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**Our practice is currently using Bio-Regenerative Therapies which have caught a lot of attention in the media under the name of stem cell therapy.**

Each of these therapies use the body's own healing properties: stem cells, growth factors and other anti-inflammatory mediators to help produce healing. One of the concerns with injecting any product, biological or non-biological, into tendons or joints is the risk of further inflammation. Utilizing the horse's own blood, bone marrow or adipose tissue greatly reduces this complication.

**Stem cell injection:** There are two populations of stem cells utilized in equine medicine, those found in adipose tissue and those in bone marrow. Those with adipose tissue are removed surgically from near the tail of the horse. They are processed to concentrate their numbers and injected back into the affected tendon, ligament or joint. Those stem cells from bone marrow are obtained from the sternum or the point of the hip. They are sent to a separate laboratory where they are cultured to increase their numbers. After three weeks they are sent back for injection into the affected area. The cost of processing makes this treatment modality the most expensive of the bio-regenerative therapies.

**IRAP injection:** The acronym stands for Interleukin-1 Receptor Antagonist Protein. Blood is collected from the horse into a special container that is then incubated for 24 hours then centrifuged. The resulting serum is extracted and either used immediately or frozen for use up to one year later. This specially conditioned serum has been used with great success in joints and tendon sheaths for some years. It has also been used recently for smaller tendon lesions by injecting directly into the affected tendon. It is thought that serum drawn from the same horse that is to be injected is conditioned to concentrate beneficial proteins that will bind inflammatory proteins in joints and/or tissues. In particular, IRAP serum has been beneficial in joints that have not responded to standard joint injections, in young horses, or in horses where you would not prefer to use corticosteroids in their joints.

**Platelet Rich Plasma (PRP):** A relatively new technique in which blood is collected from the horse and immediately filtered. A small fraction of the blood is collected and subsequently injected into a soft tissue lesion with ultrasound guidance. The portion of the blood that is looked for after filtration is the platelet concentrated portion containing numerous growth factors thought to speed and improve the healing process. This portion can also be combined with stem cells or bone marrow supernatant to further enhance the healing process.

**Bone marrow supernatant (BMS):** Another technique in which bone marrow is harvested from the sternum or point of the hip area by a specially designed needle and then centrifuged to collect the supernatant, or non-cellular portion of the bone marrow,

which is then suspended in saline. While bone marrow has been injected in certain areas of the body (such as origin of the suspensory) for years, the BMS technique is a refinement that enhances healing and reduces complications. One of the difficulties in bone marrow injections has been that the cellular portion of the bone marrow can be quite reactive in some horses, causing unintended swelling and lameness. Removing the cellular component via centrifugation prior to injection or culture of the stem cells (as in bone marrow derived stem cells) seems to greatly reduce the incidence of complications. As in the other techniques, the BMS is injected with ultrasound guidance into the damaged tendon or ligament to enhance the healing process.