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# MANAGING EQUINE OSTEOARTHRITIS

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What's in YOUR TOOLBOX?

## What's in Your Toolbox?

Do you have the tools you need for competition this year ... and do any need sharpening?

never really wanted an office with a view; I wanted a view for my office. That explains why my window looks out at the Blue Ridge Mountains and why fall is one of my favorite times of the year. By this time I'm a little burned out on competitions, and I'm starting to make plans for the coming year. The leaves are turning, and I'm scheming how to make sure my students win absolutely everything. I know they won't, but as the song says, "you gotta have a dream," or "... how you gonna have a dream come true?"

I have been thinking about the horses and riders I'll be working with this year, and it occurred to me some of my riders might need better tools for the job.

At first I just concentrated on their horses, as I'm afraid some of them will not be suitable for their riders' goals. There will be some painful conversations, but that is part of my role. Riders who are involved in ambitious careers must have the tools to do the job, starting with the appropriate horse. That led me to think further about the tools we use to ride—the existing tools we can improve and the entirely new tools we can develop during the winter.

When I say "tools," you might naturally think about equipment essential to riding such as saddles and bridles and wonder if I am about to suggest you need a different bit or saddle or maybe (shudder) a noseband more forceful than a plain cavesson. Nope, please put the tack catalog away and stifle your disappointment. By tools, I mean something you acquire by the invest-

ment of learning and time: the language we use to communicate with our horses. Of course that language entails whips, spurs and bits, but at its most basic it's legs and hands, your position, your voice and—maybe most importantly—your knowledge of horses and their responses to various stimuli.

#### Let's Start with Your Position

You need to maintain your posture in the saddle to communicate efficiently and clearly with your horse. When your legs close, it must mean something to him. If you squeeze your fingers, he must respond. But he must know what it is you want him to respond *to*. Excessive, undirected movement on your part leads to misunderstanding on his part. If you are closing your heels, but your arms are flapping like a screen door in a hurricane, your horse will always listen to the tool—the aid—you didn't want him to hear. That's where position comes in.

When you look at successful dressage riders, you notice they sit as regally as kings and queens. Regardless of your

discipline, you need a good dressage position because dressage is the tool you use to teach your horse how to respond to your aids, the aids you will use to communicate with him whatever the sport. Ask someone to look at you from the side while you are at the halt with your stirrups adjusted for dressage. Have them check that you have a vertical line from your ear through your shoulder to your hip and down to your heel. Distribute your weight equally on your two seat bones and your pubic bone. Make sure you have a slight arch at your waist so that when your horse moves, the alignment of your skeleton moves your body. This means you will not need to grip to stay with your horse. Once you're aware of these criteria, you will begin to notice that every worldclass dressage rider conforms to them and sits correctly.

Almost every world-class show jumping rider has a world-class lower-leg position. Elite cross-country riders jump up banks and down maximum drops without ever losing their balance because their position is so good they can deal with sudden changes of terrain and balance. There is no way to separate how you ride from how your horse goes.

You have a wide range of aids available when you are in the saddle. You should understand each of them and use only the one(s) you need at that instant—and no other. A good position with an independent seat will enable you to do that.

#### It All Comes Down to ...

I understand the Training Scale, but I was taught dressage before the scale was invented, and my lessons consisted simply of "calm, forward, straight." Simple, yes ... but not easy.

If your horse is not calm, he will learn the wrong lessons from your aids; you will be training him to misbehave



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Charlotte Dujardin and Valegro are an excellent example of one of my favorite aphorisms: You can't separate how you ride from how your horse goes. In this photo, you can see all the basic things your dressage instructor tells you during your lessons. "Keep a vertical line from your ear to your shoulder to your hip to your heel." Check. "Have a slight arch in the small of your back so that you can follow the motion of your horse's back with your back." Check. "Adjust your stirrup leathers so that your stirrups push your toes higher than your heels." Check. "Look where you are going." Check. "Make sure you maintain a straight line from your elbow to your horse's mouth." Check. "Have an equal feel of both sides of your horse's mouth." Check. "Always have your horse in front of your leg." Check.

