PRACTICAL GUIDE
TO LAMENESS IN HORSES
Practical Guide to Lameness in Horses

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IN COLLABORATION WITH CHERRY HILL

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Dedication

To conscientious horse owners, trainers, veterinarians, equine science students, and farriers everywhere so that together we might make our horses more comfortable.
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Preface

When lameness strikes, it is often painful for the horse and can be frustrating, disappointing, heart-breaking, and costly. Because Adam's Lameness in Horses, Fourth Edition, is generally considered too technical for horse owners, trainers, and students in equine science and farrier programs, we elected to develop a comprehensive text that was user friendly. We extracted some of the information from the Fourth Edition and updated every topic. We heavily revised the Conformation and Shoeing chapters.

We hope that this information, coupled with conscientious management, will result in fewer horses suffering from lameness. When a lameness does occur, and you seek professional assistance, we suggest you stay informed and actively involved in the case yourself. It will be most helpful for the horse if you are knowledgeable about the lameness that is being treated. Toward that end, we have provided detailed information about all equine lamenesses: description, causes, signs, treatment, and prognosis. For the horse's sake, we strongly encourage you to develop a cooperative team involving yourself, your veterinarian, and your farrier. This is the key to your horse's recovery and comfort.

Ted S. Stashak and Cherry Hill
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Functional Anatomy*

Anatomy, by nature, is a complex, technical subject. Rather than simplify it too much, we have retained the detail for your future reference.

Anatomic Nomenclature

In Figure 1–1, note that the positional adjectives "proximal" and "distal" refer to the limbs and "dorsal" and "ventral" refer to the upper body, head, and neck. "Rostral" is used to indicate the direction toward the nose. With the exception of the eye, the terms "anterior" and "posterior" are not applicable to quadrupeds. "Cranial" and "caudal" apply to the limbs proximal to the knee [antebrachiocarpal radiocarpal] joint and the hock [tarsocrural tibiotalar] joint. Distal to these joints, "dorsal" and "palmar" [on the forelimb] or "plantar" [on the hindlimb] are the correct terms. The adjective "solar," is used to designate structures on the palmar [plantar] surface of the coffin bone [distal phalanx] and the ground surface of the hoof.

Thoracic Limb [Fig. 1–2]

Digit and Fetlock

The foot and pastern comprise the equine digit. The bones of this region include the coffin bone [also known as [a.k.a.] the distal phalanx, third phalanx, or P3], the navicular bone [a.k.a. the distal sesamoid], the short pastern bone [a.k.a. the middle phalanx, the second phalanx, or P2], and the long pastern bone [a.k.a. the proximal phalanx, the first phalanx, or P1]. The fetlock is the region where the long pastern bone articulates with the cannon bone and the two proximal sesamoid bones.

Foot

The foot consists of the hoof [epidermis] and all it encloses: the corium [dermis], digital cushion, coffin bone, lateral cartilages, coffin joint, distal extremity of the short pastern bone, navicular bone, navicular bursa, several ligaments, tendons of insertion of the common digital extensor and deep digital flexor muscles, blood vessels, and nerves.

The hoof is continuous with the epidermis [outer skin] at the coronet. Here the dermis [inner layer] of the skin is continuous with the dermis [corium] of the hoof. Regions of the corium correspond to the parts of the hoof under which they are located: perioplic corium, coronary corium, laminar corium, corium of the frog, and corium of the sole [Fig. 1–3].

The exterior parts of the hoof protect underlying structures of the foot and dissipate concussive forces when the hoof strikes the ground. Figure 1–4 illustrates the sole, frog, heels, bars, and ground surface of the wall. The ground surface of the forefoot is wider than that of the hindfoot, corresponding to the rounder coffin bone of the forefoot.

The hoof wall extends from the ground surface to the coronary border, where the soft white horn of the periople joins the epidermis of the skin at the coronet. Regions of the wall are the dorsal toe, the medial and lateral quarters, and the heels. From the thick toe, the wall becomes progressively thinner and more elastic toward the heels, where it thickens again at the junction of the bars [the "buttress" of the hoof]. The medial wall is usually steeper [more upright] than the lateral wall.

The horn’s tubules are sometimes visible as fine lines on the hoof wall, running from the coronet to the ground [Fig. 1–5]. Differential growth rates of the wall from the coronary border toward the ground account for the smooth ridges parallel to the coronary border.

Most of the epidermis is devoid of nerve endings; it is the "insensitive" part of the foot.

Three layers comprise the hoof wall: the stratum tectorium, stratum medium, and stratum internum [see Fig. 1–5]. The superficial stratum tectorium is a thin layer of horn extending distally from the periople a variable distance that decreases with age. The bulk of the wall is a stratum medium consisting of horn tubules and intertubular horn. The horn tubules are generated by the germinal layer of the coronary epidermis covering the long papillae of the coronary corium. Intertubular horn is formed in between the projections.

Distal to the coronary groove, approximately 600 primary insensitive [epidermal] laminae interlock with the primary sensitive [dermal] laminae of the laminar corium [Figs. 1–4 and 1–5]. Approximately 100 microscopic secondary laminae branch at an angle from each primary lamina, further binding the hoof and corium together [Fig. 1–6].

Some confusion exists concerning the terms "insensitive" and "sensitive" laminae. In the strictest sense, the keratinized parts of the primary epidermal