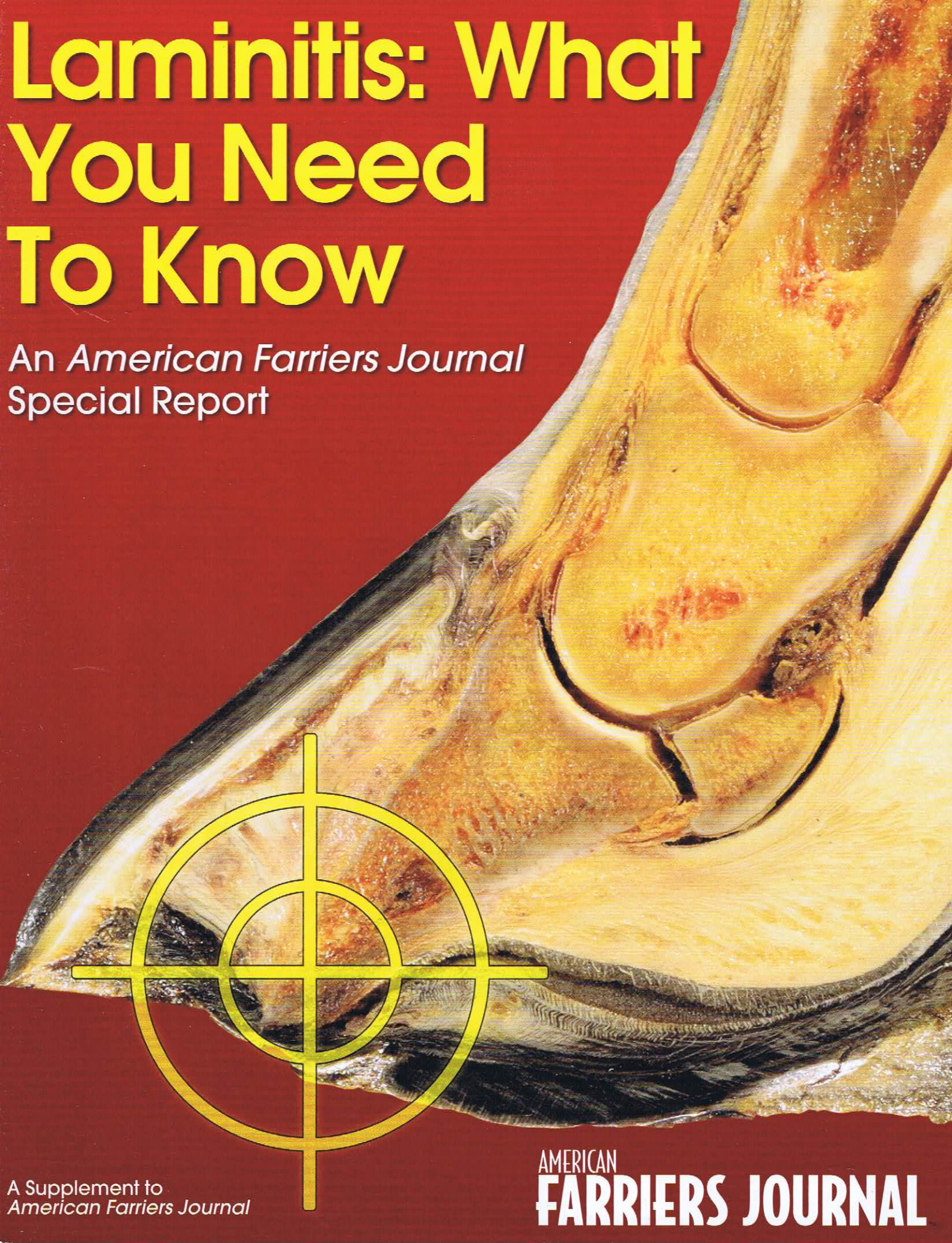


Laminitis: What You Need To Know

An American Farriers Journal
Special Report



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Why Heart Bars Work With Laminitis

It's been 27 years since a leading farrier and equine veterinarian presented the breakthrough paper on using heart bar shoes for treating laminitis

By Esco Buff, PhD, CF

In 1984, the late Burney Chapman, a farrier from Lubbock, Texas, and George Platt, a veterinarian from Eagle, Colo., presented a laminitis research paper at the annual meeting of the American Association of Equine Practitioners (AAEP).¹ They evaluated the theories, ideas and techniques using the heart bar shoe for treating laminitis.

