

PREVENTING INJURIES DURING TRAINING

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- Understanding the cause of injuries will help you prevent them
- Training programs must be 'custom fit' for every horse
- Proper shoeing and footing are critical
- Early recognition and proper treatment will improve the outcome of injuries

The most common musculoskeletal injuries of horses in work include tendon and ligament injuries, stress fractures, chip fractures, joint sprain/strain and foot soreness. The severity of the injury a horse may have depends on the type of training. Harness racing horses rarely develop bucked shins, while most flat racing horses are expected to have some shin soreness during their early training period. A horse in dressage training is unlikely to develop a chip fracture, but may be expected to develop back soreness as it strengthens its back and neck muscles as it learns collection. Some injuries, such as joint swelling due to osteochondrosis (OCD), occur because of an abnormality in joint development.

What are the major problems and how often do these problems occur?

Information regarding this question focuses primarily on the racehorse. A study by Dr. Peter Rosedale of the U.K. evaluated the number of training days lost for racehorses in training centers at Newmarket (Vet Rec 1985;116:66-69). Over a 2 year period 6 stables were evaluated for a total of 114,933 days of training. 9,826 (8.5%) days of training were lost in this study group. Lameness was the most common cause of lost days of training (68%). Lameness was most commonly localized to the foot (19%), muscle (18%), carpus (14%), fetlock (14%), tendon (10%), and sore shins (9%). Respiratory disorders were responsible for 20% of the lost days of training. Wounds, unthriftiness and other problems accounted for 12% of lost days. A more recent study by Oliver and colleagues from South Africa had similar results in Thoroughbred racehorses and found 8.1% of training days were lost with 72% of the lost days due to lameness (J S Afr Vet Assoc 1997;68:125-129).



A group of 169 Australian Thoroughbred yearlings sold at auction were followed for their 2 and 3 year old seasons. Fifty-six percent of these horses lost training days due to lameness. Eighty-five percent of 2-year-old horses lost training days due to injury or illness. Sore shins in 2-year-olds was the cause of 42% of the lost days. Other causes of lost training included fetlock lameness (25%), coughs and nasal discharge (16%), lacerations (13%), foot problems (9%), carpal problems (7%), tying-up (6%), and ligament sprain (5%) (Bailey, et al. *Vet Rec* 1999;145:487-493). Days lost to training averaged 2.7% of the total training days available.

In a study of equine facilities in the U.S. during 1992-1994, the 10 most frequent problems with horses of any use were lameness, dermatitis, respiratory disorders, hoof/foot problems, reproductive problems, and colic (Kaneene, et al. *Prev Med* 1997;29:277-292).

Early development

The manner in which a young horse is raised has an influence on strength and future soundness. A study of Dutch Warmblood foals from birth to 11 months of age found that the musculoskeletal system underwent rapid and profound changes that were influenced by exercise (van Weeren, et al. *Proceedings Am Assoc Equine Practnr* 2000;46:29-35). Foals were evaluated under 3 different exercise regimes from 1 week of age until weaning at 5 months. The first group was confined to a stall. The second group was also maintained in box stalls, but was trained with increasing gallop sprints in a 48 × 15 m enclosure. The third group was maintained at pasture during the entire study. From 5 to 11 months of age, all foals were housed in a large stall with free access to a small paddock. Tendon, muscle, cartilage and bone were analyzed at 5 and 11 months of age.

Continuous turn-out in pasture was superior to the other exercise regimes. The box stall-confined group had retarded development of some tissue components, particularly cartilage. The trained group of foals had increased bone density compared to pasture and box stall groups at 5 months, but tissue quality parameters for cartilage, bone and tendon were less in this group at 11 months compared to the other groups.

Another study determined that appropriate exercise in young horses may lead to lower incidence of tendon injuries in adults (Smith, et al. *Equine Vet J Suppl* 1999;30:201-209). A protein thought to influence development of tendon strength (COMP) is present at higher levels in tendons of horses less than 2 years old compared with older horses.

These studies have made us aware of the rapid changes that occur in foals during early development. Some day, when we better understand the process, we will be able to manipulate exercise of growing youngsters to better prepare them for their athletic endeavors. Overprotective housing scenarios may not be in a foal's best interest. Access to turn out in terrain that is safe but that challenges the growing foal's level of condition may be best.

Where the rubber meets the road: shoeing and footing

Musculoskeletal injuries can be minimized with attention to shoeing and footing--shoeing is easily adjusted, while footing often is problematic to modify.

Foot and shoe imbalance are major contributors to lameness. The foot should be balanced from medial to lateral (side-to-side) and the toe angle must be correctly conformed to the horse's pastern confirmation. Heel support must be continually evaluated. Lack of heel support, especially in a foot with long-toe and an under-run heel, results in excessive strain on the heel region of the lower limb. High stress in this region may result in injury to the navicular area, distal tendons and ligaments, digital cushion and the pastern and coffin joints. Consult with your farrier regarding proper shoeing techniques to maximize your horse's soundness. Regular evaluations by your farrier are crucial to the soundness of your horse.

Footing is not very easy to change but careful attention to this aspect of training can pay big dividends in your horse's soundness and longevity. At racetracks, training centers and horse stabling facilities, the managers and owners take responsibility for the footing. It may still fall on the user of these facilities to suggest footing upkeep and care if circumstances dictate.

Good working surfaces are developed through attention to the detail during construction and by good maintenance. A site with good drainage, a well leveled and compacted sub-base which lies under the appropriate base material makes for a good working area. The base should be impenetrable to hooves and water. The base is usually made of decomposed granite or limestone and should be at least 4-6 inches deep. The surface layer should be no more than 2-3 inches deep and is often composed of angular sand. Footing that is too thin does not provide sufficient concussion protection to the horse; footing that is too deep results in excessive strain on tendons and suspensory ligaments. Other footing materials include wood products or mixtures of the above with rubber or binding agents that decrease dust or increase resiliency.

