

Regenerative Medicine and the Veterinary Technician: A Quick Guide to PRP and Stem Cell Therapy

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Veterinary technicians often serve as the first and last point of contact with pet owners. They are charged with fielding and answering questions and are typically a wealth of knowledge when it comes to various treatment options. Regenerative medicine is an innovative field in veterinary medicine that shows great promise for patients. For this reason, veterinary technicians will benefit from learning the basics of two of the most common regenerative medical treatments: platelet-rich plasma (PRP) and stem cell therapy.

The goal of regenerative medicine is to assist the body in regenerating tissue damaged by disease or injury. Every day, veterinary technicians encounter patients with fractures, soft tissue injuries, and joint disease. Traditional treatments include cage rest, medications, physical therapy, or in some cases, surgery. PRP and stem cells offer additional options for pain management and healing.¹ These two therapies can be used separately or in combination to achieve a synergistic effect.

A Brief Overview of Platelet-Rich Plasma

Platelets are the body's first responders to injury and inflammation. Platelets release alpha granules at the site of injury or inflammation. Alpha granules contain both growth factors and cytokines. Growth factors promote the creation of new, healthy tissue while cytokines have anti-inflammatory properties.² Utilizing PRP amplifies the body's own healing capacity and can also act as a homing beacon for stem cells, which further promote healing.

The Basics of Stem Cell Therapy

Stem cells are derived from a variety of sources: embryonic, bone marrow, and adipose tissue. Adipose derived stem cells are the most accessible cells for the average veterinary clinic.³ Stem cells stimulate regeneration in bone, joint, tendon, and ligament injuries. Stem cells also act as drug factories churning out potent biomolecules to reduce inflammation and pain. In immune-mediated diseases, stem cells will buffer or modulate an overactive immune system to reduce the attack of the body on itself. Stem cells can home to areas of injury and inflammation to begin reducing that inflammation and working to heal damaged tissue.

Common Uses of PRP and Stem Cell Therapy

Many of the conditions veterinary technicians see weekly can benefit from regenerative medical treatments. Orthopedic indications are the most common use of PRP and stem cell therapy. Osteoarthritis has become one of the biggest concerns in veterinary medicine because patients are living longer, and their owners have become more adept at recognizing pain in their pets. Owners are also looking for alternatives to traditional drugs to control pain and inflammation in their pets while reducing the side effects. Both PRP and stem cells are very useful in the treatment of orthopedic conditions but utilizing them together can provide a more profound outcome.

Outside of orthopedics, there are many uses for both PRP and stem cell therapy being studied and tested in clinical trials. Both PRP and stem cells can be used in conditions such as dry eye (KCS),⁴ non-healing wounds,⁵ and even bladder inflammation.⁶ PRP is not indicated for systemic conditions that would require intravenous administration. Stem cells can be delivered IV and are therefore a potential therapy for conditions such as inflammatory bowel disease and kidney disease. Conversely, there are cases where PRP might be more appropriate such as for milder injuries (small wounds, tendon/ligament strains) or in patients who cannot undergo the surgical fat collection required to harvest stem cells.

How is PRP Prepared

Until recently, the method of obtaining PRP required a kit, a centrifuge, and plenty of technician time and expertise. PRP kits on the market currently require approximately 10-60 mLs of whole blood. The blood draw needs to be an extremely clean "stick" to get the largest number of platelets for treatment and to avoid contamination of the blood collected. These kits require centrifuging at specific speeds for a specified amount of time and careful handling after centrifuging to preserve the injectable product.

The downsides to autologous (patient derived) PRP from these kits are worth mentioning. The most obvious is that the amount of blood is prohibitive to some of the smaller or geriatric patients in clinics. It is also dependent on the patient's production of platelets. If the patient has lower than normal platelets, which can occur for a variety of reasons, their PRP will have fewer platelets as well. Ensuring that the blood collection is done without any clotting, and that the centrifuge is properly calibrated and set for the correct spin time and RPM are also

crucial to the preparation of the final injectable product. Each of the above indicated issues can cause lower than optimal platelet counts, and that variability in the number of platelets in PRP can affect the efficacy of treatment. Many clinics do not have a platelet counter that can properly measure the higher concentration of platelets to even know the delivered dose.

Donor Derived PRP Can Help Mitigate These Shortcomings

New to the market is a product that resolves many of these concerns. PrecisePRP™ is a shelf stable allogeneic (donor derived) PRP product. This product is species specific for both dogs and horses and is currently in its final phase of FDA review. PrecisePRP™ is room temperature stable and easily reconstituted with sterile water, a process that veterinary technicians are familiar with and perform multiple times a day. This product can be used on patients of all sizes since there is no blood draw required. Platelet count and potency is known on each vial, meaning a consistent and therapeutic dose of platelets can be delivered with each injection of PrecisePRP™. The best thing about this product for the veterinary technician is that it doesn't take them off the clinic floor for 20-30 minutes to prepare.

Stem Cell Processing in an FDA Compliant Facility

Stem cell therapy has a similar dichotomy: there are countertop machines made to process stem cells in the hospital as well as companies that process adipose tissue and create doses using FDA compliant methods and standardized equipment in FDA compliant facilities. The latter option is much more accessible for most clinics as it does not require training or a large capital investment, or use of counter space. Like off the shelf PRP, using the processing laboratory saves technician time and keeps them on the floor to perform other tasks.

The VetStem cell processing lab has the added benefits of utilizing an extremely accurate cell counter that ensures a therapeutic dose of stem cells,⁷ much like PrecisePRP™ for platelets. Frozen storage of additional doses as well as culturing for more doses are all handled at the lab, taking the burden off veterinary staff, and providing reassurance to the owner that their pet can receive future treatments with their own stem cells if needed.



Conclusion

Veterinary technicians are a key respected source of information for clients. Having up to date knowledge on the latest therapies allows technicians to better educate clients. Regenerative medicine is now easily available through PrecisePRP™ and VetStem and technicians can be at the forefront of advocating for their patients and moving their clinics forward. This knowledge allows technicians to easily present the case for regenerative medicine to veterinarians and clients alike. VetStem offers RACE approved CE courses for technicians and veterinarians seeking more in-depth knowledge. ●

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