The Use of Platelet Rich Plasma in Soft Tissue Musculoskeletal Injuries

SAMARITAN HEALTH SERVICES

ORTHOPEDICS AND SPORTS MEDICINE CONFERENCE

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Objectives

Basic Science of Platelet Rich Plasma (PRP)

Evidence based review of applications of PRP

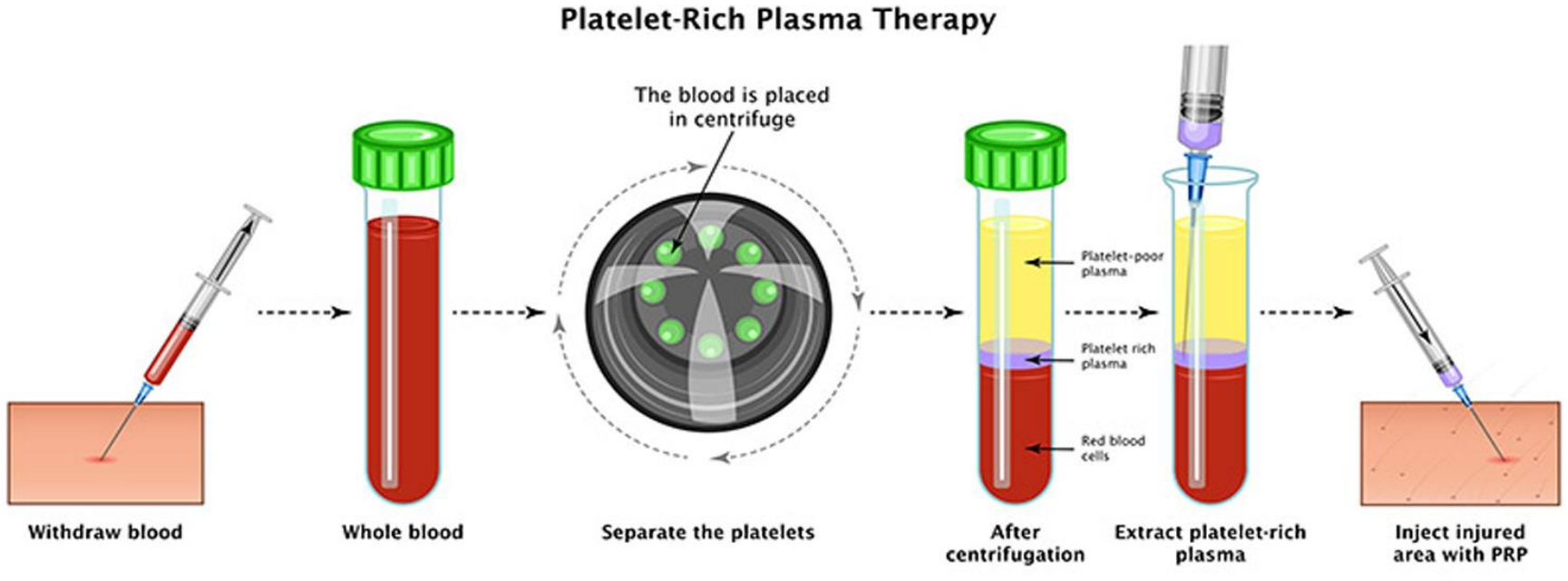
- Lateral epicondylosis
- Patellar tendinopathy
- Rotator Cuff Pathology
- Hamstring Injuries
- Achilles tendinosis
- Plantar fasciitis
- Gluteal Tendinopathy
- Ulnar Collateral Ligament Tears of the Elbow
- Knee Osteoarthritis

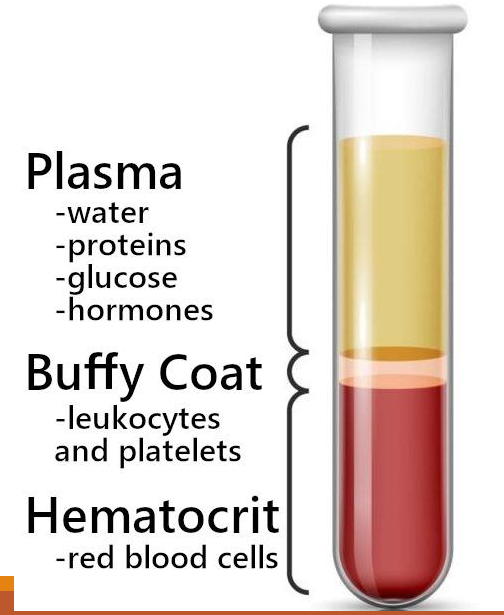
Basic Science of PRP

Delivery of concentrated volume of platelets to a site of injury

How is this done?

