

Horse Hock Health

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The hock is one of the most complex and hardest-worked joints in the horse's body, so it must be strong and sturdy to avoid injury. Much of what we ask our horses to do, whether high-performance dressage, reining, jumping, or simply going up and down hills on trail rides, requires strong and well-functioning hocks. In this article we'll examine hock conformation, injury, ways to counteract joint stress, and how to treat injuries.

Conformation

David McCarroll, DVM, Dipl. ACVIM, of Interstate Equine Services, near Goldsby, Okla., often treats athletic injuries in performance horses. He says hocks are under great stress because of the activities we ask the horse to do.

"The hock joint is analogous to the human ankle," says McCarroll. "Because of the horse's anatomy, the hock is always under a certain degree of flexion, enabling it to be a shock absorber to reduce effects of concussion."

A horse with fairly large angle in the hocks (as opposed to an acute angle in over-bent, sickle-hocked limbs, or a too-wide angle in over-straight, post-legged limbs) can withstand stress and concussion best—without putting extra stress on any one part of the joint.

"The average hock angle of a good athletic horse should be somewhere between 154 to 159 degrees," says McCarroll. "You want a fairly flat croup, forward sloping femur (between pelvis and stifle), vertical cannon (set directly beneath the point of the buttocks), and sloping pastern. An upright pastern and narrow angled hock tend to go together, and this combination puts more stress on the fulcrum (the hock)."

The hock consists of six bones, four extensor tendons, four collateral ligaments on each side of the hock, and two flexor tendons that pass through the



hock. "It also has a large Achilles tendon that comes from muscles of the gaskin to the point of the hock," says McCarroll.

The hock is actually four separate joints within a larger structure. He notes that the tarsocrural joint (TCJ) at the top is responsible for more than 80% of the flexor and extension motion of the hock. "Communicating directly with that joint (exchanging fluids with it), but responsible for only a very small range of motion, is the proximal intertarsal (PIT joint)," he notes. "An opening in the joint capsule between these two allows fluid to interchange."

Immediately below the PIT joint is

the distal intertarsal (DIT) joint that normally does not communicate with any of the others. The joint that connects the hock to the cannon bone is the tarsometatarsal (TMT) joint.

The top joint is a high motion/low concussion joint, and the three lower joints are low motion/high concussion joints. A horse with poor conformation places more stress and pressure on certain areas of the hock. These concentrated forces, over time, cause tissues to break down.

Hock Damage

Scott McClure, DVM, PhD, Dipl. ACVS, an assistant professor in the Department of Veterinary Clinical Sciences at Iowa State University, says conformation is a major factor in hock health, but another factor is use. "No matter what we do when training young horses during their 2- and 3-year-old years, there's a lot of repetitive stress and loading on those hocks—particularly in horses that must sit down on their hindquarters, pivot, etc.," he notes.

"The lower two hock joints (TMT and DIT) are fairly immobile. They present most of the issues we deal with in hocks." This means those joints suffer the most concussion and commonly are the site of osteoarthritis.

Repetitive trauma, concentrated in such a small area, first causes the tissues to respond with inflammation. McCarroll explains, "If that inflammation is not relieved, either by rest or medication, or correction of the anatomy or physiology (such as by fusion), those inflamed tissues begin to break down and the body responds to that breakdown by trying to limit the motion of the joints." The end result is bony buildup over time, and eventual natural fusion of those joints.

Bone remodeling is a major issue. "We used to think in terms of cartilage problems," says McClure. "But new information from MRIs, CT scans, etc., are showing it may be as much remodeling of the subchondral bone plate (beneath the cartilage) rather than the cartilage itself. Typical spavin in the lower hock—changes in the lower joint—is the most common thing. You may see other issues in the hock such as OCD (osteochondrosis dissecans), but those lesions are mostly at the top of

the hock, at the tarsocrural joint. Most of those are correctable by surgical removal of the lesion from the top joint."

The two most common hock disorders are distal tarsal osteoarthritis (bone spavin) and tarsocrural effusion (bog spavin).

Overworked joints are painful during the inflammatory stage. "Pain develops when inflammation is not resolved," explains McCarroll. "When inflammation builds on previous inflammation, breakdown occurs either by loss of cartilage or crushing of cells in the matrix that makes up the cartilage. The body's response to that type of pressure is to produce more fluid to help relieve friction."

Unfortunately, this response is not adequate. "The fluid produced is of very poor quality, and it's not good lubrication," says McCarroll. Thus, the horse's body, without rest, is not capable of reversing the condition. The tissues continue to deteriorate to the point they are damaged or destroyed.

"The body's response is to pull in healing components from the blood and surrounding tissues that will alter the anatomy of the affected area," he says. Bony growths (spurs) can develop around the joint.

