long-term	12 mos. (NR)		24 mos. (NR)		NR	
Country	United Kingdom		United States		India	
Funding	None received		None received		None received	
Risk of bias	Moderately high		Moderately high		Moderately high	

AOFAS: American Orthopedic Foot and Ankle Society; f/u: follow-up; MPSS: methylprednisolone; NR: not reported; NSAID: nonsteroidal anti-inflammatory drug; PRP: protein rich plasma; SD: standard deviation; VAS: visual analog scale.

*Patients randomized by heel, bilateral injections were performed in 14 of the 46 patients.

†median ± SD

Appendix Table F13. Plantar Fasciitis RCTs comparing PRP to Conservative Control (Prolotherapy, ESWT, or CC): Study and Patient Characteristics (Studies 4-5 of 5)

	Kim 2014		Chew 2014		
	PRP (n=10)	Prolotherapy (n=11)	PRP + CC (n=19)	ESWT + CC (n=19)	CC (n=16)
Patient demographics					
Males, %	40%	64%	53%	58%	50%
Age, years; mean (range)	36 (20-57)	38 (19-51)	46 (38-51)†	45 (37-53)†	48 (41-53)†
Minimum duration of symptoms	>6 mos.	>6 mos.	≥4 mos.	≥4 mos.	≥4 mos.
Mean duration of symptoms, mos..; mean (range)	34 (12-72)	35 (12-72)	12 (7-24)†	18 (7-24)†	11 (6-16)†
Previously failed conservative therapy	Yes (variety of conservative therapies stated; no steroid injections in prior 6 mos.)		Not required (no steroid injections in prior 4 mos.)		
FFI total score, mean ± SD	151.5 ± 37.9	132.5 ± 31.1	NR	NR	NR
FFI pain subscale, mean ± SD	60.4 ± 14.7	56.5 ± 14.0	NR	NR	NR
FFI disability subscale, mean ± SD	55.8 ± 19.5	53.4 ± 15.7	NR	NR	NR
FFI activity limitation subscale, mean ± SD	31.3 ± 10.2	22.6 ± 9.8	NR	NR	NR
VAS pain (0-10 (worst)), median (range)	NR	NR	7 (5-8)	7 (6-8)	6 (5-8)
AOFAS ankle-hindfoot score (0-100 best), median (IQR)	NR	NR	65 (49-72)	62 (52-69)	72 (71-75)
Procedural characteristics					
Patient blinded to treatment received	Yes*		No		
Peppering technique used?	Yes (5-6 passes)	Yes (5-6 passes)	No	-	-
PRP/prolotherary solution volume injected	5 ml	1.5 ml dextrose 20%	-	-	-
Platelet concentration/µl, mean ± SD	1.3 ± 1.1 x 10^6	-	NR	-	-
Activating agent used	NR	-	No	-	-
Local anesthetic used	NR	0.5 mL lidocaine 0.5%	No	-	-
Other injectate	Sodium citrate 22 mg, citric acid 7.3 mg, glucose	No	No	-	-

	monohydrate 24.5 mg				
Imaging guidance	Ultrasound		Ultrasound	Ultrasound	-
Repeat injections/procedures	2 injections total		None	2 sessions, 1 week apart	-
Cross-over (timing)	NR	NR	0%	0%	0%
Co-interventions	Light activity with return to ADLs or normal sports activities as tolerated at 4 weeks, acetaminophen for pain; NSAIDs and any type of foot orthoses prohibited		Physical therapy sessions, independent daily home exercise, orthotic evaluation for those with biomechanical foot abnormalities; pain medication as needed		
Length (%) f/u					
Short-term	2.5 mos. (95%)		NR		
Intermediate-term	6.5 mos. (95%)		6 mos. (83%)		
Long-term	NR		NR		
Country	Korea		Singapore		
Funding	NR		Singapore National Medical Research Committee grant		
Risk of bias	Moderately High		Moderately High		

AOFAS: American Orthopaedic Foot and Ankle Society; CC: Conservative care; ESWT: Extracorporeal Shock Wave Therapy; FFI: Foot Function Index; f/u: follow-up; IQR: interquartile range; PRP: platelet rich plasma; SD: standard deviation
*Blood withdrawn from all patients
†median (range)

Appendix Table F14. Cohort studies comparing PRP and steroids in patients with plantar fasciitis.

	Aksahin 2012 Prospective cohort study		Say 2014 Prospective cohort study		Shetty 2014 Prospective cohort study	
	PRP (n=30)	**Steroid** (n=30)	**PRP** (n=25)	**Steroid** (n=25)	**PRP** (n=30)	**Steroid** (n=30)
Patient demographics						
Males, %	40%	43%	20%	24%	37%	43%
Age, years; mean ± SD	46 ± 9	46 ± 9	47 ± 7	49 ± 6	34 ± 9	39 ± 9
Minimum duration of pain	≥3 mos.		≥3 mos.		≥3 mos.	
Duration of pain, months; mean ± SD	8.6 ± 5.4	9.4 ± 5.2	NR		NR	
Lesions per patient; mean (lesions/patients)	NR	NR	NR	NR	NR	NR
Previously failed conservative therapy	Yes (≥3 mos., but no prior injection therapy or surgery)		Yes (≥3 mos., stretching, NSAIDs, no prior steroid injection, ESWT, or surgery)		Yes (but no prior injection therapy or surgery)	
Previous steroid injection for heel pain, %	0%	0%	0%	0%	0%	0%
VAS pain (0-10 (worst)), mean ± SD	7.3 ± 0.6	6.2 ± 1.6	8.8 ± 1	8.7 ± 0.9	8.1 ± 1.3	7.8 ± 1.1
AOFAS Ankle and Hindfoot score (0-100 (best)), mean ± SD	NR	NR	62.9 ± 8.5	60.1 ± 5.7	33.9 ± 8.2	32.5 ± 7.2
FADI (0-104 (best)), mean ± SD	NR	NR	NR	NR	32.0 ± 5.9	35.2 ± 6.6
Procedural characteristics						
Patient blinded to treatment received	Yes*		No		No	
Peppering technique used?	NR	NR	Yes	Yes	NR	NR
PRP volume injected	3 ml	-	2.5 ml	-	8 ml	-
Steroid injected	-	2 ml MPSS 40 mg	-	1 ml MPSS 40 mg	-	TAC 40 mg (ml NR)
Platelet concentration; mean ± SD	NR	-	8.2 ± 1.2 X 10^6 per mL	-	NR	-
Activating agent used	Calcium	-	calcium chloride 5.5%	-	NR	-
Local anesthetic used	2 ml prilocaine 2%		NR	1 ml prilocaine 2%	3 ml lignocaine 2%	
Other injectate	No	No	sodium citrate 3.2% (ml NR)	No	6 ml citrate dextrose	No

Imaging guidance	None		None		NR	
Repeat injections/procedures	NR	NR	NR	NR	NR	NR
Cross-over (timing)	NR	NR	NR	NR	NR	NR
Co-interventions	Ice and elevation, avoidance of high impact activities for 10 days, standardized stretching program; use of NSAIDs, orthoses and night splints prohibited		Rest for 24-hours, standardized stretching and strengthening program; use of NSAIDs, orthoses and night splints prohibited		NR	
Length (%) f/u						
Short-term	3 wks. (NR)		1.5 mos. (NR)		3 mos. (NR)	
Intermediate-term	6 mos. (NR)		6 mos. (NR)		NR	
Long-term	NR		NR		NR	
Country	Turkey		Turkey		India	
Funding	NR		NR		None received	
Risk of bias	Moderately High		Moderately High		Moderately High	

AOFAS: American Orthopedic Foot and Ankle Society; f/u: follow-up; MPSS: methylprednisolone; NR: not reported; NSAID: nonsteroidal anti-inflammatory drug; PRP: protein rich plasma; SD: standard deviation; TAC: triamcinolone; VAS: visual analog scale.

*Authors state that "patients were blind for the agent used in the treatment".

Appendix Table F15. RCTs comparing ABI with steroids in patients with plantar fasciitis.

	Kalaci 2009			Kiter 2006			Lee 2007	
	ABI (n=25)	**Steroid** (n=25)	**LA + DN** (n=25)	**ABI** (n=15)	**Steroid** (n=14)	**LA + DN** (n=15)	**ABI** (n=30)	**Steroid** (n=31)
Patient demographics								
Males, %	24%	32%	28%	31%†			7%	6%
Age, years; mean ± SD	53 ± 11	50 ± 19	50 ± 11	51 (range, 26-70)†			48 ± 11	49 ± 11
Minimum duration of pain	NR	NR	NR	≥6 months			≥6 weeks	
Duration of pain, months; mean ± SD	8 ± 13	9 ± 8	12 ± 21	19 (range, 6-180)†			7 ± 6	8 ± 7
Lesions per patient; mean (lesions/patients)	NR	NR	NR	NR	NR	NR	NR	NR
Previously failed conservative therapy	Not required (no surgery in prior 6 months, no prior injection therapy at any time)			No (except heel pads or NSAIDs, and except steroid injections within 12 mos.)			Not required (no prior surgery)	
Previous steroid injection for plantar fasciitis	0%	0%	0%	0%‡	0%‡	0%‡	NR	NR
Calcaneal spur (yes), %	77%	77%	73%	NR	NR	NR	60%	48%
VAS pain (0-10 (worst)), mean ± SD	6.8 ± 2.3	7.0 ± 2.7	6.7 ± 1.7	7.6 ± 1.3	7.3 ± 1.2	6.4 ± 1.1	7.3 ± 1.8	6.9 ± 1.7
AOFAS Ankle and Hindfoot score (0-100 (best)), mean ± SD	NR	NR	NR	71.6 ± 14	65.7 ± 12.7	64.1 ± 15.1	NR	NR
Procedural characteristics								
Patient blinded to treatment received	Yes§			No			No	
Peppering technique used?	No	No	Yes	No	No	Yes	NR	NR
ABI volume injected	2 ml	-	-	2 ml	-	-	1.5 ml	-
Steroid injected	-	2 ml TAC (mg NR)	-	-	MPSS 40 mg (ml NR)	-	-	0.5 ml TAC 40 mg
Local anesthetic used	NR	NR	2 ml lidocaine	1 ml prilocaine 2%			1 ml lignocaine HCL 2%	2 ml lignocaine HCL 2%
Other injectate	NR	NR	NR	NR	NR	NR	NR	NR
Imaging guidance	NR	NR	NR	NR	NR	NR	NR	NR
Repeat injections/procedures	NR	NR	NR	Max. 3 injections total**			NR	
Cross-over (timing)	NR	NR	NR	NR	NR	NR	NR	NR

Co-interventions	No additional medication was given and no restriction of activity was advised	All other treatment modalities were terminated during the study	No high-impact activities for ≥10 days, NSAIDs for ≤3 days, ice and elevation for swelling, standardized stretching program; no additional treatments permitted
Length (%) f/u			
Short-term	3 wks. (NR)	NR	3 mos. (95%)
Intermediate-term	6 mos. (NR)	6 mos. (98%)	6 mos. (95%)
Long-term	NR	NR	NR
Country	Turkey	Turkey	Malaysia
Funding	None received	NR	NR
Risk of bias	Moderately high	Moderately high	Moderately high

AOFAS: American Orthopedic Foot and Ankle Society; f/u: follow-up; MPSS: methylprednisolone; NR: not reported; NSAID: nonsteroidal anti-inflammatory drug; PRP: protein rich plasma; SD: standard deviation; TAC: triamcinolone; VAS: visual analog scale.

*Demographic reported only for those who completed follow-up.

†Demographics were not reported by treatment group; authors state that all groups were similar at baseline. Mean values include the group that received anesthetic + dry needling.

‡Patients who had received corticosteroid injections for heel pain in the past year were excluded from the study.

§Authors state that the patients were blinded to the type of injection but do not give details.

**ABI vs. steroid: 1 injection only (13% vs. 50%), 2 injections only (20% vs. 50%), and 3 injections (67% vs. 0%).

††A second injection was given to 10% of patients in the ABI group and 6.5% in the steroid group per patient request due to continued pain.

Appendix Table F16. Acute local muscle injury RCTs comparing PRP and CC vs. CC alone or with placebo injection: Study and Patient Characteristics

	Bubnov 2013		Hamid 2014		Hamilton 2015		Reurink 2015	
	PRP + CC (n=15)	CC alone (n=15)	PRP + CC (n=14)	CC alone (n=14)	PRP + CC (n=30)	CC alone (n=30)	PRP + CC (n=41)	Saline + CC (n=39)
Patient demographics								
Males, %	100%	100%	93%	79%	100%	100%	95%	95%
Age, years; mean ± SD	24	24	20 ± 7†	21 ± 9†	27 ± 6	26 ± 6	28 ± 7	30 ± 8
Duration of pain, days; mean ± SD	NR (acute*)	NR (acute*)	5 ± 3†	5 ± 3†	2 ± 1	2 ± 1	3 (2-4)†	3 (2-5)†
Recurrent injury, %	NR	NR	57%	21%	63%	50%	66%	59%
Lesions per patient; mean (lesions/patients)	1.1 (17/15)	1.1 (17/15)	1 (14/14)	1 (14/14)	1 (30/30)	1 (30/30)	1 (41/41)	1 (39/39)
VAS pain (0-10 (worst)), mean ± SD	8	7.8	NR	NR	NR	NR	NR‡	NR‡
BPI-SF pain intensity (0-10 (worst)), mean ± SD	NR	NR	3.9 ± 1.8	4.3 ± 1.9	NR	NR	NR	NR
BPI-SF pain interference (0-10 (worst)), mean ± SD	NR	NR	3.0 ± 1.4	3.6 ± 2.4	NR	NR	NR	NR
Subjective global function (0-100 (best)), mean ± SD	55	53	NR	NR	NR	NR	NR	NR
Location of injury, % (n)								
Thigh (unspecified)	59% (10 lesions)	47% (8 lesions)	0%	0%	0%	0%	0%	0%
Hamstring	0%	0%	100%§	100%§	100%**	100%**	100%**	100%**
Foot/ankle	29% (5 lesions)	29% (5 lesions)	0%	0%	0%	0%	0%	0%
Shoulder	12% (2 lesions)	24% (4 lesions)	0%	0%	0%	0%	0%	0%
Athletic competition level, %								
Professional	100%	100%	0%	0%	100%	97%††	NR††	NR††
National	0%	0%	57%	50%	0%	NR	NR††	NR††
Procedural characteristics								
Patient blinded to treatment received	No	No	No	No	Yes‡‡	No	Yes	
PRP/control volume injected	5 ml	–	3 ml	–	3 ml	–	3 ml	
Platelet concentration; mean ± SD	NR	–	1.3 X 10^6	–	7.7 ± 4.2 X	–	433 ± 125 X 10^3	–

(µL)					10^{11}			
Activating agent used	NR	–	No	–	No	–	NR	–
Local anesthetic used	NR	–	No	–	NR	–	NR	
Other injectate	Trisodium citrate	–	ACD-A	–	ACD-A	–	Anticoagulant	NR
Imaging guidance	Ultrasound	–	Ultrasound	–	No	–	Ultrasound	
Repeat injections/procedures	NR	–	No§§	–	No§§	–	2 injections total	
Cross-over (timing)	NR	NR	NR	NR	NR	NR	NR	
Conservative care	Immobilization, general physiotherapy		PATS exercises (supervised and home)		6-stage, standardized and supervised program (5x/wk): ROM, progressive strengthening, core stability and agility exercises and sport-specific FFT		Progressive phased, criteria-based standardized rehabilitation program (daily home exercises and physiotherapist supervised training sessions 2x/wk)	
Co-interventions	Anti-inflammatory therapy		Acetaminophen as needed (1000 mg, max. 4 x daily)		NR		None (instructed to avoid co-interventions, NSAIDs)	
Length (%) f/u								
Short-term	1 mo. (NR)		2 mos. (86%)		2 mos. (85%)		2.5 mos. (100%)	
Intermediate-term	NR		NR		6 mos. (92%)***		6.5 mos. (91%)	
Long-term	NR		NR		NR		12 mos. (93%)	
Country	Ukraine		Malaysia		Qatar		The Netherlands	
Funding	NR†††		University grant		Hospital		Industry; Royal Netherlands Football Association	
Risk of bias	Moderately High		Moderately Low		Moderately Low		Low	

ACD-A: Anticoagulant Citrate Dextrose Solution-Formula A; BPI-SF: Brief Pain Inventory–Short Form; CC: conservative care; FFT: function field testing; f/u: follow-up; NR: not reported; NSAID: non-steroidal anti-inflammatory drug; PATS: progressive agility and trunk stabilization; PRP: protein rich plasma; ROM: range of motion; SD: standard deviation; VAS: visual analog scale.

*Authors state that the injury was "acute" and patients were treated "within days of injury".

†median ± IQR or (IQR).

‡NRS (0-10 (worst)) was used.

§Specifically (PRP vs. CC): Biceps femoris (57.1% vs. 78.6%); semimembranosus (35.7% vs. 7.1%); semitendinosus (7.1% vs. 14.3%).

**Hamilton 2015: Grade I (PRP 57% vs. CC 43%) and Grade 2 (PRP 43% vs. CC 57%); Reurink 2015: Grade I (PRP 27% vs. Saline 31%) and Grade 2 (PRP 73% vs. Saline 69%).

††Hamilton 2015: One patient was listed as "competitive"; Reurink 2015: 73% and 74% of PRP vs. Saline patients were considered "competitive athletes".

‡‡This trial included a third arm (excluded from our analysis) which received platelet poor plasma (PPP). Both groups were blinded to the injection received.

§§Single injection per protocol

***At 6 months, there was a 10% difference in loss to follow-up between the PRP and the CC groups: (86.7% (26/30) vs. 96.7% (29/30)).

†††Authors state no conflicts of interest.

Appendix Table F17. Acute Achilles tendon rupture cohort comparing PRP and CC versus CC alone: Study and Patient Characteristics

	Kaniki 2014 Retrospective cohort study	
	PRP + CC (n=73)*	CC alone (n=72)*
Patient demographics		
Males, %	81%	82%
Age, years; mean ± SD	42 ± 11	41 ± 8
Duration of pain, days; mean ± SD	NR (acute)†	NR (acute)†
Recurrent injury, %	NR	NR
Lesions per patient; mean (lesions/patients)	NR	NR
Leppilahti score (0-100 (best)); mean ± SD	NR	NR
Mechanism of injury, %		
Sports	85%	79%
Activities of daily living	15%	21%
Procedural characteristics		
Patient blinded to treatment received	No	No
PRP volume injected	3-4 ml	-
Platelet concentration; mean ± SD (μL)	NR	-
Activating agent used	NR	-
Local anesthetic used	Lidocaine 2% (ml NR)	-
Other injectate	ACD-A	-
Imaging guidance	No	-
Repeat injections/procedures	2 injections total	-
Cross-over (timing)	NR	NR
Conservative care	Removable below-knee arthrosis and 2 weeks non-weight-bearing with progression to weight bearing as tolerated between 4-6 weeks; standardized rehabilitation program with progression at therapist's discretion	
Co-interventions	NR	
Length (%) f/u		
Short-term	NR	
Intermediate-term	NR	
Long-term	24 mos. (69%)‡	
Country	Canada	
Funding	NR§	
Risk of bias	Low	

ACD-A: Anticoagulant Citrate Dextrose Solution-Formula A; AOFAS: American Orthopedic Functional Ankle Scale; CC: conservative care; f/u: follow-up; NR: not reported; PRP: protein rich plasma; SD: standard deviation.

*PRP group was enrolled prospectively whereas the control group was retrospective and included patients from a previous randomized controlled trial published in 2010.

†Per protocol, all patients presented within 14 days of injury. Mean time from injury to first injection in the PRP group was 8.3 (2-20) days.

‡At 24 months, the difference in loss to follow-up between groups was >10%: PRP 81% vs. CC alone 57%.

§Authors report no conflicts of interest.

Appendix Table F18. Ankle sprain RCTs comparing PRP and placebo injection: Study and Patient Characteristics

	Rowden 2015	
	PRP (n=18)*	**Stérile normal saline** (n=15)*
Patient demographics		
Males, %	22%	40%
Age, years (range)	30 (19-54)	35 (18-61)
Duration of pain, days; mean ± SD	NR (acute)†	NR (acute)†
Lesions per patient; mean (lesions/patients)	NR	NR
VAS pain (0-10 (worst)), mean ± SD	8.8 ± 1.8	7.7 ± 2.2
LEFS (0-80 (best)), mean ± SD	12.9 ± 9.5	18.6 ± 12.2
Procedural characteristics		
Patient blinded to treatment received	Yes‡	
PRP/placebo volume injected	3-4 ml	4 ml
Platelet concentration; mean ± SD (µL)	NR	-
Activating agent used	NR	-
Local anesthetic used	Lidocaine 1%, Bupivacaine 0.25% (1 mL each)	
Other injectate	NR	No
Imaging guidance	Ultrasound	
Repeat injections/procedures	NR (assumed single injection)	
Cross-over (timing)	NR	
Co-interventions/medication	posterior splint, crutches and training, pain medication at the treating physician's discretion, avoidance of NSAIDs	
Length (%) f/u		
Short-term	1 mo. (NR)	
Intermediate-term	NR	
Long-term	NR	
Setting	Emergency Department	
Country	United States	
Funding	NR	
Risk of bias	Moderately High	

f/u: follow-up; LEFS: Lower Extremity Function Scale; NR: not reported; NSAIDs: non-steroidal anti-inflammatory drugs; PRP: protein rich plasma; SD: standard deviation; VAS: visual analog scale.

*Initially, 37 patients agree to participate and were enrolled; four (11%) withdrew before study procedures were performed. No information was provided as to which groups these patients were initially randomized to, therefore, baseline demographics are for patients included after loss-to-follow-up.

†Emergency department setting; all patients had acute, traumatic injuries.

‡All patients underwent a blood draw (50 cc) and the placebo groups' blood was discarded; the syringe was prepared by an un-blinded assistant and then taped to blind both the investigator and the patient.

Appendix Table F19. Osteochondral lesions of the talus RCTs comparing PRP and Hyaluronic acid injection: Study and Patient Characteristics

	Mei-Dan 2012	
	PRP (n=14)*	Hyaluronic acid (n=15)*
Patient demographics		
Males, %	80%	73%
Age, years; mean ± SD	43 ± 18	37 ± 15
Minimum duration of pain	NR	NR
Duration of pain, years; mean ± SD	7.2 ± 5.5	9.2 ± 6.2
Previous arthroscopy	27%	33%
Lesions per patient; mean (lesions/patients)	1.1 (15/14)	1 (15/15)
AHFS (0-100 (best)), mean ± SD	68 ± 14	66.4 ± 15
VAS pain (0-10 (worst)), mean ± SD	4.1 ± 2.1	5.6 ± 1.7
VAS function (0-10 (worst)), mean ± SD	4.7 ± 2.1	5.8 ± 1.9
Subjective global function (1-100 (best)), mean ± SD	58 ± 22	56 ± 18
Lesion characteristics, %		
Location		
Posteromedial/medial	93%	87%
Anterolateral/lateral location	7%	13%
Ferkel Grade†		
1	13%	13%
2a	33%	27%
2b or 3	54%	60%
Procedural characteristics		
Patient blinded to treatment received	No	No
Volume injected	2 ml	2 ml
Platelet concentration; mean (mM)	22.8	-
Activating agent used	Calcium chloride	-
Local anesthetic used	No	Yes (patients' request; type NR)
Other injectate	No	No
Imaging guidance	NR	NR
Repeat injections/procedures	3 total injections	3 total injections
Cross-over (timing)	NR	NR
Co-interventions/mediations	Rest for 24 hours and no sports activity or heavy physical work for 2-3 days post-injection; acetaminophen as needed; NSAIDs to be avoided	
Length (%) f/u		
Short-term	3 mos. (%NR)	
Intermediate-term	7 mos. (91%)	
Long-term	NR	
Country	Israel	
Funding	NR‡	
Risk of bias	Moderately High	

AHFS: Ankle-Hindfoot Score; f/u: follow-upNR: not reported; PRP: protein rich plasma; SD: standard deviation; VAS: visual analog scale.

*These numbers represent patients after loss-to-follow-up. Initially, 33 lesions in 32 patients were allocated to PRP (16 lesions, patients NR) and hyaluronic acid (17 lesions, patients NR).

†Grade 1: cystic lesions with intact walls; Grade 2 (2a, 2b): cystic lesions communicating with the talar dome or a full-thickness lesion with an overlaid fragment; Grade 3: undisplaced lesions with lucency.

‡Authors report no conflict of interest.

Appendix Table F20. RCTs comparing autologous blood injection with surgery in patients with TMJ dislocation

	Hegab 2013*	
	ABI (n=16)	IMF (n=16)
Patient demographics		
Males, %	NR*	NR*
Age, years; mean ± SD	NR*	NR*
Minimum duration of pain	NR	NR
Duration of pain, days; mean ± SD	NR (chronic, bilateral)	NR (chronic, bilateral)
Pain	NR	NR
Function	NR	NR
Procedural characteristics		
Patient blinded to treatment received	No	No
ABI volume injected	5 ml†	-
Local anesthetic used	Unclear‡	-
Other injectate	Ringer's lactate 20 ml	-
Imaging guidance	No	-
Repeat injections/procedures (% of patients)	2 injections total (37.5%) 3 injections total (12.5%)	-
Means of fixation (duration)	-	Eyelet wiring or wires applied into orthodontic brackets (4 weeks)
Cross-over (timing)	NR	
Co-interventions/medication	NSAIDs for the first week; instructed to restrict opening of mouth and eat soft foods for 2 weeks	Instructed to limit their fluid intake and shown how to cut the wires in case of vomiting
Length (%) f/u		
Short-term	NR	
Intermediate-term	NR	
Long-term	12 mos. (NR)	
Country	Egypt	
Funding	NR	
Risk of bias	Moderately High	

ABI: autologous blood infusion; f/u: follow-up; IMF: intermaxillary fixation; NR: not reported; NSAID: non-steroidal anti-inflammatory drug; SD: standard deviation; TMJ: temporomandibular joint.

*This study included a third arm (n=16) that was treated with a combination of ABI and IMF. This group was no analyzed because it did not meet our inclusion criteria. Demographics were reported for the study population as a whole only: mean age 33 (range, 23-53) years and 23% (11/48) male.

†Drawn from the cubital fossa; 4 ml of blood was injected into the superior joint space and 1 ml into the pericapsular tissue.

‡Authors indicate that ABI can be given under local anesthesia, local anesthesia plus sedation, or general anesthesia but do not described the method(s) used in the study.

