

Balanced Joint Health

*Learn more about joint injections in
the equine athlete. First in a series.*

By Dr. Steve Fisch

WE FREQUENTLY HEAR THE WORDS balance and balanced, which Webster defines “as a state of equilibrium.” We talk about balanced budgets, balanced tires, balanced diets and balanced lives.

Balance is also important to maintaining healthy equine joints.

The most important part of balancing a successful equine team is the horse itself. Job No. 1 is to take care of the horse and always do what is best for the horse. In the long run, the decisions that are best for the horse will always be the most important part of keeping the successful horse/owner/trainer/veterinarian team successfully balanced. The second most important part of the equation is the owner. Without the owner, the rest of the equation is way out of balance.

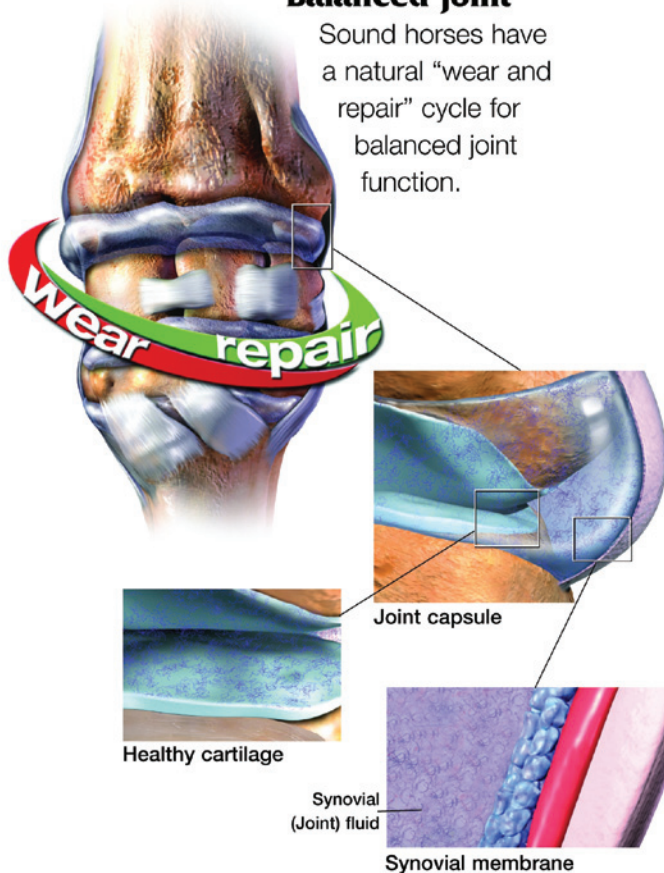
Injecting Balance

JOINT INJECTIONS: TO DO OR NOT to do, that is the question. Joint injections are an important but expensive part of keeping equine athletes healthy and sound. Joint injections at the right time and with the correct diagnosis help keep the successful team in balance. They can keep a horse’s joints healthy, allowing him to win and stay sound for the long term.

Done at the wrong time and for the wrong reasons, joint injections can throw the whole equation out of balance by hurting the horse and creating negative financial situations for the owner. To keep the equation of healthy horse and healthy owner in balance and growing, we need treatment decisions to be based on facts and not tradition or fear.