Certainly Valegro ("Blueberry" to his friends) is a once-in-a-lifetime horse; however, I shudder to think what might have happened if he had been developed by a rider who used her reins for balance or gripped with her heels. Take another look at this photo, this time noticing that Charlotte's reins appear too short. Instead, I would say her reins are adjusted correctly, and she has opened her elbows to allow Blueberry to stretch his neck in the extended trot. (There is a similarity to correct riders' elbows in the air over an obstacle, but I will save that for another time.) In addition, Charlotte's heels are lower than her toes and her leg is quiet, which tells us her horse is consistently in front of her leg. She doesn't have to grip with her heels or nag with her spur to produce forward motion.

rather than to improve. You need a calm approach with your horse from the moment you tack him up every day.

If we accept "calm, forward, straight" as a guiding principle, and your horse is calm, then the next step is the correct use

of your lower leg. Although horses vary widely in their response to leg aids, you must ride with very simple rules. If you close your legs, your horse must *immediately* move forward. If you close one leg, your horse must *immediately* step away

from the pressure. The leg pressure you use should be applied in the following sequence: a slight, almost imperceptible heel pressure, then spur, then a tap with your whip behind your leg to enforce what was an invisible aid a nanosecond before the whip arrived. Your horse absolutely must respond to your leg aid; end of story.

Note that if your horse does not respond to your first aid, each of your aids is stronger than the one before and follows quickly. Notice also that in this sequence, there is no place for a nagging, repetitive heel aid or for lifting the heel and grip-

ping with the spur. (You'll quickly realize that doing this also messes up your lower-leg position.) Obviously, each horse is different in his sensitivity to the leg aid, but the final result must be that you can create forward movement from an invisible aid. Horses who are ultra-sensitive to your leg—or, alternatively, are nearly impervious to your leg aids—are difficult to train but become much easier once you commit to my simple sequence.

It goes without saying, so I'll say it anyway, that an ultra-sensitive horse already satisfies my rule that he must be in front of your leg. To train him, you should continue to ride with subtle leg aids and teach him to accept the inside-leg to outside-rein connection that I'll explain in a moment. Your outside rein controls the speed. If you have a horse who goes willingly forward to that connection, you are well on your way to having a delightful, well-trained horse to ride. All you need now is time and dressage.

Like ultra-sensitive horses, ultra-sluggish horses are hard to ride. However,



I want your lower leg position to look exactly like this: ball of your foot on the tread of the stirrup, your little toe against the outside branch of the stirrup, heels lower than your toes, weight distributed equally across the stirrup, stirrup leather vertical, and the stirrup perpendicular to the girth. Rather than pressing your heels down, have the feeling your stirrups are pushing your toes up. Your foot should be diagonally across the stirrup with a slight angle to your horse's body; that angle should be the same as that with which you walk. This angle ensures the correct alignment of your joints and is the most efficient means of absorbing the shock of galloping and jumping.

Pay close attention to the spur and strap in this photo: The spur is fitted correctly with the shaft parallel with the seam of the heel box and the shank of the spur turned down. The buckle is centered above your instep, because in that position it is least likely to hang up on your stirrup when you fall off. Your spur should not be in constant contact with your horse's side. If your heels are up and you are gripping with your spurs, your horse is behind your leg.

your hands by slowing down. You should ride sluggish horses in a plain snaffle with a loosely fitted cavesson. To

help you to ride forward with very soft hands, carry your reins in a "bicycle" grip, holding the reins between your thumb and index finger, rather than under your ring finger. This will make you more aware of the weight of your contact with your horse's mouth. If you don't open the door, your horse will not step willingly through it.

I'm not a big fan of modern spurs, many of them with rowels or exaggerated lengths or shapes. I prefer a pair of Prince of Wales spurs, correctly adjusted. If your horse does not respond to a sharp prod (notice I said "a" sharp prod, meaning just one) with these spurs, you must do two things: Make sure your hands are soft and then immediately support your leg with your whip ... and I mean immediately. If you repeat the same aid twice, you are not riding—you are nagging.

