

# EDUCATING HORSEOWNERS ABOUT COMMON HOOF DISEASES

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Horse ownership, for most people, is an expensive proposition. In fact, next to owning a home and a car, purchasing and caring for a horse is likely to be the largest initial and running expense a horse lover will ever incur.

Yet, as any farrier or veterinarian will tell you, a surprisingly large number of horse owners seem to know very little about the proper care and management of their charges. Just as a car that lacks proper maintenance will fall apart and lose its value and usefulness, so will a neglected horse; but unlike an inanimate object, an animal can also suffer unnecessary physical pain. Owner neglect is not only a problem among beginners—as one might have suspected—but also among otherwise experienced horse people, making owner education on all levels an essential issue.

One of the most common areas of neglect is proper foot care. Horses may

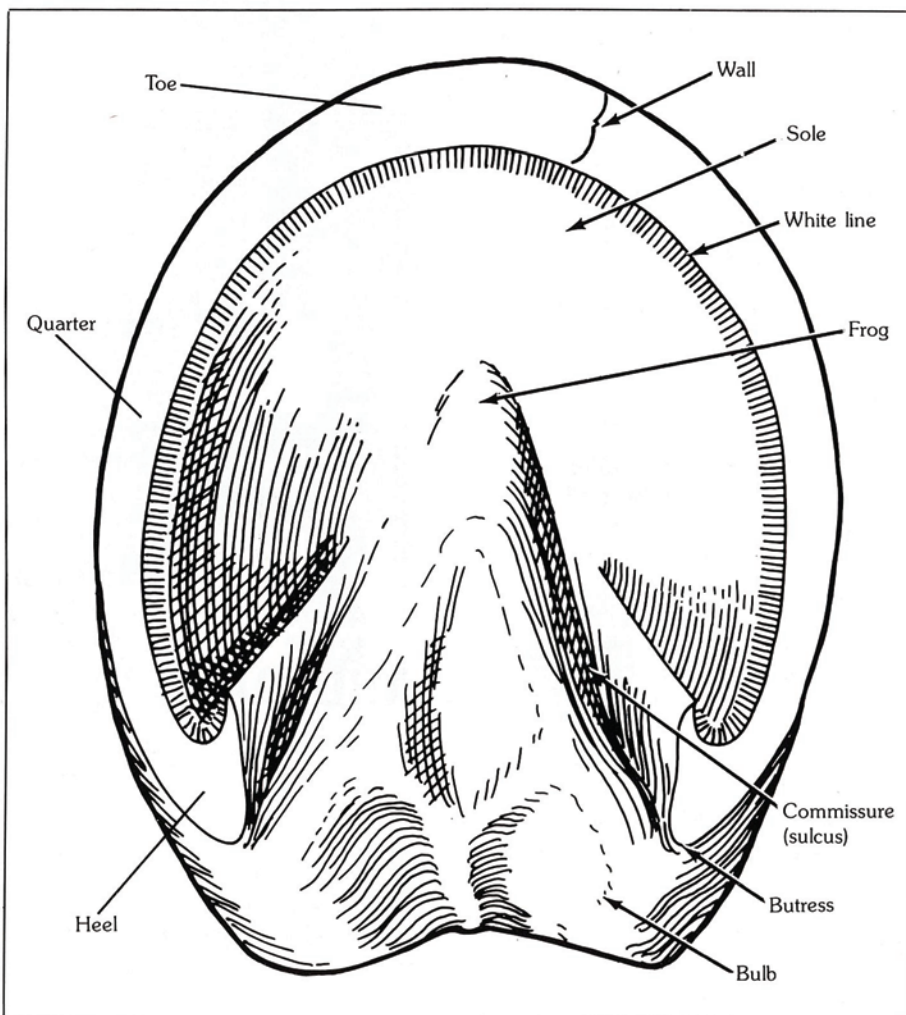


Figure 1. Bottom view of hoof.

vary in terms of pedigree, conformation, temperament, and use, but they all have one element in common: no foot, no horse. Few horse problems have as lasting and destructive an effect on the animal's performance and value as do foot diseases. And the most frequent cause of these is also the most preventable: owner neglect.

