

FOUR STAGES OF HEALING & BEST USE OF SILVER WHINNYS®

There are 4 stages of healing as described by Dr Erica Lacher of Springhill Equine Clinic in Newberry, Florida. Though this is most relevant to wound healing, some characteristics of various stages of healing can be present with Equine Pastern Dermatitis. We have included photos that demonstrate the various stages of healing. **WARNING GRAPHIC IMAGES ***.

Stage 1: Hemostasis

The hemostasis stage of wound healing happens very quickly. Within five to 10 minutes of an injury's occurrence, the blood vessels react to narrow and quickly dilate to cause blood clotting at the site of the wound. White blood cells are drawn to the wound to fight infection and begin the healing process.

As a result of all this activity, inflammation develops, and while it's a normal phase, excessive inflammation will slow healing. Continued chronic inflammation can lead to scarring and granulation tissue formation, typically referred to as "proud flesh."

Controlling the inflammatory response is important so it doesn't get out of hand. This is why your veterinarian will often recommend giving an anti-inflammatory like bute or banamine shortly after injury and for a period of time, but always talk with your veterinarian *before* administering any of these medications.



Figure 1: Stage 1 Hemostasis



Figure 2; Stage 1 Bandaging

Bandaging at this stage is to

1. prevent infection and keep the wound site free of dirt and bacteria.
2. prevent additional damage.
3. stop the bleeding.

The bandage is designed to block germs and dirt. Keeping the area clean and protected from additional trauma is the goal.

Stage 2: Debridement/Inflammation



Stage 2 Healing

As a result of the body's reaction to the wound, inflammation, the second stage of wound healing, begins right after the injury. Inflammation both controls bleeding and prevents infection. During this stage, the body removes damaged cells, pathogens, and bacteria from the wound area by exuding waste materials, serums, dirt, and debris. Swelling, heat, pain, and redness also generally occur. Silver Whinnys® become the bandage/barrier that protects while healing happens.

While it's a normal phase, excessive inflammation will slow healing. Continued chronic inflammation can lead to scarring and granular tissue formation, typically referred to as "proud flesh."

Controlling the inflammatory response is important, which is why your veterinarian will often recommend an anti-inflammatory like bute or banamine shortly after injury and for a period of time; always talk with your veterinarian *before* administering any of these medications.

The body is doing its best to clean up the damaged tissue. "You will see a lot of drainage from very dirty wounds at this point and that's okay, although it may mean the bandages have to be changed as often as twice daily," says Dr. Lacher. "I recommend more time with the hose at this point. Ten minutes of hosing at every bandage change will help remove the debris and pus from the wound."

Dr. Lacher recommends rinsing only with plain water as your cleaning routine. She advises **not** using Chlorhexidine or iodine. These cleaners can inhibit the healthy growth of granulating tissue!

"After hosing, I give the wound a few minutes of air time before applying either triple antibiotic ointment (Neosporin) or silver sulfadiazine to the wound. **Use surgical gloves** so that you are not transferring bacteria from your hands onto the wound," she adds. "Then reapply a clean bandage or sock." Sox For Horses recommends that you use surgical gloves when applying any topical medications to wounds or dermatitis. You have many billions and billions of bacteria on your fingers.

Your veterinarian will know when it is time for a wound to get air and a lighter bandage. The injury pictured as 'Stage 1' did not involve tendon and bone damage. It would be ready for less bandaging much sooner than a far more serious wound involving severe structural damage. Please keep your veterinarian involved, as he or she knows when a wound is ready to meet oxygen.

Using Silver Whinnys® as a bandage helps wick excess materials, blood, and fluids, soaking them up through the sock where they can evaporate into the air and away from the wound. The socks may look terrible after a few hours of soaking up this material but changing them often is far better than allowing those fluids to be held against the wound.

Changing the Silver Whinnys as the bandage during Stages 2 and 3 healing requires you to be gentle and patient. When putting on the Silver Whinnys, put a clean-unused Hefty Baggie® over the hoof and gently pull the sock over the hoof and the Baggie. Once the sock is on the leg, and the hoof is still in your hand, pull the baggie off the hoof. Then put the hoof down and gently adjust the sock up and down on the leg. Hefty Baggies **do not** have a zip top. They are simple, inexpensive plastic bags that come on a roll, and should be used like surgical gloves; use once and throw away.

Gently place the sock over the wound. Don't drag it over the wound. This way you aren't causing your horse any pain and you aren't disrupting the wound surface.

Sox For Horses recommends that you change the sock at least twice a day. The exterior is still very wet and sticky. Changing the sock diminishes the time the developing granulating tissue cells have to grow around the sock fibers, resulting in less of the sock sticking to the wound. Twice daily sock changes make it easier for you and easier on your horse. The silver in the socks is at its highest level of microbe reduction during the first 24 hours.

You may find the socks have stuck to the wound, mostly in the mornings. To help with removal, take a clean spray bottle of warm water and spray the socks until they are soaked. You can also spray a solution of colloidal silver to wet the socks, and this isn't a bad idea. (Go to <https://www.silversolutionusa.com/large-combo-16-oz-silver-sol-and-4-oz-20-ppm-silver-gel/> to find exceptional colloidal silver at a very affordable price.) Wait until the socks release from the surface. Gentle is the word. Everything here is done carefully and gently. You don't want to cause pain.

