

# SHOEING

## THE MODERN HORSE

The Horse Owner's Guide  
to Farriery and Hoof Care

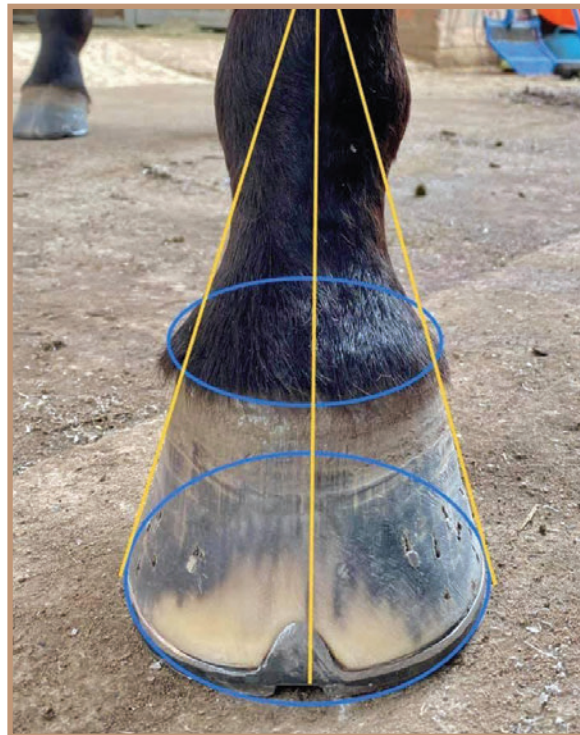


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# 3

## CHAPTER 3

# Modern Horseshoe Styles

**S**ince most horses wear traditional metal horseshoes, it's easy to assume that there are fewer options for horses than the thousands of styles you can choose among at the store. But that's far from the truth. A decades-old display case in the Cornell University Farrier Collection features approximately 400 different types of therapeutic horseshoes (figs. 3.1 A–C). This collection is likely the only place you can see examples of so many types of horseshoes all in one

place. There are bar shoes, shoes with frog support, plastic models for cracks, acrylics for hoof reconstruction, pads, metal plates, and even regular steel shoes.

When the basic rim shoe is simply not enough for a horse, farriers turn to some of these therapeutic shoes to keep the horse comfortable and, in some cases, heal the hoof. Only a handful of specialty shoes are pre-manufactured, so many are custom-made based on a specific lameness or disease problem identified in an individual horse.



**3.1 A** The upper three rows from this part of the Cornell University Collection features “Scotch” style draft horseshoes by Eugene Layton, Cornell Farrier from 1939–1965. The shoes below from Henry Asmus are those used on driving horses.



**3.1 B** This panel features horseshoes from Michael Wildenstein, Cornell Farrier, 1991–2010, and some made by me, Cornell Farrier since 2010.



**3.1 C** Hand-forged shoes like these by Henry Asmus show how farriers can customize horseshoes to treat a myriad of hoof problems. These were specifically for driving horses.

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For instance, the Cornell display includes:

- U Diverse types of older-style Standardbred shoes with varying modifications to correct gait problems.
- U Specialized heavy horseshoes for “street horses” where traction is important.
- U Hand-forged horseshoes made by all six Cornell Farrier instructors during their 100 years combined work.
- U Aluminum shoes for a fatiguing jumper.
- U Plastic shoes once applied to an endurance horse.
- U Rubber shoes for a carriage horse.
- U Glue-on shoes for thin-hoof-walled horses.
- U Titanium shoes where strength and less weight is needed.

When a horse has a hoof issue, these are some of the options a farrier might choose to use.

## Modern Shoe Modifications

I have touched on a number of the different shoe style options and modifications in previous chapters. Here, I will review some of that information as well as explore some of the shoeing alternatives in more detail.

### Straight Bar Shoe

The basic rim horseshoe has an opening between the branches of the horseshoes where it fits onto the heels. As I explained on p. 40, a *bar shoe* has extra metal that



**3.2** A classic bar shoe uses metal to close the gap between the heel branches on traditional shoes.

closes that gap. The additional material is like putting an orthotic in your own shoe—it provides greater heel support, and it can help hold an injured hoof together (fig. 3.2). This style of shoe is useful when a horse has severe cracks, such as sheared heels or a quarter crack, or lameness that can be improved by reducing movement in the hoof capsule.