### Hoof Structure and Function

Before we discuss foot diseases in detail, it is essential that we review the anatomy of the foot:

The bottom of the hoof consists of three major sections (the toe, quarters, and heels) and seven external structures (the wall, white line, sole, frog, buttresses, bulbs, and commissures). Their locations shown in **Figure 1**. A side view of some of the key elements of the hoof's internal structure are shown in *Figure 2*. (These are the wall, laminae, white line, coffin bone, navicular bone, and deep flexor tendon.) Each of these structures carries out specific functions related to the horse's movements. Their malfunctions are the symptoms of the diseases of the foot.

The hoof **wall** ultimately bears the weight of the animal. This weight is transmitted from the **coffin bone**, the tip of the horse's bone structure, to the wall by means of "laminated" connecting tissue, the **laminae**. The hoof wall is fed and moisturized through the **coronary band**, from which it grows downwards at an average rate of 3/8 inch per month. The hooves of younger horses grow faster, those of older ones more slowly.

The **white line** is a buffer zone between the **sole** and the wall, each of which flexes and moves as it absorbs impact during movement. The white line is also the guideline for correct nail placement during shoeing. The sole protects the internal structure of the hoof from injury. The frog serves as the shock absorber and traction device.

In addition to carrying weight, providing traction, and absorbing shock, the foot has an important circulatory function. Through its rhythmic flexing motions, it assists in pumping blood back to the heart.

Practically all foot diseases can be understood as a failure of these structural elements of the hoof to perform their proper functions. Prevention and treatment of hoof diseases, therefore,

means making sure that these structures are restored to their original working order or, even better, that they don't become damaged in the first place. Since the owner decides where the horse is kept and how it is cared for and used, it is the owner who also holds most of the cards in the equine soundness game. Hoof conformation has a great influence on a horse's *predisposition* to disease, but owner understanding or ignorance of the internal workings of the hoof is often the key to whether or not a horse will actually *develop* a disease.

### Hoof Diseases

Below is a list of the six most frequently encountered hoof diseases, ranked in terms of increasing severity. The six are:

1. Thrush
2. Bruised sole
3. Abscess
4. Sand crack
5. Navicular disease
6. Laminitis and founder

All six can lead to lameness. While some occur quite naturally, even under ideal conditions, all of them can be caused or made more severe through owner neglect. Therefore, the farrier or veterinarian called in to deal with such cases is often confronted not just with an equine problem, but with a human problem as well.

As a professional, you try to deal with the **cause** of the disease—and sometimes that ultimate cause is the very person who is paying your bill. The proper treatment, then, depends not only on the metal you carry in your rig, but also on the mettle you carry in yourself. You must educate your customer carefully and tactfully, but firmly. You must do it for the animal's sake—and your own. After all, if the horse does not improve because of the owner's ignorance, who do you think will get the blame—and the bad reputation in the neighborhood? In the following paragraphs are some of the basic facts you will need when trying to educate an owner.