Appendix Table F21. Knee Osteoarthritis RCTs comparing PRP to HA: Study and Patient Characteristics (1-3 of 6 trials)

	Filardo 2015		Gormeli 2015		Cerza 2012	
	PRP (n=96)	HA (n=96)	PRP (n=91)*	HA (n=46)	PRP (n=60)	HA (n=60)
Patient demographics						
Males, %	64%	58%	42%	44%	42%	47%
Age, years; mean ± SD	53 ± 13	58 ± 12	54 ± 13	54 ± 13	66 ± 11	66 ± 11
Minimum duration of symptoms	>4 mos.		>4 mos.		NR	
Mean duration of symptoms, mos.; mean ± SD	65 (range, 4-360)	68 (range, 4-300)	NR		66 ± 11	66 ± 11
Previous nonoperative tx, %	31%	38%	NR		100%†	100%†
Previous operative tx, %	56%	54%	0%‡	0%‡	0%‡	0%‡
Bilateral or unilateral	Unilateral		Unilateral		Unilateral	
Characteristics of Osteoarthritis						
OA Inclusion Criteria	Kellgren-Lawrence Grades I-III		Kellgren-Lawrence Grades I-IV		Kellgren-Lawrence Grade I-III	
Early OA, %§	NR		67%	64%	NR	
Advanced OA, %§	NR		32.5%	35.8%	NR	
Kellgren-Lawrence score, mean ± SD	2.0 ± 1.1	2.0 ± 1.1	NR		NR	NR
Kellgren-Lawrence Grade I, %	NR		NR		35%	42%
Kellgren-Lawrence Grade II, %	NR		NR		40%	37%
Kellgren-Lawrence Grade III, %	NR		NR		25%	21%
Kellgren-Lawrence Grade IV, %	NR		NR		NR	NR
Patient Baseline Measures						
WOMAC: Total score (0-96 (worst)), mean ± SD	NR		NR		76.9 ± 9.5	75.4 ± 10.7
KOOS: Symptom (0-100 (best)), mean ± SD	65.5 ± 16.6	65.8 ± 16.3	NR		NR	
KOOS: ADL score (0-100 (best)), mean ± SD	70.6 ± 19.4	68.2 ± 20.2	NR		NR	
KOOS: Sport (0-100 (best)), mean ± SD	37.9 ± 25.0	35.7 ± 24.6	NR		NR	
IKDC (0-100 (best)), mean ± SD	52.4 ± 14.1	49.7 ± 13.0	40.8 ± 5.52	40.6 ± 4.5	NR	
Tegner activity (0-10 (best)), mean ± SD	2.9 ± 1.3	2.8 ± 1.3	NR		NR	
KOOS: pain (0-100 (best)), mean ± SD	66.1 ± 17.9	64.1 ± 16.5	NR		NR	
KOOS: QoL (0-100 (best)), mean ± SD	36.0 ± 19.4	48.4 ± 23.1	NR		NR	
EQ-VAS (0-100 (best)), mean ± SD	NR		50.3 ± 5.47	50.5 ± 4.6	NR	
Procedural characteristics						
Patient blinded to treatment received	Yes		Yes		No	

	Filardo 2015		Gormeli 2015		Cerza 2012	
	PRP (n=96)	HA (n=96)	PRP (n=91)*	HA (n=46)	PRP (n=60)	HA (n=60)
Volume of injectate (mL)	5 mL	2 mL	5 mL	2 mL	5.5 mL	2 mL
Platelet concentration/ml, mean ± SD	4.6 ± 1.4 X baseline values	-	5.2-5.3 X baseline**	-	NR	-
LR- or LP-PRP used?	LR-PRP	-	NR	-	LP-PRP	-
Leukocyte concentration/ ml, mean ± SD	1.1 ± 0.5 X baseline values	-	-	-	NR	-
Activating agent used	Calcium Chloride, 1 mL	-	10% Calcium Chloride, 1 mL	-	Sodium Citrate, 1 mL	-
Local anesthetic used	No	NR	No	NR	Lidocaine chlorohydrate	
Other injectate, volume	NR		NR		Sodium citrate, 1 ml	
Imaging guidance	NR		NR		None	
Number of injections/procedures	3 injections	3 injections	3 injections (n=46)* 1 injection (n=45)*	3 injections	4 injections	4 injections
Cross-over (timing)	NR		NR		NR	
Co-interventions	None		Paracetamol for discomfort; NSAIDs prohibited; no limitations on physical activity		NR	
Length (%) f/u						
Short-term	2 mos. (NR)		NR		1 mo. (NR)	
Intermediate-term	6 mos. (NR)		6 mos. (89%)		3 mos. (NR)	
Long-term	12 mos. (95%)		NR		6 mos. (100%)	
Country	Italy		Turkey		Italy	
Funding	Government		NR		NR	
Risk of bias	Low		Moderately Low		Moderately High	

ADL: activities of daily living; EQ-VAS: EuroQol visual analog scale; f/u: follow-up; HA: Hyaluronic Acid; IKDC: International Knee Documentation Committee; KOOS: Knee injury and Osteoarthritis Outcome Score; LP/LR-PRP: Leukocyte-rich/leukocyte-poor platelet rich plasma; NR: not reported; OA: osteoarthritis; PRP: platelet-rich plasma; QOL: quality of life; RCT: randomized controlled trial; SD: standard deviation; tx: treatement; WOMAC: Western Ontario and McMaster University Arthritis Index.

*Gormeli 2015: Groups receiving either 3 PRP injections or a single PRP injection were statistically combined to form a single PRP group.

†Cerza 2012: Per inclusion criteria, all patients had previously received physical therapy or pharmacological therapy with little benefit.

‡ Gormeli 2015 and Cerza 2012: Previous lower extremity surgery was an exclusion criteria.

§Gormeli 2015 defines "Early OA" as Kellgren-Lawrence grade 0 with cartilage degeneration, or Kellgren-Lawrence grades I-III OA; "Advanced OA" is defined as Kellgren-Lawrence grade IV OA.

**Gormeli 2015: Platelet concentration was different for each PRP injection group-- 5.2x for those receiving 3 PRP injections, 5.3x for those receiving a single PRP injection.

Appendix Table F22. Knee Osteoarthritis RCTs comparing PRP to HA: Study and Patient Characteristics (4-6 of 6 trials)

	Raeissadat 2015		Sanchez 2012		Vaquerizo 2013	
	PRP (n=87)	HA (n=73)	PRP (n=89)	HA (n=87)	PRP (n=48)	HA (n=48)
Patient demographics						
Males, %	10%	24%	48%	48%	33%	46%
Age, years; mean ± SD	57 ± 9	61 ± 7	60 ± 8	59 ± 8	62 ± 7	65 ± 8
Minimum duration of symptoms	>3 mos.		NR		>6 mos.	
Mean duration of symptoms, mos.; mean ± SD	NR		NR		NR	
Previous nonoperative tx, %	NR		NR		NR	
Previous operative tx, %	NR		NR		NR	
Bilateral or unilateral	NR		Unilateral		NR	
Characteristics of Osteoarthritis						
OA Inclusion Criteria	Kellgren-Lawrence grades I-IV		Ahlbäck grades I-III		Kellgren-Lawrence grades II-IV	
Kellgren-Lawrence Grade I, %	6%	0%	NR		0%	0%
Kellgren-Lawrence Grade II, %	44%	47%	NR		29.2%	37.5%
Kellgren-Lawrence Grade III, %	38%	37%	NR		54.2%	43.8%
Kellgren-Lawrence Grade IV, %	12%	16%	NR		16.7%	18.8%
Ahlback Grade I, %	NR		51%	49%	NR	
Ahlback Grade II, %	NR		36%	38%	NR	
Ahlback Grade III, %	NR		13%	13%	NR	
Primary Arthritis, %	NR		NR		44%	42%
Patient Baseline Measures						
WOMAC: Total score (various, higher score, worse)* , mean ± SD	39.5 ± 17.06*	28.69 ± 16.69*	121.8 ± 44.4*	115.6 ± 45.1*	45.9 ± 12.7*	50.8 ± 18.4*
WOMAC: Function (0-68 (worst)), mean ± SD	28.91 ± 12.63	19.88 ± 16.69	39.6 ± 16.3	38.8 ± 17.4	32.6 ± 9.9	36.7 ± 13.7
WOMAC: Stiffness (0-8 (worst)), mean ± SD	2.24 ± 1.76	1.88 ± 1.72	41.8 ± 17.3*	38.5 ± 18.3*	3.7 ± 1.7	4.0 ± 2.0
Lequesne index (0-24 (worst)), mean ± SD	NR		9.5 ± 3.0	9.1 ± 3.2	12.8 ± 3.8	13.1 ± 38
WOMAC: Pain (0-20 (worst)), mean ± SD	8.46 ± 4.17	6.91 ± 3.82	40.4 ± 16	38.4 ± 5.6	9.6 ± 2.5	10.2 ± 3.5
Sum of SF-36 mental health components (0-	229.22 ± 95.62	226.43 ± 97.39	NR		NR	

	Raeissadat 2015		Sanchez 2012		Vaquerizo 2013	
	PRP (n=87)	HA (n=73)	PRP (n=89)	HA (n=87)	PRP (n=48)	HA (n=48)
400 (best))†, mean ± SD						
Sum of SF-36 physical health components (0-400 (best))†, mean ± SD	178.14 ± 81.00	180.4 ± 68.52	NR		NR	
SF-36: Role Limitations (0-100 (best)), mean ± SD	28.83 ± 31.11	28.62 ± 36.17	NR		NR	
SF-36: Physical functioning (0-100 (best)), mean ± SD	37.4 ± 24.92	43.66 ± 22.3	NR		NR	
SF-36: Pain (0-100 (best)), mean ± SD	49.9 ± 24.77	45.45 ± 20.5	NR		NR	
SF-36: General health (0-100 (best)), mean ± SD	61.68 ± 25.72	61.37 ± 19.14	NR		NR	
SF-36: Emotional well-being (0-100 (best)), mean ± SD	61.01 ± 26.86	57.74 ± 21.24	NR		NR	
SF-36: Role limitations due to emotional problems (0-100 (best)), mean ± SD	50.64 ± 43.46	51.61 ± 46.13	NR		NR	
SF-36: Vitality (0-100 (best)), mean ± SD	54.25 ± 24.95	54.43 ± 21.47	NR		NR	
SF-36: Social functioning (0-100 (best)), mean ± SD	63.31 ± 28.41	60.64 ± 27.86	NR		NR	
Procedural characteristics						
Patient blinded to treatment received	No		Yes		Yes	
Volume of injectate (mL)	4-6 mL	2 mL	8 mL	NR	8 mL	NR
Platelet concentration, mean ± SD	4.8 ± 1.8 X baseline values	-	NR	-	NR	-
LR- or LP-PRP used?	LR-PRP	-	LP-PRP	-	LP-PRP	-
Leukocyte concentration/ ml, mean ± SD	5.2 ± 1.5X baseline values	-	NR	-	NR	-
Activating agent used, volume	None	-	Calcium Chloride, 400 µL	-	Calcium Chloride, 400 µL	-
Local anesthetic used	None‡	NR	NR		NR	
Other injectate	ACD-A 5 ml	NR	Sodium citrate 3.8%		Sodium citrate 3.8%	NR
Imaging guidance	None	NR	NR		NR	
Number of injections/procedures	2 injections	3 injections	3 injections	3 injections	3 injections	1 injection
Cross-over (timing)	NR		NR		NR	
Co-interventions	Acetaminophen 500 mg or acetaminophen with codeine (per		Acetaminophen as needed; NSAIDs prohibited		None§	

	Raeissadat 2015		Sanchez 2012		Vaquerizo 2013	
	PRP (n=87)	HA (n=73)	PRP (n=89)	HA (n=87)	PRP (n=48)	HA (n=48)
	physician); standardized exercises; other analgesics, NSAIDs, and steroid prohibited					
Length (%) f/u						
Short-term	1 mo. (NR)		1 mo. (NR)		6 mos. (NR)	
Intermediate-term	6 mos. (NR)		2 mos. (NR)		NR	
Long-term	12 mos. (88.5%)	12 mos. (84.93%)	6 mos. (88.76%)	6 mos. (85.05%)	12 mos. (88.76%)	12 mos. (83.3%)
Country	Iran		Spain		Spain	
Funding	NR		NR		Research Institute	
Risk of bias	Moderately High		Moderately Low		Low	

ACD-A: Anticoagulant Citrate Dextrose Solution-A; ADL: activities of daily living; EQ-VAS: EuroQol visual analog scale; f/u: follow-up; HA: Hyaluronic Acid; IKDC: International Knee Documentation Committee; KOOS: Knee injury and Osteoarthritis Outcome Score; LP/LR-PRP: Leukocyte-rich/leukocyte-poor platelet rich plasma; NR: not reported; NSAID: non-steroidal anti-inflammatory drug; OA: osteoarthritis; PRP: platelet-rich plasma; QOL: quality of life; RCT: randomized controlled trial; SD: standard deviation; SF-36: Short Form-36 questionnaire; tx: treatment; WOMAC: Western Ontario and McMaster University Arthritis Index.

*Different WOMAC scoring method appear to be reported, with higher scores representing worst function: Raeissadat reported 5-point Likert scale for 24 items (maximum scores, 120 points total, pain 25 points, stiffness 10 point, function 85 points); Sanchez reported normalized WOMAC, appears to have summed the 3 subscales (-0-100 each subscale, total 300); Vaquerizo references original WOMAC publication (Bellamy 1988), 0-96 total is was assumed (pain 20 points, stiffness 8 points, function 68 points .

†Raeissadat 2015: "Sum of physical health components" outcome is called PCS-36 by authors; mean appears to be the sum of SF-36 subscales physical functioning, role-physical, bodily pain, and general health. "Sum of mental health components" outcome is called MCS-36 by authors; mean appears to be the sum of SF-36 subscales vitality, social functioning, role-emotional, and mental health. Authors have not reported the MCS/PCS-36 in the standard method, as described by Ware et al. 1994.

‡Raeissadat 2015: Local anesthetic not used but a single dose of acetaminophen-codeine was given 2 hours before injection.

§No NSAIDs or steroid treatment in prior 3 months (part of inclusion criteria).

Appendix Table F23. Knee Osteoarthritis Observational Studies comparing PRP to HA: Study and Patient Characteristics

	Kon 2011 Prospective cohort study		Sanchez 2008 Retrospective cohort study		Say 2013 Prospective cohort study	
	PRP (n=50)	HA (n=100)*	PRP (n=30)	HA (n=30)	PRP (n=45)	HA (n=45)
Patient demographics						
Males, %	60%	52%	34%	40%	11%	13%
Age, years; mean ± SD	50 ± 14	54 ± 9	64 ± 9	61 ± 9	55 ± 8	56 ± 5
Minimum duration of symptoms	≥4 mos.	≥4 mos.	NR		NR	
Mean duration of symptoms, mos.; mean ± SD	NR		NR		NR	
Refractory to previous nonoperative tx, %	NR		0%†	0%†	100%‡	100%‡
Refractory to previous operative tx, %	36%	30%	NR		NR	
Bilateral or unilateral	Unilateral		NR		Bilateral	
Characteristics of Osteoarthritis						
OA Inclusion Criteria	NR		NR		NR	
Cartilage degeneration, %	44%	40%	NR		NR	
Early OA, %	40%	41%	NR		NR	
Advanced OA, %	16%	19%	NR		NR	
Kellgren-Lawrence score, mean ± SD	NR		NR		NR	
Kellgren-Lawrence Grade I, %	NR		NR		2.2%	2.2%
Kellgren-Lawrence Grade II, %	NR		NR		37.7%	33.3%
Kellgren-Lawrence Grade III, %	NR		NR		60%	64.4%
Kellgren-Lawrence Grade IV, %	NR		NR		NR	
Ahlback Grade I, %	NR		15%	15%	NR	
Ahlback Grade II, %	NR		16.6%	16.6%	NR	
Ahlback Grade III, %	NR		3.3%	3.3%	NR	
Ahlback Grade IV, %	NR		15%	15%	NR	
Patient Baseline Measures						
WOMAC: Function (0-68 (worst)), mean ± SD	NR		26.4 ± 22.3	22.9 ± 24.5	NR	
WOMAC: Stiffness (0-8 (worst)), mean ± SD	NR		3.6 ± 2.9	3.2 ± 3.1	NR	
WOMAC: Total score (0-96 (worst)), mean ± SD	NR		38.45 ± 31.3	32.33 ± 34.1	NR	
KOOS (0-100 (best)), mean ± SD	NR		NR		46 ± 16.2	43.8 ± 8.6
IKDC (0-100 (best)), mean ± SD	41.2 ± 10.9	46.0 ± 10.8	NR		NR	

	Kon 2011 Prospective cohort study		Sanchez 2008 Retrospective cohort study		Say 2013 Prospective cohort study	
WOMAC: Pain (0-20 (worst)), mean ± SD	NR		8.4 ± 6.1	6.3 ± 6.6	NR	
VAS (0-10 (worst)), mean ± SD	NR		NR		7.3 ± 1.6	7.0 ± 1.3
EQ-VAS (0-100 (best)), mean ± SD	53.6 ± 18.3	51.7 ± 10.35	NR		NR	
Procedural characteristics						
Patient blinded to treatment received	NR		Varies§		NR	
Volume of injectate (mL)	5 mL	2 mL	6-8 mL	2 mL	2.5 mL	2.5 mL
Platelet concentration, mean ± SD	6 x 10^9/mL	-	2.0 ± 0.5 X baseline value	-	400% increase**	-
LR- or LP-PRP used?	NR	-	LP-PRP	-	NR	-
Leukocyte concentration/ ml, mean ± SD	NR	-	NR	-	NR	-
Activating agent used	10% Calcium Chloride	-	Calcium Chloride	-	5.5% Calcium Chloride	-
Local anesthetic used	NR		NR		NR	
Other injectate	NR		3.8% Sodium Citrate	NR	3.2% Sodium Citrate	NR
Imaging guidance	NR		NR		NR	
Number of injections/procedures	3 injections	1 injection	3 injections	3 injections	3 injections	1 injection
Cross-over (timing)	NR		NR		NR	
Co-interventions	No structured rehabilitation but recommendations provided regarding exercise and activity levels; ice for pain/swelling; NSAIDs not permitted		NR		No standardized rehabilitation; ice and paracetamol for pain/swelling; NSAIDs permitted up to 7 days post-injection (PRP group only)	
Length (%) f/u						
Short-term	2 mos. (NR)		1.25 mos. (NR)		3 mos. (NR)	
Intermediate-term	6 mos. (NR)		NR		6 mos. (NR)	
Long-term	NR		NR		NR	
Country	USA and Italy		Spain		Turkey	
Funding	NR		Government		NR	
Risk of bias	Moderately High		Moderately High		Moderately High	

ADL: activities of daily living; EQ-VAS: EuroQol visual analog scale; f/u: follow-up; HA: Hyaluronic Acid; IKDC: International Knee Documentation Committee; KOOS: Knee injury and Osteoarthritis Outcome Score; LP/LR-PRP: Leukocyte-rich/leukocyte-poor platelet rich plasma; NR: not reported; OA: osteoarthritis; QOL: quality of life; SD: standard deviation; tx: treatment; VAS: visual analog scale; WOMAC: Western Ontario and McMaster University Arthritis Index.

*Kon 2011: Groups receiving low-molecular weight HA and high-molecular weight HA have been statistically combined to form a single HA group.

†Sanchez 2008: Previous intra-articular treatment is an exclusion criteria.

‡Say 2013: Previous failed treatment with analgesics and anti-inflammatories in the last three months is an inclusion criteria.

§Sanchez 2008: Unclear if patients were blinded.

**Say 2013: Increase compared to thrombocyte count, no further details provided.

Appendix Table F24. Knee Osteoarthritis Observational Studies comparing PRP to HA: Study and Patient Characteristics, Continued

	Spakova 2012 Prospective cohort	
	PRP (n=60)	HA (n=60)
Patient demographics		
Males, %	55%	52%
Age, years; mean ± SD	53 ± 12	53 ± 15
Minimum duration of symptoms	>12 mos.	>12 mos.
Mean duration of symptoms, mos.; mean ± SD	NR	
Refractory to previous nonoperative tx, %	100%*	100%*
Refractory to previous operative tx, %	NR	
Bilateral or unilateral	NR	
Characteristics of Osteoarthritis		
OA Inclusion Criteria	Kellgren-Lawrence grades I-III	
Kellgren-Lawrence Grade I, %	3.3%	3.3%
Kellgren-Lawrence Grade II, %	65%	61.6%
Kellgren-Lawrence Grade III, %	31.6%	35%
Kellgren-Lawrence Grade IV, %	0%	0%
Patient Baseline Measures		
WOMAC: Function (0-68 (worst)), mean ± SD	NR	
WOMAC: Stiffness (0-8 (worst)), mean ± SD	NR	
WOMAC: Total score (0-96 (worst)), mean ± SD	38.8 ± 16.5	43.2 ± 13.7
NRS (0-10 (worst)), mean ± SD)	5.3 ± 1.9	6.0 ± 1.8
Procedural characteristics		
Patient blinded to treatment received	NR	
Volume of injectate (mL)	3 mL	NR
Platelet concentration (platelets/ml), mean ± SD	680 ± 132 x 10^6	-
LR- or LP-PRP used?	LP-PRP	-
Leukocyte concentration/ ml, mean ± SD	NR	-
Activating agent used	None	-
Local anesthetic used	NR	
Other injectate	Sodium Citrate	NR
Imaging guidance	NR	
Number of injections/procedures	3 injections	3 injections
Cross-over (timing)	NR	
Co-interventions	No standardized exercise program; paracetamol for pain (max. 4g/day)	
Length (%) f/u		
Short-term	3 mos. (NR)	
Intermediate-term	6 mos. (NR)	
Long-term	NR	
Country	Slovakia	
Funding	NR	
Risk of bias	Moderately High	

ADL: activities of daily living; EQ-VAS: EuroQol visual analog scale; f/u: follow-up; HA: Hyaluronic Acid; NR: not reported; NRS: numerical rating pain; OA: osteoarthritis; PRP: platelet-rich plasma; QOL: quality of life; SD: standard deviation; WOMAC: Western Ontario and McMasters University Arthritis Index.

*Refractory to previous conservative treatment with NSAIDs and analgesics for at least 6 months is part of inclusion criteria.

Appendix Table F25. Knee Osteoarthritis RCT comparing PRP to Corticosteroid: Study and Patient Characteristics

	Forogh 2015	
	PRP (24 knees, n=NR)	Steroid (24 knees, n=NR)
Patient demographics		
Males, %	29%	37%
Age, years; mean ± SD	60 ± 7	61 ± 7
Minimum duration of symptoms	>3 mos.	>3 mos.
Mean duration of symptoms, mos.; mean ± SD	NR	
Previous nonoperative tx, %	100%*	
Previous operative tx, %	0%*	
Bilateral or unilateral	NR	
Characteristics of Osteoarthritis		
OA Inclusion Criteria	Kellgren-Lawrence Grade II-III	
Kellgren-Lawrence Grade II, %	29.2%	33.3%
Kellgren-Lawrence Grade III, %	70.8%	66.7%
Patient Baseline Measures		
KOOS: Symptom (0-100 (best)), mean ± SD	55.2 ± 14.0	54.6 ± 16.8
KOOS: ADL score (0-100 (best)), mean ± SD	51.9 ± 14.2	46.1 ± 21.5
KOOS: Sport (0-100 (best)), mean ± SD	5.9 ± 6.8	5.0 ± 7.1
KOOS: Pain (0-100 (best)), mean ± SD	45.8 ± 13.5	52.3 ± 11.8
VAS-based pain intensity (0-100 (worst)), mean ± SD	81.3 ± 13.4	77.8 ± 13.8
KOOS: QoL (0-100 (best)), mean ± SD	7.4 ± 8.4	5.1 ± 7.4
Procedural characteristics		
Patient blinded to treatment received	Yes	
Volume of injectate (mL)	5 mL	1 mL
Platelet concentration, mean ± SD	1.5×10^9 platelets/ml	-
LR- or LP-PRP used?	NR	-
Leukocyte concentration/ ml, mean ± SD	NR	-
Activating agent used, volume	Calcium Gluconate, 10 mL	-
Local anesthetic used	NR	
Other injectate	ACD-A, 2 mL	Depro-Medrol, 1 mL
Imaging guidance	NR	
Number of injections/procedures	1 injection	1 injection
Cross-over (timing)	NR	
Co-interventions	Asked to avoid weight pressure on injected joint for 24 hours; allowed acetaminophen and cold compress for pain; instructed to exercise	
Length (%) f/u		
Short-term	2 mos. (NR)	
Intermediate-term	6 mos. (81.3 %)	
Long-term	NR	
Country	Iran	
Funding	None	
Risk of bias	Moderately Low	

ACD-A: Anticoagulant Citrate Dextrose Solution-A (anticoagulant); ADL: activities of daily living; f/u: follow-up; HA: Hyaluronic Acid; KOOS: Knee injury and Osteoarthritis Outcome Score; LP/LR-PRP: Leukocyte-rich/leukocyte-poor platelet rich plasma; NR: not reported; NSAID: non-steroidal anti-inflammatory drug; OA: osteoarthritis; PRP: platelet-rich plasma; QOL: quality of life; SD: standard deviation; tx: treatment;

* All included patients had history of undergoing, but not benefitting from at least 2 OA treatments; history of surgery during the previous 6 months was part of exclusion criteria.

Appendix Table F26. Knee Osteoarthritis RCTs comparing PRP to Saline: Study and Patient Characteristics

	Patel 2013		Gormeli 2015	
	PRP* (n=102 knees, 52 patients)	Saline* (n=52 knees, 26 patients)	PRP† (n=91)	Saline (n=45)
Patient demographics				
Males, %	31%	26%	42%	50%
Age, years; mean ± SD	52 ± 10	54 ± 8	54 ± 13	53 ± 13
Minimum duration of symptoms	NR		>4 mos.	>4 mos.
Mean duration of symptoms, mos.; mean ± SD	NR		NR	
Recurrent injury, %	NR		NR	
Refractory to previous nonoperative tx, %	NR		NR	
Refractory to previous operative tx, %	NR		0%	
Bilateral or unilateral	Bilateral		Unilateral	
Characteristics of Osteoarthritis				
OA Inclusion Criteria	Ahlback Grades I-II		Kellgren-Lawrence Grades I-IV	
Early OA, %	NR		67%	67.4%
Advanced OA, %	NR		32%	32.5%
Ahlback Grade I, %	74.5%‡	54.3%	NR	
Ahlback Grade II, %	21.4%‡	39.1%	NR	
Ahlback Grade III, %	4.1%‡	6.5%	NR	
Primary Arthritis, %	NR		NR	
Patient Baseline Measures				
WOMAC: Total score (0-96 (worst)), mean ± SD	51.38 ± 16.93	45.54 ± 17.29	NR	
WOMAC: Stiffness (0-8 (worst)), mean ± SD	3.28 ± 2.05	2.70 ± 2.02	NR	
WOMAC: Function (0-68 (worst)), mean ± SD	37.61 ± 12.17	38.80 ± 12.44	NR	
IKDC (0-100 (best)), mean ± SD	NR		40.8 ± 5.52	40.4 ± 4.3
VAS (0-10 (worst)), mean ± SD	4.60 ± 0.57	4.57 ± 0.62	NR	
WOMAC: Pain (0-20 (worst)), mean ± SD	10.40 ± 3.74	9.04 ± 3.73	NR	
EQ-VAS (0-100 (best)), mean ± SD	NR		50.3 ± 5.47	50.2 ± 4.5
Procedural characteristics				
Patient blinded to treatment received	Yes		Yes	
Volume of injectate (mL)	8 mL/knee	NR	5 mL	2 mL
Platelet concentration, mean ± SD	3.1 x 10^8/ml	-	5.2-5.3 X baseline value§	-
LR- or LP-PRP used?	LP-PRP	-	NR	-
Leukocyte concentration/ ml, mean ± SD	NR	-	NR	-
Activating agent used, volume	Calcium Chloride, 1 mL	-	Calcium Chloride, 1 mL	-
Local anesthetic used	None	NR	None	NR
Other injectate	CPD-A1	NR	None	NR
Imaging guidance	None	NR	None	NR
Number of injections/procedures	2 injections (n=50 knees, 25 patients)*	1 injection	3 injections (n=46)†	3 injections
	1 injection (n=54 knees, 27		1 injection (n=45)†	

	Patel 2013		Gormeli 2015	
	PRP* (n=102 knees, 52 patients)	Saline* (n=52 knees, 26 patients)	PRP† (n=91)	Saline (n=45)
	patients)*			
Cross-over (timing)	NR	NR	NR	NR
Co-interventions	Paracetamol 500 mg allowed for discomfort; NSAIDs prohibited; all patients asked to stop medications 48 hrs. before follow-up assessment		Paracetamol allowed for discomfort; NSAIDs prohibited; no limitations on physical activity	
Length (%) f/u				
Short-term	3 mos. (%NR)		NR	
Intermediate-term	6 mos. (94.8%)		6 mos. (90.4%)	
Long-term	NR		NR	
Country	India		Turkey	
Funding	Academic**		NR	
Risk of bias	Moderately Low		Moderately Low	

CPD-A: Citrate phosphate dextrose and adenine (anticoagulant); EQ-VAS: EuroQol visual analog scale; f/u: follow-up; IKDC: International Knee Documentation Committee; LP/LR-PRP: Leukocyte-rich/leukocyte-poor platelet rich plasma; NR: not reported; OA: osteoarthritis; PRP: platelet-rich plasma; QOL: quality of life; RCT: randomized controlled trial; SD: standard deviation; tx: treatment; VAS: visual analog scale; WOMAC: Western Ontario and McMaster University Arthritis Index.

*Patel 2013: PRP results reflect number of knees receiving either a single PRP injection or two PRP injections. Results from these injection groups were statistically combined to create a single PRP group.

†Gormeli 2015: Groups receiving 3 PRP injections or a single PRP injection were statistically combined to create a single PRP group.

‡Patel 2013: There were only 98 total patients with Ahlback grades I-III. Remaining 4 patients in PRP group are unaccounted for in the study.

§Gormeli 2015: Concentrations of PRP ranged from 5.2 (PRP3 group) to 5.3 (PRP1 group) times those of baseline values.

