

"No Hoof; No Horse" - The Importance of Hoof Balance

by Christine Woodford, DVM

As a veterinarian certified in chiropractic and acupuncture on animals, I work on many horses that have movement issues. An important part of my assessment of a horse's conformation and structural integrity includes the careful analysis of foot and leg conformation. The wise old saying "no foot, no horse," captures the importance of a proper foot in relation to the structural integrity of a horse. Just as you would not build a house on an uneven or weak foundation, one cannot expect a horse to support itself on uneven or weak feet. This paper will discuss the basics of evaluating hoof balance and then address a common condition in horses called high/low heel syndrome.

Hoof Balance

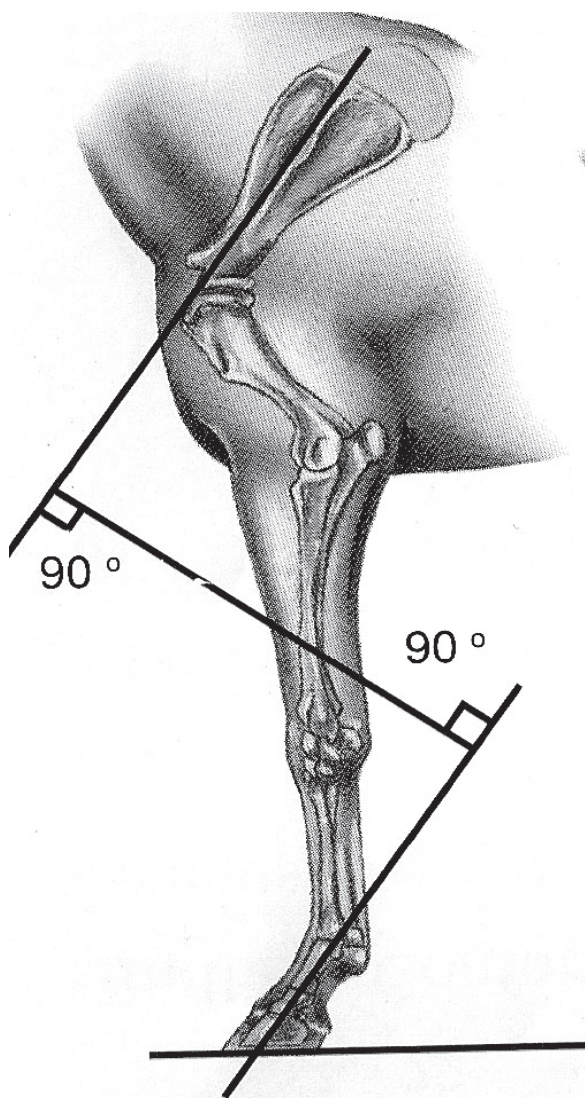
The angle of the hoof capsule and coffin bone should be parallel to the angle of the pastern and the angle of the shoulder. This will help the horse to distribute its weight evenly. The ideal hoof angle is around 54 degrees for the front feet and 58 degrees for the hind feet. If the hoof angle is too

low, more stress will be put on the back of the leg. Over time, such stress can lead to the degeneration of the flexor tendon, suspensory ligament and/or navicular bone and bursa in the heel area. If the angle too high, or the hoof conformation is more up-right, this will lead to more stress on the front of the leg, specifically the front of the fetlock or carpus (front knee).

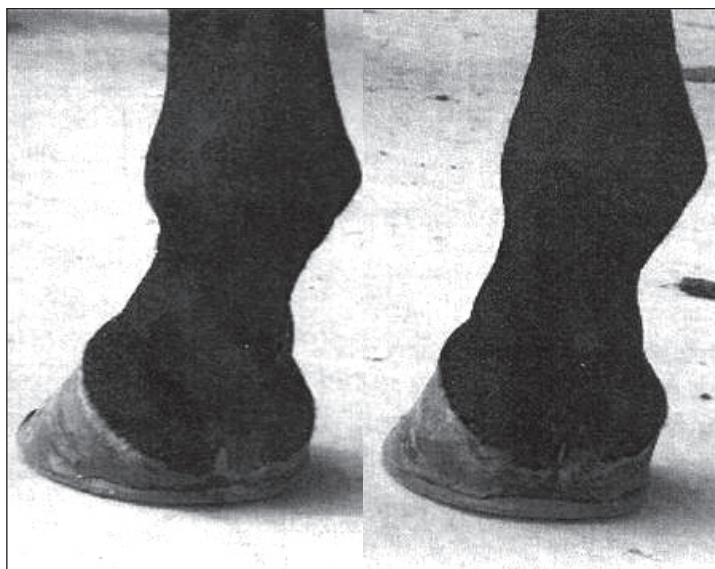
It is very important to keep up with regular hoof care so as to keep the angles of the foot parallel to the slope of the pastern and slope of the shoulder. To assess your horse's angles examine the slope of each hoof and its relationship to the pastern axis when the horse is standing on a level surface. The longer the hoof gets, the weaker it gets. Often times the toes will grow forward and the heel will get pushed forward. This in turn can cause crushed heels and puts more strain on the soft tissue structures in the back part of the leg. When the slope of the hoof is greater than the slope of the pastern, the horse is said to have a broken-back hoof-pastern axis. This changes the break-over of the foot and alters the stride in ways that may put the horse at a greater risk for injury.