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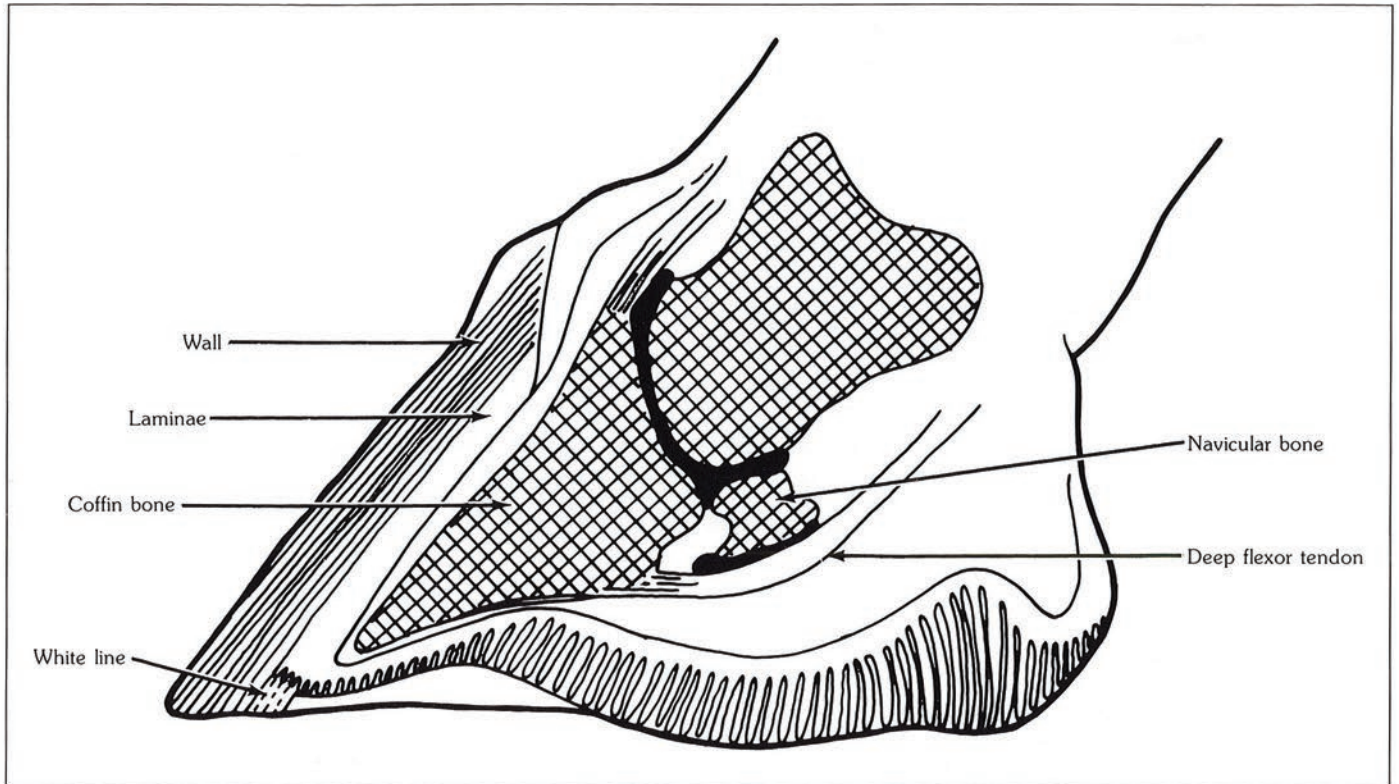


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Figure 2. Side view of hoof (interior).



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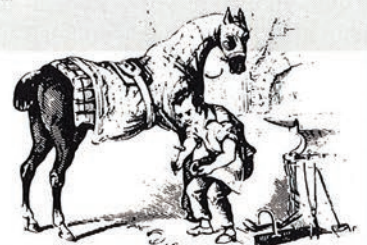
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**Thrush**

Thrush is the destruction of the frog by a bacteria that can live only in an anaerobic environment, that is, in a place without oxygen. The biological name of this organism is, appropriately, *Fusibacterium necrophorum*. (The Greek word *nekrosis* means death.) Older texts often refer to it as *Spherophorus necrophorus*. This bacteria thrives particularly well in necrotic (dead) hoof tissue around the frog and the commissures (see Figure 3), provided packed-in muck blocks out all oxygen to the sole. Once *F. necrophorum* goes to work, a foul smell begins to rise from blackening hoof material. If thrush is permitted to progress without treatment, it will eventually penetrate the sole, cause an abscess and attack the sensitive internal structure of the hoof. The deeper the thrush infection, the more difficult it usually is to clear it up.