### Egg Bar

The *egg bar* type of shoe is similar to the straight bar shoe, except that there is even more metal connecting the shoe branches. The additional metal gives the shoe an egg-like appearance, hence the name. These shoes offer increased support to the back part of the hoof, leg, tendons, and suspensory ligaments. This style shoe



**3.3** Egg-bar shoes provide additional support, though the shoe design can be prone to being “stepped off” by a hind hoof.



**3.4** Another variation of a bar shoe forms a heart shape over the frog.



**3.5** The Z-bar is another form of a bar shoe. The upper right quadrant pictured here includes an antibiotic packing material.

may be more prone to being “stepped off” during leg interference—being pulled off by a back hoof mid-stride—but the egg-bar shoe can be effective in some situations (fig. 3.3).

### Heart Bar

One look at a *heart bar* shoe and you’ll understand how it earned its name. A V-shaped piece of metal is forged into the shape of a heart to cover and protect the frog. Pads or packing material can be placed between the space for added support (fig. 3.4).

Most often, these shoes are used on laminitic horses and for horses with hoof and coffin bone injuries that require additional frog support. The wedge-shaped material relieves pressure on the frog and spreads the weight across the area more evenly. This also prevents

rotation of the coffin bone (see I.2, p. 3) within the hoof. Before the shoe is applied, X-rays are needed to understand the current position of the bone to avoid putting pressure in the wrong areas, so farriers and veterinarians work closely when these shoes are used.

### Z-Bar

When one side of the hoof is damaged or infected, a Z-bar shoe might be what your farrier chooses. Instead of the horseshoe following the traditional curve, a section of the metal is forged into the shape of the letter Z (fig. 3.5). It’s often used on horses with heel bruising (“corns”), hoof-wall separations, quarter/heel cracks, and bar fractures. Like the other shoes I’ve described, this design protects a damaged hoof and shifts the pressure points on the hoof to alleviate pain and encourage regrowth.

CHAPTER 6

# How Conformation Determines Soundness and Performance

**W**hen it comes to buying property, all you hear is “location, location, location.” When horse shopping all you should *listen to* is “conformation, conformation, conformation.” Eye appeal, bloodlines, and color dominate the conversation, but how a horse is put together is more important to predict his future performance than any other criteria.

A horse’s build is often discussed in terms of how it enables him to succeed in a given discipline. For example, does the horse have a shoulder tying in too low so that he cannot elevate his front end in quick turns? Can he gather his hindquarters to perform a piaffe?

Just as a house needs a sturdy foundation, a working horse needs a correct base. That starts at the bottom of the horse at his hooves and legs. Deciding which horse to buy or how he must be trimmed or shod always starts with conformation (fig. 6.1).

Now, let us get to the actual details.

## Where Do Conformation Defects Start?

Conformation starts in the breeding shed. Focusing on single traits like coat color, competition accomplishments, or show-ring fads emphasizes a



**6.1** This symmetrical front foot shod with a racing plate shows perfect medio-lateral and anterior-posterior balance.

“desired look” over functionality. Line-breeding limits genetic diversity, which can bring out hidden conformation defects in subsequent generations. An unsound horse often becomes breeding stock because he can’t perform. Unfortunately, he is likely to produce unsound offspring with the same conformation that predisposed him to lameness or underperformance.

Think of having a basic understanding of equine conformation as being similar to having a crystal ball—it offers a chance at predicting the future. For example, a large horse with small hooves is predisposed to lameness issues more than a horse with appropriate-sized hooves.

The good news is that many conformation abnormalities are manageable through hoof care. Regardless of the discipline or work a horse does, his body structures follow the basic laws of physics: force always equals mass times acceleration. Without reasonably correct conformation, the abnormal forces produced during performance work will cause lameness in predictable ways.

Farriers and veterinarians are in the business of managing the results of unsuitable conformation to enable horses to keep working. When this skilled assistance contributes to a successful career there is a tendency to worry less about conformational defects, especially when the horse does well competitively.

The real trouble begins when a talented performer, with undesirable conformation, is selected as a breeding prospect. By selecting horses for breeding based solely on performance, the resulting cross usually reproduces the same defects.

