

Stem Cell Preparation and Delivery (AAEP 2012)

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Having stem cells at our disposal for treating tendon and ligament injuries in horses but not knowing exactly how to administer them is like having a million dollars you can't spend. One researcher from Colorado State University (CSU) described stem cell preparation and delivery at the 2012 American Association of Equine Practitioners' Convention, held Dec. 1-5 in Anaheim, Calif.

"Stem cells are now widely used by equine practitioners to treat a variety of conditions, most commonly tendon and ligament injuries and joint disease," relayed Laurie Goodrich, DVM, PhD, Dipl. ACVS, from CSU's Orthopedic Research Center. She said that knowing how and when to use stem cells is important, as is using the right "type" of stem cell to derive the maximum benefit from stem cell therapy.

Although there are a variety of stem cell types (e.g., sourced from fat vs. bone marrow) and different ways to prepare and use them, Goodrich indicated that bone marrow-derived stem cells that are grown in culture appear superior to other types of cells for treating musculoskeletal injuries.

During her presentation, Goodrich described how to thaw frozen cells; prepare the cells, horse, and equipment for injection; and use ultrasound imaging to inject a tendon or ligament.

Some key points Goodrich made:

- The cells must be thawed rapidly at 37°C (98.6°F, within 2-4 minutes to maintain viability of the cells);
- The practitioner must maintain a strict aseptic (sterile) technique throughout the injection procedure to prevent infection;
- An assistant might be required during the procedure to help manipulate the equipment;
- It is essential to visualize the tip of the needle used to inject the stem cells using ultrasound (no smaller than a 22-gauge) the entire time the veterinarian is advancing it into the lesion;
- If the lesion is greater than two to three centimeters (cm) in length, the veterinarian can use multiple injection sites or redirect the tip of the needle (without completely removing the needle from the skin) to disperse the stem cells throughout the lesion; and
- After injection, the practitioner should apply a pressure bandage and should prescribe a non-steroidal anti-inflammatory drug for administration during the two to three days after the procedure.

"Although there is little information as to the ideal numbers of cells (to inject) or whether multiple treatments can help healing and return to athletic function, my colleagues and I have used the techniques I described in over 1,500 cases," Goodrich explained. "Further research will help guide clinicians in determining ideal cell and treatment numbers, but until then we recommend using 1-3 million cells for a lesion measuring 1 cm."

Disclaimer: Seek the advice of a qualified veterinarian before proceeding with any diagnosis, treatment, or therapy.