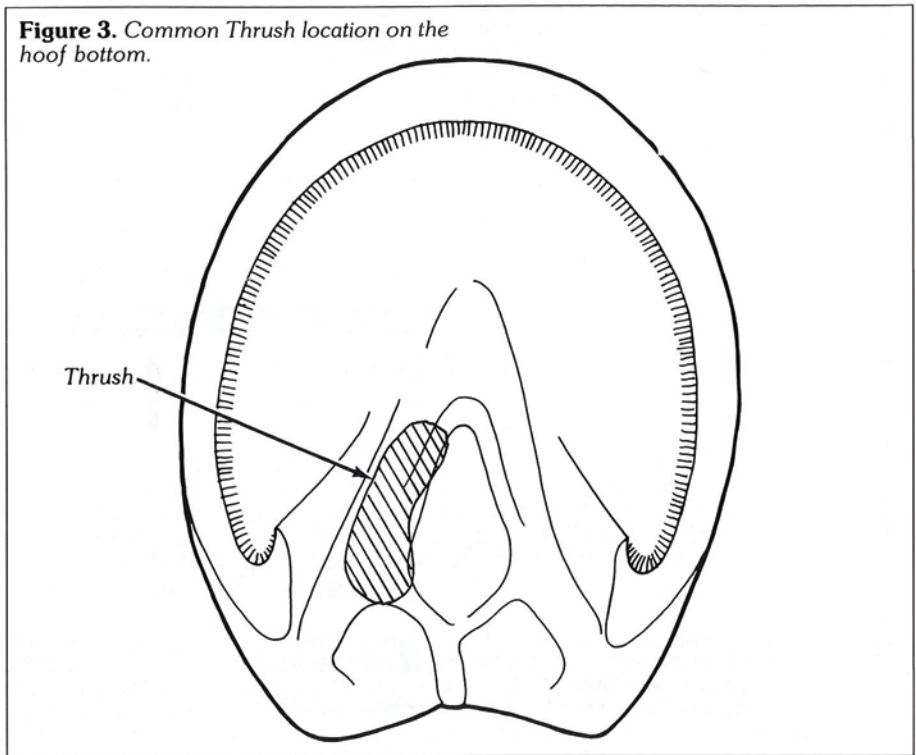
Sadly, thrush is usually caused by owner neglect. Unclean, mucky conditions provide an ideal environment for anaerobic organisms, whereas a dry, clean stall or paddock exposes the hoof to enough oxygen to keep the thrush bacteria at bay. Treatment of thrush consists, therefore, mainly of cleaning out the affected hoof regularly, trimming off the necrotic tissue, applying a seven percent iodine solution or a commercially available copper sulfate solution to help destroy the remaining bacteria—and having a heart-to-heart talk with the owner. Daily cleaning of the horse's feet and his stall are usually all it takes to keep the infection from recurring.

**Sole Bruises**

Sole bruises (see Figure 4) are caused by trauma to the sole from rocks, gravel, frozen clumps of mud, and just about any other hard object the horse may step on. An improperly fitted shoe, too, can lead to a bruised foot. If a shoe was the culprit, it should be removed immediately. Replace the misfit with a wide-webbed shoe that has been concaved or seated out.

The easiest preventive measure against bruising is also the most elementary one. Under no circumstances should a horse that is used in rough terrain or on hard ground be left unshod.

**Figure 3.** Common Thrush location on the hoof bottom.



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If a barefooted horse gets bruised, it, too, should be shod right away. (There are a few tough horses that have worked hard all their lives and never been shod. However, these are the exceptions, not the rule.) Regardless of the source of the bruise, using pads with shoes provides further protection of the tender sole and, thus, relieves some of the pain.

A corn is a particular type of owner-preventable sole bruise. It can occur in the heel area of the hoof, when the shoe is left on too long without resetting. If the corn is caught in time, removing the offending shoe and trimming the hoof can usually correct the problem. If unattended, however, the bruise can abscess.

Try to explain to the owner how corns are caused and make him understand that a regular resetting schedule is important.

**Abscess**

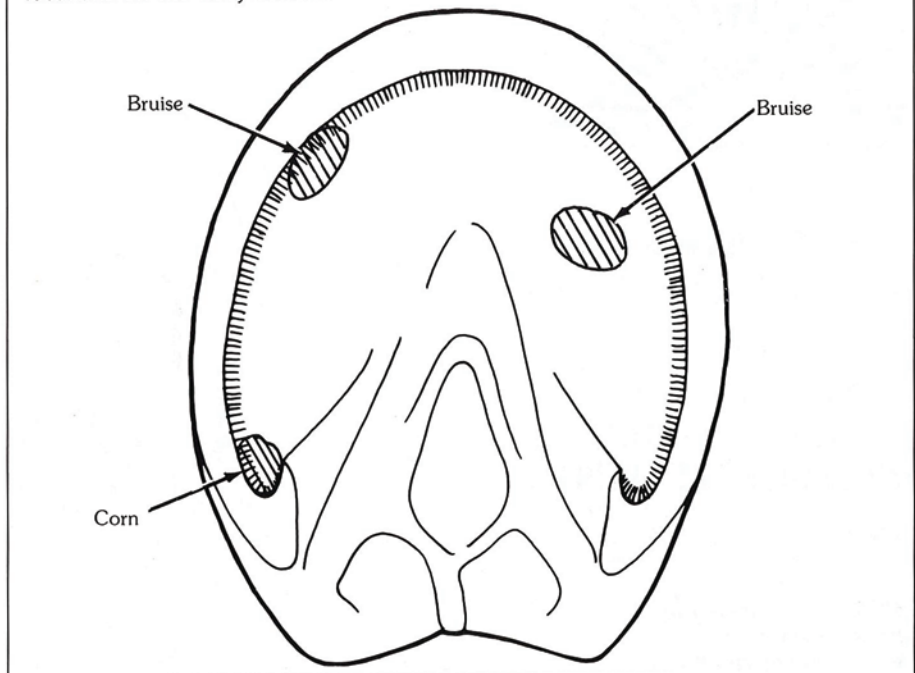
An abscess is an infection or a pocket of pus inside the hoof. It occurs most commonly in the sole area. Such hoof problems as puncture wounds, sole bruises, or laminitis are themselves often the cause of abscess.

