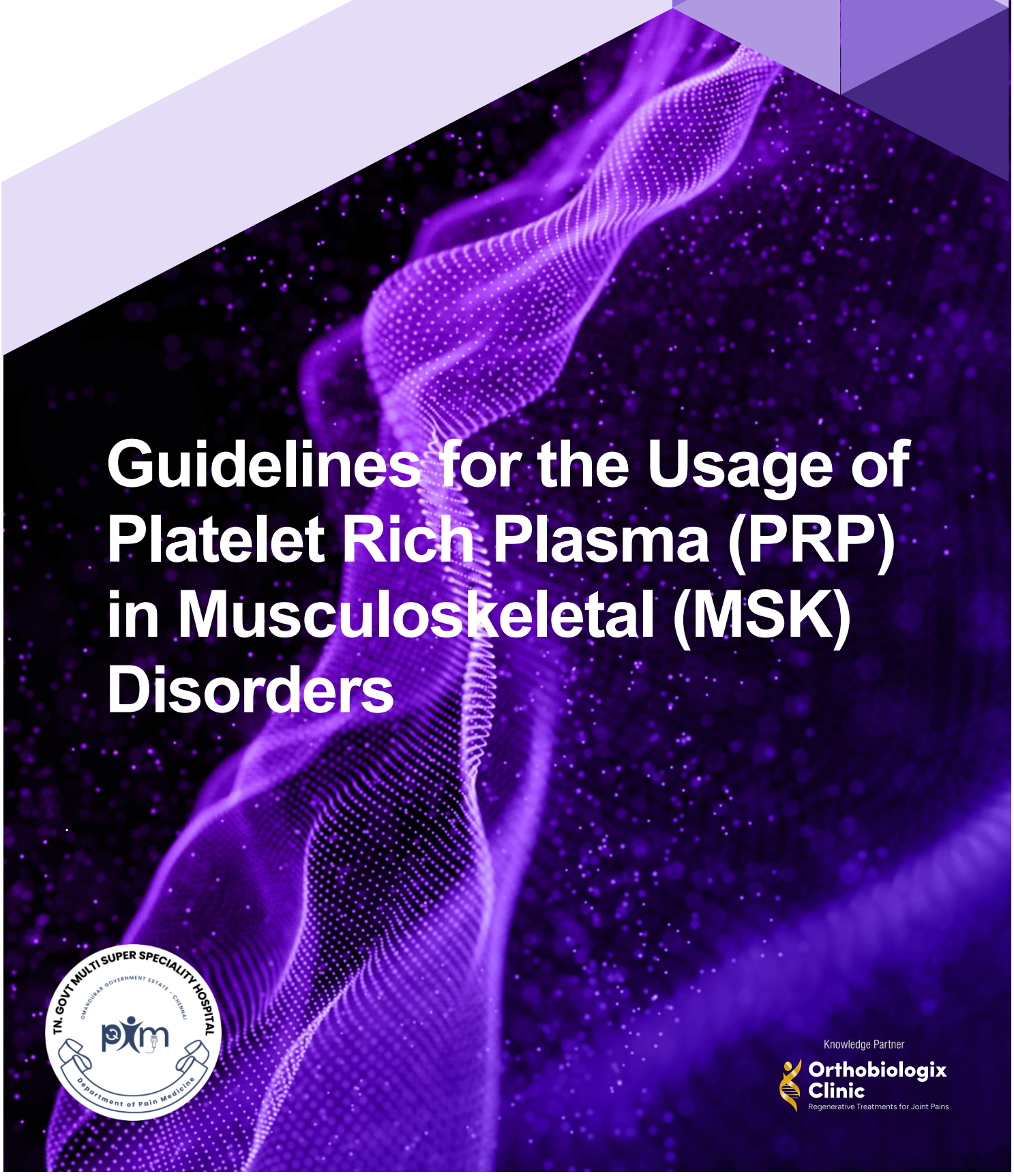
2025 ReGen

1-3 AUGUST > > CHENNAI

# Guidelines for the Usage of Platelet Rich Plasma (PRP) in Musculoskeletal (MSK) Disorders



TN. GOVT MULTI SUPER SPECIALITY HOSPITAL
OMANDURAR GOVERNMENT ESTATE - CHENNAI
pim
Department of Pain Medicine

Knowledge Partner
Orthobiologix Clinic
Regenerative Treatments for Joint Pains

# List of Contributors

**This Document is prepared by a special National Regenerative Core committee, under the aegis of ReGen 2025.**

We thank each contributing member of the Core Committee (in alphabetical order) for their expertise and commitment:


**Dr. Asawari Bapat**
DPB (Clinical Pathology), MBBS, CABP (H), DABRM & FABRM, PGDHHM (Hospital & Healthcare Management),
Dubai

**Dr. Ashim Gupta**
PDCR (India), MS (USA), PhD (USA), MBA (USA), DABRM (USA), FABRM (USA)
India

**Dr. B.S. Rajput**
M.Ch Ortho (reg. can) Liverpool,
Visiting Professor, GSVM Medical College - Kanpur,
Senior Consultant Orthopaedic & Cellular Transplant Surgeon
Mumbai

**Dr. Bishnu Prasad Patro**
MS(Ortho),
Professor and HoD, Dept of Orthopaedics, AIIMS, Bhubaneswar

**Dr. G. K. Kumar**
MD (Anaesthesiology), DA, FIPP
Professor & HoD, Dept of Anesthesiology, & Pain Medicine,
TN Govt Multi Super Specialty Hospital,
Director - The Pain Clinic
Chennai

**Dr. Himanshu Bansal**
MBBS, MS (Ortho), DNB (Ortho) - Rudrapur- Uttarakhand

**Dr. Karun Jain**
MBBS, D'Ortho, MS (Ortho), MCh (Trauma & Ortho-Royal College of Surgeons- Edinburgh, UK)., FACS.
Senior Orthopaedic Surgeon - New Delhi

**Dr. Krishna Poddar**
MBBS, MD (Anaesthesiology), FIAPM, FIPM
Interventional Pain Specialist & Anaesthesiologist
Director - Kolkata Pain Clinic

**Dr. Madhan Jeyaraman**
MBBS, MS (Ortho), FEIORA, FIRM, FROSM, FASM, FIRO, PhD (Stem Cells and Regenerative Medicine)
Tamil Nadu

**Dr. Manish Khanna**
MBBS, MS(Ortho),
Dean Academics; Prof. Orthopaedics -Dr KNS MIMS
(Formerly k/A Mayo Institute of Medical Sciences)
Barabanki - Lucknow

**Dr Maryam Asadi**
Ph.D. (Molecular Medicine), DABRM
American Board of Regenerative Medicine, Affiliate Chapter (Iran)
Founder & CEO Unihealth Platform

**Dr. A. Navaladi Shankar**
MBBS, MNAMS, D'Ortho, DNB, FAO.
Senior Orthopaedic Surgeon and Knee Replacement Surgeon
Apollo Hospital - Chennai

**Dr. Ravi V.R.**
MS(Ortho)
Director, Mothercell Regenerative Centre Pvt. Ltd.
Trichy

**Dr. S. S. Amarnath**
MBBS, D'Ortho., D.Trauma, MAMS Vienna., Austria
Trauma, Orthopaedic & Regenerative Therapies Surgeon
Trinity Hospital & Heart Foundation
Bangalore

**Dr. Sairam Atluri**
MD, ABIPP, FIPP
Director, Interventional Pain - Arete Hospitals

**Dr. Sandeep Shrivastava**
MS, DNB(Ortho), ACME, Ph.D (Medical Education), PGM
Former President of Indian Stem Cell Study Association Group
Executive Director, DMIHER, Director, Prof (Ortho) - JNMC,

**Dr. Secunda Rupert**
MBBS, MD.,
Assistant Professor, Dept. of RM and Research,
Government Stanley Medical College and Hospital (Tamil Nadu)

**Dr. Sharmila Tulpule**
MBBS, M.S. (Ortho), M.Ch (Ortho), DABRM, FABRM (USA)
Founder Director Orthobiologix Biotech Pvt. Ltd.,
Senior Consultant, Mubadala Health, Dubai


Special thanks to **Dr. Maryam Assadi** for her invaluable contribution to this initiative.

# Disclaimer

The information presented in this document is intended for educational and clinical guidance purposes only. It is based on current evidence, expert consensus, and evolving clinical practices related to Platelet-Rich Plasma (PRP) therapy in musculoskeletal conditions.

This document does **not constitute medical advice** and should not replace clinical judgment or individualized patient care. Treatment decisions must be tailored to each patient's specific condition, response, comorbidities, and preferences, and should be made by qualified healthcare professionals.

While efforts have been made to ensure accuracy and relevance, the authors and contributors do **not assume any legal liability** or responsibility for the use, misuse, or outcomes of applying the information herein. PRP use in some indications may be considered off-label or experimental, and clinicians are encouraged to consult local regulatory and ethical guidelines.

Patients should be appropriately informed about the **risks, benefits, and alternatives** before undergoing PRP therapy.

# Table of Contents

# 1. Introduction

Musculoskeletal (MSK) injuries or pathologies affect millions of individuals across the globe and contributes to significant socioeconomic burden. The most frequent patient complaints involve pain, swelling, restricted function, thereby affecting mental health, quality of sleep, participation at work, and decreased overall quality of life (QoL). Conventional treatment modalities include non-pharmacological approaches such as physical therapy; pharmaceuticals such as oral and/or injectable non-steroidal anti-inflammatory drugs (NSAIDs), opioids or corticosteroids; and surgical intervention. Nonetheless, these aforesaid approaches have drawback, continually aiming to reduce pain rather than targeting the underlying pathophysiology.

Over the last two decades, there has been a significant interest in the use of regenerative medicine modalities, derived from both autologous and allogenic sources, for the management of various MSK indications. Among these, autologous PRP is the most widely used and researched modality.

Platelet-Rich Plasma (PRP) therapy has evolved into a cornerstone modality within the field of regenerative musculoskeletal medicine. It holds promise as a minimally invasive, autologous treatment option that capitalizes on the body's intrinsic healing potential. The biologic basis of PRP, concentrated platelets delivering growth factors, cytokines, and other bioactive molecules, lends it the capacity to modulate inflammation, promote angiogenesis, and accelerate tissue repair across a wide range of orthopaedic and sports medicine applications.

However, PRP remains a technically sensitive intervention. Variation in preparation techniques, dosing, composition (leukocyte-rich vs. poor), and clinical indications has led to a spectrum of outcomes and, often, confusion among practitioners. Recognizing this gap, a multidisciplinary Core Committee, comprising leading orthopaedic surgeons, interventional pain specialists, and translational researchers from across India, convened to form the Advanced Regenerative Medicine India Group.

This guideline document is the result of a collaborative effort to harmonize and standardize PRP therapy protocols specifically tailored for musculoskeletal conditions in the Indian clinical context. Evidence synthesis was conducted from PubMed-indexed literature, focusing on Level 1 to Level 3 studies. The group's goal was not only to consolidate best practices but also to establish a practical, evidence-informed framework that clinicians can trust and implement confidently.

This first edition aims to demystify essential components, from patient selection and procedural technique to centrifugation parameters and follow-up care. We recognize that the field is rapidly evolving, and this living document will be periodically updated in response to emerging evidence and clinical experience.

# 2. Clinical Protocols for PRP Therapy

## 1. Comprehensive Evaluation

A thorough **clinical and radiological assessment is mandatory** before considering PRP therapy. Accurate diagnosis and case selection are essential for optimal outcomes.

## 2. Patient Selection Criteria

Patients suitable for PRP therapy typically present with **chronic musculoskeletal conditions** unresponsive to standard conservative treatments such as physical therapy, analgesics, or lifestyle modifications. for at least 3 months, unless the pain is excruciating, and who exhibit pathology amenable to biological healing processes.

These may include:

- Chronic soft tissue injuries
- Early osteoarthritis (OA)
- Chronic tendinopathies
- Partial ligament tears

💡 *Refer to the attached list of indications.*
*However, clinical judgment remains paramount, as there are no absolute indications.*

## 3. Contraindications

### A. Absolute Contraindications

PRP therapy is contraindicated in the following conditions:

1. Active infections (local or systemic)
2. Active malignancy or metastasis
3. Severe anaemia
4. Bleeding disorders (e.g., thrombocytopenia, platelet dysfunction, von Willebrand disease)
5. Septic arthritis or osteomyelitis

### B. Relative Contraindications

These conditions require individualized assessment, possible modification, or postponement of PRP therapy:

1. **Anticoagulation therapy** – When discontinuation is not possible, PRP is not advisable.
2. **Hypertension** – Elevated blood pressure may cause premature platelet degranulation.
3. **Mental and physical stress** – Can trigger spontaneous release of platelet growth factors.
4. **Dietary influences** – Diets high in saturated fats, refined sugars, or simple carbohydrates may inhibit platelet aggregation.

5. **Substances reducing platelet activation** – Caffeine, quercetin (found in onions, apples, wine), and isoflavones (from soy, legumes, chickpeas).
6. **Medication interactions** – non-selective NSAIDs, aspirin, acetaminophen, and other anticoagulants may impair platelet aggregation.
   *COX-2 inhibitors and statins are generally safe.*
7. **Smoking** – Affects platelet function, oxygen delivery, and healing capacity.
8. **Alcohol use** – Has a dose-dependent inhibitory effect on platelet aggregation and stem cell activity.
9. **Past history** of malignancy
10. **Pregnancy** and **lactation**

## 4. Considerations for Low Platelet Count

Patients with low baseline platelet counts may yield suboptimal PRP. Evaluate:

A. Baseline CBC
B. Cause of thrombocytopenia
C. Risk-benefit profile before proceeding
D. Consider alternatives or rescheduling

# 3. Pre-Procedure Patient Instructions

1. **Following instructions should be carefully followed , before the scheduled procedure:**

   A. **Discontinue NSAIDs (Non-Steroidal Anti-Inflammatory Drugs) –** Stop taking all NSAIDs at least 5 days prior to the procedure.

