PRP & Stem Cell Therapy

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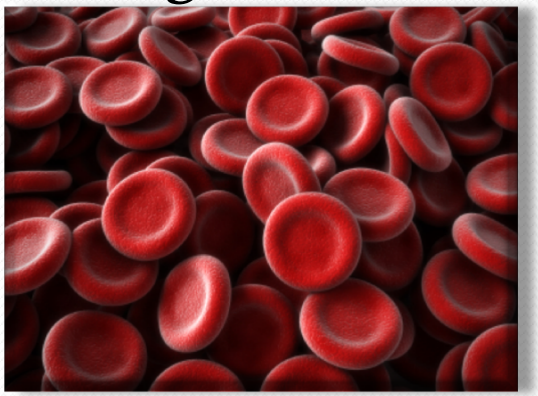
DEUK SPINE INSTITUTE

What is PRP?

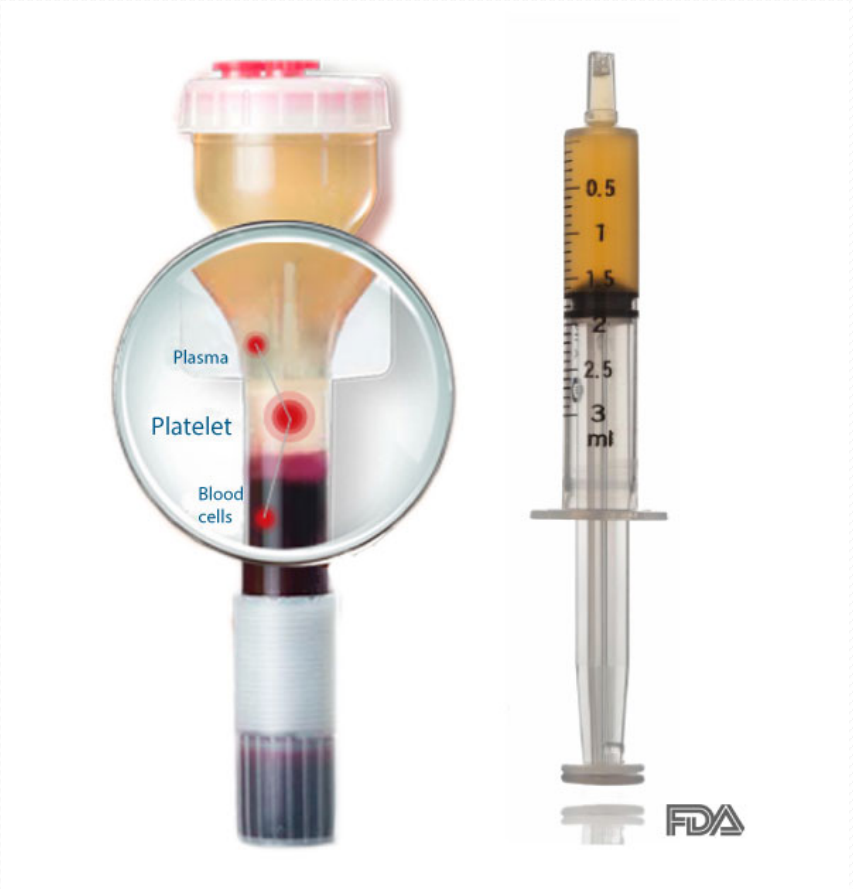
- Platelet-rich plasma is autologous (your body's own) blood plasma with concentrated platelets. Typical concentrations in PRP are 5-10 times that found in blood.

- Platelets are small disk-shaped cell within your blood that contain natural sources of growth factors, proteins and cytokines that **stimulate the healing of bone and soft tissues**.

