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Equine Degenerative Joint Disease
Roundtable Discussion

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Equine Degenerative Joint Disease, Parts 1-4

Moderator:

Nathaniel White, DVM
Virginia-Maryland Regional
College of Veterinary Medicine
Marion DuPont Scott Equine
Medical Center
P.O. Box 1938
Leesburg, Virginia 22075

Barrie Grant, DVM
San Luis Rey Equine Clinic
4200 Holly Lane
Bonsall, California 92003

Denise McNitt, DVM
Blackstrap Hill Veterinary
Clinic
35 Mountain Road
Gray, Maine 04039

Panelists:

Ernie Benner, DVM
Valley Veterinary Hospital
515 East 5th Avenue
Ranson, West Virginia 25438

Reid Hanson, DVM
Department of Large Animal
Surgery and Medicine
Auburn University
Auburn, Alabama 36848

Rick Mitchell, DVM
Fairfield Equine Associates
755 Main Street, #6B
Monroe, Connecticut 06468

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About the Participants

- Dr. Nathaniel White, the roundtable moderator, is with the Marion DuPont Scott Equine Medical Center in Leesburg, Virginia, where he specializes in equine orthopedic and soft tissue surgery. Dr. White is a professor at the Virginia-Maryland Regional College of Veterinary Medicine in Blacksburg, Virginia.
- Dr. Barrie Grant is a private practitioner at an equine referral clinic in Bonsall, California. He specializes in surgery and sports medicine. Previously, Dr. Grant practiced at a number of Thoroughbred and Standardbred racetracks.
- Dr. Rick Mitchell is a member of Fairfield Equine Associates in Monroe, Connecticut, a five-member private practice group dealing exclusively with sport horses. Dr. Mitchell has also frequently accompanied the United States Equestrian Team on international tours as the team veterinarian.
- Dr. Reid Hanson is an assistant professor at Auburn University in Auburn, Alabama. He specializes in equine orthopedic and soft tissue surgery. Prior to taking the post at Auburn, Dr. Hanson was in a private sport horse surgery practice in Charlottesville, Virginia.
- Dr. Denise McNitt is a private practitioner in Gray, Maine. She works primarily with performance horses and specializes in lameness problems. She is the owner of Blackstrap Equine Services and a former intern at the Rochester Equine Clinic in Rochester, New Hampshire.
- Dr. Ernie Benner is the senior member of Valley Veterinary Service in Charlestown, West Virginia, specializing in equine surgery and lameness problems.



White: Equine degenerative joint disease (DJD) is a major problem in equine medicine, primarily afflicting sport and other working horses. Because it affects a wide variety of breeds in many different ways, veterinary practitioners often have varying definitions of the disease. How do each of you define equine DJD in your practices?

Mitchell: In order for me to diagnose a horse as suffering from DJD, the affected joint has to be more than just acutely affected; it normally has to have sufficient inflammatory problems that create a chronic thickening of the synovial membrane which causes a change in the character of the synovial fluid that is produced. Often, there is some degree of cartilaginous damage as well. I normally

associate a certain amount of radiographic change with most cases of DJD. In earlier chronic or more acute cases, however, there may only be subtle changes in the synovial fluid viscosity or cell types and counts. In more severe cases of DJD, gross radiographic changes, cartilaginous destruction, and bony proliferation will be readily apparent.

Hanson: The definition of DJD is broad in scope because it encompasses so much. Different types of lesions are seen in different parts of the joint. Within the articular surface, for example, there could be fibrillation, erosion, or wear lines. These lesions could go all the way through the articular surface into the subchondral plate creating thickening and sclerosis of the trabecular bone or associated thickening of the joint capsule and synovium. It is a challenge to determine whether a horse has arthritis due to acute trauma, articular wear and fragmentation, or a strain of the joint capsule and subsequent soft tissue injury. For the most part, veterinarians tend to consider DJD a condition that is caused either by joint instability or acute trauma.

Benner: Degenerative joint disease is directly related to the articular cartilage. It can be broken down into two categories: DJD as it affects older horses as part of the aging process and DJD in younger horses due to bone chips or traumatic injuries to the joint. The end result in either type of case is usually some destruction of articular cartilage. How we treat the disease involves protecting that cartilage to prevent any further damage.

McNitt: Equine DJD is a chronic condition. It occurs when acutely injured joints fail to repair themselves or continue to be prone to re-injury. A joint that is not functioning properly becomes a chronic condition.

Grant: I diagnose DJD when I see clinical signs of pain on flexion, abnormal distention, and loss of the joint's base or proliferation of bone, radiographically.

White: It is a correct assumption, then, to state that if you assemble any group of equine practitioners they will each have slightly different ways of defining DJD. To take this a step further, a pathologist might define DJD as lesions of the cartilage that may be seen grossly or may be a histologic lesion. Clinicians, on the other hand, might define DJD as a joint that is chronically causing lameness, even with treatment. These veterinarians often make the diagnosis without even seeing the joint radiographically. These varying definitions may be due to the fact that we each see different breeds in our practices, training under a variety of condi-

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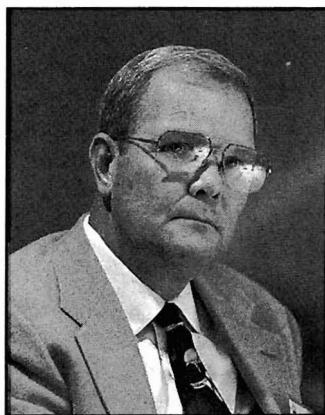
tions. Which type of joint diseases are the most common to the equine athletes you see in your practice?

Grant: The most common site of DJD we see in Thoroughbred racehorses are the fetlocks. We have been able to recognize these much more easily in the rear fetlocks with nuclear imaging. When I worked with Standardbreds, I most commonly saw DJD in the hocks.

McNitt: Of course we always think about hock problems in Standardbreds. Degenerative joint disease or synovitis of the coffin (distal phalangeal joints) is one of the forms of DJD I see frequently, along with fetlock problems. I am detecting synovitis/DJD of the hind fetlocks more often than I used to, probably because I am looking harder for other causes of hind leg lameness. Trotters seem to have a lot of coffin joint problems, possibly be-

cause of concern about veterinary expense. They often do not seek attention from their veterinarian unless absolutely necessary. Because of this we do not see as many acute injuries unless the horse becomes unable to work. We do not get as much chance to see subtle, acute lameness as we would like to. It is a problem I struggle with when trying to convince trainers to perform an examination when problems first arise.

