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## Laminitis

Commonly referred to as founder, laminitis is the inflammation of the laminae in the foot. The laminae connect the coffin bone to the hoof wall, and laminitis occurs when there is disruption between these structures. The cause of laminitis is much debated, but the result is a decrease in blood flow to the laminae, cellular death, and laminar disruption. Keep in mind this is a simplified definition of a complex problem.

Laminitis is a sequel to a variety of diseases, repeated concussion on hard ground, injury, nutritional overloads (grain, lush grass or alfalfa, etc.), abortion or retained placenta, certain drugs, or toxins. Even though you don't necessarily think of laminitis resulting from a horse's eating fresh grass or alfalfa hay, if a horse ingests too much grass, or alfalfa, it might be enough to cause a gastrointestinal upset that starts a systemic response. This combination of events can lead to laminitis.

Compensatory weight bearing can cause laminitis. An example of this occurs if a horse with a fracture in the left front leg has to bear all its weight on the right front leg. The effort of bearing that extra weight might damage the junction between the dermal and epidermal laminae in the right foot, which in turn might lead to laminitis. Once the junction between the dermal and epidermal laminae is disrupted, the tissues begin to pull apart, like pulling the lining out of a glove.

It's been well documented that horses ridden too long and too hard on roads are susceptible to "road founder." This is different from stone bruising, and it's caused by the mechanical trauma to the laminae—the result of repeated pounding of the hoof on a hard surface.

Laminitis occurs in three stages. The first stage, called the prodromal phase, is the time between when the horse eats the feed/grass (or becomes systemically ill) and when he begins to show clinical signs of lameness. The usual time frame for this to happen is approximately 40 hours after endotoxemia (the presence of bacterial toxins in the blood) has occurred.

The second phase is acute laminitis. The acute phase is the first three to five days after the horse exhibits clinical signs of lameness.

The third phase is called chronic laminitis. Chronic laminitis occurs when the horse already has been through the acute phase and the initial destruction has ended. In this phase, the repair process of reattaching the laminae to the hoof takes place. It can take some time to heal the structures in the foot, and when the reparative process is complete, the foot might not be anatomically correct.

Treatment for laminitis varies depending on the individual horse's history, the experience of his veterinarian, and the severity of the disease. In extreme cases, the horse rapidly becomes severely lame. At that point, aggressive treatment should be initiated, with stall rest being mandatory. In my opinion, the shoes should be removed, if removal can be done without causing harm to the horse. Some additional support must be provided to the bottom of the foot such as frog pads (lilly pads) or standing the horse in deep bedding. The reason you might harm the horse by removing a shoe is that if you pick up one foot for an extended period of time, then the other foot will bear the extra

weight and cause additional damage. Also, removing the shoe and nails may cause more trauma to the foot than the shoe is removed from. If you can't get the nails out cleanly when you pull the shoe, then you end up ripping the bottom of the foot, causing more traumas.

In the acute phase, many drugs are used to treat laminitis. In chronic laminitis, fewer drugs are used to treat the disease, but phenylbutazone still is administered to control pain. The treatment for the deformation caused by laminitis is therapeutic shoeing. The prognosis in the acute phase is highly correlated to the degree of rotation. Phenylbutazone is the best analgesic for musculoskeletal pain and often is used in treating laminitis. If laminitis is caused by the horse's being systemically ill, Banamine also would be used. Of course, the combination of these two drugs will vary from case to case. There is a variety of medications aimed at the blood supply and the inflammatory response of the foot. Acepromazine is a vasodilator that often is used on horses suffering acute founder.

Another vasodilator drug used in these cases is nitroglycerin, which is applied topically either around the coronary band or the palmaris arteries of the foot. Heparin, an anticoagulant, sometimes is used to improve the flow of blood through the small vessels in the foot. Aspirin is used to prohibit platelet aggregation, which keeps arteries from clogging. Pentoxifylline has numerous effects and is beneficial in treating endotoxemia. The drug also can help cells get through damaged blood vessels. DMSO, a free radical scavenger, is yet another drug that is used to reduce the inflammatory response in the initial stages of laminitis.

Your veterinarian will watch the horse's progress and recommend drugs accordingly.

In general, in acute laminitis, as lameness worsens and as radiographic evidence of rotation worsens, the prognosis for recovery diminishes. Depending on the severity of the laminitis, the outcome will range from the horse's recovering to a state where it is rideable again to euthanasia.

(For more information on laminitis and the foot see *The Horse Interactive* for reports from the Bluegrass Laminitis Symposium and the American Farriers Association annual meeting.)

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