- Obtained from autologous whole blood
- Platelets separated via centrifuge
- Platelet concentration above baseline
  - **1 x 10^6 or 5x platelet concentration above baseline** *(Park et al., 2018; Haunschild et al., 2020)*





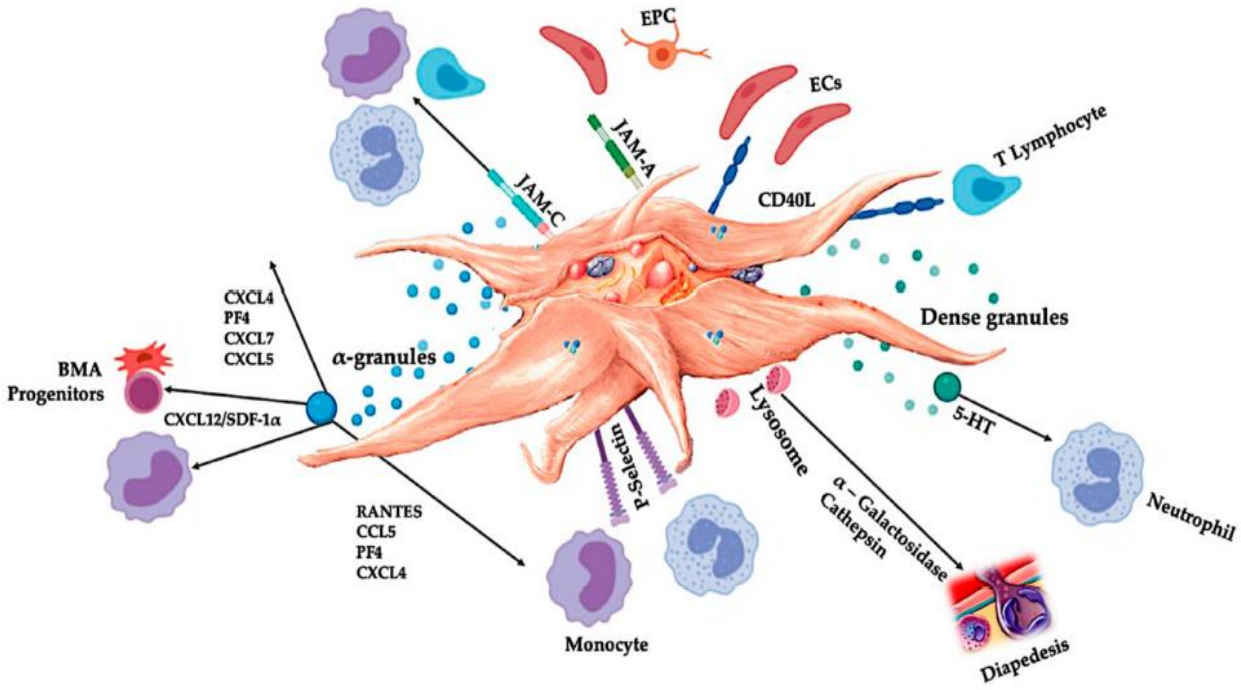
Basic Science of PRP

Stages of Healing

- Inflammation
- Cellular proliferation
- Tissue remodeling

PRP initiates **tissue repair** via release of many biologically active factors (e.g. growth factors, cytokines, lysosomes) *(Everts et al., 2020)*

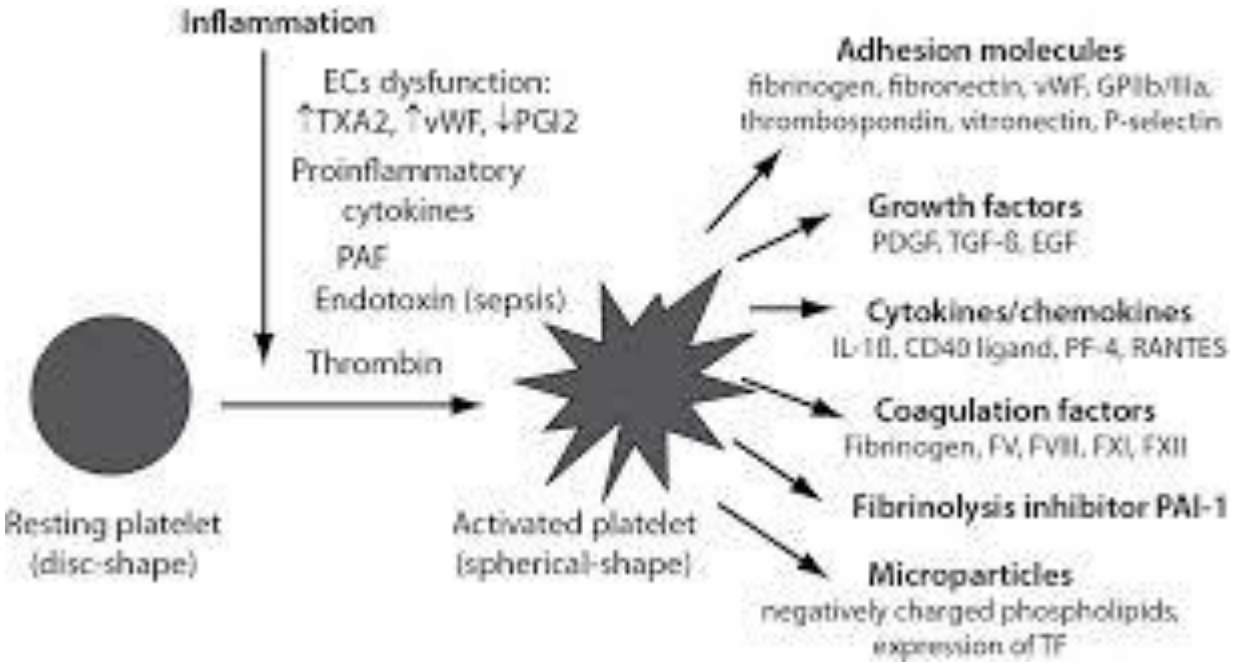
- **Platelet activation**->cells proliferate and differentiate
- **Synthesizes new connective tissue**
- **Promotes neovascularization**