Benner: We most commonly see DJD of the fetlocks in the Thoroughbreds we work with. The second most common site of DJD in these animals is in the intercarpal joints. Small chip fractures also lead to a number of joint problems for the Thoroughbreds. In Standardbreds, the most common sites of DJD are the tarsal, intertarsal, or tarsal metatarsal areas of the hocks. The distal phalangeal joints, whether the coffin joint or the navicular



“(Treatment of DJD) involves protecting...cartilage to prevent ...further damage.”

— Brenner

cause they can hit the ground so hard and often wear half-round shoes which may affect the biomechanics of the joint problem. I have seen coffin joint lameness in the hind foot of a pacer who wore half-rounds, so there may be some connection.

Hanson: Do you see many stifle problems?

McNitt: Yes, I see them, but they are over-considered in my opinion. In the hind leg I see most commonly both distal tarsal and tibiotarsal DJD of the hock which is associated with the high incidence of osteochondritis of the tibiotarsal joint. I have seen a number of trotters that are racing at Yonkers and other banked tracks develop a right stifle effusion and lameness that I believe is soft tissue, cruciate, and/or meniscal.

White: Do you consider these stifle problems a degenerative process in these horses?

McNitt: Yes. Standardbred trainers tend to continue to work a horse that has a subacute lameness due to economic pressure from owners and

bursa, are also common sites for DJD in Standardbreds.

Hanson: In the show/pleasure horses we work with, the most common site of DJD is the tarsal metatarsal area of the hock. Lower navicular column foot pain in that same area is also a frequently encountered problem. Fetlocks are not usually affected in show horses unless they also double as pleasure horses or eventers, or if they do any type of speed work on grass or dirt. Ring bone disease is a common problem associated with Western rodeo horses. It seems to be brought on by acceleration, deceleration, and twisting.

Mitchell: Most of the show horses I work with are hunters that are either used for dressage or jumping. Hunters that do not jump the high jumps seem to most frequently experience distal tarsitis, a DJD of either the distal intertarsal or tarsal metatarsal joints. The lamenesses we see with the distal intertarsal joint are often more severe than those

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associated with the tarsal metatarsal joints. The second most common problem that plagues these horses is coffin joint synovitis, which can be both progressive and degenerative. Whenever possible, I treat these animals in the acute phase of the disease and have had good success in eliminating it. Unfortunately, many times these horses are subtly lame, and they warm out of their lameness. In these cases the owners or trainers consider the animal "stiff" and believe they can "work out" this stiffness. And they do. Some of these horses have navicular disease. Before making that diagnosis, however, I need to see radiographic changes in the navicular bone. We do scintigraphy on many of these horses if we have any confusion about the diagnosis. Once diagnosed, I will use Intra-articular (IA) therapy on these horses, along with corrective shoeing. In many of these animals there is a basic fundamental imbalance in the foot due to the way they were shod. If you catch these horses in the early stages of DJD and go straight to this primary therapy, they generally respond well.

Jumpers that do the higher jumps tend to suffer more hind fetlock and hind coffin joint problems. The DJD of the fetlocks is due to the stress that is placed on the front end of the horse as the jumps get bigger. Warmbloods, in particular, tend to have pastern joint difficulties. On radiography, some of these animals appear to have profound radiographic lesions with the absence of lameness, but many of them have severe DJD that is producing the lameness.

McNitt: Morgans and Saddlebreds are fairly similar groups. In these two breeds distal tarsitis is the primary type of DJD. I also see some knee and ankle problems in these animals. I begin treatment by injecting these horses. The most common DJD areas of dressage horses are the coffin joints, navicular bones, and hocks. Some have navicular disease, but not all. Some will block partially to a posterior digital nerve block, and then block completely with an intra-articular block to the coffin joint.

Grant: We see a great deal of distal tarsitis in jumpers. This is followed in frequency by DJD of the fetlocks. Fetlock damage is career-limiting for endurance horses. It results in the dreaded Triple S Syndrome — suspensory, splint, sesamoid — that just makes it too difficult for these horses ever to compete again. An early diagnosis in these cases can sometimes prolong these horses' careers. Horses with chronic high suspensory problems seem to survive this type of injury quite well. The Arabians, in particular, respond well to treat-

ment for coffin joint problems. Their speed might be reduced, but they're still able to log in long miles.

White: In my practice, we see a lot of horses that were once athletes and are now kept as backyard pets. The DJD problems in these horses range from those with ring bone to problems in the hocks. In most instances, these horses have cases of DJD that have progressed. In fact, this was probably the reason for their "retirement" from competition. In the older animals, the ones who have had DJD the longest, the owner might point out that they have noticed a sudden change in the way the animal is moving. It is an old injury, but one that is no longer tolerated as well.

In the jumpers we see, I've noticed more degeneration in the stifle. The more arthroscopic surgery we do, the more we see cartilage fibrillation on articulating surfaces and lesions such as crevices that are not necessarily related to OCD, but probably related to injury. We relate this to both soft tissue injury in the joint and cartilage injury and the degeneration which subsequently occurs.

Mitchell: We see some degree of synovitis in the femoral patellar joint in jumpers. When we see some subtle performance problems, where the horse just is not "quite right," we will do a work-up to include the more distal joints on the hindlimbs as well.

Benner: Do those horses exhibit palpable effusion?

Mitchell: To a subtle degree, perhaps. Improvement with the intra-articular block or therapy with HA (hyaluronic acid) and corticosteroids indicates joint involvement. Oftentimes these animals have a sore back. Most of them probably have DJD in the hocks, some also have primary stifle problems. We also see a great deal of DJD in the femoral patellar joints, for which we will perform a femoral patellar block.

White: What are your current treatment programs for acute joint injuries in order to prevent joint degeneration? For example, if you have a suspected lameness in the joint, how do you proceed with diagnosing DJD?

