Animal Physical Therapy SIG Citation Blast:
Equine Assessment and General Equine Rehab

The objective of this citation blast is to report on the literature available regarding equine rehab. As the Animal Physical Therapy SIG is serving their members, one of the objectives of the Research Committee is to provide summaries of peer reviewed articles. The primary audience for this blast would be physical therapists, physical therapist assistants, and students interested in equine rehabilitation. As the Research Committee progresses with this process, we strive to bring themed citation blasts for both equine and canine rehab; however, due to the amount of research these themes may or may not be achieved every month. These articles were found through Google Scholar with the keywords equine rehabilitation. It is the Animal Physical Therapy SIG's hope that this will continue to progress the practitioner's knowledge and practice forward.

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Hammarberg, M., Egenvall, A., Pfau, T., & Rhodin, M. (2016). Rater agreement of visual lameness assessment in horses during lungeing. *Equine veterinary journal*, *48*(1), 78–82. https://doi.org/10.1111/evj.12385

This study investigated inter-and intra-rater agreement of visual lameness assessment in horses during lungeing. Although there is no standard protocol for diagnosing lameness in horses, equine rehab clinicians typically evaluate horses trotting in a straight line and during lungeing, as lungeing tends to accentuate lameness issues in horses for easier visual diagnosis. Hammarberg et al. developed a survey with 50 videos of 23 riding horses being lunged and had participants decide which limb they suspected to be lame. Researchers measured lameness objectively during a straight-line trot via an inertial sensor-based system. 86 equine orthopedic veterinarians' responses were included in the survey. Inter-rater agreement was poor for less-experienced veterinarians and moderate for experienced veterinarians. Agreement was higher for forelimb lameness than for hindlimb lameness and veterinarians were more likely to correctly identify a lame forelimb than hindlimb. The more pronounced the lameness, the higher the agreement. Mean intra-rater agreement kappa value was 0.52. Movement asymmetries are induced in horses during circular locomotion, and it is essential that equine orthopedic clinicians understand compensatory movement patterns during painful limb loading.

Kaneps, A. (2016). Practical rehabilitation and physical therapy for the general equine practitioner, *Veterinary Clinics of North America: Equine Practice,* 32(1), 167-180. https://doi.org/10.1016/j.cveq.2015.12.001

Equine rehabilitation clinicians have a variety of therapeutic modalities at their disposal for pain reduction and acceleration of tissue healing. Extensive knowledge of indications, contraindications, and proper usage is essential for practitioners to possess in order to best serve equine patients. This article summarizes various modalities and their indications. Thermal therapy includes the use of cold and heat to modulate inflammation, metabolic rate, tissue extensibility, and pain. Thermal therapies come in a wide variety of forms such as wraps, packs, blankets, boots, soaking, and hosing. Therapeutic ultrasound may stimulate healing, decrease, pain, reduce tissue edema, and reduce fibrous scars. Extracorporeal shock wave therapy (ESWT) is effective for soft tissue and bone injuries such as tendinitis, desmitis, osteoarthritis, and deep muscle pain. ESWT modulates inflammation, increases vessel proliferation and growth factors that result in healing, increases osteoblast production, and increases stem cell recruitment. Laser therapy is used to treat wounds, soft tissue injuries, osteoarthritis, and for local pain relief. Laser has anti-inflammatory effects and is effective in reducing IL-1 levels, pain sensation via endorphin release and reduction of nerve depolarization, and enhancing ATP production. Wavelength and energy output decisions should be made based on depth of targeted tissue and desired treatment time. Manipulative therapies such as stretching may be applied by an equine clinician and can be taught to owners. Pain in the neck, back, and sacroiliac regions may especially benefit from stretching. Ground poles, work in long lines, and elastic bands can be used to improve range of motion and engage core muscles. Although modalities may be used for pain control and to accelerate tissue healing, exercise is essential for return to work after injury and must be controlled and slowly increased as tissue healing allows. Intensity levels must be adjusted for level of soundness. Various protocols for rehabilitative exercise exist.

Long, K., McGowan, C., Hyytiäinen, H. (2020) Effect of caudal traction on mechanical nociceptive thresholds of epaxial and pelvic musculature on a group of horses with signs of back pain, *Journal of Equine Veterinary Science,* 93. https://doi.org/10.1016/j.jevs.2020.103197

This study investigated whether caudal traction has an effect on mechanical nociceptive thresholds (MNTs) in horses with clinically detectable back pain. Spinal traction is commonly used in humans and is effective in increasing joint range of motion and decreasing pain. Very little research is done on the effects of caudal traction in horses although it is effective in anecdotal reports. 11 horses with back pain, grade 0-2 lameness, and for which caudal traction was indicated were included in the study (two mares and nine geldings; four warmbloods, four thoroughbred crosses, two quarter horses, and one appaloosa). Horses stood square on a flat surface with their neck in line with their back. Five bilateral locations in the thoracolumbar region along longissimus dorsi thoracic, middle gluteal muscle, and the vertebral head of biceps femoris were identified and marked with correction fluid. A calibrated pressure algometer was used to measure MNTs on the marked locations. Pressure was stopped immediately once an equine behaviorist noted a recognized behavioral response due to pain. Measurements were repeated three times in each location. Caudal traction was then applied for 1.5 minutes and pressure was measured by a digital fish scale hooked through the tail, which was plaited. A steady pull of 4.5 kg was applied for 20 seconds, followed by a release of 10 seconds, and repeated three times. A clinometer bubble level was placed on the tail to ensure the therapist pulled at a 30-degree angle from horizontal. After traction was applied, measurements with the algometer were repeated. There was a significant increase in MNT after caudal traction at all sites, although the percentage of improvement was highest in the thoracic region and lowest in the lumbar region. Positive effects of this treatment may be due to both mechanical and neural systems via physical effects on joints, fascia, and muscles and neurophysiological effects on inflammatory mediators and peripheral nociceptors. Based on this study’s results, caudal traction increased MNTs in thoracolumbar and pelvic musculature, although additional research is warranted to determine the clinical relevance an effect of this treatment.