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Appendix Table F27. Knee Osteoarthritis RCTs comparing PRP to Exercise or TENS + Exercise: Study and Patient Characteristics

	Rayegani 2014		Angoorani 2015	
	PRP (n=32)	Exercise (n=33)	PRP (n=27)	TENS + Exercise (n=27)
Patient demographics				
Males, %	7.0%	7.0%	18.5%	7.4%
Age, years; mean ± SD	58 ± 9	55 ± 11	58 ± 9	55 ± 11
Minimum duration of symptoms	>3 mos.		>3 mos.	
Mean duration of symptoms, mos.; mean ± SD	NR		NR	
Symptom period of 3-12 mos., %	16.7%	25.8%	NR	
Symptom period of >12 mos., %	83.3%	74.2%	NR	
Previous nonoperative tx, %	NR		NR	
Previous operative tx, %	NR		NR	
Bilateral or unilateral	NR		NR	
Characteristics of Osteoarthritis				
OA Inclusion Criteria	Kellgren-Lawrence Grades I-IV		Kellgren-Lawrence Grades I-III	
Tibiofemoral OA, Grade I	3.3%	10%	NR	
Tibiofemoral OA, Grade II	50%	70%	NR	
Tibiofemoral OA, Grade III	33.3%	20%	NR	
Tibiofemoral OA, Grade IV	13.3%	0.0%	NR	
Patellofemoral OA, Grade I	6.7%	0.0%	NR	
Patellofemoral OA, Grade II	43.3%	51.7%	NR	
Patellofemoral OA, Grade III	30%	44.9%	NR	
Patellofemoral OA, Grade IV	20%	3.4%	NR	
Patient Baseline Measures				
WOMAC: Stiffness (0-8 (worst)), mean ± SD	2.3 ± 1.76	1.67 ± 1.64	NR	
WOMAC: Function (0-68 (worst)), mean ± SD	31.86 ± 9.81	25.03 ± 17.25	NR	
KOOS: Symptom (0-100 (best)), mean ± SD	NR		51.5 ± 4.47	50.3 ± 3.87
KOOS: ADL score (0-100 (best)), mean ± SD	NR		48.3 ± 3.81	42.4 ± 4.09
KOOS: Sport (0-100 (best)), mean ± SD	NR		23.8 ± 4.87	28.4 ± 6.16
WOMAC: Pain (0-20 (worst)), mean ± SD	9.13 ± 3.72	7.12 ± 3.37	NR	
KOOS: pain (0-100 (best)), mean ± SD	NR		44.9 ± 3.56	41.3 ± 3.43
KOOS: QoL (0-100 (best)), mean ± SD	NR		17.1 ± 2.62	0.6 ± 3.65
Procedural characteristics				
Patient blinded to treatment received	No		NR	
Volume of injectate (mL)	4-6 mL	-	5 mL	-
Platelet concentration/ml, mean ± SD	1st injection: $1.3 \times 10^6 \pm 5.2 \times 10^5$ 2nd injection: $1.4 \times 10^6 \pm 3.6 \times 10^5$	-	3-7 X baseline values	-
LR- or LP-PRP used	LR-PRP	-	LP-PRP (80%)†	-

	Rayegani 2014		Angoorani 2015	
	PRP (n=32)	Exercise (n=33)	PRP (n=27)	TENS + Exercise (n=27)
			LR-PRP (20%)†	
Leukocyte concentration/ml, mean ± SD	NR	-	NR	-
Activating agent used, volume	None	-	Calcium gluconate, 0.5 mL	-
Local anesthetic used	None	-	None	-
Other injectate, volume	ACD-A, 5 mL	-	NR	-
Imaging guidance	NR	-	NR	-
Number of injections/procedures	2 injections	-	2 injections	-
Cross-over (timing)	NR		NR	
Control intervention	-		Exercise video provided, 10 sessions of TENS (2 sessions/week, 100 hZ for 30 minutes)	
Co-interventions	Exercise and acetaminophen without codeine, 500 mg		NSAIDs, green tea, and cranberry consumption were disallowed; paracetamol 500 mg and ice as needed	
Length (%) f/u				
Short-term	NR		2 mos. (92.5%)	
Intermediate-term	6 mos. (93.8%)		NR	
Long-term	NR		NR	
Country	Iran		Iran	
Funding	NR*		Academia	
Risk of bias	Moderately Low		Moderately Low	

ACD-A: Anticoagulant Citrate Dextrose Solution-A; ADL: activities of daily living; f/u: follow-up; HA: Hyaluronic Acid; KOOS: Knee injury and Osteoarthritis Outcome Score; LP/LR-PRP: Leukocyte-rich/leukocyte-poor platelet rich plasma; NR: not reported; NSAID: Non-steroidal anti-inflammatory drug; OA: osteoarthritis; PRP: platelet-rich plasma; QOL: quality of life; RCT: randomized controlled trial; SD: standard deviation; TENS: Transcutaneous electrical nerve stimulation; tx: treatment; WOMAC: Western Ontario and McMaster University Arthritis Index.

*Funding not reported, but acetaminophen utilized by patients in trial was donated by the Hakim Pharmaceutical Company.

†Based on personal correspondence with the author

Appendix Table F28. Hip Osteoarthritis RCT comparing LP-PRP to HA: Study and Patient Characteristics

	Battaglia 2013	
	PRP (n=52)	HA (p=52)
Patient demographics		
Males, %	60%	56%
Age, years; mean ± SD	51 ± 12	56 ± 12
Range of duration of symptoms	6-24 months	
Mean duration of symptoms, mos.; mean ± SD	NR	
Previous nonoperative tx, %	NR	
Previous operative tx, %	0%*	
Bilateral or unilateral	Unilateral	
Characteristics of Osteoarthritis		
OA Inclusion Criteria	NR	
Kellgren-Lawrence Grade I, %	NR	
Kellgren-Lawrence Grade II, %	32%	46%
Kellgren-Lawrence Grade III, %	42% (not stratified by group)	
Kellgren-Lawrence Grade IV, %	26%	8%
Patient Baseline Measures		
Harris Hip Score, mean (95% CI)	5.47 (4.97, 5.96)	5.97 (5.48, 6.47)
VAS (0-10 (worst)), mean (95% CI)	5.47 (4.97, 5.96)	5.97 (5.48, 6.47)
NSAID usage, %	92%	74%
Procedural characteristics		
Patient blinded to treatment received	Yes	
Volume of injectate (mL)	5 mL	2 mL
Platelet concentration/ml, mean ± SD	600% increase from whole blood	-
LR- or LP-PRP used	LR-PRP	-
Leukocyte concentration, mean ± SD	8300/µL	-
Activating agent used	10% Calcium Chloride	-
Local anesthetic used	None	
Other injectate	Sodium Citrate	NR
Imaging guidance	Ultrasound	
Number of injections/procedures	3 injections	
Cross-over (timing)	NR	
Co-interventions	Patients instructed to limit use of leg for few days then perform light exercise; NSAID consumption was forbidden for only the first 48 hours after injection	
Length (%) f/u		
Short-term	3 mos. (NR)	
Intermediate-term	6 mos. (NR)	
Long-term	12 mos. (96.1%)	
Country	Italy	
Funding	NR	
Risk of bias	Moderately Low	

CI: confidence interval; LP/LR-PRP: Leukocyte-rich/leukocyte-poor platelet rich plasma; NR: not reported; NSAID: non-steroidal anti-inflammatory drug; OA: osteoarthritis; SD: standard deviation; tx: treatment; VAS: visual analog scale

* Previous hip surgery at the affected hip is part of exclusion criteria.

Appendix Table F29. Temporomandibular Joint (TMJ) Osteoarthritis RCT comparing PRP to HA: Study and Patient Characteristics

	Hegab 2015	
	PRP (n=25)	HA (n=25)
Patient demographics		
Males, %	26%	44%
Age, years; mean ± SD	39 ± 5	38 ± 4
Minimum duration of symptoms	NR	NR
Mean duration of symptoms, mos.; mean ± SD	NR	NR
Recurrent injury, %	NR	NR
Previous nonoperative tx, %	0%*	
Previous operative tx, %	0%*	
Bilateral or unilateral	NR	
Characteristics of Osteoarthritis		
OA Inclusion Criteria	NR	
Patient Baseline Measures		
Maximum non-assisted (voluntary) mouth opening, mean ± SD	33.8 ± 3.1	32.4 ± 2.7
Joint Sounds, %	100%	100%
VAS pain (0-10 (worst)), mean ± SD	7.3 ± 1.1	6.9 ± 1.2
Procedural characteristics		
Patient blinded to treatment received	Yes	
Volume of injectate (mL)	1 mL	1 mL
Platelet concentration/ml, mean ± SD	NR	-
LR- or LP-PRP used	NR	-
Leukocyte concentration/ ml, mean ± SD	NR	-
Activating agent used	NR	-
Local anesthetic used	Yes	
Other injectate	Sodium Citrate†	NR
Imaging guidance	NR	
Number of injections/procedures	3 injections	
Cross-over (timing)	NR	
Co-interventions	NSAIDs were not given to PRP patients during treatment period.	
Length (%) f/u		
Short-term	3 mos. (NR)	
Intermediate-term	6 mos. (NR)	
Long-term	12 mos. (NR)	
Country	Egypt	
Funding	No funding was received.	
Risk of bias	Moderately High	

HA: hyaluronic acid; LP/LR-PRP: Leukocyte-rich/leukocyte-poor platelet rich plasma; NSAID: nonsteroidal anti-inflammatory drug; NR: not reported; PRP: platelet-rich plasma; SD: standard deviation; VAS: Visual analog scale

* Patients who had previous treatment for TMJ disorders were excluded.

† Added as an anticoagulant.

APPENDIX G. Study Characteristics Data Abstraction Tables

Appendix Table G1. Elbow Epicondylitis RCT Study and Patient Characteristics Data Abstraction Tables

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Funding
PRP vs. ABI										
Creaney 2011 (UK)	N=150	Inclusion: Elbow tendinopathy ≥6 months, failure of conservative physical therapy. Exclusion: Previous corticosteroid injection, dry-needling, or blood injection.	PRP (n=80): 1.5 mL PRP (prepared by centrifugation of autologous blood 2000g X 15 min) injected into clefts of hypoechoicity; mean 652x10^9 platelets/L ABI (n=70): ABI (volume NR), injected into clefts of hypoechoicity; mean 234x10^9 platelets/L All treatments: Prior to PRP or ABI injection, tendons surface-bathed with 2 ml bupivacaine followed by 2 minute wait time	6 mos. 86.7% PRP vs ABI: 88% vs 86%)	No	Ultrasound	Total: 2/patient (at 0 & 1 month)	Ice, paracetamol as needed; continue normal activities but avoid physical activity or heavy carrying for 48 hours; avoid anti-inflammatory drugs	PRP vs. ABI Age (mean ± SD): 53 vs. 48 % Female: 43% vs. 44% Duration of pain (months) (mean ± SD): NR (≥6 mos. per inclusion criteria) Baseline VAS pain (mean ± SD): NR Baseline PRTEE (mean (95% CI)): 45.8 (41.9, 49.6) vs. 52.5 (48.5, 56.5)	No competing interests, study not commissioned
Raeissadat 2014 "is platelet" (Iran)	N = 64	Inclusion: Chronic clinically diagnosed lateral epicondylitis with duration of symptoms more than 3 months and pain severity with a minimum score of 5 (based on 10 scale VAS) Exclusion: Patients ≥70 years old, any recent febrile or infections desiease, history of any	PRP (n = 33): Injection: 2 mL lidocaine 1% injected 8 minutes before, single injection of 2 mL of autologous PRP, deep at the origin of the wrist extensors, into maximal tenderness point at elbow region under aseptic technique and using a peppering technique	12 mos. 95.3% PRP vs ABI (93.9% vs 96.7%)	No	NR	None	No cortisone or NSAIDs were prescribed during f/u. For pain relief only, oral paracetamol and ice therapy were used. Patients requested to refrain from heavy labor activities for a week. Tennis	PRP vs. ABI Age (mean ± SD): 43 ± 6 vs 44 ± 7 % Female: 74% vs 80%, p = 0.8 Side of involvement: Right: 61% vs 73% Left: 39% vs 27%, p = 0.4 Mean duration of symptoms: 14.5 ± 3 mos. Mean platelet count:	NR

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Funding
		malignancy, carpal tunnel syndrome, peripheral nerve injuries (e.g. radial nerve injury), cervical radiculopathy, systemic illnesses including ischemic heart disease, diabetes, rheumatoid arthritis, hepatitis, bony malformations, bony or articular lesions at the elbow, history of autoimmune and platelet disorders, treatment with anticoagulant and anti-platelet medications 10 days before injection, consistent use of NSAIDs within 48 hours before procedure, use of systemic steroids during the past 3 weeks, haemoglobin measures of less than 10 g/dl and platelet counts of less than 150,000/uL, history of vasovagal shock, pregnancy, or breastfeeding	spreading in a clock-like manner to achieve a more expansive zone of delivery Preparation: Rooyagen kit, at concentration 4-6 times the average values from 20 mL of blood collected. 2 mL ACD-A added as an anticoagulant, centrifugation at 1600 RPM x 15 minutes, then 2800 RPM for 7 minutes. Final product was 2 mL of PRP containing leukocytes, with mean platelet count of 250,000 ± 53000/uL. ABI (n = 31): Injection: 2 mL lidocaine 1% injected 8 minutes before single injection of 2 mL of autologous peripheral whole blood (mean platelet concentration 250,000 ± 53,000/uL) under same technique as above.					elbow strap (Oppo™) was administered, patients instructed to apply strap 2 cm below maximal tenderness point at elbow, and instructed how to use elbow splint and perform exercise. 3 days post-injection, patients started a simple program of extensor muscles stretching and 2 weeks after injection eccentric loading exercises were prescribed to be performed on an individual basis 2x/day for 5 weeks. Patients allowed to perform full ADL after 4 weeks.	250,000 ± 53,000/uL, which increased to 1,227,000 ± 250,000 in PRP prep Leucocyte count: 6740 ± 1396/uL vs 6453 ± 1193/uL VAS score: 7.1 ± 2.1 vs 6.8 ± 1.5 MMCPIE score: 53.9 ± 16 vs 48.8 ± 18 PPT score: 17 ± 5.6 vs 16.9 ± 5.4	
Raeissadat 2014 "effect" (Iran)	N = 45	Inclusion: Chronic clinically diagnosed lateral epicondylitis, with duration of symptoms more than 3 months and pain severity with a minimum score of 5	PRP (n = 23): Preparation: 20cc of venous blood drawn, 2 mL ACD-A added as anticoagulant, sample centrifuged 1600 RPM x 15 min, then 2800 RPM x 7 min. Final product	8 wks. 89% (40/45) PRP vs ABI (87% (20/23) vs 91% (20/22))	No	NR	None	No cortisone or NSAIDs were prescribed during f/u. For pain relief, oral paracetamol and ice therapy were used. Patients	PRP vs. ABI Age (mean ± SD): 47.2 ± 6.3 vs 45.3 ± 8.7 % Female: 75% (15/20) vs 85% (17/20), p = 0.7 Duration of	Faculty of Medicine, Shahid Beheshti University of Medical Sciences

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Funding
		Exclusion: Patients who are pregnant, >75 years, have a history of trauma, any platelet dysfunction syndrome, any other coagulopathies, local infection at the site of the procedure, recent febrile or infections disease, consistent use of NSAIDs within 48 hours before procedure, recent use of cortico steroids during last 2 weeks, history of local injection of any medications into the site of lateral epicondyle, hemoglobin <10gr/dL, plasma platelet count <100,000/mm^3, history of any malignancy, carpal tunnel syndrome, cervical radiculopathy or peripheral radial nerve injury, systemic illnesses including ischemic heart disease, diabetes, rheumatoid arthritis, hepatitis, any bony malformations, bony or articular lesions at elbow, a history of vasovagal syncope, or hemodynamic instability	was 2 mL of PRP containing leukocytes, and 990,000 ± 43,000 platelets/mm^3 Injection: 2 mL 1% lidocaine injected 8 minutes before PRP injected at maximal tender point at elbow using a peppering technique spreading in a clock-like manner to achieve an expansive zone of delivery ABI (n = 22): single injection of 2 mL of autologous peripheral whole blood (platelet count 220,000 ± 23000/mm^3), using same technique as PRP.					were requested to refrain from heavy labor activities for a week. Tennis elbow strap (Oppo™) was administered and applied 2 cm below the maximal tenderness point. Patients were instructed on how to use elbow splint to perform exercises. 3 days post-injection, a program of extensor muscles stretching started, and 2 weeks after injection, eccentric loading exercises were prescribed to be performed 2x daily for 5 weeks. Full ADL after 4 weeks was allowed.	symptoms: 14.5 ± 3 mos. Platelet count: 220,000/mm^3 ± 23,000 Side of involvement: Right: 55% (11/20) vs 75% (15/20) Side: 45% (9/20) vs 25% (5/20) PPT score (kg/cm^2): 17.8 ± 8.9 vs 15.5 ± 5.2, p = NR VAS score (0-10): 7.2 ± 1.4 vs 6.8 ± 1.7, p = 0.51 MMCPIE (0-100): 58.42 ± 15.1 vs 50.9 ± 20.4, p = 0.2	
Thanasas 2011 (Greece)	N = 28	Inclusion: clinically diagnosed chronic lateral epicondylitis,	PRP (n = 14): Preparation: Biomet GPSIII, 27-55 mL of	3 mos.: 100% PRP vs ABI	No	Ultrasound guidance	None	No cortisone or NSAIDs were prescribed, oral	PRP vs ABI Age: 35.9 (34-55) vs 36.6 (29-52)	NR

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Funding
		duration of symptoms ≥3 months Exclusion: history of trauma, duration <3 months, previous injection of any kind, medical history of rheumatic disorder, signs of posterior interosseous nerve entrapment, suspicion of nerve involvement	autologous peripheral blood with 3-5 mL of anticoagulant, centrifuged at 3200 RPM x 15 minutes, extracting 3-6 mL PRP. Concentration of platelets was about 1,292,500/mL, white blood cells included in the concentrate with an average ratio of 111/1 platelets/leukocytes Injection: single injection of 3 mL of autologous PRP, deep at the origin of wrist extensors with a peppering technique Autologous Peripheral whole blood: (n = 14) single injection of autologous whole blood (platelet count 235,000/mL), 3 mL, deep at the origin of wrist extensors with a peppering technique	100% (14/14) vs 100% (14/14) 6 mos.: 96% (27/28) PRP vs ABI 100% (14/14) vs 93% (13/14)				paracetamol and ice therapy were allowed for pain relief only. Patients asked to refrain from heavy labor activities for a week. 1 week post-injection, each patient was processed and given a simple program of stretching and eccentric loading exercises to be performed 2x/day for 5 weeks.	% Female: 67% (10/15) vs 79% (11/14) Duration of symptoms: 4.7 (3-12) vs 5.1 (3-14) mos. VAS (mean, 95% CI): 6.1 (5.43 to 6.77) vs 6.0 (5.32 to 6.68) Liverpool elbow score (mean, 95% CI): 6.99 (6.98 to 7.30) vs 6.97 (6.65 to 7.29)	
ABI vs Corticosteroid										
Arik 2014 (Turkey)	N = 80	Inclusion: patients presenting with lateral epicondylitis Exclusion: history of recent trauma, congenital or neuromuscular disease, upper limb surgery,	Autologous Blood Injection (n = 40): 2 mL of autologous venous blood (mean platelet count NR) collected from the atecubital fossa of the ipsilateral side mixed with 1 mL of 2% prilocaine	6 mos. 100% ABI vs Steroid (100% (40/40) vs 100% (40/40)	No	NR	None	Abstain from heavy work, NSAIDs and physiotherapy were not prescribed.	ABI vs Steroid Mean age (mean ± SD): 43.7 ± 7.8 vs 46.7 ± 8.4, p = 0.096 % Female: 73% (29/40) vs 75% (30/40) Side of involvement: Left: 23% (9/40) vs	NR

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Funding
		rheumatic disease, cervical disc pathology, carpal tunnel syndrome, abnormality of the upper limb, systemic corticosteroid treatment, local injection treatment, or an allergic reaction to local anesthetics or corticosteroids	hydrochloride Corticosteroid injection (n = 40): 1 mL of 40 mg methylprednisolone acetate mixed with 1 mL of 2% prilocaine hydrochloride						35% (14/40) Right: 78% (31/40) vs 65% (26/40), p = 0.162 Duration of symptoms: 4.3 ± 2.3 vs 4.5 ± 3.5 mos., p = 0.844 VAS: 6.9 ± 1.2 vs 6.8 ± 1.3, p = 0.679 PRTEE: 66.7 ± 12.8 vs 62.2 ± 15.6, p = 0.165	
Dojode 2012 (India)	N = 60	Inclusion: Age > 15 years, and a diagnosis of lateral epicondylitis Exclusion: Patients receiving steroid injections in the three months prior to the study treatment, history of substantial trauma,, previous surgery for lateral epicondylitis, presence of other causes of elbow pain such as osteochondritis dessicans of capitellumn epiphyseal plate injuries, lateral compartment arthosis, various instability, radial head arthritis, posterior interosseous nerve syndrome, cervical disc syndrome, synovitis of radiohumeral joint, cervical radiculopathy, fibromyalgia, osteoarthritis of elbow, or carpal tunnel	Autologous Blood injection (n = 30): patients were infiltrated with injection of 2 mL autologous blood (mean platelet count NR) drawn from the contralateral upper limb vein mixed with 1 mL of 0.5% bupivacaine, the needle is introduced proximal to the lateral epicondyle along the supracondylar ridge, and gently advanced into the undersurface of the exterior carpi radialis brevis while infiltrating. Local corticosteroid (n = 30): patients were infiltrated with 2 mL of local corticosteroid mixed with 1 mL of 0.5% bupivacaine, at	6 mos. % f/u Unclear	No	NR	None	Patients advised to rest the upper limb for 3 days, with no restriction of activity after	Age (mean years, range): 42.9 (22 to 67) vs 42.2 (17-62) % Female: 56.7% (17/30) vs 60% (18/30) Duration of pain (mean weeks [range]): 9.5 (2 to 54) vs 7.7 (1 to 36) Side operated on: Right: 77% (23/30) vs 77% (23/30) VAS (mean ± SD): 7.7 ± 1.3 vs 7.5 ± 1.3, p = 0.5395 Nirschl score (mean ± SD: 5.4 ± 1.1 vs 5.2 ± 1.0, p = 0.4918	No specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Funding
		syndrome.	the lateral epicondyle, the needle is introduced proximal to the lateral epicondyle along the supracondylar ridge, and gently advanced into the undersurface of the exterior carpi radialis brevis while infiltrating.							
Jindal 2013 (India)	N = 50	Inclusion: previously untreated for, and had no other identifiable cause of, elbow pain. Those reporting with typical symptoms of tennis elbow and having no radiographic cause of pain Exclusion: Other causes of pain like radiocapitellar arthritis.	Autologous blood (n = 25): 2 mL venous blood (mean platelet count NR) drawn from the ipsilateral or the contralateral upper limb, mixed with 1 mL of 2% lignocaine solution, then injected. Injection was administered by introducing the needle just proximal to the lateral epicondyle, and the contents were injected on the undersurface of the extensor carpi radialis group of muscles. Local steroid injection (n = 25): 40 mg of methylprednisolone acetate and 1 mL 2% lignocaine solution. Injection was administered by introducing the needle just proximal to the lateral epicondyle, and	1.5 mos. % f/u Unclear	No	NR	None	Patients advised to restrain from activities involving repetitive movements of the wrist and elbow during the initial 3 weeks after the injection. Gentle passive stretching exercises of the extensor group of muscles was started as soon as the pain permitted.	Age (mean ± SD): 39.04 ± 6.67 vs 37.32 ± 7.52, p = 0.3965 % Female: 44% (11/25) vs 32% (8/25) Side operated: Right: (92% (23/25) vs 81% (21/25), p = 0.1404 Duration of symptoms (mean weeks ± SD): 4.48 ± 1.82 vs 4.4 ± 2.38, p = 0.8944 VAS (mean ± SD): 5.88 ± 1.83 vs. 6.2 ± 1.61, p = 0.5147 Nirschl stage (mean ± SD): 4.52 ± 1.23 vs 4.84 ± 0.94, p = 0.3065	NR

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Funding
			the contents were injected on the undersurface of the extensor carpi radialis group of muscles.							
Kazemi 2010 (Iran)	N = 60	Inclusion: A new episode of lateral elbow tendinopathy within the last year before recruitment, lack of upper limb function in ADL, pain on the lateral side of the elbow, worsening of the pain after activity, tenderness over the origin of extensor carpiradialis brevis 5-10 mm distal to the lateral epicondyle and at least one of the following: epicondylar pain during resisted dorsiflexion of the wrist with the elbow in full extension, or positive coffee-cup test in which picking up a full cup of coffee or water will produce localized pain at the lateral elbow. Exclusion: active arthritis, history of arthritis, or related diseases, a previous operation on the elbow, joint deformity, any corticosteroid injection during the 3 mos., history of trauma to the elbow region, pregnant	Autologous blood (n = 30): 2 mL of autologous blood (mean platelet count NR) was drawn from the distal region of the ipsilateral upper limb and mixed with 1 mL of 2% lidocaine. Then a single dose of the mixture was injected. Corticosteroid (n = 30): Single dose of LC injection of methylpredniosolone 20 mg mixed with 1 mL of 2% lidocaine. The needle was introduced proximal to the lateral epicondyle along the supracondylar ridge and moved forward to the undersurface of the extensor carpi radialis brevis.	2 mos. 100% (60/60) AB vs Steroid 30/30 (100%) vs 30/30 (100%)	No	None	None	Patients advised to return gradually to normal activities but to avoid pain-provoking physical stresses that irritated their elbow region especially within the first 48 hours after injection. Also instructed to not use brace, physiotherapy, or analgesic medications including nonsteroidal or steroidal anti-inflammatory drugs throughout the duration of the study.	Age (mean ± SD): 47.2 ± 10.6 vs 47.0 ± 10.3, p = 0.32 % Female: 77% (23/30) vs 87% (26/30), p = 0.32 Duration of symptoms: ≤1 mo: 7% (2/30) vs 0% (0/30) >1 and ≤2 mos: 10% (3/30) vs. 13% (4/30) >2 mos.: 63% (19/30) vs 57% (87% (26/30) Overall P = 0.34 Limb pain (0-9 VAS, mean ± SD): 6.1 ± 1.7 vs 5.6 ± 1.6, p = 0.65 Limb function (mean ± SD): 6.1 ± 1.7 vs 5.6 ± 1.6, p = 0.25 Pain in maximum grip: 7 ± 1.8 vs 7 ± 1.7 Pressure pain threshold (mean ± SD): 8.8 ± 5.8 vs 9.4 ± 5.2 p = 0.70 Modified Nirschl: 2.8 ± 0.5 vs 3.1 ± 0.6, p = 0.10 Quick DASH (mean ± SD): 51.6 ± 15.1 vs 52.3 ± 19.3, p = 0.88	NR

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Funding
		or breastfeeding mothers and participants who were taking NSAIDs or were wearing a brace at the time of the study								
Ozturan 2010 (Turkey)	N = 60	Inclusion: >18 years of age, history of lateral epicondylitis for a minimum of 6 months, tenderness on palpation of the lateral epicondyle, >40 mm on the VAS (Thomsen test) Exclusion: pregnancy, local corticosteroid injection for lateral epidcondylitits in the previous 3 weeks, PT in the previous 3 months, NSAID or acetaminophen medication in the previous week, cervical spondylosis, history or radiograph or the upper extremity and elbow arthritis, rheumatologic disease, severe systemic illness, neurological pathology such as carpal tunnel, cubital tunnel syndrome, and radial nerve entrapment, previous surgery or elbow dislocation	Autologous blood injection (n = 18): Blood (platelet count NR) was taken from the contralateral antecubital fossa of the patients and gently shaken to prevent clotting. Prilocaine 1 mL was used for local anesthesia of the cutaneous and subcutaneous tissues and the autologous blood (2 mL) was injected at the most painful part of the lateral epicondyle using 1 skin portal Corticosteroid injection (n = 20): prilocaine 1 mL injection to the skin and subcutaneous tissues followed by methylprednisolone acetate injection with 5 skin penetrations at the tender part of the tendon, using 1 skin portal	12 mos.: 95% ABI vs Steroid: 90% vs 100%)	None	NR	A second corticosteroid or autologous blood injection was applied to patients who had a decrease in VAS value <50%. Autologous blood injection: Fourteen patients received a second dose of autologous blood at 6 weeks. Corticosteroid injection: two patients whose pain did not improve significantly received a second dose of corticosteroid at 6 weeks.	Acetaminophen prescribed to treat post-procedure pain in all patients for 24 to 48 hours	ABI vs Corticosteroid injection Age (years, mean ± SD): 44 ± 8.5 vs 45.8 ± 8.1 % Female: 61.1% (10/18) vs 50% (10/20) Symptom Duration (mean mos. ± SD): 10 ± 2.7 vs 9.5 ± 3.1 Previous episodes: 33.3% (6/18) vs 35% (7/20) Functional scale (mean ± SD): 47.2 ± 10.28 vs 46.6 ± 10.87 VAS (0-100, mean ± SD) 75 ± 12.9 vs 77 ± 14.1	NR
Singh 2013 (India)	N = 60	Inclusion: previously untreated patients of lateral epicondylosis, having no other	Autologous blood (n = 30): 2 mL of venous blood (mean platelet count NR) was drawn	3 mos. % f/u NR	None	None	NR	All patients advised to rest and moderate activities to avoid	Age (mean ± SD): 35.2 ± 6.84 vs 33 ± 5.68, p = 0.1432 % Female: 60%	NR