In the upcoming chapter about foals (see p. 122), there is an explanation of conformation defects of these young horses. This is the only time defects can be corrected, either with trimming, shoeing, or surgery. Flaws in the mature horse can only be managed, not reversed, with detailed trimming and horseshoe modifications.

The visible features in a horse’s body characteristics, like size, color, and conformation, are *phenotypes*, whereas the *genotype* is a horse’s genetic constitution. When the phenotype is altered with interventions like corrective shoeing or surgery, the genotype does not change. So, when foals with crooked legs have been corrected in these ways, they still have the predisposition to reproduce future offspring with the same defects.

In worst-case scenarios, a horse is only pasture-sound. In less severe cases, the horse may not be performing to his fullest potential. As the horse ages, naturally weaker areas are susceptible to tendon and ligament injuries, and arthritis. Specialized shoeing and additional veterinary treatments may be necessary, both of which can significantly increase the cost of ownership—all as a result of not considering conformation in the breeding or selection process.

The tricky part is that there is no “perfect” horse. If you waited for a horse with ideal conformation, you will have an empty stable. It’s unrealistic to think you will find a horse without some conformational aspect that could be improved. That being said, learning the basics of equine conformation remains a guide to good buying and breeding decisions.



**6.2 A & B** In Photo A we see how a severely toed-in stance created an excess of pressure on the coronary band that split the coronary band away from the hoof. This separation is painful and at risk for infection. The bow-legged hind end in Photo B also has a right hock pointing straight backward. This conformation is impossible to keep sound.

### Defining the Level of Conformational Issues

Understanding the severity of the defect and management options can be used to support a decision to buy or walk away from a horse (figs. 6.2 A & B). For this reason, it's helpful to classify conformational defects as *mild*, *moderate*, or *severe*.

*Mild defects* are quite common and are not easily recognized. Some can even be considered "normal" when they fall within certain limits. For example, horses



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**6.3** Shoes with a lateral extension on the heel help to support a horse with base-narrow conformation.

can tolerate a slightly crooked leg or pastern angle. A slight misalignment of the fetlocks or knees can also be tolerable. Regular trimming that makes slight adjustments to align the foot with any minor imbalances serves these horses well. A horseshoe that is appropriate for the horse's work is shaped and further modified to adapt it to any misalignments that the trim could not achieve.

*Moderate defects* require extra attention, often through shoes specially designed to add support in specific areas of the horse's foot.



**6.4** A severely toed-in, base-narrow stance has led to osteoarthritis in this horse's knee.

For example, a shoe that is shaped to reduce leverage and correct gait faults can keep the horse sound and comfortable. Here is where attention to detail matters. Generic horseshoes without specific modifications will not help a horse with moderate conformation defects (fig. 6.3).

*Severe defects* require critical management decisions. These abnormalities are obvious—there is a noticeable crookedness to the leg or a twist at the joints. Often there are multiple severe defects on the same leg.

A high-maintenance individual may not hold up under hard work regardless of the care he receives (fig. 6.4). Surgery and specialty shoes may be the only options. Caring for a horse with severe defects requires teamwork between a farrier, a veterinarian, and the horse owner to provide the level of trimming and shoeing to compensate for the issue (fig. 6.5).

Another thing to consider is that the taller and heavier a horse, the more likely he is to have soundness issues from conformational abnormalities. Taller horses produce more leverage on crooked legs or joints that can have negative consequences for bones, joints, and soft tissue.

## An Objective Evaluation Method

A “pretty” horse has wildly different meanings from one horseman to the next. Even within the same discipline, what one person finds attractive about a horse doesn’t always resonate with another. When buying or breeding your next horse, it’s okay to look for color, desired head size, or spots. But also take the

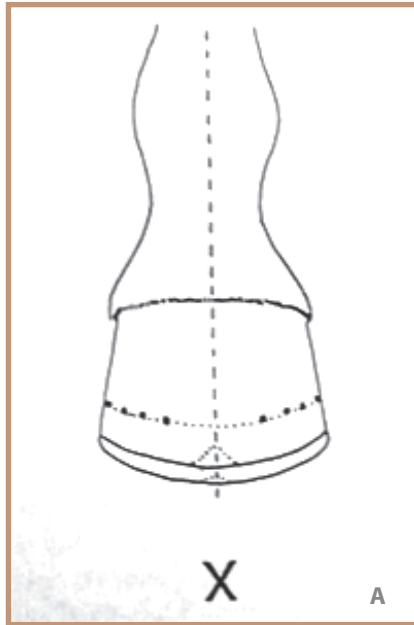


**6.5** A horse with severe defects needs a team that includes his farrier, veterinarian, and owner working together.

time to consider any conformation weaknesses that can become problematic.