McCarroll says some of the bone may be destroyed, which leads to erosion of cartilage surfaces. "(Subchondral) bone attached directly to the cartilage becomes brittle," he notes. "This sclerotic bone has a white, chalky appearance on X rays. Instead of being spongy, the bone becomes compressed. It is weak and can be painful. If damaged further, it may break—and we see bone chips or larger slab fractures, or total collapse of the bone in some cases."

Counteracting Stress

The first way to prevent hock stress is to select a horse with correct conformation and strong, healthy hocks. "Function follows form," says McCarroll. "The second thing we can do is pay close attention to the horse's feet and make sure they are properly cared for on a regular basis so there's no extra stress on the hock. Make sure the feet are balanced.

"Third, the work schedule must not be more than the horse can tolerate," he adds. "Make sure the horse is fit as you prepare him for performance. If the soft tissues are not conditioned to withstand the stress of work and are weakened to the point they can't support the limb, then the bony structures, cartilage, ligaments, and tendons will all suffer."

Good nutrition is another part of

the recipe for soundness. The horse needs adequate energy to perform without becoming fatigued. When a horse becomes exhausted and weak from overwork—without enough "fuel" or muscle tone for the activity—injuries generally occur.

The next ingredient to prevent hock injuries is daily maintenance: giving the horse time for rest and repair after workouts. "In most situations, 24 hours will give the body time to recover if the horse is fit, but if worked excessively hard, he may need longer than that," notes McCarroll.

Riders often work horses several times at a show when preparing for an event. The horse might not have time to rest between workouts, and his joints, especially those in his legs, can become sore.

Things the rider/trainer can do to help minimize effects of inflammation include application of cold immediately after use," he says. "There are many ways to do it—cold water hosing, ice buckets, ice wraps, equipment that applies cold to the area. If you do this from 15 to 30 minutes daily after you've worked the horse hard it helps joints recover faster, so inflammation is no longer present the next time you ride. It's the additional, cumulative inflammation (in tissues that have not recovered yet) that does damage."

Other things that can help are poultices to draw out fluid, heat, and swelling, and providing support around the joint. Leg dressings, liniments, and leg braces might also help take out some of the soreness.

Treating an Inflamed Joint

If the hock suffers serious inflammation, you must be proactive in treating it. "You can't substitute medication/drugs for proper conditioning and fitness, but often various treatments can help keep the horse sound—especially a horse approaching peak performance," says McCarroll. "A quick fix to help horses with sore joints is to inject the hocks, either with corticosteroid or hyaluronate. This is not without risk, due to potential side effects, and sometimes injections are given unnecessarily."

McClure continues, "Spavin is the most common thing we deal with. You can't tell the owner to quit using the horse. Usually I tell them this is a manageable situation. When a horse starts showing hock pain, we start with injections into the joint to control the inflammation. With most horses this is all we need to do for them to maintain soundness. You may have to

reinject the joints periodically."

"Some horses require more intensive treatment once they get to that point," says McClure. "We can fuse the lower hock joints using a laser, or fuse them using ethyl alcohol. We have several options on how to permanently fix them, but the standard treatment is corticosteroids injected into the lower joints." This reduces inflammation that causes pain and damage.

McClure notes, "Direct injection of corticosteroid into the joint, and use of oral anti-inflammatories (Bute, Banamine, and Equioxx) are probably the most cost-effective methods to treat hocks. More aggressive methods of treatment would be considered on a case-by-case basis."

Take-Home Message

Hock problems usually are a result of poor conformation, underconditioning, or overtraining/overwork. "Regarding the lameness/soreness problems we deal with day in and day out, hocks are one of the most common things we treat," says McClure. "You just have to manage each horse individually regarding when they need to be injected again, or whether injections are going to work."

IMPORTANCE OF HEALTHY SYNOVIAL LINING

The soft tissue lining of a joint can also suffer injury. "The synovial lining produces lubrication for the joint and viscosity to the fluid—and provides nutrition to the bone via specialized cells," says David McCarroll, DVM, Dipl. ACVIM, of Interstate Equine Services, near Goldsby, Okla. Health of the lining is important for maintaining health of the joint.

"When inflammation occurs because of stress or activity, this affects the ability of those cells to protect the joint surfaces, overwhelming the lining's ability to produce the chemicals, fluids, and tissues needed to minimize inflammation," McCarroll says. "There's just too little response to too much injury."

After injury the lining is invaded by inflammatory cells from the circulatory system that try to remove the overwhelming production of chemicals and cellular debris that has occurred due to cartilage cell death. "At the same time fluids leak from blood vessels into cellular space around the joint. This causes the joint and lining to swell," explains McCarroll.—*Heather Smith Thomas*