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Funding
		identifiable cause of lateral elbow pain Exclusion: previously treated patients of lateral epicondylosis, or those with identifiable causes of lateral elbow pain	from the upper limb and was injected after mixing 1 mL of 2%, lignocaine solution, Injected into the point of maximal tenderness at the extensor origin of the lateral epicondyle of the humerus Steroid (n = 30): 40 mg of "depot methyl prednisolone acetate" was used with 1 mL of 2% lignocaine solution. Injected into the point of maximal tenderness at the extensor origin of the lateral epicondyle of the humerus					aggravation of their symptoms	(18/30) vs 47% (14/30), p = 0.1432 Duration of symptoms (mean weeks ± SD) 7.33 ± 2.49 vs 6.93 ± 3.28, p = 0.5967 PRTEE score (mean ± SD): 72.8 ± 6.97 vs 73.2 ± 8.16, p = 0.8389	
ABI vs Shock Wave Therapy (SWT)										
Ozturan 2010 (Turkey)	N = 60	Inclusion: >18 years of age, history of lateral epicondylitis for a minimum of 6 months, tenderness on palpation of the lateral epicondyle, >40 mm on the VAS (thomsen test) Exclusion: pregnancy, local corticosteroid injection for lateral epidcondylitits in the previous 3 weeks, PT in the previous 3 months, NSAID or acetaminophen medication in the previous week, cervical spondylosis, history or	Autologous blood injection (n = 18): Blood (mean platelet count NR) was taken from the contralateral antecubital fossa of the patients and gently shaken to prevent clotting. Prilocaine 1 mL was used for local anesthesia of the cutaneous and subcutaneous tissues and the autologous blood (2 mL) was injected at the most painful part of the lateral epicondyle using 1 skin portal	12 mos.: 92.5% ABI vs SWT 90% vs 95%	None	NR	A second corticosteroid or autologous blood injection was applied to patients who had a decrease in VAS value <50%. Autologous blood injection: Fourteen patients received a second dose of autologous blood at 6 weeks.	Acetominophen prescribed to treat post-procedure pain in all patients for 24 to 48 hours	ABI vs ESWT Age (years, mean ± SD): 44 ± 8.5 vs 47 ± 8.7 % Female: 61.1 (10/18) vs 57.8 (11/19) Symptom Duration (mean mos. ± SD): 10 ± 2.7 vs 9.6 ± 2.7 Previous episodes: 33.3% (6/18) vs 42.1% (8/19) Functional scale (mean ± SD): 47.2 ± 10.28 vs 49.9 ± 9.56 VAS (0-100, mean ± SD) 75 ± 12.9 vs 77.8 ± 13.6	NR

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Funding
		radiograph or the upper extremity and elbow arthritis, rheumatologic disease, severe systemic illness, neurological pathology such as carpal tunnel, cubital tunnel syndrome, and radial nerve entrapment, previous surgery or elbow dislocation	Extracorporeal shock wave therapy (n = 19: The most tender point at the patient's elbow was determined by palpation, and prilocaine (1 mL) was applied for local anesthesia of the cutaneous and subcutaneous tissues, ultrasound coupling gel was applied to the skin at the point of contact with the shock wave tube. Active treatment consisted of 1 treatment with 2000 impulses at 0.17 mJ/mm^2 once a week for 3 weeks. Patients were closely monitored for vital signs, local pain, and possible side effects.							
PRP vs. Steroid Injection										
Gautam 2015 (India)	N = 30	Inclusion: 18 to 60 years with recalcitrant (>6 months) lateral epicondylitis not responsive to oral medication or non-invasice treatment Exclusion: pregnant, symptoms of carpal tunnel syndrome or cervical radiculopathy or systemic disorders (diabetes, rheumatoid	PRP (n = 15): 20 mL of blood was collected in an acid citrate dextrose vacutainer and centrifuged at 1500 rpm for 15 minutes to separate. 2 mL PRP (mean platelet count NR) was then injected at the most tender point over the lateral epicondyle humerus using the peppering	6 mos. % f/u Unclear	None	None	None	After injection, patients rested for 30 minutes and were advised agasint massage or hot fomentation. Ice packs or paracetamol were advised for discomfort rather than NSAIDs, as the latter may	Age: NR vs NR % Female: NR vs NR Duration of symptoms: > 6 mos. per inclusion criteria VAS (0-10, mean ± SD): 7.1 ± 0.8 vs 7.0 ± 0.8, p = 0.650 DASH (mean ± SD): 69.7 ± 6.1 vs 67.5 ± 6.9, p = 0.378 Oxford Elbow score (mean ± SD): 27.4 ±	NR

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Funding
		arthritis, or hepatitis), those that had undergone surgery or local CS injection in the past 6 mos.	technique. Steroid (n = 15): 2 mL of methylprednisolone 40 mg/mL was injected at the most tender point over the lateral epicondyle of the humerus using the peppering technique.					interfere with platelet function.	3.9 vs 31.2 ± 4.1, p = 0.015 MMCPIE (mean ± SD): 56.1 ± 6.9 vs 56.8 ± 5.4, p = 0.770	
Gosens 2011, Peerbooms 2010 (Netherlands)	N = 106	Inclusion: clinically diagnosed lateral epicondylitis for >6 mos. and pain of at least 50 on a 0-100 VAS, prior treatments of the elbow were allowed if >6 mos. prior (cast immobilization, injections, corticosteroids, physiotherapy). Exclusion: age < 18 years, pregnant, history of carpal tunnel or cervical radiculopathy, systemic disorders such as diabetes, rheumatoid arthritis, and hepatitis; patients treated with injection or surgical intervention in the past 6 months	PRP (n = 51): patients own platelets were collected with the Recover system (uses a desktop-size centrifuge) to isolate the platelet-rich fraction from a small volume (27 mL) of the patient's anticoagulated blood (3 mL sodium citrate added) drawn at the time of procedure. Approximately 3 mL PRP (mean platelet count NR) was obtained for each patient, then buffered, then epinephrine was added (1:200,000). 1 mL of PRP was injected with bupivacaine hydrochloride 0.5% with epinephrine (1:200,000) directly into the area with maximum tenderness. Then the remaining PRP was injected using a peppering technique into the common	12 mos.: 94.1% vs 93.9% 24 mos.: 94% (94.1% vs 93.9%)	No	None	Occurred in 9 patients overall, 4% (2/51) vs 14% (7/49)	Patients kept in supine position post injection for 15 minutes. Patients instructed to rest arm for approximately 24 hours, if necessary acetaminophen was allowed, but the use of NSAIDs was prohibited. After 24 hours, the patients were given a standardized stretching protocol to follow for 2 weeks under the supervision of a physiotherapist. A formal eccentric muscle and tendon-strengthening program was initiated after stretching. At 4 weeks, patients were allowed to	Age (mean ± SD): 46.8 ± 8.5 vs 47.3 ± 7.8 % Female: 52.1% (28/51) vs 55.8% (26/49) Duration of symptoms: ≥6 mos. per inclusion criteria VAS (mean ±SD): 69.0 ± 15.9 vs 66.2 ± 14.0, p = 0.285 DASH (mean ± SD): 54.3 ± 19.5 vs 43.3 ± 16.1, p < 0.0001	Sponsored by Biomet, Dordecht, The Netherlands. The funding source had no involvement in study design; in the collection, analysis, and interpretation of data; in the writing of the report; and in the decision to submit the work for publication.

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Funding
			extensor tendon, using a single skin portal and 5 penetrations of the tendon. Steroid injection (n = 49): Blood was drawn for blinding of patient, but not used for injection. 1 mL corticosteroid (knacort 40 mg/mL triamcinolone acetonide) with bupivacaine hydrochloride 0.5% with epinephrine (1:200,000) was injected directly into the area of maximum tenderness, then using a peppering technique, the rest of the steroid solution (±4 mL) was injected into the common extensor tendon.					proceed with normal sporting or recreational activities as tolerated.		
Krogh 2013 (Denmark)	N = 60	Inclusion: Lateral epicondylitis symptoms for more than 3 mos. In which LE was defined as pain on the lateral side of the elbow and pain at te lateral epicondyle on direct palpation and during resisted dorsiflexion of the wrist. Ultrasonography of the common tendon origin required a sign of tendinopathy with a color Doppler flow of at	PRP (n = 20): 27 mL of whole blood was collected into a 30 mL syringe with 3 mL sodium citrate, then centrifuged at 1000 RPM x 15 min. Platelets were collected using the Recover GPSII system, and about 3-3.5 mL of PRP was produced at an average 8-fold concentration of platelets, and the pH was buffered with	3, 6, 12 mos. (6 and 12 mos. data excluded due to low % f/u) 3 mos.: 100% (100% vs 100%)	None	Ultrasound	None	It was asked of all patients to not use or minimally use the arm for 3-4 days after, then gradually return to normal activities if the pain level was acceptable. If analgesic drugs were needed, acetaminophen was recommended. A	PRP vs Steroid Age (mean ± SD): 47.6 ± 7.1 vs 43.9 ± 8.7 % Female: 55% (11/20) vs 45% (9/20) Previous glucocorticoid treatment for lateral epicondylitis %: Never: 40% (8/20) vs 45% (9/20) 1 injection: 30% (6/20) vs 20% (4/20)	The Danish Rheumatism Association provided a 6-month grant, Biomet Biologics provided the Recover GPS II Platelet Concentrate Separation Kit and an unrestricted grant to the Region Hospital in Silkeborg in

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Funding
		least grade 2 (range 0-4) assessed at baseline. Exclusion: Age < 18 years, glucocorticoid injection within the past 3 months, previous tennis elbow surgery, inflammatory diseases (rheumatoid arthritis, psoriatic arthritis, or inflammatory bowel disease), neck pain, shoulder pain on the ipsilateral side, and other chronic widespread pain syndromes.	sodium bicarbonate 8.4%. The PRP was then injected using an antiseptic peppering technique with 1 skin portal and about 7 tendon perforations evenly distributed in the common tendon origin from the most proximal part of the lateral epicondyle toward the humeroradial joint. Corticosteroid (n = 20): Blood was drawn to blind the patient. 1 mL of triamcinolone 40 mg/mL + 2 mL lidocaine 10 mg/mL was injected with 1 skin portal, and was injected at the deepest aspects of the common tendon origin to limit the risk of skin atrophy.					standard tennis elbow stretching and training program from sportnetdoc.com was prescribed.	>1 injection: 30% (6/20) vs 40% (6/20) Analgesic use, %: 50% (10/20) vs 60% (12/20) Duration of symptoms (mean ± SD): 18.1 ± 36.0 vs 35.6 ± 54.1 Duration of symptoms (median, range): 9.6 (3.8 to 169.8) vs 15.4 (5.1 to 232.7) PRTEE pain (0-50, mean ± SD): 27.5 ± 7.5 vs 28.0 ± 8.0 PRTEE function (0-100, mean ± SD): 51.5 ± 19.1 vs 51.1 ± 22.3	Denmark.
Yadav 2015 (India)	N = 65	Inclusion: 21-60 years, suffering from lateral epicondylitis Exclusion: history of arthritis, trauma or fracture, nerve entrapment around elbow, bleeding disorder, psychiatric disorder	PRP (n = 30): Single injection of 1 mL PRP with platelet count of 1 million platelets/mm^3 confirmed by manual counting. PRP was prepared as per the departmental laboratory standardized procedure, a 9001:2000 ISO certified R-23 centrifuge was used. PRP was injected into the common extensor	3 mos: 92% (by group % f/u unclear)	None	NR	None	Only paracetamol (500 mg) tablets were allowed as rescue medication for a maximum period of one week.	Age: 36.6 vs 36.67, p = 0.699 % Female: 66.7% vs 76.7%, p = 0.346 Duration of symptoms (mean mos.): 2.26 vs 1.93, p = 0.236 VAS (mean): 7.6 vs 7.7, p = 0.834 qDASH (mean): 88 vs 88, p = 0.6055	No financial or other competing interests.

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Funding
			origin at the lateral epicondyle of the humerus. Corticosteroid (n = 30): Single injection of 1 mL (40 mg) methylprednisolone. Steroid was injected into the common extensor origin at the lateral epicondyle of the humerus.							
Lebiedzinski 2015 (Poland)	N = 120	Inclusion: clinical diagnosis of lateral epicondylitis for more than six weeks, lack of conservative treatment of lateral epicondylitis for at least six weeks prior to treatment, and informed consent. Exclusion: patients who failed to attend one of the f/u visits, refused to participate, or had previous operative procedures of the elbow	Autologous conditioned plasma (n = 53): Double Syringe System, Arthrex, performed according to the manufacturer's instructions, injected 1% lignocaine and ACP subcutaneously. Mean platelet count NR. Steroid (n = 46): 1 mL diprophos (6.43 mg betamethasone dipropionas and 2.63 mg of betamethasone natrii phosphas) and 2 mL of 1% lignocaine were injected subcutaneously.	12 mos.: 83% (83% vs 82%)	No	None	NR	NR	Age (mean, range): 47.0 (25 to 67) vs 54.0 (21-96), % Female: 47% (25/53) vs 74% (34/46) DASH (mean ± SD): 53.2 ± 15.5 vs 58.6 ± 14.8, p > 0.05 DASH (median, range): 49.2 (22.5 to 94.2) vs 53.3 (27.8 to 88.7), p > 0.05 Duration of pain: >1.5 mos. per inclusion criteria	Author had no financial support for the article.
PRP vs Saline										
Krogh 2013 (Denmark)	N = 60	Inclusion: Lateral epicondylitis symptoms for more than 3 mos. In which LE was defined as pain on the lateral side of the elbow and pain at te lateral epicondyle	PRP (n = 20): 27 mL of whole blood was collected into a 30 mL syringe with 3 mL sodium citrate, then centrifuged at 1000 RPM x 15 min. Platelets	3, 6, 12 mos. (6 and 12 mos. data excluded due to low % f/u)	None	Ultrasound	None	It was asked of all patients to not use or minimally use the arm for 3-4 days after, then gradually return to normal	PRP vs Steroid vs Saline Age (mean ± SD): 47.6 ± 7.1 vs 44.7 ± 7.9 % Female: 55% (11/20) vs 55%	The Danish Rheumatism Association provided a 6-month grant, Biomet Biologics provided the

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Funding
		on direct palpation and during resisted dorsiflexion of the wrist. Ultrasonography of the common tendon origin required a sign of tendinopathy with a color Doppler flow of at least grade 2 (range 0-4) assessed at baseline. Exclusion: Age < 18 years, glucocorticoid injection within the past 3 months, previous tennis elbow surgery, inflammatory diseases (rheumatoid arthritis, psoriatic arthritis, or inflammatory bowel disease), neck pain, shoulder pain on the ipsilateral side, and other chronic widespread pain syndromes.	were collected using the Recover GPSII system, and about 3-3.5 mL of PRP was produced at an average 8-fold concentration of platelets, and the pH was buffered with sodium bicarbonate 8.4%. The PRP was then injected using an antiseptic peppering technique with 1 skin portal and about 7 tendon perforations evenly distributed in the common tendon origin from the most proximal part of the lateral epicondyle toward the humeroradial joint. Saline Injection (n = 20): 3 mL saline 0.9% was injected using an antiseptic peppering technique making 1 skin portal and 7 tendon perforations evenly distributed in the common tendon origin from the most proximal part of the lateral epicondyle toward the humeroradial joint.	3 mos.: 100% (100% vs 100%)				activities if the pain level was acceptable. If analgesic drugs were needed, acetaminophen was recommended. A standard tennis elbow stretching and training program from sportnetdoc.com was prescribed.	(11/20) Previous glucocorticoid treatment for lateral epicondylitis %: Never: 40% (8/20) vs 40% (8/20) 1 injection: 30% (6/20) vs 20% (4/20) >1 injection: 30% (6/20) vs 35% (7/20) Analgesic use, %: 50% (10/20) vs 65% (13/20) Duration of symptoms (mean ± SD): 18.1 ± 36.0 vs 15.5 ± 12.8 Duration of symptoms (median, range): 9.6 (3.8 to 169.8) vs 12.3 (4.1 to 57.1) PRTEE pain (0-50, mean ± SD): 27.5 ± 7.5 vs 25.0 ± 7.3 PRTEE function (0-100, mean ± SD): 51.5 ± 19.1 vs 47.1 ± 22.3	Recover GPS II Platelet Concentrate Separation Kit and an unrestricted grant to the Region Hospital in Silkeborg in Denmark.
PRP vs Local Anesthetic (LA)										
Mishra 2014 (United States)	N = 231	Inclusion: Pain by palpation at the lateral epicondyle of the elbow, baseline elbow	PRP (n = 116): 30 mL whole blood drawn from peripheral vein of each patient, blood was	3 mos.: 83% 87% vs 79% 6 mos.: 88%	None	None	None	NR	Age: 48.4 vs 47.4 years, p = 0.375 Sex: p = NS Duration of pain: NR,	Biomet biologics, ThermoGenesis, Auxilium, DePuy, Rerring

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Funding
		pain ≥ 50 mm/100 mm using VAS during resisted wrist extension, history of elbow pain for at least 3 months, pain unresponsive to 1 of 3 conventional therapy programs (local steroid injection, physical/occupational therapy, NSAIDs, and patient informed consent. Exclusion: pregnancy, age < 18 years, history of: anemia, bleeding disorder, or carpal tunnel on the affected side 1 year before randomization, cervical radiculopathy, systemic disorders such as diabetes, rheumatoid arthritis, or hepatitis, uncooperative patient or patient with neurological disorders who is incapable of following directions, or is predictably unwilling to return for follow-up examinations, previous surgery for elbow tendinosis, active bilateral elbow tendinosis within 4 weeks before randomization, hypothyroidism, history of any blood disorder, hemoglobin <11 g/dL,	mixed with anticoagulant (ACD-A), and centrifuged at 3200 rpm X 15 minutes, produces type 1A PRP (leukocyte-enriched PRP with platelets 5x baseline used in an unactivated manner). PRP then removed and buffered using 8.4% sodium bicarbonate. Injection site was then blocked using 0.5% bupivacaine with epinephrine and then 2-3 mL of the prepared PRP was injected into the extensor carpi radialis brevis tendon and surrounding area using a peppering technique consisting of 5 penetrations of the target area using a single skin penetration. LA (n = 114): 30 mL whole blood drawn from patient. 2-3 mL of bupivacaine using the same peppering technique described in the PRP group was used.	119 of the 136 enrolled in 24-wk protocol by group (unclear)					at least 3 mos. per protocol Pain (VASRWE):NR p = NS Function (PRTEE): 54.15 vs 57.71, p = NS Extended wrist examination: NR	Pharmaceuticals, Biomemetic, Pfizer, Smith & Nephew, Zimmer, Wyeth

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Funding
		hematocrit<33%, platelet count outside of the normal range of 150 to 400 x1000 uL, participation in a workers compensation program or planning to apply for the program and/or any ongoing, pending, or planned legal actiona s a result of elbow pain, history of arthritis or fracture of the affected elbow, received local steroid injections within 6 weeks, physical/occupational therapy within 4 weeks, or NSAIDs within 1 week of randomization, intolerance of acetaminophen.								
Behera 2015 (India)	N = 25	Inclusion: ≥25 years, ≤ 60 yearswith painful (VAS>60) and recalcitrant (failed conservative treatment for >3 mos) lateral epicondylar tendinopathy of the humerus, where bony pathology was ruled out Exclusion: Patients <25 and >60 years, those with pain secondary to radial tunnel syndrome or cervical radiculopathy, or a history of carpal tunnel	PRP (n = 15): 100 mL blood was collected into an anticoagulant blood bag, and centrifuged at 1500 RPM x 15 minutes. Supernatant fluid was transferred into another blood bag. Leukocytes were filtered out using a filter to obtain leukocyte-poor PRP, with platelet count between 6 and 8 $x10^5$/uL, and leukocyte count a 3-log reduction.	12 mos.: 96% (100% vs 90%)	None	Ultrasonographic	NR	Patient sat for 15 minutes after injection with arm supported in sling. Advised to rest arm for 2 days, taking oral paracetamol (650 mg) for pain was allowed. After 2 days, standard wrist extensor stretching was started at home for 4 weeks under the supervision of a physiotherapist.	Age: 38 vs 37 % Female: 80% (12/15) vs 56% (5/9) Duration of symptoms (mean, mos.): 12.1 vs 10.3 VAS (0-100, mean): 75.3 vs 75.6 MMCPIE (mean): 63.2 vs 61.4 Nirschl score: 5.1 vs 5.3	NR

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Funding
		syndrome or systemic disorders (diabetes, rheumatoid arthritis, hepatitis), those with thrombocytopenia, taking anticoagulants, or were pregnant.	3 mL of type 4B PRP and 0.5 mL of calcium chloride were injected into the maximum hypoechoic area of the extensor carpi brevis tendon using the peppering technique. 5/6 passes were made into the tendon using a single skin portal. LA (n = 10): 10 mL blood was collected and not used, then 3 mL of bupivacaine and 0.5 mL of normal saline was injected in a similar fasion to the PRP.					After 4 weeks, wrist extensor muscles strengthening exercise were started under supervision, with advise to avoid strenuous activities for 3 mos. Full activity was allowed after 4 mos.		
ACP vs Dry Needling										
Stenhouse 2012 (UK)	N=28	Inclusion: Lateral epicondylitis diagnosis (based on symptoms and site of tenderness) with symptoms of at least 6 months following initial presentation and having failed conservative treatments. Exclusion: Previous surgery or trauma to elbow, recent steroid or local injection of any kind within past three months, history of inflammatory arthropathy or a tendon tear.	ACP + dry needling (n=15): 2.0 mL autologous conditioned plasma (prepared by centrifugation of autologous blood spun at 1500 rpm x 5 min) injected into abnormal common extensor origin tendon; platelet concentration NR, but around the reported 0.6 x 10^6 platelets/uL per ACP definition provided in paper. Dry needling (n=13): 23 G fine needle was passed in and out through the long axis of the tendon without exiting the skin	6 mos.: 89.2% (87% vs 92%)	Yes	Ultrasound	Total: 2/patient (at 0 & 1 month)	None	ACP vs. ABI Age (mean ± SD): 53.2 ± 9.87 vs. 47.6 ± 6.12 Female: 46.6% vs. 61.5% Duration of symptoms (months) (mean ± SD): 18.9 ± 17.8 vs. 22.2 ± 14.5 Baseline VAS pain (mean ± SD): 8.07 ± 1.18 vs. 6.87 ± 2.15 Baseline Nirschl score (mean ± SD): 11.1 ± 14.3 vs. 22.9 ± 19.1	No competing interests, funding NR

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Funding
			approximately 40-50 times to pepper the tendon, approximately 2 minutes. <u>All treatments:</u> Prior to dry needling or dry needling + autologous conditioned plasma injection, skin was cleaned with antiseptic and 1-2 mL 1% lignocaine was injected deep into the fascia, taking care to avoid local anesthetic injection into tendon; was followed with "short interval (to allow the anesthetic to act)" (time not further specified)							

*N=number randomized

Appendix Table G2. Elbow Epicondylitis Cohort Study and Patient Characteristics Data Abstraction Tables

Study Year (Country)	N	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat interventions	Co-interventions	Patient Characteristics	Funding
Ford 2015 (United States)	N = 78	Inclusion: symptomatic lateral tendionsis for a minimum of 6 mos. And clinical f/u of at least 3 mos. Exclusion: Patients who had received previous surgical interventions	PRP (n = 28): Injection of PRP was performed under local anesthesia. 1 mL of Anticoagulant Citrate Dextrose was mixed with 10 mL of venous blood. The syringe was then centrifuged at 1500 RPM x 5 min. 3-5 mL of concentrated plasma (concentration NR) was then withdrawn, the lateral epicondyle was identified by palpation, prepped, and anesthetized with 5 mL of 1% lidocaine. 3-4 mL of PRP was injected into the extensor tendon origin in a peppered pattern. Surgery (n = 50): Surgical release of the extensor tendon origin was performed under MAC sedation and local anesthesia. An upper arm tourniquet was insufflated to 250 mmHg and 10 mL of 1% lidocaine was injected over the lateral epicondyle. An oblique incision was made just proximal to the lateral epicondyle and continued distally toward the radial head. Dissection was then carried out through the subcutaneous layer until the extensor aponeurosis was identified. A longitudinal incision was made to visualize the extensor group. The	Minimum 3 mos.	None	None	Yes 7.2% (2/28) vs 6% (3/50)	All patients were asked to stop taking NSAIDs 2 weeks prior to injections. Stretching protocols initiated 48 hours after injection and continued for 2 weeks. Sports activities were restricted for 3 mos. postoperatively. Avoidance of repetitive activities was recommended until 6 weeks following procedure. PRP: Patients were restricted from lifting >20 lbs until the 2 week f/u, at which point physical therapy strengthening was initiated. Surgery: Full active and passive range of motion exercises were started at 2-6 weeks. Isometric and resistance strengthening exercises were initiated at 6-12 weeks	Age: 45.4 ± 9.51 vs 44.6 ± 8.22, p = 0.404 % Female: 67.9% (19/28) vs 52% (26/50), p = 0.208 Duration of symptoms to initial visit (mean days ± SD): 206 ± 53 vs 204 ± 37, p = 0.975 Duration of symptoms to intervention (mean days ± SD): 416 ± 361 vs 394 ± 329, p = 0.635 VAS (1-10, mean ± SD): 6.45 ± 2.49 vs 6.32 ± 2.10, p = 0.782 Tenderness: 92.9% (26/28) vs 98% (49/50), p = 0.286 Pain with resisted wrist extension: 95.8% (27/28) vs 98% (49/50), p = 571 Steroid injections prior to intervention: 29.6% (8/28) vs. 56% (28/50), p = 0.033	NR

Study Year (Country)	N	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat interventions	Co-interventions	Patient Characteristics	Funding
			extensor carpi radialis longus was retracted to reveal the extensor radialis brevis tendon. A small V-shaped incision with 1-2 cm arms was made through the superficial ECRB tendon origin, exposing the deeper portions with degenerative changes. Excision of the affected region and decortication of the exposed lateral epicondyle were performed to bleeding bone. Once adequate decortication had been achieved, the tendon incision was closed with simple interrupted 2-0 nonabsorbable braided polyester sutures in a V-Y fashion, followed by dermal and subcuticular closure with absorbable monofilament sutures.							
Tetschke 2015 (Germany)	N = 61	Inclusion: Clinically diagnosed epicondylitis (pain in epicondyle region, pain with resisted wrist extension, pain with middle finger extension), minimum 3 mos. pain with previously unsuccessful physiotherapy or medical treatment : (manual therapy, ultrasonic, NSAID, brace, protection), in vicinity of study hospital. Exclusion: Local	PRP (n = 26): three intralesional PRP injections with an interval of 7 days. 10 mL of whole blood was collected from a vein in the region of the cubital fossa. Blood was centrifuged at 1500 RPM x 5 minutes, resulting in 3-5 mL supernatant. PRP was injected at first subfascially in region of the common head of the extensors, then further intralesional dispersion followed with a two-times over fan-like wheal injection. Laser (n = 26): A low level laser	2, 6, 12 mos. 84% (87% vs. 84%)	No	None	PRP: 3 injections with an interval of 7 days. Laser: 12 applications, 2 sessions per week.	8 weeks post-treatment, a physiotherapeutic post-procedure was initiated. It was based on 12 sessions with manual therapy techniques for trigger point elimination in the initial phase, stretching and strengthening exercises in the first 2 weeks, as well as patient adapted	Age (mean ± SD): 51.5 ± 10.4, p = 0.627 % Female: 53.8% (14/26) vs 65.4% (17/26), p = 0.397 Duration of symptoms: >3 mos. VAS (mean ± SD): 3.3 ± 1.5 vs 4.4 ± 1.6, p = 0.016 DASH (mean ± SD): 27.9 ± 18.1 vs 35.4 ± 17.0, p = 0.129	No financial conflict of interest reported by authors.