An objective method to evaluating conformation removes the emotion and considers the facts. One way to do this is by using what farrier Doug Butler, PhD, defined as the “X, Y, and Z axes” in his book, *Shoeing in Your Right Mind*.

This method divides the horse into three sections and is based on visualizing vertical reference lines, or

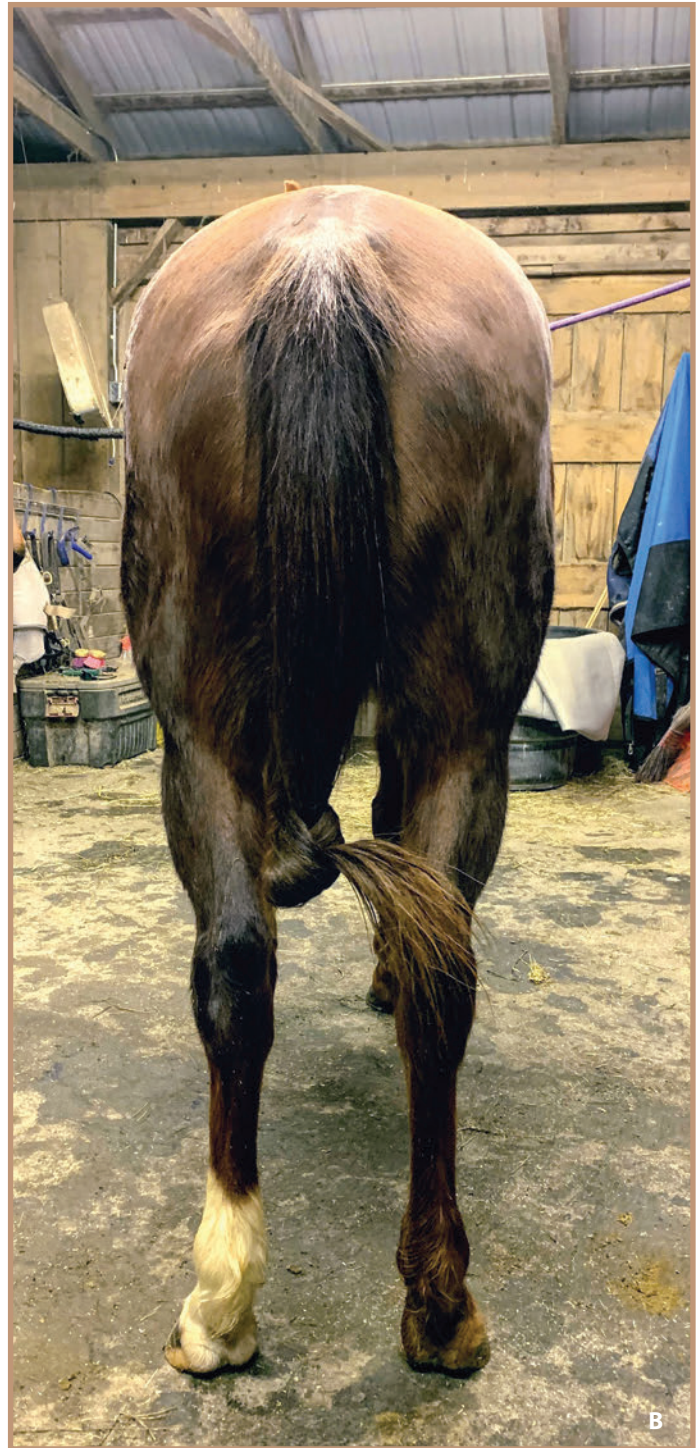


plumb lines, dropped from key points on the horse. Using these plumb lines as the “X,” “Y,” and “Z” axes of the horse highlights any deviations.

Before starting, make sure the horse is standing in a square, relaxed position. If the horse is not standing in a neutral position, the posture can play tricks on your eyes.

The “X axis” is the view seen when standing directly in front of or behind a horse. This vantage point determines if he has a base-wide or base-narrow stance in relation to shoulders or hips (figs. 6.6 A & B). The “X axis” affects whether the hoof lands flat or not.

