

Dealing with Chronic Founder

Managing foundered feet

BY HEATHER SMITH THOMAS



ANNE M. EBERHARDT

A horse with chronic founder needs continual hoof care and support for the foot

AFTER A HORSE has suffered laminitis, the acute phase eventually passes and the horse either recovers or progresses into a chronic state—often called founder—in which the coffin bone has rotated or dropped. The horse with chronic founder needs continual hoof care and support for the foot, to work back toward soundness (if possible) by getting the coffin bone in a more normal position within the foot.

Success often depends on having an early, correct diagnosis—evaluating the amount of rotation and whether the bone is sinking or displacing to one side.

Paul Goodness, chief of Farrier Services at Virginia Tech's Equine Medical Center in Leesburg, Va., says that when horses suffer laminitis, they are put on appropriate medication by a veterinarian, and in a mild case this often resolves the problem.

“But if the horse is in pain, I view this as both a medical and mechanical emergency,” he said. “We get the veterinarian involved to administer medications to reduce the inflammation and maybe reduce or eliminate the causative factors.

“Then how we approach it, from the farrier's standpoint, is initially to try to get some gentle sole support under the horse,” he said. “This enables the sole to become a weight-bearing structure and helps reduce some of the stress on the laminae. Hopefully within a couple of days the inflammation will settle down and the horse will be OK.”

The important thing is not to have any stress/weight-bearing on the compromised laminae (which normally secure the coffin bone to the hoof wall) or these attachments might stretch/give way and the coffin bone sinks.

“For the horses that don't immediately recover, and are still at a very painful level or getting worse



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Reviewing hoof/leg X-rays

after a few days, special shoes or boots can be very helpful,” Goodness said. “Some people want to keep their horses barefoot, but this is one instance where shoes or some kind of support will be beneficial to keep the horse comfortable, protecting the areas of the foot that are sore and providing support to any undamaged area—even if used only temporarily.

“One reason we put a shoe of some type on these horses is to provide pain relief (in addition to the medications being given) and disrupt the inflammation cycle,” he continued. “Another reason is to help provide support to the areas that have not been damaged (that can bear weight). This helps encourage any new growth of the foot to be healthy and functional. Proper shoeing can really enhance healing.

“The most painful area is typically the toe region. The laminae that connect the front of the coffin bone to the dorsal wall have been damaged. When that happens, the laminae can’t hold the bone in place and the bone tends to drop into the sole. This is why it’s been called ‘founder’ (like a foundered, sinking ship). This descending of the bone onto

the solar corium also becomes painful. In our shoe design we have to address these factors,” he said.

“We use all sorts of ways to do this. Some people may use a reversed shoe, so the toe area is open, with no shoe under the toe to create pressure, and to provide support across the heels.”

The dorsal wall (front of the hoof) doesn’t always have to bear weight, and this gives the damaged laminae



COURTESY DR. MICHAEL L. STEWARD

Dr. Michael L. Steward of Shawnee Animal Hospital in Oklahoma has developed a wooden rocker shoe to help laminitic horses

in that area some relief.

“We may use a fairly thick shoe, usually plastic, to keep the toe area up off the ground and get it out of harm’s way,” Goodness said. “Creating some kind of shoe that will do those two important things—protect the sole and relieve the duties of the toe while those areas are regrowing—is most important.

“Support is the next major issue to address. We try to give frog and sole as much support as possible, keeping in mind that if the horse has foundered, the sole at the toe is still very sore (at least initially) and can’t provide much support. This area is usually painful for about three months and incapable of being a weight-bearing structure,” he said.

“So we concentrate the support on the back part of the foot—the frog and the heels and everything in between (basically any area that is not painful). We can do that with many different types of shoes, such as an egg bar, heart bar, or anything that provides support across the back of the foot. We can create bevels along the ground surface for easy break-over, to relieve some of the stress on the front of the foot when moving forward, or help prevent shearing of the laminae if the horse is turning.”

Another advance that’s often done with shoes today is to add some kind of removable sole support.

