

**MAGNETIC RESONANCE IMAGING**

Magnetic resonance imaging (MRI) is a diagnostic method of imaging the horse by stimulating the molecules in the tissues to ‘resonate’ when a magnetic field is applied to them.

The most common application is to investigate causes of foot pain in horses when a specific diagnosis is required to aid prognosis and enable more appropriate treatment or management. MRI first became available to equine practitioners in the mid 1990s, and, until 2001, a general anaesthetic was required to carry out the scan. Since then, an MRI scanner has been developed that allows horses to stand during the scan, reducing the risk of general anaesthesia. Every year, around 300 horses undergo an MRI scan as part of the veterinary evaluation of the foot, fetlock, upper cannon and knee.

Advantages of MRI over other imaging techniques

MRI allows us to see what’s going on in the tissues internal to the bone.

Radiography and ultrasound are limited to aspects of bone and tissue. An MRI scan can reveal a much greater range of tissue types and structures.

MRI is particularly useful for diagnosing soft tissue injuries and anatomical abnormalities.

A horse, under sedation, positioned in the MRI scanner for imaging of its lower limbs.

**How MRI works**

When the area (i.e. tissue) we are interested in is placed into a strong magnetic field and a short pulse of radio waves is applied, the tissues resonate and emit echoes back from the tissue.

The echoes vary depending on the density and composition of the tissue present in the area. Tissues, bone and tendon have a characteristic signal on MRI images. The images appear in black and white ‘slices’ through the tissue that can be created by computer software and viewed on a monitor. MRI is a method of imaging the horse’s tissues, ligaments, bone and tendons. It allows us to identify changes in the tissues. A magnetic field is applied to the area of interest and then a strong radiofrequency signal is transmitted to the area. This signal causes the water molecules in the tissues to resonate or ‘resonate’ and a weak ‘signal’ is detected. This signal is measured by computer software that creates images of the tissues.

The images are then used to produce cross-sectional images of the tissues, which can be viewed in three dimensions. MRI is a non-invasive technique that does not require a general anaesthetic.

**When is an MRI scan appropriate?**

MRI scans are requested for horses where lameness has been localized to a specific region or bone and joints. MRI is particularly useful where the overlying soft tissue is damaged or not clearly visible on X-rays or ultrasound. MRI is the best method of identifying and localizing abnormalities in the soft tissues, ligaments, bone and tendon. MRI is not suitable for the detection of stress fractures, as these can be identified on X-rays.

MRI can be used to investigate the following:

- Soft tissue injuries
- Bone injuries
- Ligament and tendon injuries
- Arthritis
- Anatomical abnormalities
- Developmental abnormalities
- Infections

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**A week in brief...**

Monday: A National Hunt horse has injured its knee during a crushing fall over fences. He has been referred to Rossdales’ orthopaedic surgeon Richard Payne to repair the fracture and plan a regimen of anti-inflammatory. Radiographs are inconclusive about the degree of fragmentation of the radial bone (bone within the knee), which is commonly displaced in this type of fall. It is decided that a complete orthopaedic examination is needed.

Tuesday: Today I am giving two lectures at a course entitled ‘No Foot No Horse’ at the British Racing College (Royal Veterinary College at the British Racing School) on the use of mobile radiography in the yards and farms. I was interested to see how well the participants were learning the techniques.знакомиться с медицинскими данными в области ортопедии. Я особенно интересовался контрастными и магнитогидродинамическими методами исследования и использованием в ранней диагностики травм и заболеваний в рентгеноскопии.

Часто у меня возникают вопросы о том, как влияет это на нашу работу. Мне интересно, как у нас работает эта система, и как мы можем улучшить ее в будущем. Я также хотел бы продемонстрировать некоторые из наших новых методов диагностики и лечения, которые мы разработали в последние годы.

Спасибо за внимание и интерес к нашей работе.