## Got 'Forward, Straight and Calm'? OK, Next ...

The movements and paces you ask from your horse should be precise, clear and understandable. If you ask for leg-yield before you have taught turn on the forehand, you may disturb his equanimity. Why are leg-yield and (later on) shoulder-in so important? These are the first exercises we use to teach your horse to go forward from one leg to the opposite hand. In that configuration, you have your horse between the accelerator and the brakes; you have taught him to accept your ability to control impulsion and speed. Now all you need is time ... and the right tool for each job.

My experience is that once you develop a truly independent position, you can make progress with horses of every type. By using very clear aids, and insisting on a correct response to those aids, you will begin to understand the interrelationship between your aids and your ability to train horses. The more you learn about horses, the more calm you will become and the more effective in your riding. Remember ... calm, forward and straight.

they become easier once you make the commitment to riding forward. The key to riding them well is to insist on forward motion while riding with *extremely soft hands*. "Clashing" your aids—kicking and pulling at the same time—is the most common error I see riders make when riding sluggish horses. Admittedly, strengthening your leg aids without tensing your upper body, arms and hands is difficult, and requires a truly independent position. (Yes, that again.)

Keep in mind that you have no chance of getting a sluggish horse correctly on the bit until you have activated his hindquarters. Don't try to do this using the kick-and-pull approach; instead, ride him *forward* into a soft hand. Sluggish horses are a challenge to train, not so much because they are dead to your leg aids, but more because they are *too ready to listen to* 



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- 2 Burba DJ, Collier MA, DeBault LE, Hanson-Painton O, Thompson HC, Holder CL: In vivo kinetic study on uptake and distribution of intramuscular tritium-labeled polysulfated glycosaminoglycan in equine body fluid compartments and articular cartilage in an osteochondral defect model. *J Equine Vet Sci* 1993; 13: 696-703.

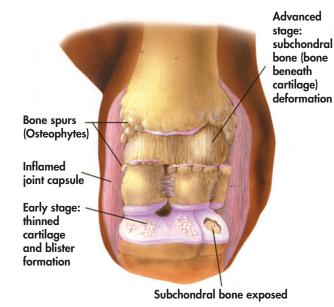
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Osteoarthritis, or degenerative joint disease, is an irreversible condition, but careful management of symptoms will keep your horse moving freely.

#### **Degenerative Joint Disease**



#### **By Leslie Threlkeld**

id your horse take a funny step or are you just imagining it? He seems to be working happily and you checked his feet for stones before mounting. Yet he does seem to take a little longer to warm up for work recently. Could something be wrong? When your horse comes up lame or even

a bit stiff or lackadaisical under saddle, countless different ailments could be the cause. One likely reason for lameness or a reluctance to work has to do with soreness in the joints. Many joints work together to allow a horse to accomplish daily activities like walking and grazing in the field as well as athletic feats like jumping a cross- country fence or performing a half-pass in the dressage arena. When a joint becomes painful, a horse's ability to move comfortably is compromised.

Similar to humans, horses may develop arthritis in their joints that can lead to decreased mobility. Osteoarthritis, also known as degenerative joint disease, is one of the most common causes of lameness. While it cannot be cured, the symptoms can be controlled so your horse can continue to do his job.

#### **How Joints Work**

To understand osteoarthritis, you must first understand a joint's structure and function. In a joint, two or more bones connect and



Certain conformation flaws, such as knock knees, upright pasterns, sickle and cow hocks (shown) or very straight hind-leg angles, may put undue stress on joints and could contribute to osteoarthritis development.

allow movement through the harmonious force of muscles, tendons and ligaments.

The ends of the bones are contained in what is called a joint capsule, the health of which is extremely important to a horse's ability to move. In the joint capsule, a layer of cartilage on the surface of each bone prevents the bones from painfully grinding against one another. Synovial fluid, produced by the synovial membrane in the joint lining, fills the joint capsule to provide additional protection and lubrication.

The joint maintains healthy function in an efficient wear-and-repair process that produces synovial fluid and repairs damaged or aged cartilage cells. However, if the joint is compromised through injury or overuse, the cartilage will wear away, putting more pressure on the bones and causing pain and discomfort. It is the combined breakdown of cartilage and the resulting secondary changes in the bony structures of the joint capsule, such as bone spurs (osteophytes) or subchondral (bone beneath cartilage) deformations, that is known as osteoarthritis. Because lost cartilage cannot be regrown, the damage caused by osteoarthritis is irreversible.