Basic Science of PRP

PRP stimulates supraphysiological release of growth factors to **jump-start healing in chronic injuries and accelerate acute injury repair process** *(Everts, 2006)*

- Cytokines in PRP are involved in the restorative process



Ligament injury and Tendinopathy

Chronic Tendinopathy: biologic milieu unfavorable for tissue healing

- Accumulation of inflammatory mediators
- Immune cell dysfunction
- Oxidative stress
- Extracellular matrix dysregulation

Morphologic tendon changes *(Eliasberg & Rodeo, 2024)*

- Collagen fiber disorganization
- Inflammatory cell infiltration
- Altered tenocyte morphology
- Neovascularization

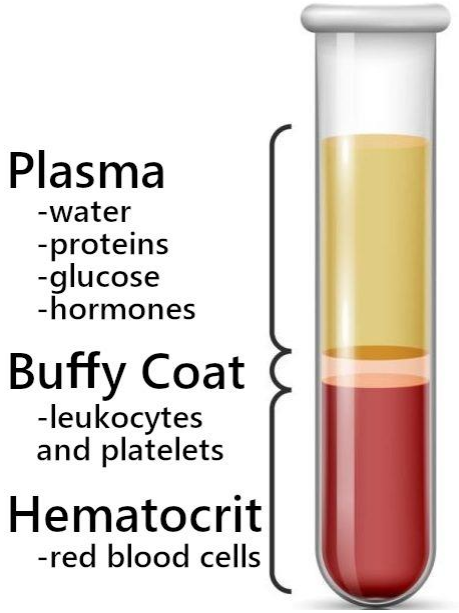
Benefits and Drawbacks of PRP

Benefits

- Safe
  - Autologous Blood- No known adverse effects *(Puzzitiello, 2020)*
  - Utilizing endogenous, natural processes
- Broad application profile
  - Musculoskeletal medicine
  - Dermatology
  - Wound Healing

Negatives

- Cost
- Variability of formulation and composition of PRP (e.g. platelet concentration, white blood cell content, cytokines etc.)
  - Individual variability
  - Commercial device variability



PRP Types

No consistent classification

- **Leukocyte-rich PRP (LR-PRP)**
  - High Concentration of Neutrophils, lymphocytes and monocytes and macrophages
    - High concentration of neutrophils
      - Lead to angiogenesis and tissue restoration *(Phillipson, 2019)*
  - Thought to be more pro-inflammatory
  - Commonly used in tendons and ligaments
- **Leukocyte –poor PRP (LP-PRP)**
  - Low concentration of WBCs
  - Thought to be less inflammatory
  - Commonly used for joints

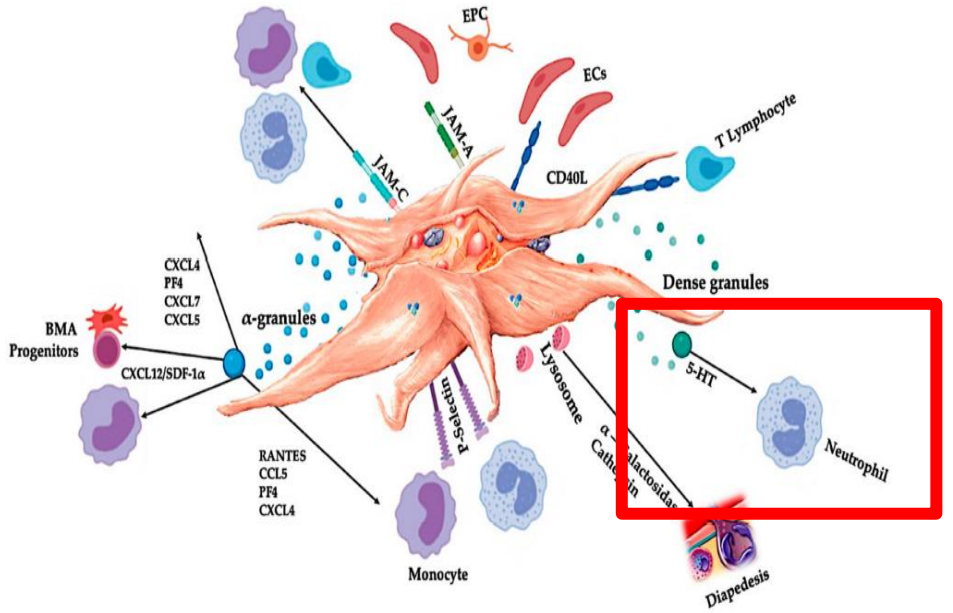
PRP and Analgesia

Release of 5-HT (Serotonin)