Study Year (Country)	N	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat interventions	Co-interventions	Patient Characteristics	Funding
		injections in past month, previous laser treatment of affected arm, evidence of disordered pain perception, age <18 years, pregnancy, cervical radiculopathy, systemic inflammatory diseases (rheumatism, morbus bechterew), hemato-oncological diseases with low platelet numbers (myelodysplastic syndromes, leukemia, malignant lymphoma), infectious diseases (hepatitis).	BTL 5000 was used. Radiation was applied in a circular movement to the region of the lateral epicondyle. Myofascial manipulation was done after the laser application for additional benefit of hyperemia and metabolism activation.					muscle-trophic training in the advanced phase. Patients were assigned to do daily self-contained stretching exercises.		
Tonk 2014 (India)	N = 81	Inclusion: between 20 and 70 years or age, presented after 7 days of onset of pain and one of the following clinical positive tests were included: Tenderness elicited just distal and anterior to the lateral epicondyle, pain with resisted wrist extension with an elbow in full extension, Coffee cup test - picking up a full cup of coffee/water associated with localized pain at lateral epicondylar region, chair test - picking up chair with extended elbow, Thomson test - flex the patient shoulder to 60°	PRP (n = 39): 55 mL blood taken from patients, mixed with 3 mg of anticoagulant citrate dextrose-A. Blood was then prepared by gravity separation to yield 4 mL PRP, which was centrifuged at 700 RPM x 20 min. The plasma was again centrifuged at 1750 rpm x 15 min to yield 3 mL PRP of 509% increase (platelet/mL) from whole blood values. Field block of 1 mL 3% xylocaine was given, and 3 mL PRP injected at site of maximum tenderness and in the vicinity around the tendon of the ECRB. This involved a single skin portal and 5 penetrations of the tendon. The elbow was then kept in a sling for comfort.	0.25, 0.5, 0.75, 2, 3, 5, 6, 12 mos.	No	None	None	All patients initially treated with brace, NSAIDs, and cold therapy (10-15 min of ice, 4-5 times/day) for 1 week. 24 hours post treatment,, patients were taught a standardized stretching protocol to follow for 2 weeks. Forearm strengthening program was initiated after this stretching. At 3 weeks after the procedure, patients were allowed to proceed with normal sporting or	Age (mean ± SD): 41.15 ± 12.63 vs 39.76 ± 9.31, p = 0.081 % Female: 48.7% (19/39) vs 76.2% (32/42) Mode of onset: Subacute: 71.8% (28/39) vs 52.4% (22/42) Chronic: 28.2% (11/39) vs 47.6% (20/42) Nirschl pain (mean ± SD): 5.28 ± 0.83 vs 5.24 ± 0.76, p = 0.669 Duration of pain (mean, units NR): 37.30 vs 46.37, p = 0.086	None

Study Year (Country)	N	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat interventions	Co-interventions	Patient Characteristics	Funding
		with the elbow extended forearm pronated and wrist extended 30°, apply pressure to dorsum of second and third metacarpal in the direction of flexion and ulnar deviation and Cozens test - flex elbow and extended wrist against resistance; did not respond to 1 week of conservative care (brace, NSAID, cold therapy) Exclusion: patients with rheumatoid arthritis of the elbow, cervical radiculitis, infective pathology, neoplastic lesion, dermatomyositis, previous trauma around elbow, patients previously treated surgically for lateral epicondylitis, patients who had received steroid injection within 3 months, patients with elbow instability (assessed by varus valgus instability test) were excluded from this study	Laser (n = 42): 904 nm wavelength lasers were used, the probe of laser unit was directed to the point of tenderness in the soft tissue at a right angle to the surface of the skin. Duration of treatment was 5 min. for 10 days.					recreational activities as tolerated.	Elbow disability (% Yes): 47.5% (19/40) vs 55.8% (24/43), p = 0.762 Elbow swelling (% Yes): 7.5% (3/40) vs 4.7% (2/43), p = 0.586	

Appendix Table G3. Achilles Tendinopathy RCT Study and Patient Characteristics Data Abstraction Tables

Study Year (Country)	N	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat interventions	Co-interventions	Patient Characteristics	Funding
ABI vs Dry Needling										
Bell 2013 (New Zealand)	N = 53	Inclusion: Patients presenting with their first episode of mid-portion Achilles tendinopathy confirmed by diagnostic ultrasonography, with duration of symptoms ≥ 3 months Exclusion: Bilateral Achilles tendon symptoms, alternative diagnosis, or previous adjuvant therapies such as any kind of injection or shockwave therapy	Autologous blood injection (n = 26): 3 mL of blood taken from the antecubital fossa was injected during 3 passes (1 mL per injection), once perpendicularly to the tendon at the site of maximal tenderness, followed by 20° superiorly and 20° inferiorly Dry needling (n = 27): Dry needling was performed with the same technique but no substance was injected All treatments: Blood was unprocessed and no local anesthetic was used.	ABI vs Dry Needling: 1, 2, 3 mos., f/u NR 6 mos. (96% vs 93%)	Control group only	None	All participants received a second injection at one month f/u	After injection, patients were instructed to massage the area for 5-minutes followed by a 5-minute walk. After injection-site discomfort had ceased patients were instructed to perform 180 eccentric heel drops per day for a minimum of 12 weeks.	ABI vs. Dry needling Age: (mean ± SD): 51.2 ± 10.6 vs. 47.2 ± 9.7 % Female: 38% (10/26) vs. 56% (15/27) Side of involvement: Left: 77% (20/26) vs. 48% (13/27) Right: 23% (6/26) vs. 52% (14/27) Duration of pain (mean months ± SD): 22.9 ± 33.1 vs. 38.6 ± 84.6 Participates in physical activity: 85% vs. 100% VISA-A score (mean ± SD): 58.1 ± 17.2 vs. 57.3 ± 12.7	No specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Study Year (Country)	N	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat interventions	Co-interventions	Patient Characteristics	Funding
ABI + exercise vs Exercise										
Pearson 2012 (New Zealand)	N = 33	Inclusion: Diagnosis of mid-Achilles tendinopathy with duration of symptoms ≥ 3 months Exclusion: Diagnostic uncertainty, concurrent presence of insertional pathology, anticoagulant therapy, systemic disease that may contribute to pathology; being an elite-level sportsperson; or having received any injection therapy for the tendon within the last 3 months	ABI + exercise: (20 tendons, number patients NR) 1 mL of 1% lignocaine followed by 3 mL of venous blood from the antecubital region. Exercise focused on the Alfredson eccentric strengthening program. Exercises were explained and demonstrated and a mild to moderate degree of pain while performing the exercises was endorsed Exercise: (20 tendons, number patients NR) An eccentric exercise program was administered as described above	ABI + exercise vs Exercise 3 mos. 70.0% (14/20) vs. 70.0% (14/20)	No	None	10 tendons at 6 wks.	After injection, the patient was asked to massage the area for 5 min and return to eccentric exercises within 48 hours	ABI + exercise vs. Exercise Age: (mean ± SD): 49 ± 8.8 vs. 51 ± 7.6 % Female: 60% (12/20) vs. 65% (13/20) Side of involvement: Left: 55% (11/20) vs. 50% (10/20) Right: 45% (9/20) vs. 50% (10/20) Duration of symptoms (mean months ± SD): 13 ± 10 vs. 9 ± 10 Baseline VISA-A score (mean ± SD): 54 ± 26 vs. 52 ± 25	NR

Study Year (Country)	N	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat interventions	Co-interventions	Patient Characteristics	Funding
PRP vs Saline										
De Jonge 2011/De Vos 2010 (Netherlands)	N = 54	Inclusion: Presence of chronic midportion Achilles tendinopathy, aged 18-70 years with duration of symptoms ≥ 2 months Exclusion: Clinical suspicion of other musculoskeletal injuries, inflammatory internal disorders, or use of specific medications that can cause tendinopathy; previous performance of a complete heavy load eccentric exercise program or inability to perform it; a previous PRP injection	PRP (n=27): 54 mL of venous blood was collected from the cubital vein and mixed with 6 mL of citrate to prevent clotting. The PRP injection was prepared using the recover platelet separation kit. 0.3 mL of 8.4% sodium bicarbonate buffer was added. 2 mL of 0.5% marcaine was subcutaneously injected. 4 mL PRP was injected (platelet count NR) through 3 puncture locations and patients lay prone for 10 minutes Saline (n=27): Whole blood was collected and prepared as described. 4 mL of isotonic saline was injected rather than PRP using the same injection	PRP vs Saline: 3 mos.: 100% (27/27) vs 100% (27/27) 6 mos.: 100% (27/27) vs 100% (27/27) 12 mos.: 100% (27/27) vs 100% (27/27)	No	Ultrasonography	After 24 weeks 4 patients in the PRP group underwent an additional treatment of orthotics (n=1), shockwave therapy (n=3) and/or glyceryl trinitrate patches (n=3). In the saline group 1 patient received glyceryl trinitrate patches	All patients received detailed instructions on the standardized rehabilitation program of stretching and eccentric exercises. Accetaminophen (500 mg) could be used as rescue medication	PRP vs. Saline: Age: (mean ± SD): 49 ± 8.1 vs. 50 ± 9.4 % Female: 48% (13/27) vs. 48% (13/27) Duration of symptoms (weeks) (median (IQR)): Activity: Active in sports: 81% (22/27) vs. 89% (24/27) Sedentary: 19% (5/27) vs. 11% (3/27) Sports activity at baseline: Unchanged: 9% (2/27) vs. 37% (9/27) Reduced: 36% 9/27) vs. 21% (5/27) Ceased: 55% (12/27) vs. 42% (10/27) Duration of sports cessation (weeks) (mean ± SD): 11 ± 16 vs. 12 ± 23 BMI (mean ± SD): 26.8 ± 3.9 vs. 26.2 ± 3.5 Baseline VISA-A score (mean ± SD):	Biomet Biologics LLC, Warsaw, Indiana

Study Year (Country)	N	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat interventions	Co-interventions	Patient Characteristics	Funding
			technique.						46.7 ± 16.2 vs. 52.6 ± 19.0	
PRP vs Exercise										
Kearney 2013 (United Kingdom)	N = 20	Inclusion: Diagnosis of mid-substance Achilles tendinopathy, increasing pain on loading activities ≥ 3 months Exclusion: Tendinopathy secondary to a systematic condition; Achilles tendinopathy presenting at the insertion; patients who had sustained a previous rupture or previous surgery on the Achilles tendon; previous lower limb injuries in the last 12 months	PRP (n=10): 52 mL of whole blood was withdrawn from the antecubital fossa, combined with 5 mL of anticoagulant, and centrifuged for 12 minutes at 2400 rpm. 3-5 mL of PRP (platelet count NR) was injected into the Achilles tendon using a peppering technique. Exercise (n=10): 3 sets of 15 repetitions of 2 eccentric exercises were performed twice daily for 12 weeks	PRP vs Exercise: 3 mos.: 90% (9/10) vs 100% (10/10) 6 mos.: 90% (9/10) vs 100% (10/10)	No	NR	NR	NR	PRP vs. Exercise: Age: (mean): 47.8 vs. 49.4 % Female: 60% (6/10) vs. 70% (7/10) Duration of symptoms (months) (mean (range)): 30.8 (9-156) vs. 28.1 (8-144) Mean height (cm): 170.7 vs. 169.8 Mean weight (kg): 82.4 vs. 78.6 % Smoker: 0% vs. 20% (2/10) Baseline VISA-A score (mean (range)): 41 (23-72) vs. 36 (5-71) Baseline EQ-5D score (mean (range)): 0.75 (0.62-1.00) vs. 0.56 (0.09-1.00)	Chartered Society Research Foundation

Appendix Table G4. Rotator Cuff Tendinopathy RCT Study and Patient Characteristics Data Abstraction Tables

Study Year (Country)	N	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat interventions	Co-interventions	Patient Characteristics	Funding
PRP vs Saline										
Kesikburun 2013 (Turkey)	N = 40	Inclusion: pain in the shoulder and/or lateral deltroid area and exacerbation of pain with overhead-throwing activity, more than 3 mos. of symptoms, pain on palpation at the insertion site of the cuff in the proximal humerus and/or decreased range of motion with shoulder flexion, abduction, and internal and external rotation, rotator cuff tendinosis or partial tendon tear diagnosed by MRI (tendinosis on MRI was defined as only intensity changes in the rotator cuff and absence of disruptions in the tendon, a partial tendon tear was defined as a tendon disruption that did not involve the entire thickness of the tendon and was classified as bursal, articular, or intratendinous, and age 18-70 years. Exclusion: a full-thickness tear diagnosed by MRI, presence of another	PRP (n = 20): 54 mL of venous blood drawn from the patients and mixed with 6 mL citrate for inhibition of clotting. The 60 mL mixture was then centrifuged at 3200 RPM x 15 minutes, and 6 mL of PRP was obtained. 5 mL of PRP without buffering or activating agent was infiltrated, mean PRP platelet count was 1014.9 ± 340.2 x 10^3/uL. Injection was made under the posterolateral aspect of the acromion, directly into the rotator cuff tendon. 1 mL 1% lidocaine was administered to anesthetize the rotator cuff, then 5 mL PRP was injected into the center of the lesion and 4 sites around the lesion through 1 skin portal. If the lesion was a partial	3 mos.: % f/u NR 6 mos.: % f/u NR 12 mos. 97.5% (39/40), 100% (20/20) vs 95% (19/20)	None	Real-time ultrasound	NR	After injection, patients lay supine without moving the shoulder for 15 minutes. Additionally, all patients underwent a standard rehabilitation program. Patients were instructed to rest from overhead-throwing activity and rotary movements of the shoulder during the first 2 days. Acetaminophen and cold compression were allowed if needed for postinjection pain control; the use of NSAIDs was prohibited. After 2 days, a 3-week exercise program supervised by a physical therapist was started. The exercise program initially involved passive range of motion and Codman exercises. When the pain subsided and movement was tolerated, stretching	Age (mean ± SD): 45.5 ± 11.8 vs 51.4 ± 10.9, p = 0.093 % Female: 65.0% (13/20) vs 70.0% (14/20), p = 0.736 Dominant side affected: 65.0% (13/20) vs 60% (12/20), p = 0.744 Duration of symptoms (median mos, range): 8.5 (3 to 36) vs 10 (2 to 48), p = 0.602 WORC (median, range): 34.6 (5.0 to 65.7) vs 29.9 (0.0 to 55.2), p = 0.698 SPADI (median, range): 77.5 (31.6 to 96.2) vs 78.2 (33.6 to 100.0), p = 0.565 Pain with Need impingement sign (100 mm VAS, median, range): 80 (60 to 100) vs 90 (60 to 100), p = 0.068	NR

Study Year (Country)	N	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat interventions	Co-interventions	Patient Characteristics	Funding
		disease that may cause shoulder pain and dysfunction such as arthritis or a bony lesion; (3) systemic disease such as diabetes, rheumatoid arthritis, hepatitis, or coagulopathy; (4) hemoglobin level of\11 g/dL and platelet level of\150 3 103/mL; (5) pregnancy; and (6) a history of subacromial/intra-articular steroid injections within 6 weeks and/or NSAID use during the past week.	tear, it was infiltrated into the center of the tear gap and the edges of the tear at 4 sites. If the lesion was tendinosis, it was infiltrated into the center, where the echogenicity changes on the ultrasound scan were the most prevalent and the surrounding 4 points. Saline (n = 20): Injection was made under the posterolateral aspect of the acromion, directly into the rotator cuff tendon. 1 mL 1% lidocaine was administered to anesthetize the rotator cuff, then 5 mL Saline was injected into the center of the lesion and 4 sites around the lesion through 1 skin portal. If the lesion was a partial tear, it was infiltrated into the center of the tear gap and the edges of the tear at 4					of the posterior capsule and pectoral muscles and light resistive exercises of the rotator cuff and scapular muscles were added to the program. The patients moved onto a homebased program focusing on isotonic strengthening and stretching exercises for a further 3 weeks. The exercise program lasted a total of 6 weeks.		

Study Year (Country)	N	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat interventions	Co-interventions	Patient Characteristics	Funding
			sites. If the lesion was tendinosis, it was infiltrated into the center, where the echogenicity changes on the ultrasound scan were the most prevalent and the surrounding 4 points.							
PRP vs Dry Needling										
Rha 2012 (South Korea)	N = 39	Inclusion: Patients who had more than six months of shoulder pain, had a pain score measured by the visual analogue scale in the affected shoulder greater than 5 (on a numeric scale of 0–10), had a painful arc and/or an impingement sign, demonstrated no weakness on resisted testing of musculotendinous units of the rotator cuff, were diagnosed with supraspinatus tendon disease, such as a tendinosis or a partial thickness tear of less than 1.0 cm upon sonographic examination, and no or little response to conservative therapy for at least three	PRP: PRP was prepared using the Prosys PRP Platelet Concentration system. 25 mL of the patient's blood was obtained and mixed with 3 mL of anticoagulant citrate dextrose formula A. The sample was centrifuged at 1600xg, then 2000xg to separate appropriately. After centrifugation, 3 mL of the PRP (mean platelet count NR) was obtained, and infiltrated into the lesion of the supraspinatus tendon. If it was difficult to inject the PRP into the	3 mos.: 80% vs 84% 6 mos.: 80% vs 74%	In dry needling group	Ultrasound guidance	PRP and Dry needling both performed in the affected supraspinatus tendon twice at a 4 week interval between injections	Acetaminophen or Hydrocodone were prescribed if needed, and a self-exercise protocol was provided to all participants and no other therapy was allowed except self-exercise and posture correction. Until the first f/u, patients were recommended relative rest and allowed to continue usual ADL. However, overhead activity and rounded shoulder posture were prohibited. Passive range of motion exercises and Codman pendulum exercise for the shoulder were started on the first	Age (mean ± SD): 52.2 ± 9.5 vs 53.9 ± 11.6, p = NS % Female: 55% (11/20) vs 57.9% (11/19), p = NS Duration of pain (mean mos ± SD): 9.6 ± 3.6 vs 9.2 ± 3.2 SPADI score (mean ± SE): 62.3 ± 4.1 vs 62.8 ± 4.2 VAS pain (0-100, mean ± SE): 24.4 ± 3.9 vs 24.6 ± 4.6 VAS disability (0-100, mean ± SE): 38.0 ± 2.5 vs 38.3 ± 2.6	Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education, Science and Technology (2011-0005611).

Study Year (Country)	N	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat interventions	Co-interventions	Patient Characteristics	Funding
		months. Exclusion: Presence of other obvious pathology for the rotator cuff pain, such as a fracture or rheumatic diseases, referred pain from the neck, prior surgery to either the shoulder or neck region, a history of NSAID use during the most recent two weeks and/or steroid injection within six weeks, hypersensitivity to lidocaine, presence of an unstable medical condition or a known uncontrolled systemic disease, and any conditions or situations that might place the patient at significant risk during the study.	site of the tear directly, the PRP was infiltrated around the lesion. Dry Needling: The lesion was localized and adjusted according to the site of maximum tenderness. A 25 gauge needle was used to anesthetize the suprapsinatus tendon with less than 1 mL of 0.5% lidocaine. After anesthetizing the target and ensuring reduced shoulder pain, dry needling into the abnormal portion of the tendon was performed; the needle was passed through the lesion of the tendon approximately 40-50 times under ultrasound guidance.					post-injection day. Active range of motion and light resistive exercises for strengthening the rotator cuff were allowed only if the pain had significantly subsided and movement was possible with less discomfort.		
Cohort: PRP vs Other										
Von Wehren 2015	N = 50	Inclusion: ≥18 years, experienced persistent continuous pain in one shoulder for at least 2 months and had evidence of a partial	ACP (n = 25): 10 mL of autologous blood was taken from the antecubital vein, centrifuged at	3 mos: NR 6 mos: 84% vs 72%	No	None	Three sequential injections in 7-day intervals were performed in every patient.	Reduced ADL or suspended sport activities due to their shoulder pain prior to admission. After injection,	Age (mean ± SD): 53 ± 14 vs 55 ± 10, p = NS % Female: 52% (13/25) vs 44% (11/25), p = NS	NR

Study Year (Country)	N	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat interventions	Co-interventions	Patient Characteristics	Funding
		supraspinatus tear. Exclusion: Generalized inflammatory arthritis including ankylosing spondylitis, rheumatoid arthritis, or psoriatic arthritis, prior supraspinatus tendon tear, pregnancy, sever infection, known malignancy, bleeding disorder, nerve-related symptoms such as radiculopathy or osteoarthritis of the shoulder, previous extracorporeal shock wave therapy or corticosteroid injection into the shoulder.	1500 RPM x 5 minutes. 2 mL of citrate dextrose was used to prevent clotting. Sequential injections of PRP (mean platelet count NR) were performed in every patient. Steroid (n = 25): cortisone injection (40 mg triamcinolone acetonide, crystal suspension), injected into the lateral subacromial space below the lateral border of the acromion whilst directing the syringe to above the footprint of the supraspinus tendon					patients were allowed to move their shoulder but were advised to avoid sport activities for 4 weeks. NSAIDs were not allowed for 6 mos. No physiotherapy was prescribed.	Duration of symptoms: ≥2 mos. according to inclusion criteria Partial rupture/ tendinopathy grade 0-2: 0% (0/25) vs 0% (0/25) CMS score (mean ± SD): 66.2 ± vs 21.1 vs 69.9 ± 19.5, p = NS SST score (mean ± SD): 6.5 ± 3.1 vs 5.8 ± 3.2 ASES score (mean ± SD): NR	

Appendix Table G5. Patellar Tendinopathy RCT Study and Patient Characteristics Data Abstraction Tables

Study Year (Country)	N	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat interventions	Co-interventions	Patient Characteristics	Funding
PRP + dry needling vs Dry needling										
Dragoo 2014 (USA)	N = 23	Inclusion: Patellar tendinopathy with persistence of symptoms after 6 weeks (12 sessions) of physical therapy with eccentric exercise Exclusion: Previous injection or surgery in the affected knee and inability to complete patient surveys	PRP + dry needling (n=10): 6 mL of leukocyte-rich PRP (platelet count NR) injected into the patellar tendon during the dry needling procedure Dry needling (n=13): Dry needling was performed with the same technique but no substance was injected All treatments: 55 mL of peripheral blood was obtained and processed with a GPS III kit. The area of tendinopathy was injected with 3 mL of 0.25% bupivacaine with 1:100,000 epinephrine subcutaneously. Patients were blindfolded and the area of tendinopathy was penetrated 10 times with or without PRP according to assigned treatment group	3 mos. (90% vs. 100%) 6 mos. (80% vs. 69%) for PRP + dry needling vs. dry needling	Yes	Ultrasound	At 12 week f/u 3 patients in the dry needling group were dissatisfied with treatment and received the PRP injection	All patients were instructed to follow a standardized 5-phase eccentric exercise program, attending physical therapy twice per week and performing standardized additional exercises at home.	PRP + dry needling vs. Dry needling Age (mean ± SD): 28 ± 8 vs. 40 ± 14 % Female: 11% vs. 0% Duration of symptoms: NR (>1.5 mos. per inclusion criteria) Baseline VISA scores (mean ± SD): 41.0 ± 14.3 vs. 47.4 ± 18.0 Baseline Tegner scores (mean ± SD): 3.7 ± 2.5 vs. 4.0 ± 2.1 Baseline Lysholm scores (mean ± SD): 58.3 ± 14.5 vs. 48.5 ± 16.5 Baseline VAS scores (mean ± SD): 4.1 ± 1.5 vs. 3 ± 2.3 Baseline SF-12 (mean ± SD): 49.2 ± 3.7 vs. 40 ± 7.5	Stanford University Department of Orthopedic Surgery

Study Year (Country)	N	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat interventions	Co-interventions	Patient Characteristics	Funding
PRP vs shock wave therapy										
Vetrano 2013 (Italy)	N = 46	Inclusion: Athletic participants involved in various sports activities between the ages of 18 and 50 with a diagnosis of chronic jumper's knee at the intersection of the patellar tendon at the lower pole of the patella for at least 6 months, and failure of non-operative management Exclusion: Bilateral complaints; signs or symptoms of other coexisting knee lesions' knee surgery or injection therapy with corticosteroids in the past 3 months; systematic disorders such as diabetes, rheumatoid arthritis, etc.; therapy with anticoagulants-antiaggregants; platelet values of fewer than 150,000/mm^3; pregnancy	PRP (n=23): 10 mL of venous blood was collected from the cubital vein. PRP was prepared by a single centrifugation of whole blood using MyCells Autologous Platelet Preparation System. Patients received 1 injection of 2 mL PRP (mean platelet concentration 0.89 to 1.1 x 109 mL) per week for two weeks (2 injections total). The injection was performed using a 22-g needle in a single skin portal. After injection the patient rested in a supine position without moving the leg for 15 minutes and a moderate compression bandage was applied for the rest of the day. Electracorporeal shock wave therapy (ESWT) (n=23): 3 sessions of ESWT at 48- to 72-hour intervals were administered using a focused	2, 6, 12 mos. 96% vs. 96% for all time points	No	Ultrasound, color Doppler	None	One week after the last treatment session all patients were given a standardized stretching and muscle strengthening protocol to be followed for 2 weeks, and subsequently were allowed to begin water activities if these activities could be performed with only mild discomfort or pain.	PRP vs. ESWT Age (mean ± SD): 26.9 ± 9.1 vs. 26.8 ± 8.5 % Female: 13.1% vs. 26.1% Duration of symptoms (months) (mean ± SD): 18.9 ± 19.1 vs. 17.6 ± 20.2 VISA-P (0-100, mean ± SD): 55.3 ± 14.3 vs 56.1 ± 19.9, p = 0.817 VAS (0-10, mean ± SD): 6.6 ± 1.8 vs 6.3 ± 2.0, p = 0.358 Modified Blazina scale (0-2), % (n/n): 43% (10/23) vs 61% (14/23) Previous CO_2 laser therapy: 34.8% vs. 21.7% Previous Tecar therapy: 82.6% vs. 69.6% Previous therapeutic ultrasound: 13.0% vs. 21.7% Previous therapeutic exercises: 91.3% vs. 95.7% Previous NSAIDs: 39.1% vs. 52.2% Sport activity: Elite athletes: 78.3% vs. 78.3% Non-elite athletes:	NR

Study Year (Country)	N	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat interventions	Co-interventions	Patient Characteristics	Funding
			electromagnetic shock wave device. In each session the treatment area was prepared with a coupling ultrasound gel and 2.400 impulses were administered with energy flux density of 0.17 to 0.25 mJ/mm^2 All treatments: No local anesthesia was applied						21.7% vs. 21.7% Sport involved: Basketball: 47.8% vs. 52.2% Volleyball: 47.8% vs. 39.1% Soccer: 4.4% vs. 8.7%	

Appendix Table G6. Plantar Fasciitis RCT Study and Patient Characteristics Data Abstraction Tables

Study Year (Country)	N	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat interventions	Co-interventions	Patient Characteristics	Funding
PRP + CC vs ESWT + CC										
Chew 2013 RCT	N = 54	Inclusion: clinically diagnosed plantar fasciitis defined as the following: at least 4 mos. of plantar heel pain, point of maximal tenderness on clinical examination over the medical tubercle of the calcaneus and sonographic features of plantar fasciitis. Increased thickness of the plantar fascia and hypoechoic fascia are recognized as sonographic findings of plantar fasciitis. Exclusion: arthritis, fractures, tumors of the foot or ankle, rheumatoid arthritis, generalized polyarthritis, seronegative arthropathy, diabetes mellitus, neurologic impairments, lower extremity nerve entrapment, vascular abnormalities, prior operative treatment of the foot, or current pregnancy.	PRP + CC (n = 19): 10 mL peripheral blood drawn and centrifuged at 1500 rpm x 5 minutes, using Arthrex ACP Double Syringe System. No buffer or preservative was added. 3 mL of ACP was extracted and subsequently injected at a single perifascial target at the site of plantar fascia thickening and tenderness at the medial calcaneal tubercle. Additionally, CC as described in cointerventions was part of treatment. ESWT + CC (n = 19): 2 sessions of ESWT 1 week apart using Domier EPOS Ultra ESWT machine. ESWT was delivered to the painful and thickened region of the plantar fascia at the medial calcaneal tubercle. Each treatment involved 2000 shockwaves with energy levels	1, 3, 6 mos. 6 mos: 78.9% (15/19) vs 89.5% (17/19)	No	Ultrasound for PRP and ESWT	None	All the subjects in all 3 treatment groups were advised that they could continue pain medications on an as needed basis only. No new pain medications were prescribed on study entry. Patients could resume activities of daily life as tolerated after the procedure. CC (for both groups): 1-2 physical therapy sessions to learn an independent daily home exercise program, including (1) standing lunge stretch of the gastrocnemius and soleus performed with the knee bent and the knee straight and the palms of the hands pressed against a wall, and (2) seated plantar fascia stretch by pulling the toes back with their fingers while seated and with the affected leg crossed over the other thigh [5,6,20]. The subjects received 1-2 physical therapy	Age (median, IQR): 46 (38 to 51) vs 45 (37 to 53), p = NS % Female: 47.4% (9/19) vs 42.1% (8/19), p = NS Duration of pain (median mos., IQR): 12 (7 to 24) vs 18 (7 to 24), p = NS AOFAS ankle-hindfoot scale (median, IQR): 65 (49 to 72) vs 62 (52 to 69), p = 0.03 (when all 3 tx groups compared) VAS (0-10, median, IQR): 7 (5 to 8) vs 7 (6 to 8), p = NS	Singapore National Medical Research Committee grant.