Hanson: When an animal first presents, we will take a complete history. The length of time the lameness has been present is the most important piece of information. This helps determine whether or not there is an acute synovitis or chronic synovitis with DJD. The horse's previous work history, especially in the case of the horse that is just kept now as a backyard animal, is important. In these cases, the injury may seem acute to the owner. As

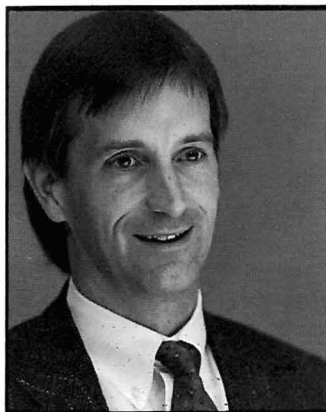
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the history is understood, it might be determined that the condition is a chronic one. It is necessary to observe the degree of heat, swelling, and reduction in range of motion, as well as the response of the horse to any pain during joint motion. We will observe how it stands (i.e., does it hold any one limb back as if trying to guard it from pain?). After we take the parameters on the joint, we will watch the horse in motion. We will look for signs of lameness at a walk and on a trot, and preferably while lunging. Then we will conduct flexion tests, regional and/or joint injections for analgesia. To confirm

know if the joint actually is septic or has just sustained a traumatic injury.

Grant: We use joint fluid analysis to determine bicipital bursa injuries. We are still trying to determine whether it is normal for a horse to have fluid on its bicipital bursa or not. It might be abnormal in a horse that is now kept as a backyard animal, but in the past was a racer or trotter. When I drain fluid from these animals, I will send it to a cytologist for traditional analysis.

McNitt: I would rely more on joint fluid analysis if I worked with a laboratory that supplied me with



"The length of time the lameness has been present is the most important piece of information..."

— Hanson

any assumptions we have made at this point, we will take radiographs. If we are still uncertain of the actual problem following radiography, we will do scintigraphy to look for any signs of soft tissue injury that might be associated with the joint.

White: Does anyone use joint fluid analysis?

Grant: Yes. It is quite helpful in differentiating between the number of conditions we see. We send the fluid to a cytologist who can examine the many different types of cells in cerebrospinal fluid and joint fluid, and their report will give us a fairly good idea of whether we have a chronic joint, infected joint, or subinfected joint. The joint fluid analysis is especially helpful in cases that are referred to us. It aids us in determining whether or not we have a case of DJD and if it is responding to any previous medications. Joint fluid analysis is most helpful when you use it to make a distinction between acute trauma and subacute infection.

Mitchell: I use joint fluid analysis to make that same distinction. I work in Florida 4 months each year and see a number of seemingly spontaneous septic joints. This might be due to the climate or the high bacterial concentration in the soil. It occurs in joints that were not previously infected. When I am presented with a joint like that, I want a report on the synovial fluid immediately. It lets me

practical information. In these economic times, I see no point in continuing to do a diagnostic procedure that does not repay the client. It would be of great value if you could determine the severity of a cartilage lesion with fluid analysis; however, I have yet to see that happen. I inject a lot of joints, and I will usually examine a sample of the fluid. You can tell quite a lot on gross examination of the fluid (i.e., color and viscosity).

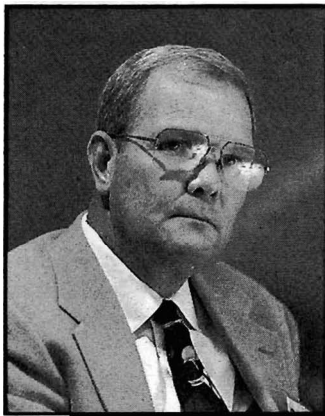
Benner: Being from a Thoroughbred racing background, two aspects of the clinical diagnosis of DJD are of the utmost importance. First, one should always look for the conformation defect, and normally the lameness in those horses follows the conformation defect quite reliably. Second, the practitioner should palpate the entire horse. It is amazing how much more you will discover when you are not just looking for problems obviously associated with a left runner, a right runner, or the rear legs. It is best to conduct this part of the examination outdoors, or in a room with good lighting, and on level ground. Take an overall look at the horse to see whether or not it is symmetrical. You will be astounded at how many horses you will encounter that are not symmetrical and the number of subtle changes you will find in the musculature over the scapula.

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DEGENERATIVE JOINT DISEASE

Grant: The majority of lame horses that come into our clinic are referred to us by veterinarians who have already done a good work-up, yet they cannot determine what the problem is. We initially examine these horses at a walk or trot and see how they respond to flexion tests. We encourage whole body scans on horses even though they may be lame only in one hind leg. Many horses have multiple subtle problems and when they try so hard in competition they put more force on one leg in order to compensate for the other problems. In most cases we find they have multiple areas of increased isotope uptake. These findings point out why many horses are unable to return successfully

ultrasound you can pick up not only soft tissue injury, but also cartilage defects and irregularities. I use ultrasound in the fetlock particularly when looking for villonodular synovitis or the thickening of the synovial pad. I have tried to use it in the intercarpal joint for the tear of that medial ligament in the back of the joint. We have also attempted to use it in the stifle. It is a valid diagnostic tool. We are also using diagnostic arthroscopy more frequently. It is expensive, but sometimes it is the only way you can determine the extent of the problem. For example, we saw a horse that had a pastern injury which caused a chip fracture and we thought that we would try to



"...palpate the entire horse"
— **Brenner**

to training immediately following arthroscopy. Arthroscopic surgery might take care of one problem, but many horses have a number of stress remodeling problems that require 90 days to become normal. In this aspect technetium 99 becomes a therapeutic agent, as many horses given 3 months of rest and no surgery can return to the track as winners. All they need is time off in order for their bones to have a chance to remodel and they come back and are training soundly with all four legs working and none of them overcompensating.

McNitt: It is imperative that as practitioners we try to maintain both a systemic and systematic approach to lameness. Often we are called to look at a horse with a sore ankle or a bad hock, and because of time constraints, that is all we examine. It cannot be stressed enough that you have to take the time to look at the whole horse. You can give a whole body examination of the musculoskeletal system in about 5 minutes.

White: For diagnosing DJD or a related problem, we also rely on ultrasound. We have never used contrast arthrography very much. With

take some of the fragment arthroscopically. The fragment was in the soft tissue capsule of that joint, but there was tremendous degeneration and erosion on the front of the joint. The arthroscope allowed us to diagnose the extent of the joint injury as well as treat the problem during the surgery.