- Serotonin can interfere with nociceptive transmission at peripheral sites

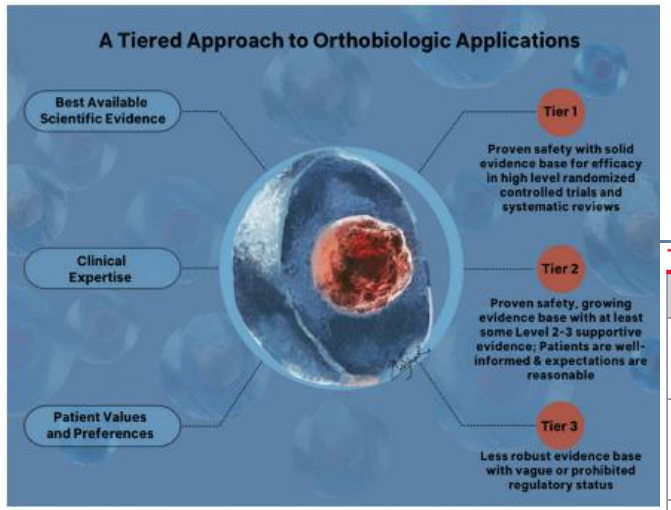
PRP and Non Steroidal Anti-Inflammatory (NSAID) medications

- NSAIDS reversibly binds to COX-1 and COX-2, thus inhibiting inflammatory cascade and inhibiting platelet activation
- Platelet growth factors significantly reduced one week after naproxen use *(Mannava, 2019)*
  - Returned to normal after **1 week** washout period



Tiered approach to considering orthobiologics for patients with musculoskeletal conditions

Shane A Shapiro [1], Zubin Master [2], Jennifer R Arthurs, [3] Kenneth Mautner [4]



Review Article

Orthobiologics: Current Status in 2023 and Future Outlook

Scott A. Rodeo, MD

Table 1. American Academy of Orthopaedic Surgeons Clinical Practice Guidelines

Orthopaedic Condition	Recommendation	Strength of Recommendation	Date Adopted by AAOS
Knee OA (nonarthroplasty)	Platelet-rich plasma (PRP) may reduce pain and improve function in patients with symptomatic osteoarthritis of the knee	Limited	August 31, 2021
	Hyaluronic acid intra-articular injection(s) is not recommended for routine use in the treatment of symptomatic osteoarthritis of the knee	Moderate	August 31, 2021
Rotator cuff tendinopathy or partial tears	Limited evidence supports the use of hyaluronic acid injections in the nonoperative management of patients with rotator cuff pathology	Limited	March 11, 2019
	Limited evidence does not support the routine use of platelet-rich plasma for the treatment of rotator cuff tendinopathy or partial tears	Limited	March 11, 2019
Full-thickness rotator cuff tears	In the absence of reliable evidence, it is the consensus of the work group that we do not recommend the routine use of platelet-rich plasma in the nonoperative management of full-thickness rotator cuff tears	Consensus	March 11, 2019
	Strong evidence does not support biological augmentation of rotator cuff repair with platelet-derived products on improving patient-reported outcomes; however, limited evidence supports the use of liquid platelet-rich plasma in the context of decreasing retear rates	Strong	March 11, 2019

CURRENT CONCEPTS REVIEW

Current State of Platelet-Rich Plasma and Cell-Based Therapies for the Treatment of Osteoarthritis and Tendon and Ligament Injuries

…oufic R. Jildeh, MD, Matthew L. Vopat, MD, Robert A. Waltz, MD, Peter J. Millett, MD, T. Provencher, MD, Marc J. Philippon, MD, and Johnny Huard, PhD

TABLE III Grades of Recommendation*

Orthopaedic Pathology†	Grade of Recommendation
Knee osteoarthritis	
PRP	C
Mesenchymal stromal cells	C
Lateral epicondylitis	
PRP	I
Rotator cuff pathology	
PRP	I
Ligament and tendon injuries	
PRP	I
MSCs	I

Recommendation Classifications

Variability among consensus groups and authors' recommendation based on available evidence

- Recommendations change as evidence emerges

RECOMMEND

- Safe
- Robust high level studies supporting efficacy
- Clinically recommend along with other first line treatments

NEUTRAL

- Safe
- Growing evidence base supporting efficacy
- Moderate level of studies
- Demonstrates studies that both support and don't support use
- Clinically recommend as alternatives or second tier treatments

DO NOT RECOMMEND

- Strong evidence not supporting efficacy
- Little to no evidence

PRP for Lateral Epicondylosis (Tennis elbow)

Initial studies promising:

- Double blind, multicenter RCT: LR- PRP vs. local anesthetic:
  - **PRP demonstrated improvements in pain** and **decreased elbow tenderness**, *(Mishra et al., 2014).*
- Double blind RCT: PRP vs. corticosteroid:
  - **PRP showed improved DASH scores and VAS** at 1 and 2 years. *(Peerbooms et al., 2010, Gosens, et al., 2011)*

