

A special advertising section

# Regenerative medicine in your practice

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For The Education Center

**P**latelet rich plasma (PRP) is a regenerative medicine therapy that is believed to aid in tissue healing, and has become increasingly popular in both human and veterinary medicine to treat multiple disease processes.

While PRP's first clinical applications were limited to dentistry and maxillofacial surgery to improve bone healing, PRP presently has much broader clinical applications, extending to orthopedic surgery and sports medicine.

Recent studies have shown PRP to be efficacious in managing numerous orthopedic conditions, including osteoarthritis, chronic tendinopathies, acute soft tissue injuries, anterior cruciate ligament reconstruction, ro-

lage breakdown that is associated with osteoarthritis.

In addition to their healing properties, platelets have also been shown to recruit and activate stem cells.

PRP is a self-derived fluid concentrate composed primarily of platelets and their growth factors. PRP is prepared by using a sample the patient's own blood, which is then mixed with an anticoagulant and processed either manually by spinning it in a centrifuge to separate its components (centrifugation) or through an automated system.

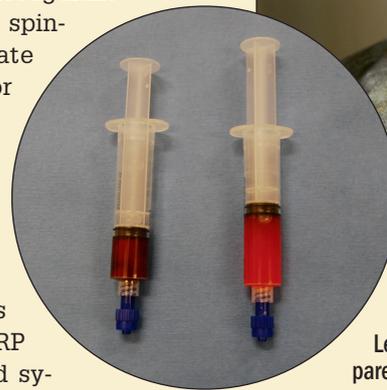
The goal in PRP isolation is to obtain the highest concentration of platelets and growth factors while removing other components of the blood such as the red and white blood cells. Studies show that red blood cells in the PRP product can damage cartilage and synovium, increase inflammation, and cause discomfort, while white blood cells in the PRP product have been shown to degrade collagen and cause inflammation.

PRP therapy is often performed as a series of one to three injections, with two weeks between each injection. It is a minimally invasive procedure that can typically be performed on an outpatient basis. Non-steroidal anti-inflammatory medication and steroids are avoided during the post-injection period, and a dedicated rehabilitation therapy program is often recommended for eight to 12 weeks after injection, depending on the diagnosed condition.

Many commercial systems are available to concen-

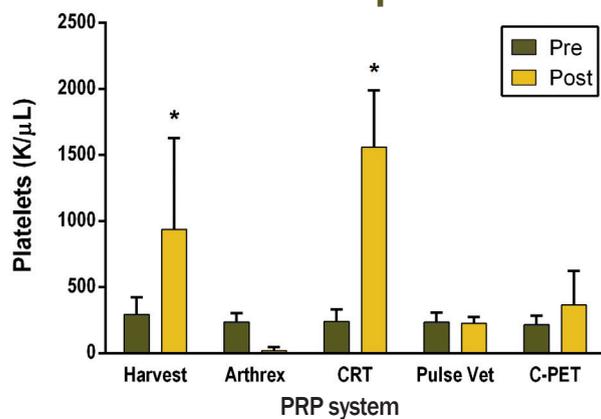


Above: highly concentrated PRP (isolated using the CRT system) is directly injected into the joint space.

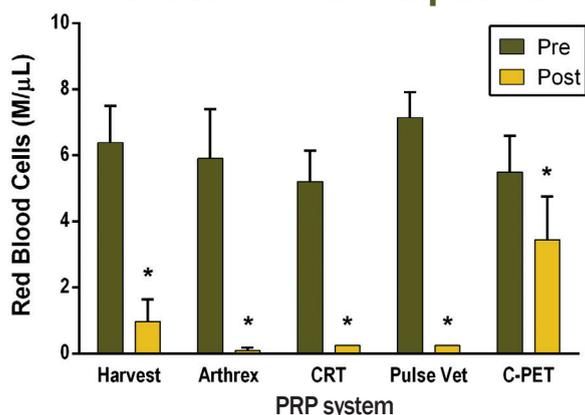


Left: BMAC Stem cell, left, and PRP, right, isolates in prepared syringes ready for injection

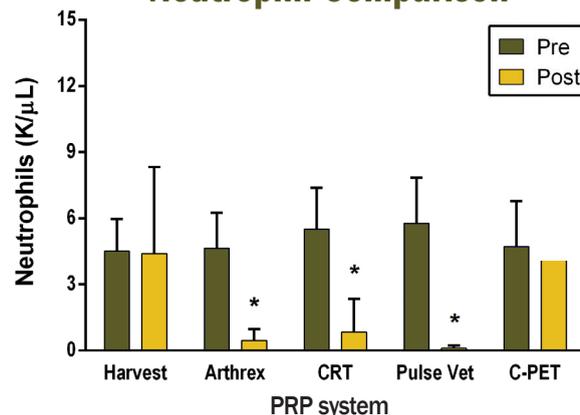
## Platelet Comparison



## Red Blood Cell Comparison



## Neutrophil Comparison



tator cuff repair, and Achilles tendon repair.<sup>1</sup>

Platelets are cells that circulate in the bloodstream and play roles in both blood clotting and wound healing. Platelets contain two types of granules.

The first type increases permeability of blood vessels to allow inflammatory cells to access the site of damage and aid in blood clot formation. The second type of granule releases growth factors that stimulate other cells to migrate to the area of trauma, thus facilitating tissue healing.

It is the growth factors contained within the platelets that are of significance for tissue healing. Many of these growth factors have been shown in recent studies to promote cartilage health and counteract carti-

trate platelets. When choosing a system, it is important to use one that has been validated for canine use, with the proven ability to concentrate platelets at least five- to sevenfold, remove red blood cells and significantly decrease white blood cells.

A prospective study was performed at Veterinary Orthopedic and Sports Medicine Group (VOSM) to determine which system achieves the highest platelet concentration with very few red and white blood cells. The study results showed that the Companion Regenerative Therapies (CRT) Pure PRP system yielded a product with a platelet concentration of seven to 10 times above normal and very few red and white blood cells.

The system used at VOSM, the

CRT PurePRP®, has a high concentration of platelets and growth factors that amplify the healing process properties.

In addition to isolating a high quality PRP sample, this system can also isolate and concentrate bone marrow-derived stem cells. Studies have shown that bone marrow-derived stem cells can regenerate and heal injured tissue, supply growth factors, enhance tissue architecture, decrease inflammation, activate resident stem cells and contribute to healing.

Furthermore, studies have also shown that PRP combined with stem cells can be advantageous by allowing the PRP to aid in stem cell recruitment, activation and scaffolding. This combination therapy has been used to manage numerous orthopedic conditions, including osteoarthritis and soft tissue injuries.

VOSM uses the Bone Marrow Concentrate (BMC) system, provided by CRT, to obtain and isolate stem cells from the patient's bone marrow. In select patients, the BMC and PurePRP® isolates are combined to deliver a synergistic effect and amplify the healing process.

Consideration should be given as to when to administer PRP alone or in combination with stem cell therapy. The biology of healing is complex and has many stages, and a combination of the therapies may be more beneficial in some tissues over others. Timing of their application is crucial and should be carefully considered when deciding on a patient's treatment plan. ●

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For additional information about platelet rich plasma and bone marrow concentrate, or for references cited in this article, contact Heather Weir at heatherw@companiontherapy.com