

# Putting Science Into Farriery: Lameness Evaluation

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April 09 2007

When a group of people are standing at the barn watching a "lame" horse move, many of you will say he's lame in different legs. How do you know who's right? If it makes you feel any better, picking out the source of lameness isn't always easy for veterinarians and farriers, either. Andrew Parks, MA, VetMB, MRCVS, Dipl. ACVS, professor of large animal surgery and head of the department of large animal medicine at the University of Georgia, discussed lameness evaluation in theory and practice at the recent American Association of Equine Practitioners (AAEP) convention, held Dec. 2-6 in San Antonio, Texas. He spoke during the first AAEP session open to farriers, called "Putting Science Into Farriery."

"I want to talk about lameness here because I think farriers are often the first to see it," Parks began. "You can use observation of lameness to evaluate the effects of shoeing and to increase job satisfaction (by treating lameness)."

He presented video of several horses in motion, discussing the various findings of clinical examinations to illustrate the challenges of diagnosing lameness in horses. A key point was that lameness evaluation is quite often a process of ruling things out, not an instant diagnosis of a single problem.

## Forelimb Lameness

"In veterinary school, we were taught to watch for a head drop on the sound limb and a head lift on the lame limb (as the horse tries to shift weight to the rear limbs when a lame forelimb strikes the ground)," said Parks. He explained that pain leads to decreased loading (weight bearing) on the lame limb, which results in decreased flexion of the lame limb and decreased descent of the horse's body while the lame limb is on the ground.

"In a sound horse the movement of the head closely mirrors the movement of the trunk, but in a lame horse, the movement of the head is exaggerated," he added. "Normally, novice observers look for the head drop on the sound limb, but experienced observers frequently look for the head lift on the lame limb."

"However, when you watch a sound horse jog, you notice that its head drops twice a stride (during the stance phase of the stride); that is, it drops when the horse bears weight on each limb and rises when both legs are off the ground (suspension phase of the stride)," he went on. "In other words, during a normal stride (a complete stride in which each limb lands once), the head rises in a biphasic manner (twice per stride), but we have been taught to look for a monophasic (once per stride) head lift and drop in lame horses. The answer to this apparent dichotomy was explained by Dr. Florian Buchner in a paper several years ago. He was able to demonstrate that in horses with foot pain, the head stayed higher during the stance phase on the sound limb and dropped more during the stance phase of the lame limb. As the magnitude of the lameness increased, to the human observer, the biphasic stride begins to appear monophasic."

"Still, there are times when I watch a horse and can't figure out if he's lifting his head at the end of one stride, or lifting it to prepare for landing of the other," Parks admitted. "Though I normally look for the head lift on the lame limb, under these circumstances, I revert to looking for the head drop on the sound limb. In other words, not all horses follow the same simple pattern."

"Last year at this convention, Dr. Keegan (Kevin Keegan, DVM, MS, Dipl. ACVS, of the University of Missouri) described four different patterns of (forelimb) lameness that reflect altered movement of the head and trunk depending on what phase of the stride the horse appeared to be in the greatest discomfort" Parks said. "Three of these patterns showed less drop of the head during the stance phase of the lame limb (while it was on the ground and bearing weight). In one pattern, the head didn't drop much during stance of the normal or lame limb, but it rose during the flight phase of the lame limb. This latter pattern is compatible with the lameness clinicians consider to indicate a swinging leg lameness frequently attributed to pain originating in the upper limb.

For more information on Keegan's work, see [www.TheHorse.com/ViewArticle.aspx?ID=6500](http://www.TheHorse.com/ViewArticle.aspx?ID=6500).

### **Hindlimb Lameness**

"In school, I was taught to identify hindlimb lameness by observing the tuber coxae (the points of the hips) from behind," said Parks. "We should see symmetry in hip movement of a sound horse. If we suspect lameness, we look for a hip hike, hip drop, or total excursion (vertical movement) of the hips. The hind limbs are more difficult to evaluate than the forelimbs because you don't have movement of the head, which amplifies the movement of the trunk, to look at. Additionally, the movement of the pelvis in the horse is more complex to explain than that of the head, because not only does it go up and down during the stride, but it also rotates left and right with each stride."

He noted that if you watch the center of sacrum (the point of the croup) from behind as the horse moves away from you, it doesn't drop as much during the stance phase of the lame leg. "The sacrum drops more when the sound leg hits the ground," he said.

### **Everything's Connected**

Wouldn't it be nice if diagnosing lameness were that simple? Unfortunately, "Hindlimbs and forelimbs affect each other," cautioned Parks. "If you have a lame forelimb, it may cause an asymmetry in the pelvis to implicate a contralateral (opposite) hind limb. It's an inconsistent finding; a much more consistent observation is that a lame hindlimb causes asymmetry in movement of the head and neck to mimic ipsilateral forelimb lameness (in the forelimb on the same side).

### **Bilateral lameness**

What if a horse is lame in both front or hind limbs (termed bilateral lameness)? "Mild bilateral lameness is hard to identify," said Parks. "If you're longeing the horse in a circle, you can see if you can make him go lame on different limbs (generally the horse appears more lame when the sore limb is on the inside of the circle and bears more weight). You can also do flexion tests and/or block one limb at a time" and re-evaluate to see when the lameness disappears.

### **How many lame limbs are there?**

Parks asked the audience, "When a horse appears lame in multiple limbs, do you really have two problems or a main lameness and a compensatory lameness?" He said that primary hindlimb lameness accompanied by apparent contralateral forelimb lameness is almost always the result of lameness in both limbs. The same is true of primary forelimb lameness accompanied by lameness in the ipsilateral (same side) hind limb. In contrast, in a horse with a primary hindlimb lameness that is accompanied by an ipsilateral forelimb lameness of lesser severity, or a primary forelimb lameness with a contralateral

hindlimb lameness of lesser severity, it may be impossible to tell if the less severely affected limb is a genuine problem or secondary to the primary problem.

"It may be impossible to identify multiple lamenesses at the straight trot," Parks told the audience. "You don't know if they're real or not until they block out (disappear with local analgesia) the lameness in one and observe whether a lameness is still present in another limb or not."

### **Non-Invasive Diagnostic Tests**

**Flexion tests** These consist of holding a limb joint flexed to put pressure on certain structures, and see if the horse appears lame when moving after those structures have been stressed. "We do these to try to differentiate the location of a lameness," said Parks. "Remember: *Lots of sound horses flex positive*. Flexion test results are proportional to force applied and time (how long the limb is held flexed). We do them sometimes because we're not sure what limb is lame."

**Longeing** "This can provide really useful information," he noted. "We can compare the straight trot to the longe and compare the left rein to the right rein (looking for changes in which limb appears lame or in the degree of lameness). Most forelimb lamenesses are worse when the lame limb is on the inside of the circle. Most hindlimb lamenesses are harder to see on a circle, to me."

### **It's Not a Perfect Science**

Lameness exams are not necessarily exact; in fact, Parks said they "can be fraught with error." Observer variation, human memory, speed of horse movement during examination, and the use of reins and/or restriction of movement by the lead shank can yield variable results.

"Try to make sure handlers move horses at the same speed--the slowest trot possible," he recommended. "Lamenesses are speed-dependent. Make sure handlers don't restrict movement of the horse's head."

"Above all, write it down!" he strongly recommended. "Record the circumstances of the lameness. Do you see it on a straight trot and/or longe? Do you see it with a different type of shoe? Which limb is lame, and how lame is it? How much has it worsened or improved? If you don't write it down, it didn't happen."