“There are many types of sole support materials readily available to farriers and veterinarians, such as urethanes, silicones, and various types of impression material,” Goodness said. “Almost unlimited choices exist today if the farrier or veterinarian uses imagination to create something that works, with the gels and many other pliable materials available. It’s important to have these removable materials so you can micromanage the support—the location, thickness, density, etc. You can really help the horse by paying close attention to these things.

“A certain number of horses don’t do well and become complicated (unstable). We’ve had very good luck with a

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COURTESY DR. MICHAEL L. STEWARD

Steward's wooden shoes 'rock' to help facilitate movement which increases blood flow

more aggressive medical approach. We sometimes use botox to lessen tension on the deep flexor muscle and tendon (which is pulling upward on the back of the coffin bone and causing the front of it to drop more).

"The laminae at the dorsal wall are compromised, and the strong pull of the deep flexor tendon is causing the bone rotation because the opposing force at the front is compromised," he said. "There is a limit to what can be done with shoeing, if the pull of the tendon is overpowering.

"In some of these complicated (unstable) cases, when things aren't going well and the bone continues to rotate, the farrier needs help—with some type of aggressive medical procedure—in order to make any progress. The veterinarian will often use something like botox to temporarily paralyze the muscle/tendon. This is generally injected into one of the deep flexor muscle bellies and it temporarily weakens them, which reduces the pull from that tendon. Effects of the botox seem to wear off in about six months. This may give the farrier a window of opportunity to correct the rotation and realign the coffin bone so the horse can regrow a new hoof

capsule down around it.

"The downside of using botox is that it seems to work in only about half of the horses injected, and we don't yet understand why," he said. "It's a great tool when it does work because it's non-invasive and the horse has full strength of the tendon again in a few months.

"In other cases the veterinarian may do a deep flexor tenotomy and actually cut that tendon when it is pulling too much. This also gives the farrier quite a bit of time to get things straightened out. Over time, the tendon heals and reattaches quite well. Because it's been cut surgically, most of the time, if it's done properly, it heals much better (with less damage and scar tissue) than an injury would—such as a bowed tendon."

Often, these horses progress and their feet (and tendons) heal so they can be turned out or sometimes used for light riding or can be sound enough for breeding.

"A certain percentage, however, develop some scar tissue and adhesions around the surgical site," he said. "If that happens, the horse may have limited athletic ability because the tendon doesn't work quite as well anymore."

So there is always some risk, but it's

still a viable treatment if the owner wants to try this option.

"One of the newer things some people have been trying on severe cases is injecting them with stem cells," Goodness said. "The jury is still out on that, but the early information indicates this may be a useful treatment, especially for the sinkers (in which the entire coffin bone drops). We are still learning about this treatment. The biggest downside at this point is the cost."

But in the future this may become a good weapon to add to the arsenal for treating chronic founder.

"There are many ways to accomplish the various objectives in managing foundered horses," he said. "Each case is different, and we often have to try different things. For example, the farrier might use a nailed-on metal heart bar on one horse and a glued-on plastic shoe on another. We are constantly trying to do things better the next time. Our knowledge and experience are always evolving.

"But, in a nutshell, the farrier's role comes down to simply protecting the areas that have been damaged, and using what we can to give adequate support to the areas of the foot that have not

been damaged. Today it's easier to work with these horses because of modern technology. We have many more tools and materials—such as space age foam, adhesives, plastics, etc. We are having much greater success helping foundered horses today than we did 40 years ago.

“If you are lucky enough to catch it early, and lucky enough to have people in your area who have experience dealing with founder, most of these horses end up doing pretty well—and it used to be the opposite,” Goodness said. “What’s discouraging is that we still hear reports of people giving up and euthanizing a horse when they find out it has laminitis. This is sad because many of these horses do have a future with proper management.”

Goodness feels that horses being managed for founder are better off moving around (to whatever degree they can be comfortable) than confined.

“You have to be very careful about how much movement the horse is allowed, because the attachment between the bone and hoof wall is damaged,” he said. “You must be careful about turnout, especially early on, but the more these horses can be moving, with caution, the better off they will be.”

This can help blood circulation, which helps with healing.