## Cause and Effect

Joints will naturally experience wear and tear over time, but there are several factors that may lead to the development of osteoarthritis.

Conformation flaws, such as knock knees, upright pasterns, sickle and cow hocks or extremely straight

hind-leg angles, may put abnormal pressure on joints. The chances of developing osteoarthritis also increase with age simply due to many years of hard use and the during training and competition.

"It could be chronic cyclical forces over an athletic career that cause stress and injury to the cartilage, joint capsule and synovium," explains Dane Tatarniuk, DVM, MS, DACVS-LA, a veterinary surgeon at Highline Veterinary Orthopedics. Osteoarthritis is more likely to develop in hardworking, weight-bearing joints, such as the fetlocks, knees, hocks and stifles. How quickly osteoarthritis progresses can vary, however. Major injuries like a fracture or an infection can cause the disease to worsen quickly. Transient or short-lived inflammation in a joint will not necessarily cause osteoarthritis, but it could eventually be a problem if the reason of the inflammation is not addressed.

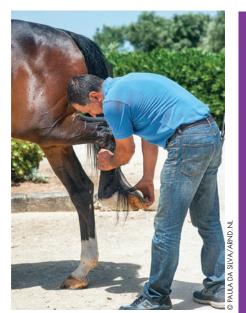
At the cellular level, degradative enzymes most commonly belonging to the family called matrix metalloproteinases (or MMPs) increase with inflammation. "These MMPs, in higher concentration compared to normal joints, lead to erosion of the cartilage," Dr. Tatarniuk says. "As the inflammation persists, the body responds by trying to stabilize the inflamed joint. This is why the joint capsule thickens, and increased mineralization and bony changes start to progress. The changes to the bone are a slow physiological response to the chronic inflammation present."

Symptoms of osteoarthritis range from mild to severe joint pain and lameness. You may also notice heat caused by inflammation. In the early stages of the disease, your horse may seem only

Horses participating in a high-intensity athletic career will be more susceptible due to repetitive use during training and competition.

natural degeneration of the body. Another possible cause of osteoarthritis is a soft-tissue injury or infection that causes inflammation in a joint. However, the simplest explanation for the development of osteoarthritis is use. Horses participating in a high-intensity athletic career will be more susceptible due to repetitive use

to have some stiffness in his joints after he's come out of the stall or begun a work session. On the other hand, he may experience varying degrees of lameness or decreased performance and a reluctance to work. Call your vet if your horse is suddenly or increasingly sore or lame.



In order to provide an accurate diagnosis, a vet will typically conduct a lameness exam, which includes flexion tests of the horse's joints.

#### **Diagnosing the Disease**

As with any lameness in horses, the first step is to find the source of the pain. The vet will begin with a physical exam and try to narrow down the exact location of an injury. Some signs he or she will look for are excess fluid, heat, decreased range of motion and pain associated with flexion tests.

"The hallmark of diagnosis that every vet should start with is thorough palpation and watching the horse move," Dr. Tatarniuk says. "We try to identify which legs are lame by watching them trot on a straight line or longe line. Flexion tests are common to look for an increase in soreness and give an idea of which area is hurting. From there, we palpate the legs thoroughly from top to bottom."

In some cases, joint effusion—increased synovial fluid in the joint capsule-secondary to inflammation may indicate disease. "Sometimes the fluid is normal in a joint, and it's the veterinarian's job to determine if the joint is truly sore. But if there is fluid and the joint flexes positive, there will be strong suspicion that that is an area of concern."

Once the vet has identified the limb causing a horse's lameness and further

### How Does Joint Disease Affect My Horse's Career?

Because osteoarthritis widely varies in how quickly it progresses and the level of pain it produces, a positive diagnosis may mark a different future, depending on the horse. In the case of early-onset osteoarthritis that is progressing slowly, a horse may easily continue his career supported by appropriate joint management. In more acute cases, a horse may need to reduce his workload or compete at a lower level. For older horses, transitioning into retirement may be the best solution. Much of it depends on what the

they are happy working and are comfortable

comfortable and sound, it may be time to think about a different career or lesser workload," says Patrick Loftin, DVM, MS, a surgeon at Tarheel Veterinary Surgical Specialists in Louisburg, North Carolina.