Mitchell: If the lameness is overt and the responses to flexion are quite obvious, then I would proceed to a radiographic examination. If the response to flexion is somewhat questionable, I might do some regional nerve blocks distal to the joint, especially if it is a fetlock joint in order to rule out any foot involvement because distal limb flexions and coffin joint disease are often confused with fetlock problems. To rule out any fetlock problems, I usually proceed with an intra-articular block. I also might take a synovial fluid sample. If the sample appeared fine grossly, I would discard it, but if there was evidence of an unusual degree of hemorrhage in the fluid, I would have it analyzed to rule out a septic joint problem. At this point, I proceed with intra-articular anesthesia, and if that is positive, a radiographic examination is needed.

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We have a fluoroscope, so we might also fluoroscope these areas to get a more complete view of the problem. The fluoroscope will let you see in 30 seconds what it usually takes 10 to 12 radiographs to see. It is convenient, although I still prefer standard radiographic techniques. Treatment includes initially stabilizing the joint, cooling it with ice, administering hydrotherapy, and nonsteroidal, anti-inflammatory drugs (NSAIDs).

White: Do you have a preference for any particular treatment?

Mitchell: I prefer them all. I have no objection to using Banamine® (Schering-Plough Animal Health Corp., Kenilworth, N.J.), but I also like to use Butazolidin for acutely inflamed joints. Butazolidin is in-

might become chronic. The average dose is twice weekly initially, followed by once weekly through a course of approximately six to eight doses (500 mg) intramuscularly. I have stopped using the drug intra-articularly because of the possibility of immunosuppression.

Benner: In horses that we diagnose with tarsitis we might incorporate a corticosteroid into a diagnostic block in order to make a therapeutic diagnosis.

White: How do you decide between using HA vs. a corticosteroid for joint therapy in an acutely affected joint?

McNitt: I use several parameters. The first is economic (i.e., concerning whether the client willing to



"I believe systemic therapies are efficacious."

— McNitt

expensive and efficacious. I will also use ice and cold poultices just to try to cool the joint off until we can evaluate the radiographs. If there is no evidence of obvious fracture in the fetlock, I like to stabilize the joint with a simple standing bandage support. I usually treat this systemically with NSAIDs, or perhaps sodium hyaluronate IV.

White: How do you determine whether or not you will use sodium hyaluronate IV?

Mitchell: I use it on any joint that I believe is inflamed, but not septic, and only if the client can afford it, because it is costly. We have been using sodium hyaluronate IV for almost 2 years with many positive results. In the past I would use HA IV on acute coffin joints before I would inject them, but now I go back to an acutely inflamed joint within 48 hours and inject it, normally with just HA. I am hesitant to use corticosteroids in joints that are very acute and hot. In more chronic cases, however, I use short-acting corticosteroids. For supportive therapy following that, we prefer Adequan® (Luitpold Pharmaceuticals, Inc., Animal Health Division, Shirley, N.Y.) for support of previously injured joints, or joints that we suspect

undertake the cost of the HA because it is expensive). Unfortunately, if the client finds the cost of HA to be too high, steroids are often used. My ideal course is still HA or Adequan, depending on circumstances, sometimes mixed with short-acting steroids.

I see many young horses with a subtle ongoing lameness that ends up being a condylar fracture, despite repeated negative radiographs. This happens so frequently that whenever I see young horses coming off a training mile with lameness I take them off the track. I check the fetlock and if they do not block out 100% with an intra-articular block, but they block out 100% with the ring block, then I will not inject their joint. Twice I have seen condylar fractures that would not show up for a long time after the lameness started. I have used NSAIDs acutely. I will not put a horse back to work if there is something wrong with it that we cannot yet determine. I will keep trying to find out what the problem is. I will inject Legend™ (Miles Animal Health, Shawnee Mission, Kan.) and Adequan in the muscle. I inject a fair number of joints in racehorses. I am not entirely convinced that the systemic methods are

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as efficacious as IA therapy. Nor am I certain whether I would advise someone against injecting a joint and using systemic therapy instead. I do believe systemic therapies are efficacious. They certainly are less risk-adverse than IA therapy, but IA therapy has earned its place with trainers and owners because it works.

Mitchell: I agree. If a client is against the use of IA therapy, it may be because they had a bad experience with it on another horse or with another veterinarian. If this was the case, I would respect their wishes and not use it, but otherwise that is my treatment of choice. Fortunately, I do not see too many young horses with fetlock problems. I do not like to put steroids in acutely inflamed joints. I would much rather try to administer something that will reduce the inflammation, such as HA or Adequan.

McNitt: It can be difficult to assess some of these inflamed joints completely. I had a horse with an effusion in both front coffin joints who was lame in the right front. This horse blocked 95% sound in the right front coffin joint. Radiographs were unremarkable. I recommended a bone scan, but it is a long way to the nearest referral clinic and the owner opted to wait and try treatment. We injected the horse with a short-acting steroid and HA and he went back to work sound. Three weeks later he fractured the right front P-3 in a race. Stress fractures are dangerous because they are so difficult to detect. I have become a lot more conservative about acute joints.

Grant: I have had some experience with condylar fractures that were radiographically silent, but clinically sore. We bone scanned them and saw a joint problem and they went back to the track where they were injected and raced, and then the condylar fracture became obvious.

Mitchell: Do you encounter any technical problems when trying to radiographically evaluate a coffin joint in order to determine whether it is inflamed or it is fractured?

Grant: It depends on the view you take. We take a dorsal ventral and a lateral view. If the isotope increase is throughout the bone, then it is not just the joint that has been inflamed. Do you put HA in joint fluid that is very bloody?

Hanson: When we see joints that are hot, we tap them first to see whether or not they are infected. If we determine the joint is hemorrhaging, we are very aggressive in joint lavage first and in combination with ice and NSAIDs. This is a mechanism designed to control the inflammation or enzymatic actions that are occurring in the joint.

Grant: Some research investigations have been conducted with the middle carpal joints on horses

with acute hemorrhage in the joint. Hyaluronic acid was injected into some of the horses' joints and the other horses were given a saline injection at the time of surgery. The HA joints were more painful.

White: We used to use HA at surgery. We would perform surgery and flush the joint and then inject HA into the joints. I am not sure it helps anymore than flushing. This practice is no longer used primarily because of the cost and because of the ability to give HA intravenously a day or two following surgery and assess the inflammation at that time. We have not observed any problems with pain in the horses after using HA.