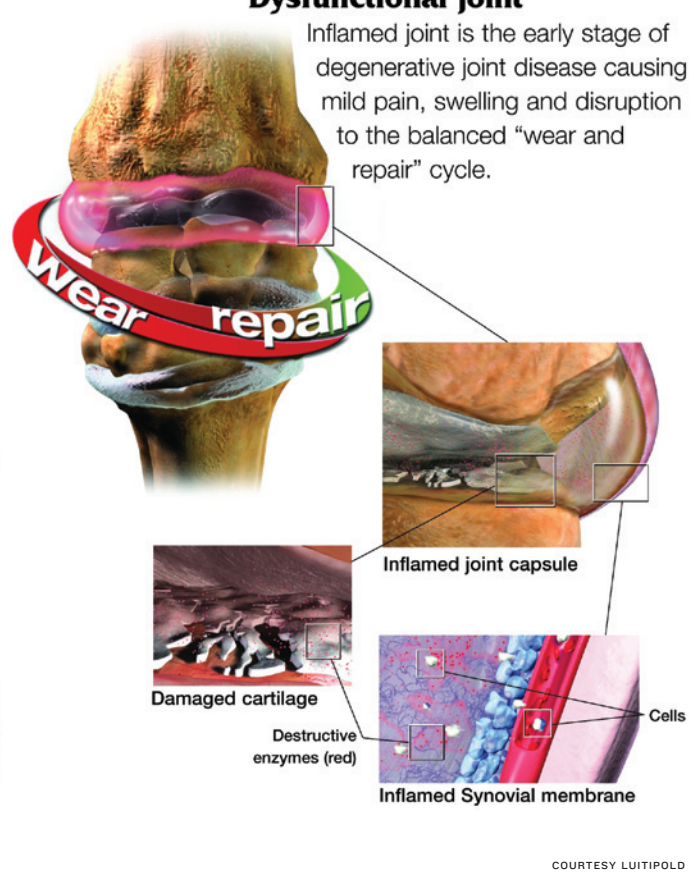
Balanced joint

Sound horses have a natural "wear and repair" cycle for balanced joint function.



Dysfunctional joint

Inflamed joint is the early stage of degenerative joint disease causing mild pain, swelling and disruption to the balanced "wear and repair" cycle.



COURTESY LUITIPOLO

There are many causes of equine lameness, and there is no part of the horse's body that stands alone in a state of balanced health. Sooner or later, a disease process in one organ, joint or leg will cause failure in another organ, joint or leg. It is just a matter of time. When an equine athlete is examined for a joint lameness issue, the joint in question is zeroed in but the horse's whole body condition and any other problems should also be taken into consideration.

(This includes diet. When I eat healthier, my joints feel much better and I feel younger, and I am sure this is true with horses. Make sure all the supplements you give him are not overdone. Too much of a good thing gets the equation out of balance.)

Many people think of a joint as a vat that contains lubricating fluid, and if the fluid is low or worn out, the treatment is merely to change the oil in the joint like they change the oil in a car. The equine joint is actually a highly complex structure made up of many connective tissues, including the bone, synovial fluid, articular cartilage and supporting soft tissue peri-articular structures. All of these when healthy contribute to normal joint function.

If any one of the structures is diseased or damaged, it affects joint function. The soft tissue structures of the joint include the joint capsule, tendons, ligaments and muscles. These structures provide stability for the joint. A horse might be sore in a certain joint because a collateral ligament has been stretched. This can cause joint laxity and eventual wear and tear on the joint cartilage. Muscles near the shoulder and hip provide stability to those large joints. Injuries to these structures require rest, not injections. This is one instance where just routinely injecting a joint without a proper diagnosis might actually cause more damage to the horse.

Subchondral bone is basically the bone underneath the joint surface. This bone becomes thicker with increased loads. Under such loads, the bone might show signs of pain and inflammation due to bruising or even a fracture, and a lameness that will not respond to joint injections even though the problem might be near the joint surface. A bruise or fracture might take weeks to heal and a strained or torn collateral ligament might take months to heal. There are several treatments that might shorten recovery time, but the main therapy is rest.

The articular cartilage is responsible for load distribution of the joint and is probably the most important part of the joint as far as joint diseases are concerned. Healthy cartilaginous tissues move over each other in a frictionless manner. Diseased cartilage or joints with osteoarthritis can lead to progressive joint destruction as the joint becomes more and more unhealthy. Joint injections with the correct medications will help, but the team must make sure there are no other contributing factors to the joint lameness.

When a horse is at rest, the joint surfaces are not completely aligned, but when loaded, the joint surfaces in a healthy joint increase in contact surface, which increases stability of the joint. The cartilage acts as a shock absorber, but its ability to absorb shock is limited due to its limited thickness, so some of the shock goes to the subchondral bone. The subchondral bone under the articular cartilage becomes thicker and stiffer with repetitive and increased loading. This lack of flexibility can lead to microfractures, which might lead to changes in the articular cartilage.

However, these microfractures also lead to improved strength, flexibility and shock absorption if acquired at an

acceptable rate and given time to heal. If acquired too quickly, they can lead to fractures in the subchondral bone and articular cartilage damage.

This is important to remember when setting training and competition schedules. Stress is needed to strengthen the bones and cartilage, but too much loading at excessive frequency exceeds the rate at which optimal healing can take place. Therefore, the trainer must find that fine line of training between enough to make sure the joint and its supporting structures are strong enough to withstand the horse's job but give the horse enough recovery time so that its joints and supporting structures can heal.