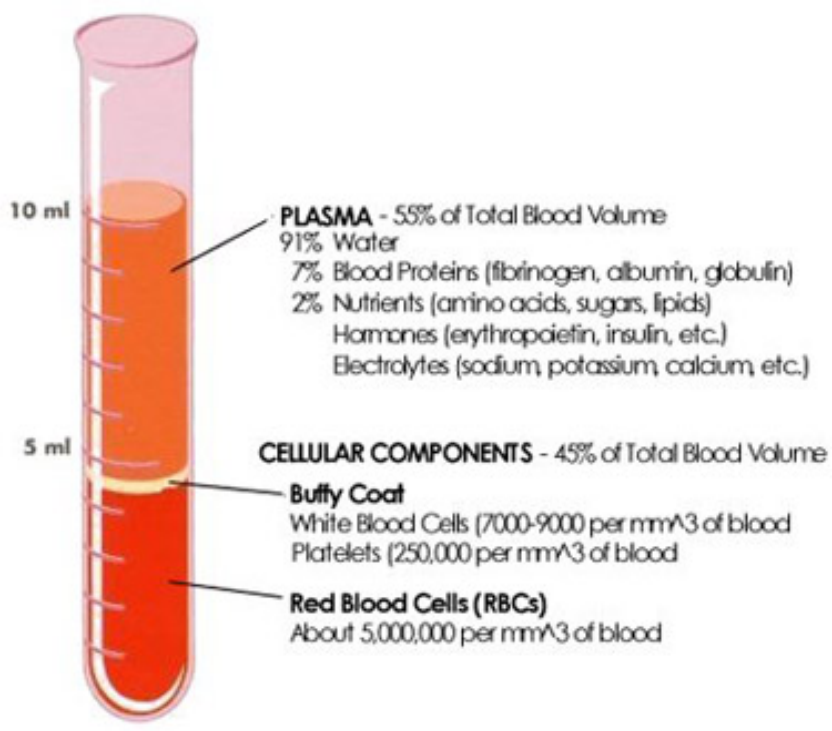


PRP injections

- Platelet Rich Plasma (PRP) injections are an emerging treatment for musculoskeletal injuries and joint arthritis.
- PRP is a method of concentrating platelets from your own blood which contain healing cells such as growth factors, stem cell signaling markers, and white blood cells.
- These cells are vital for tissue repair and regeneration.
- The PRP is then injected directly into an injured area or arthritic joint to help repair and rebuild the damaged tissue.
- This accelerated healing process **reduces pain, promotes increased tissue strength, and improves overall function**.



What is PRP Therapy?



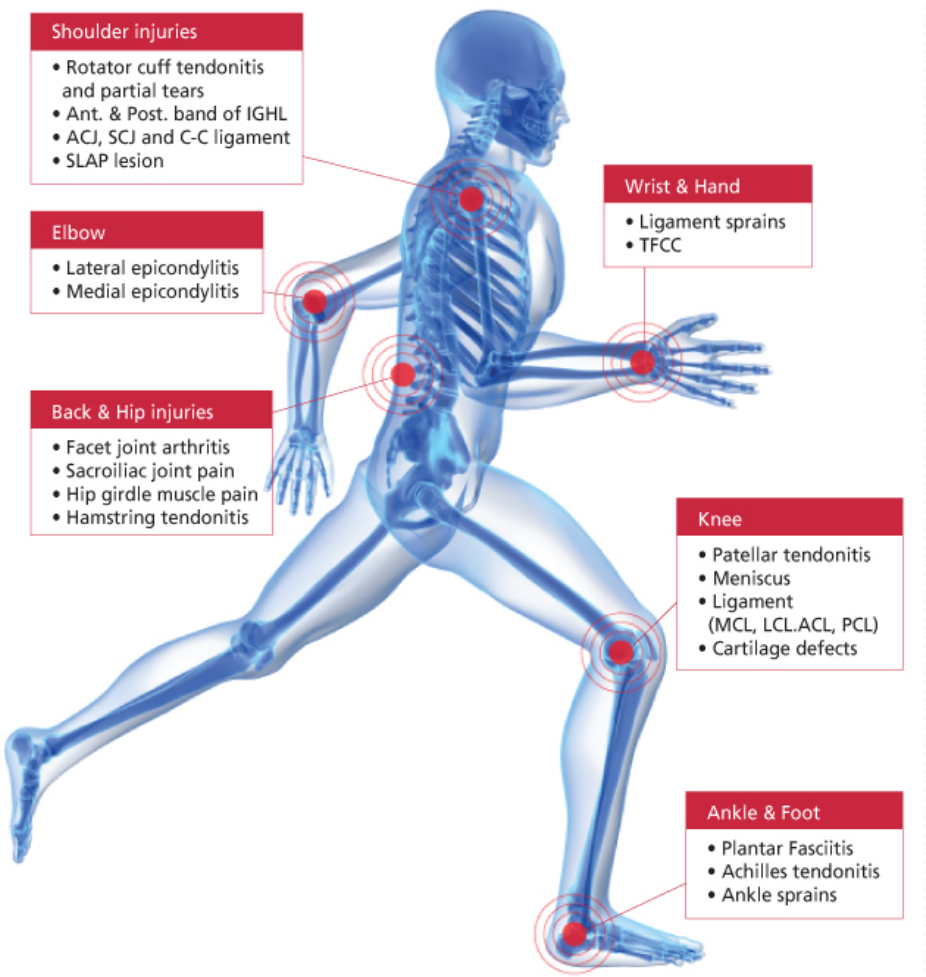
What is PRP therapy?

