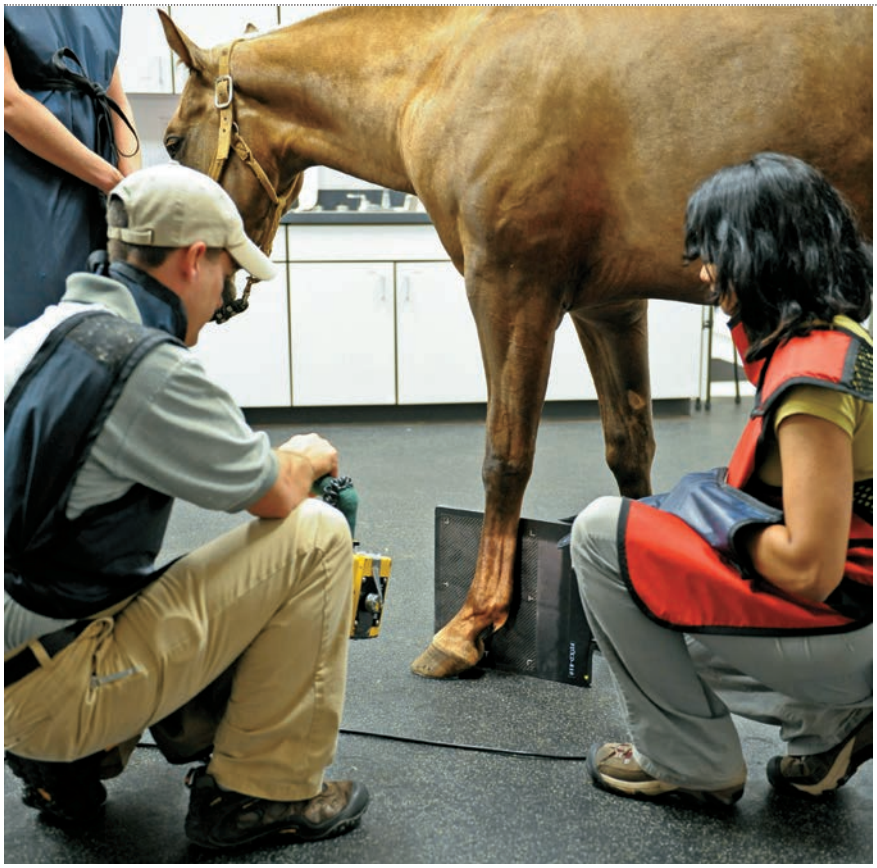

Radiographs can be useful in pinpointing the cause of lameness

Getting It Right

PROMPT LAMENESS EXAMS KEY IN KEEPING SMALL PROBLEMS FROM BECOMING BIG ISSUES

By **AMANDA DUCKWORTH**
Photos by **ANNE M. EBERHARDT**

LOOKING FOR AN easy way to describe a potentially complicated problem sometimes requires more general terminology. For example, explaining that a horse has arthritis is often a catch-all for any number of different issues relating to joint health.

In general, arthritis is inflammation of a joint or joints that causes stiffness and/or pain. When it comes to equines, this could also mean a horse actually is dealing with a myriad of related specific conditions such as osteoarthritis (inflammation involving bone changes) or synovitis (inflammation of the joint lining).

Not surprisingly, a horse suffering from joint issues will likely have a reduced range of motion that presents itself as lameness or stiffness. Lameness exams can be crucial in figuring out exactly what is going on, and the lameness scale developed by the American Association of Equine Practitioners (AAEP) remains a gold standard. The AAEP discussed why lameness exams are so important in "Lameness Exams: Evaluating the Lame Horse."

"When lameness occurs, you should contact your veterinarian promptly," the AAEP explained. "A prompt examination can save you time, money, and frustration by diagnosing and treating the problem immediately, possibly preventing further damage. The goal of such early examinations is to keep small problems from becoming big ones.

"Essential features for a thorough exam include a horse's medical history, a visual appraisal of the horse at rest, a hands-on exam, application of hoof testers to the feet, evaluation of the horse in motion, and joint flexion tests. However, a horse usually will need diagnostic tests as well."

"Diagnostic procedures are often necessary to isolate the specific location and cause of lameness," explained the AAEP. "Lameness is best treated with a specific diagnosis. If your veterinarian has cause for concern based on initial examination, he or she may recommend further tests, including diagnostic nerve or joint blocks, radiographs, nuclear scanning, ultrasound, arthroscopy, or examination of blood, synovial fluid and tissue samples.

