

Recent (Dr. Robert M. Bowker/MSU) and not-so-recent (Dr. James R. Rooney) research has shown us that problems in the navicular region are caused by unnatural use or specifically a lack of use of the back of the foot. (Please read "Digging for the Truth About Navicular Syndrome" in the "Articles" section of www.hoofrehab.com) We once thought of navicular disease (damage to or remodeling of the navicular bone) as a primary problem, but now look at it as a simple symptom of long term toe-first impact, a lack of frog pressure, excessive bar length and/or peripheral loading (forcing the hoof wall to bear all the weight; without natural help from the frog and sole). This knowledge has rightfully caused us to panic if our horses land toe-first and to have deep concern if they have dysfunction in the back of the foot.

In this article, we'll discuss frog trimming and management. Many horses are stuck in a pattern they can't easily escape. The frogs are too weak, infected with fungus and have a lack the callusing necessary to be the natural, front-line impact zone nature intended. If the frog is too sensitive to impact the ground, the lack of stimulation reduces growth and makes callusing and development impossible; thus a "wheel-spinning" vicious cycle for hoof managers. While thoughtful heel trimming and the use of padded insoles in hoof boots help break this pattern, the proper trimming and management of the frog itself is critical.



*In these feral cadavers (front feet), notice the prominence of the frog. This horse came from the rockiest terrain I have ever seen and these tough frogs gave the protection, traction and front-line energy absorption she needed for the rigorous lifestyle.*

In the previous articles, "Heel Height; The Deciding Factor" and "Boots and Pads; A Breakthrough in Healing" we discussed the importance of trimming to achieve correct heel-first impact and frog stimulation, and beneficial shortcuts to frog development we can reap from boot and pad use.

*After the setup trim we should very often leave the frogs alone. Neither of these frogs have been trimmed at all in the past year, and both horses are all-terrain "gravel crunchers". It would take exactly one pass through these frogs with a hoof knife to make boots a necessity on rocky terrain for the next six months! Too many professionals keep the horses in their care sensitive to rocky ground simply by over-trimming the frogs and never give it a moment's thought!*

An often overlooked, but very important factor is the diet of the horse. The most common reason diabetic humans are hospitalized is foot pathology. Number two; altered skin wound healing. A key feature of any metabolic stress is a shutdown of nutrition to the extremities. High insulin levels increase keratin growth. High glucose levels decrease keratin growth (skin, hair, hoof, laminae, sole and frog). Unnatural, high sugar/starch diets can have the same devastating effect to the frogs that we see in the horses' laminae.

That said, from a physical standpoint, constant pressure and release stimulation is the real hero with any frog improvement. Everything we do with trimming, pads and living terrain should focus on this. Every time you trim a frog, you should consider these four things the trim may be accomplishing:

- 1) The removal of "flaps" that harbor destructive fungus and bacteria. (frog trimming is healthy)

- 2) The removal of external callusing that protects the frog from destructive fungus and bacteria. (frog trimming is harmful)
- 3) The removal of excess frog height/pressure that can cause sensitivity. (frog trimming increases comfort)
- 4) The thinning of the frog's protective barrier between the sensitive corium and the terrain can overexpose nerves to pressure. (frog trimming causes lameness and bruising)

If this thoroughly confused you; you're on the right track to learning some important lessons. There are no simple answers, so you should carefully consider each factor before you pull your hoof knife out of your pocket. Lets wade through these contradictions one by one.

### 1) The removal of "flaps" that harbor destructive fungus and bacteria.

The flaps that commonly fold over the central sulcus and the collateral grooves may naturally form to hold dirt in place within the grooves to help support the center of the foot (Ovnicsek, Bowker). Leaving these flaps alone usually works well in dry areas similar to the high desert biomes most of our horses evolved for. In wet environments or when horses are stabled in close quarters, these "flaps" can harbor mud, manure, and be an ideal breeding ground for harmful microbes. In these environments it is usually best to trim away these flaps so the grooves can self-clean; this is especially important at the central clefts.