The quickest way to relieve the pain caused by abscess is to cut hoof material away until the abscess begins to drain. Abscess fluids, like any other pressurized liquid, will follow the path of least resistance. Since the outer structure of the hoof is rather hard, an abscess, without human intervention, might even travel as high as the coronary band before it can find a soft spot for drainage. Creating an artificial soft spot will hasten that process. Soaking the foot in Epsom salts can help as well.

Once the abscess begins to drain, a germicide should be applied to the opening to kill the remaining bacteria and to promote drying of the wound. A drawing agent or poultice is then packed into the opening to assist in the completion of the draining process. To protect the foot from reinfection during healing, it should be shod with a permanent pad or, if the packing and dressing need to be changed, with a removable plate.

An abscess causes intense pain and can cause severe lameness. There are two important preventive measures

**Figure 4.** Common sole bruise and corn locations on the hoof bottom.



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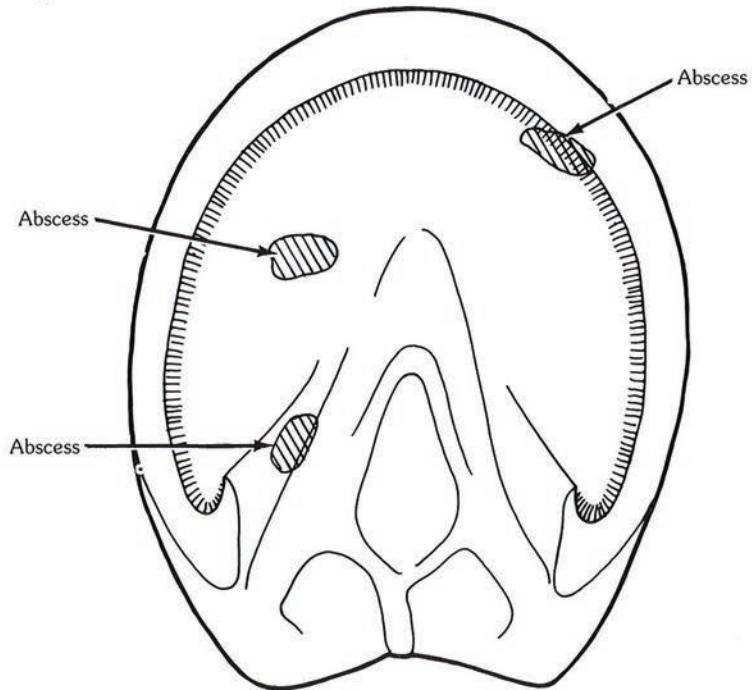
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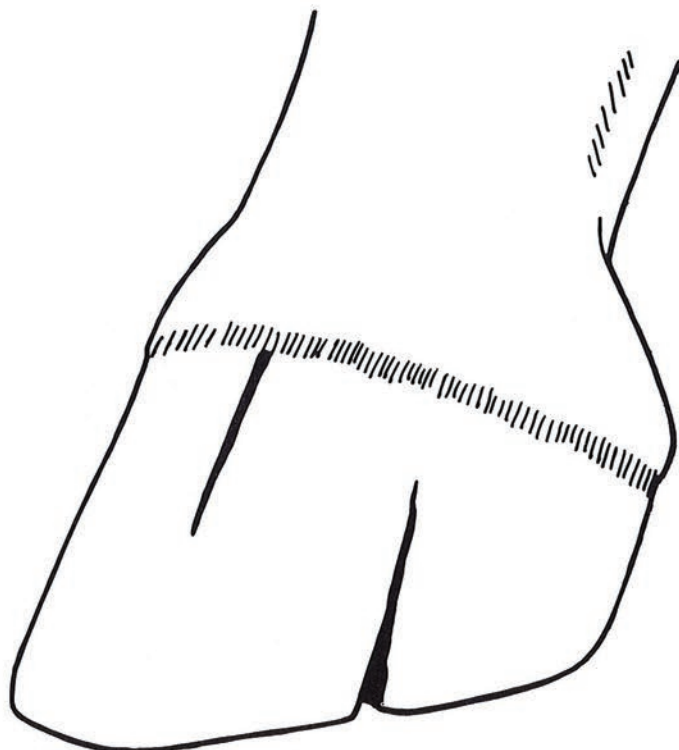
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**Figure 5.** Common abscess locations on the hoof bottom.