- PRP injection therapy is a highly-effective, non-surgical treatment that uses your body's platelets to optimize the healing process in knee, ankle, foot, hip, hand, wrist, back, neck, elbow, and shoulder injuries as well as osteoarthritis.

What conditions does PRP treat?

- **Osteoarthritis of Joints**
  - Knee
  - Hip
  - Shoulder
  - Elbow
- **Tendon and Sports Injuries**
  - Achilles tendon
  - Rotator cuff tendons
  - Biceps tendon
  - Tennis elbow
  - Golfer's elbow
  - Patellar tendon
  - Shoulder bursitis
  - Hip tendons/bursitis
  - Plantar fasciitis
- **Sacroiliac Joint pain/dysfunction**

Conditions Treated by PRP



How does it work?

Platelets play a central role in blood clotting and wound healing.

Tissue repair begins with clot formation and platelet degranulation, which release the growth factors necessary for wound repair.

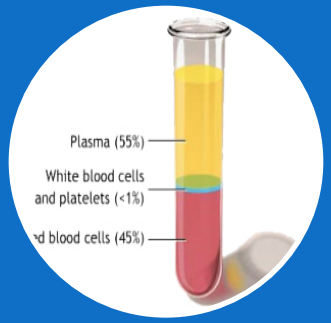
Platelet-derived growth factors are biologically active substances that enhance tissue repair mechanisms.

How does PRP work?

- Studies have shown that the increased concentration of growth factors in PRP can potentially speed up the healing process
- PRP can be carefully injected into the injured area.
  - For example, a mixture of PRP and local anesthetic can be injected directly into inflamed tissue of a joint. Afterwards, the pain at the area of injection may actually increase for the first week or two, and it may be several weeks before the patient feels a beneficial effect.

How does the procedure work?

The growth factors are obtained directly from the patient's own blood. The blood is then spun in a centrifuge to separate the red cells, serum and buffy coat.

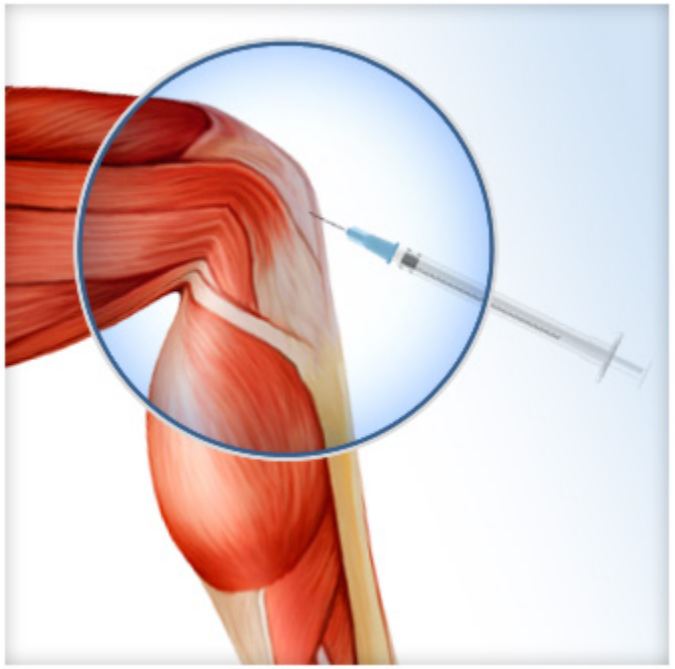


The buffy coat contains both platelets and white bloods cells.

Under the guidance of ultrasound or a fluoroscopy unit, the doctor injects the PRP into the desired area.

How is the PRP injection performed?

- PRP therapy is a simple procedure that is performed in the office setting with little risk because the PRP is from your own blood.
- First a small sample of the patient's blood is taken and concentrated in a centrifuge machine in a two-step process that eliminates red blood cells and neutrophils.
- The remaining plasma portion contains a high concentration of platelets up to 8 times that of whole blood.
- The PRP is then precisely injected into the injured tissue using ultrasound guidance.
- The PRP therapy accelerates the body's natural healing process leading to a faster and more efficient restoration of the injured tissue to a healthy state.