Study Year (Country)	N	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat interventions	Co-interventions	Patient Characteristics	Funding
			progressing gradually from 0.02 mJ/mm^3, to 0.42 mJ/mm^3. The total treatment duration was 10 minutes. Additionally, CC as described in cointerventions was part of treatment.					sessions only, because the goal was to become independent in the stretching exercises. The subjects were instructed to perform the stretches 3 times a day, 3 times for each stretch, and to hold each stretch for 30 seconds at a time. In addition, all the subjects in all the treatment groups identified by the physician as having biomechanical foot abnormalities that contributed to their symptoms also were referred to podiatry for orthotics evaluation		
PRP + CC vs CC alone										
Chew 2013 RCT	N = 54	Inclusion: clinically diagnosed plantar fasciitis defined as the following: at least 4 mos. of plantar heel pain, point of maximal tenderness on clinical examination over the medical tubercle of the calcaneus and sonographic features of plantar fasciitis. Increased thickness of the plantar fascia and hypoechoic fascia are recognized as	PRP + CC (n = 19): 10 mL peripheral blood drawn and centrifuged at 1500 rpm x 5 minutes, using Arthrex ACP Double Syringe System. No buffer or preservative was added. 3 mL of ACP was extracted and subsequently injected at a single perifascial target at the site of plantar fascia thickening	1, 3, 6 mos. 6 mos.: 78.9% (15/19) vs 81.3% (13/16)	No	Ultrasound for PRP and ESWT	None	All the subjects in all 3 treatment groups were advised that they could continue pain medications on an as needed basis only. No new pain medications were prescribed on study entry. Patients could resume activities of daily life as tolerated after the procedure.	Age (median, IQR): 46 (38 to 51) vs 47.5 (41 to 53), p = NS % Female: 47.4% (9/19) vs 50% (8/16) Duration of pain (median mos., IQR): 12 (7 to 24) 10.5 (6 to 16), p = NS AOFAS ankle-hindfoot scale (median, IQR): 65 (49 to 72) vs 72	Singapore National Medical Research Committee grant.

Study Year (Country)	N	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat interventions	Co-interventions	Patient Characteristics	Funding
		sonographic findings of plantar fasciitis. Exclusion: arthritis, fractures, tumors of the foot or ankle, rheumatoid arthritis, generalized polyarthritis, seronegative arthropathy, diabetes mellitus, neurologic impairments, lower extremity nerve entrapment, vascular abnormalities, prior operative treatment of the foot, or current pregnancy.	and tenderness at the medial calcaneal tubercle. Additionally, CC as described below was part of treatment. CC Alone (n = 16): 1-2 physical therapy sessions to learn an independent daily home exercise program, including (1) standing lunge stretch of the gastrocnemius and soleus performed with the knee bent and the knee straight and the palms of the hands pressed against a wall, and (2) seated plantar fascia stretch by pulling the toes back with their fingers while seated and with the affected leg crossed over the other thigh [5,6,20]. The subjects received 1-2 physical therapy sessions only, because the goal was to become independent in the stretching exercises.						(71 to 75), p = 0.03 (when all 3 tx groups compared) VAS (0-10, median, IQR): 7 (5 to 8) vs 6 (5 to 8), p = NS	

Study Year (Country)	N	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat interventions	Co-interventions	Patient Characteristics	Funding
			The subjects were instructed to perform the stretches 3 times a day, 3 times for each stretch, and to hold each stretch for 30 seconds at a time. In addition, all the subjects in all the treatment groups identified by the physician as having biomechanical foot abnormalities that contributed to their symptoms also were referred to podiatry for orthotics evaluation							
PRP vs Steroid										
Jain 2015 RCT United Kingdom	N=46 (60 heels)	Inclusion: intractable plantar fasciitis (duration ≥12 mos.), which had not responded to cushioned insoles, a full course of eccentric stretching exercises and physiotherapy Exclusion: NR	PRP (n=24, 30 heels): 2.5 ml PRP; from centrifugation of 27 ml autologous blood, mixed with 3 ml sodium citrate (anticoagulant), buffered with 8.4% sodium bicarbonate; use of activating agent NR Steroid (n=22, 30 heels): Triamcinolone 40 mg and Levobupivacaine hydrochloride	3, 6, 12 mos. (%NR for any time-point)	Yes, both groups (pepper-ing tech-nique: single skin entry, partially withdrawing the needle, re-directing and making multiple penetrations to the fascia)	None	NR	All patients advised to continue eccentric stretching program and cushioned insoles following the injection	Overall Age (NR by group) (mean, range): 55.6 (31-79) years Female: 67% vs. 64% Duration of pain: mean NR ("≥12 months") Roles–Maudsley Score (mean ± SD): 3.70 ± 0.47 vs. 3.63 ± 0.62 VAS pain (mean ± SD): 8.30 ± 0.88 vs. 8.27 ± 1.95 AOFAS Ankle and Hindfoot score (mean ± SD):	No funding was received

Study Year (Country)	N	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat interventions	Co-interventions	Patient Characteristics	Funding
									58.63 ± 15.81 vs. 56.70 ± 16.29	
Monto 2014 RCT United States	N=40	Inclusion: chronic refractory plantar fasciitis (≥4 months heel pain); failed standardized trial of traditional nonoperative treatment including rest, physical therapy (≥6 weeks), silicone heel lifts (≥4 weeks), CAM walker bracing or cast immobilization (≥4 weeks), night splinting (≥4 weeks), and nonsteroidal medication; x-ray and MRI confirmed diagnosis Exclusion: NR	PRP (n=20): 3 ml PRP; from centrifugation of 27 ml autologous blood, mixed with 3 ml sodium citrate (anticoagulant), unbuffered; 6 ml of bupivicaine 0.5% used; no activating was used Steroid (n=20): DepoMedrol cortisone 40 mg; 6 ml of bupivicaine 0.5% used	3, 6, 12, 24 mos. (%NR for any time-point)	No	Ultrasound	No (single injection per protocol)	All patients placed into a cam walker brace for 2 weeks and allowed to return to activities as tolerated along with a daily home eccentric exercise (Swedish heel drop program) and calf/arch stretching regimen; NSAID use was not permitted during the first 2 weeks post-injection and was discouraged throughout the entire study period; no other treatment modalities were used during the study	Age (range): 51 (21-67) vs. 59 (24-74) years Females: 60% vs. 55% Duration of symptoms (range): 5.7 (4-26) vs. 5.4 (4-24) months AOFAS (range): 37 (30-56) vs. 52 (56-90); p<0.05	No financial support received (author is a consultant for Exactech, Inc.)
Tiwari 2013 RCT India	N=60	Inclusion: age ≥ 18 years; pain and tenderness centered on the medial tubercle of the calcaneus on weight bearing after rest which resolved, either partly or fully, after activity; patients using orthoses, insoles, or pads were also included. Exclusion: local steroid injection within prior 6 months; NSAID therapy within prior week; significant	PRP (n=30): 5 ml PRP; from centrifugation of 30-50 ml autologous blood from the antecubital vein mixed with 7 ml citrate dextrose (anticoagulant); xylocaine 2% was used; use of activating agent NR Steroid (n=30): 1 ml methyl prednisolone acetate 40 mg; xylocaine 2% was	1, 3, 6 mos. (%NR at any time-point)	No	NR	NR	Advised to rest for 24 hours; prescribed paracetamol for pain; NSAIDs were discouraged;	*Demographic not reported by group* Age, range: 30-85 (mean age NR) Duration of pain (median ± SD): 6 ± 20.6 (range, 1-120) months PRP vs. steroid VAS pain (mean ± SD): 5.9 ± 0.76 vs. 6.03 ± 0.85	No outside funding

Study Year (Country)	N	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat interventions	Co-interventions	Patient Characteristics	Funding
		cardiovascular disease; renal or hepatic disease; pregnancy; any local malignancy; anemia (Hb < 5 gm%); previous surgery for planter fasciitis,; diabetes; hypothyroidism; diagnosis of vascular insufficiency or neuropathy	used							
Aksahin 2012 Prospective Cohort Turkey	N=60	Inclusion: plantar fasciitis treated conservatively for ≥3 months with no response to conservative treatment modalities Exclusion: history of any previous injection treatment or surgery for heel pain; any other associated pathology involving the lower limb (e.g., tarsal tunnel syndrome or effusion around the ankle indicating an intra-articular disease, calcaneal fracture, calcaneal bone cysts, bone tumor, osteomyelitis, Achilles tendinopathy); abnormal erythrocyte sedimentation rate or C-reactive protein	PRP (n=30): 3 mL PRP (from centrifugation of 25 mL autologous blood) activated with calcium; 2 mL of 2% prilocaine Steroid (n=30): 2 mL of 40 mg Methylprednisolone with 2 mL of 2% prilocaine	3 wks., 6 mos. (%NR)	No	None	NR (assume to be single injection)	Ice application for pain in addition to elevation of the limb; no weight bearing for 3 days; advised to wear comfortable shoes and avoid all running and other high impact activities for 10 days; standardized stretching program for the Achilles tendon and the plantar fascia was given to all patients; no additional treatment was permitted during the study periods, including NSAIDs, orthoses, and night splints	Age (mean ± SD): 46.4 ± 8.5 vs. 45.7 ± 9.4 years Females: 60% vs. 57% Duration of pain (mean ± SD): 8.6 ± 5.4 vs. 9.4 ± 5.2 months VAS pain (mean ± SD): 7.3 ± 0.6 vs. 6.2 ± 1.6	NR

Study Year (Country)	N	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat interventions	Co-interventions	Patient Characteristics	Funding
		level; any systemic disorders such as rheumatoid arthritis, haematological diseases, diabetes mellitus, gout and pregnancy								
Say 2014 Prospective Cohort Turkey	N=50	Inclusion plantar fasciitis of ≥3 months duration with no benefit from conservative treatment starting with stretching exercises and NSAIDs; diagnosis made by clinical exam with x-ray to rule out other pathology Exclusion: systemic disease, pregnancy, active tumor or hematological malignant disease, infection, a history of anticoagulant use, use of NSAIDs in the five days prior to the study, Hb values of less than 11 g/dL, thrombocyte count of less than 150,000/mm^3, previous steroid injection to the heel area or ESWT therapy, a history of calcaneus fracture, or surgery in the heel area	PRP (n=25): 2.5 mL PRP (platelet count 818,520 ± 119,236/mL) from centrifugation of 30 mL autologous blood, mixed with 3.2% sodium citrate (anticoagulant); activated with 5.5% calcium chloride; use of local anesthetic NR Steroid (n=25): 1 ml of methylprednisolone 40 mg and 1 ml of prilocaine	1.5, 6 mos (%NR)	peppering injection technique was used in both groups and the fascia was injected in 4 to 5 different locations	None	NR (assume single injection)	Standard Achilles and plantar fascia stretching and strengthening exercises applied to all patients. Patients advised to rest and not stand for the first day after the injection. No NSAID, orthosis or splint was given to any patient.	Age (mean ± SD): 47 ± 6.8 vs. 48.6 ± 6.4 years Females: 80% vs. 76% Duration of pain (mean ± SD): NR VAS pain (mean ± SD): 8.8 ± 1 vs. 8.7 ± 0.9 AOFAS (mean ± SD): 62.9 ± 8.5 vs. 60.1 ± 5.7	NR (authors declare no conflicts of interest)
Shetty 2014 Prospective	N=60	Inclusion: plantar fasciitis of ≥3 months duration with previous	PRP (n=30): 8 mL PRP from centrifugation of 54	3 mos.	NR	NR	NR (assume single injection)	NR	Age (mean ± SD): 34 ± 9.2 vs. 39.2 ± 9.4 years	No funding received

Study Year (Country)	N	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat interventions	Co-interventions	Patient Characteristics	Funding
Cohort India		unsuccessful conservative therapy Exclusion: previous surgery for plantar fasciitis; diagnosis of vascular insufficiency or neuropathy related to heel pain; and previous exposure to corticosteroid therapy	mL autologous blood mixed with 6 mL citrate dextrose solution (anticoagulant); use of activating agent NR; local anesthetic used Steroid (n=30): Triamcinolone acetonide 40 mg (ml NR) and 3 ml of 2% lignocaine						Females: 63% vs. 57% Duration of pain (mean ± SD): NR VAS pain (mean ± SD): 8.1 ± 1.3 vs. 7.8 ± 1.1 AOFAS (mean ± SD): 33.9 ± 8.2 vs. 32.5 ± 7.2 FADI (mean ± SD): 32.03 ± 5.9 vs. 35.23 ± 6.6	
PRP vs Prolotherapy										
Kim 2014 RCT Korea	N=21	Inclusion: chronic (≥6 months) recalcitrant unilateral plantar fasciitis; ultrasound confirmed plantar fascia thickness ≥4 mm; previously failed conservative therapy such as NSAIDs, stretching and physical therapy, a night splint, arch supports, corticosteroid injections, and extracorporeal shock wave therapy Exclusion: local steroid injections within 6 months or NSAIDs within 1 week before randomization; cardiovascular, renal, or hepatic disease; diabetes, anemia; vascular insufficiency;	PRP (n=10): 5 ml PRP with platelet concentration of 1303 ± 111.9 X 10^3/µL; from centrifugation of 20 ml autologous blood from the antecubital fossa, mixed with 2 ml anticoagulant (sodium citrate 22 mg, citric acid 7.3 mg, glucose monohydrate 24.5 mg); no activating agent was; use of anesthetic NR Prolotherapy with dextrose (n=11): 2 mL dextrose solution (1.5 mL of 20% dextrose and 0.5 mL of 0.5% lidocaine); blood	2.5, 6.5 months (95% [20/21]; 90% [9/10] vs. 100 [11/11] at both time-points)	Used a peppering technique for both injections(single skin portal followed by 5 penetrations of the fascia)	Ultrasound	2/patient, 2nd injection at 2 weeks	Immediately after injection, patient were kept in the sitting position without moving their foot for 30 minutes; instructed to limit the use of the the affected foot (allowing only indoor activities of daily living) for approximately 72 hours and to use acetaminophen for pain; NSAIDs and any type of foot orthoses was not allowed; instructed to refrain from any heavy loading activity during the week after the procedure; at 4 weeks (2 weeks after the second injection),	Age (range): 36 (20-57) vs. 38 (19-51) years Females: 60% vs. 36% Duration of symptoms (range): 2.8 (1-6) vs. 2.9 (1-6) years Foot Function Index total score (mean ± SD): 151.5 ± 37.9 vs. 132.5 ± 31.1 Foot Function Index pain subscale (mean ± SD): 60.4 ± 14.7 vs. 56.5 ± 14.0 Foot Function Index disability subscale (mean ± SD): 55.8 ± 19.5 vs. 53.4 ± 15.7 Foot Function	NR (authors state no disclosures)

Study Year (Country)	N	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat interventions	Co-interventions	Patient Characteristics	Funding
		peripheral neuropathy; active bilateral plantar fasciitis; or previous surgery for plantar fasciitis	draw with blood discarded					patients were allowed to proceed with activities of daily living or normal sports activities, as tolerated	Index activity limitation subscale (mean ± SD): 31.3 ± 10.2 vs. 22.6 ± 9.8	
ABI vs Steroid										
Kalaci 2009 RCT Turkey (also included in ABI vs. anesthetic + dry needling)	N=50*	Inclusion: plantar fasciitis Exclusion: associated conditions involving the lower limb, such as injury to the ankle, tarsal tunnel syndrome and effusion about the ankle indicating an intra-articular disease, calcaneal fracture, calcaneal bone cysts, bone tumor, osteomyelitis; surgery for plantar fasciitis in the previous 6 months; abnormal erythrocyte sedimentation rate or C-reactive protein level; or previous injections for plantar fasciitis	ABI (n=25): 2 ml autologous blood alone Steroid (n=25)*: 2 ml triamcinolone (mg NR)	3 wks., 6 mos. (%NR at either time-point)	Yes – peppering technique used	NR	NR	No additional medication was given, and no restriction of activity was advised	Age (mean ± SD): 52.9 ± 11.1 years vs. 49.9 ± 19.4 years % female: 76% vs. 68% Duration of pain (mean ± SD): 8.1 ± 12.8 vs. 9.4 ± 8.4 months Calcaneal spur (yes): 77% vs. 77% VAS pain (0-10) (mean ± SD): 6.84 ± 2.27 vs. 6.96 ± 2.71	No funding received
Kiter 2006 RCT Turkey (also included	N=45	Inclusion: plantar heel pain; failed conservative treatment of ≥6 months Exclusion: corticosteroid injections for heel pain	ABI (n=15): 2 ml autologous blood (drawn from the ipsilateral or contralateral upper extremity) and 1 ml prilocaine 2%	6 months (98% [44/45]; 100% ABI vs. 93% [14/15] steroid)	No	NR	up to 3 injections total ABI: 13% (2/15) had 1 injection only, 20% (3/15) had a 2nd injection,	all other treatment modalities were terminated during the study	DemographicsNR by treatment group; authors state "All of the groups had equal distributions according to age,	NR

Study Year (Country)	N	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat interventions	Co-interventions	Patient Characteristics	Funding
in ABI vs. anesthetic + dry needling)		in the past year; inflammatory or severe metabolic disease, morbid obesity according to body mass index, and the presence of lower-limb deformity or functional deficit	Steroid (n=15): 40 mg methyl-prednisolone acetate and 1 ml prilocaine 2%				67% (10/15) had a 3rd injection Steroid (repeat injections performed at 1 mo. intervals): 50% (7/14) had 1 injection only, 50% (7/14) had a 2nd injection, 0% required a 3rd injection		sex, body mass index, duration of complaints, and pain level before the injections" *Overall (include anesthetic + dry needling group)* Age (mean, range): 50.7 (26-70) years % female: 69% (31/45) Duration of pain (mean, range): 19.3 (6-180) months *ABI vs. steroid* VAS pain (mean ± SD): 7.6 ± 1.3 vs. 7.3 ± 1.2 Rearfoot scores (mean ± SD): 71.6 ± 14 vs. 65.7 ± 12.7	
Lee 2007 RCT Malaysia	N=64	Inclusion: Adults; presenting complaint of plantar heel pain, worse on rising in the morning and/or after periods of sitting or lying, which have been present for more than 6 weeks; on examination, the site of maximal tenderness	ABI (n=33): 1.5 ml autologous blood (drawn from the antecubital vein) and 1 ml lignocaine HCL 2% Steroid (n=31): 20 mg triamcinolone acetonide (0.5 ml of a 40 mg/ml solution)	3 mos. (% f/u NR) 6 months (95%; [61/64]; 91% [30/33]ABI vs. 100% steroid)	No	NR	Repeat injections offered to all patients at 6-week intervals if pain was not entirely relieved until the patient was satisfied or refused further injections; a 2nd injection was	All patients advised to avoid impact-loading activities, such as running or jumping, for ≥10 days; NSAIDs prescribed for not more than 3 days; ice packs were allowed for postinjection pain; elevation of the foot advised for swelling;	Reported after loss to follow-up: *ABI (n=30) vs. steroid (n=31)* Age (mean ± SD): 48.3 ± 10.5 (range 28-65) years vs. 49.2 ± 11.1 (range 29-66) years % female: 93% vs.94%	NR

Study Year (Country)	N	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat interventions	Co-interventions	Patient Characteristics	Funding
		was at the attachment of the plantar fascia on the medial tubercle of the calcaneus. Exclusion: previous surgery for heel pain; nerve-related symptoms (radiculopathy, tarsal tunnel syndrome, tarsi sinus syndrome); regional pain syndrome; Achilles tendon pathology; rheumatoid arthritis; diabetes; local or systemic infection; peripheral vascular disease; metabolic disease (e.g., gout); clotting disorder; anticoagulant therapy; pregnancy; dysfunction of the knee, ankle, or foot; work-related or compensable injury	and 2 ml lignocaine HCL 2%				given to 10% (3/30) in the ABI group vs. 6.5% (2/31) in the steroid group	All subjects instructed to perform a standardized stretching program for the Achilles tendon and the plantar fascia; no additional form of treatment was permitted during the study periods, including orthoses, night splints, and NSAIDs	Duration of pain (mean ± SD): 7.2 ± 5.6 (range 2-24) months vs. 8.3 ± 7.7 (range 2-24) months Calcaneal spur (yes): 60% vs. 48% VAS pain (0-10) (mean ± SD): 7.3 ± 1.8 vs. 6.9 ± 1.7	
ABI vs Anesthetic + dry needling										
Kalaci 2009 RCT Turkey (also included in ABI vs. steroid)	N=50	Inclusion: plantar fasciitis Exclusion: associated conditions involving the lower limb, such as injury to the ankle, tarsal tunnel syndrome and effusion about the ankle indicating an intra-articular disease, calcaneal fracture,	ABI (n=25): 2 ml autologous blood alone Anesthetic + dry needling (n=25): 2 ml lidocaine with peppering technique	3 wks., 6 mos. (%NR at either time-point)	Yes – peppering technique used	NR	NR	No additional medication was given, and no restriction of activity was advised	Age (mean ± SD): 52.9 ± 11.1 years vs. 49.9 ± 10.8 years % female: 76% vs. 72% Duration of pain (mean ± SD): 8.1 ± 12.8 vs. 11.9 ± 20.6 months Calcaneal spur (yes): 77% vs. 73%	No funding received

Study Year (Country)	N	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat interventions	Co-interventions	Patient Characteristics	Funding
		calcaneal bone cysts, bone tumor, osteomyelitis; surgery for plantar fasciitis in the previous 6 months; abnormal erythrocyte sedimentation rate or C-reactive protein level; or previous injections for plantar fasciitis							VAS pain (0-10) (mean ± SD): 6.84 ± 2.27 vs. 6.72 ± 1.74	
Kiter 2006 RCT Turkey (also included in ABI vs. steroid)	N=45	Inclusion: plantar heel pain; failed conservative treatment of ≥6 months Exclusion: corticosteroid injections for heel pain in the past year; inflammatory or severe metabolic disease, morbid obesity according to body mass index, and the presence of lower-limb deformity or functional deficit	ABI (n=15): 2 ml autologous blood (drawn from the ipsilateral or contralateral upper extremity) and 1 ml prilocaine 2% Anesthetic + dry needling (n=15): 1 ml prilocaine 2% followed by peppering technique (needle inserted, withdrawn, slightly redirected, and reinserted 10-15 times without emerging from the skin)	6 months (100%; 45/45)	Yes-peppering technique used	NR	up to 3 injections total ABI: 13% (2/15) had 1 injection only, 20% (3/15) had a 2nd injection, 67% (10/15) had a 3rd injection Anesthetic + dry needling: 27% (4/15) had 1 injection only, 27% (4/15) had a 2nd injection, 46% (7/15) had a 3rd injection	all other treatment modalities were terminated during the study	NR by treatment group; authors state "All of the groups had equal distributions according to age, sex, body mass index, duration of complaints, and pain level before the injections" *Overall (including steroid group)* Age (mean, range): 50.7 (26-70) years % female: 69% (31/45) Duration of pain (mean, range): 19.3 (6-180) months *ABI vs. anesthetic + dry needling* VAS pain (mean ±	NR

Study Year (Country)	N	Inclusion & Exclusion Criteria	Interventions	Length, % f/u	Dry needling	Imaging Guidance	Repeat interventions	Co-interventions	Patient Characteristics	Funding
									SD): 7.6 ± 1.3 vs. 6.4 ± 1.1 Rearfoot scores (mean ± SD): 71.6 ± 14 vs. 64.1 ± 15.1	

*A second steroid group was included in the study which used a peppering technique along with the injection. This group was excluded for our purposes since the other control groups within this comparison (i.e., ABI vs. steroid) did not use dry needling.

Appendix Table G7. Acute Muscle Injury RCT Study and Patient Characteristics Data Abstraction Tables

RCT Country Setting	N*	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
PRP + CC vs. CC alone										
Bubnov 2013 Ukraine Hospital Trauma and Sports Medicine Clinic	N=30 (34 lesions)	Inclusion: professional male athletes; acute local muscle injury with US confirmation Exclusion: NR	PRP + CC (n=15): 5 mL PRP (prepared by centrifugation of autologous blood 40 cm^3) injected into lesion; mean platelet concentration NR; use of activating agent NR CC (n=15): Immobilization, general physiotherapy, and anti-inflammatory therapy All treatments: All patients underwent conventional conservative care as described above	No	Ultrasound	NR	NR	PRP + CC vs. CC Age (mean ± SD): 24 years Male: 100% vs. 100% Professional athletes: 100% vs. 100% Duration of pain (months) (mean ± SD): NR – "acute, within days of initial injury" Location of injury (per lesion): Thigh (58.8% vs. 47.1%); foot/ ankle (29.4% vs. 29.4%); shoulder (11.8 vs. 23.5%) Recurrent vs. new injury: NR Baseline VAS pain (mean ± SD): 8 vs. 7.8 Subjective global function: 55 vs. 53	1 month (% NR)	Funding NR; authors state no conflict of interest
Hamid 2014 Malaysia Sports Medicine Clinic	N=28	Inclusion: age ≥ 18 years; acute grade 2 hamstring muscle injury (<7 days since injury onset); and able to understand the study and follow the study protocol Exclusion: had received any form of injection therapy for the current	PRP + CC (n=14): 3 mL PRP (prepared by centrifugation of autologous blood) injected into lesion without local anesthetic at a mean 4.6 ± 1.9 days after injury; mean platelet concentration 1297 X 10^3 µL; no	No	Ultrasound	No; single injection	Patients were asked to reduce their activities for 48 hours. Patients were allowed to take only acetaminophen (1000 mg) as required (maximum, 4 times a day) for pain control	PRP + CC vs. CC Age (median ± IQR): 20.0 ± 6.5 vs. 21.0 ± 8.5 years Female: 7.1% vs. 21.4% Competitive at the national level: 57.1% vs. 50.0% Duration of pain (days) (median ± IQR): 5.0 ± 3.0 vs. 5.0	2.5 mos. (10 wks); 85.7% (24/28)	The University of Malaya Research Grants (UMRG 382/11HTM) and the Institute of Postgraduate Studies (PV076/2011A)

RCT Country Setting	N*	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
		injury; use of nonsteroidal anti-inflammatory drugs within 1 week before randomization; unable to fulfill weekly follow-up appointments and comply with the rehabilitation program; significant cardiovascular, renal, or hepatic disease; malignancy; history of anemia; or previous muscle surgery.	activating agent used CC (n=14): rehabilitation program focused on progressive agility and trunk stabilization (PATS) exercises All treatments: All patients were prescribed a rehabilitation program (PATS) by a sports physical therapist at enrollment. In addition, an instructional video and booklet on PATS exercises were distributed to each patient. All patients were asked to perform the home exercise program at least once a day and to record their session in the activity booklet provided.					± 3.0 Location of injury (all hamstring): Biceps femoris (57.1% vs. 78.6); semimembranosus (35.7% vs. 7.1%); semitendinosus (7.1% vs. 14.3%) Recurrent injury: 57.1% vs. 21.4% Baseline pain intensity on BPI-SF (mean ± SD): 3.9 ± 1.8 vs. 4.3 ± 1.9 Baseline pain interference on BPI-SF (mean ± SD): 3.0 ± 1.4 vs. 3.6 ± 2.4		
Hamilton 2015 Qatar Orthopedic	N=60	Inclusion: Age 18–50 years; available for follow-up; cute onset of posterior thigh pain; resenting an MRI within 5 days from injury; MRI	PRP + CC (n=30): PRP (total 3 mL prepared by centrifugation of autologous blood for 15 mins.) 1 mL	No	No guidance	No; single injection	NR	PRP + CC vs. CC Age (mean ± SD): 26.6 ± 5.9 vs. 25.5 ± 5.7 years Male: 100% vs. 100% Professional athlete:	2 months (83.3% [25/30] vs. 86.7% [26/30] 6 months (86.7% [26/30] vs. 96.7%[29/30])	No external funding