Benner: We always give phenylbutazone at the time of treatment after we administer HA intra-articularly. We have more flares with HA than any other drug, so it is just normal operating procedure in our practice.

McNitt: Is there any clear, clinical difference between the different types of HA that are available?

White: Some of the literature suggests that there may be some benefit to using an HA with a higher molecular weight, but other literature reports on conflicting experiments in that regard. Experimentally, you may be able to show a difference, but from my experience, there is not that much difference in one from another. Some studies have proposed that the higher molecular weight provides a longer effect.

Mitchell: The most frequently injected joint in our practice is the distal hock. On joints that are not significantly degenerative radiographically, we will use HA and a steroid. Generally, I will use a lower molecular weight product because it is less expensive. In the coffin joint and the fetlock joint, however, I would use a higher molecular weight product, and a higher viscosity product. Hylartin V (Luitpold Pharmaceuticals, Inc., Animal Health Division, Shirley, N.Y.) is our preferred drug of choice, but it is quite expensive because of its prepackaged syringes. This, of course, limits handling and provides less of an opportunity for contamination. Legend is also a good product and is moderately priced, so we use that quite often instead of Hylartin V. Our rule of thumb is that the higher motion joints get the higher molecular weight products, and in the distal hocks we use lower molecular weight products, specifically Equoron (Solvay Animal Health, Inc., Mendota Heights, Minn.).

Benner: Some of the dissatisfaction practitioners express regarding HA lies in the way it works. Because HA works on the soft tissue structures, it does not do much good to use it on horses that are already suffering from cartilage damage. Ste-

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roids and Adequan work for those horses suffering cartilage involvement, not HA. In 2-year-olds we have had some success with HA, but HA has not been as successful with older horses. In the older animals, we will often use HA with steroids, but any success we have with that combination is probably due mostly to the steroids.

Mitchell: I rarely use HA by itself. I do not use steroids very much alone either. If I use steroids, I use very small doses with HA.

Benner: We use about 25 to 30% of the steroid therapeutic dose when administering with HA therapy.

White: What are your recommendations regarding rest and rehabilitation as a form of treatment for acute injuries and DJD? How do you decide when a horse is ready to go back to training?

Hanson: Rest and rehabilitation are part of the triad for treating acute synovitis. One starts out with controlling the heat and relieving the pain, associated with a period of rest and rehabilitation to get the horse back to work. I am always impressed by how well this triad approach works. At this stage I will also curtail the use of phenylbutazone. The client has much more control of the animal in a hack than with turnout alone. During this period I try to encourage the owner or trainer to watch for signs of heat. If the horse backs off, gets more heat in that area and is not tolerating it, then we have to stop and re-evaluate the condition. That has worked well for us.

Grant: I agree. One of the most important points that has been made in equine sports medicine is that horses do not lose condition that quickly. Ten days of standing in a stall and just being hand walked will not cause a horse to lose all of its conditioning. An acute, simple injury can be healed with just 10 to 12 days of rest.

If you have the opportunity to control the horse's activities during this period, then you should take advantage of that. It is difficult to get clients to cooperate sometimes, and that is why acute injuries become chronic problems. A client might believe that after a few days of rest the horse is better and can go back to work, and that is not always the case. Diet restriction is another area where it is important to have a client's cooperation. When a horse is on rest and rehabilitation, it is important to keep its energy level down. A thin horse heals faster than a heavy horse. Proper rest and rehabilitation will keep horses from having to undergo arthroscopic surgery. Rest and rehabilitation reduce the incidence of acute problems turning into DJD.

Hanson: Is heat a reliable indicator as far as knowing when a joint is painful?

Benner: A good point of comparison is to get the client to feel the horse's bad leg on a daily basis, using the other legs as a standard. If a horse has heat on a joint, that's an indication of a problem. I mainly work with racehorses. It is very common for the owners and trainers of these horses to try to push them ahead to get back to work. If you have a horse with an acute inflammatory problem and you want to treat that with a proper course of rest and rehabilitation and the client is telling you that they want the horse to race again in 5 days, you have got a problem. I set the standard with these clients by telling them that if it takes more than two phenylbutazone tablets (2 g each) per day to reduce heat and have that horse moving without pain, then rest is necessary. Horses that have more severe problems will not respond to this 2-g dose.

McNitt: It is important to leave the client with guidelines with which to judge when to increase the level of activity. I try to rest most horses with an acute joint for 1 to 3 days, depending on the severity of the injury. Then, I ask the client to jog the horse in hand first in order to make sure the horse is sound. If I question the client's ability to follow my instructions properly, especially if I believe he or she will try to move the horse sooner than I recommend, I will make a point of returning to see this animal before recommending it be jogged. I will make sure the horse is at least sound on a lead shank before it goes back out on the racetrack. I use a walker often. Turnout is the equivalent of regular jogging, 3 or 4 miles in the Standardbred, and probably galloping in the Thoroughbred because horses just do not control themselves very well when they are turned out. Turning the horse out is not part of the rest recommendation. It is part of the rehabilitation recommendation. Making clients aware that turnout is not rest is a key factor in the treatment program.

Mitchell: Rehabilitation involves a considerable amount of time in the hack and tack walking, followed by light exercise under saddle for a 2- to 4-week period of time. During this rehabilitation period, we also begin to taper off medication. If the horse has had an inflamed joint and it was not injected, yet the symptoms have lessened — and maybe because of NSAIDs — we will taper those down and initiate exercise and continue the exercise as long as there is no return of the heat. We will gradually increase exercise, fully under tack, before these horses are turned out. I use this as a

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standard for all of our horses coming out of surgery, even the colic cases. I do not turn them out until they are working fully in their tack.

McNitt: I see very few horses with acute joint problems in my practice, and when I do, the problems usually stem from a fracture that was undetectable. I put very few horses on strict stall rest, although I do put a lot of horses on the walker. It is difficult to get clients to walk Standardbreds. You cannot even walk Saddlebreds outdoors because it is life-threatening to do so.