   B. **Blood Thinners –** If Patient is on blood thinners, consult with prescribing physician regarding temporary discontinuation. These medications must be stopped before the procedure as advised by doctor.

   C. **Oral Steroids –** If taking oral steroids, discontinue them at least 3 weeks before the procedure, in consultation with doctor.

   D. **Intra-Articular Steroid Injections –** There should be a minimum gap of 4 weeks between the steroid injection and this procedure.

   E. **Hydration –** Stay well hydrated for 2–3 days before the procedure. Drink plenty of water unless otherwise advised.

   F. **Dietary Guidance –** Follow an anti-inflammatory and healthy diet in the days leading up to the procedure.

   G. **Transportation –** Arrange for transportation to and from the procedure, if necessary, as patient may not be able to drive yourself.

2. **Patient Expectations Management**

   Effective communication and patient education are essential during the consultation process. Please ensure the following points are discussed:

   **A. Nature of PRP Therapy**

   1. Explain that Platelet-Rich Plasma (PRP) therapy is a **biological treatment** that enhances the body's natural healing capabilities.
   2. Clarify that **PRP is not a guaranteed cure**, but a supportive intervention aimed at recovery.

   **B. Outcome Variability**

   1. Emphasize that the **response to PRP** varies between individuals.
   2. Factors influencing outcomes include:
      - Age
      - General health and lifestyle
      - Severity and duration of the condition
      - Adherence to post-procedure rehabilitation protocols

   **C. Timeline of Relief**

   1. Patients should understand that **improvement may be gradual**, and multiple sessions might be required.
   2. **Informed Consent** – Ensure that patients receive and sign a **detailed and condition-specific informed consent form**, outlining risks, benefits, and expected outcomes

# 4. Platelet-Rich Plasma (PRP) Preparation Guidelines

The efficacy and safety of PRP therapy rely on standardized preparation protocols. The following guidelines are intended to ensure consistent quality, sterility, and therapeutic effectiveness of PRP preparations.

### A. Objectives of Standardized Preparation

Ensure:

- **Optimal platelet concentration**
- **High cell viability**
- **Sterility of the final product**

These parameters directly influence the therapeutic potential and clinical success of PRP applications.

### B. Quality Control Measures

Quality control must be integrated at all stages to maintain:

- Safety and sterility
- Consistency of platelet yield
- Clinical reproducibility

### C. Pre-Processing Checks

Prior to blood draw and centrifugation, ensure:

1. **Patient Evaluation**

   Obtain a **baseline Complete Blood Count (CBC)** to assess:

   - Platelet count
   - Haemoglobin levels
   - White blood cell count
   - CRP

2. **Anticoagulant Mixing**

   Immediately invert collection tubes **gently and adequately** post-draw to ensure proper anticoagulation and prevent clotting.

3. **Equipment Calibration**

   Verify and maintain **regular calibration** of equipment such as centrifuge machines:

   Confirm **RPM** and **g-force** settings per standard protocol.

## D. Platelet Count Verification

### 1. Post-Processing Platelet Count

Analyse final PRP sample to:

- Confirm concentration factor
- Verify platelet dose meets clinical target

### 2. Alternative Estimation

If platelet count verification is not feasible:

- Use an **average draw volume of 60 mL** whole blood (for large joints)
- Assumes average baseline platelet count ~2 lakh/µL

## E. Sterility Assurance

### 1. Aseptic Technique

Maintain strict aseptic technique during:

- Blood collection
- Sample processing
- PRP injection

### 2. Sterility Testing

While batch sterility testing may not be routine:

- Adhere to **sterile compounding protocols**
- Ensure clean environment and trained personnel
- Check the sterility of the consumables, kits, equipment periodically.

## F. Documentation Requirements

Accurate documentation ensures traceability, audit readiness, and quality assurance. Record the following:

- Patient identification and demographics
- Date and time of blood collection and PRP injection
- Total volume of blood collected
- Type and amount of anticoagulant used
- Centrifugation parameters (RPM, duration, g-force)
- Final PRP volume
- Calculated platelet concentration or dose (if tested)
- Lot or batch numbers of collection kits
- Any protocol deviations or observed adverse events

# 5. PRP Types Based on Composition

1. **Leukocyte-Poor PRP (P-PRP / Pure PRP)**
   A. **Composition:** High platelet concentration, minimal leukocytes, and negligible red blood cells (RBCs).
   B. **Clinical Effect:** Promotes **anti-inflammatory** and **regenerative** responses with reduced cytokine-induced inflammation.
   C. **Preferred Use:** Ideal for **intra-articular injections** where minimizing post-procedure inflammation is critical.

2. **Leukocyte-Rich PRP (L-PRP)**
   A. **Composition:** High in platelets and leukocytes.
   B. **Clinical Effect:** Initiates a **stronger inflammatory cascade** via cytokine release, both pro- and anti-inflammatory, facilitating **tissue repair**, especially in chronic or degenerative settings.
   C. **Preferred Use:** Commonly used in **tendinopathies** and **ligament injuries** but may cause transient swelling or discomfort after injection.

3. **Platelet-Rich Fibrin (PRF)**
   A. **Composition:** A fibrin-based matrix rich in platelets and leukocytes, prepared **without anticoagulants.**
   B. **Clinical Effect:** Enables **slow, sustained release** of growth factors and cells, forming a **biological scaffold** ideal for healing.
   C. **Preferred Use:** Often utilized in **surgical applications**, **wound care**, and **oral / maxillofacial procedures** as a **gel** or **membrane.**

*While clinical outcomes vary and evidence remains evolving, current practice generally Favors P-PRP for joint-related therapies and L-PRP for soft tissue conditions.*

# 6. PRP Preparation Techniques

1. **Preparation Parameters for PRP**

   To ensure consistency, efficacy, and reproducibility in PRP therapy, the following preparation parameters are recommended:

   A. **Centrifugation Method**

   - **Double-spin centrifugation** is preferred for achieving optimal platelet separation and concentration.

   B. **Anticoagulant**

   - **ACD-A (Acid Citrate Dextrose – Formula A)** is the anticoagulant of choice to preserve platelet integrity during collection and processing.
   - Heparin 1000U/ml (1 ml for 10ml of blood) if ACD-A is not available or possible.
   - Sodium Citrate is another alternative.

   C. **Target Platelet Concentration**

   - Aim for a final PRP concentration of **1.0 – 1.5 million platelets/µL** in the injectable product.

   D. **Minimum Effective Dose**

   - A total platelet dose of **at least 5 billion** is recommended for therapeutic efficacy, particularly in the treatment of **large joints** (e.g., knee, shoulder).

2. **Blood Collection Protocol for PRP Preparation in Musculoskeletal Applications**

   Proper blood collection is critical for obtaining high-quality PRP. Adhere to the following protocol for optimal outcomes:

   A. **Blood Volume**

   - Collect **40–60 mL of peripheral blood**, depending on the clinical requirement.
   - Higher volumes are typically needed for **large joints or extensive musculoskeletal areas.**

   B. **Needle Size**

   - Use a **21-gauge needle** for venipuncture.
   - This gauge provides an optimal balance between **patient comfort** and **adequate blood flow.**

   C. **Venipuncture Site**

   - Preferred site: **Antecubital fossa**
   - Recommended veins:
     a. **Median cubital vein**
     b. **Cephalic vein**

c. **Basilic vein**

- These veins are generally large, superficial, and easily accessible.

**D. Collection Tubes and Anticoagulant**

- Use **sterile blood collection tubes preloaded with anticoagulant.**
- **Recommended anticoagulant:**
  a. **ACD-A (Acid Citrate Dextrose Solution A)**
  b. Preserves platelet function and prevents clotting during processing.
- **Immediately invert tubes** gently after collection to ensure thorough mixing with anticoagulant and prevent coagulation.

## 3. PRP Preparation Techniques

The technique used for PRP preparation critically influences the **composition, sterility,** and **customizability** of the final product. Two primary methods are utilized:

### A. Open System (Manual / Laboratory-Based Method)

**Overview**

- Utilizes manual **double-spin centrifugation.**
- Allows for **customization** of volume and cellular content.
- Must be performed under **strict aseptic conditions** (e.g., biosafety cabinet or laminar flow hood).

**Standard Protocol**

i. **Blood Collection**
Draw peripheral venous blood into sterile tubes containing an anticoagulant (preferably **ACD-A**).

ii. **First Spin (Soft Spin)**
Separates red blood cells (RBCs) from plasma and buffy coat.

iii. **Transfer Step**
Aspirate the plasma and buffy coat into a sterile secondary tube.

iv. **Second Spin (Hard Spin)**
Concentrates platelets into a pellet at the bottom of the tube.

v. **Final Preparation**
Remove the platelet-poor plasma (PPP) and resuspend the platelet pellet in the remaining plasma to form PRP.

vi. **Sterility Maintenance**
All steps must be performed in a **sterile field** (biosafety cabinet or LFH).

**Advantages**

- Customizable **platelet and leukocyte concentration**
- Flexible **PRP volume and dosing**

**Disadvantages**

- Higher **risk of contamination**
- **Labor-intensive** and time-consuming
- Requires **trained personnel** and sterile infrastructure

**B. Closed System (Commercial Kit-Based Method)**

Recommended to use any of the DCGI approved PRP kits listed in the DCGI website for medical devices.

**Overview**

- Employs **pre-sterilized, sealed kits** for the entire process.
- Minimizes exposure of blood components to the external environment.

**Core Principles**

- Integrated design for **collection, separation, and extraction.**
- Utilizes **single- or double {R-spin centrifugation** within a **closed, self-contained system.**

**Advantages**

- **Standardized PRP** product with minimal operator variability
- **Lower contamination risk**
- **Quick and user-friendly** protocol

**Disadvantages**

- **Higher per-use cost**
- Limited ability to **customize volume** or **cellular composition**

# 7. Centrifuge Specifications and Parameters for PRP Preparation

1. **Double-Spin (Two-Spin) Method**

   The double-spin technique is widely adopted for producing PRP with high platelet yield and controlled leukocyte content.

   **A. First Spin (Soft Spin)**

   - **Purpose:** To separate red blood cells from the platelet- and leukocyte-rich plasma (buffy coat).
   - **Relative Centrifugal Force (RCF): 100–300 g**
   - **Duration:** 5–10 minutes
   - **Outcome:** RBCs are pelleted at the bottom, while platelets and leukocytes remain in the plasma above.

   **B. Second Spin (Hard Spin)**

   - **Purpose:** To concentrate platelets by pelleting them from the plasma.
   - **Relative Centrifugal Force (RCF): 400–700 g**
   - **Duration:** 10–17 minutes
   - **Outcome:** Platelet-rich pellet is formed; platelet-poor plasma (PPP) can be discarded or partially retained depending on desired final concentration.

   🔍 Note: Always refer to the specific centrifuge or kit manufacturer's protocol for optimal RPM and time settings. System designs vary, and manufacturer-validated parameters ensure reliable PRP quality.

2. **Centrifugal Force (RCF) Calculation**

   RCF is the **standardized measure of centrifugal force** and ensures reproducibility across centrifuges with different rotor radii.

   **Formula:**

   - $\mathbf{RCF = 1.118 \times 10^{-5} \times r \times RPM^2}$

   **Where:**

   - **RCF** = Relative Centrifugal Force (in g)
   - **r** = Rotor radius (in cm)
   - **RPM** = Rotations per minute
   - $\mathbf{1.118 \times 10^{-5}}$ = Conversion constant

**Example:**

- For a rotor radius of 15 cm at 3000 RPM:
- RCF = $1.118 \times 10^{-5} \times 15 \times (3000)^2 = 1510.45$ g

**Application:**

This formula is essential for converting RCF to RPM specific to your centrifuge model, allowing accurate replication of PRP preparation protocols across varied equipment.

## 3. Mathematical Formulas for PRP Preparation

These formulas help evaluate the efficiency and quality of PRP production, allowing clinicians and technicians to optimize procedures.

### A. Platelet Yield Efficiency

- Determines the percentage of total platelets from whole blood that are recovered in the PRP.
- Platelet Yield Efficiency = (PRP Volume × PRP Platelet Concentration) ÷ (Blood Volume × Blood Platelet Concentration).

### B. Amplification Factor

- Indicates how concentrated the platelets are in PRP compared to baseline blood.
- Amplification Factor = PRP Platelet Concentration ÷ Blood Platelet Concentration.

### C. Relative Centrifugal Force (RCF)

- Used to calculate the centrifugal force applied, factoring in rotor size.
- RCF = $(RPM^2) \times 1.118 \times 10^{-5} \times$ Rotor Radius (cm).
- These formulas support data-driven improvements in technique, consistency across procedures, and tailored PRP therapy.

# 8. Guideline for Use of Image Guidance and Injection Technique

1. **All PRP injections**, whether into joints, tendons, or soft tissues, **are recommended to be performed under image guidance** (ultrasound or fluoroscopy) to ensure **accuracy, safety,** and **optimal outcomes.**
2. Employ **real-time visualization** to guide the needle and monitor progress.
3. **Confirm precise needle tip placement** within the target structure before delivering PRP.
4. If joint **effusion is present,** aspirate before injection to:
    A. Decompress the joint and remove the inflammatory load.
    B. Confirm needle positioning, to rule out vascular placement.
5. **Administer PRP slowly and steadily** to minimize pain and reduce the risk of tissue injury.
6. After completion, **withdraw the needle carefully** and apply a **sterile dressing** over the injection site.