"Lameness is a complicated condition, with many possible causes. Be a conscientious observer. By identifying even minor lameness and acting swiftly to correct it, you will minimize the risk of injury to the horse and yourself, and you will be rewarded by better performance and a longer useful life from your horse."

NEW FRONTIERS

Having a proper diagnosis obviously is a key to managing a horse's pain, but it is important to realize that although osteoarthritis holds the title for being one of the most common causes of lameness in horses, there is no set cure. Management of the condition is the best option, and research is constantly being conducted on the most effective way to do that.

One approach drawing attention

Lameness can be a complicated condition involving a number of joint health issues

lately is using a synthetic joint lubricant. Shown to have the ability to decrease knee osteoarthritis in people, polyacrylamide hydrogel is a nondegradable synthetic viscous gel. In June 2019, the *Journal of Equine Veterinary Science* published "Use of a 2.5% Cross-Linked Polyacrylamide Hydrogel in the Management of Joint Lameness in a Population of Flat Racing Thoroughbreds: A Pilot Study."

"Osteoarthritis is one of the most common disease processes affecting equine athletes, causing up to 60% of all lameness," said researchers. "This prospective longitudinal study reports on the effect of treatment of carpal and metacarpophalangeal joint lameness with 2.5% cross-linked polyacrylamide hydrogel (PAAG)."

The study used 49 Thoroughbreds at a single training facility, and the results were promising. The study horses showed a significant improvement in lameness grades at weeks one, four, 12, and 24 when compared with baseline lameness at week zero.

"This pilot study suggests that 2.5% cross-linked PAAG is a safe and effective joint treatment for managing joint lameness in Thoroughbred racehorses and warrants further blinded and controlled studies to fully evaluate the efficacy of the 2.5% cross-linked PAAG and its

mode of action," researchers concluded.

The topic was examined again in "An assessment of the effectiveness of hyaluronic acid and polyacrylamide hydrogel in horses with osteoarthritis: Systematic review and network meta-analysis," which was published in the January 2021 issue of *Research in Veterinary Science*.

"For several years, hyaluronic acid (HyA) and, more recently, polyacrylamide hydrogel (PHyd) have been used to reduce lameness and pain caused by osteoarthritis," said researchers. "However, there is still a lack of scientific evidence of the efficacy of these substances to allow veterinary experts to make decisions about their use in horses."

Using systematic review and network meta-analysis (NMA), researchers examined the effectiveness of hyaluronic acid and polyacrylamide hydrogel in relieving lameness in horses with osteoarthritis. They found polyacrylamide hydrogel has a high rate of success in treatment of lameness in horses with osteoarthritis, but that there is no scientific evidence that hyaluronic acid is effective for a long period of time.

Horses can demonstrate lameness from their earliest days

"The efficacy of HyA and PHyd was estimated through the relative risk difference method," said researchers. "Heterogeneity was observed in the efficacy of HyA, indicating long-term ineffectiveness of this drug when associated or not with anti-inflammatory drugs. In contrast, the results indicate that PHyd is an effective alternative therapy, with a long period of action in reducing lameness in horses with osteoarthritis.

"This study provides evidence that the application of PHyd and HyA is effective in reducing lameness caused by osteoarthritis in horses at different time periods, where PHyd has a longer time of action."

AT ANY AGE

Horses can demonstrate lameness from their earliest days, and in young foals it is usually due to septic arthritis. While owners might think a mare was careless and stepped on her baby, often times the swollen joints are caused by a bacterial infection.

Researchers looked at the racing career outcome for foals with septic arthritis in the study "Factors associated with survival and racing performance of 114 Thoroughbred foals with septic arthritis compared with maternal siblings (2009-2015)," which was published in the November 2020 *Equine Veterinary Journal*.

"There is little consensus on factors associated with survival in foals with septic arthritis and limited data on long-term racing performance of Thoroughbred foals treated for septic arthritis," researchers explained. "A more thorough understanding of short- and long-term outcome is necessary to help

inform owners, and subsequently guide treatment."

For the study, researchers reviewed the clinical records of Thoroughbred foals 180 days old or younger that underwent arthroscopic, cannulae, or through-and-through needle lavage for the treatment of septic arthritis from 2009-2015.

Additionally, the foaling records of the dam were reviewed as well as the lifetime racing records of the foal in question as well as two of its siblings. Logistic regression analysis was used to determine factors associated with survival to discharge or racing, and then comparisons between treated foals and their siblings were made.

In total, 90 of 115 foals diagnosed with septic arthritis were discharged alive, which is 78%, but foals that were less than 26 days old at the time of admission were five times less likely to reach that milestone. Additionally, foals with concurrent multisystemic disease were six times less likely to survive.