“Often you may have no choice and have to confine the horse in a stall for awhile, but this is not ideal,” Goodness said. “You want these horses moving—in a safe way—as soon as possible, not only from a physical standpoint but also mentally. They will be happier if they can be out moving around, even a little. They need a reason to live.”

Even if a horse can just be pasture sound, able to move around and graze, he will be a lot happier.

WOODEN SHOES

About 30 years ago Dr. Michael L. Steward of Shawnee Animal Hospital, Shawnee, Okla., created a wooden rocker shoe to help laminitic horses.

Steward wanted to develop a safe, easy, effective, and affordable therapeutic shoe that would support the foot, reduce pain, and promote blood flow and healing. His roller-motion shoe (also called the Steward Clog) is an orthopedic shoe that helps stabilize and de-rotate the coffin bone, promotes sole growth, and relieves pressure and pain.

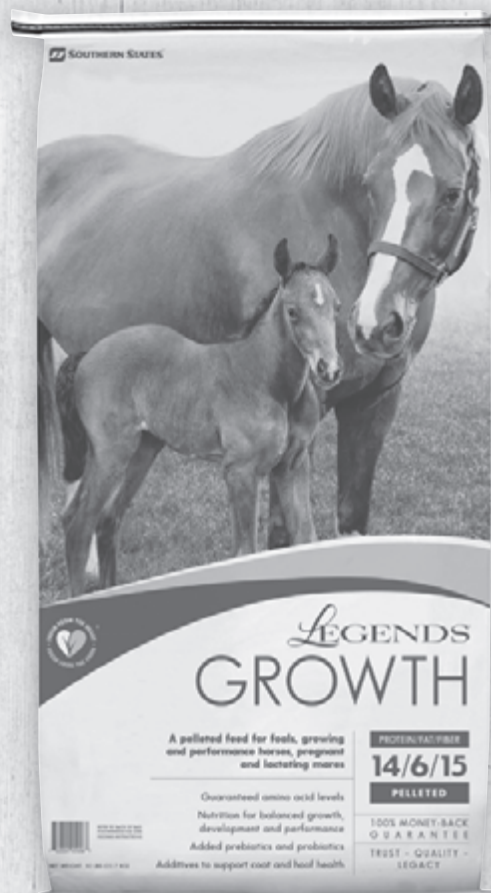
At one of Steward’s presentations at a veterinary conference, the person who introduced him said, “This is a guy who thinks outside the box. He takes the box apart and puts it on the bottom of the horse’s foot!”

It’s a great invention.

“Actually, a horse invented it,” Steward said. “When I was a young veterinarian, one of my high school classmates brought in a foundered mare, with the coffin bone starting to come out the bottom of the foot. There wasn’t a farrier around, and I was desperate and didn’t know what to do, so I simply put a piece of plywood on the bottom of the foot. I cut the plywood in the shape of the foot and screwed it onto the foot; the horse

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HEALTH ZONE

Hoof Care

actually designed it over a three-month period, due to wear on the shoe.”

Steward attached it with a few deck screws and Vetrap around the hoof wall and jokingly said it looked like a wooden clog.

Three months later the mare was still wearing the shoes and the owner brought her in for a Coggins test because he was taking her around the country barrel racing.

“I was surprised the horse recovered, so I picked her feet up and was amazed at the wooden shoes and their unusual shape and got to thinking about it,” Steward said.

The relatively soft plywood had worn away where the foot wanted to break over, and the horse could walk more easily. The base of the platform at the ground was smaller than the top where it was attached to the hoof, which enabled the mare to pivot on the shoe in any direction. She could move comfortably, especially while turning, which is something most horses with laminitis find difficult until complete healing has occurred.

Steward began experimenting with this idea on other horses.

Over time this innovation proved to be beneficial in the rehabilitation of horses' feet. It took him about 10 years to figure

out how to keep the wooden shoes on for an extended length of time because the screws kept rusting and breaking. He started putting casts on the feet (below the hair line) to hold the shoe on.