# 9. Dosing Strategies for PRP Therapy

**Single Dose vs. Multiple Doses**

1. **Overview**

   The ideal PRP dosing strategy depends on the **nature of the condition, PRP composition** (volume and concentration), and **individual patient factors.**

   A. It is recommended to start with a **maximal dose.**

   B. If required, repeat the injection after **3 weeks** based on clinical response.

2. **Key Principle**

   Avoid underdosing. Insufficient platelet volume or concentration can lead to **suboptimal outcomes.** Always aim for a **therapeutic platelet concentration** and total platelet dose.

3. **Single vs. Multiple Doses**

   **A. Single High-Concentration Injection**

   - Best for **acute injuries** or **localized lesions.**
   - Provides a **strong initial regenerative stimulus.**

   **B. Multiple High-Concentration Injections (2–3 doses)**

   - Preferred in **chronic conditions** or **larger treatment areas** such as **knee osteoarthritis.**
   - Injections are typically spaced **1–4 weeks apart** to maintain biological activity and modulate inflammation over time.

4. **Maximal Dose & Influencing Factors**

   A. Maximal Dose Targets:

   - Platelet concentration: **3–7× baseline**
   - Platelet count: **~1–1.5 million/µL**
   - Total dose: Aim for **≥5 billion platelets** in large joints

   B. 3-Week Interval Strategy:

   - Provides time to assess the **biological effect** and **symptomatic relief** before considering a repeat dose.

5. **Dosing Considerations**

   Key factors influencing dosing decisions:

   A. **Severity and chronicity** of the condition

   B. **Initial patient response** to the first injection

   C. **Size and location** of the lesion

   D. **Patient compliance** and ability to follow up

# 10. Post-Procedure Care and Rehabilitation: Instructions

1. **Immediate Post-Procedure Care (First 24–48 Hours)**
   A. **Expect** mild-to-moderate soreness, swelling, and occasional bruising at the injection site.

   B. **Use** only **acetaminophen** (paracetamol) for pain relief.
      - **Avoid** NSAIDs (e.g., ibuprofen, diclofenac) for **2 weeks** to preserve the healing response.

   **C. Apply the R.I.C.E. protocol:**
      - **Rest** the affected area.
      - **Ice:** 15–20 minutes every 2–3 hours.
      - **Compression** using elastic bandage if recommended.
      - **Elevation** to reduce swelling and discomfort.

2. **Activity Progression & Rehabilitation Phases**
   **Phase 1: Days 1–7**
      - **Rest** and **protect** the injection area.
      - **Begin** only **gentle, pain-free movements.**
      - **Avoid** weight-bearing or strenuous activity.

   **Phase 2: Weeks 1–3**
      - **Initiate** controlled range-of-motion exercises.
      - **Introduce** light strengthening activities (non-weight-bearing as appropriate).
      - **Avoid** high-intensity or heavy-load exercises.

   **Phase 3: Weeks 3–6+**
      - **Progress** to functional strengthening and proprioception training.
      - **Begin** sport-specific or occupational training under **supervision of a physiotherapist.**
      - **Return to full activity** only after individualized evaluation and clearance.

## 3. Monitoring, Red Flags & Follow-Up

**Watch for Red Flags:**

- Severe or increasing pain
- Fever or signs of infection
- Redness spreading from the injection site
- Numbness, tingling, or neurological changes
- Unusual or persistent swelling
- Immediate pain and swelling should raise the suspicion for an acute inflammatory reaction and usually reassurance will suffice whereas delayed pain and swelling warrants investigation to rule out infection and if infection confirmed, aggressive treatment must be initiated.

**Schedule Follow-Ups:**

- **3 weeks:** Clinical response assessment, rehab review, consider second injection if needed.
- **6 weeks:** Functional evaluation.
- **3 months:** Detailed clinical review; order imaging if indicated.
- **6 and 12 months:** Assess long-term outcomes.
- **Annual review** thereafter if necessary.

# 11. Indications in MSK Pathologies

Generally speaking, PRP is indicated for various joint, tendon and ligament inflammation from benign conditions.

1. **Tendinopathies:**
    A. Lateral Epicondylitis (Tennis Elbow)
    B. Medial Epicondylitis (Golfer's Elbow)
    C. Patellar Tendinopathy (Jumper’s Knee)
    D. Achilles Tendinopathy (mid-portion and insertional)
    E. Gluteal Tendinopathy
    F. Rotator Cuff Tendinosis (Partial Thickness tears)
2. **Ligament Injuries:**
    A. Medial Collateral Ligament (MCL) sprains
    B. Lateral Collateral Ligament (LCL) sprains
    C. Ulnar Collateral Ligament (UCL) injuries (elbow)
    D. Chronic Ankle Ligament Injuries (ATFL, CFL)
3. **Muscle Injuries:**
    A. Grade II muscle tears (hamstrings, quadriceps, calf, groin)
    B. Chronic muscle injuries
4. **Joint Pathologies:**
    A. Early to moderate Osteoarthritis (Knee, Hip, Shoulder, CMC joint, Ankle)
    B. Focal Chondral or Osteochondral Lesions
    C. Post-microfracture adjunct treatment
5. **Spine:**
    A. Discogenic low back pain
    B. Facet joint arthropathy
    C. Sacroiliac joint dysfunction
6. **Post-Surgical Applications:**
    A. Rotator cuff repair
    B. ACL reconstruction
    C. Meniscal repair
    D. Post-arthroscopy symptom management
7. **Foot & Ankle:**
    A. Chronic plantar fasciitis
    B. Achilles tendinopathy
    C. Peroneal tendinopathy
8. **Wound management**
    A. Burns, Chronic non healing ulcers, Diabetic foot
9. **Non-Union of fractures**

# 12. Specific Musculoskeletal (MSK) Indications for PRP Therapy with Evidence Grading

1. **Tendinopathies**

   PRP is frequently employed in chronic tendinopathies resistant to conventional treatment, aiming to stimulate tenocyte function and enhance collagen synthesis.

   A. **Lateral Epicondylitis (Tennis Elbow)**
      - Evidence Level: I
      - Strong support from multiple RCTs and meta-analyses
      - **Superior to corticosteroids**, comparable to dry needling or placebo in long-term relief

   B. **Patellar Tendinopathy**
      - Evidence Level: II–III
      - Mixed outcomes; favourable in **mild to moderate** cases
      - **Better than exercise** alone in some controlled studies

   C. **Achilles Tendinopathy**
      - Evidence Level: II–III
      - Variable results; beneficial in **chronic, non-responding cases**

   D. **Rotator Cuff Tendinosis (Including Partial Tears)**
      - Evidence Level: II
      - Effective for **pain reduction** and **functional improvement** when combined with physiotherapy

2. **Ligamentous Injuries**

   A. **Medial Collateral Ligament (MCL) Sprains**
      - Evidence Level: III–IV
      - Early evidence suggests **faster recovery** in **partial ligament injuries**, particularly in athletes

3. **Muscle Injuries**

   A. **Grade II Muscle Tears (e.g., hamstrings, quadriceps)**
      - Evidence Level: III
      - Some studies report **accelerated return to sport** and **lower recurrence rates**
      - Evidence still **preliminary**

4. **Joint Pathologies**

   A. **Osteoarthritis (OA)**

      **Knee OA**

      - Evidence Level: I
      - Robust RCT and meta-analysis support; superior to **hyaluronic acid and saline**

      **Hip OA**

      - Evidence Level: II–III
      - Less consistent data; outcomes **generally positive**

   B. **Focal Chondral Lesions**

      - Evidence Level: III
      - Often used as an **adjunct** to microfracture or other cartilage repair techniques

5. **Spinal Applications (Emerging Use)**

   A. **Discogenic Low Back Pain**

      - Evidence Level: IV
      - Early-phase studies suggest benefit in **annular repair** and **inflammation control**

   B. **Facet Joint / Sacroiliac (SI) Joint Pain**

      - Evidence Level: IV
      - Limited clinical trials: **anecdotal reports** suggest potential utility

6. **Post-Surgical Applications**

   - Evidence Level: I–II
   - Positive outcomes in:
     - **Rotator cuff repair**
     - **ACL reconstruction**
     - **Meniscal repair**
   - Benefits include enhanced healing and reduced re-tear rates in selected patient populations

7. **Foot and Ankle**

   **Chronic Plantar Fasciitis**

   - Evidence Level: I
   - PRP shown to **outperform corticosteroids** in long-term pain relief and functional improvement

# 13. Appendix

## References (Indian)


**Comparison of Conventional Dose Versus Superdose Platelet-Rich Plasma for Knee Osteoarthritis: A Prospective, Triple-Blind, Randomized Clinical Trial**
Authors: *Sandeep Patel , Shivam Gahlaut, Tarkik Thami, Devendra Kumar Chouhan, Ashish Jain, Mandeep Singh Dhillon*
Link: https://search.app/YDP2ygwx45DotJZV8
Year of Publication: 2024

**Platelet-rich plasma helps in early stages of knee osteoarthritis**
Authors: *Dr. Sandeep Patel*
Link: https://search.app/dTxogfoSB4StYGks7
Year of Publication: 2024

**Treatment With Platelet-Rich Plasma Is More Effective Than Placebo for Knee Osteoarthritis: A Prospective, Double-Blind, Randomized Trial**
Authors: *Sandeep Patel - MS, Mandeep S. Dhillon - MS, FAMS, Sameer Aggarwal, Neelam Marwaha - MD, FAMS, Ashish Jain - MD*
Link: https://search.app/DRTkaY5vGutkCgnb6
Year of Publication: 2013

**Role of Knee PRP in OA**
Authors: *Dr. Raju Vaishya*
Link: https://search.app/xPoZUbXzsfWoSbQPA
Year of Publication: 2015

**Chondraprotective Effects of a Single PRP Injection in a Spontaneous Osteoarthritis Model of Dunkin Hartley Guinea Pig: An Immunohistochemical Analysis**
Authors: *Devendra Kumar Chouhan, Sandeep Patel, Tarkik Thami, Narayan Prasad Mishra, Uma Nahar & Mandeep Singh Dhillon*
Link: https://link.springer.com/article/10.1007/s43465-024-01145-z
Year of Publication: 2024

**Is There a Need for an Exogenous Activator Along with PRP for Early Knee Osteoarthritis? A Triple-Blinded Randomized Control Trial**
Authors: *Shivam Rai, Sandeep Patel, Devendra Kumar Chouhan, Ashish Jain, Tarkik Thami, Ankit Dadra & Mandeep Singh Dhillon*
Link: https://pubmed.ncbi.nlm.nih.gov/38948365/
Year of Publication: 2024

**Comparison of Conventional Dose Versus Superdose Platelet-Rich Plasma for Knee Osteoarthritis: A Prospective, Triple-Blind, Randomized Clinical Trial**
Authors: *Sandeep Patel , Shivam Gahlaut , Tarkik Thami , Devendra Kumar Chouhan, Ashish Jain, Mandeep Singh Dhillon*
Link: https://pubmed.ncbi.nlm.nih.gov/38410168/
Year of Publication: 2024

**Exploring the Efficacy of Biologics in Knee Osteoarthritis: Ultrasound Evaluation of Cartilage Regeneration Effect**
Authors: *Aditya Ganesh Pundkar, Sandeep Shrivastava, Rohan Chandanwale, Ankit Jaiswal & Hardik Patel*
Link: https://link.springer.com/article/10.1007/s43465-024-01199-z
Year of Publication: 2024

**Leukocyte-Poor Platelet-Rich Plasma for the Management of Knee Osteoarthritis: A Retrospective Study With 12 Months of Follow-Up**
Authors: *Ashim Gupta, Arun Viswanath, G. Hari Kumar*
Link: https://www.cureus.com/articles/292101-leukocyte-poor-platelet-rich-plasma-for-the-management-of-knee-osteoarthritis-a-retrospective-study-with-12-months-of-follow-up#!/
Year of Publication: 2024

**Autologous Growth Factor-Rich Concentrate (GFC) Injection in Non-union of Fractures: A Quasi-experimental Study**
Authors: *Karun Jain, Madhan Jeyaraman, Naveen Jeyaraman & Ashim Gupta*
Link: https://link.springer.com/article/10.1007/s43465-024-01278-1
Year of Publication: 2024

**Is Platelet-Rich Plasma Effective in Enhancing Spinal Fusion? Systematic Overview of Overlapping Meta-Analyses**
Authors: Sathish Muthu, Madhan Jeyaraman, Parvez Ahmad Ganie, Manish Khanna
Link: https://pubmed.ncbi.nlm.nih.gov/33472410/
Year of Publication: 2021

**Platelet-rich plasma as an effective biological therapy in early-stage knee osteoarthritis: One year follow up**
Authors: *Deepak Rai, Jyotsana Singh, Thimmappa Somashekharappa and Ajit Singh*
Link: https://doi.org/10.1051/sicotj/2021003
Year of Publication: 2021

**Role of Triple Injection Platelet-Rich Plasma for Osteoarthritis Knees: A 2 Years Follow-Up Study**
Authors: *Najmul Huda, Mir Shahid ul Islam, Sandeep Bishnoi, Hemant Kumar, Shubham Aggarwal & Aijaz Ahmad Ganai*
Link: https://doi.org/10.1007/s43465-021-00459-6
Year of Publication: 2021

