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Use of Magnetic Resonance Imaging in the Horse

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Magnetic resonance imaging (MRI) has been a cornerstone for musculoskeletal imaging in humans for over 20 years. Until recently, there were only a small number of horses being imaged with MRI. As information has spread about the benefits of MRI in horses, so have the number of facilities with magnetic resonance units available for our equine patients. We are still in the infancy of equine MRI but it has already proven to be an extremely valuable tool for diagnosis and treatment of horses with performance limiting lameness.

MRI is a proton based imaging modality. Briefly, the horse is placed in the magnet under general anesthesia, radiowaves are pulsed into the patient, the patient emits a signal, and the signal is used to construct an image. The examination takes about an hour and a half and generates 600-800 images. Due to the nature of how an image is acquired with MRI, we are able to detect changes in the chemical makeup of the tissues before they are visible grossly. This allows earlier detection and treatment of injuries in our equine patients.

When discussing the MRI examination, it is critical to mention the lameness exam. All horses should have the lameness localized to a specific region of the horse before being having a MRI examination. This includes specific nerve blocks or joint blocks that improve the degree of lameness after they are performed. The MRI is not a scanning tool and should not be used to image up and down the leg. For example, if a horse blocks to its heel region of the right front foot, this is a small enough area to image with MRI. Regions that can be imaged include the foot, fetlock (ankle), cannon bone, suspensory, knee, and hock. We do image both legs on almost all horses for comparison and the fact that most horses are lame bilaterally with one leg being worse than the other. Also, there is so much individual variation between some of the structures in the legs that comparison to the “normal” side helps to detect small injuries.

MRI was first performed on live horses in 1997 at Washington State University. MRI allows diagnosis of both bone and soft tissue (ligament/tendon) problems that were not previously possible in horses with the use of other imaging techniques (x-rays, ultrasound, bone scan). Indications for MRI examination are those horses in which a diagnosis cannot be determined by other imaging modalities or persistent lameness that is non-responsive to treatments. Observations made with MRI on horses with lameness problems have improved our ability to make an accurate diagnosis and have increased our understanding of important clinical problems (for example, horses that are “navicular”or have a “high suspensory” injury). By far and away the biggest benefit of MRI is that it allows us to determine an accurate diagnosis. An **accurate diagnosis then leads to appropriate treatment recommendations** for the horse that will maximize the horse’s chance of returning to performance.