Treatment Options

- Rest from physical activity
- Physical therapy
- Pain medication and anti-inflammatories
- Surgery

In contrast to the above treatment options, PRP can:

- Shorten your time away from physical activity
- Reduce necessary amounts of pain medications
- Help avoid invasive treatment with long recovery times, or speed up recovery.

What to expect after PRP?

- It is normal to feel very sore for up to several days after a PRP injection.
- For the first 48 hours you should rest the area and use as tolerated.
- For the next two weeks, you should perform light stretching and range of motion exercises.
- Two weeks after the injection, you should begin strengthening exercises under the direction of your health care team and/or physical therapist.
- Maximum results are achieved after 8-12 weeks.
  - May require additional treatments

Is PRP effective?

- Studies comparing both steroid injections and PRP therapy for tennis elbow determine in the short term, steroid injections were better.
- However, PRP therapy patients progressively improved and had better pain relief and function **long-term**.

Who uses PRP?

- Many famous athletes — Tiger Woods, tennis star Rafael Nadal, and several others — have received PRP for various problems, such as sprained knees and chronic tendon injuries.
- These types of conditions have typically been treated with medications, physical therapy, or even surgery. Some athletes have credited PRP with their being able to return more quickly to competition.

Am I a candidate?

- Patients who have:
  - Acute injuries
  - Chronic injuries
  - Osteoarthritis
  - Failed other conservative treatments

What is Stem Cell Therapy?

Stem cells help to create new cells in existing healthy tissues and may help to repair tissues in those structures that are injured or