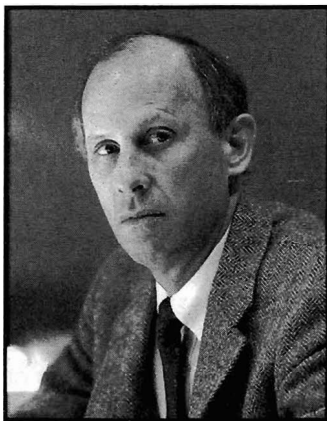
White: We rely heavily on absolute stall confinement. This means the animals do not come out of the stall for a prescribed period. I am a firm believer

Medrol® (Upjohn Co., Kalamazoo, MI) in the joint, the low-dose treatment calls for 20 mg, which I find more acceptable.

Hanson: How do you treat systemically?

Grant: I find keeping these horses on phenylbutazone every day may have some benefit. Repeated small injections of steroids in the joint once every 6 weeks, however, may be more practical. I prefer not to have any horses on systemic steroids unless necessary. The horses' moods seem improved with smaller doses of steroids as opposed to the larger doses.

If the joint is chronically thick, and you believe that the synovitis and dysfunction of that joint are



"We rely...on absolute stall confinement."

— White

in supporting the leg, if it is a high motion joint, specifically the fetlock. When these horses go back into walking, either saddle or hand walking, it is imperative to keep fluid and edema out. Warmth and support can be helpful in ensuring this.

Chronic synovitis is another stage in the DJD process that is frequently observed. How do each of you treat cases of chronic synovitis. For example, what do you do after you have treated an acute problem and it recurs, persists, perhaps intermittently responds to treatment, but keeps returning? You may suspect some cartilage degeneration. You are aware that you are dealing with an inflamed joint, though, one that is either subacute or bordering on chronic.

Grant: We use hyaluronic acid (HA) for suspected synovitis. It seems to help. We have also had some success with Legend™ (Bayer Animal Health, Shawnee Mission, KS) intravenously into the joints. I am very impressed with low-dose steroid therapy, although I am more satisfied now that the profession has stopped using those almost toxic-to-the-cartilage-cells levels of steroids as it did in the past. Instead of putting 120 mg of Depo-

coming from a reduced range of motion, then therapeutic ultrasound is a great way to administer physical therapy to these horses. I am a firm believer in ultrasound therapy if it will loosen the animal up, although you do have to be careful which joints on which you choose to use it. Some P-2 joints are supposed to be stiff.

Mitchell: The course of treatment you follow all depends on the joint. There is a difference in the way you should treat a high motion joint as opposed to a shock absorbing joint or a distal intertarsal joint. If a joint is radiographically unremarkable, I would still use some HA with a low dose of steroid. If the joint has significantly degenerative osteoarthritis, I use a long-acting corticosteroid, like Depo-Medrol because if there is a profound degenerative change, I want to relieve the discomfort and the inflammation. Most of the horses I treat do not have profound radiographic lesions, and they frequently will block intra-articularly. On those horses I prefer to use HA and low-dose steroids. On distal interphalangeal joints, I will use HA or HA and a low-dose of a short-acting steroid. If a pastern joint is chronically degenerative and there is a

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significant amount of radiographic change, then I would probably use a long-acting corticosteroid. I try to be conservative in my treatments of the other joints, (i.e., metacarpophalangeal, middle carpal, femero-patellar), and not use any long-acting corticosteroids. In fact, I am more inclined to use systemic Adequan® (Luitpold Pharmaceuticals, Inc., Shirley, NY) or systemic HA in treating those joints or systemic HA or HA intra-articularly with systemic Adequan.

White: As far as corticosteroids are concerned, I often would like something that lasts only 48 hours; however, presently, an effective product with a short period of activity is not available, so we use the longer acting products. When we use a corticosteroid, such as triamcinolone or methylprednisolone, in a joint we expect it to provide clinical benefit for 3 to 6 weeks.

It seems to have an even better effect than some of the older, oral GAG products. Horses certainly do seem to be in less pain after their administration, and they do not require as much of a warm-up period when they are on one of these GAG products.

White: Is this your opinion only for hocks, or in general?

McNitt: In general, although, in my practice with the dressage horses, I predominantly use the GAG products only to treat hock problems. I have seen several horses that required fairly frequent joint injections go completely off joint injections once they were started on Cosequin.

Mitchell: Cosequin has been very successful in treating older dogs with canine hip dysplasia. Those studies alone led me to believe that it might be a very useful drug for treating horses with low-



“Clinically (oral glycosaminoglycans)... are quite beneficial...”

— McNitt

McNitt: I have worked with a number of dressage horses and Standardbreds that have started to compartmentalize. Even though they do not have radiographic changes, I have injected a number of hocks and seem to have found little places to go into that are not in any text anywhere. Both practitioners and trainers have seen hocks injected in a number of fashions, from the lateral aspect of the splint and the front of the tarsal bones. You have to be a little flexible if you believe that is where the horse is lame and not be afraid to change your approach to how you inject a joint. I use a great deal of oral glycosaminoglycans (GAG) as a therapeutic modality. Clinically, they are quite beneficial and are well accepted by the majority of my performance horse clients. I have not seen any side effects from their usage. The traditional flex-free, J-type chondroitin sulfates have been around for a number of years, and I have found them satisfactory.

The newer products, like Cosequin® (Nutramax Laboratories, Inc., Baltimore, MD), are quite good.

grade, chronic arthritic conditions. Cosequin does reduce the need for me to see a horse as often. I believe it can be effective in treating low-grade, chronic conditions, but acute arthritis conditions are another story.

White: We do not know enough yet about how any of these proteoglycans are absorbed and what a particular dose will do to the joint. If we believe that the synthetic-like GAG, such as Adequan, are effective then it would make sense that some of these oral compounds may be effective as well. The question is, however, at what level are these drugs getting to the joint via the oral route? There is increasing anecdotal evidence that they are effective. Many of our clients report satisfaction with these compounds. I have seen some cases where they have been effective, although, I have seen other cases where there was no response. It could be the rest regimen that goes along with the administration of the oral proteoglycans that makes them appear so successful. It seems that

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many of these products are beneficial, to some degree, but there is very little in the literature that supports this.

Hanson: There has been a tremendous response to these GAG products, but we need literature to support these hands-on experiments. All we have right now is the support of our clients and colleagues saying that they know of incidents where these products were successful.

Mitchell: Clients prefer the oral GAG supplements to the injectables. They are easier to administer.