“The cast has a very beneficial effect all by itself,” Steward said. “There’s been research on just putting casts on the feet and this reduced the shear forces by 49% on the hoof wall. Initially, I just used the cast to keep the shoe on, but it also helps stabilize the foot and enhance healing.”

When making the shoe the wood is cut at a 35-degree angle across the perimeter of the shoe, and this usually relieves pressure in the toe region of the sole, which helps the typical laminitic horse.

“This also moves break-over back from the toe toward the mid-foot region, which aids the hoof during locomotion,” he said. “Increasing thickness by adding additional layers of wood or impression material can further enhance break-over and transfer more weight from the front to the back of the hoof. Shoe height can be stacked three to six inches to help transfer weight to the hind end of the horse, if desired.”

Most laminitic horses put more weight on the sore feet after the therapeutic shoes are applied because of the pain reduction.



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There are several orthotic systems out there to address the possibility of laminitis

“The entire circumference of the shoe is sloped, to provide the rolling nature of the shoe—which helps facilitate movement and probably increases blood flow,” he said.

The back of the shoe is sloped as well, to aid the horse when getting up from the ground. The rocking nature of the shoe helps facilitate movement, which increases blood flow.

Before the shoe is applied, the hoof wall is carefully trimmed and usually lowered at the heels to redistribute weight off the sore toe.

“For custom fit, you can trough out the plywood between the foot and the wood if the coffin bone has dropped and is sticking out the bottom of the foot—to give it some room,” Steward said. “We paint the bottom of the foot with iodine, hold the wooden shoe on the sole, and then carve out the brown places on the shoe (where there was pressure). The goal is to disperse pressure evenly as much as you can, and unload the painful areas by grinding the top of the shoe out to allow the protruding coffin bone to settle down in the top of the shoe.”

The shoe is applied with wood screws (no painful hammering) while the horse stands on the shoe. The foot does not need to be picked up for shoeing (which puts too much weight on the opposite foot, which may be just as painful). This way, the horses’ pain can be closely monitored, and he will generally feel more comfortable immediately after shoeing.

“A laminitis case is similar to a broken bone; it needs to be immobilized so it can heal,” Steward said. “Excessive overloading movement will keep tearing the injured laminar attachment until healing has occurred. The less damaging/overloading movement the coffin bone encounters, the better off the foot will be.”

Steward recommends the horse be re-shod every four weeks because the foot is growing rapidly and the angles must be maintained to re-establish normal coffin bone alignment. Average time in wooden shoes is about 60 days. Successful recovery depends upon the severity of the damage, the amount of coffin bone degeneration, and the owner’s and horse’s cooperation.

Screws make adjustment of shoe placement simple and fast when wooden shoes are put on.

“When applying these shoes, we rarely twitch the horses and hardly ever tranquilize them, and we never nerve block them, even though these are standard practices that most people used to do,” he said. “I want to custom-fit these shoes to maximize the comfort of the horse, so I need to know if he’s comfortable. If I put these shoes on a typical laminitic horse and if he hasn’t improved in soundness and comfort, I pull them off and start over. We need the horse to be able to tell us if he’s not comfortable.”

Steward is sometimes frustrated with farriers and veterinarians who don’t give these horses a good chance for healing.

“Some horses are euthanized that could recover with minimal treatment,” he said. “One of the reasons I came up with this shoeing system was economics. All the other systems cost

more than my clients could afford. When we first started using the wooden shoe, for the first 25 years we were doing them here at the clinic for \$150 and that included X-rays.”

All too often laminitis can be the aftermath following surgery or illness, and he feels that preventative care could halt the damage.

“I believe when a horse has colic surgery, he should immediately be put in some kind of orthotic system to address the possibility of laminitis. We tape on EVA pads (ethylene-vinyl acetate, or memory foam) with the same design as the clog, to reduce the leverage forces on the laminae from the hoof wall and also to transfer the weight of the horse from the laminae to the bottom of the foot,” Steward said. “This concept should be standard care after colic surgery or any other complicated surgery. Sole impression material taped into the sole of the foot would be helpful and you can do this even with conventional shoes. Veterinarians don’t typically take these precautions because they are in a hurry and surgery is the primary focus. Also, until recently these concepts have not been widely accepted as beneficial.” **BH**

Heather Smith Thomas is a freelance writer based in Idaho.



