

Clinical Minute: Platelet Rich Plasma

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Introduction

The use of regenerative medicine has become increasingly popular in both human and veterinary medicine for multiple disease processes. Platelet rich plasma (PRP) is a regenerative medicine therapy that is believed to aid in tissue healing. 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. PRP is currently used in both people and animals to help with healing in numerous tissues. Recent studies have shown PRP to be efficacious in managing numerous orthopedic conditions, including osteoarthritis and soft tissue injuries (tendon and ligament injuries).

What is Platelet Rich Plasma (PRP)?

Platelets are cells that circulate in the blood stream and play roles in both hemostasis (clotting of blood) and wound healing. Platelets contain two types of granules. The first type increases permeability of blood vessels to allow for access of inflammatory cells to the site of damage and contributes to blood clot formation. The second type of granule releases growth factors that stimulate other cells of the body 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. These growth factors include platelet-derived growth factor (PDGF), transforming growth factor- β 1 (TGF- β 1), transforming growth factor- β 2 (TGF- β 2), vascular endothelial growth factor (VEGF), basic

fibroblastic growth factor (bFGF), and epidermal growth factor (EGF). Many of these growth factors have been shown in recent studies to promote cartilage health and counteract the cartilage breakdown that is associated with osteoarthritis. Platelets have also been shown to recruit and activate stem cells.

Platelet rich plasma (PRP) is an autogenous (self derived) fluid concentrate composed primarily of platelets and growth factors. On average dogs have 200,000 to 500,000 platelets per microliter. Platelet rich plasma (PRP) is made by processing a patient's own blood sample. The goal is to obtain the highest concentration of platelets and growth factors, while removing the other components of the blood such as the red and white blood cells, which can cause pain and inflammation. To make PRP, a sample of blood is obtained from the patient, mixed with an anticoagulant, and processed either manually by spinning it in a centrifuge to separate its components (centrifugation) or through an automated system. This process concentrates the platelets as well as growth factors, amplifying healing properties.

There are many commercial systems available to concentrate platelets. At Veterinary Orthopedic and Sports Medicine Group (VOSM), we have performed a prospective analysis of the commercial systems available to determine which system achieves the highest platelet concentration with few red and white blood cells. The systems used at VOSM is not only validated for use in dogs but also yields platelet counts five to nine times above normal, with minimal red and white blood cells in the product.

What should I expect if my pet has a PRP injection?

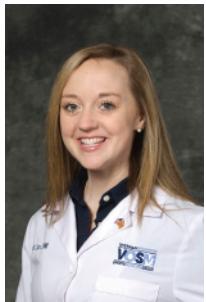
PRP therapy is often performed as a series of one to three injections with two weeks between each injection. About 50% of dogs require more than one injection for significant improvement. PRP therapy is a minimally invasive procedure that typically can be performed on an outpatient basis. Approximately 30 to 60 milliliters of blood is obtained, processed, and prepared for injection. Once the PRP is processed, the area that is to be treated is clipped and aseptically prepared. Sedation or general anesthesia may or may not be required, depending on the location of the injection. For osteoarthritis, PRP joint injections are usually performed without sedation; however, some joints such as the hip require sedation and may also require advanced imaging (fluoroscopy) for guidance. For soft tissue injuries, ultrasound guidance is used to ensure accuracy of the injection

as PRP is most effective when administered directly into the site of injury. Sedation is often required. Please be sure to talk with your specialist at VOSM regarding all details of the procedure. Mild discomfort has been reported in people for the first 24 to 72 hours following the injection and can be managed with cold compressing and pain medication prescribed by your VOSM specialist if needed. Non steroidal anti-inflammatory medication and steroids are avoided during the post-injection period unless there is inflammation (joint flare) following the injection. A dedicated rehabilitation therapy program is often recommended for 8 to 12 weeks following PRP therapy, depending on the diagnosed condition. Additionally, a brace or support wrap may also be recommended. The most common side effect is discomfort associated with the injection, which typically resolves within 12 to 24 hours of the injection.

Summary

PRP therapy has been used to manage numerous orthopedic conditions, including osteoarthritis and soft tissue injuries. Please talk more with your VOSM specialist to determine if PRP could be a treatment option for your pet. Should you have further questions or concerns regarding PRP therapy, please contact VOSM.

About the Authors



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