PRP for Lateral Epicondylosis (Tennis elbow)

Subsequent meta-analyses demonstrate **mixed results**

- **PRP showed significantly improved VAS and DASH scores** compared to corticosteroids and autologous blood *(Arirachakaran et al., 2016)*
- Long term follow-up showed **less pain in PRP group** compared to controls *(Chen et al., 2018)*
- 36 RCTs: **No clear benefit of PRP** compared to local anesthetic, saline, corticosteroid or autologous whole blood *(Franchini et al., 2018)*

Conclusion:

- **RECOMMEND/NEUTRAL**
- Robust data
- Heterogeneous data, data neither support nor discourage
- **Substantial improvements with respect to pain and function**

PRP for Rotator Cuff Tendinopathy (RTC)

Variability of rotator cuff pathology and heterogeneity of tears/pathology (articular vs. bursal sided vs. interstitial vs. tendinopathy)

Meta-analyses and systematic reviews

- Partial thickness RTC tears and tendinopathy:
  - **PRP provided statistically significant reduction of pain and improved function at 6 months**
  - **Difference not present at one year** *(Xiang et al., 2021)*

Randomized control trial (RCT): RTC tendinopathy- PRP vs. control (therapy alone, no injection, sham injection)

- **No difference in pain at 3, 6 or 12 weeks**
- **PRP demonstrated superior pain control at 24 weeks** *(Lin et al., 2020)*

PRP for Rotator Cuff Tendinopathy

Meta-analyses and systematic reviews *(cont.)*

- 8 RCTs: RTC tendinopathy- PRP vs. Normal saline solution vs. Rehabilitation program and dry needling
  - No differences at 3 weeks
  - **PRP significantly better pain relief at 6 months and 12 months** *(Hamid et al., 2021)*
- Heterogeneous studies:
  - **Improved pain in PRP group**
  - **Unable to conclude that PRP injections superior** to exercise or physical therapy *(Liu et al., 2021)*
  - lack of high quality studies

Conclusions:

- **NEUTRAL**
  - PRP may mitigate pain
  - Data also mixed
  - AAOS: Limited data to support use (2019)
  - Other authors/groups: variable recommendations between: **recommend to inconclusive**

Use of Injections and Biologics for the Nonoperative Treatment of Rotator Cuff Pathology

Clin. J Sport Med, 2023

- Corticosteroid injections (CSI) and Rotator Cuff pathology
  - Most commonly used injection for management of non operative rotator cuff related pain
  - CSI provide short term relief of rotator cuff tendinopathy pain, but minimal to no long-term benefit
    - **Benefit approximately x 2 months, but diminished by 3 months**
    - Number needed to treat (NNT) = 4.9 patients
    - No additional benefit with Ultrasound guidance

Adverse Effects of Corticosteroid injections (CSI) on Rotator Cuff Pathology

Basic Science

- CSIs clearly show several **deleterious effects** to cellular proliferation, collagen composition, inflammatory pathways, and cellular survival

Clinical Implications

- Systematic reviews in 2019 and 2020
  - CSI injection **within 1 month** prior to surgery **increased risk** of **postoperative infection by 65-75%** *(Forsythe, 2019)*
    - **Injection >1 month** prior to surgery **did not increase risk** of postop infection
  - Single CSI administered within 1 year of surgery increased risk of revision rotator cuff repair surgery. (OR = 1.3-2.8) *(Puzzitielo et al., 2020)*
  - Adverse outcomes of rotator cuff surgery greatest if CSI administered within 6 months of surgery, or **if >2 CSI injections given within one year** of surgery
- Systematic review of Level I-III studies
  - **No conclusive data** to suggest an increased risk of retear or infection with CSI (*Kunze et al, 2020)*

PRP for Rotator Cuff repair

Studies **favoring** use of PRP in RTC repair

- Systematic review of 18 RCTs
  - **Use of PRP in rotator cuff repair results in improved healing rates, pain levels and functional outcomes** *(Hurley et al., 2018)*
- Systematic review and meta-analysis 23 RCTs
  - **PRP improved pain levels and functional outcome scores**
  - **PRP reduced retear rate after surgery** *(Li et al., 2022)*

PRP for Rotator Cuff repair

Studies **not favoring** use of PRP in RTC repair

- Systematic review, meta-analysis of 11 studies
  - **No differences between PRP augmented RTC repair and RTC repair alone in outcome scores, or re-tear rates**
- RCT: PRP + RTC repair vs. Ropivacaine + RTC repair (control)
  - **No difference in function at 3, 6, 24 months** *(Flury, et al., 2016)*
- RCT: PRP + RTC repair vs. RTC repair alone
  - **No clinical or structural improvement between groups at 5 year f/u** *(Malavolta et al., 2018)*

Conclusion:

- **DO NOT RECOMMEND**
- AAOS: **strong evidence does not support** PRP augmentation with RTC repair on improving patient reported outcomes. However, limited evidence that PRP can decrease retear rates (2019)

Patellar Tendinopathy and PRP

Patellar Tendinopathy: Critical Analysis Review of Current Nonoperative Treatments

Marigi, Erick M. MD[1]; Buckley, Patrick BS[2]; Razi, Farzad BS[3]; Abbas, Muhammad J. BS[2]; Jildeh, Toufic R. MD[4]; Camp,

Double blinded RCT comparing LR-PRP vs. dry needling

- PRP group **had improved Victorian Assessment (VISA) scores at 12 weeks** post injection, but **no differences at 26 weeks** post injection *(Dragoo et al., 2014)*

RCT comparing LR-PRP vs. LP-PRP vs. saline injection:

- **No differences** in VISA scores or pain at any time up to **12 months** *(Scott et al., 2020)*

Strong evidence supporting eccentric-loading exercise and rehab program.