"Don't despair. It's not necessarily the end of your horse's career. There are many horses out there doing high-level jumping, dressage and even racing with ugly X-rays. Work with your veterinarian to come up with a plan for your horse to moderate symptoms and keep him comfortable as well as an exercise program. Try to reduce inflammation and slow the progress of the symptoms and progression of clinical signs and lameness."

If you plan on competing in rated shows while your horse is on medication for joint pain, be sure to check the United States Equestrian Federation rules to ensure the drugs your horse is taking are allowed. You can email the USEF Drug Hotline medequestrian@aol.com or call 800-633-2472.

proper management can help horse's job is and his level of use. keep him ready for competition. "Let them tell you what they can do. If and sound with some maintenance, keep them working. If you can't keep them

narrowed the location of pain down to a specific area of the leg, it may be necessary to block nerves with an analgesic like lidocain to isolate the pain. If an area is numbed and the horse's comfort improves and he moves more soundly, then the vet knows there is inflammation or pain in the numbed area. From there, the vet will use radiographs to examine the bones of the joint. Cartilage damage will not show up on a radiograph, but as the disease progresses, bone spurs (bony growths on the edges of bones that indicate an area of increased force on a joint) may be visible. The narrowing of a joint space due to cartilage loss may also be visible on an

ultrasound. Cartilage acts as a supportive cushion and shock absorber between bones. If the cartilage wears away, there is nothing separating the bones and allowing smooth movement of the joint. Severe cases of cartilage loss may result in painful bone-on-bone situations.

"That's where we might see osteophytes, or spurs, which are bony proliferations or irregularities associated with the joint. That gives us an idea of how far the bony changes have progressed. If we see no abnormalities on the radiographs, but there are clinical signs of osteoarthritis, it could just be the early stages of the disease," Dr. Tatarniuk says.

An osteoarthritis diagnosis doesn't necessarily mean your horse's show career is over-



Radiographs of joints are common during the prepurchase exam process.

## Radiographs For Prepurchase Exams

Radiographs are a normal part of a prepurchase exam, and the parts of a horse's anatomy you decide to X-ray may depend on his history and intended future use. For instance, you're likely to look at the front feet and knees of an off-the-track Thoroughbred you hope to event. Alternatively, you may look at the hocks and stifles of a

horse who has been jumping for some years if you're hoping to continue competing him. Radiographs can reveal any number of things, but you shouldn't get bogged down in one single inconsistency on an X-ray. You have to look at the whole horse.

"I try to take the X-rays as one piece of the entire exam," Dr. Loftin says. "If he's out showing and winning and is sound on my exam, negative on flexions and I look at the X-ray and see arthritic changes, I'm going to be less concerned about that. Or the X-rays could not be as bad, but there is clinical evidence that there is arthritis active and causing a problem."

Ultimately, you as the buyer have to decide how the results of the prepurchase exam fit into what you want to do with the horse and what you're willing to manage as he ages. "You can still get a long, useful career out of a horse with arthritis. But are you OK with having to do joint injections in the future? It all comes down to the buyer's risk tolerance," Dr. Loftin says.

Ultrasounds are typically used to diagnose soft-tissue injuries, but they can also be used to evaluate the margins of the joint. Patrick Loftin, DVM, MS, a surgeon at Tarheel Veterinary Surgical Specialists, explains that when using ultrasounds, "You can't see through the bone, but you can start to see if a spur is building and is not fully calcified. You can also see if there is excess fluid or if the synovium is thickened." An inflamed synovial membrane is known as synovitis and may cause pain and swelling of the joint.

It is possible to perform an MRI (magnetic resonance imaging) for further examination, but this is a very specialized and expensive procedure. Few veterinary facilities have MRI machines, and they are rarely used, especially to diagnose arthritis, which can usually be accomplished through a physical exam and series of X-rays.

Osteoarthritis is not always the cause of

joint pain. It is possible that the collateral ligaments or other structures of the joint have been injured. "It could be 100 different things and that's where your physical and lameness exams come into play," Dr. Loftin says. "When we talk about arthritis in the horse, it seems like the most common thoughts are of the cartilage and bone spurs, but the joint is a full-functioning structure. There's cartilage but also underlying bone, synovial lining and joint fluid that all have to work together to make the joint function normally. You have to think about it as an entire structure."