While much of the information in their paper is still valid, we've learned much more about the pathogenesis of laminitis, vascular blood flow, pharmacology options, radiograph techniques, have refined the heart bar process and have established a protocol that is a repeatable process for any farrier with at least a basic level of shoeing skills.²

Mechanical treatments for laminitis include hoof and sole support, raised heels, barefoot, bone column support and other miscellaneous treatments.

Heart Bar Remedies

Heart bar shoes fall within the category of bone column support treatments. The choice of treatment

really depends on countering the various forces that are involved. Those can be the horse's weight, upward ground forces, pull of the deep digital flexor tendon (DDFT), laminae forces and pull of the extensor tendon.

The key to any successful laminitis treatment is blood flow. There are no vascular foramina perforating the solar surface of the distal phalanx except over the palmer processes. This means nearly all of the sole corium depends on a blood supply from the circumflex artery that arises first on the dorsal surface of the distal phalanx and then curls under the margin of the distal phalanx.

Researchers have also found that alternative circulation coming from the dorsal artery at the rear of the distal phalanx is activated when weight bearing is shifted from the wall to the frog.³ This could be one reason why sole support methods are contra-indicated.

The use of inadequately proven mechanical theories leads to many divergent views among equine professionals about treating laminitis. Some research has been published



The position of the tack marker in the frog is not critical, as long as the entire sole and frog are marked with a line to note the position after the tack is removed.

on general results, as well as on several different shoeing modalities. Among several published laminitis treatment options, one has a 58.2% survival rate⁴ and another has a 51% survival rate.⁵ Yet several published studies with heart bar shoes have a survival rate that varies from 71% to 98%.^{2, 6, 7, 8}



A dorsal wall wire of a known length should be placed at the point where the hoof wall turns from hard to soft.

HOOF-CARE TAKEAWAYS

- Use of heart bar shoes is among several bone column support treatment options with laminitis.
- Radiographs are extremely valuable in the use of heart bar shoes, but must be taken properly.
- Seven types of precise hoof measurements from radiographs can help align heart bars properly.
- Proper aftercare is essential in laminitis cases.
- Avoid the use of pain-masking drugs with laminitic horses.

Proper Application Is Critical

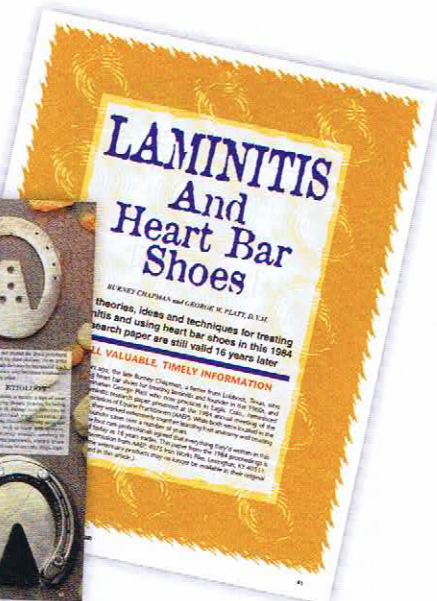
So, why are so many equine professional not using heart bar shoes to deal with laminitis?

In some cases it's because the placement of a heart bar shoe needs to be precise. Many cases of laminitic horses not recovering when treated with heart bar shoes are due to application without radiographs or to a lack of correct frog pressure. However, following a few simple procedures during the process can make a significant difference between a radiograph that has some use for diagnostic, prognostic and treatment purposes compared to one that does not.

To show the frog in relation to the distal phalanx, a tack should be used to highlight the frog. This tack is merely a reference point to determine proper placement of both the frog plate and toe of the heart bar shoe. The exact placement is not as important as long as its position on the frog



Many of the theories, ideas and techniques for treating laminitis and using heart bar shoes in this 1984 paper are still valid today.