**Multiple Platelet-Rich Plasma Injections Versus Single Platelet-Rich Plasma Injection in Early Osteoarthritis of the Knee: An Experimental Study in a Guinea Pig Model of Early Knee Osteoarthritis**
Authors: *Devendra K. Chouhan - MS Ortho, Mandeep S. Dhillon - MS, FAMS, FRCS, Sandeep Patel - MS Ortho, DNB Ortho, Tungish Bansal - MS Ortho, Alka Bhatia - MD, Himanshu Kanwat - MS Ortho*
Link: https://doi.org/10.1177/0363546519856605
Year of Publication: 2019

**Treatment with platelet-rich plasma is more effective than placebo for knee osteoarthritis: a prospective, double-blind, randomized trial**
Authors: *Sandeep Patel, MS, Mandeep S. Dhillon, MS, FAMS, Sameer Aggarwal, Neelam Marwaha, MD, FAMS, and Ashish Jain, MD*
Link: https://pubmed.ncbi.nlm.nih.gov/23299850/
Year of Publication: 2013

**Chondroprotective effects of multiple PRP injections in osteoarthritis by apoptosis regulation and increased aggrecan synthesis- Immunohistochemistry based Guinea pig study**
Authors: *Sandeep Patel, Narayan Prasad Mishra, Devendra Kumar Chouhan, Uma Nahar, Mandeep S. Dhillon*
Link: https://www.sciencedirect.com/science/article/abs/pii/S0976566222000030
Year of Publication: 2022

**Platelet-rich plasma (PRP) in osteoarthritis (OA) knee: Correct dose critical for long term clinical efficacy**
Authors: *Himanshu Bansal, Jerry Leon, Jeremy L. Pont, David A. Wilson, Anupama Bansal, Diwaker Agarwal & Iustin Preoteasa*
Link: https://search.app/9ewKvjSuZqi7s4Vu7
Year of Publication: 2021

**Intra-articular injections of hyaluronic acid versus plasma rich in growth factors (PRGF) for knee osteoarthritis: a meta-analysis of randomised controlled trials**
Authors: *Filippo Migliorini MD PhD MBA, Nicola Maffulli, Gennaro Pipino, Madhan Jeyaraman, Swaminathan Ramasubramanian & Naveen Jeyaraman*
Link: https://doi.org/10.1007/s00132-025-04615-w
Year of Publication: 2025

**Does the Intradiscal Injection of Platelet Rich Plasma Have Any Beneficial Role in the Management of Lumbar Disc Disease?**
Authors: *Sathish Muthu, Madhan Jeyaraman, Girinivasan Chellamuthu, Naveen Jeyaraman, Rashmi Jain, Manish Khanna*
Link: https://pubmed.ncbi.nlm.nih.gov/33840260/
Year of Publication: 2021

**Evidence analysis on the utilization of platelet-rich plasma as an adjuvant in the repair of rotator cuff tears**
Authors: *Muthu S, Jeyaraman N, Patel K, Chellamuthu G, Viswanathan VK, Jeyaraman M, Khanna M.*
Link: https://www.wjgnet.com/2308-3840/full/v10/i3/143.htm
Year of Publication: 2022

**Leukocyte-Rich vs. Leukocyte-Poor Platelet-Rich Plasma for the Treatment of Knee Osteoarthritis**
Authors: Ashim Gupta, Madhan Jeyaraman and Anish G. Potty
Link: https://www.mdpi.com/2227-9059/11/1/141
Year of Publication: 2023

**Common Medications Which Should Be Stopped Prior to Platelet-Rich Plasma Injection**
Authors: Ashim Gupta, Madhan Jeyaraman and Nicola Maffulli
Link: https://www.mdpi.com/2227-9059/10/9/2134
Year of Publication: 2022

**Evidence-based orthobiologic practice: Current evidence review and future directions**
Authors: *Jeyaraman M, Jeyaraman N, Ramasubramanian S, Balaji S, Muthu S.*
Link: https://www.wjgnet.com/2218-5836/full/v15/i10/908.htm
Year of Publication: 2024

**Photoactivated platelet-rich plasma: is it the future of platelet-rich plasma?**
Authors: *Madhan Jeyaraman, Sathish Muthu, Naveen Jeyaraman, Ashim Gupta*
Link: https://pubmed.ncbi.nlm.nih.gov/35703033/
Year of Publication: 2022

**Efficacy of intra-articular platelet-rich plasma in osteoarthritis knee**
Authors: *Ashim Gupta, Surya Prakash Sharma, Chetana Chetan, Madhan Jeyaraman*
Link: https://www.ijos.co.in/article-details/22701
Year of Publication: 2024

**Implication of Covid-19 Infection on PRP Extraction in a Patient Suffering from Knee Osteoarthritis**
Authors: *Pooja Pithadia and Sharmila Tulpule*
Link: https://doi.org/10.52793/JSCR.2023.4(1)-44
Year of Publication: 2023

**Efficacy of stromal vascular fraction for knee osteoarthritis: A prospective, single-centre, non-randomized study with 2 years follow-up**
Authors: *Madhan Jeyaraman, Naveen Jeyaraman, Tarun Jayakumar, Swaminathan Ramasubramanian, Rajni Ranjan, Saurabh Kumar Jha, Ashim Gupta*
Link: https://pubmed.ncbi.nlm.nih.gov/38835682/
Year of Publication: 2024

**Autologous Peripheral Blood-Derived Orthobiologics for the Management of Hip Osteoarthritis: A Systematic Review of Current Clinical Evidence**
Authors: *Ashim Gupta & Anish G. Potty*
Link: https://www.cureus.com/articles/304756-autologous-peripheral-blood-derived-orthobiologics-for-the-management-of-hip-osteoarthritis-a-systematic-review-of-current-clinical-evidence#!/
Year of Publication: 2024

**Autologous Peripheral Blood-Derived Orthobiologics for the Management of Shoulder Disorders: A Review of Current Clinical Evidence**
Authors: *Ashim Gupta & Nicola Maffulli*
Link: https://link.springer.com/article/10.1007/s40122-024-00684-5
Year of Publication: 2024

**Platelet Lysate and Osteoarthritis of the Knee: A Review of Current Clinical Evidence**
Authors: *Ashim Gupta & Nicola Maffulli*
Link: https://link.springer.com/article/10.1007/s40122-024-00661-y
Year of Publication: 2024

**Autologous Peripheral Blood-Derived Orthobiologics for the Management of Elbow Disorders: A Review of Current Clinical Evidence**
Authors: *Ashim Gupta, Filippo Migliorini, Tommaso Bardazzi & Nicola Maffulli*
Link: https://link.springer.com/article/10.1007/s40122-025-00707-9
Year of Publication: 2025

**Autologous Conditioned Serum in Knee Osteoarthritis: A Systematic Review of Current Clinical Evidence**
Authors: *Naveen Jeyaraman, Madhan Jeyaraman, Swaminathan Ramasubramanian, Sankalp Yadav, Sangeetha Balaji, Bishnu P. Patro, Ashim Gupta*
Link: https://www.cureus.com/articles/278409-autologous-conditioned-serum-in-knee-osteoarthritis-a-systematic-review-of-current-clinical-evidence#!/
Year of Publication: 2024

**Effect of platelet-rich plasma therapy in conjunction with physical therapy for rotator cuff tendinopathy**
Authors: *Pooja Pithadia, Pratham Surya & Mrinalini Singh*
Link: https://www.openaccessjournals.com/articles/effect-of-plateletrich-plasma-therapy-in-conjunction-with-physical-therapy-for-rotator-cuff-tendinopathy-14897.html
Year of Publication: 2021

**Autologous peripheral blood-derived orthobiologics: Different types and their effectiveness in managing knee osteoarthritis**
Authors: *Ashim Gupta, Vijay Kumar Jain*
Link: https://pubmed.ncbi.nlm.nih.gov/38835681/
Year of Publication: 2024

**Red Blood Cells in Platelet-Rich Plasma: Avoid If at All Possible**
Authors: *Ashim Gupta, Nicola Maffulli and Vijay Kumar Jain*
Link: https://www.mdpi.com/2227-9059/11/9/2425
Year of Publication: 2023

**Platelet-Rich Plasma One Week Prior to Hyaluronic Acid vs. Platelet-Rich Plasma Alone for the Treatment of Knee Osteoarthritis**
Authors: *Ashim Gupta*
Link: https://www.mdpi.com/2227-9059/10/11/2805
Year of Publication: 2022

**Autologous Adipose Tissue vs. Platelet-Rich Plasma for Treatment of Knee Osteoarthritis**
Authors: *Ashim Gupta*
Link: https://www.mdpi.com/2227-9059/10/10/2527
Year of Publication: 2022

**Photoactivated Platelet-Rich Plasma: is it the Future of Platelet-Rich Plasma?**
Authors: *Madhan Jeyaraman, Sathish Muthu, Naveen Jeyaraman & Ashim Gupta*
Link: https://www.tandfonline.com/doi/full/10.2217/rme-2022-0063
Year of Publication: 2022

**Growth Factor Concentrate (GFC) for the Management of Osteoarthritis of the Knee: A Systematic Review**
Authors: *Ashim Gupta & Nicola Maffulli*
Link: https://link.springer.com/article/10.1007/s43465-024-01172-w
Year of Publication: 2024

**Serial intraarticular injections of growth factor concentrate in knee osteoarthritis: A placebo controlled randomized study**
Authors: *Amit Saraf, Altaf Hussain, Sandeep Bishnoi, Hamza Habib, Abhishek Garg*
Link: https://pubmed.ncbi.nlm.nih.gov/36974096/
Year of Publication: 2023

**Hyperacute Serum and Knee Osteoarthritis**
Authors: *Ashim Gupta & Adarsh Aratikatla*
Link: https://pubmed.ncbi.nlm.nih.gov/38420081/
Year of Publication: 2024

**Autologous Protein Solution (APS) and Osteoarthritis of the Knee: A Scoping Review of Current Clinical Evidence**
Authors: *Ashim Gupta*
Link: https://pubmed.ncbi.nlm.nih.gov/38449974/
Year of Publication: 2024

**Autologous Conditioned Plasma (ACP) and Osteoarthritis of the Knee: A Review of Current Clinical Evidence**
Authors: *Ashim Gupta & Vijay Jain*
Link: https://pubmed.ncbi.nlm.nih.gov/38384614/
Year of Publication: 2024

**Chondroprotective effects of multiple PRP injections in osteoarthritis by apoptosis regulation and increased aggrecan synthesis- Immunohistochemistry based Guinea pig study**
Authors: *Sandeep Patel, Narayan Prasad Mishra, Devendra Kumar Chouhan, Uma Nahar, Mandeep S Dhillon*
Link: https://pubmed.ncbi.nlm.nih.gov/35070686/
Year of Publication: 2022

**Exploring the Efficacy of Biologics in Knee Osteoarthritis: Ultrasound Evaluation of Cartilage Regeneration Effects**
Authors: *Aditya Ganesh Pundkar, Sandeep Shrivastava, Rohan Chandanwale, Ankit Jaiswal & Hardik Patel*
Link: https://doi.org/10.1007/s43465-024-01199-z
Year of Publication: 2024

# References (International)


**Knee Osteoarthritis Injection Choices: Platelet- Rich Plasma (PRP) Versus Hyaluronic Acid (A one-year randomized clinical trial)**
Authors: *Seyed Ahmad Raeissadat, Seyed Mansoor Rayegani, Hossein Hassanabadi, Mohammad Fathi, Elham Ghorbani, Marzieh Babaee, Kamran Azma*
Link: https://pubmed.ncbi.nlm.nih.gov/25624776/
Year of Publication: 2015

**Multiple PRP injections are more effective than single injections and hyaluronic acid in knees with early osteoarthritis: a randomized, double-blind, placebo-controlled trial**
Authors: *Gökay Görmeli, Cemile Ayşe Görmeli, Baybars Ataoglu, Cemil Çolak, Okan* Aslantürk, Kadir Ertem
Link: https://pubmed.ncbi.nlm.nih.gov/26233594/
Year of Publication: 2015

**Intra-Articular Injections of Platelet-Rich Plasma versus Hyaluronic Acid in the Treatment of Osteoarthritic Knee Pain: A Randomized Clinical Trial in the Context of the Spanish National Health Care System**
Authors: *Elvira Montañez-Heredia, Sofia Irízar, Pedro J Huertas, Esperanza Otero, Marta del Valle, Isidro Prat, Macarena S Díaz-Gallardo, Macarena Perán, Juan A Marchal, María del Carmen Hernandez-Lamas*
Link: https://pmc.ncbi.nlm.nih.gov/articles/PMC4964440/
Year of Publication: 2016

**Randomized controlled trial comparing hyaluronic acid, platelet-rich plasma and the combination of both in the treatment of mild and moderate osteoarthritis of the knee**
Authors: *José F S D Lana, Adam Weglein, Steve E Sampson, Eduardo F Vicente, Stephany Cares Huber, Clarissa V Souza, Mary A Ambach, Hunter Vincent, Aline Urban-Paffaro, Carolina M K Onodera, Joyce M Annichino-Bizzacchi, Maria Helena A Santana, William D Belangero*
Link: https://pubmed.ncbi.nlm.nih.gov/28096631/
Year of Publication: 2016

**Single- and double-dose of platelet-rich plasma versus hyaluronic acid for treatment of knee osteoarthritis: A randomized controlled trial**
Authors: *Mehdi Tavassoli, Nasser Janmohammadi, Akram Hosseini, Soraya Khafri, Seyed Mokhtar Esmaeilnejad-Ganji*
Link: https://pubmed.ncbi.nlm.nih.gov/31572668/
Year of Publication: 2019