The frog tends to callus in the correct shape and thickness if the horse is barefoot and excess wall length is not allowed. If you look for the "body" of the frog, you should be able to visualize the shape of the inner structures, the natural frog's shape and the flaps that protrude from it. You should usually remove the flaps only and avoid any temptation to "make it prettier" by trimming deep into the frog. It is particularly important to open the central cleft. This "opening" should parallel the inner structures without thinning the needed frog material. Follow the natural shape into the cleft.



*These are contracted frogs. The digital cushions and lateral cartilages are underdeveloped. The frog's corium is "pinched" together (thus closer to the ground) and the body of the frog flows into the deep collateral groove with no excess material built up. There is no room here for trimming to open the central cleft; both would be easily quicked and any trimming will create sensitivity. The right photo shows a partially shed frog, but the new frog growing in underneath is still immature. Pea gravel, foam boot insoles, anti-fungal soaking, constant barefoot stimulation and thousands of heel first landings are needed to build adequate inner structure and healthier frogs. I see no trimming that needs to be done to either one; both are too thin, now.*

### Added 5-22-07

For years I've searched for the perfect thrush medicine. Most products that kill the fungi and bacteria also kill living tissue; contributing to the problem. I use a 50/50 mix of Triple Antibiotic Ointment and Athletes Foot Cream (1% Clotrimazole) (for humans; over the counter at any pharmacy). I mix it thoroughly and put it in a 60cc catheter-tip syringe (available from any vet) (The syringe may well be more important than the cream, as it allows deep penetration to the core of the problem). Mix the products in a Tupperware bowl, then spoon in or 'top load' 15cc with a butter knife. I have my horse owners treat deep into central cleft daily until no cleft is present. No need to squirt it all over the frog; just a pea-sized dab at the very bottom of the central sulcus. To date, I've seen it eliminate deep, sensitive central frog clefts in 100% of cases within 2 months. (A first, with every treatment I've ever used, though past experience tells me we'll never find a product that works on every case in every environment.)



## **2. The removal of external callusing that protects the frog from destructive fungus and bacteria.**

Here's where things get complicated. Yes, we should often trim a frog to create better hygiene and protection from microbes, but you must also be aware that every time you trim away the outer callused layer of frog material, the softer tissue you expose is a perfect target for opportunistic pathogens.

I was originally taught as a farrier to routinely trim the entire frog every time I trimmed the rest of the foot. I was also taught that most horses (shod or bare) living in our wet Appalachian environment could be expected to get thrush every winter. When I became more conservative with the trimming of my client's frogs, I almost eliminated thrush in my clientele. I had to admit to myself I had been causing thrush for years, by routinely removing the protective callus from the frogs.

Of course there is a time and a place to trim frogs. Just think before you do it, and have a good reason why. To make things pretty? Not a good enough reason. Flap removal for hygiene? Maybe, maybe not. It varies from horse to horse; barn to barn. Just don't trim an entire frog because one small part of it needed a trim. Trim the part that needs attention and leave the rest untrimmed. If a frog needs a large reduction, do it; but if you think a particular frog needs to have 1/8 inch layer shaved off, leave it alone!

## **3. The removal of excess frog height/pressure that can cause sensitivity.**

As discussed in the articles previously mentioned, most domestic horses have not been allowed to roam enough to fully develop the internal structures in the back of the foot. (Bowker) This is the most common cause of hoof sensitivity and ultimately, navicular disease.

Hooves with fully developed inner structures often have tremendous frogs, often longer than the heel walls yearning to absorb the energy of impact. This is natural, very good news for the horse and should be encouraged.

Sometimes, however, a frog that is longer than the heels can cause pain if the internal structures aren't ready for it. Often a horseshoe or a long heel on a barefoot horse lifts the frog from its natural impact position. The frog's corium, "knowing" how important frog pressure is, responds by moving towards the ground or prolapsing. Suddenly trimming heels to a more natural height or pulling the shoes can cause soreness because a tremendous new excessive pressure is being applied to the weak internal structures. Trimming the frogs can relieve this pressure and increase comfort while the corium migrates back up into its natural position. This is very often the right thing to do on a "set-up" trim; **BUT.....**

**4. The thinning of the frog's protective barrier between the sensitive corium and the terrain can cause sensitivity.** Every time we trim (thin) the frog we risk sensitivity. Most of us are too quick to routinely trim the entire frog. It looks prettier and more

See this horse in our DVD Series: The deep thrush persisted through a year of other treatments we tried, then cleared up in 6 weeks with the "New Goo".