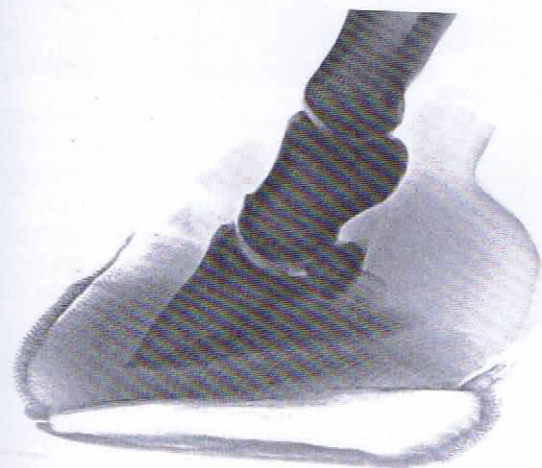


is marked in some way. A heavy felt marking pen works best. Draw a line across the sole and frog marking the spot of the tack in the frog.

For prognostic purposes and to calibrate magnification, a straight stiff wire of known length (20-40 mm) is taped to the hoof wall so the

top of the wire is positioned where the wall starts changing from hard to soft. Since all radiograph images are subject to magnification, all of the objects measured in a radiograph will appear larger than they are. Knowing the exact length of the wire makes it easy to adjust the effect of

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Note the shoe toe placement, the tack mark and the tip of the frog plate of the heart bar shoe mark.

magnification in taking radiographs.

When the veterinarian is taking radiographs, the horse should stand with each foot on a wooden block or radiograph box with the cannon bone vertical to the ground. This ensures equal weight bearing, which is critical for measurements in sinker cases.

Data can then be collected from the radiograph and documented.⁹ After calibrating for magnification, the collected data will provide very important information, such as:

Wall Thickness. A wall thickness that is greater than 13-15 mm for miniatures, 15-17 mm for horses and 17-19 mm for draft horses is an indicator that the horse may be foundering and/or showing laminar separation.^{10, 11, 12} In the early stages, the hoof wall and distal phalanx will draw apart, but still remain parallel. Rotation of the distal phalanx occurs later.

Palmar Cortex Of The Distal Phalanx Length. This can be used as an assessment of how much, if any, the distal phalanx has remodeled between radiographs.¹³

Founder Distance (or CE distance by others). The greater this is from normal (0-10 mm), the less chance there is that the horse will return to useful soundness. This measurement also helps monitor the

horse's progress and aids in determining the prognosis and probability of success.⁸

Angle Of Hoof Capsule Rotation. This measurement is only useful for helping the farrier determine how much dead laminar needs to be removed from the toe. The measurement of rotation has been shown to be unrelated to outcome. It is interesting to note that rotation doesn't occur at the onset of laminitis, when the laminae have been most damaged and they are at their weakest stage.

Instead, it occurs weeks after the onset. This is when the proliferative response (new growth) begins to press against the distal phalanx due to the altered alignment of cells in the coronary band and white line area. In my opinion, this rules out raising the heels to ease tension on the DDFT as a treatment option.^{7, 8}

Angle Of Distal Phalanx Rotation. This helps determine how much foot to trim to realign the hoof capsule and phalangeal axis.

Frog Plate Placement. This measurement is the most accurate way to find the spot where the tip of the frog plate needs to

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Laminitis And Heart Bar Shoes

The *American Farriers Journal* 16-page reprint of the 1984 research paper presented by Texas farrier Burney Chapman and Colorado equine veterinarian George Platt at the American Association of Equine Practitioners is as valuable today as it was 27 years ago. This highly valuable management report covers all aspects of laminitis, including detection, diagnosis and treatment, as well as answers to 20 of the most commonly asked questions concerning laminitis.

To order your copy, go to the *American Farriers Journal* website at www.americanfarriers.com and then click on store and reports.

end. Previously, this was found by measuring back on the bottom of distal phalanx, 37% from its tip. However, this method fails to account for degenerative bone loss.¹

Shoe Toe Placement. This is the easiest and most accurate way to determine the proper placement of the toe on the heart bar shoe.² Once the measurements have been calculated, the frog plate and shoe-toe placement measurements can be transferred to the foot and marked with a heavy felt pen.

Lots Of Options

There are many options for heart bar shoe, from buying commercially made ones to making your own. Use the most accurate, efficient and cost-effective method for you.