**The combined use of platelet rich plasma and hyaluronic acid: prospective results for the treatment of knee osteoarthritis**
Authors: *R Papalia, B Zampogna, F Russo, G Torre, S De Salvatore, C Nobile, M C Tirindelli, A Grasso, G Vadalà, V Denaro*
Link: https://pubmed.ncbi.nlm.nih.gov/31168999/
Year of Publication: 2019

**Intra-articular injections of platelet-rich plasma, hyaluronic acid or corticosteroids for knee osteoarthritis : A prospective randomized controlled study**
Authors: *Yong Huang, Xiaolu Liu, Xinliang Xu, Junbin Liu*
Link: https://pubmed.ncbi.nlm.nih.gov/30623236/
Year of Publication: 2019

**Intra-articular Injection of Platelet-Rich Plasma Is Superior to Hyaluronic Acid or Saline Solution in the Treatment of Mild to Moderate Knee Osteoarthritis: A Randomized, Double-Blind, Triple-Parallel, Placebo-Controlled Clinical Trial**
Authors: *Kuan-Yu Lin, Chia-Chi Yang, Chien-Jen Hsu, Ming-Long Yeh, Jenn-Huei Renn*
Link: https://pubmed.ncbi.nlm.nih.gov/30611335/
Year of Publication: 2019

**Platelet-Rich Plasma Versus Hyaluronic Acid Injections for the Treatment of Knee Osteoarthritis: Results at 5 Years of a Double-Blind, Randomized Controlled Trial**
Authors: *Alessandro Di Martino, Berardo Di Matteo, Tiziana Papio, Francesco Tentoni, Filippo Selleri, Annarita Cenacchi, Elizaveta Kon, Giuseppe Filardo*
Link: https://pubmed.ncbi.nlm.nih.gov/30545242/
Year of Publication: 2018

**Clinical therapy of hyaluronic acid combined with platelet-rich plasma for the treatment of knee osteoarthritis**
Authors: *Wenxing Yu, Peng Xu, Guiling Huang, Lin Liu*
Link: https://pubmed.ncbi.nlm.nih.gov/30186448/
Year of Publication: 2018

**Clinical and radiographic comparison of a single LP-PRP injection, a single hyaluronic acid injection and daily NSAID administration with a 52-week follow-up: a randomized controlled trial**
Authors: *David Buendía-López, Manuel Medina-Quirós, Miguel Ángel Fernández-Villacañas Marín*
Link: https://pubmed.ncbi.nlm.nih.gov/30128934/
Year of Publication: 2018

**Comparison of hyaluronic acid and PRP intra-articular injection with combined intra-articular and intraosseous PRP injections to treat patients with knee osteoarthritis**
Authors: *Ke Su, Yuming Bai, Jun Wang, Haisen Zhang, Hao Liu, Shiyun Ma*
Link: https://pubmed.ncbi.nlm.nih.gov/29388085/
Year of Publication: 2018

**Clinical outcomes are associated with changes in ultrasonographic structural appearance after platelet-rich plasma treatment for knee osteoarthritis**
Authors: *Hamada S Ahmad, Sherief E Farrag, Amr E Okasha, Aisha O Kadry, Tamer B Ata, Amir A Monir, Ibrahim Shady*
Link: https://pubmed.ncbi.nlm.nih.gov/29878617/
Year of Publication: 2018

**Growth Factors Levels Determine Efficacy of Platelets Rich Plasma Injection in Knee Osteoarthritis: A Randomized Double Blind Noninferiority Trial Compared With Viscosupplementation**
Authors: *Marie Laure Louis, Jeremy Magalon, Elizabeth Jouve, Charles Eric Bornet, Jean Camille Mattei, Christophe Chagnaud, Alexandre Rochwerger, Julie Veran, Florence Sabatier*
Link: https://pubmed.ncbi.nlm.nih.gov/29366744/
Year of Publication: 2018

**Treatment of knee osteoarthritis: platelet-derived growth factors vs. hyaluronic acid. A randomized controlled trial**
Authors: *Claudio Lisi, Cesare Perotti, Luigia Scudeller, Luigi Sammarchi, Francesca Dametti, Valeria Musella, Giuseppe Di Natali*
Link: https://pubmed.ncbi.nlm.nih.gov/28783969/
Year of Publication: 2017

**Hyaluronic Acid Versus Platelet-Rich Plasma: A Prospective, Double-Blind Randomized Controlled Trial Comparing Clinical Outcomes and Effects on Intra-articular Biology for the Treatment of Knee Osteoarthritis**
Authors: *Brian J Cole, Vasili Karas, Kristen Hussey, Kyle Pilz, Lisa A Fortier*
Link: https://pubmed.ncbi.nlm.nih.gov/28146403/
Year of Publication: 2016

**[Platelet rich plasma intra-articular and extra-articular injection for the treatment of knee osteoarthritis]**
Authors: *Wei Du, Hong-Peng Cui, Ben-Sheng Fu, Wen Li, Qian Liu, Yu-Xian Zhong, Yan-Han Dong*
Link: https://pubmed.ncbi.nlm.nih.gov/32233245/
Year of Publication: 2019

**Comparison of two platelet rich plasma formulations with viscosupplementation in treatment of moderate grade gonarthrosis: A prospective randomized controlled study**
Authors: *Yüksel Uğur Yaradilmis, Ismail Demirkale, Ahmet Safa Tagral, Mustafa Caner* Okkaoglu, Ahmet Ates, Murat Altay
Link: https://pubmed.ncbi.nlm.nih.gov/32071523/
Year of Publication: 2020

**Effects of platelet-rich plasma on subchondral bone marrow edema and biomarkers in synovial fluid of knee osteoarthritis**
Authors: *Wanchang Lin, Li Xie, Liang Zhou, Jiapeng Zheng, Wenliang Zhai, Dasheng Lin*
Link: https://pubmed.ncbi.nlm.nih.gov/37001332/
Year of Publication: 2023

**Evaluation of the effect of intra-articular platelet-rich plasma and hyaluronic acid injections on femoral cartilage thickness in chronic knee osteoarthritis**
Authors: *Okan Küçükakkaş, Teoman Aydin, Ozan Volkan Yurdakul*
Link: https://pubmed.ncbi.nlm.nih.gov/36800668/
Year of Publication: 2023

**Clinical Outcome of Multiple Platelet-Rich Plasma Injection and Correlation with PDGF-BB in the Treatment of Knee Osteoarthritis**
Authors: *Radiyati Umi Partan, Khoirun Mukhsinin Putra, Hafizzanovian Hafizzanovian, Surya Darma, Muhammad Reagan, Putri Muthia, Afifah Salshabila Radiandina, Eny Rahmawati*
Link: https://pmc.ncbi.nlm.nih.gov/articles/PMC10890090/
Year of Publication: 2024

**Impact of autologous platelet-rich plasma therapy vs. hyaluronic acid on synovial fluid biomarkers in knee osteoarthritis: a randomized controlled clinical trial**
Authors: *Tianshu Li, Yuefang Li, Wanyue Li, Xu Wang, Qixin Ding, Jiahuan Gao, Ying Zhang, Weisheng Zhuang*
Link: https://pmc.ncbi.nlm.nih.gov/articles/PMC10585111/
Year of Publication: 2023

**Assessment of the effectiveness and satisfaction of platelet-rich plasma compared with hyaluronic acid in knee osteoarthritis at minimum 7-year follow-up: A post hoc analysis of a randomized controlled trial**
Authors: *Zhengming Wang, Rui Wang, Sicheng Xiang, Yong Gu, Ting Xu, Hengkai Jin, Xinbo Gu, Peijian Tong, Hongsheng Zhan, Shuaijie Lv*
Link: https://pubmed.ncbi.nlm.nih.gov/36507262/
Year of Publication: 2022

**Comparing the Efficacy of Intra-Articular Single Platelet-Rich Plasma(PRP) versus Novel Crosslinked Hyaluronic Acid for Early-Stage Knee Osteoarthritis: A Prospective, Double-Blind, Randomized Controlled Trial**
Authors: *Ying-Chun Wang, Chia-Ling Lee, Yu-Jen Chen, Yin-Chun Tien, Sung-Yen Lin, Chung-Hwan Chen, Paul Pei-Hsi Chou, Hsuan-Ti Huang*
Link: https://pmc.ncbi.nlm.nih.gov/articles/PMC9415551/
Year of Publication: 2022

**[Effectiveness of platelet rich plasma in pain management of osteoarthritis knee: double blind, randomized comparative study]**
Authors: *Babita Ghai, Vasudha Gupta, Ashish Jain, Nitika Goel, Devender Chouhan , Yatinder Kumar Batra*
Link: https://pubmed.ncbi.nlm.nih.gov/31672420/
Year of Publication: 2019

**The efficiency of platelet-rich plasma treatment in patients with knee osteoarthritis**
Authors: H眉seyin Elik, Beril Do臒u, Figen Y眓lmaz, Feyza Akan Bego臒lu, Banu Kuran
Link: https://pubmed.ncbi.nlm.nih.gov/31127755/
Year of Publication: 2020

**Platelet-rich plasma shows beneficial effects for patients with knee osteoarthritis by suppressing inflammatory factors**
Authors: Guilin Huang, Sha Hua, Tuanmin Yang, Jianbing Ma, Wenxing Yu, Xiujin Chen
Link: https://pmc.ncbi.nlm.nih.gov/articles/PMC5867452/
Year of Publication: 2018

**Effects of Platelet-Rich Plasma on Pain and Muscle Strength in Patients With Knee Osteoarthritis**
Authors: Yung-Tsan Wu, Kao-Chih Hsu, Tsung-Ying Li, Cheng-Kuang Chang, Liang-Cheng Chen
Link: https://pubmed.ncbi.nlm.nih.gov/29210705/
Year of Publication: 2018

**MRI Changes After Platelet Rich Plasma Injection in Knee Osteoarthritis (Randomized Clinical Trial)**
Authors: *Seyed Ahmad Raeissadat, Elham Ghorbani, Morteza Sanei Taheri, Reza Soleimani, Seyed Mansoor Rayegani, Marzieh Babaee, Sara Payami*
Link: https://pubmed.ncbi.nlm.nih.gov/32021396/
Year of Publication: 2019

**Comparison of clinical outcome, cartilage turnover, and inflammatory activity following either intra-articular or a combination of intra-articular with intra-osseous platelet-rich plasma injections in osteoarthritis knee: A randomized, clinical trial**
Authors: *Apurba Barman, Debapriya Bandyopadhyay, Sudipta Mohakud, Jagannatha Sahoo, Rituparna Maiti, Somnath Mukherjee, Satya Prakash, Sankha Subhra Roy, Amrutha Viswanath*
Link: https://pubmed.ncbi.nlm.nih.gov/36414504/
Year of Publication: 2023

**Platelet-Rich Plasma Injections for Advanced Knee Osteoarthritis: A Prospective, Randomized, Double-Blinded Clinical Trial**
Authors: *Nayana Joshi Jubert, Luciano Rodríguez, Maria Mercedes Reverté-Vinaixa, Aurora Navarro*
Link: https://pubmed.ncbi.nlm.nih.gov/28255569/
Year of Publication: 2017

**Clinical and Biochemical Correlation of Intra-articular Platelet-Rich Plasma and Corticosteroid Using Serum Matrix Metalloproteinase 3 (MMP-3) Levels in Osteoarthritis of Knee**
Authors: *Vaneet Arora, Manmohan Sharma, Sandeep Bishnoi, Vakul Mahipal, Angad S Sandhu, Rajat Khanna, Tarun Aggarwal, Krishnadev S Yadav, Gautam Jain, Shubham M Sharma*
Link: https://pubmed.ncbi.nlm.nih.gov/37388595/
Year of Publication: 2023

**Double-Blind Randomized Controlled Trial Comparing Platelet-Rich Plasma With Intra-Articular Corticosteroid Injections in Patients With Bilateral Knee Osteoarthritis**
Authors: *Jacques Pretorius, Nouman Nemat, Almutaz Alsayed, Ahmed Mustafa, Yasir Hammad, Tony Shaju, Sayed Nadeem*
Link: https://pmc.ncbi.nlm.nih.gov/articles/PMC9617571/
Year of Publication: 2022

**The Efficacy of Intra-articular Platelet-Rich Plasma Injection Versus Corticosteroid Injection in the Treatment of Knee Osteoarthritis: A Prospective Comparative Analysis**
Authors: *Sumbal Irshad, Usman Waleed, Muhammad Hassan Zafar, Muhammad Tayyab Ramzan, Muhammad Abdullah Tariq, Muhammad Hassan, Muhammad Ahmer Sohaib, Sana Liaquat, Sanwal Mehmood, Rana Shahzaib Ali, Tayyab Mumtaz Khan*
Link: https://pmc.ncbi.nlm.nih.gov/articles/PMC11194758/
Year of Publication: 2024

**Morphological and Quantitative Parametric MRI Follow-up of Cartilage Changes Before and After Intra-articular Injection Therapy in Patients With Mild to Moderate Knee Osteoarthritis. A Randomized, Placebo-Controlled Trial**
Authors: *Tschopp, Marcel MD, OLY; Pfirrmann, Christian W.A. MD, MBA; Brunner, Florian MD, PhD; Fucentese, Sandro F. MD; Galley, Julien MD; Stern, Christoph MD; Sutter, Reto MD; Catanzaro, Sabrina; Kühne, Nathalie; Rosskopf, Andrea B. MD*
Link: https://journals.lww.com/investigativeradiology/fulltext/2024/09000/morphological_and_quantitative_parametric_mri.6.aspx
Year of Publication: 2024