RCT Country Setting	N*	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
and Sports Medicine Hospital		confirmed a grade I or II hamstring lesion; male sex; able to perform five sessions of physiotherapy a week at the clinic Exclusion: Contraindication to MRI; reinjury or chronic hamstring injury; concurrent other injury inhibiting rehabilitation; unwilling to comply with follow-up; needle phobia; overlying skin infection; diabetes, immunocompromised state; medication with increasing bleeding risk; medical contraindication to injection	injected at 3 sites around the central injury site; mean platelet concentration 765.8 ± 423.6 X 10^9 L; no activating agent used CC (n=30): daily (5 times/week) intensive, fully supervised and standardized 6-stage rehabilitation program including ROM exercises, progressive strengthening exercises, core stability training, agility exercises and sports-specific functional field testing (FFT); progression of volume and intensity drills designed to mimic the muscle fatigue and competitiveness which characteristics training and game situations All treatments: all posterior thighs					100% vs. 96.7% Competitive athlete: 0% vs. 3.3% Duration of pain (days) (mean ± SD): 1.8 ± 0.9 vs. 2.3 ± 1.1 Grade of injury (all hamstring): Grade I (56.7% vs. 43.3%); Grade 2 (43.3% vs. 56.7%) Previous hamstring injury: 63.3% vs. 50.0%		

RCT Country Setting	N*	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
			were cleaned with Betadine and 3 dressings placed over area of the injury, and ice placed on thigh for 15 mins; rehab within 24 hours in the physiotherapy department							
PRP + CC vs. control injection + CC										
Reurink 2015 The Netherlands Sports Medicine Department	N=80	Inclusion: Age 18–50 years; Clinical diagnosis of an acute hamstring injury, defined as: history of acute onset of posterior thigh pain, and localized pain on palpation, and localized pain on passive stretch of the hamstring, and increasing pain on isometric contraction; hamstring lesion on MRI, defined as increased signal intensity on STIR and/or T2-weighted images, limited to one location in the muscle Exclusion: not capable of doing an active exercise program; received injection therapy for this injury before; does not have the intention to return	PRP + CC (n=41): PRP (total 3 mL prepared by centrifugation of autologous blood) 1 mL injected at 3 sites around the central injury site within 30 mins. of blood collection; mean platelet concentration 433 ± 125 X 10^3 µL; use of an activating agent NR Placebo + CC (n=39): Injections of isotonic saline 0.9% (3 mL); 1 mL injected at 3 sites around the central injury site within 30 mins. of blood collection All treatments: Standardized	No	Ultrasound	2/patient (1^{st} injection within 5 days of injury; 2^{nd} injection 5-7 days later)	patients instructed to avoid the use of co-interventions and NSAIDs until they returned to play	PRP + CC vs. placebo injection + CC Age (mean ± SD): 28 ± 7 vs. 30 ± 8 years Female: 5% vs. 5% Competitive athlete: 73% vs. 74% Duration of pain (days) (median, IQR): 3 (2-4) vs. 3 (2-5) Grade of injury (all hamstring): Grade I (27% vs. 31%); Grade 2 (73% vs. 69%) Previous hamstring injury: 66% vs. 59% NRS (0-10) for pain at rest: NR NRS (0-10) in 15° knee flexion: 4.5 ± 2.6 vs. 4.4 ± 2.4 NRS (0-10) in 90° knee flexion: 3.5 ± 2.5 vs. 3.5 ± 2.4	2 months (100% [41/41] vs. 100% [39/39]) 6.5 months (90.2% [37/41] vs. 92.3% [36/39]) 12 months (90.2% [37/41] vs. 94.9% [37/39])	Arthrex Medizinische Instrumente GmbH and the Royal Netherlands Football Association

RCT Country Setting	N*	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
		to full sports activity; does not want to receive one of the two therapies; cause of the injury is an extrinsic trauma on the posterior thigh; chronic low back pain; contraindications for MRI; chronic hamstring complaints, defined as recurrent tenderness of hamstring muscles during at least two months 12; grade III lesion (total rupture) and/or avulsion on MRI	rehab program started 48 hrs. after injection; daily progressive phased, criteria-based program consisting of a daily home exercises and twice-weekly physiotherapist supervised training sessions. To improve and monitor adherence to the rehabilitation program, patients were instructed to keep daily logs in the supplied logbooks							

Appendix Table G8. Acute Achilles Tendon Rupture Cohort Study and Patient Characteristics Data Abstraction Tables

RCT Country Setting	N*	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
PRP + CC vs. CC alone										
Kaniki 2014 Canada Outpatient clinic (following referral from the ED)	N=32	**Inclusion**: Complete primary Achilles tendon rupture confirmed by a positive Thompson squeeze test and the presence of a palpable gap; presentation within 14 days after injury; age 18 to 70 years; willing and able to comply with and carry out the prescribed rehabilitation protocol; provided informed consent; ability to speak English **Exclusion:** Additional ipsilateral injury; open injury; fluoroquinolone-associated rupture (i.e., rupture within 2 weeks after taking this medication); insulin-dependent diabetes; Achilles avulsion from the calcaneus; surgical	PRP + CC (n=73): 3-4 ml of blood (12 ml of autologous drawn from the cubital fossa and prepared via centrifugation) injected into the area of the palpable gap within the ruptured tendon; local anesthetic used (lidocaine 2%); bracing and rehabilitation identical to that of the CC group CC (n=72): lower limbs placed in a removable below-knee orthosis (Aircast pneumatic walking brace) with a 2-cm heel lift providing approximately 20 degrees of plantar flexion; Patients instructed to maintain a non-weight-bearing status for the first 2 weeks and practice protected weight-bearing for the next 2 weeks; Patients allowed to progress to weight bearing as tolerated between 4 and 6 weeks and were given a copy of the standardized rehabilitation protocol and a prescription written by the surgeon to the physiotherapist that outlined milestones and	None	None	Repeat injection administered at the same location 2 weeks after the primary injection using an identical protocol	NR	PRP vs. CC Age (mean ± SD): 41.5 ± 11.1 vs. 41.1 ± 8.0 years Male: 80.8% vs. 81.9% Mechanism of injury: ADLs, 15.1% vs. 20.8%; Sports, 84.9% vs. 79.2% Time from injury to first injection (days, mean ± SD): 8.3 (range, 2-20) vs NR ("within 14 days of injury" per protocol) Baseline VAS pain (mean ± SD): NR	12 months (64%; 93/145) 24 months (69%; 100/145)	NR - authors report that they have no conflicts of interest in the authorship And publication of this article

RCT Country Setting	N*	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
		contraindications; neurologic or vascular disease requiring medications recognized to impair tendon healing	timelines; Therapists could progress through the protocol at their discretion.							

Appendix Table G9. Acute Ankle Sprain RCT Study and Patient Characteristics Data Abstraction Tables

RCT Country Setting	N*	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
PRP vs. Placebo injection										
Rowden 2015 USA Level I trauma center/ED	N=37	Inclusion: Age ≥18 years; sever ankle sprain based on clinical criteria from Coughlin (diffuse tenderness and selling and inability to walk), and ankle radiograph was negative for fracture Exclusion: pregnancy and lactation; history of peripheral vascular disease; current anticoagulation therapy; current antiplatelet therapy; history of thrombocytopenia; allergy to study medications; evidence of active infection, and prior surgery at the site of injury.	PRP (n=18): 3-4 cc PRP (prepared by centrifugation of autologous blood 50 cc), 1 cc of 1% lidocaine, and 1 cc of 0.25% bupivacaine injected into lesion; mean platelet concentration NR; use of activating agent NR Placebo injection (n=15): 4 cc of sterile normal saline, 1 cc of 1% lidocaine, and 1 cc of 0.25% bupivacaine injected into lesion All treatments: all patients underwent a blood draw (50 cc), however, the placebo groups' blood was discarded; when an injured ligament could be identified, the injection was placed adjacent to the injury; when no injury could be identified, the injection was placed at the site of maximal tenderness.	No	Ultrasound	NR, but assumed to be single injection	posterior splint, crutches and training, pain medication at the treating physician's discretion, avoidance of NSAIDs	PRP vs. Placebo Age (mean, range): 30.3 years (19-54) vs. 35 years (18-61) Female: 77.8% vs. 60.0% African American: 72.2% vs. 60.0% BMI (mean, range): 31.6 kg/m^2 (22.7-48.5) vs. 32.2 kg/m^2 (22-49.9) VAS pain (0-10): 8.8 ± 1.8 vs. 7.7 ± 2.2 LEFS (0-80): 12.9 ± 9.5 vs. 18.6 ± 12.2	1 months 89.1% (33/37) (4 withdrew before study procedures were performed)	NR

Appendix Table G10. Osteochondral Lesion of the Talus RCT Study and Patient Characteristics Data Abstraction Tables

RCT Country Setting	N*	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
PRP vs. Hyaluronate injection										
Mei-Dan 2012 Israel University Medical Center, Department of Orthopedic Surgery	N=32 (33 lesions)	**Inclusion**: Symptomatic osteochondral lesions of the talus; failure to respond to previous treatment modalities including nonoperative therapy consisting of temporary immobilization, the use of analgesics and anti-inflammatories, partial weightbearing, and orthotic provision **Exclusion**: Nonambulatory; osteoarthritic changes at imaging; suspected previous joint infection; hypersensitivity/allergy to Hyaluronate; pregnant or lactating women; concomitant systemic disease; open wounds, or skin ulcers; taking anticoagulants or having a prolonged bleeding time; and those who had undergone lower limb intraarticular injection or surgery within the previous 6 months.	PRP (n=14 [15 lesions]): 2 ml PRP (from 18 mL autologous blood prepared via centrifuge for 8 mins), one injection every 2 weeks, over 4 weeks for a total of 3 injections; calcium chloride added just prior to injection; no local anesthetic used Hyaluronate (n=15 [15 lesions]): 2 ml 1% (20 mg) sodium hyaluronate solution, one weekly injection over 2 weeks for a total of 3 injections; superficial local anesthetic used only at patient's request	NR	NR	3/patient	Immediately after each injection, patient's ankle moved passively throughout its full range ROM to disseminate the injected fluid throughout the joint; patients advised to avoid unnecessary walking for 24 hours. Acetaminophen was recommended, if needed, but patients were instructed to avoid NSAIDs for 2 weeks after the last injection; also instructed to avoid sports activity or heavy physical work for 2 to 3 days after injection.	PRP vs. HA Age (mean ± SD): 42.8 ± 18.1 vs. 36.5 ± 15.2 Female: 20.0% vs. 27.0% Duration of pain (mean ± SD): 7.2 ± 5.5 vs. 9.2 ± 6.2 Posteromedial/medial location: 93% vs. 87% Previous arthroscopy: 27% vs. 33% Ferkel grade: grade 1 (13% vs. 13%); grade 2a (33% vs. 27%); grade 2b or 3 (54% vs. 60%) Baseline Ankle-Hindfoot Scale score (mean ± SD):: 68 ± 14 vs. 66.4 ± 15 Baseline VAS pain score (0-10): 4.1 ± 2.1 vs. 5.6 ± 1.7 Baseline VAS function score (0-10): 4.7 ± 2.1 vs. 5.8 ± 1.9 Baseline subjective global function: 58 ± 22 vs. 56 ± 18	3 and 7 months 90.9% (30/33 lesions; 29/32 patients)	Funding NR; authors declare no conflicts of interest

Appendix Table G11. Temporomandibular Joint (TMJ) Dislocation Cohort Study and Patient Characteristics Data Abstraction Tables

RCT Country Setting	N*	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
Autologous blood injection (ABI) vs. Intermaxillary fixation										
Hegab 2013 Egypt Oral and Maxillofacial surgery department	N=32	**Inclusion**: chronic bilateral recurrent dislocation of the TMJ **Exclusion:** previous treatment (either conservative or surgical)	ABI (n=16): 5 ml of blood (drawn from the cubital fossa) injected into the superior joint space (4 ml) and pericapsular tissue (1 ml) bilaterally; patients instructed to restrict opening of mouth and to eat only soft food for 2 weeks; NSAIDs for the first week Intermaxillary fixation (n=16): IMF alone via eyelet wiring or wires applied into orthodontic braces for 4 weeks; patients instructed to limit their fluid intake; told how to cut wires themselves in from of mirror in case they needed to vomit.	None	None	Repeat injection upon recurrence of dislocation: 37.5% (6/16) had a second ABI injection; 12.5% (2/16) had a third ABI injection	NR	NR; no significant differences in age among groups	3, 6, 12 months %f/u NR	NR

Appendix Table G12. Knee Osteoarthritis (OA) RCT and Cohort Study and Patient Characteristics Data Abstraction Tables

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
PRP vs. HA: RCTs										
Cerza 2012 (Italy)	N=120	Inclusion: Clinically and radiographically documented grades I, II or III gonarthrosis, graded according to the Kellgren-Lawrence radiographic classification scale. Previously received physical therapy or pharmacological therapy with little benefit. Exclusion: History of previous knee operations, previous infiltrative treatment of the affected knee, documented rheumatoid or autoimmune abnormalities, and cases of grade IV gonarthrosis. Patients with a platelet count less than 150,000/ mL were excluded from the treatment, in accordance with the instructions for the use of ACP.	PRP (ACP) (n=60): 5.5 mL PRP (centrifugation performed according to criteria established by Authority Operational Office of Haematology of authors' hospital); PRP contained 1 mL anticoagulant (sodium citrate), injected at medial joint line of knee at "soft spot" between patella and femur to affected knee, platelet concentration NR. HA (n=60): 20 mg/2 mL (Hyalgan, Fidia, Abano, Terme, Italy); injected at medial joint line of knee at "soft spot" between patella and femur to affected knee. All treatments: Patients were monitored for 10 mins. after	NR	NR	Total: 4 intra-articular injections/ patient once a week for 4 weeks	NR	PRP vs. HA Age (mean ± SD): 66.5 ± 11.3 vs. 66.2 ± 10.6 Female: 58% vs. 53% Kellgren Lawrence OA Grade I (%): 35% vs 42% Kellgren Lawrence OA Grade II (%): 40% vs. 37% Kellgren Lawrence OA Grade III (%): 25% vs. 21% Baseline WOMAC score (mean ± SD): 76.96 ± 9.5 vs. 75.4 (SD NR)	Length: 6 mos. % f/u: 100% (120/120)	Funding NR

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
			injection ensure no AEs.							
Gormeli 2015 (Turkey)	N=137	Inclusion: History of chronic (>4 months) pain or swelling radiographically documented grades I to IV gonarthrosis (graded according to the Kellgren–Lawrence classification scale for tibiofemoral joint degeneration) Exclusion: Previous lower extremity surgery, systemic disorders (diabetes, rheumatic diseases, severe cardiovascular diseases, haematological diseases, infections), patients with generalized OA, patients undergoing anticoagulant or antiaggregant therapy, the use of NSAIDs in the 5 days before injection, patients with haemoglobin values less than 11 g/dL and platelet values less than 150,000/mm^3	PRP (n=91)*: 5 mL PRP with 1 mL calcium chloride to activate platelets (centrifuged at 1500 rpm x 6 min, then at 3500 rpm x 12 min); injection in knee was done intraarticularly using superolateral approach, concentration factor of platelets ranged from 5.2 – 5.3x from baseline. HA (n=46): High molecular weight preparation (30 mg/2 mL, Orthovisc, Anika Therapeutics Inc., Woburn, MA, USA), injection in knee was done intraarticularly using superolateral approach, Treatment consisted of 3 injections of 2 mL once weekly. All treatments: Knee was immobilized for 10	NR	NR	Total: In patients receiving 3 PRP injections (n=46), received 3 injections/patient every 7 days. Details NR for patients receiving only 1 PRP injection (n=45). Patients receiving HA injections (n=46) and saline injections (n=45) received a total of 3, spaced 7 days apart.	Patients instructed to use cold therapy on affected area for pain relief, and NSAIDs were not allowed during the follow-up period. Paracetamol was prescribed for discomfort.	PRP* vs. HA Age (mean ± SD): 53.75 ± 13.18 vs. 53.5 ± 12.8 Female: 57.8% vs. 56.4% Early OA: 67.4% vs. 64.1% Advanced OA: 32.5% vs. 35.8% Baseline EQ-VAS (mean ± SD): 50.3 ± 5.47 vs. 50.5 ± 4.6 Baseline IKDC (mean ± SD): 40.8 ± 5.52 vs. 40.6 ± 4.5	Length f/u: 6 mos. % f/u: 89.1% (122/137)	Funding NR

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
			min after injection, and patient discharged after 1 hr observation period.							
Raeissadat 2015 (Iran)	N=160	Inclusion: Knee OA within 40-70 years of age, with symptoms greater than 3 months, confirmatory x-ray diagnosis (Kellgren-Lawrence grade 1-4) within past 3 months Exclusion: History of diabetes mellitus, immunodeficiency and collage vascular disorders, history or presence of malignant disorders, infection or active wound in the knee area, recent history of severe trauma to the knee, autoimmune and platelet disorders, treatment with anticoagulant and antiplatelet medications 10 days before injection, use of NSAIDs 2 days before injection, history of knee intraarticular injections of corticosteroids during the past 3 weeks or use of systemic	PRP (L-PRP) (n=87): 4-6 mL PRP (prepared by centrifugation of autologous blood at 1500 rpm x 15 min, then buffy coat layer from first centrifugation at 2800 rpm x 7 min) injected laterally, mid-patellar; mean leukocyte count 808.69 ± 825.38. HA (n=73): 2 mL Hyalgan© (Fidia Farmaceutici S.p.A., Abano Terme, Italy) containing 17 mg NaCl, 0.1 mg monobasic sodium phosphate, 1.2 mg dibasic sodium phosphate, and up to 2 cc water injected laterally, mid-patellar. All treatments: Patients were given a single dose of acetaminophen-	NR	NR	Total: 2 injections/patient administered 4 weeks apart	Acetaminophen 500 mg or acetaminophen with codeine (per physician); standardized exercises; other analgesics, NSAIDs, and steroid prohibited.	PRP vs. HA Age (mean ± SD): 56.8 ± 9.13 vs. 61.1 ± 7.48, p<0.05 Female: 89.6% vs. 75.8% Duration of pain (months) (mean ± SD): NR Baseline WOMAC, pain (mean ± SD): 8.46 ± 4.17 vs. 6.91 ± 3.82 Baseline WOMAC, stiffness (mean ± SD): 2.24 ± 1.76 vs. 1.88 ± 1.72 Baseline WOMAC, function (mean ± SD): 28.91 ± 12.63 vs. 19.88 ± 16.69 Baseline WOMAC, total (mean ± SD): 39.5 ± 17.06 vs. 28.69 ± 16.69 Baseline SF-36, physical functioning (mean ± SD): 37.4 ± 24.92 vs. 43.66 ± 22.3 Baseline SF-36, role limitations due to physical health (mean ± SD): 28.83 ± 31.11 vs. 28.62 ±	Length f/u: 52 weeks % f/u: 86.8% (139/160)	Funding NR

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
		corticosteroids 2 weeks before PRP injections, hemoglobin measures of <12g/dL and platelet counts of <150,000/ml, history of vasovagal shock, pregnancy, or breastfeeding, and genu valgum/varum greater than 20 degrees, allergy to avian proteins, feathers and egg products or hypersensitivity to hyaluronate.	codeine 2 hours before the injection. After injection, patients were instructed to rest for 24-48 hours after injection, to limit weight bearing over injected joints, and apply cold therapy 3x day for 10 min. Allowed to use 500 mg of acetaminophen w/out codeine if desired.					36.17 Baseline SF-36, pain (mean ± SD): 49.9 ± 24.77 vs. 45.45 ± 20.5 Baseline SF-36, general health (mean ± SD): 61.68 ± 25.72 vs. 61.37 ± 19.14 Baseline sum of SF-36, physical health components (mean ± SD): 178.14 ± 81.00 vs. 180.4 ± 68.52 Baseline SF-36, emotional well-being (mean ± SD): 61.01 ± 26.86 vs. 57.74 ± 21.24 Baseline SF-36, role limitations due to emotional problems (mean ± SD): 50.64 ± 43.46 vs. 51.61 ± 46.13 Baseline SF-36, vitality (mean ± SD): 54.25 ± 24.95 vs. 54.43 ± 21.47 Baseline SF-36, social functioning (mean ± SD): 63.31 ± 28.41 vs. 60.64 ± 27.86 Baseline sum of SF-36 mental health components (mean ± SD): 229.22 ± 95.62 vs. 226.43 ± 97.39 Baseline Kellgren Lawrence OA Grade		

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
								1 (%): 6% vs. 0% Baseline Kellgren Lawrence OA Grade 2 (%): 44% vs. 47% Baseline Kellgren Lawrence OA Grade 3 (%): 38% vs. 37% Baseline Kellgren Lawrence OA Grade 4 (%): 12% vs. 16%		
Filardo 2015 (Italy)	N=192	Inclusion: (1) unilateral symptomatic knee with history of chronic pain (at least 4 months) or swelling and (2) imaging findings of cartilage degeneration, that is, chondropathy (Kellgren-Lawrence score of 0, detected by magnetic resonance imaging [MRI]) or osteoarthritis (Kellgren-Lawrence score of 1-3). Exclusion: Age > 80 years, Kellgren-Lawrence score >3, major axial deviation (varus >5°, valgus >5°), focal chondral or osteochondral lesion, presence of any concomitant knee lesion causing pain or swelling (i.e.,	PRP (n=96): 3 weekly intraarticular injections of 5 mL (prepared by centrifugation of blood at 1480 rpm x 6 min, then 3400 rpm x 15 min; activated with 10% calcium chloride prior to injection); concentration of platelets per mm increased a mean 4.6 ± 1.4 times with respect to baseline blood values. Leukocytes increased a mean 1.1 ± 0.5 times with respect to normal blood value. High-molecular weight HA (n=96): 3 weekly intraarticular injections of	NR	NR	Total: 3 injections/patient "weekly", timing not further specified.	NR	PRP vs. HA Age (mean ± SD): 53.32 ± 13.2 vs. 57.55 ± 11.8 years, p = 0.026 Female: 36% vs. 42% Duration of symptoms (months) (mean (range)): 65.5 (4-360) vs. 68.4 (4-300) Baseline Kellgren-Lawrence score (mean ± SD): 2.0 ± 1.1 vs. 2.0 ± 1.1 Baseline KOOS: Symptom score (mean ± SD): 65.5 ± 16.6 vs. 65.8 ± 16.3 Baseline KOOS: ADL score (mean ± SD): 70.6 ± 19.4 vs. 68.2 ± 20.2 Baseline KOOS: Sport score (mean ± SD): 37.9 ± 25.0 vs. 35.7 ± 24.6 Baseline KOOS: Pain score (mean ± SD): 66.1 ± 17.9 vs. 64.1 ±	Length: 12 months % f/u: 95.3% (183/192)	Funded by RICERCA FINALIZAATA 2009, grant from the Italian Health Ministry and PRRU (Emilia-Romagna/University of Bologna Project (2010-2012 grant.

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
		ligamentous or meniscal injury), inflammatory arthropathy, hematological diseases, severe cardiovascular diseases, infections, immunodepression, therapy with anticoagulants or antiaggregants, use of nonsteroidal anti-inflammatory drugs in the 5 days before blood donation, and hemoglobin count lower than 11 g/dL and platelet count lower than 150,000/mm^3.	Hyalubrix 20 mg/2 mL, molecular weight >1500 kDa, Fidia SpA All treatments: After injection, patients were instructed to restrict the use of the leg for at least 24 hours and to use ice or other cold therapy on the affected area to relieve pain.					16.5 Baseline KOOS: QoL score (mean ± SD): 36.0 ± 19.4 vs. 48.4 ± 23.1 Baseline IKDC subjective score (mean ± SD): 52.4 ± 14.1 vs. 49.7 ± 13.0 Baseline Tegner score (mean ± SD): 2.9 ± 1.3 vs. 2.8 ± 1.3		
Sanchez 2012 (Spain)	N= 176	Inclusion: Aged between 41 and 74 years and had OA of the knee diagnosed based on American College of Rheumatology criteria with radiographic confirmation (Ahlbäck grades 1 to 3, on a scale of 1 to 4, with higher numbers indicating more severe signs of the disease). Exclusion: Bilateral knee OA requiring infiltration in both knees; BMI ≥33; suffering from	PRP (n=89) 8 mL (centrifuged at 580g x 8 min, activated with 400 µL of calcium chloride); location of injection, platelet concentration NR HA (n=87) Details NR	NR	NR	Total: 3 injections/patient (weekly)	Acetaminophen as needed for pain; NSAIDs prohibited.	PRP vs. HA Age (mean ± SD): 60.5 ± 7.9 vs. 58.9 ± 8.2 Female (%): 52% vs. 52% Baseline dose of acetaminophen (mg/d ± SD): 2.9 ± 7.1 vs. 1.7 ± 5.6 Baseline Ahlback grade I (%): 51% vs. 49% Baseline Ahlback grade II (%): 36% vs. 38% Baseline Ahlback grade III (%): 13% vs. 13% Baseline normalized	Length: 6 mos. % f/u: 86.9% (153/176)	Funding NR

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
		polyarticular disease; severe mechanical deformity (diaphyseal varus deformity of 4° and valgus of 16°; previous arthroscopy within last year; HA intra-articular infiltration within <6 mos; systemic autoimmune rheumatoid disease (connective tissue disease and systemic necrotizing vasculitis); glycosylated hemoglobin above 7%; blood disorders (thrombopathy, thrombocytopenia, anemia with hemoglobin <9); undergoing immunosuppressive therapy and/or warfarin; having undergone treatment with steroids during 4 mos before inclusion in study; treatment with NSAIDs during 15d before patient inclusion in study.						WOMAC score: pain (mean ± SD): 40.4 ± 16 vs. 38.4 ± 5.6 Baseline normalized WOMAC score: stiffness (mean ± SD): 41.8 ± 17.3 vs. 38.5 ± 18.3 Baseline normalized WOMAC score: physical function (mean ± SD): 39.6 ± 16.3 vs. 38.8 ± 17.4 Baseline normalized WOMAC score: total (mean ± SD): 121.8 ± 44.4 vs. 115.6 ± 45.1 Baseline Lequesne index (mean ± SD): 9.5 ± 3.0 vs. 9.1 ± 3.2		
Vaquerizo 2013 (Spain)	N=96	Inclusion: >50 years and had OA of the knee as diagnosed based on the American College of Rheumatology	PRP (n=48) 8 mL (prepared by centrifugation at 580g x 8 min.); activated with 400 µL calcium chloride, injected	NR	NR	Total: 3 injections, once a week; HA given only once	NR	PRP vs. HA Age (mean ± SD): 62.4 ± 6.6 vs. 64.7 ± 7.7 Female (%): 66.7% vs. 54.2% Primary arthritis (%):	Length: 6 mos, 12 mos % f/u: 93.75% (90/96)	Funding from BTI Biotechnology Institute ImasD, Vitoria, Spain

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
		criteria, with radiographic confirmation of the Kellgren-Lawrence classification grade 2 to 4 (on a scale of 1 to 4, with higher numbers indicating more severe signs of the disease). Exclusion: Intra-articular HA injection in last 6 months; severe mechanical deformity; allergic or sensitive to HA-based product; treatment with dicomuarin not to be reversed temporarily; polyarticular or infectious disease; systemic autoimmune rheumatic Disease; blood dyscrasia; immunosuppressive (or immunodepressive) disease; body mass index >40; cancer/malignant lesions; difficulties in comprehension and/ or reading and writing; physical impediments to answer questionnaire	using an external suprapatellar approach. Concentration NR. HA (n=48) Clinicians injected Durolane HA using an external suprapatellar approach.					44% vs. 42% Baseline Kellgren-Lawrence grade (mean ± SD): 2.6 ± 7.1 vs. 2.8 ± 0.7 Baseline Kellgren-Lawrence Classification, 2 (%): 29.2% vs. 37.5 Baseline Kellgren-Lawrence Classification, 3 (%): 54.2% vs. 43.8% Baseline Kellgren-Lawrence Classification, 4 (%): 16.7% vs. 18.8% Baseline WOMAC score: pain (mean ± SD): 9.6 ± 2.5 vs. 10.2 ± 3.5 Baseline WOMAC score: stiffness (mean ± SD): 3.7 ± 1.7 vs. 4.0 ± 2.0 Baseline WOMAC score: physical function (mean ± SD): 32.6 ± 9.9 vs. 36.7 ± 13.7 Baseline WOMAC score: total (mean ± SD): 45.9 ± 12.7 vs. 50.8 ± 18.4 Lequesne index (mean ± SD): 12.8 ± 3.8 vs. 13.1 ± 38		
PRP vs. HA: Cohort Studies										
Kon 2011	N=150	Inclusion:	PRP (n=50):	NR	NR	Total: 3 PRP	During the	PRP vs. HA†	Length: 6 mos.	Funding NR