In any strength training program, the only way to make a structure stronger is to stress it beyond its current limits. However, adequate recovery time after each training session is essential. In racehorses, it usually takes a minimum of 10 and usually 14 days for the bones and joints to recover after a speed work or race. Pushing speed works and races closer than that usually causes problems.

The same is true of the repetitive work of performance and pleasure horses. They need time to recover physically after extensive training sessions. Repetitive microtrauma without sufficient recovery time is a major cause of equine osteoarthritis.

Good Steroids, Bad Steroids

SOMETIMES THE VERY MEDICATIONS WE USE TO TREAT A JOINT can be a source of later problems. An example of this are some steroids that are injected into joints. Some steroids have

insoluble crystals; cells that are markers of inflammation have been found around these crystals six weeks post injection. While these steroids are less likely to cause laminitis versus others if injected into several joints at one time, they are probably more likely to cause joint degradation in high-motion joints in the future versus chondroprotective steroids that actually protect the joint. This necessitates the use of better diagnostics so that instead of injecting several joints at one time, the team can pick and choose the joints that need to be injected and use a chondroprotective steroid in the appropriate joints.

Knowing more about the anatomy of the joint, its supporting structures and some of the causes of joint disease allows us to look at how these processes can set in motion a cascade of biochemical and metabolic reactions that are harmful to the joint. In healthy joints, chondrocytes maintain balance between the tearing down and building up or repairing of the joint's articular cartilage. This equilibrium is maintained by a series of interactions between the chondrocytes, different joint metabolites and mechanical stimulus.

In osteoarthritis, this balance is disrupted and the catabolic versus the anabolic state predominates. The result is cartilage loss and remodeling of bone and the supporting soft tissue structures of the joint. Timely joint injections can be of great benefit to restoring the equilibrium of the joint. It is equally important to treat the joint with the correct medication, as there are several matrix metalloproteinases and cytokines, such as interleukin, that are released during osteoarthritis and can do extensive damage to the joint. The correct

To ensure a horse's long term health, proper diagnostics, such as flexion tests, are vital before using treatments such as joint injections.

Good X-rays of joints can help detect issues before they become major problems.



medications can slow these processes and return the joint to its balanced state.

Know the Signs

EARLY RECOGNITION OF JOINT DISEASE IS IMPORTANT BECAUSE, just as with any other disease process, earlier treatment is more effective and less expensive than delayed treatment, even if that treatment is merely rest. Joint pain is a good indicator of joint disease although the degree of joint pain might not correspond with the degree of joint disease. The articular cartilage does not have nerves, so it is not until the surrounding support structures become inflamed that any sensory nerves in the joint are stimulated.

A joint with inflammation or osteoarthritis often exhibits decreased range of motion. This can be caused by synovial effusion or excessively low molecular weight synovial fluid, edema of the supporting structures or fibrosis of the supporting structures. Excessive joint fluid can destabilize the joint.

Another important sign of joint disease is decreased viscosity of the synovial fluid due to a decrease in the joint concentration of hyaluronate. There are several tests that can determine the degree of viscosity of the joint fluid, but a simple method is to look at it visually: A drop of normal synovial fluid should string between the thumb and index finger if the fingers are spread out. However, not all joints will produce fluid when tapped with a needle. There should be negative pressure in the joint, so not all joints that do not produce fluid in the hub of the needle are diseased joints.

Radiographic or X-ray changes are another excellent method to diagnose joint disease. However, even with excellent digital radiographs, many joints will look worse on arthroscopy versus on radiographs.