**6.6 A & B** Stand in front of the horse and picture an imaginary line dropping straight down in front of the leg to the ground to find the “X-axis” (A). This horse shows nearly perfect hind-end conformation from the rear “X-axis” view (B). She engages her hind end well and has very smooth gaits.





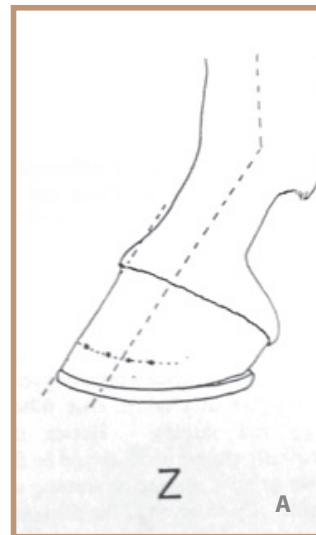
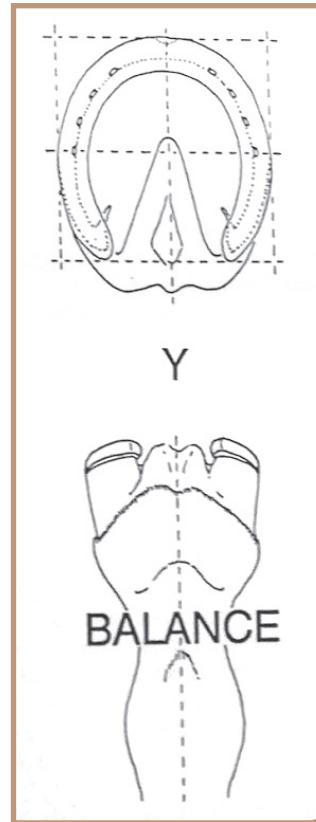
The “Y axis” considers what a horse’s leg looks like if you were to lie on the ground and look upward at his belly. It is as if the horse is standing on a glass table above you. The same view is also offered if you stood above your horse and looked straight down his legs. This assesses whether a horse “toes in” or “toes out.” (Both are considered rotational deviations.) The “Y axis” also reveals bone and joint alignment and evaluates how the leg swings when the hoof comes off the ground (fig. 6.7).

The “Z axis” is viewed from the horse’s side. It concentrates on the foot position under the body, and the angles or stance of the hoof and leg. In this view, the plumb lines descend from the center of the shoulder or center of the hip (figs. 6.8 A & B). The “Z axis” is used to observe stance, anterior/posterior hoof balance, and position of the hoof under the leg.

The most common conformational flaws are a combination of those seen in the “X” and “Y” axes. These are called *base-narrow*, *toed-in*, and *base-wide*, *toed out* (see more on p. 94). In a normal stance, the front hooves line up directly under the center of the horse’s shoulder, are parallel to the cannon bones, and directly align with the radius (figs. 6.9 A & B).

Any misalignment of the limb’s joints (“Y” axis) leads to arthritis. Deviations from the plumb line (“X” axis) produce bone remodeling known as *Wolf’s Law*. This name is used to describe the process that happens when the bone adapts to the force exerted on it (fig. 6.10).

**6.8 A & B** An illustration of an ideal “Z-axis” angle (A), and a horse that shows near perfect conformation of the hind end from the side “Z-axis” view (B).



**6.7** The “Y-axis” projects a line straight upward from the center bottom of the hoof drawing on the left. The “Y-axis” accounts for rotational deviations from the leg’s center line, which can be seen from the rear of the hoof. Rotational deviations can be internal (toward the spine of the horse) or external (away from the spine of the horse). The “Y-axis” also accounts for misalignment of joints.





**12.4** Introducing foals to farrier work begins at a young age through farrier visits and regular handling of the legs.

### Training Horses for Shoeing

Training for shoeing starts with preparation for trimming. Because foals need to be observed during the first few weeks of life, and possibly earlier if there are noticeable deformities, basic handling starts at that time (fig. 12.4).

Short, daily sessions spent touching or brushing legs, leading, and standing pay dividends in the future. Teaching the horse to hold his hoof up for increasingly longer periods of time teaches patience. The stretching exercises mentioned on p. 168 are one way to introduce the position and sensation a horse experiences during a visit from the farrier.

