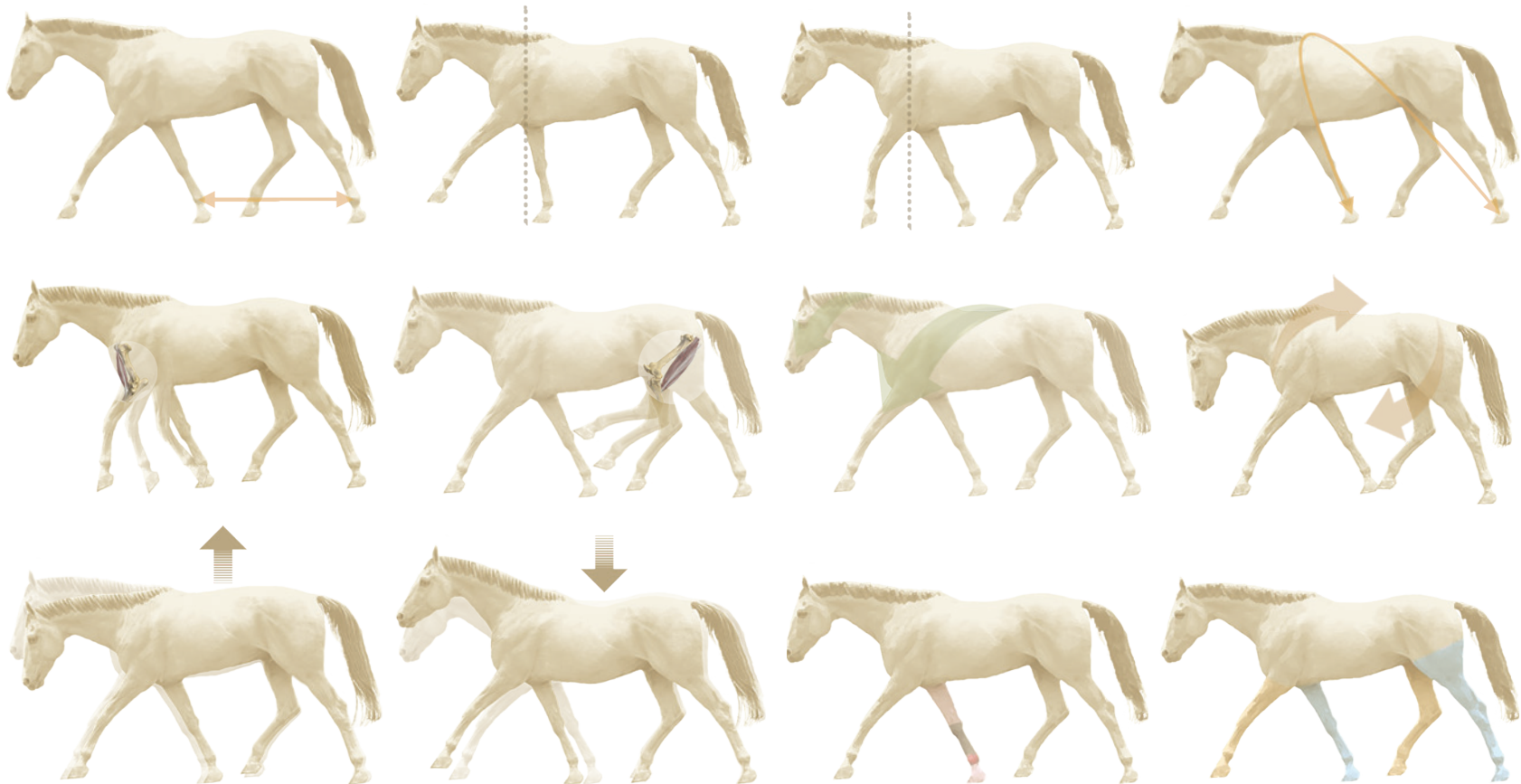


EQUINE LAMENESS

FOR THE LAYMAN



Tools for Prompt **Recognition**, Accurate **Assessment**, and Proactive **Management**

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10 Authentic versus Artificial Lameness

From a visual standpoint, all gait deficits are “real” in that they alter movement and produce lameness. Some deficits, however, exist for the sole purpose of helping the horse to adjust for a shift in body weight or balance that occurred as a result of a problem somewhere else. Without constant incitement from the primary issue, this secondary “adjustment” would instantly resolve. Since it is nothing more than a visible product of another lameness, we denote this type of gait deficit as *artificial* or *referred*.

Referred lameness is secondary by definition. Even though it isn’t considered to be “real” and doesn’t factor into the treatment strategy, its existence dramatically facilitates our ability to accurately assess the poorly performing horse. Like all secondary issues, referred gait deficits provide valuable insight into the nature of the primary problem.

Referred deficits, although seemingly obscure, are fairly easy to predict in the lame horse. Proper identification and classification of the primary component usually exposes

the basis behind any referred elements. And, as previously mentioned, acute characterization of a referred component can correspondingly lead us to likely primary instigators.

It is important to note that primary deficits will typically generate referred deficits of comparable nature. In the event that referred lameness manifests, the observer will usually find that:

- A primary *weight-bearing* lameness in the forelimb generates a referred *weight-bearing* lameness in the **contralateral** hind limb.
- A primary *non weight-bearing* lameness in the forelimb generates a referred *non weight-bearing* lameness in the contralateral hind limb.
- A primary *combination* lameness in the forelimb generates a referred *combination* lameness in the contralateral hind limb.
- A primary *weight-bearing* lameness in the hind limb generates a referred *weight-bearing* lameness in the **ipsilateral** forelimb.