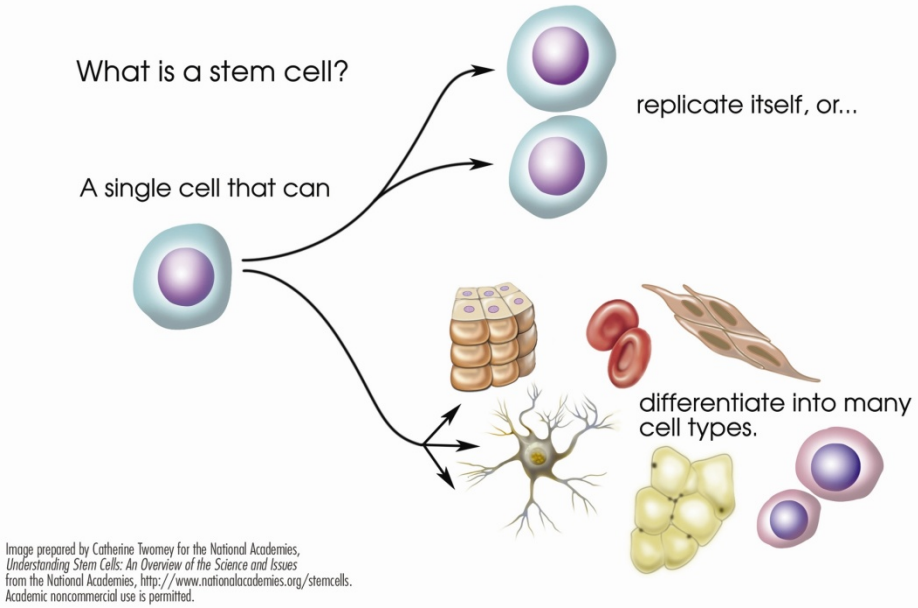


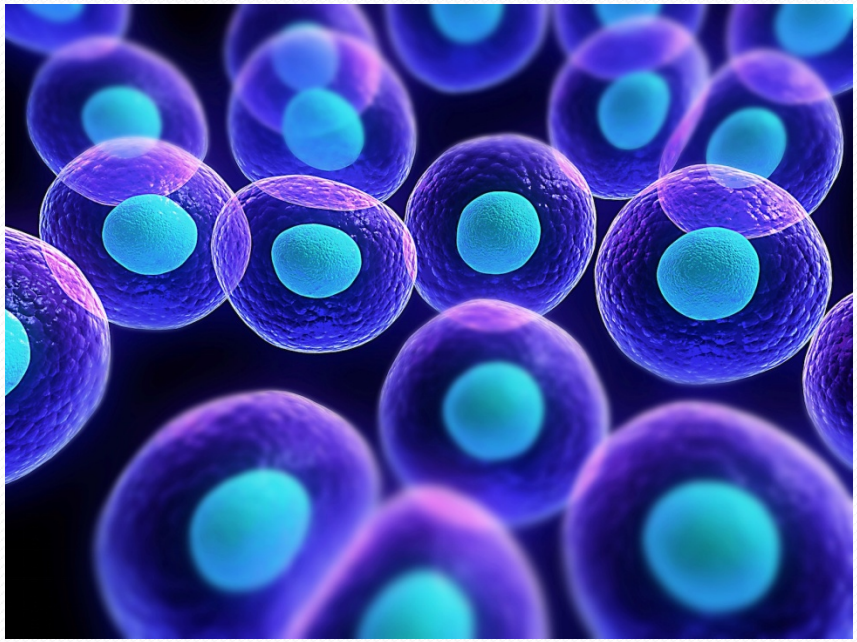
Image prepared by Catherine Twomey for the National Academies, *Understanding Stem Cells: An Overview of the Science and Issues* from the National Academies, http://www.nationalacademies.org/stemcells. Academic noncommercial use is permitted.

Stem Cells

- **Self renewal**
  - the ability to reproduce itself indefinitely through mitotic cell division while maintaining an undifferentiated state
- **Potency**
  - The ability to differentiate into specialized cells of distinctly different cell types

Types of Stem Cells

- 3 types
  - Embryonic stem cells
  - Induced pluripotent stell cells
  - Adult stem cells
    - Mesenchymal stem cells



Adult Stem Cells

- What we use
  - Adult stem cells
    - Autologous source- bone marrow; adipose
    - Found in all tissues and organs of the body
    - They function to repair/restore damaged tissue
    - Retain ability to divide while maintaining undifferentiated state
    - All stem cells exhibit plasticty, which means that they are easily influenced by their environment
      - Inference- it does not matter where they originate but where they end up because that dictates what cell type they differentiate into

What can Stem Cells treat?

- **Osteoarthritis of Joints**
  - Knee
  - Hip
  - Shoulder
  - Elbow
- **Tendon and Sports Injuries**
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  - Shoulder bursitis
  - Hip tendons/bursitis
  - Plantar fasciitis
- **Sacroiliac Joint pain/dysfunction**
- **Facet Joints**
- **Degenerative/Abnormal spinal discs**

How do Stem Cells work?

- Stem cell treatment is designed to target areas within the joints to help with the creation of new cartilage cells.
- As mesenchymal stem cells are multipotent they have the ability to differentiate into cartilage called (chondrytes).
- The goal of each stem cell treatment is to inject the stem cells into the joint to create cartilage (chondryte cells).
- Stem cells are also natural anti-inflammatories which can assist with osteoarthritis pain and swelling in the joint area.

How does stem cell therapy work?

- Bone marrow is harvested (5-10 minutes)
- BMA is concentrated through centrifugation utilizing a specialized device (14 minutes)
- BMAC is isolated from the rest of the marrow components (2 minutes)
- BMAC in injected into or applied to a predefined location for a specific purpose (less than 5 minutes)

- TOTAL procedure time- 30 minutes

What to expect after stem cell therapy?

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Who is a candidate for Stem Cells?

- Patients who have:
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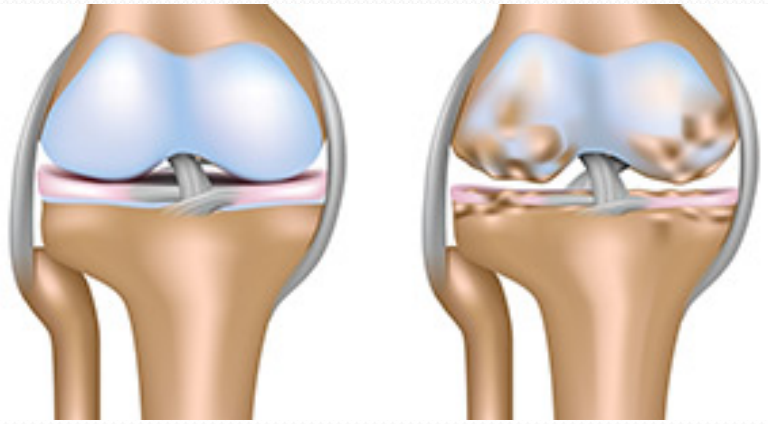
  - Chronic injuries
  - Osteoarthritis
  - Failed other conservative treatments



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