- Supporting evidence for progressive tendon loading exercise program (PTLE).

Conclusion:

- **NEUTRAL**
- PRP evidence shows mixed results
- PRP has **"fair"** evidence, but still inferior evidence as compared to physical therapy.
- May consider PRP after instituting rehab program

Achilles Tendinopathy and PRP

Majority of RCTs, meta-analyses, systematic reviews **do not demonstrate consistent benefit of PRP** compared to eccentric exercises, saline/anesthetic injection

Conclusion:

- **DO NOT RECOMMEND**
- Conflicting data regarding use of PRP in acute achilles ruptures, but **no consistent evidence** favoring PRP for non-operative treatment of achilles ruptures or PRP augmented achilles tendon repair.

Hamstring Injuries and PRP

Evidence-Based Management and Factors Associated With Return to Play After Acute Hamstring Injury in Athletes

A Systematic Review

75 studies included *(Rudisill et al., 2021)*

Acute muscular/myotendinous injuries:

- 3 studies showed patients receiving PRP achieved **earlier return to play** (RTP) compared to controls by **10-15 days**
- 5 studies showed **no difference in RTP**

National Football League (NFL) cohort study showed no difference in days missed or time to return to practice, but PRP group did allow faster return to competition by 1 game. *(Bradley et al., 2020).*

Hamstring Injuries and PRP

Evidence-Based Management and Factors Associated With Return to Play After Acute Hamstring Injury in Athletes

A Systematic Review

Acute muscular/myotendinous injuries (cont.):

- No effect of PRP on:
  - hamstring strength
  - re-injury rates
  - hamstring ROM differences
- **Conclusion:**
  - **NEUTRAL**
  - PRP use in acute hamstring muscular injuries is **inconclusive.**
  - Heterogeneity of methodology of PRP formulations, frequency of injection, etc.
  - Anectdotally- PRP effective for athletes with prolonged recovery, multiple re-injuries

Treatment of Gluteal Tendinopathy

A Systematic Review and Stage-Adjusted Treatment Recommendation

27 studies, 1106 hips, Level IV Evidence

Treatment based on pathology stage

TABLE 1
Grades of Progressive Tendon Degeneration[a]

Description		MRI Findings	Histopathological Findings[b]
Grade 1	Bursitis	No or minimal changes within gluteal tendons	Wavy pattern of collagen fibers
Grade 2	Tendinopathy	Increased tendon signal on T1-weighted images and normal appearance on T2-weighted images	Tendinosis, angiofibroblastic hyperplasia, and disorganization and fragmentation of collagen fibers
Grade 3	Partial-thickness tear	Increased signal intensity on T2-weighted images	Depletion of functional tendon cells and breakdown of collagen and extracellular matrix
Grade 4	Full-thickness tear	Discontinuity of 1 or both gluteal tendons	Gross structural disruption and mechanical failure

[a]MRI, magnetic resonance imaging.
[b]From Bhabra et al.[2]

Ladurner A, Fitzpatrick J, O'Donnell JM. Treatment of Gluteal Tendinopathy: A Systematic Review and Stage-Adjusted Treatment Recommendation. Orthop J Sports Med. 2021 Jul 29;9(7)

Treatment of Gluteal Tendinopathy

A Systematic Review and Stage-Adjusted Treatment Recommendation

TABLE 4
Treatment Recommendations[a]

Treatment	Recommendation[b]	LoE	Comments
Grades 1-2 tendinopathy			
PRP	+++	1b	• Large number of publications • Good intermediate-term results (2-y follow-up) • Clear instructions on preparation
SWT	++	1b	• High LoE • No standard protocol regarding total energy, energy per session, or No. of sessions available
Exercise	++	1b	• Higher patient satisfaction than single CSI after 12 mo (pain levels comparable with CSI) • Type and mode of exercising still need to be defined
CSI	++	1b	• Good short-term results • Effects usually do not last >3-6 mo • Therapeutic effect inferior to PRP
Endoscopic or open bursectomy with or without ITB release	++	4	• Good results in function and pain improvement • Long follow-up times shown • Complication rate of 8% • Low LoE

Ladurner A, Fitzpatrick J, O'Donnell JM. Treatment of Gluteal Tendinopathy: A Systematic Review and Stage-Adjusted Treatment Recommendation. Orthop J Sports Med. 2021 Jul 29;9(7)

Treatment of Gluteal Tendinopathy

A Systematic Review and Stage-Adjusted Treatment Recommendation

Grade 1-2 tendinopathy (cont.)