- A primary *non weight-bearing* lameness in the hind limb generates a referred *non weight-bearing* lameness in the contralateral forelimb.
- A primary *combination* lameness in the hind limb generates a referred *combination* lameness in the ipsilateral forelimb.

The Concept of Diagonal Synchrony

The walk and trot each comprise a two-beat stride pattern in which the horse's weight is distributed evenly between diagonal pairs of limbs. The left hind and right front limbs comprise one diagonal pair, whereas the right hind and left front limb constitute the other (fig. 10.1). The horse maintains similar movement (i.e. synchrony) between the two limbs comprising each diagonal pair at these gaits. In other words, the diagonal pair of limbs move at the same time and in the same way (**VL 10a**). The left pelvic (LH) and right thoracic (RF) limbs maintain concurrent weight-bearing and non weight-bearing (flight) phases of the stride. The right pelvic (RH) and left thoracic (LF) limbs do the same. This form of coordinated movement is known as *diagonal synchrony*.

The horse will attempt to maintain diagonal synchrony whether it is sound or lame.

10.1 Diagonal Pairs of Limbs



The left hind and right front limbs comprise one diagonal pair (*blue*). The right hind and left front limbs constitute the other diagonal pair (*orange*).

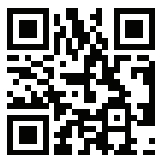
Stride-to-stride gait compensation is necessary at the walk and trot to support the horse's weight and maintain balance. This is an important consideration during lameness assessment, because what affects the movement of one limb will also affect the movement of the contralateral limb on the other end of the horse (**VL 10b**). For example, application of a toe extension to the left hind foot as a means of delaying limb **breakover** and lengthening stride will generate a similar gait adjustment of the right forelimb. And as you might expect, the limbs constituting the other diagonal pair will adapt in reciprocal



VL 10a
Scan to view video.



VL 10b
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VL 10c

Scan to view video.

fashion so that the horse can remain stabilized during movement.

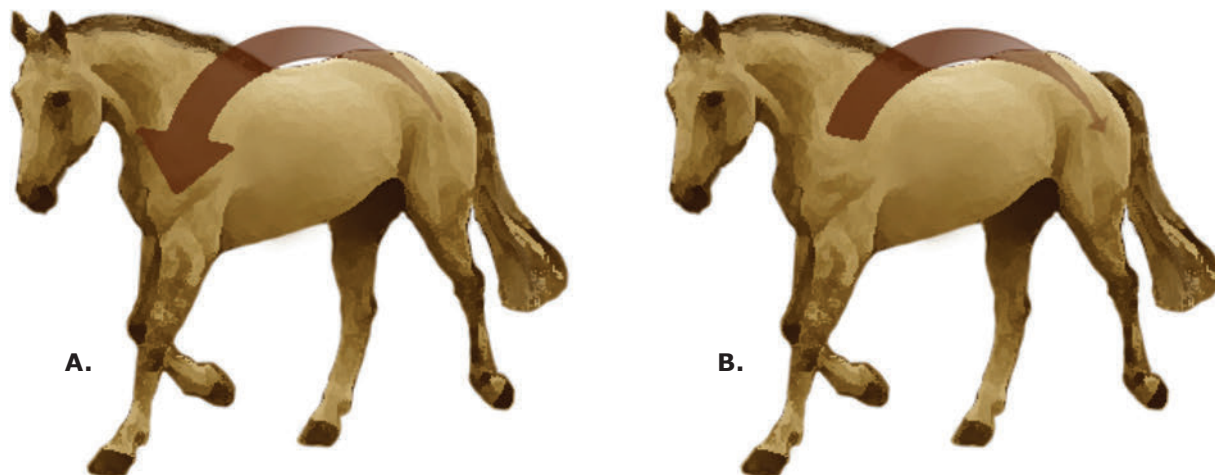
During lameness evaluation, the practitioner must determine whether the origin of each gait deficit is primary in nature or a result of the horse's attempt to maintain synchrony with its diagonal counterpart. In the latter case, lameness would be considered to be artificial or *referred*.

Referred lameness manifests dissimilarly between the front and hind limbs. This is due to a number of factors, most of which in-

criminate the horse's general physique. Since horses are inherently *front-end heavy*, it is much easier for them to transfer weight in a hind-to-fore direction (fig. 10.2 A). Hind limb asymmetry, even when very mild, can dramatically influence how the horse loads the front end (**VL 10c**). In many instances, the degree of secondary/referred forelimb lameness exceeds that of its primary hind limb complement.

By contrast, horses are only marginally effective at transferring weight from the front

10.2 Dissimilar Transfer of Weight Between the Front and Hind End



A. Since horses naturally bear more load on their front end, it is relatively easy for them to transfer weight from the hind end in a forward direction (toward the front end).

B. Dissimilarly, horses are not very proficient at transferring weight in a backward direction (from the front end toward the back end).

to the back end (fig. 10.2 B). For this reason, forelimb weight-bearing lameness only generates visible hind limb asymmetry when it is pronounced (**VL 10d**). Moreover, the components of the lameness that get transferred tend to be those associated with stride length rather than load burden. Since the driving motive is usually to maintain balance (rather than shift weight), fore-to-hind referrals are almost always expressed in the contralateral hind limb. This is useful knowledge to the observer, who can surmise that any demonstrative weight-bearing lameness in the hind limb is probably authentic, since it is rare for referred deficits to manifest in this way.

It is important to keep in mind that the severity of the referred component may exceed that of its parent source. In fact, recognition of secondary and/or artificial lameness is often what prompts the horse owner to solicit veterinary intervention in the first place. Examiners who visually separate front and back halves of the animal, evaluate each half individually and actively seek potential relationships between coexisting deficits, will both clarify their assessment and enhance the quality of their interpretation.



VL 10d: Scan to view video.