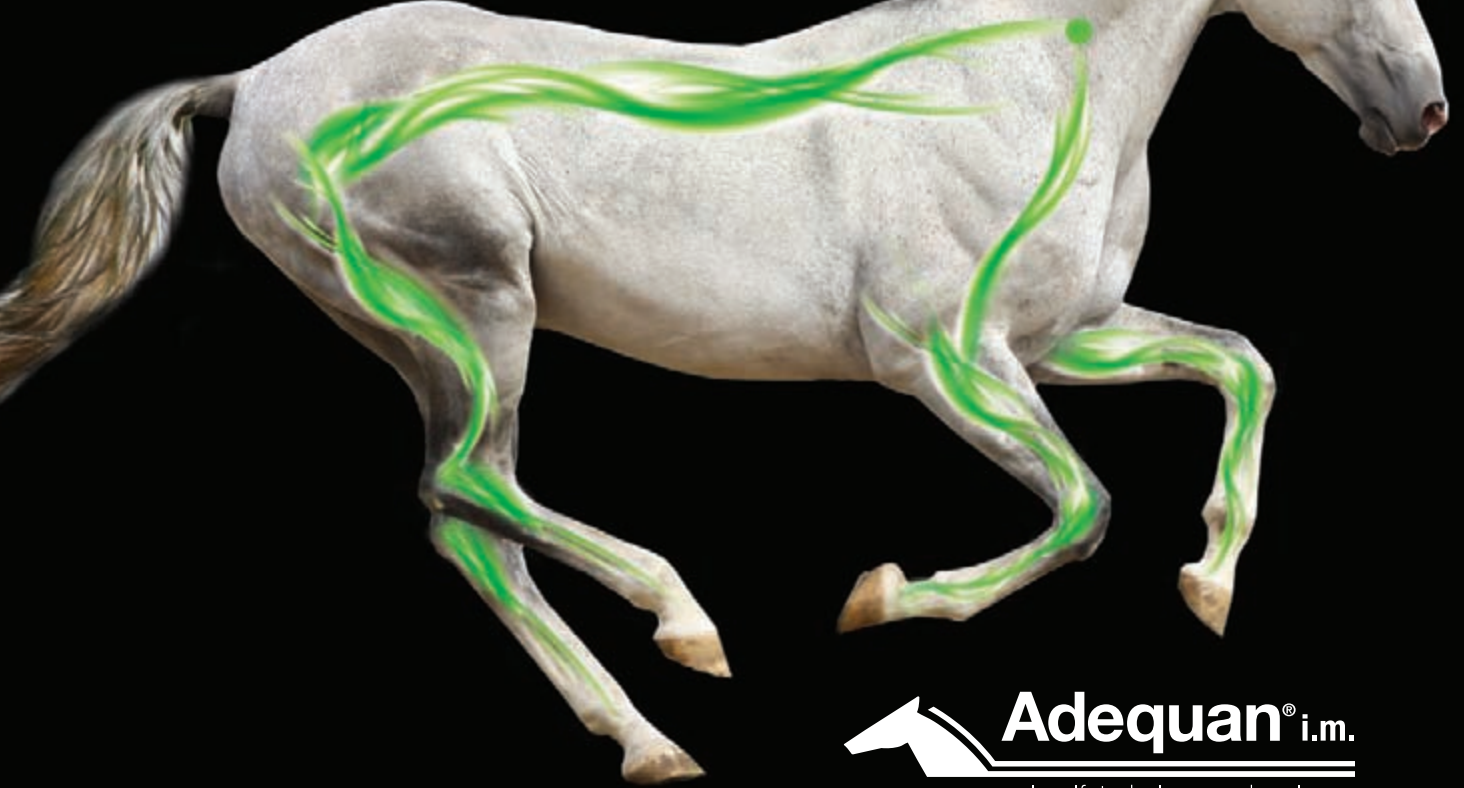
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