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
(USA and Italy)		Patients affected by a unilateral lesion with a history of chronic (≥4 months) pain or swelling of the knee and imaging findings (radiography or magnetic resonance imaging [MRI]) of degenerative changes of the joint. Exclusion: Systemic disorders such as diabetes, rheumatic diseases, hematologic diseases (coagulopathies), severe cardiovascular diseases, infections, immunosuppression, patients receiving therapy with anticoagulants-antiaggregants, use of nonsteroidal anti-inflammatory drugs in the 5 days before blood donation (for reasons of caution, because disagreement exists on the use of concomitant nonsteroidal anti-inflammatory drugs before the PRP treatment), and patients with hemoglobin (g/dl)	5 mL activated with 10% calcium chloride (centrifuged at 1480 rpm x 6 min, then 3400 rpm x 15 min); mean of more than 6 billion platelets were injected through a classic lateral approach. High-molecular weight (HW) HA (n=50) or Low-molecular weight (LW) HA (n=50)†: HW HA comprised of 30 mg/2mL of HA with MW 1,000 to 2,900 kDa; LW HA comprised of 30 mg/2mL of HA with MW 530 to 730 kDa. All treatments: Patients were sent home with instructions on limiting the use of the leg.			injections/patient every 14 days	injection cycle, rest or mild activities (such as exercise bike or mild exercises in a pool) were indicated, and subsequently, a gradual resumption of normal sport or recreational activities was allowed as tolerated in all the treatment groups; ice for pain/swelling; NSAIDs not permitted	Age (mean ± SD): 50.6 ± 13.8 vs. 54.05 ± 9.3 Female (%): 40% vs. 48% BMI (kg/m^2) (mean ± SD): 24.6 ± 3.2 vs. 25.5 ± 2.97 Cartilage degeneration (%): 44% vs. 40% Early OA (%): 40% vs. 41% Advanced OA (%): 16% vs. 19% Previous surgery (%): 36% vs. 30% Baseline IKDC (mean ± SD): 41.2 ± 10.9 vs. 46.0 ± 10.8 Baseline EQ-VAS (mean ± SD): 53.6 ± 18.3 vs. 51.7 ± 10.35	% f/u: NR	

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
		values of less than 11 and platelet values of less than 50,000/cubic mm.								
Sanchez 2008 (Spain)	N=60	Inclusion: NR Exclusion: Idiopathic and secondary post-traumatic and mechanical OA were included. OA secondary to joint inflammatory disease was excluded. Patients with other diseases affecting the knee, those with generalized OA or arthroscopic lavage in the year previous to treatment, or intra-articular treatment within the previous three months were excluded.	PRP (n=30): 6-8 cc PRP combined with 3.8% (wt/vol) sodium citrate and calcium chloride activator (22.8 mM concentration) (centrifuged at 640g x 8 min); platelet concentration was increased 2.0 ± 0.5-fold compared to peripheral blood,‡ injected knee intraarticularly using lateral approach. HA (n=30): 2 cc of HA (Arthrum H 2%, LCA Pharmaceutical, Chartres France) injected into knee intraarticularly.	NR	NR	Total: 3 HA or PRP injections/patient every week	NR	PRP vs. HA Age (mean ± SD): 63.53 ± 8.91 vs. 60.9 ± 8.63 Female (%): 66% vs. 60% Ahlback grade I (%): 15% vs. 15% Ahlback grade II (%): 16.6% vs. 16.6% Ahlback grade III (%): 3.3% vs. 3.3% Ahlback grade IV (%): 15% vs. 15% Baseline WOMAC: Pain (mean ± SD): 8.40 ± 6.1 vs. 6.27 ± 6.57 Baseline WOMAC: Stiffness (mean ± SD): 3.63 ± 2.9 vs. 3.2 ± 3.07 Baseline WOMAC: Physical Function (mean ± SD): 26.43 ± 22.33 vs. 22.87 ± 24.5 Baseline WOMAC: total (mean ± SD): 38.47 ± 31.33 vs. 32.33 ± 34.13	Length: 5 weeks % f/u: NR	Funding partially from the Basque and Spanish Governments.
Say 2013 (Turkey)	N=90	Inclusion: Patients with a diagnosis of OA who had been	PRP (n=45): 2.5 mL PRP with 3.2% sodium citrate and	NR	NR	Total: In PRP group, 1 injection/patient; in HA	No standardized rehabilitation; ice and paracetamol for pain/swelling;	PRP vs. HA Age (mean ± SD): 55.2 ± 7.8 vs. 56.2 ± 5.1	Length: 6 mos. % f/u: NR	Funding NR

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
		followed-up and had not seen any benefit from analgesic and anti-inflammatory treatment over a period of at least three months were included in the study. The application was made to symptomatic knees in patients determined with bilateral gonarthrosis. Exclusion: Patients were not included if they had any systemic disease, active tumour or haematologically malign disease, infection, a history of anticoagulant use, Hb value < 11g/dl, thrombocyte count <150,000/mm3 or radiologically gonarthrosis at Kellgren-Lawrence Stage 4.	activating agent 5.5% calcium chloride (2.8 mM) (centrifuged at 1800rpm x 8 min); platelet count per milliliter increased by 400% compared to thrombocyte count, PRP was injected intraarticularly to the knee. HA (n=45): Low molecular weight HA (730 with 900 kDa) at 25 mg/2.5 mL dosage was injected intra-articularly into the knee.			group, 3 injections/patient once a week.	NSAIDs permitted up to 7 days post-injection (PRP group only).	Female (%): 88.8% vs. 86.6% Baseline Kellgren-Lawrence Grade 1 (%): 2.2% vs. 2.2% Baseline Kellgren-Lawrence Grade 2 (%): 37.7% vs. 33.3% Baseline Kellgren-Lawrence Grade 3 (%): 60% vs. 64.4% Baseline KOOS (mean ± SD): 46.0 ± 16.2 vs. 43.8 ± 8.6 Baseline VAS (mean ± SD): 7.3 ± 1.6 vs. 7.0 ± 1.3		
Spakova 2012 (Slovakia)	N=120	Inclusion: History of chronic pain of the knee lasting at least 12 mos. and the radiologic signs of knee OA Grade 1, 2, and 3 according to Kellgren and Lawrence classification. All	PRP (n=60): 3 mL PRP with 0.106 M sodium citrate (centrifuged at 3200 rpm x 15 min, then 1500 rpm x 10 min); platelet concentration mean was 680 ±	NR	NR	Total: 3 injections/patient of either HA or PRP in weekly intervals.	No standardized exercise program; paracetamol for pain (max. 4g/day).	PRP vs. HA Age (mean ± SD): 52.8 ± 12.43 vs. 53.2 ± 14.53 Female (%): 45% vs. 48.3% Baseline Kellgren-Lawrence Grade 1 (%): 3.3% vs. 3.3% Baseline Kellgren-	Length: 6 mos. % f/u: NR	Funding NR

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
		patients had previously been treated conservatively using analgesics and nonsteroidal anti-inflammatory drugs without success for at least 6 mos. Exclusion: thrombocytopenia (platelet count, G100 109/liter), anemia (hemoglobin, G10 g/dl), systemic disease, hematologic disease, history of tumor or active tumor or hematologic malignant disease, severe cardiovascular disease, infection, immunosuppressive status, active anticoagulant therapy, and application of intra-articular depot glucocorticoid injection or HA within 3 mos. before application of tested substance. Using anti-inflammatory drugs was not permitted from 5 days before the beginning of treatment to 7 days after the last treatment dose of PRP or HA.	132 x 10^6 (an average 450% platelet increase compared to whole blood), laterally injected intraarticularly into the knee. HA (n=60): HA used was Erectus 1.2% (CSC Pharmaceuticals, Handels GmbH), laterally injected intraarticularly into the knee. All treatments: No activities were prohibited. In the case of worsening of knee pain, the use of paracetamol (acetaminophen) was recommended up to maximum daily dose of 4 g.					Lawrence Grade 2 (%): 65% vs. 61.6% Baseline Kellgren-Lawrence Grade 3 (%): 31.6% vs. 35% Baseline Kellgren-Lawrence Grade 4 (%): 0% vs. 0% Baseline WOMAC: total (mean ± SD): 38.76 ± 16.5 vs. 43.21 ± 13.7 Baseline NRS (mean ± SD): 5.27 ± 1.87 vs. 6.02 ± 1.77		

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
PRP vs. Saline: RCTs										
Patel 2013 (India)	N=78	Inclusion: Patients with bilateral early OA of the knee, Ahlback grade 1 or 2 knees without significant deformity. Exclusion: OA secondary to joint inflammatory diseases; patients with generalized OA, metabolic diseases of the bone, coexisting backache, and advanced stages of OA; patients who had received intra-articular injections within 3 months or arthroscopic lavage in the previous 1 year or who were receiving anticoagulant therapy; and patients with a hemoglobin level less than 10 gm% or associated comorbidities, infection, tumor, crystal arthropathies, or tense joint effusion.	PRP (n=52)§: 8 mL (prepared by centrifugation 1500 rpm x 15 min); injected into suprapatellar pouch through a supralateral approach without LA, mean platelet count 310.14 x $10^3/\mu L$, mean quantity of platelets per injected knee was 238.5 x 10^7. Saline (n=26): Details NR	NR	NR	Total: 25 patients given 2 injections at interval of 3 weeks.	Paracetamol 500 mg allowed for discomfort; NSAIDs prohibited; all patients asked to stop medications 48 hrs. before follow-up assessment.	PRP§ vs. Saline Age (mean ± SD): 52.35 ± 10.45 vs. 53.635 ± 8.17 Female: 69.2% vs. 73.9% Duration of symptoms (months) (mean ± SD): NR Ahlback grade 1 (OA of knee joint) (% knees): 74.5% (73/102) vs. 54.3% (25/46) Ahlback grade 2 (OA of knee joint) (% knees): 21.4% (21/102) vs. 39.1% (18/46) Ahlback grade 3 (OA of knee joint) (% knees): 4.1% (4/102) vs. 6.5% (3/46) By knee, baseline WOMAC score, pain (mean ± SD): 10.40 ± 3.74 vs. 9.04 ± 3.73 By knee, baseline WOMAC score, stiffness (mean ± SD): 3.28 ± 2.05 vs. 2.70 ± 2.02 By knee, baseline WOMAC score, physical function (mean ± SD): 37.61 ± 12.17 vs. 38.80 ± 12.44 By knee, baseline	Length: 3 months % f/u: 94.8% (74/78)	Funding from Prof D.S. Grewal Memorial Orthopaedics Society, Chandigarh, and the Indian Arthroplasty Association.

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
								WOMAC score, total (mean ± SD): 51.38 ± 16.93 vs. 45.54 ± 17.29 By knee, baseline VAS score (mean ± SD): 4.60 ± 0.57 vs. 4.57 ± 0.62		
Gormeli 2015 (Turkey)	N=136	Inclusion: History of chronic (>4 months) pain or swelling radiographically documented grades I to IV gonarthrosis (graded according to the Kellgren–Lawrence classification scale for tibiofemoral joint degeneration) Exclusion: Previous lower extremity surgery, systemic disorders (diabetes, rheumatic diseases, severe cardiovascular diseases, haematological diseases, infections), patients with generalized OA, patients undergoing anticoagulant or antiaggregant therapy, the use of NSAIDs in the 5 days before injection, patients with	PRP (n=91)*: 5 mL PRP with CPD-A1 anticoagulant and 1 mL calcium chloride to activate platelets (centrifuged at 1500 rpm x 6 min, then at 3500 rpm x 12 min); injection in knee was done intraarticularly using superolateral approach, concentration factor of platelets ranged from 5.2 – 5.3x from baseline. Saline (Control) (n=45): Details NR All treatments: Knee was immobilized for 10 min after injection, and patient discharged after 1 hr observation period.	NR	NR	In patients receiving 3 PRP injections (n=46), received 3 injections/patient every 7 days. Details NR for patients receiving only 1 PRP injection (n=45). Patients receiving saline injections (n=45) received a total of 3, spaced 7 days apart.	Paracetamol allowed for discomfort; NSAIDs prohibited; no limitations on physical activity	PRP* vs. Saline Age (mean ± SD): 53.75 ± 13.18 vs. 52.8 ± 12.8 Female: 57.8% vs. 50% Early OA: 67.4% vs. 67.5% Late OA: 32.5% vs. 32.5% Baseline EQ-VAS (mean ± SD): 50.3 ± 5.47 vs. 50.2 ± 4.5 Baseline IKDC (mean ± SD): 40.8 ± 5.52 vs. 40.4 ± 4.3	Length f/u: 6 mos. % f/u: 90.4% (123/136)	Funding NR

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
		haemoglobin values less than 11 g/dL and platelet values less than 150,000/mm^3								
PRP vs. Control: RCTs										
Rayegani 2014 (Iran)	N=65	Inclusion: Arthralgia from past 3 months with radiologic evidence of articular damage (grade 1-4 of Kellgren-Lawrence scale) based on knee OA criteria of American College of Rheumatology. Exclusion: Age >75 years, history of diabetes mellitus, immunosuppressive and collagen vascular disorders, history or presence of cancer or malignant disorders, any infection or active wound of the knee, recent history of severe trauma to the knee, autoimmune and platelet disorders, treatment with anticoagulant and anti-platelet medications 10 days before injection, use of non-steroidal anti-inflammatory drugs (NSAIDs) 3 days before injection, history of knee	PRP (n=32): 4-6 mL leukocyte-containing PRP with anticoagulant (ACD-A) (centrifuged at 1600 rpm x 15 min, then 2800 x 7 min); concentration was 4-6 times the average normal value (1st injection [PRP] = 1346060.00 ± 523291.05, 2nd injection [PRP] = 1367833.33 ± 364955.38; 1st injection [WBC] = 240.0 ± 203.6, 2nd injection [WBC] = 388.89 ± 489.76), PRP was injected without local anesthetic using the classic approach for intra-articular injection (suprapatellar or medial). Patients were recommended to have relative rest 24-48 hours post-	NR	NR	Total: 2 injections/patient in 4 week intervals.	Exercise and acetaminophen 500 mg without codeine (PRN according to the patient needs up to 2 g/day) were prescribed. Exercise was composed of multi-angle isometric exercises of muscles around the knee as well as stretching of the hamstring 3 times a day and every move lasting 10 seconds and repeated 10 times. After 4 weeks, concentric exercises were taught to the patient.	PRP vs. Control Age (mean ± SD): 58.07 ± 8.95 vs. 54.68 ± 10.83 Female: 93.5% vs. 93.5% Baseline WOMAC, pain (mean ± SD): 9.13 ± 3.72 vs. 7.12 ± 3.37 Baseline WOMAC, stiffness (mean ± SD): 2.3 ± 1.76 vs. 1.67 ± 1.64 Baseline WOMAC, functional capacity (mean ± SD): 31.86 ± 9.81 vs. 25.03 ± 17.25 Dominant knee involvement, right (%): 36.7% vs. 48.4% Dominant knee involvement, left (%): 63.3% vs. 51.6% Grade 1 tibiofemoral osteoarthritis (%): 6.7% vs. 0% Grade 2 tibiofemoral osteoarthritis (%): 50% vs. 70% Grade 3 tibiofemoral osteoarthritis (%): 33.3% vs. 20%	Length: 6 mos. % f/u: 93.8% (61/65)	Funding NR, but acetaminophen utilized by patients in trial was donated by the Hakim Pharmaceutical Company.

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
		articular injections of corticosteroids during previous 3 weeks or use of systemic corticosteroids 2 weeks before PRP injections, hemoglobin measures of less than 12 g/dL and platelet counts of less than 150,000 per microliter, history of vasovagal shock, pregnancy or breastfeeding and genu valgum/varum greater than 20 degrees.	injection and to limit weight bearing on the injected joint. In the case of pain, patients were permitted to use 500 mg of acetominophen-codeine PRN, but not NSAIDS, aspirin, or any steroids. Patients could resume usual activities of daily living 1 week after injection, and exercise was started a week after injection with lower intensity in the first days. Control (n=33): Exercise was prescribed immediately after entrance in the study, and patients could use only acetaminophen without codeine if they felt pain, but could change to acetaminophen-codeine in case of persistent pain.					Grade 4 tibiofemoral osteoarthritis (%): 13.3% vs. 0.0% Grade 1 patellofemoral osteoarthritis (%):6.7% vs. 0.0% Grade 2 patellofemoral osteoarthritis (%):43.3% vs. 51.7% Grade 3 patellofemoral osteoarthritis (%):30% vs. 44.9% Grade 4 patellofemoral osteoarthritis (%): 20% vs. 3.4% Regular physical activity- Regular active** (%): 48.4% vs. 45.2% Regular physical activity- not active (%): 51.6% vs. 54.8% Symptom period of 3-12 mos. (%): 16.7% vs. 25.8% Symptom period of >12 mos. (%): 83.3% vs. 74.2%		
PRP vs. TENS + Exercise										
Angoorani 2015	N=54	Inclusion: Grade 1, 2 and	PRP (n=27): 5 mL PRP activated	NR	NR	Total: 2 injections/pati	SAIDs, green tea, and cranberry	PRP vs. TENS + Exercise	Length: 2 mos.	Funding from Iran University

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
(Iran)		3 knee osteoarthritis based on Kellgren and Lawrence radiographic scoring system, no history of corticosteroid injection or consumption within past 6 months, no history of peripheral vascular disease, spinal stenosis, severe disabilities, inflammatory and metabolic diseases and lack of history of anticoagulativrayeae drugs consumption or coagulopathies. Exclusion: Consumption or intra-articular injection of corticosteroids during the study, anticoagulative drugs consumption during the study, and patient request for leaving the study.	with 0.5 mL calcium gluconate prior to injection (centrifuged at 1600 rpm x 6 min, then at 2000 rpm x 5 min); platelet concentration was 3-7x from baseline, injected through infero-medial or infero-lateral approach without LA. TENS (n=27): Conventional treatment approach with TENS and exercise therapy			ent in 4 week intervals.	consumption were disallowed; paracetamol 500 mg and ice as needed	Age (mean ± SD): 62.15 ± 12.14 (range 43-80) vs. 61.59 ± 8.07 (range 44-80) Female: 81.5% vs. 92.6% Baseline KOOS- Pain (mean ± SD): 44.9 ± 3.56 vs. 41.3 ± 3.43 Baseline KOOS-Symptoms (mean ± SD): 51.5 ± 4.47 vs. 50.3 ± 3.87 Baseline KOOS- ADL (mean ± SD): 48.3 ± 3.81 vs. 42.4 ± 4.09 Baseline KOOS-Sport/Rec (mean ± SD): 23.8 ± 4.87 vs. 28.4 ± 6.16 Baseline KOOS-QoL (mean ± SD): 17.1 ± 2.62 vs. 20.6 ± 3.65	% f/u: 92.5% (50/54)	of Medical Sciences
PRP vs. Steroid RCTs										
Forogh 2015 (Iran)	N=48 knees	Inclusion: Aged 50-75, suffering from knee osteoarthritis, pain intensity of 60 in VAS at admission, knee pain with duration >3 mos., residing in Tehran and its suburbs, and a history of undergoing, but not benefitting	PRP (n=24 knees) 5 mL PRP with anticoagulant citrate dextrose solution A and 0.5 mL of activating calcium gluconate (1 g/10 mL) (centrifuged at 1600 relative centrifugal force	NR	NR	Total: 1 injection/knee; if the other knee had clinical indications for intra-articular injection, it was carried out at least 3 weeks after	Asked to avoid weight pressure on injected joint for 24 hours; allowed acetaminophen and cold compress for pain; instructed to exercise daily.	PRP vs. CS Age (mean ± SD): 59.13 ± 7.03 vs. 61.13 ± 6.7 Female: 70.8% vs. 62.5% Smoking (%): 0% vs. 12.5%, p NS Right knee injected (%): 50% vs. 45.8% Left knee injected	Length: 6 mos. % f/u: 81.3% (39/48)	No funding was received for this study.

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
		from, at least two OA treatments (including lifestyle changes, weight loss, oral medications, physiotherapy, acupuncture, laser, using insole, cane or orthotic device), grade II or III Kellgren-Lawrence Grade. Exclusion: History of collagen vascular or severe cardiovascular and hematopoietic diseases, diabetes mellitus, history or presence of cancer, malignant disorders or immunosuppression, hepatitis B or C, HIV infection, any active infection or wound of the knee, history of any knee articular injections, infection, arthroscopy or surgery during the previous 6 months, active lumbosacral radiculopathy and/or drug abuse. Additionally, those who experienced physiotherapy treatment modalities, laser or acupuncture on their knees in the 6 months following	(RCF) x 6 min, then 2000 RCF x 6 min); average PRP platelet count was 1501 x 10^3 platelets/µL, injected from the supra-lateral patellar area. Corticosteroid (CS) (n=24 knees) 5 mL of blood was drawn from those undergoing CS injection to maintain blinding. Injection was intra-articular, no further details reported.			the first injection.		(%): 50% vs. 54.1% Education— Illiterate or elementary (%): 33.3% vs. 41.7% Education- Middle school (%): 8.4% vs. 8.4% Education— High School (%): 37.5% vs. 33.3% Education– University (%): 20.8% vs. 16.6% Kellgren-Lawrence OA grade II (%): 29.2% vs. 33.3% Kellgren-Lawrence OA grade III (%): 70.8% vs. 66.7% Baseline 20 meter-walk test (seconds, mean ± SD): 16.33 ± 4.4 vs. 19.3 ± 5.3 Baseline KOOS-Symptom relief (mean ± SD): 55.2 ± 14.0 vs. 54.6 ± 16.8 Baseline KOOS- ADL (mean ± SD): 51.9 ± 14.2 vs. 46.1 ± 21.5 Baseline KOOS-sporting ability (mean ± SD): 5.9 ± 6.8 vs. 5.0 ± 7.1 Baseline KOOS- pain relief (mean ± SD): 45.8 ± 13.5 vs. 52.3 ± 11.8 Baseline VAS-based pain intensity (mean ± SD): 81.3 ± 13.4 vs.		

RCT (Country)	N*	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
		injection were excluded.						77.8 ± 13.8 Baseline KOOS- QoL (mean ± SD): 7.4 ± 8.4 vs. 5.1 ± 7.4		

ADL: Activity of daily life; EQ-VAS: EuroQol visual analog scale; HA: Hyaluronic acid; IKDC: International Knee Documentation Committee Subjective Knee Form; KOOS: Knee injury and Osteoarthritis Outcome Score; MCS: Mental Component Summary; NRS: numeric rating scale; PCS: Physical Component Summary; QoL: Quality of Life; SD: standard deviation; SF-36: short form 36; VAS: visual analog scale; WOMAC: Western Ontario and McMaster score

* Gormeli 2015: PRP group is comprised of patients receiving either 3 PRP injections (n=46) or a single PRP injection (n=45).

† Kon 2011: HA group is comprised of patients receiving either low-molecular weight HA (n=50) and high-molecular weight HA (n=50)

‡ Sanchez 2008: The levels of the main platelet secretory growth factors were 29.15±12.88 ng/cc (range, 8.39-57.55 ng/cc) for TGF-β1 and 17.41±9.66 ng/cc (range, 3.66-46.72 ng/cc) for PDGF. VEGF was also secreted from platelets but was less abundant (212 pg/cc, range 18-447 pg/cc). Other GFs present in PRGF reflect mainly plasma levels, among these growth factors are IGF-I (54.85±18.41 ng/cc, range 22.0-85.9 ng/cc) and less concentrated HGF (522±253 pg/cc, range 227-1115 pg/cc).

§ Patel 2013: PRP results are comprised of knees receiving either a single PRP injection (n=50 knees or n=25 patients) or two PRP injections (n=54 knees or n=27 patients).

** Rayegani 2014: "Regular active" baseline characteristic defined as physical activity 3x week for at least 30 minutes each time.

Appendix Table G13. Hip Osteoarthritis (OA) RCTs: Study and Patient Characteristics

RCT (Country)	N	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
PRP vs. HA										
Battaglia 2013 (Italy)	N=104	Inclusion: History of chronic monolateral hip pain lasting between 6 and 24 months, resistant to NSAIDs, and associated with radiological findings of hip OA. Previous HA hip injections were not considered an exclusion criterion if performed more than 12 months from study enrollment.	PRP (n=52): 5 mL with sodium citrate and 10% calcium chloride (centrifuged at 1800 rpm x 15 min, then 3500 rpm x 10 min); platelets/microliter were 600% greater on average than whole blood value, mean value of leukocytes was 8300/microliter,	NR	Ultrasound, 1- to 4-MHz convex transducer (Acuson Sequoia Ultrasound System; Siemens Healthcare, Malvern, Pennsylvania) with a lateromedial and	Total: 3 injections of PRP or HA/patient once every 2 weeks.	Patients instructed to limit use of leg for few days then perform light exercise; NSAID consumption was forbidden for only the first 48 hours after injection	PRP vs. HA Age (mean ± SD): 51.0 ± 12.0 vs. 56.0 ± 12.0, p = 0.035 Female (%): 40% vs. 34% Baseline Kellgren-Lawrence OA Grade II (%): 32% vs. 46%, p < 0.05 Baseline Kellgren-Lawrence OA	Length: 12 mos. % f/u: 96.1% (100/104)	Funding NR

RCT (Country)	N	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
		Exclusion: Previous hip surgery at the affected hip, severe hip deformities following hip fractures, severe dysplasia, breastfeeding, diabetes mellitus, rheumatoid arthritis, severe cardiovascular diseases, infections and immunodepression, current consumption of drugs other than NSAID, current physical therapies for the treatment of OA, hematological diseases, coagulopathies, therapies with anticoagulant or antiaggregant drugs, hemoglobin levels less than 11 mg/dL or platelet levels less than 150,000/µL, and previous ipsilateral hip prosthesis.	PRP was injected intra-articularly at the level of the femoral head-neck junction using a classic anterior approach. HA (p=52): 30 mg/2 mL high-molecular weight (15000 kD) HA (Hyalubrix; Fidia Farmaceutici Spa, Padova, Italy), injected intra-articularly at the level of the femoral head-neck junction using a classic anterior approach.		caudocranial Inclination.			Grade III (%): NR, p NS Baseline Kellgren-Lawrence OA Grade IV (%): 26% vs. 8%, p = 0.047 Baseline Harris Hip Score (HHS)* (mean [95% CI]): 58.11 (54.18 to 62.04) vs. 62.9 (58.98 to 66.84) Baseline VAS* (mean [95% CI]): 5.47 (4.97 to 5.96) vs. 5.97 (5.48 to 6.47) Baseline NSAID usage (%): 92% vs. 74%, p = 0.03		

kD: kilodalton; MHz: megahertz; NSAID: Nonsteroidal anti-inflammatory drug; rpm: revolutions per minute; VAS: visual analog scale

* Adjusted for age, OA, and NSAID consumption.

Appendix Table G14. Temporomandibular Joint (TMJ) Osteoarthritis (OA) RCT: Study and Patient Characteristics

RCT (Country)	N	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
PRP vs. HA										
Hegab 2015 (Egypt)	N=50*	Inclusion: Required to have TMJ osteoarthritis as confirmed by imaging findings (i.e., radiography or magnetic resonance imaging) that demonstrated mild to severe degenerative changes. The patients had undergone no previous treatments for TMJ disorders. Exclusion: Previous treatment for TMJ disorders. Patients with systemic diseases (e.g., rheumatoid arthritis, psoriatic arthritis, and juvenile arthritis), those who were unwilling to participate, those receiving therapy with anticoagulants and those with histories of previous treatment (e.g., joint injections, surgeries and splints) were excluded from	PRP (n=25): 1 mL PRP with sodium citrate (centrifuged at 3200 rpm x 12 min); injected into the joint cavity with LA, concentration NR. HA (n=25): 1 mL low-molecular weight HA (Suplasyn, 20 mg/2 mL) with 50 mL Ringers lactate. All procedures: Arthrocentesis performed prior to PRP or HA injection with 50 mL Ringers lactate to eliminate the catabolytes present in synovial fluid.	NR	NR	Total: 3 PRP or HA injections/patient once a week for 3 consecutive weeks	NSAIDs were not given to PRP patients during treatment period.	PRP vs. HA Age (mean ± SD): 39.0 ± 4.9 vs. 38.2 ± 4.3 Female (%): 64% vs. 56% Baseline MVMO (mm, mean ± SD): 33.8 ± 3.0 vs. 32.4 ± 2.7 Baseline VAS Pain (mean ± SD): 7.3 ± 1.1 vs. 6.9 ± 1.2 Baseline presence of joint sounds (%): 100% vs. 100%	Length: 12 mos. % f/u: NR†	No funding was received for this study.

RCT (Country)	N	Inclusion & Exclusion Criteria	Interventions	Dry needling	Imaging Guidance	Repeat injections	Co-interventions	Patient Characteristics	Length, % f/u	Funding
		the study.								

MVMO: Maximum non-assisted (voluntary) mouth opening; VAS: visual analog scale

* This is the final sample size after follow-up and data analysis exclusion; original number randomized is NR.

† Number of those originally randomized in study is not reported.

APPENDIX H. Clinical Experts

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