TABLE 4
Treatment Recommendations[a]

Treatment	Recommendation[b]	LoE	Comments
Autologous tenocyte injection	+	4	• Small numbers • Low LoE
Tendon fenestration	+/–	4	• Short-term data only (2 wk) • No long-term outcomes as stand-alone procedure • PRP plus tendon fenestration not superior to PRP alone
Trochanteric reduction osteotomy	–	4	High complication rate

Treatment of Gluteal Tendinopathy

A Systematic Review and Stage-Adjusted Treatment Recommendation

TABLE 4
Treatment Recommendations[a]

Treatment	Recommendation[b]	LoE	Comments
Grade 3 tendinopathy			
Open or endoscopic tendon repair	++	4	• Large improvements in PROM scores • High patient satisfaction at long-term follow-up (5-y results) • Mean complication rate of 10% (4.5% revision surgery) • Endoscopic repair appears to have lower complication rates • Low LoE
PRP	+/–	1b	Uncertain, as no differentiation in outcome assessments performed
SWT	+/–	1b	Results inferior compared with grades 1-2 tendinopathy
Grade 4 tendinopathy			
Open tendon repair	+++	4	• Good clinical and patient-reported outcomes • Long follow-up times (up to 5-y results) • Transosseous fixation for large tears recommended and suture anchors for small tears • Complication rate of 10% (4.5% revision surgery)
Endoscopic tendon repair	+++	4	• Similar improvements in functional outcomes and patient satisfaction to open repair • Appears to result in fewer postoperative complications
Tendon augmentation	+++	4	• Good clinical and functional outcomes up to 24 mo • Comparative trials to unaugmented repair lacking

Treatment of Gluteal Tendinopathy

A Systematic Review and Stage-Adjusted Treatment Recommendation

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Conclusions:

RECOMMEND

Good Evidence for using PRP for grade 1 and 2 gluteal tendinopathy

Shockwave therapy, exercise, CSI show good outcomes

- CSI effect short term

Surgery recommended with full thickness tears (Grade 4)

Plantar Fasciitis and PRP

RCT- chronic plantar fasciitis: Extracorporeal shockwave therapy (ESWT) vs. PRP

- **Both groups demonstrated significant improvements** at all time points between 2-24 weeks with reduced VAS
- **VAS reduction greater in PRP group** *(Haddad et al., 2021)*

Double Blind RTC- 115 patients with chronic plantar fasciitis: corticosteroid injection (CSI) vs. PRP

- PRP group showed **significantly decreased** pain scores and disability scores compared to CSI at **one year** (84.4% vs. 55.6%) *(Peerbooms et al., 2019)*

Conclusion:

- **RECOMMEND/NEUTRAL**
- PRP injections can be effective for improving pain and function
- May be superior to CSI, especially when considering complications of CSI (e.g. fat pad atrophy, plantar fascia rupture)
- Limited Studies

Elbow Ulnar Collateral Ligament (UCL) injuries in Overhead Athletes and PRP

Return to sport after nonoperative management of UCL injuries

- AJSM- Systematic Review, 15 studies *(Gopinatth et al., 2023)*
  - Return to sport (RTS) = 79.7%, Return to previous level of play (RTLP)= 77.9%
    - RTS grade 1 = 81.8%
    - RTS grade 2 = 80.8%
    - RTS grade 3 = 69%
    - RTS grade 4 = 12.5%
  - Return to sport for partial proximal tears: **89.7%**
  - Return to sport for distal tears: **41.2%**
  - **No significant difference in return to sport with PRP.**

UCL Injury Classification	Description
Type 1	Edema in UCL only, low-grade partial tear
Type 2	Partial tear of UCL, no extravasation of fluid on arthrogram, high-grade partial tear
Type 3	Complete full-thickness tear of UCL with extravasation of fluid on arthrogram
Type 4	Tear/pathology in >1 location on UCL (ie, ulna and humerus)

a
MRI, magnetic resonance imaging; UCL, ulnar collateral ligament.

Elbow Ulnar Collateral Ligament (UCL) injuries in Overhead Athletes and PRP

Orthopaedic Journal of Sports Medicine | SAGE

Orthop J Sports Med. 2018 Aug 17;6(8):2325967118790760. doi: 10.1177/2325967118790760

Return to Play After PRP and Rehabilitation of 3 Elite Ice Hockey Players With Ulnar Collateral Ligament Injuries of the Elbow

Christopher L McCrum [*], Joanna Costello [†], Kentaro Onishi [‡], Chris Stewart [§], Dharmesh Vyas [‖,¶]

Elbow Ulnar Collateral Ligament (UCL) injuries in Overhead Athletes and PRP

Other studies demonstrate modest improvements with PRP

- Systematic review- partial ulnar UCL injuries treated non operatively with PRP injection
  - 75% RTS, average of 82 days after PRP injection
  - PRP showed **complete reconstitution/healing** of UCL in **87%** on MRI, and improvement on humeral/ulnar joint space
  - Poor quality evidence *(Ilfarraguerri et al., 2024)*

Conclusion:

- **NEUTRAL**
- Mixed evidence
- UCL injuries inherently have lengthy RTS, time is key factor
- PRP augmented rehabilitation protocol may save time

Knee Osteoarthritis (OA) and PRP

Data for PRP is most studied for knee OA

Basic Science

- Decreases cartilage anabolism
- Promotes chondrocyte proliferation
- Stimulates synoviocyte hyaluronic acid (HA)
- Decreases inflammatory state

Basic science research promising for PRP

Clinic data more conservative

Multiple meta-analyses and systematic reviews **favored PRP** over other intra-articular treatments to improve pain scores in short and medium term (6-12 months)

- Level of evidence low, high risk of bias

TABLE I Systematic Reviews and Meta-Analyses of PRP Treatment for Various Orthopaedic Conditions*

	Level of Evidence	No. of Studies; No. of Patients	Length of Follow-up	Summary of Outcomes
Knee OA				
Anitua et al.[75] (2014)	I	2 RCTs, 2 prospective studies, and 1 retrospective analysis; 530 patients	>4 wk	PRP intra-articular infiltration in patients with knee OA reduced pain and improved outcomes related to function and stiffness compared with controls.
Chang et al.[76] (2014)	I	8 single-arm studies, 3 quasi-experimental studies, and 5 RCTs; 1,543 patients	6-24 mo	PRP application improved function from basal evaluations in patients with knee OA and tended to be more effective than HA administration.
Laudy et al.[77] (2015)	I	10 RCTs and non-RCTs; mean 102 patients per trial	6-12 mo	PRP injections reduced pain more effectively than placebo or HA injections for OA of the knee (level of evidence limited to moderate because of a high risk of bias). Additionally, function improved significantly more when PRP injections were compared with controls (limited to moderate evidence).
Shen et al.[78] (2017)	I	14 RCTs; 1,423 patients	12 wk-12 mo	Compared with controls, PRP injections significantly reduced pain scores and improved physical function scores at 3, 6, and 12-mo follow-up. Four studies were considered at moderate risk of bias and 10 at high risk of bias
Meheux et al.[79] (2016)	I	6 RCTs; 739 patients	>6 mo	PRP injection resulted in significant clinical improvements up to 12 mo after injection. Clinical outcomes and WOMAC scores were significantly better after PRP versus HA at 3 to 12 mo after injection.

Knee Osteoarthritis (OA) and PRP

Initially, LP-PRP favored over LR-PRP

- Due to release of **pro-inflammatory** molecules into joint with **LR-PRP**
- Recent studies: leukocyte concentration **doesn't matter** *(Di Martino et al., 2022).*

Platelet concentration appears to influence outcomes

- Higher platelet concentration
  - lower failure rate
  - greater clinical improvement *(Boffa et al., 2024).*
- Recommend 10 billion platelets

Conclusions:

- **RECOMMEND/NEUTRAL**
- Robust data that PRP can improve symptoms of OA
- Little evidence that PRP leads to any function tissue healing or regeneration
- PRP maybe more "symptom modifying" than "structurally modifying"
- AAOS: limited strength of recommendation (2021)
- PRP Likely not effective for severe OA

Combining PRP and Rehab

Paucity of Data

Mechanical loading is regenerative to tendons

- PRP thought to be synergistic to mechanical load

Summary

PRP is a subset of biologic injectables that are promising the field of sports medicine/orthopedics

PRP may be more symptom modifying than structurally modifying

PRP side effect/safety profile favorable, especially compared to CSI

Lots of variability in research methods and PRP formulations in the literature

Recommendations of PRP use also variable among consensus groups, research authors.

Summary

Lateral epicondylosis: **RECOMMEND/NEUTRAL**

- Robust data
- Substantial **improvements** with respect to **pain** and function

Rotator cuff tendinopathy: **NEUTRAL**

- PRP may mitigate pain
- Data mixed

Rotator cuff PRP augmented repair: **DO NOT RECOMMEND**

- **strong evidence does not support** PRP augmentation with RTC repair

Patellar tendinopathy: **NEUTRAL**

- PRP evidence shows mixed results
- PRP has **"fair"** evidence, but still inferior evidence as compared to physical therapy.

Hamstring Injuries: **NEUTRAL**

- PRP use in acute hamstring muscular injuries is **inconclusive.**

Summary

Achilles tendinosis: **DO NOT RECOMMEND**

- **no consistent evidence** favoring PRP for non-operative treatment of achilles ruptures or PRP augmented achilles tendon repair.

Plantar fasciitis: **RECOMMEND/NEUTRAL**

- PRP injections can be effective for improving pain and function
- Limited Studies

Gluteal Tendinopathy: **RECOMMEND**

- Good Evidence for using PRP for grade 1 and 2 gluteal tendinopathy

Ulnar Collateral Ligament Partial Tears of the Elbow: **NEUTRAL**

- Mixed evidence
- PRP augmented rehabilitation protocol may save time

Knee Osteoarthritis: **RECOMMEND/NEUTRAL**

- Robust data that PRP can improve symptoms of OA
- PRP likely not effective for severe OA

Thank you!

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