**Does intra articular platelet rich plasma injection improve function, pain and quality of life in patients with osteoarthritis of the knee? A randomized clinical trial**
Authors: *Seyed Mansoor Rayegani, Seyed Ahmad Raeissadat, Morteza Sanei Taheri, Marzieh Babaee, Mohammad Hassan Bahrami, Dariush Eliaspour, Elham Ghorbani*
Link: https://www.ncbi.nlm.nih.gov/pubmed/25317308/
Year of Publication: 2014

**Treatment of knee osteoarthritis with platelet-rich plasma in comparison with transcutaneous electrical nerve stimulation plus exercise: a randomized clinical trial**
Authors: *Hooman Angoorani, Ali Mazaherinezhad, Omid Marjomaki, Shima Younespour*
Link: https://www.ncbi.nlm.nih.gov/pubmed/26478881/
Year of Publication: 2015

**Bone Marrow Aspirate Concentrate Is Equivalent to Platelet-Rich Plasma for the Treatment of Knee Osteoarthritis at 1 Year: A Prospective, Randomized Trial**
Authors: *Adam W Anz, Ryan Hubbard, Nicole K Rendos, Peter A Everts, James R Andrews, Joshua G Hackel*
Link: https://pubmed.ncbi.nlm.nih.gov/32118081/
Year of Publication: 2020

**Platelet-Rich Plasma Versus Microfragmented Adipose Tissue for Knee Osteoarthritis: A Randomized Controlled Trial**
Authors: *Michael Baria, Angela Pedroza, Christopher Kaeding, Sushmitha Durgam, Robert Duerr, David Flanigan, James Borchers, Robert Magnussen*
Link: https://pubmed.ncbi.nlm.nih.gov/36147791/
Year of Publication: 2022

**Autologous microfragmented adipose tissue and leukocyte-poor platelet-rich plasma combined with hyaluronic acid show comparable clinical outcomes for symptomatic early knee osteoarthritis over a two-year follow-up period: a prospective randomized clinical trial**
Authors: *Alberto Gobbi, Ignacio Dallo, Riccardo D'Ambrosi*
Link: https://pubmed.ncbi.nlm.nih.gov/35997833/
Year of Publication: 2022

**Serial Platelet-Rich Plasma Intra-articular Injections in Kellgren and Lawrence Grade IV Knee Joint Osteoarthritis: A Prospective Blinded Placebo-Controlled Interventional Study**
Authors: *Amit Saraf, Altaf Hussain, Sandeep Bishnoi, Goushul Azam, Hamza Habib*
Link: https://pubmed.ncbi.nlm.nih.gov/36187584/
Year of Publication: 2022

**Single-dose intra-articular corticosteroid injection prior to platelet-rich plasma injection resulted in better clinical outcomes in patients with knee osteoarthritis: A pilot study**
Authors: *Yalkin Camurcu, Hakan Sofu, Hanifi Ucpunar, Nizamettin Kockara, Adem Cobden, Serda Duman*
Link: https://pubmed.ncbi.nlm.nih.gov/29710676/
Year of Publication: 2018

**Comparison of Efficiency Between Corticosteroid and Platelet Rich Plasma Injection Therapies in Patients With Knee Osteoarthritis**
Authors: *Ece Uslu Güvendi, Ayhan Aşkin, Güven Güvendi, Hikmet Koçyiğit*
Link: https://pubmed.ncbi.nlm.nih.gov/30632533/
Year of Publication: 2018

**Microfragmented Adipose Tissue Versus Platelet-Rich Plasma for the Treatment of Knee Osteoarthritis: A Prospective Randomized Controlled Trial at 2-Year Follow-up**
Authors: *Stefano Zaffagnini, Luca Andriolo, Angelo Boffa, Alberto Poggi, Annarita Cenacchi, Maurizio Busacca, Elizaveta Kon, Giuseppe Filardo, Alessandro Di Martino*
Link: https://pubmed.ncbi.nlm.nih.gov/35984721/
Year of Publication: 2022

**Leukocyte-poor platelet-rich plasma is more effective than the conventional therapy with acetaminophen for the treatment of early knee osteoarthritis**
Authors: *Mario Simental-Mendía, José F Vilchez-Cavazos, Víctor M Peña-Martínez, Salvador Said-Fernández, Jorge Lara-Arias, Herminia Guadalupe Martínez-Rodríguez*
Link: https://www.ncbi.nlm.nih.gov/pubmed/27506585/
Year of Publication: 2016

**Intraarticular injection of platelet-rich plasma in knee osteoarthritis: single versus triple application approach. Pilot study**
Authors: *Mario Simental-Mendía, Carlos Alberto Acosta-Olivo, Alejandra Nohemí Hernández-Rodríguez, Oscar Rubén Santos-Santos, Santiago de la Garza-Castro, Víctor Manuel Peña-Martínez, Félix Vilchez-Cavazos*
Link: https://www.ncbi.nlm.nih.gov/pubmed/31243258
Year of Publication: 2019

**The varying clinical effectiveness of single, three and five intraarticular injections of platelet-rich plasma in knee osteoarthritis**
Authors: *Weisheng Zhuang, Tianshu Li, Yuefang Li, Ying Zhang, Jiahuan Gao, Xu Wang, Qixin Ding, Wanyue Li*
Link: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11077828/
Year of Publication: 2024

**A Comparative Study of Osteoarthritis Knee Arthroscopy versus Intra-Articular Platelet Rich Plasma Injection: A Randomised Study**
Authors: *N Singh, V Trivedi, V Kumar, N K Mishra, S Ahmad, S J Ayar, S S Kataria, H Kharbanda*
Link: https://pubmed.ncbi.nlm.nih.gov/35992984/
Year of Publication: 2022

**Is There a Need for an Exogenous Activator Along with PRP for Early Knee Osteoarthritis? A Triple-Blinded Randomized Control Trial**
Authors: *Shivam Rai, Sandeep Patel, Devendra Kumar Chouhan, Ashish Jain, Tarkik Thami, Ankit Dadra, Mandeep Singh Dhillon*
Link: https://pubmed.ncbi.nlm.nih.gov/38948365/
Year of Publication: 2024

**Comparison of Conventional Dose Versus Superdose Platelet-Rich Plasma for Knee Osteoarthritis: A Prospective, Triple-Blind, Randomized Clinical Trial**
Authors: *Sandeep Patel, Shivam Gahlaut, Tarkik Thami, Devendra Kumar Chouhan, Ashish Jain, Mandeep Singh Dhillon*
Link: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10896053/
Year of Publication: 2024

**Comparison of the short-term results of single-dose intra-articular peptide with hyaluronic acid and platelet-rich plasma injections in knee osteoarthritis: a randomized study**
Authors: *Fatma Nur Kesiktas, Bahar Dernek, Ekin Ilke Sen, Havva Nur Albayrak, Tugba Aydin, Merve Yildiz*
Link: https://pubmed.ncbi.nlm.nih.gov/32358661/
Year of Publication: 2020

**Is the Combination of Platelet-Rich Plasma and Hyaluronic Acid the Best Injective Treatment for Grade II-III Knee Osteoarthritis? A Prospective Study**
Authors: *Gianluca Ciapini, Matteo Simonettii, Michele Giuntoli, Giorgio Varchetta, Silvia De Franco, Edoardo Ipponi, Michelangelo Scaglione, Paolo Domenico Parchi*
Link: https://pubmed.ncbi.nlm.nih.gov/36938102/
Year of Publication: 2023

**Short-Term Outcomes of Percutaneous Trephination with a Platelet Rich Plasma Intrameniscal Injection for the Repair of Degenerative Meniscal Lesions. A Prospective, Randomized, Double-Blind, Parallel-Group, Placebo-Controlled Study**
Authors: *Rafal Kaminski, Marta Maksymowicz-Wleklik, Krzysztof Kulinski, Katarzyna Kozar-Kaminska, Agnieszka Dabrowska-Thing, Stanislaw Pomianowski*
Link: https://www.ncbi.nlm.nih.gov/pubmed/30781461
Year of Publication: 2019

**Platelet-Rich Plasma versus Corticosteroid Intra-Articular Injections for the Treatment of Trapeziometacarpal Arthritis: A Prospective Randomized Controlled Clinical Trial**
Authors: *Michael-Alexander Malahias, Leonidas Roumeliotis, Vasileios S Nikolaou, Efstathios Chronopoulos, Ioannis Sourlas, Georgios C Babis*
Link: https://www.ncbi.nlm.nih.gov/pubmed/30343590
Year of Publication: 2021

**Comparison of Clinical and Functional Outcomes after Platelet-Rich Plasma Injection and Corticosteroid Injection for the Treatment of de Quervain's Tenosynovitis**
Authors: *Vivek Kumar, Jatin Talwar, As`hish Rustagi, Loveneesh G Krishna, Vinod Kumar Sharma*
Link: https://pubmed.ncbi.nlm.nih.gov/36926208/
Year of Publication: 2023

**Ultrasound-Guided Injection of Platelet-Rich Plasma and Hyaluronic Acid, Separately and in Combination, for Hip Osteoarthritis: A Randomized Controlled Study**
Authors: *Dante Dallari, Cesare Stagni, Nicola Rani, Giacomo Sabbioni, Patrizia Pelotti, Paola Torricelli, Matilde Tschon, Gianluca Giavaresi*
Link: https://www.ncbi.nlm.nih.gov/pubmed/26797697
Year of Publication: 2016

**Efficacy of ultrasound-guided intra-articular injections of platelet-rich plasma versus hyaluronic acid for hip osteoarthritis**
Authors: *Milva Battaglia, Federica Guaraldi, Francesca Vannini, Giuseppe Rossi, Antonio Timoncini, Roberto Buda, Sandro Giannini*
Link: https://www.ncbi.nlm.nih.gov/pubmed/24579221
Year of Publication: 2013

**Comparison between the effects of ultrasound guided intra-articular injections of platelet-rich plasma (PRP), high molecular weight hyaluronic acid, and their combination in hip osteoarthritis: a randomized clinical trial**
Authors: *Farshad Nouri, Marzieh Babaee, Parya Peydayesh, Hadi Esmaily, Seyed Ahmad Raeissada*
Link: https://pubmed.ncbi.nlm.nih.gov/36096771/
Year of Publication: 2022

**Comparisons of Ultrasound-Guided Platelet-Rich Plasma Intra-Articular Injection and Extracorporeal Shock Wave Therapy in Treating ARCO I-III Symptomatic Non-Traumatic Femoral Head Necrosis: A Randomized Controlled Clinical Trial**
Authors: *Shuo Luan, Shaoling Wang, Caina Lin, Shengnuo Fan, Cuicui Liu, Chao Ma, Shaoling Wu*
Link: https://pubmed.ncbi.nlm.nih.gov/35153512/
Year of Publication: 2022

**Leucocyte-Rich Platelet-Rich Plasma Treatment of Gluteus Medius and Minimus Tendinopathy: A Double-Blind Randomized Controlled Trial With 2-Year Follow-up**
Authors: *Jane Fitzpatrick, Max K Bulsara, John O'Donnell, Ming Hao Zheng*
Link: https://pubmed.ncbi.nlm.nih.gov/30840831/
Year of Publication: 2019

**Ultrasound-Guided Subfascial Platelet-Rich Plasma Injections Versus Enthesis Needling for Greater Trochanteric Pain Syndrome: A Randomized Controlled Trial**
Authors: *Leire Atilano, Nerea Martin, Jose Ignacio Martin, Gotzon Iglesias, Josu Mendiola, Paola Bully, Ayoola Aiyegbusi, Jose Manuel Rodriguez-Palomo , Isabel Andia*
Link: https://pubmed.ncbi.nlm.nih.gov/38751852/
Year of Publication: 2024

**Comparison of the Effectiveness of Platelet-Rich Plasma, Corticosteroid, and Physical Therapy in Subacromial Impingement Syndrome**
Authors: *Tuğçe Pasin, Safinaz Ataoğlu, Özge Pasin, Handan Ankarali*
Link: https://pubmed.ncbi.nlm.nih.gov/31598597/
Year of Publication: 2019

**Subacromial injection of autologous platelet-rich plasma versus corticosteroid for the treatment of symptomatic partial rotator cuff tears**
Authors: *Ahmed Shams, Mohamed El-Sayed, Osama Gamal, Waled Ewes*
Link: https://www.ncbi.nlm.nih.gov/pubmed/27544678
Year of Publication: 2016

**Comparing the Efficacy of Intra-articular Platelet-Rich Plasma and Corticosteroid Injections in the Management of Frozen Shoulder: A Randomized Controlled Trial**
Authors: *Tarun Kumar Somisetty, Hariprasad Seenappa, Subhashish Das, Arun H Shanthappa*
Link: https://pubmed.ncbi.nlm.nih.gov/37398735/
Year of Publication: 2023

**Effectiveness of single intra-bursal injection of platelet-rich plasma against corticosteroid under ultrasonography guidance for shoulder impingement syndrome: a randomized clinical trial**
Authors: *Padma Badra Hewavithana, Mihiri Chami Wettasinghe, Gothami Hettiarachchi, Manel Ratnayaka, Hilary Suraweera, Nuwan Darshana Wickramasinghe, Pallegoda Vithanage Ranjith Kumarasiri*
Link: https://pubmed.ncbi.nlm.nih.gov/37266723/
Year of Publication: 2023