**Figure 6.** Common Sand crack locations on the hoof wall.



against abscess. First, the owner should guard against the primary diseases of which abscess is often a follow-up complication. Second, the owner should keep the horse's stall, paddock, or pasture area clear of debris, shards, pieces of wire, and other junk that could injure or puncture a foot.

Once an abscess does occur, prompt treatment is critical. Also, during the healing period, the horse's surroundings must be kept meticulously clean. Common locations of abscess in the foot are shown in Figure 5.

### Sand Cracks

Sand cracks (or quarter cracks) are vertical cracks in the hoof wall. They can extend the full length of the wall, part way down from the coronary band, or part way up from the bottom of the hoof. There are superficial cracks and there are those that reach deep into the wall, affecting the hoof's sensitive inner parts and causing severe pain. Sand cracks can occur on any portion of the wall—the toe, the quarter, or the heel. (See Figure 6 for typical locations.)

Sand cracks can result from a horse bearing its weight unevenly (if it favors one foot, the opposite one may crack), from irregular hoof growth, or as the name of the disease indicates, from living in an excessively dry paddock or stable.

Once sustained, sand cracks will not grow back together; they must grow out instead. Treatment of cracks, therefore, is directed less at repair than at prevention of further damage.

There are several common shoeing methods that tend to accomplish this, although some animals may present problems requiring unique aids. In general, you can use one or a combination of the following techniques: 1. applying a shoe with clips on both sides of the crack, 2. burning a hole at the end of the crack to prevent it from spreading any further, 3. mounting a thin metal strip over the crack, using screws to hold it to the wall, or 4. lacing the crack tightly with plastic. All of these methods should prevent the wall from flexing and the crack from widening. Yet, occasionally it is necessary to remove the entire hoof wall. [Donald R. Tritz provides a description of this more

*drastic crack treatment in his article in this issue on pp.54-57.—Ed.]*

### Navicular Disease

Navicular disease usually starts with bursitis, an inflammation of the navicular bursa. The bursa is simply a small, fluid-filled sac that lies between the navicular bone and the deep flexor tendon, reducing friction between the two. More progressive stages of the disease are marked by erosion of the navicular bone surface, the tearing of tendon fibers, the development of bone spurs on the navicular bone, the death of navicular bone cells, and the ultimate destruction of the tendon. The dead bone cells form what are known as *lollipop* lesions due to their appearance in a radiograph (see Figure 7).

There is no agreement among experts on the exact cause of the disease but it is generally accepted that an improper hoof angle (heels too high or too low), together with severe concussions


of the navicular bone from strenuous work or hard surfaces, contributes greatly to its development. Invariably, navicular disease leads to lameness.

Hoof testers are a quick method for diagnosing navicular disease. Nerve blocks and radiographs often supply supporting evidence for clinical diagnosis in suspected incidents of the disease. For the farrier, the treatment of navicular disease involves trimming the affected hoof short at the toe and fitting it with a bar shoe with a rocker toe, so that the strain on the deep flexor tendon and the pressure on the heel area are reduced to a minimum.

A treatment of last resort is *nerving* the horse by severing its posterior digital nerve. However, owners who decide to have their horses nerved should be made aware of the dangers to the animal. A nerved horse has absolutely no feeling in the back part of the treated foot and, therefore, will show no sign

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of lameness should a puncture wound or other injury occur there.

An owner can best safeguard against his horse ever contracting navicular disease by: 1. giving it *regular exercise*, 2. not working it too hard immediately after a longer lay-up, and 3. not insisting on a shoeing job that would alter the natural angle of the foot excessively. Your farrier-as-teacher role could, once again, prevent much damage before it has a chance to occur.