## How to Cope With Joint Disease

Degenerative joint disease cannot be cured. "Once it starts you can't turn back the clock," Dr. Loftin says. However, you can manage the symptoms and potentially slow the progression of the disease. It is ideal to catch the signs of disease early



A common osteoarthritis treatment option is injecting the joint directly, which delivers the medicine straight to the affected area.

so that treatment can begin. The primary goals when treating osteoarthritis are to reduce inflammation in order to slow the degradative process and subsequently provide the horse with some pain relief.

Systemic anti-inflammatories or a nonsteroidal anti-inflammatory medication, such as phenylbutazone, are typically the first step in treatment. Some horses are sensitive to taking bute for an extended period of time and may develop stomach ulcers or kidney problems. Therefore, bute is an effective treatment to soothe acute arthritis flare-ups, but firocoxib (Equioxx®) may be a better long-term solution because it is gentler on the stomach.

Dr. Loftin says that medications such as hyaluronate sodium delivered intravenously (LEGEND®) and polysulfated glycosaminoglycan delivered intramuscularly (Adequan®) have good results as far as full-body care, especially for horses who have multiple joint problems, and can help increase joint function before resorting to intra-articular joint injections.

Intra-articular joint injections, or injecting the joint, deliver the medicine straight to the affected area rather than treat the whole horse with systemic drugs. The most common type of injectable medication are corticosteroids, but Dr. Tatarniuk explains that while they are "very good at reducing inflammation in a joint, they are



You can help prevent joint issues in your horse by monitoring his weight and making sure he has a regular exercise program that's appropriate for his level of fitness.

a little irritating to the cartilage" over time.

"Studies find that long-term use of steroids, although very good at reducing inflammation, will increase the amount of degradative enzymes in the joint," Dr. Tatarniuk says. "The short-term gain of reducing the inflammation in the joint from the corticosteriod helps eliminate pain and lameness. But long-term or repetitive

Dr. Tatarniuk says. "They are usually derived from a horse's own blood system or bone marrow. Basically, we're manipulating the cells in the body to secrete really good anti-inflammatory proteins that are natural and in high concentrations. We are learning a lot about how and why they work. They do seem to be anti-inflammatory in nature and may have a regenera-

In general, making sure your horse is at a good weight and remains active with regular turnout and some level of exercise will promote joint health.

use certainly does not help the degradation of the joint already happening from osteoarthritis. However, with arthritic joints, the steroids are very effective at reducing inflammation and improving comfort, so they still act as a very important tool in managing arthritis. This rationale, though, is why preventive joint injections with a corticosteriod in a healthy, non-arthritic joint are not recommended.

"Newer biological therapies include platelet-rich plasma [PRP] and stem cells,"

tive effect in the joint."

Dr. Loftin agrees that treatments like stem cells and PRP are still being researched and are less common in clinical practice. "Once you have cartilage loss, you can't get that back even with stem cells. Hopefully, down the road we will gain more information on the use of these therapies in diseased joints."

Besides administering NSAIDs and joint injections, there are other treatment options that horse owners may find ef-

fective for managing joint pain and inflammation. Some compression therapies and specialized wraps are designed to increase blood flow and can help prevent swelling.

Additionally, there are hundreds of oral supplements on the market that may support joint health. However, Dr. Tatarniuk cautions, "Joint supplements aren't regulated by the FDA so there can be a lot of variability in consistency, ingredients and quality assurance. I usually tell clients that some companies out there put a lot of time and effort into supporting research into the efficacy of their product. Work with your vet to determine the best joint supplement so you know you get what you're paying for."

In general, making sure your horse is at a good weight and remains active with regular turnout and some level of exercise will promote joint health. The last thing you want to do is keep an arthritic horse in the stall and limit his movement. Just as people do physical therapy after a major injury to keep the bone and joint structures functioning properly, horses also need to keep moving.

Dr. Loftin stresses, "We're not talking about covering up pain and keeping them in work. We're trying to keep the joint functional and normal."