A standard rim shoe fit to the foot at the shoe-toe placement measurement is often easiest for someone who can braze or weld. The frog plate can be forged from round stock, an old horseshoe or pre-made pieces

of metal. After brazing/welding the plate into the shoe, there probably will not be enough pressure applied to the frog.

The easiest way to obtain the proper amount of pressure is to apply a layer of adhesive, such as Vettec Super Fast. You can then grind or rasp away the excess adhesive until you have the right amount of pressure on the frog.

Heart bar shoes work better when they apply positive pressure to the frog. When the plate is resting on the frog, the shoe will be about 1/8 inch off the wall. The shoe should be nailed and blocked down to the hoof wall to stabilize the distal phalanx. In cases of penetrating sinkers, the distal phalanx will be pushed back into the hoof.

In their 1984 paper, Platt and Chapman recommended the heart bar shoe not be used with a straight vertical displacement of the distal phalanx.¹ But others don't agree with this, as the same shoe and process

is used on all cases of laminitis and founder.²

Hidden Dangers

There are numerous hidden dangers associated with lamellar wedge formation and inward horn growth as a consequence of distal phalanx rotation.¹⁴ This distortion changes the direction of sole horn production and can lead to an inward growing mass of horn that progressively impinges on the apex of the distal phalanx. The lamellar wedge also leaves the foot susceptible to secondary fungal infections.

As a result, the lamellar wedge needs to be removed, either by rasping or sanding.^{2, 14} At one time, dorsal wall resections were very common. This is not so today and resections are generally only performed in cases of complete hoof-wall sloughing and sinker cases where the hoof wall impinges on or under the coronary band.

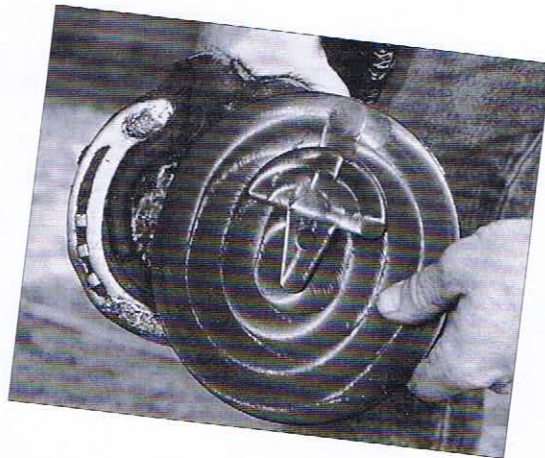
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via the sole, but instead through the hoof wall. This will keep the sole stronger, as well as prevent the swollen solar corium from prolapsing.

Platt and Chapman wrote, "The heels grow faster than the toe on a foundered foot."¹ A more correct statement would be that the heels grow very slowly or not at all, and the toe of the foundered foot is grow little or not at all due to reduced blood supply. For this reason, heart bar shoes need to be reset every 3 or 4 weeks.

As the shoeing appointment nears, the hoof grows away from the frog plate. If the horse becomes slightly sore, the heart bar shoe should be reset with the same amount of frog pressure as at the first shoeing. If the horse is doing well, the heart bar shoe can be reset with slightly less frog pressure. As conditions improve, frog pressure can gradually be eased, until there it is either eliminated or there in only passive pressure.

Proper Aftercare Is Critical

Aftercare for laminitis can be time consuming and tedious. It may require daily bandaging, maintaining deeply bedded stalls (6 to 12 inches) and attending to decubital ulcers or bedsores. Encouraging the horse to

lie down and shift its weight from one foot to the other will help prevent circulatory stagnation. Even properly managed laminitic horses may remain painful during the immediate recovery period.

Care With Pain Medication

Avoid the use of pain-masking drugs. A laminitic horse that does not feel pain, may try to move, which could cause further damage to its feet and further tearing of its laminae.

Pain medications are often used indiscriminately, which can interfere with the ability to accurately evaluate the horse's current condition, mechanical treatment evaluation and monitoring of the horse's progress.

Paraphrasing the advice equine of veterinarian George Platt on this subject, the best pain reliever will be the use of a correctly placed, positive-pressure, rigid heart bar shoe. **Q**

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