Some horse owners expect farriers to teach horses to accept trimming and shoeing. Not all farriers are willing or capable of training. Farriers should be experienced horse handlers, but training horses is a different skill. A farrier understands that working with inexperienced horses is part of the job and would not expect a horse owner to introduce her horse to the tools and smells of the trade, but he has every right to expect the horses have a basic level of respect for people.

Graduating from trimming to shoeing follows similar principles. When done correctly, horses do not feel pain from the horseshoe nails because the hoof is made of a hard material, much like your fingernails. However, it does take time for a horse to get used to the sensation of a farrier pounding on his hoof. Some horses also need time to get used to the smell and smoke of a hot shoeing. Forcing an untrained horse to stand still and behave for a new



**12.5 A & B** Regularly pick up and clean all four feet for good hoof care and to prepare the horse for the farrier (B). Basic handling skills set a solid foundation of respect in all areas of horse ownership, including farrier visits (B). Teaching a horse to lead, respect his handler, and remain calm walking to and from the barn prepares him for farrier care.



set of shoes without prior preparation is unfair to both the horse and the farrier and can result in a bad experience for both.

Use this pre-shoeing checklist to evaluate your horse's readiness for his first shoeing (figs. 12.5 A & B):

- Can you pick up and clean all four feet?
- Can you lead the horse?
- Does the horse cross-tie or straight tie?
- Does the horse threaten to kick, or kick out when you reach for the hind legs?
- Does the horse bite?
- Is the horse in pain?

## FROM THE FORGE Tales from the Field

**O**n a remote polo field at Cornell University, a group of horses was turned out for summer, and that is where I would shoe them. The horses stood tied to the shady side of a trailer for trimming and shoeing. All were well-behaved and used to being tied while I worked, so I never had a problem. Except for that one time...

During one visit, the trailer was being used off-site. A pipe gate was the only place in the field to tie to—something I would only do with horses I trusted. I tied two horses to the gate and stood between them. As I bent over to start, the roan rubbed on the gate. It caught on his halter and lifted the gate off the pegs. Not a problem until the horse realized the gate was attached to his halter. My helper remembers looking up and seeing two horses running backward while I ran toward them, trying to release them. The horses broke their lead rope snaps then just stood there. Luckily, no one was hurt.

A similar experience happened during a visit to two retired Cornell University polo horses bought by a beef farmer. Usually, a student worker caught and held the horses. On one visit, the student was unavailable, and the horses were tied to a steel gate at the back of the pole barn.

I parked far from the horses anticipating what might happen next. As I slowly approached, one horse pulled violently. The gate popped off the pegs and flew over my head, forcing me to duck.

The horse ran, trying to flee the gate chasing him. He blindly headed for my truck and hit the back end. Then he slid alongside the truck body, pulling the gate against the rear of the truck pinning himself there. He caught his breath and, still attached to the gate. He decided to jump it.

Catching both front feet in the gate, he flipped. Now the gate was on the ground in front of him and he just stared at it. The cheap snap should have broken but didn't, so I crept forward and cut the lead rope with my knife. The horse was uninjured but shook up. Needless to say, I got the owner to hold him and required someone to be present for every visit.

It can be a matter of personal pride for a farrier to finish the job on a horse he has started. And horse owners can put pressure on a farrier to finish when a competition is looming or a schedule is limited.

Early in my career, a chestnut mare stood unusually still with a glassy look in her eyes. As I positioned myself to reach for a hind leg, this mare shrieked and sent both legs right by my head. The air snapped in front of my face. Undaunted, I reached for that hind leg again with the same results. Obviously, it was dangerous to continue, but the owner needed the horse finished because her daughter had a 4-H show coming up.

The woman called her husband to help. He had little patience for horses and used a nose twitch to restrain the mare. I could feel the tension building. I put her leg down, stepped away, and said the horse was too dangerous to work on. The husband said, "If you were any kind of real man, you would finish the job!" I later learned this horse kicked and broke the leg of the previous farrier.

I've run into other mares with this same behavior throughout my career. Talking with veterinarians has revealed that hormonal imbalances or cysts on the ovaries can cause this type of reaction because of the pain, even though it is unrelated to the hoof or legs. There is not any training that resolves a problem like this, and further veterinary attention is necessary to help these horses.