### Laminitis and Founder

Laminitis is characterized by the destruction of the *laminae*, the connecting tissue between the coffin bone and the hoof wall. Founder involves the rotation or sinking of the coffin bone either as a result of laminitis or from other tissue-destroying causes such as concussion. [For a detailed discussion of the causes and progression of laminitis and founder, see our report on the January 1986 symposium on laminitis in Lexington, KY, pp. 30-53; the two sum-

maries of laminitis and founder on pp. 36-37 and 44-45; and the article on the farrier's role in the treatment of founder by J.R. Rooney, DVM, in our new feature, *LOOKING BACK*, on pp. 26-29—all in this issue.—Ed.]

The circumstances that favor the development of laminitis or founder have been well understood for quite some time, but the exact causes of these diseases are still the subject of intense research. Among the common conditions that can bring on laminitis or founder are: 1. excessive grain intake, 2. retention of the placenta after birth, 3. concussion on hard surfaces, 4. internal infections and blood poisoning, 5. drug abuse and allergies, and 6. a change in the animal's water and food intake routine.

Treatment of both diseases is difficult, at best, and often fails to prevent the ultimate destruction of the animal. The veterinarian tends to concentrate on the biological agents (bacteria) and the chemical agents (poisons) involved in the destruction of internal hoof tissue and the reduction of blood circulation in the laminae, while the farrier tends to concentrate on the effects of mechanical impact on the foot.

In choosing a shoe for animals afflicted with laminitis or founder, look for the shoe's ability to apply pressure to the tip of the frog. This pressure will help stabilize the coffin bone. A typical design that should provide some relief is the heart-bar shoe. Other designs with frog pressure have been successfully used as well.

To have any chance of success in treating laminitis and founder, it is essential that veterinarian, farrier and owner work closely together throughout the treatment period, which can take as much as a year.

### Prevention—The Best Cure

Few equine diseases are more serious and potentially fatal than hoof diseases, yet, at the same time, few are as easily preventable. What it takes, above all, is owner cooperation. Once an owner understands how the foot works, what makes it well, and what makes it ill, the incidence of hoof disease may be greatly reduced, and the task of the farrier becomes that much easier.

To be sure, there are times when hoof diseases become unavoidable and the professional farrier and veterinarian are

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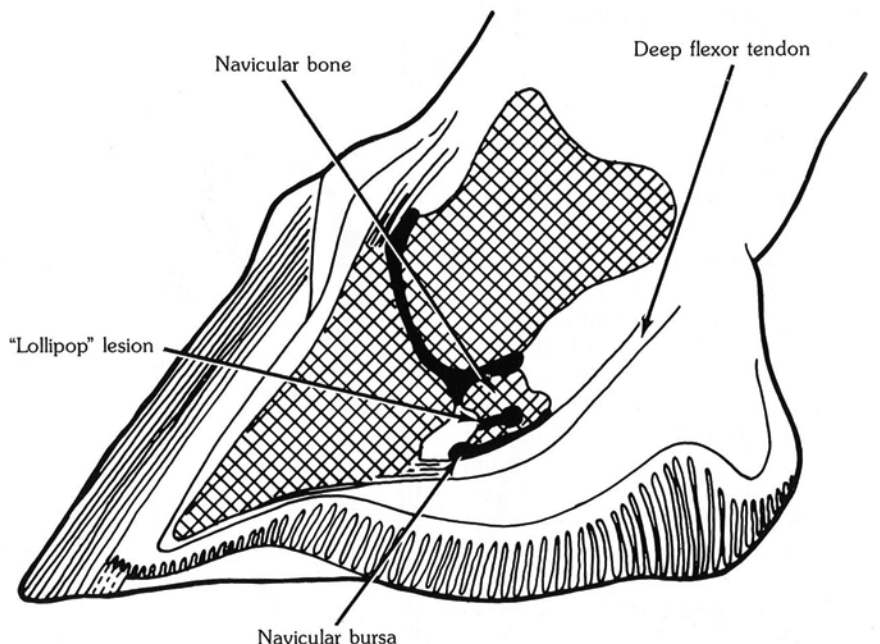


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**Figure 7.** Navicular bursa and the "lollipop" lesion of the navicular bone.





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needed to administer the proper treatment. But the ultimate objective is to make the owner an important and active part of that triangle of care. After all, the common goal of the owner, farrier and veterinarian is a sound and happy horse. And prevention will always have sounder and happier results than does the best of cures.

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