Stage 3: Repair/Proliferation - and how to use Silver Whinnys® to protect during this stage.



Stage 3 Repair/Proliferation

Within days of an injury, the body is already actively repairing the wound. Cells are forming connective tissue; a new network of blood vessels is in construction, beginning to fill the area and bringing the edges of the wound together with what is known as granulation tissue. This new granulation tissue is healthy if proper oxygen and nutrients have been supplied to the wound and body during this recovery stage. New granulation tissue is in good shape if its color is a pinkish red. It may still bleed some but that is to be expected. You don't want to see dark granulation tissue that can be a sign of infection. Use Silver Whinnys to protect during this stage. Silver Whinnys® allow oxygen to reach the wound, which is why they are very useful during this time.

As Dr. Lacher explains, "This is the stage where horse owners often need to do less rather than more. I have a list of 'don't-dos.' Don't scrub, don't apply wound powder and don't overly disturb the wound. I also try very hard to keep the wound just a bit moist with triple antibiotic or silver sulfadiazine. New skin growth happens faster when wounds are kept a bit moist and hydrated. You don't the tissue wet and closed off from air. During this time bandaging can become less frequent."

"Wounds can itch as they heal and if the horse repeatedly scratches at the area, this can not only damage the new tissue that is forming but also keep the wound inflamed. Talk with your veterinarian if your horse is scratching the wound excessively," advises Dr. Lacher. "There are good options for reducing itch that won't slow down healing."

On leg wounds in particular, if the granulated tissue that forms during this stage of healing becomes excessive, it can lead to "proud flesh," which is basically a disproportionate amount of fibrous tissue and blood vessels that the skin cells aren't able to migrate over and cover. Excessive granulated tissue is typically described as rising above the level of the surrounding skin.

"Firm bandaging is the best thing you can do to limit proud flesh, and Silver Whinnys® are the absolute easiest way to do that," Lacher points out.

Careful monitoring of the wound during this stage is important. Follow your veterinarian's instructions closely and alert him/her promptly if you think the wound is not healing as it should or is starting to develop proud flesh.

Because the socks allow oxygen to reach the tissue surface, the granulation tissue will begin to dry in a week or two. The sock should no longer be sticking to the wound, but “gentle” is still the word of the day. Nothing should be done that hurts the horse. You want to encourage your horse to be a willing patient.

Stage 4: Maturation/Remodeling



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The length of time required for healing will depend on the severity of the injury. During Stage 4, the granulated tissue is converted to scar tissue and the new skin or epithelial tissue closes over the wound. If all has gone well with the first three stages, the wound should continue to heal with minimal scarring.

"A little bit of movement is key during this phase," says Lacher. "I will start hand walking, light riding or other movement to help get the tissue back doing what it does normally. Again, keeping the wound clean, and covered is very important. Moisture becomes less critical during this phase, but I recommend the continued use of Silver Whinnys, with the application of triple antibiotic or silver sulfadiazine to the wound edges."

Under desired circumstances, Maturation/Remodeling begins about 21 days after an injury and can continue for a year or more. Wound areas continue to be weaker than uninjured skin, generally having only 80% or less of the strength of unwounded skin tissue.

The stages of wound healing are a complex and fragile process. Failure to progress in the stages of wound healing can lead to chronic wounds. Careful wound care can speed up the stages of wound healing by keeping wounds clean, and protected from reinjures and infection.

Sox For Horses recommends that the Silver Whinnys continue to be used to protect the new skin tissue for a while to come. New skin is fragile and it takes time to thicken and become durable. It can take months, even a year. It is a good time **not** to drop your guard and to do your best to prevent an injury that could damage the new skin.

Dr. Lacher says "the most common mistakes horse owners make is applying too much of the wrong products and not bandaging correctly or not bandaging for a long enough period." Lacher's rule of thumb for bandaging is not to stop until there's durable skin over the entire wound. She recommends "you don't take a 'wait-and-see' approach if healing is not progressing as it should. Your veterinarian may need to reevaluate the wound, change the horse's pain medication, and/or adjust the topical treatment."

Several elements of care will influence successful wound healing:

- Start healing off on the right track. Clean the wound thoroughly with plenty of water and always call your veterinarian.
- Monitor your horse closely throughout the stages of healing and follow your veterinarian's instructions to the letter when treating the wound.
- Remember that the most important aspects of wound care are your diligent care and a clear line of communication with your vet.

For more information about Silver Whinnys® regarding wound, sore, and dermatitis care go to ["Sock Support"](#)

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See Additional Articles:

“Using Silver Whinnys® as Bandaging over Large Surface Wounds”

“Keeping the Silver Whinnys® in Place and Protected.”

“About Compression and Silver Whinnys”

“A Brush Up On Wound Care”

- ***Photos shown are not wounds belonging to one horse. The photos demonstrate the stages of healing and each of the horses is either currently using Silver Whinnys® as bandaging or did use Silver Whinnys during appropriate healing stages.***

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