Also, of course daily hoof picking is particularly important in these environments. Most horse owners think it is a waste of time because the grooves are immediately filled back up with mud, manure or dirt. They need to understand how quickly microbes can multiply while consuming their horse. Picking out the hooves removes high concentrations of destructive microbes next to the "skin" even if the hoof is packed again one minute later.

Hygiene is important. I have seen too many horses that were lame simply because of advanced fungal infection in the frogs. It is very easy to prevent; very difficult to get rid of, once it becomes established. If you live in a wet environment and want to see "frog magic" try pea gravel for a loafing surface.



*This horse, diagnosed with navicular disease, had been lame during three years of heel wedging. The sole and frog's corium have migrated to a pathologically low position in the hoof capsule. At the setup trim I lowered the heel walls to the level of the healthy sole plane, attempting to leave protruding frog alone. We walked the horse and found him to be miserable, so my next step was to immediately lower the frog to the heel height. He was instantly more comfortable, and rideable (for the first time in several years) in padded hoof boots. Four months later, he no longer needed the boots.*

professional if the entire frog is clean, white and perfectly shaped after a trim. But "pretty is, as pretty does". Imagine the calluses being routinely trimmed from your own heels every four weeks. Can you see that it could rob your performance? Certainly, and the horse is no different.



To really develop the skill of trimming frogs without over-thinning the protective material, a professional should do as many cadaver dissections as possible to become familiar with the shape and location of the inner corium. If you understand the shape of the frog's corium and understand that the bottom of the collateral grooves are about a 1/2 inch from the corium, you can learn to paint a picture of the inner structure in your mind when looking at the foot from the outside.

You should always leave at least 5/8 inches of frog covering the sensitive structure and it is even more important to understand that the 5/8 inch thick callused frog horses need can take at least a year

to build and compact. This fully callused frog can never build if it is routinely cut away at regular intervals.

If the heel height is diligently maintained, you will find that most frogs will callus off at the right height and need little or no trimming. Routine frog thinning can seriously rob performance. Even if the trim cycle is long enough that 1/4 inch of excess heel is removed during the maintenance trim it is usually okay to leave the frog longer than the heels. It will find the "right place" in a matter of hours or days. Don't touch it if trimming would only accomplish shaving off the external callus.

Frog pressure is critical for the support of the impact loaded, dropped fetlock, the coffin joint and thus the ligaments and tendons. It is a strong statement, but I truly believe a lack of frog support (including too-soft terrain) is the culprit behind almost all ligament injuries in the lower leg. Frog pressure is important for P3 support on impact, armor plating the back of the foot and plays a role in overall hoof mechanism or function. Too many of us were taught to protect it or relieve it from pressure. . . . We need to put it into hard work. Frog pressure is good!

If we do anything to cause or allow sensitivity through the frog, the horse will toe walk. This motion directly causes all known "navicular problems" and most joint, tendon and ligament problems, it can also wreck the entire body. Toe walking can single-handedly cause white line separation; even P3 rotation in spite of the best hoof care and management efforts. Not only that, the resulting lack of frog pressure slows frog growth and prevents protective callusing; perpetuating the problems.



*In spite of the penetrated coffin bone, this horse actually “tiptoed” because of the greater pain in the back of the foot. (Actually I think the toe walking contributed to the P3 penetration). The photo at right is of the same hoof 18 months later; the day the horse was awarded the Annual Speed Event Championship for our local saddle club. He came in first in every race all year. In my opinion, building the back of the foot was more important to this rehab than building the new sole under P3 or growing the well connected wall.*

This may muddy the waters for you. Many professionals are content to routinely trim the entire frog, while others never touch it. Performance and comfort can be dramatically improved if more careful thought and decision making is applied to frog trimming. Just think before you cut! There is no such thing as a “good habit”. So much has been written about the management of every other part of the external foot and so little about the frog. Experience has shown me that the decisions we make with frog trimming may be more important than with any other part of the foot.



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