**Effects of Platelet-Rich Plasma in Tear Size Reduction in Partial-Thickness Tear of the Supraspinatus Tendon Compared to Corticosteroids Injection**
Authors: Thanathep Tanpowpong, Marvin Thepsoparn, Numphung Numkarunarunrote, Thun Itthipanichpong, Danaithep Limskul, Phark Thanphraisan
Link: https://pubmed.ncbi.nlm.nih.gov/36752928/
Year of Publication: 2023

**Comparison of the Efficacy of Platelet-Rich Plasma (PRP) and Local Corticosteroid Injection in Periarthritis Shoulder: A Prospective, Randomized, Open, Blinded End-Point (PROBE) Study**
Authors: *Govind K Gupta, Shubhendu Shekhar, Zeya Ul Haque, Subhajit Halder, Amit K Manjhi, Arpita Rai*
Link: https://pubmed.ncbi.nlm.nih.gov/36262947/
Year of Publication: 2022

**Efficacy of Ultrasound-Guided Glenohumeral Joint Injections of Leukocyte-Poor Platelet-Rich Plasma Versus Hyaluronic Acid in the Treatment of Glenohumeral Osteoarthritis: A Randomized, Double-Blind Controlled Trial**
Authors: *Jonathan S Kirschner, Jennifer Cheng, Andrew Creighton, Kristen Santiago, Nicole Hurwitz, Mark Dundas, Nicholas Beatty, Dallas Kingsbury, Gabrielle Konin, Zafir Abutalib, Richard Chang*
Link: https://pubmed.ncbi.nlm.nih.gov/35316820/
Year of Publication: 2022

**Comparison of Functional Outcome Between Intra-Articular Injection of Corticosteroid Versus Platelet-Rich Plasma in Frozen Shoulder: A Randomized Controlled Trial**
Authors: *Hafiz Faisal Shahzad, Muhammad Taqi, Syed Faraz Ul Hassan Shah Gillani, Faisal Masood, Munawar Ali*
Link: https://pubmed.ncbi.nlm.nih.gov/35103139/
Year of Publication: 2021

**Comparing the Efficacy of Intra-articular Platelet-Rich Plasma and Corticosteroid Injections in the Management of Frozen Shoulder: A Randomized Controlled Trial**
Authors: *Tarun Kumar Somisetty, Hariprasad Seenappa, Subhashish Das, Arun H Shanthappa*
Link: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10310540/
Year of Publication: 2023

**Sodium Hyaluronate and Platelet-Rich Plasma for Partial-Thickness Rotator Cuff Tears**
Authors: *Yu Cai, Zhenxing Sun, Bokai Liao, Zhanqiang Song, Ting Xiao, Pengfei Zhu*
Link: https://pmc.ncbi.nlm.nih.gov/articles/PMC6336488/
Year of Publication: 2018

**Platelet-rich plasma injection in the treatment of frozen shoulder: A randomized controlled trial with 6-month follow-up**
Authors: *Junhong Lin*
Link: https://www.ncbi.nlm.nih.gov/pubmed/29932415
Year of Publication: 2018

**Comparison of the therapeutic effects of ultrasound-guided platelet-rich plasma injection and dry needling in rotator cuff disease: a randomized controlled trial**
Authors: *Dong-wook Rha, Gi-Young Park, Yong-Kyun Kim, Min Tae Kim, Sang Chul Lee*
Link: https://www.ncbi.nlm.nih.gov/pubmed/23035005
Year of Publication: 2012

**Effects of platelet-rich plasma injection on pain, range of motion, and disability in adhesive capsulitis: A prospective, randomized-controlled study**
Authors: *Çağlar Karabaş, Havva Talay Çalış, Ulaş Serkan Topaloğlu, Çiğdem Karakükçü*
Link: https://pubmed.ncbi.nlm.nih.gov/35141486/
Year of Publication: 2021

**Effects of Adding Extracorporeal Shockwave Therapy (ESWT) to Platelet-Rich Plasma (PRP) among Patients with Rotator Cuff Partial Tear: A Prospective Randomized Comparative Study**
Authors: *Shu-Jui Kuo, Yu-Hsiang Su, Shih-Chan Hsu, Po-Hua Huang, Chia-Chun Hsia, Chin-Yi Liao, Sung-Hsiung Chen, Re-Wen Wu, Chieh-Cheng Hsu, Yen-Chun Lai, De-Yi Liu, Nien-En Ku, Jui-Feng Chen, Jih-Yang Ko*
Link: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10820784/
Year of Publication: 2024

**Treatment of Subacromial Impingement Syndrome: Platelet-Rich Plasma or Exercise Therapy? A Randomized Controlled Trial**
Authors: *Parisa Nejati, Armita Ghahremaninia, Farrokh Naderi, Safoora Gharibzadeh, Ali Mazaherinezhad*
Link: https://www.ncbi.nlm.nih.gov/pubmed/28567426
Year of Publication: 2017

**Platelet-Rich Plasma Treatment With Physical Therapy in Chronic Partial Supraspinatus Tears**
Authors: Ilker Ilhanli, Necip Guder, Murat Gul
Link: https://www.ncbi.nlm.nih.gov/pubmed/26473076
Year of Publication: 2015

**Effects of platelet-rich plasma and prolotherapy on supraspinatus tendinopathy: a double blind randomized clinical trial**
Authors: Samihah Abd Karim, Mohamad S Hamid, Alston Choong, Mun Y Ooi, Juliana Usman
Link: https://pubmed.ncbi.nlm.nih.gov/37132278/
Year of Publication: 2023

**Platelet-rich plasma in treatment of patients with idiopathic carpal tunnel syndrome**
Authors: Mohammad K Senna, Reham M Shaat, Alaa Ali Awad Ali
Link: https://pubmed.ncbi.nlm.nih.gov/31420812/
Year of Publication: 2019

**Comparison of perineural platelet-rich plasma and dextrose injections for moderate carpal tunnel syndrome: A prospective randomized, single-blind, head-to-head comparative trial**
Authors: *Yu-Ping Shen, Tsung-Ying Li, Yu-Ching Chou, Tsung-Yen Ho, Ming-Jen Ke, Liang-Cheng Chen, Yung-Tsan Wu*
Link: https://www.ncbi.nlm.nih.gov/pubmed/31368191
Year of Publication: 2019

**Six-month efficacy of platelet-rich plasma for carpal tunnel syndrome: A prospective randomized, single-blind controlled trial**
Authors: *Yung-Tsan Wu, Tsung-Yen Ho, Yu-Ching Chou, Ming-Jen Ke, Tsung-Ying Li, Guo-Shu Huang, Liang-Cheng Che*
Link: https://pubmed.ncbi.nlm.nih.gov/28273894/
Year of Publication: 2017

**Platelet-rich plasma ultrasound-guided injection in the treatment of carpal tunnel syndrome: A placebo-controlled clinical study**
Authors: *Michael-Alexander Malahias, Vasileios S Nikolaou, Elizabeth O Johnson, Maria-Kyriaki Kaseta, Sotirios-Tsambikos Kazas, George C Babis*
Link: https://www.ncbi.nlm.nih.gov/pubmed/28873284
Year of Publication: 2017

**ne-Year Efficacy of Platelet-Rich Plasma for Moderate-to-Severe Carpal Tunnel Syndrome: A Prospective, Randomized, Double-Blind, Controlled Trial**
Authors: *Si-Ru Chen, Yu-Ping Shen, Tsung-Yen Ho, Tsung-Ying Li, Yu-Chi Su, Yu-Ching Chou, Liang-Cheng Chen, Yung-Tsan Wu*
Link: https://pubmed.ncbi.nlm.nih.gov/33548206/
Year of Publication: 2021

**Platelet-rich plasma versus lidocaine as tenotomy adjuvants in people with elbow epicondylopathy: a randomized controlled trial**
Authors: *Jose Ignacio Martin, Leire Atilano, Josu Merino, Igor Gonzalez, Gotzon Iglesias, Luis Areizaga, Paola Bully 4, Gonzalo Grandes, Isabel Andia*
Link: https://www.ncbi.nlm.nih.gov/pubmed/31014382
Year of Publication: 2019

**Relationship of cytokine levels and clinical effect on platelet-rich plasma-treated lateral epicondylitis**
Authors: *Wonbong Lim, Sang H Park, Bora Kim, Sin W Kang, Jung W Lee, Young L Moon*
Link: https://www.ncbi.nlm.nih.gov/pubmed/28851099
Year of Publication: 2017

**Efficacy of platelet-rich plasma for chronic tennis elbow: a double-blind, prospective, multicenter, randomized controlled trial of 230 patients**
Authors: *Allan K Mishra, Nebojsa V Skrepnik, Scott G Edwards, Grant L Jones, Steven Sampson, Doug A Vermillion, Matthew L Ramsey, David C Karli, Arthur C Rettig*
Link: https://www.ncbi.nlm.nih.gov/pubmed/23825183
Year of Publication: 2013

**Autologous Platelet-rich Plasma versus Corticosteroid in the Management of Elbow Epicondylitis: A Randomized Study**
Authors: *Ankit Varshney, Rajesh Maheshwari, Anil Juyal, Atul Agrawal, Prabhnoor Hayer*
Link: https://www.ncbi.nlm.nih.gov/pubmed/28584745
Year of Publication: 2017

**[Treatment of elbow epicondylitis with platelet rich plasma versus local corticosteroids]**
Authors: *O Martínez-Montiel, G Valencia-Martinez, P Blanco-Bucio, C Villalobos-Campuzano*
Link: https://www.ncbi.nlm.nih.gov/pubmed/26999966
Year of Publication: 2015

**Effects of platelet-rich plasma on lateral epicondylitis of the elbow: prospective randomized controlled trial**
Authors: *Evandro Pereira Palacio, Rafael Ramos Schiavetti, Maiara Kanematsu, Tiago Moreno Ikeda, Roberto Ryuiti Mizobuchi, José Antônio Galbiatti*
Link: https://www.ncbi.nlm.nih.gov/pubmed/26962506
Year of Publication: 2016

**Comparison of Local Injection of Platelet Rich Plasma and Corticosteroids in the Treatment of Lateral Epicondylitis of Humerus**
Authors: *Raman Yadav, S Y Kothari, Diganta Borah*
Link: https://www.ncbi.nlm.nih.gov/pubmed/26393174
Year of Publication: 2015

**Platelet-rich plasma versus corticosteroid injection for recalcitrant lateral epicondylitis: clinical and ultrasonographic evaluation**
Authors: *V K Gautam, Saurabh Verma, Sahil Batra, Nidhi Bhatnagar, Sumit Arora*
Link: https://www.ncbi.nlm.nih.gov/pubmed/25920633
Year of Publication: 2015

**Ongoing positive effect of platelet-rich plasma versus corticosteroid injection in lateral epicondylitis: a double-blind randomized controlled trial with 2-year follow-up**
Authors: *Taco Gosens, Joost C Peerbooms, Wilbert van Laar, Brenda L den Oudsten*
Link: https://www.ncbi.nlm.nih.gov/pubmed/21422467
Year of Publication: 2021

**Is Ultrasound (US)-Guided Platelet-Rich Plasma Injection More Efficacious as a Treatment Modality for Lateral Elbow Tendinopathy Than US-Guided Steroid Injection?: A Prospective Triple-Blinded Study with Midterm Follow-up**
Authors: *Prashant Kamble, Rudra Mangesh Prabhu, Abhinav Jogani, Shubhranshu S Mohanty, Sameer Panchal, Shubham Dakhode*
Link: https://pubmed.ncbi.nlm.nih.gov/37274509/
Year of Publication: 2022

**Management of Lateral Epicondylitis: A Prospective Comparative Study Comparing the Local Infiltrations of Leucocyte Enriched Platelet-Rich Plasma (L-aPRP), Glucocorticoid and Normal Saline**
Authors: *K K Arora, R Kapila, S Kapila, A Patra, P Chaudhary, A Singal*
Link: https://pubmed.ncbi.nlm.nih.gov/35519524/
Year of Publication: 2022

**Arthroscopic Debridement Versus Platelet-Rich Plasma Injection: A Prospective, Randomized, Comparative Study of Chronic Lateral Epicondylitis With a Nearly 2-Year Follow-Up**
Authors: *Giovanni Merolla, Fabio Dellabiancia, Annamaria Ricci, Maria Pia Mussoni, Simonetta Nucci, Gustavo Zanoli, Paolo Paladini, Giuseppe Porcellini*
Link: https://www.ncbi.nlm.nih.gov/pubmed/28433443
Year of Publication: 2017

**Is Platelet-rich plasma superior to whole blood in the management of chronic tennis elbow: one year randomized clinical trial**
Authors: *Seyed Ahmad Raeissadat, Seyed Mansoor Rayegani, Hossein Hassanabadi, Rosa Rahimi, Leyla Sedighipour, Khalil Rostami*
Link: https://www.ncbi.nlm.nih.gov/pubmed/24635909
Year of Publication: 2014

**Platelet-rich plasma versus autologous whole blood for the treatment of chronic lateral elbow epicondylitis: a randomized controlled clinical trial**
Authors: *Christos Thanasas, George Papadimitriou, Charalambos Charalambidis, Ilias Paraskevopoulos, Athanasios Papanikolaou*
Link: https://www.ncbi.nlm.nih.gov/pubmed/21813443
Year of Publication: 2011

**Comparison of efficacy of ultrasound-guided platelet rich plasma injection versus dry needling in lateral epicondylitis-a randomised controlled trial**
Authors: G K Sharma, A Patil, P Kaur, S Rajesh, Elena Drakonaki, Rajesh Botchu
Link: https://pubmed.ncbi.nlm.nih.gov/38393452/
Year of Publication: 2024