High/Low Syndrome

Some horses tend to grow 2 very different-looking front feet. They have a high heel on one leg, and a low heel on the other. This is easiest to see when looking at the back of the front feet and comparing the distance of the hair line to the ground.



Parallel Shoulder-Pastern Angle - Ideal Conformation



When looking at the horse from the front, it looks like the low heeled leg is shorter than the other leg because the fetlock, carpus, and shoulder joints appear to be closer to the ground. Although it is most likely not anatomically shorter, it is likely functionally shorter due to the lower heel and increased muscle tension, causing the angles of the joints on that leg to be different. When looking at the horse's shoulder blade area from behind the horse, the leg with the lower heel will have a large muscle bulge in the area just under



Lower heel side

Higher heel side

the withers. The leg with the higher heel will be higher and flatter. This will certainly affect the way the saddle fits the horse, and how the horse travels.

The horse's movement is affected greatly by heel length asymmetries. Imagine if you were asked to put a sneaker on your left foot and a 2 inch boot on your right foot, and then you were asked to run a half mile. Would your stride length be the same? Would you have a tendency to short stride on one foot? Would the short stride be on the side with the high heeled boot? What would happen to the rest of your body if you were asked to "perform" with the unmatched shoes for a great period of time? Do you think your muscles would develop evenly? Now imagine if you were a horse being asked to carry the weight of a saddle and the weight of a rider. This would certainly affect the way you moved and your attitude.

Treatment of High/Low Heel Syndrome

So what should one do to correct the problem? The goal is to balance the feet and it is not as easy as just cutting

down the high heel or wedging up the low heel. First, one has to determine which foot is the problem foot or the pathological foot. Typically the high-heeled foot is the sore foot. The horse has a tendency to protect that foot from the pain and spends more time on the low heeled foot. Over time the foot bearing more of the weight gets "crushed" because it is carrying more of the load. This will cause the foot to flatten, widen out and look bigger. This is similar to what happens to some women who are pregnant; their foot size will flatten and get bigger due to carrying the extra weight of the baby. So examine the high-heeled leg carefully to determine where the pain is coming from. Flexion tests, diagnostic nerve blocks, and x-rays may be needed. Lateral and anterior view x-rays of both front feet are important to assess the pastern axis, medial lateral balance and the sole depth.

It must also be determined if the problem can be corrected with trimming alone, or if shoes are necessary. If the condition is identified early, before the sole is too thin and

the digital cushion is not crushed, the horse may benefit from being barefoot for a while. The key to successful barefoot treatment is to keep up with regular trimming/hoof balancing every four weeks which can help to correct the problem.

If the sole is too thin, and the digital cushion is too crushed, then shoes are necessary to protect the foot by promoting proper bone alignment and blood flow. The use of a wedge on the low heel may be part of the treatment process. One must be careful in the use of wedges, because the wedge itself may also cause the heel to crush. In order to assure proper break-over and heel support, the wedge should extend 1/8 inch beyond the heel of the foot. When using wedges, it is often helpful to add a frog pad to stimulate the frog when weight bearing. This increases circulation and encourages hoof growth.

The key to using wedges and pads is to balance the feet regularly at shorter intervals such as every four weeks versus the normal 6-8 week interval between re-sets. The shorter interval between re-sets is important to keep the foot from getting too long, making the hoof capsule weak and causing the heel to crush. Glue-on shoes are also an option in treating low, under-run heels. The composite between the shoe and the heel creates a protective interface so the crushed heels do not rub against the shoe. This has helped promote the heel to grow down rather than forward. After a few sessions of glue-on shoes, if the heel is growing more normally, the horse can be transferred back into regular shoes.

Recognizing and treating hoof asymmetries is the first step in managing high/low heel syndrome in horses. The main problem starts out low in the limb, but after time, by moving cautiously on the unbalanced feet, the horse oftentimes becomes sore higher up in the limb, neck, withers, and back. Along with therapeutic foot care, regular body work in the form of chiropractic, acupuncture, and/or massage therapy, are very important in treating a horse that has high/low heel syndrome.