Maintenance of the footing is crucial. Most footing materials have their best concussion protection when the moisture content is between 8 and 12%. The area must be harrowed when ruts or holes form, or when the surface layer is thin in some spots, while deep in others. There are many resources for learning about good equine footing.

Under Foot. The USDF Guide to Dressage Arena Construction, Maintenance and Repair. US Dressage Federation, Lexington, KY. 2000.

“On Sound Footing”, Equus Magazine, October 1993, pp 30-37.

“Arena Makeover”, Equus Magazine, June 1999, pp 39-49.

“Tiny Solutions”, The Quarter Horse Journal, September 1997, pp 48-49.

County Extension Agents, Soil Engineers, and excavation contractors often have relevant information on arena and footing options.

SELECTED CAUSES OF LAMENESS IN PERFORMANCE HORSES

Osteochondrosis (OCD)

OCD is a disorder of cartilage and bone maturation and most commonly affects joint surfaces. Other similar abnormalities such as physitis are grouped under a classification of diseases called *Developmental Orthopedic Disease*.

OCD is commonly recognized in horses from 6 months to 2 years of age. Clinical signs may first become evident as a young horse enters regular training or breaking. Signs include swollen joints, lameness, and progressively developing upright conformation. Diagnosis is confirmed with radiography of the affected joints. The most common areas affected are (in decreasing order of incidence): hock, stifle, fetlocks, shoulder, carpus, cervical vertebrae, elbow, and pastern.

OCD has multiple causes that are difficult to isolate. The propensity for rapid growth of the foal coupled with imbalances in the diet are the primary set of causative factors. Promoting fast growth by feeding high levels of energy has been linked with increased OCD. Heritability of OCD is difficult to ascertain. However, some breeds (and genetic lines within those breeds) are predisposed to OCD.

Most forms of OCD are very responsive to surgical treatment and have a better prognosis for soundness when treated as early as possible. The ability of the joint surface to recover following extensive surgery seems to decrease after 2 years of age. Older horses that have surgery do not appear to have the same capacity for complete remodeling of the debrided joint surfaces as younger horses.

Prevention of OCD has many facets. Recognize which foals may have a genetic propensity for fast growth based on genetics. Consult with a nutritionist to assure that your diet for broodmares and growing foals. Have joint swelling or lameness in foals and young horses in training evaluated soon after recognition.

Tendon and ligament injuries

Most tendon and ligament injuries are due to either lacerations or wear-and-tear damage. Tendons and ligaments are the “springs” in the equine suspension and help store energy in each stride. Tendons are known to incur micro damage during use. When the microdamage becomes excessive, tendon injuries, such a bowed tendon, may occur.

The swelling seen in injured tendons consists of ruptured fibers and hemorrhage. An analogy would be of an over-stretched rope; as some of the rope strands break, they bleed and intermix with the remaining rope. Many tendinous or ligamentous injuries do not have detectable swollen areas. These situations are where a lameness evaluation and an ultrasound examination by your veterinarian are often required to make the diagnosis.

Injured tendons require months for healing. If a tendon is lacerated, the healing tendon will be strong enough to bear weight at a walk in 6 to 8 weeks. Bowed tendons or suspensory ligament injuries require 6 to 12 months to heal.

First aid for tendon injuries includes cessation of all exercise, cold therapy, support bandage, and phenylbutazone. Your veterinarian should be consulted as soon as this type of injury is recognized. The most effective treatment for these injuries includes controlled exercise that is gradually increased as the tendon heals. Healing is monitored and recommendations for increasing work are based on the findings of repeated ultrasound evaluations.

Prognosis for complete recovery of tendonitis is guarded for high-level athletic competition as 40 – 50% of these injuries reoccur. Prognosis is better for harness racehorses than flat racehorses.

Shock wave therapy, injection of the tendon or ligament injury site with blood or bone marrow products, and laser therapy are being evaluated for treating tendonitis and suspensory injuries.

Dorsal metacarpal disease: “bucked shins”

Bucked shins are a very common cause of forelimb lameness in young Thoroughbred and Quarter Horse racing horses. Fifty to 90% of young racehorses are expected to develop shin soreness. If not properly treated, bucked shins may lead to stress fractures. Stress fractures occur in roughly 12% of horses with bucked shins.

The cause of bucked shins is *‘too much work too fast’*. The bone is quickly remodeling in young horses in response to the stresses of training. The remodeling further weakens the bone, making it predisposed to small micro fractures.

Signs of bucked shins include lameness characterized by a stilted gait, especially after a work or race, and pain on palpation of the shins. Radiographs need not be taken if lameness is not associated with sore shins, but should be taken in horses that are lame to rule-out stress fractures. Treatment consists of cold therapy and phenylbutazone, reduced work and a change in the nature of the work.

Reducing galloping distance by one-half and substantially reducing fast work is recommended. Fast, short sprint work should be added to the training program twice weekly (Boston and Nunamaker. Am J Vet Res 2000;61:602-608). Start with ? mile of fast work and gradually work up to ½ mile. As the speed of fast work increases, decrease the distance. The bone will remodel to accept the speed to which it is worked. If training is long and slow, the bone will remodel to that stress and will not be conditioned for racing speeds.

Stress fractures are repaired by either surgically drilling holes around the fracture that act as conduits that supply healing factors (osteostixis) or by inserting a screw across the fracture plane. Healing requires 90 to 120 days.