Of the 90 foals that were discharged alive, 60 of them, or 67%, went on to start in at least one race, and there was no difference in the proportion of foals that started in a race, or racing performance, between foals treated for septic arthritis and their maternal siblings.

When it comes to adult Thoroughbreds that break a bone, it is not surprising that arthritis is a common issue. Researchers looked further into the impact of this reality in the study "Markers for oxidative stress in the synovial fluid of Thoroughbred horses with carpal bone fracture," which was published in the March 2019 issue of the *Journal of Equine Science*. An imbalance of the oxidant-to-antioxidant ratio in the body is known as oxidative stress, which can lead to further damage.

"Arthritis is thought to cause oxidative stress in synovial fluid in humans, but there have been few reports in horses," explained researchers. "Oxidative stress in synovial fluid is thought to promote the destruction of articular cartilage. Therefore, evaluation of oxidative stress in synovial fluid is important for assessment of severity of arthritis."

The study was approved by the Animal Care and Use Committee at the Racehorse Hospital, Miho Training Center, of the Japan Racing Association. In total, 19 Thoroughbreds—11 intact


Joint issues can be a constant concern

males, seven females, and one gelding—with unilateral fractures of the carpal joint bone were used. The bone fragment in each was removed by performing an arthroscopic surgery.

Synovial fluid was collected from the carpal joint on the fracture (arthritis group) and contralateral (control group) sides. The oxidative stress index was calculated following the measurements of diacron-reactive oxygen metabolites (d-ROMs) and biological antioxidant potential (BAP). Researchers found that d-ROMs and OSI of the arthritis group were significantly higher than the control group while BAP of the arthritis group was significantly lower than the control group.

"In horses, there is a possibility that oxidative stress may occur in synovial fluid in acute arthritis," said researchers. "Since comparisons were made between different individuals in previous studies, it is possible that differences were due to arthritis or other factors such as diet and exercise level.

"In the current study, the differences were confirmed in the same individual, suggesting that oxidative stress can occur in synovial fluid during arthritis in the horse."

This confirmation is important because of the effect oxidative stress can have on horses, leading researchers to ponder future possible studies.

> **"IN HORSES THERE IS A POSSIBILITY THAT OXIDATIVE STRESS MAY OCCUR IN SYNOVIAL FLUID IN ACUTE ARTHRITIS."**
>
> —March 2019 issue of the *Journal of Equine Science*

"This study revealed that oxidative stress develops in the synovial fluid of horses during arthritis due to carpal joint fracture," researchers concluded. "Oxidative stress may damage the articular cartilage; therefore, oxidative stress generated in the synovial fluid during arthritis may damage articular cartilage present at sites other than the injured site. Future studies should evaluate the effect of reducing oxidative stress in synovial fluid for arthritis treatment."

AT ANY TIME

While dealing with joint issues can be a constant concern for owners today, the problem is not new. Researchers have discovered horse bones that show osteoarthritis dating back to medieval times, as explained in "Proximal interphalangeal joint ankylosis in an early medieval horse from Wrocław Cathedral Island, Poland," which was published in the *International Journal of Paleopathology* in June 2017.

Flexion tests are often part of lameness exams

"Animal remains that are unearthed during archaeological excavations often provide useful information about socio-cultural context, including human habits, beliefs, and ancestral relationships," researchers said. "In this report, we present pathologically altered equine first and second phalanges from an 11th century specimen that was excavated at Wrocław Cathedral Island, Poland.

"The results of gross examination, radiography, and computed tomography, indicate osteoarthritis of the proximal interphalangeal joint, with partial ankylosis. Based on comparison with living modern horses undergoing lameness examination, as well as with recent literature, we conclude that the horse likely was lame for at least several months prior to death."

Of course, there is no way to tell exactly what kind of life the horse led prior to its death, but researchers were still able to draw some conclusions.

"The ability of this horse to work probably was reduced, but the degree of compromise during life cannot be stated precisely," they said. "Present day medical knowledge indicates that there was little likelihood of successful treatment for this condition during the middle ages.

"However, modern horses with similar pathology can function reasonably well with appropriate treatment and management, particularly following joint ankylosis."

Joint health in horses is a constantly evolving process, and lameness will always be an unexpected and unpleasant problem, but the amount of research that has gone into making issues more manageable has vastly improved the quality of life of horses. When a horse is suffering from arthritis-related issues, it is important to work with a veterinarian to find the best path forward. BH