

# Platelet Rich Plasma (PRP)

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## Platelet-Rich Plasma (PRP) Injections: Overview and Applications

### Clinical Applications

PRP injections are increasingly utilized in orthopedics, pain management, aesthetic dermatology, and reconstructive surgery. Derived from the patient's own blood, PRP aims to enhance tissue repair by delivering the patient's own concentrated growth factors directly to the site of injury or arthritis.

### Mechanism of Action

PRP consists of plasma enriched with a high concentration of platelets, which release growth factors (e.g., PDGF, TGF- $\beta$ , VEGF) that modulate inflammation, angiogenesis, and cellular proliferation. The preparation involves centrifugation of the patient's blood to isolate and concentrate platelets.

### Procedure

The Arthrex ACP Max System is a closed, double-syringe platelet-rich plasma (PRP) preparation system that uses a two-spin centrifugation process to produce a high-quality, leukocyte-poor PRP.

Initially, 90cc of the patient's blood is drawn into the sterile dual-syringe device. This ensures an adequate volume for optimal platelet concentration. The device maintains a closed, sterile environment throughout the process.

The blood sample first undergoes a soft spin centrifugation (typically 9 minutes at 3,200 RPM), separating it into three layers: platelet-poor plasma (PPP), platelet-rich plasma (PRP), and red blood cells (RBCs) with the buffy coat. The PRP layer is carefully aspirated, ensuring minimal leukocyte and RBC contamination.

The collected PRP then undergoes a second spin (usually 5 minutes at 1,500 RPM) to further concentrate the platelets. After discarding excess PPP, the platelet pellet is resuspended in plasma, resulting in a final product with up to an 11x concentration of platelets.

This PRP is then injected into the target tissue such as arthritic joints and inflamed tendons, typically under ultrasound guidance to enhance precision. The dual-spin method and fluid separation optimize platelet yield and minimize inflammatory cell content, enhancing the regenerative and anti-inflammatory potential of the PRP for tissue healing and cellular activity enhancement.

### Therapeutic Indications

- **Orthopedic Injuries:** Arthritis and joint degeneration, chronic tendinopathies (e.g., tennis elbow or rotator cuff pathology), muscle strains, and ligament injuries.
- **Before and After Surgery:** Facilitates soft tissue and musculoskeletal healing.
- **Osteoarthritis:** May reduce synovial inflammation and pain and improve function.
- **Hair Restoration:** Stimulates hair follicles in androgenic alopecia; supports post-

transplant regrowth.

- **Cosmetic Use:** Employed in facial rejuvenation

### **Efficacy Timeline**

Clinical effects manifest gradually and may take up to 6 weeks for joints and up to six months for scalp applications. Repeat injections are often necessary.

### **Safety Profile**

PRP is generally well-tolerated due to its autologous nature. Common side effects include localized pain, swelling, and bruising. Rare complications include infection, nerve injury, bleeding, or tissue damage.

### **Pre-Procedure Guidelines**

Patients should be well-hydrated and consume a meal before the procedure to reduce the risk of lightheadedness during the blood draw. Discontinue all anti-inflammatory medications at least 5 days prior. Corticosteroids should be avoided for a minimum of 14 days, as they may impair platelet activity and compromise PRP effectiveness.

### **Post-Procedure Guidelines**

Transient soreness, swelling, or bruising at the injection site is common and typically resolves without intervention. Heat may be used to relieve discomfort. Tylenol may be used if needed. Avoid vigorous activity and refrain from using anti-inflammatory agents, including NSAIDs, for 5 days post-procedure to preserve the regenerative potential of PRP. Follow-up is recommended to assess therapeutic response and determine the need for further treatment.

**Contact a Key West orthopedic clinic or reach out to Dr. Jason Pirozzolo.**