

AT A GLANCE

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Advanced Veterinary Imaging

MRI to Diagnose Equine Lameness

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Imagine a time in a not-too-distant past when veterinarians couldn't get a clear picture of the equine navicular bone and its associated structures to diagnose podotrochlosis (navicular syndrome, or caudal heel pain). Then came MRI, and the game changed. Since Washington State University pioneered MRI use in horses in 1996, the technology has become easier to use and more accessible, improving lameness diagnosis and improving veterinarians' treatment plans for lame horses.



THE HORSE STAFF



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Veterinarians can perform MRI in horses either sedated and **standing** or anesthetized and **recumbent** (lying down).



COURTESY UNIVERSITY OF PENNSYLVANIA

As an imaging modality, MRI is both sensitive and specific. Today, veterinarians consider it the gold standard for diagnosing navicular syndrome and distal (lower) leg lameness.



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Racehorse Injury Prevention

Studies show MRI might be helpful in detecting bone changes that put racehorses at risk for catastrophic fetlock fractures before accidents occur, allowing for early intervention.

MRI to Diagnose Equine Lameness

Prior to MRI, veterinarians used radiographs to image bone in the foot and lower leg, while ultrasound offered a separate visual of the soft tissue structures. MRI images both. And unlike radiography and ultrasound, which give two-dimensional images, MRI offers three-dimensional and cross-sectional imaging.

When looking at the foot and lower leg, MRI helps veterinarians better see the:

- **Deep digital flexor tendon (DDFT).** The DDFT runs along the back of the horse's cannon bone and inserts at the distal phalanx (also known as the "coffin bone," third phalanx, or P3), which is located within the foot. Due to the DDFT's length, placement, and function, injuries to this structure are common. MRI can reveal an injury's exact location; the severity of the damage to the tendon; whether the abnormality is limited to a single region of the tendon (e.g., a core lesion) rather than a widespread/diffuse disease; and if so-called "sagittal splits" are present. MRI can also detect abrasions, enlargements, and mineralization.
- **Collateral ligaments.** Collateral ligaments are fibrous structures that connect one bone to another, such as on the inside and outside of each lower limb joint. An MRI's sensitivity makes it an excellent tool for assessing these structures in high detail.
- **Podotrochlear (navicular) apparatus.** Veterinarians can also use MRI to evaluate the entire podotrochlear apparatus and small associated structures. In some cases veterinarians can also assess the cartilages in the foot, as well as fluid accumulation in the navicular bursa and coffin joint.

A **COLORADO STATE UNIVERSITY STUDY** looked at eight years of MRI data related to equine lameness. The researchers found early MRI intervention (prior to lameness becoming chronic) led to improved treatment outcomes. The longer owners waited to have their veterinarians perform MRIs, the lower the horses' chances of returning to their previous levels of athletic activity. MRI findings appeared to help veterinarians prevent acute cases from becoming chronic. In the long run, early MRI and treatment became the more affordable choice for horse owners.

MRI for lameness diagnosis: Sooner is better

**LAMENESS + EARLY MRI
= MORE LIKELY RETURN
TO ATHLETIC CAREER**



Take-Home MESSAGE

As a diagnostic tool, MRI has become more accessible to horse owners and gives veterinarians the clearest window into the equine foot and lower leg. Early and accurate diagnosis can lead to better treatment outcomes and prevent catastrophic injuries.

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Byrne, C.A., Marshall, J.F., Voute, L.C. (2020) Clinical magnetic resonance image quality of the equine foot is significantly influenced by acquisition system. Equine Vet J. 00, pp 1-12

...ask for a definitive answer.