**Lumbar Intradiskal Platelet-Rich Plasma (PRP) Injections: A Prospective, Double-Blind, Randomized Controlled Study**
Authors: *Yetsa A Tuakli-Wosornu, Alon Terry, Kwadwo Boachie-Adjei, Julian R Harrison, Caitlin K Gribbin, Elizabeth E LaSalle, Joseph T Nguyen, Jennifer L Solomon 8, Gregory E Lutz*
Link: https://pubmed.ncbi.nlm.nih.gov/26314234/
Year of Publication: 2015

**The role of intra-articular injection of autologous platelet-rich plasma versus corticosteroids in the treatment of synovitis in lumbar facet joint disease**
Authors: *Shahdan Y Kotb, Nahed M Sherif, Hala A Saleh, Sahar F Ahmed, Hossam M Sakr, Mohamed O Taeimah*
Link: https://pubmed.ncbi.nlm.nih.gov/36379530/
Year of Publication: 2022

**A Prospective Study Comparing Platelet-Rich Plasma and Local Anesthetic (LA)/Corticosteroid in Intra-Articular Injection for the Treatment of Lumbar Facet Joint Syndrome**
Authors: *Jiuping Wu, Jingjing Zhou, Chibing Liu, Jun Zhang, Wei Xiong, Yang Lv, Rui Liu, Ruiqiang Wang, Zhenwu Du, Guizhen Zhang, Qinyi Liu*
Link: https://pubmed.ncbi.nlm.nih.gov/27989008/
Year of Publication: 2017

**"Platelet-Rich Plasma" epidural injection an emerging strategy in lumbar disc herniation: a Randomized Controlled Trial**
Authors: *Asarn Wongjarupong, Saran Pairuchvej, Panyajarn Laohapornsvan, Vit Kotheeranurak, Khanathip Jitpakdee, Chunrutai Yeekian, Pongsthorn Chanplakorn*
Link: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10141936/
Year of Publication: 2023

**Transforaminal Injections of Platelet-Rich Plasma Compared with Steroid in Lumbar radiculopathy: A Prospective, Double-Blind Randomized Study**
Authors: *Amit Saraf, Altaf Hussain, Angad Singh Sandhu, Sandeep Bishnoi, Vaneet Arora*
Link: https://pubmed.ncbi.nlm.nih.gov/37384009/
Year of Publication: 2023

**Lumbar Transforaminal Injection of Steroids versus Platelet-Rich Plasma for Prolapse Lumbar Intervertebral Disc with Radiculopathy: A Randomized Double-Blind Controlled Pilot Study**
Authors: *Anuj Gupta, Harvinder Singh Chhabra, Vishwajeet Singh, Daram Nagarjuna*
Link: https://pubmed.ncbi.nlm.nih.gov/38433432/
Year of Publication: 2024

**The Safety and Effectiveness of Orthobiologic Injections for Discogenic Chronic Low Back Pain: A Multicenter Prospective, Crossover, Randomized Controlled Trial with 12 Months Follow-up**
Authors: *Annu Navani, Mary Ambach, Aaron Calodney, Richard Rosenthal, Gang Li, Christine Brown Mahoney, Peter A Everts*
Link: https://pubmed.ncbi.nlm.nih.gov/38285032/
Year of Publication: 2024

**Steroid vs. Platelet-Rich Plasma in Ultrasound-Guided Sacroiliac Joint Injection for Chronic Low Back Pain**
Authors: *Varun Singla, Yatindra K Batra, Neerja Bharti, Vijay G Goni, Neelam Marwaha*
Link: https://pubmed.ncbi.nlm.nih.gov/27677100/
Year of Publication: 2016

**Effect of High-Volume Injection, Platelet-Rich Plasma, and Sham Treatment in Chronic Midportion Achilles Tendinopathy: A Randomized Double-Blinded Prospective Study**
Authors: *Anders Ploug Boesen, Rudi Hansen, Morten Ilum Boesen, Peter Malliaras, Henning Langberg*
Link: https://www.ncbi.nlm.nih.gov/pubmed/28530451
Year of Publication: 2017

**Effect of platelet-rich plasma on healing tissues in acute ruptured Achilles tendon: a human immunohistochemistry study**
Authors: *Joseph Alsousou, Mark Thompson, Paul Harrison, Keith Willett, Sarah Franklin*
Link: https://www.ncbi.nlm.nih.gov/pubmed/26312841
Year of Publication: 2015

**Comparison of Platelet-Rich Plasma and Corticosteroid Injections for Chronic Plantar Fasciitis: A Randomized Controlled Trial**
Authors: *Krishan Kumar, Vikas Rao, Amrit Panda, Sathyendra K G, Harshvardhan Buddhist*
Link: https://pubmed.ncbi.nlm.nih.gov/38836136/
Year of Publication: 2024

**Prediction of clinical response to corticosteroid or platelet-rich plasma injection in plantar fasciitis with MRI: A prospective, randomized, double-blinded study**
Authors: *Arnaud Breton, Christophe Leplat, Marie-Christine Picot, Safa Aouinti, Patrice Taourel, Isabelle Laffont, Marc Julia, Catherine Cyteval*
Link: https://pubmed.ncbi.nlm.nih.gov/34844893/
Year of Publication: 2022

**Comparison of midterm results of Platelet Rich Plasma (PRP) versus Steroid for plantar fasciitis: A randomized control trial of 118 patients**
Authors: *Ankit Khurana, Vaneet Dhankhar, Navneet Goel, Rishi Gupta, Ashish Goyal*
Link: https://pubmed.ncbi.nlm.nih.gov/33717869/
Year of Publication: 2021

**Is Platelet-rich Plasma Injection more Effective than Steroid Injection in the Treatment of Chronic Plantar Fasciitis in Achieving Long-term Relief?**
Authors: *P Soraganvi, K V Nagakiran, R P Raghavendra-Raju, D Anilkumar, S Wooly, B D Basti, P Janakiraman*
Link: https://pubmed.ncbi.nlm.nih.gov/31890104/
Year of Publication: 2019

**Positive Effect of Platelet-Rich Plasma on Pain in Plantar Fasciitis: A Double-Blind Multicenter Randomized Controlled Trial**
Authors: *Joost C Peerbooms, Paul Lodder, Brenda L den Oudsten, Kamiel Doorgeest, Hans M Schuller, Taco Gosens*
Link: https://pubmed.ncbi.nlm.nih.gov/31603721/
Year of Publication: 2019

**Comparison of Plantar Fasciitis Injected With Platelet-Rich Plasma vs Corticosteroids**
Authors: *Sumit Kumar Jain, Kumar Suprashant, Sanjeev Kumar, Arun Yadav, Stephen R Kearns*
Link: https://pubmed.ncbi.nlm.nih.gov/29600719/
Year of Publication: 2018

**Beneficial effects of platelet-rich plasma on improvement of pain severity and physical disability in patients with plantar fasciitis: A randomized trial**
Authors: *Babak Vahdatpour, Lida Kianimehr, Ahmad Moradi, Shila Haghighat*
Link: https://pubmed.ncbi.nlm.nih.gov/28028519/
Year of Publication: 2016

**Responsible, Safe, and Effective Use of Biologics in the Management of Low Back Pain: American Society of Interventional Pain Physicians (ASIPP) Guidelines**
Authors: *Annu Navani, Laxmaiah Manchikanti, Sheri L Albers, Richard E Latchaw, Jaya Sanapati, Alan D Kaye, Sairam Atluri, Sheldon Jordan, Ashim Gupta, David Cedeno, Alejandro Vallejo, Bert Fellows, Nebojsa Nick Knezevic, Miguel Pappolla, Sudhir Diwan, Andrea M Trescot, Amol Soin, Adam M Kaye, Steve M Aydin, Aaron K Calodney, Kenneth D Candido, Sanjay Bakshi, Ramsin M Benyamin, Ricardo Vallejo, Art Watanabe, Douglas Beall, Todd P Stitik, Patrick M Foye, Erik M Helander, Joshua A Hirsch*
Link: https://pubmed.ncbi.nlm.nih.gov/30717500/
Year of Publication: 2019

**Plantar Fasciitis-A Comparison of Treatment with Intralesional Steroids versus Platelet-Rich Plasma A Randomized, Blinded Study**
Authors: *Carlos Acosta-Olivo, Jorge Elizondo-Rodriguez, Ricardo Lopez-Cavazos, Felix Vilchez-Cavazos, Mario Simental-Mendia, Oscar Mendoza-Lemus*
Link: https://pubmed.ncbi.nlm.nih.gov/27726423/
Year of Publication: 2016

**Botulinum toxin A versus platelet rich plasma ultrasound-guided injection in the treatment of plantar fasciitis: A randomised controlled trial**
Authors: *Isabel M Ruiz-Hernández, Javier Gascó-Adrien, Carmen Buen-Ruiz, Laura Perelló-Moreno, Carmen Tornero-Prieto, Gonzalo Barrantes-Delgado, Mireia García-Gutiérrez, J M Rapariz-González, S Tejada-Gavela*
Link: https://pubmed.ncbi.nlm.nih.gov/37949704/
Year of Publication: 2023

**Extracorporeal Shockwave Therapy Versus Platelet Rich Plasma Injection in Patients of Chronic Plantar Fasciitis: A Randomized Controlled Trial From a Tertiary Center of Eastern India**
Authors: *Sanjay Pandey, Niraj Kumar, Anjani Kumar, Anurug Biswas, Upasna Sinha, Jyoti Pandey, Srutarshi Ghosh, Subha Das, Renu A Johnson, Ranjeet Kumar, Anjusha E V, Kalyani Kumari*
Link: https://pubmed.ncbi.nlm.nih.gov/36874677/
Year of Publication: 2023

**Comparison of Platelet-Rich Plasma Treatment and Partial Plantar Fasciotomy Surgery in Patients with Chronic Plantar Fasciitis: A Randomized, Prospective Study**
Authors: *Ran Atzmon, Dynai Eilig, Jeremy Dubin, Matias Vidra, Omer Marom, Alex Tavdi, Michael Drexler, Esequiel Palmanovich*
Link: https://pubmed.ncbi.nlm.nih.gov/36498561/
Year of Publication: 2022

**Regenerative efficacy of therapeutic quality platelet-rich plasma injections versus phonophoresis with kinesiotaping for the treatment of chronic plantar fasciitis: A prospective randomized pilot study**
Authors: *Nitesh Gonnade, Archana Bajpayee, Abhay Elhence, Vaibhav Lokhande, Neeraj Mehta, Manish Mishra, Arunpreet Kaur*
Link: https://pubmed.ncbi.nlm.nih.gov/30692793/
Year of Publication: 2018

**Similar effect of ultrasound-guided platelet-rich plasma versus platelet-poor plasma injections for chronic plantar fasciitis**
Authors: *Michael-Alexander Malahias, Andreas F Mavrogenis, Vasilios S Nikolaou, Panayiotis D Megaloikonomos, Stamatios T Kazas, Efstathios Chronopoulos, George C Babis*
Link: https://pubmed.ncbi.nlm.nih.gov/30572281/
Year of Publication: 2018

**Platelet-Rich Plasma Has Better Long-Term Results Than Corticosteroids or Placebo for Chronic Plantar Fasciitis: Randomized Control Trial**
Authors: *Sunil H Shetty, Amit Dhond, Manit Arora, Sandeep Deore*
Link: https://pubmed.ncbi.nlm.nih.gov/30448183/
Year of Publication: 2018

**Effectiveness of Four Different Treatment Modalities in the Treatment of Chronic Plantar Fasciitis During a 36-Month Follow-Up Period: A Randomized Controlled Trial**
Authors: Meri奔 U臒urlar, Mesut Mehmet S枚nmez, 脰zge Yap谋c谋 U臒urlar, Levent Ad谋yeke, Hakk谋 Y谋ld谋r谋m, Osman Tu臒rul Eren
Link: https://pubmed.ncbi.nlm.nih.gov/30149850/
Year of Publication: 2018

**Platelet-Rich Plasma Has Better Long-Term Results Than Corticosteroids or Placebo for Chronic Plantar Fasciitis: Randomized Control Trial**
Authors: *Sunil H Shetty, Amit Dhond, Manit Arora, Sandeep Deore*
Link: https://pubmed.ncbi.nlm.nih.gov/26913766/
Year of Publication: 2019

**Autologous platelet-rich plasma compared with whole blood for the treatment of chronic plantar fasciitis; a comparative clinical trial**
Authors: *Babak Vahdatpour, Lida Kianimehr, Mohmmad Hossein Ahrar*
Link: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4879850/
Year of Publication: 2016

**Core Methodology:**
*Dhurat R, Sukesh M.* Principles and Methods of Preparation of Platelet-Rich Plasma. J Cutan Aesthet Surg. 2014.
Magalon J, et al. Platelet-rich Plasma: Formulations, Preparations, Constituents. J Biomed Sci. 2021.

**Optimization Studies:**
Cavallo C, et al. Platelet-rich plasma preparation for regenerative medicine. Stem Cell Rev Rep. 2020 (PMC); Bausset O, et al. Low-cost protocol for PRP preparation. J Orthop Res. 2014.

**Clinical Validation:**
Ehrenfest DMD, et al. Classification of platelet concentrates. Oral Surg Oral Med Oral Pathol. 2009


2025
ReGen
1-3 AUGUST > > CHENNAI
www.regenindia.com
Knowledge Partner
Orthobiologix Clinic
Regenerative Treatments for Joint Pains