Hanson: The formulation between the two types of products is different. With the injectables, you inject the horse in the joint or muscle and the results are more immediate, but short lived. With the oral products, the results are less immediate and dependent upon gastrointestinal absorption and distribution.

White: Aside from drug therapy, what are your other specific therapies for treating DJD of the proximal and distal interphalangeal joints?

Mitchell: Shoeing management, hoof balance, and breakover are all extremely critical when encountering joint disease of the proximal and distal interphalangeal joints. In most cases, horses with these problems are extremely out of balance or have some type of angular deformity. In many of these horses modification of their shoeing, use of egg bar shoes, rolled toe, or just proper hoof balance will make a tremendous difference in the way they perform and respond to therapy.

White: I agree. I also try to treat these horses with corrective shoeing first. You may need an initial phase of treatment to get rid of the inflammation, but then you can usually control the problem with corrective shoeing. I use a full pad and try to get the hoof and pastern angle corrected. It is critical to get the weight support surface shifted back off the toe to support the frog and heels.

McNitt: I shoe many horses using radiography, just to make sure I have got the angle right.

Grant: A new shoe is available from the G.E. Forge company that works well with horses that have navicular disease. It has a swelled heel on it that changes the breakover point to the center of the foot.

McNitt: There have been many innovations in shoeing technology over the past 10 years. It is a very important aspect of equine medicine that used to be overlooked a bit. Now we realize improperly shod feet can lead to a whole series of health problems for the horse, especially DJD.

Grant: Along with corrective shoeing, we also have to emphasize to owners and trainers the im-

portance of not "over-training" their horses. This leads to a great deal of chronic joint disease. Owners and trainers must carefully evaluate their horses to make sure that a particular horse is really suited for the job they want it to do, and then, what

***"...clients report
satisfaction with...oral
proteoglycans...."***
— White

type of training program will be best for this animal. Training the horse on hills or putting it on the treadmill with weights may be an ideal training program for one horse, but not for another. Horse owners and trainers should consider cutting back on training days, but maybe making each individual training session longer, adding more miles that are worked at a slower pace instead of doing an anaerobic workout if the work they do is not done at anaerobic speeds. Putting weights on the jog cart is another way to work the horse just as hard, but at a slower pace.

McNitt: Training programs should be flexible.

Hanson: Soft tissues, muscles, and bones are all vascular and innervated and have lymphatics. Cartilage is avascular and alymphatic; it is dependent on nutrition through the synovial fluid. If that joint capsule is strained, then that whole nutrition and metabolism of the entire cartilage surface is altered.

White: We work with some horses which have irreversible joint disease where the owner wants to make them more comfortable, and perhaps get a little more use out of them. I will use a corticosteroid to treat these low motion joints, like the proximal interphalangeal joint. I have seen some of these horses that looked like they should be permanently lame and they responded to this therapy and became sound.

Grant: Rest is the best course of treatment for an acute problem, but with the more chronic cases motion is imperative. The horse needs to be work-

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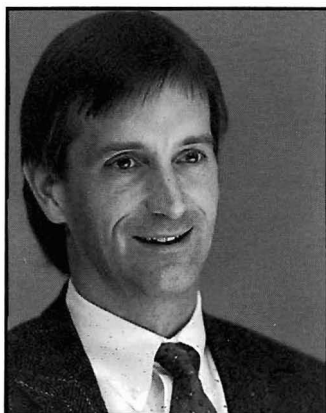
ing its joints in order to get good nutrition to the bottom cartilage layers. We see many ankle problems with the Thoroughbred racehorses and we advise rest, but after 3 months rest, the joints are more inflamed. Maybe if we had them on a reduced training program rather than complete rest this might not happen.

McNitt: Does cartilage thickness in the fetlock decrease almost at once on complete stall rest, and in order to avoid this should there be some type of exercise in chronic cases?

Grant: One of the short-term effects of immobilization in the cast is the possibility of "fracture disease" or arthrosis. When you immobilize a fetlock joint with a condylar fracture (or a P-1 fracture) with four screws in a cast it was thought arthritis of the fetlock joint would be increased. This stems from the traditional teaching that to put a horse in casts for long periods of time would be detrimental. Recent research has been done that shows a horse

of having synovial membrane attached to the primary clot. These synovial adhesions reduce the formation of hyaline cartilage. At some point, however, you need to begin stimulating the mesenchymal cells within the clot when they're at a rudimentary stage. This may need to take place earlier than the 6 straight weeks you prescribe.

White: The course of therapy you follow varies. For example, if you have an injury to the radial facet of the third carpal bone, it is difficult to get that region to properly resurface whether you recommend stall rest or exercise. There is a chance that this area will never heal correctly because of compressive forces and the opposing surface on the radial carpal bone. In the fetlock and on the side of joints with smaller defects, however, earlier exercise after the first 10 days when the blood clot is stable will most likely be beneficial as long as it is not overdone and does not strain the soft tissue or compress the cartilage. One of our biggest prob-



"If (the) joint capsule is strained, then...the entire cartilage surface is altered."

— Hanson

can be in a cast for as long as a month, with the changes in the joint cartilage still being reversible. Having a proper amount of immobilization aids in fracture healing and it reduces additional trauma to the joint that results from an unstable situation.

Benner: What if you encounter an arthritic joint due to chip fractures, and you have reached the subchondral bone by the time you remove the chip and curette cartilage? In this situation I recommend complete stall rest in order to let the defect heal over with scar tissue, and then about 6 to 8 weeks of gradually increasing exercise. Is this the wrong course of therapy to recommend?

Grant: It is important to avoid having the initial clot that occurs at the defect site be damaged. If the clot is removed too soon, it never replaces itself. Immobilization to a point is important, but doing passive flexion exercises increases the distribution of synovial fluid and reduces the chances

lems is that we do not have a system to grade what the inside of the joint is doing with these forms of exercise. It is very difficult to know how much a horse flexes at different speeds.

Generally, there is probably no harm in a little exercise. Increased mobility in the first 8 weeks following such a procedure helps both the soft tissue and the healing defect. You have to evaluate each case individually. For example, we had a stifle joint injury with severe injury to the meniscus that caused damage to the tibia as well as the condyle of the femur. Following surgery, the horse had stall rest for 3 months. We were concerned that exercise would disturb the healing process in this case. The horse recovered uneventfully.

