



VET NOTES

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May 1, 2018



Ally was born and raised in Versailles, Kentucky, a small town on the outskirts of Lexington. Her father relocated to central Kentucky in the late 1980's, where he practiced equine veterinary medicine for over two decades. She began riding at an early age and eventually joined the Keeneland chapter of the United States Pony Club. During this time she fell in love with the sport of eventing, riding aside and fox hunting. Dr. Howard attended the University of Kentucky for her undergraduate degree and received her bachelor of science in Biology. She then moved to Auburn, AL in 2012 to become part of the 2016 class at Auburn University College of Veterinary Medicine. After graduating in May 2016 and she moved back to Lexington, KY to start an equine surgical internship at Rood & Riddle Equine Hospital. She joined Peterson & Smith in June 2017 for an Ambulatory Internship and she will be staying as an associate Veterinarian in July 2018.

"ALPHABET SOUP" - Making Sense of Stem Cells, PRP, IRAP and Prostride™ **Allison Howard, DVM**

Stem Cells

While stem cells may be controversial in human medicine, they are on the leading edge of treatments for equine injuries. Stem cells are undifferentiated cells that have the ability to replicate and differentiate into other cell types to grow into tissues such as tendon, ligament, cartilage, muscle or bone. Equine medicine most commonly uses mesenchymal stem cells which are found in bone marrow, fat, and umbilical cord blood.

Autologous stem cells are cells collected from and administered to the same patient. Typically bone marrow is collected from the sedated horse via the sternum or pelvis (tuber coxae) and sent to a lab for 3-4 weeks to be cultured and expanded into millions of cells. Fat can be harvested from the tail head and turnaround time is usually days instead of weeks, but research indicates that bone marrow derived stem cells are superior to fat derived. A typical dose can range from 10 to 25 million cells per treatment. The cells can then be injected into the affected tendon, ligament, joint, or a blood vessel near the injury as a regional limb perfusion. Typically, enough cells can be grown for a series of treatments. Since the patient is receiving their own stem cells, there is minimal risk of reaction or disease transmission.

Allogenic stem cells, cells collected from a donor and given to a patient, are available in “banks” in some areas. This eliminates the wait time of growing the patient’s own cells, but there are risks of potential reactions.

PRP – Platelet Rich Plasma

Platelets are the smallest cell in the blood and are the body’s first responders to injury. These tiny cells can release bioactive substances that promote healing, stimulate blood vessel formation (angiogenesis), and recruit the body’s own stem cells to the site of the injury. PRP involves drawing the patient’s own blood and centrifuging out the other cells to create plasma with a very high concentration of platelets. Depending on how the sample is handled you can have pure PRP, leukocyte (a white blood cell) PRP, or a leukocyte-reduced PRP. There are varying efficacy rates for the different products and the current ideal product is unknown. The final solution can be injected into an affected tendon, ligament or joint. The advantage of PRP is that it can be collected and administered stall-side in as little as 20 minutes.

IRAP/ACS – Interleukin-1 Receptor Antagonist Protein/Autologous Conditioned Serum

When joint damage occurs, inflammatory mediators such as Interleukin-1 (IL-1) and other cytokines are released. IRAP works by preventing IL-1 from binding to the IL-1 receptors, blocking the inflammatory reaction caused by IL-1. IRAP involves drawing the patient’s own blood into a specialized syringe containing glass beads exposed to chromium sulfate; this stimulates production of the antagonist protein. It is usually incubated for 24hrs, and then centrifuged down to plasma which contains the antagonist protein. IRAP can also be referred to as an autologous conditioned serum (ACS) since a naturally occurring process is being upregulated. IRAP is then injected into the affected joint once every 7-10 days for 3-5 treatments. IRAP is most commonly used to treat joint disease, osteoarthritis, or synovitis (inflammation of a synovial structure). The use of IRAP in soft tissue structures, such as tendons and ligaments, is still being investigated.

Prostride™ APS – Autologous Protein Solution

Prostride is relatively new, brand named APS and is often simply viewed as a combination of IRAP and PRP. Prostride also involves drawing the patient’s blood into specialized tubes that concentrate and separate cells, platelets, growth factors, and anti-inflammatory proteins. It does not have an incubation period and does not upregulate production of anti-inflammatory proteins, so it is not an autologous *conditioned serum* (ACS) like IRAP. But the trade-off is that Prostride can be performed stall side in less than 1 hour, similar to PRP. The final solution is injected into the affected joint. Treatments can be repeated as needed, but only one treatment is produced per blood draw.

Whatever your horse’s ailment, the best plan can be determined by working closely with your veterinarian.

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