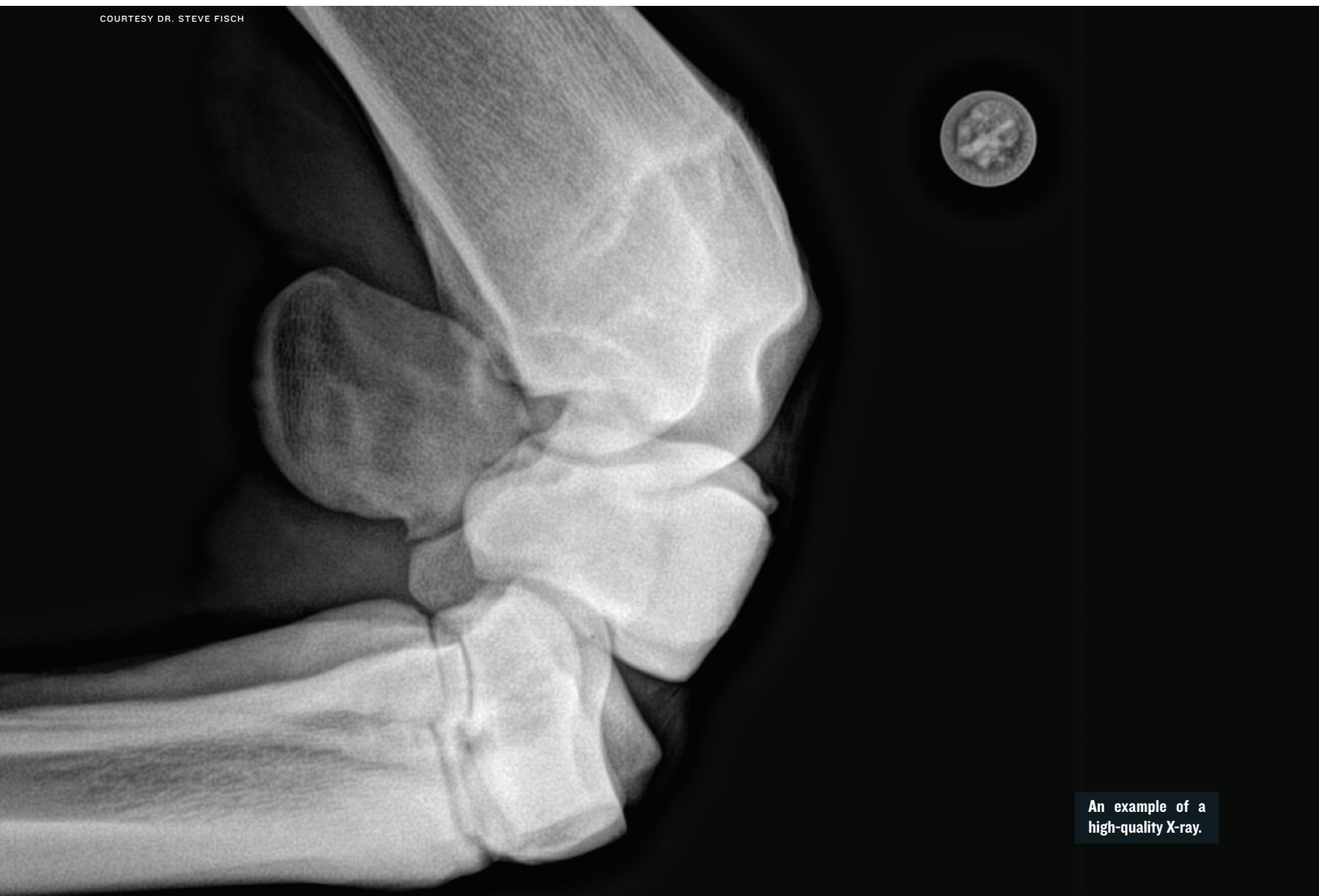
As you can see, there is much more to treating joint disease than meets the eye. It is not as simple as changing the oil in your car. Knowing the intricacies of a healthy joint will help the team of owner, trainer and veterinarian make more informed decisions in treating joint lameness in equine athletes. Teamwork should result in an overall healthier horse, a happier owner who spends less and competes more, a trainer who is more successful and a veterinarian who has the satisfaction of using a team-oriented approach to preventing and treating equine lameness, all with the horse's health uppermost in everyone's mind. When this team is working together and everything is balanced, the horse industry continues to grow and the stars of the show are all the healthier for it. 🐾

This is the first in a two-part series on joint injections. Dr. Fisch owns AVS Equine Hospital, a full-service hospital and reproductive center in Tallahassee, Florida, where he and Dr. Joe Fisch are a referral hospital for performance-related lameness. He is also a racehorse owner and a member of the AQHA Racing Council. For his efforts in bringing American Quarter Horse racing back to Florida, Dr. Fisch was the recipient of the 2010 Gordon Crone Award. To comment, write to jnrlracing@aqha.org.



Dr. Steve Fisch

COURTESY DR. STEVE FISCH



An example of a high-quality X-ray.