Grant: Sixty days of controlled exercise aids in the soft tissue healing process.

White: We recommend swimming as a form of exercise, especially for recovery from carpal joint

injury. It is a great way to get motion without having the concussion. The horses that have followed this exercise regimen have recuperated quite nicely.

Grant: I am reluctant to recommend swimming. It allows the horse to favor the injured area and slows down its return to work. I do not consider swimming a part of the training process, and when you are remodeling a stressed bone it needs stimulation that can only be provided through training.

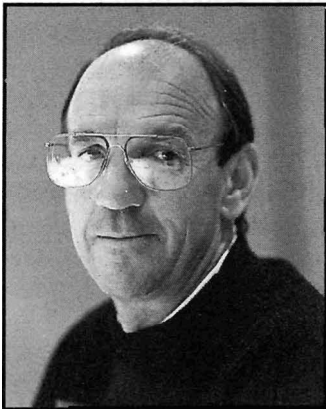
White: Do any of you employ joint fusion as a form of treating chronic DJD?

Hanson: We only use it when we have distal P-1

sessing some of these problems. You can see how it affects them; it is just difficult to describe.

Mitchell: We have a similar problem with the front limb of the sport horse. In the hindlimb we will try the same thing, that is physiologic fusion. Corticosteroid injections and phenylbutazone seem to correct lameness. We have been able to surgically fuse several pastern joints and have been successful with this technique, but it requires a long period of rest.

Hanson: I have never seen a horse fuse its hock with steroids.



"A proper work-up...is key."

— Grant

fractures. For severe ring bones with lameness, we rely on a regimen of steroids, phenylbutazone, and work. This is a daily regimen that is followed for a period of 6 to 18 months. The joint may not anatomically fuse all the way during this period, but physiologically it will, and it seems that the horse's degree of pain is greatly reduced.

McNitt: I have seen the same effect, physiological fusion but not anatomical on the front limb of a Standardbred from the pastern joint. We inject them when they need to be injected and try to keep the joint cool, and many of these horses become quite sound.

Mitchell: Do these joints progress toward fusion, or do they just calm down?

McNitt: They progress toward fusion. I have never had a race horse fuse radiographically; they have periarticular new bone and clinically appear to have a fibrous type stabilization.

Mitchell: How much of a gait deficit do these horses have?

McNitt: Gait deficits are difficult to appreciate at slow speeds in the Standardbred because of a variety of factors such as overall soundness, equipment, shoeing and how well gaited they are. To be truthful I think many of us who work on Standardbreds operate at a subconscious level when as-

Mitchell: Basically, the hocks fuse on their own. Steroids just keep the animal comfortable while that is taking place.

White: We have learned over the years that injecting the distal hock joints can stop the progress of DJD and can eliminate the pain, but it will not fuse the joints. Surgery, of course, works, but the time for recovery can be extensive.

Hanson: We have been successful with surgery for fusion in pleasure horses.

Benner: Some Quarter Horses with distal tarsal problems just do not respond to phenylbutazone and steroids.

White: How do each of you determine your prognoses for DJD? Do you rely more on radiographs or clinical response?

Grant: A prognosis depends on the degree of clinical change observed in the horse, the type of work the horse does, the owner's expectations, and, of course, the response to therapy. Every case I see presents its own parameters. A proper work-up from the start is key.

McNitt: Our expectations for a horse have a great deal to do with our prognosis, particularly for racehorses. When you are presented with a racehorse with a chronic joint problem, you have to ask the clients what their overall plans for the horse are.

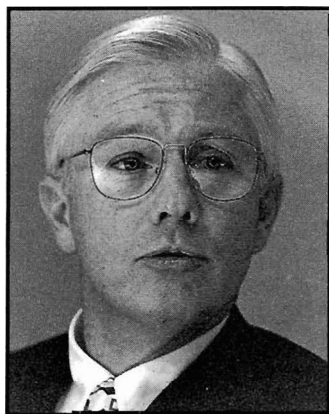
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DEGENERATIVE JOINT DISEASE

For instance, do they want to keep racing it in the class it is currently racing in, or would that be something they would consider reducing? With reduced levels of expectation on the client's part, most horses with chronic joint problems can be successfully managed. In addition to the diagnostic aspect of a prognosis, what is seen on the radiographs is also a key component, particularly when the fetlock joint is the problem. A radiographic change, for the worse, leads to a very poor prognosis. Fetlock joints take a particularly long time to show any signs of change even despite clinical evi-

That is, we can get these horses moving again without pain, but they will never be at the level they once were. The systemic use of polysulfates, glycosaminoglycans (GAGs), and Adequan® (Luitpold Pharmaceuticals, Shirley, NY) has been beneficial in the management of chronic joints. Nutritional management is probably going to play a big role in long-term management of the equine athlete that has been with an owner for a number of years. This will be something that will increase in popularity over the next 5 to 10 years.

White: Making the prognosis is becoming a dif-



"Prognosis...is a very delicate part of...practice."

— Mitchell

dence of severe disease, so when you do see the change, the prognosis is usually a career-ending one.

Benner: Gender seems to affect our prognoses. Filly racehorses and high performance horses tend to fare much better than geldings. With the geldings you might try every form of treatment and get no response, at which point the prognosis is poor.

Mitchell: I have worked with many of my patients since their birth. Prognosis, therefore, is a very delicate part of my practice. In many instances I am seeing horses that were once at the top of their level of work, and due to DJD, the best prognosis I can give is that the horse is now only suitable for a lower level of work. Radiographically, I have seen some disastrous looking joints. We try to discourage clients from purchasing or becoming more financially involved with these horses, although most of the horses respond well to therapy.

ficult part of equine practice because technology has advanced so fast, and if we rely on older systems of prognosis, we may not be doing everything possible for a horse. I have seen recent cases, where, in the past, the horse would not have stood a chance, but today it is back at work at the same level or a slightly reduced one. The use of GAGs and continued use of steroids have played a major role in these improvements. We are putting steroids back in joints after years of believing we should not do that, and these smaller doses are proving to be quite effective, especially when coupled with exercise. We tend to take more chances now, even when radiography or arthroscopy offers a poor prognosis. We might try steroids, exercise, rest, or any number of combinations and see improvements. A diagnosis of DJD used to mean the end of a horse's career. Today there are opportunities to help these horses. ■

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