Lacerations and Puncture Wounds—Oh My!

By Mallorie Theurer, DVM Student (Class of 2014)—Edited by Amanda Farr, DVM, Dipl. ABVP Equine Practice, Purdue Equine Community Practice

Due to the nature of the horse, all horse owners know that at some point they have to deal with an injury. Some of the most common injuries include lacerations, puncture wounds, and abrasions (simple scrapes). It is important to know which wounds can be treated at home, and which require evaluation and treatment by your veterinarian. The following are some tips to help you provide the best care for your equine companion.

First: Remain calm—remember panic on your part may cause the horse to become agitated, which can cause additional injury. Move your horse to a quiet, well-lit area, as long as he/she can walk comfortably. Find someone to help you properly restrain him/her—infused and painful horses can behave unpredictably. Apply immediate pressure to the wound if severe continuous bleeding is present. It is best to have a first-aid kit nearby with some simple supplies for the initial care of a wound.

Second: Examine the wound area and try to identify what tissues are involved. A flashlight is often very helpful. It is okay to gently clean the wound to remove dirt and debris.

Is the wound deep, large, or bleeding extensively?
Is any muscle, tendon, or bone exposed?
Is the wound over a joint?
Is your horse unwilling to stand on an injured limb or severely lame?
For chest or abdominal wounds:
  • Are any organs exposed?
  • Is there difficulty breathing?
Does the laceration involve an eyelid or is it close to the eye?
Has it been more than a year since a tetanus vaccine was administered?

If the answer to any of these questions is “Yes”, call your veterinarian!

If your veterinarian is coming to assess your horse, try to keep your horse quiet and calm.

Bring in a “buddy” horse to keep him/her calm.
Hang a hay bag in the stall or wherever the horse is.
Brush or talk to your horse—a calm voice and gentle hand can be reassuring.
Do not try to remove any objects from the wound; your veterinarian may need to see the foreign body in place to determine direction and depth.
Do not flush or vigorously scrub the wound.
Do not administer any drugs unless your veterinarian directs you to.

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Wounds (continued from cover)

At-Home Care:
- Clip or trim the hair from around the wound.
  - KY jelly/lube can be applied to the wound to keep hair out of it.
- Wear disposable gloves and gently clean the wound with a clean towel or gauze with Ivory dish soap or an antiseptic cleanser (Nolvasan, Betadine, Vetericyn)—Do Not Scrub as this can damage healthy tissue.
- Bandages keep wounds clean, decrease swelling, and protect from further trauma and extreme cold temperatures; but not all wounds need bandaging.
- Wounds above the elbow or stifle or on the head, chest, or abdomen are very difficult to bandage successfully and may actually heal better if kept clean and open to air.

Bandaging Tips for Legs:
- Placing a non-stick (Telfa®) pad directly over the wound, to prevent it from sticking to the bandage. Normally topical medication is not necessary, unless the wound is dry and the pads are sticking.
- A roll of thin, conforming gauze (Kling®) works well to anchor the pad to the wound.
- Placing a cotton roll bandage or no-bow pillow bandage from the coronary band/hoof up the cannon bone to cover the wound and leg will help prevent the bandage from slipping and prevent you from getting the bandage too tight.
- VetWrap® or a standing wrap (track bandage) can be used over the roll bandage. NEVER place a VetWrap® type product directly on skin as it may cord, and act like a tourniquet on the leg (cutting off the blood supply).

Elasticon® can be used to stick the bandage to the skin above and below the bandage.
- A second overlapping roll bandage and VetWrap® can be placed above the first to cover a wound above the hock or knee. Be sure to figure-8 the wraps over the back of the knee and hock, and/or to cut a small slice over the bony protrusion at the back of the roll bandage. (Figs. 2, 3)
- Bandages should be changed every one to three days, depending on the amount of drainage, how soiled they become, and if they slip down.

If you are unfamiliar with bandaging, seek help from someone more experienced—bandage sores and tendon injuries can occur from improper bandaging. (Fig. 4)

Monitoring Healing:
- Check the wound daily or at bandage changes for discharge, swelling, redness, heat, or foul odor. (Fig. 5)
- Remember that all wounds will drain normally—thin yellow, even greyish white thicker secretions are typical.
- Proud flesh (exuberant granulation tissue) typically occurs on wounds of the lower legs and the forehead—this is fleshy irregular tissue that bleeds easily and needs to be removed or treated by your veterinarian.
- Don’t hesitate to contact your veterinarian with any concerns.

First Aid Kit for Wounds

Bandaging material:
- Non-stick gauze pads (Telfa® pads)
- Kling® or conforming gauze wrap
- Absorbent padded material for pressure bandage (baby diapers, pads)
- Padding (cotton roll bandage, no-bow pillow bandage)
- Wraps (Vetwrap®, standing wrap)

Wound cleaning
- Sterile saline/contact solution
- Antiseptic solution (Betadine, Nolvasan, Chlorhexidine)
- Sterile lubricant jelly
- Gauze or clean rags/washcloths

Other
- Disposable exam gloves
- Flashlight & extra batteries
- Hoof pick
- Bandage scissors
- Stethoscope, thermometer
- Emergency numbers for your veterinarian and the closest equine referral center
- A copy of this article for reference

References:
Dr. Gabriela Arroyo

**Dr. Gabriela Arroyo** is originally from Quito- Ecuador and lived part of her childhood on a dairy farm. She graduated from Universidad San Francisco de Quito, Ecuador in 2011. She came to the US in 2011 to pursue equine externships with boarded specialists since there are no large animal hospitals or board certified large animal veterinarians in Ecuador. Gabi completed a Medicine Fellowship at Hagyard Equine Medical Institute in Kentucky in the spring of 2012 as well as a one year rotating internship in equine and camelid medicine, surgery and reproduction at Brazos Valley Equine Hospital in Texas. Her interests are exercise physiology, critical care and neonates. She enjoys traveling, running and a good movie!

Dr. Caroline Gillespie

**Dr. Caroline Gillespie** is originally from Wichita, Kansas. She received her undergraduate degree from Washington University in St. Louis in Civil Engineering and her DVM from Kansas State University. Caroline first became interested in being a large animal veterinarian while working with and showing American Saddlebreds. After veterinary school she interned at an equine referral practice, Kendall Road Equine Hospital, outside Chicago for one year prior to starting her surgical residency. She is very happy to be at Purdue and is enjoying exploring the area with her lab, Addy.
After several years of successful showing and competition, you are ready to retire your favorite mare. Because she’s been so great for the family, everyone wants her to have a baby; foal fever has set in on the barn. But what needs to be done to make sure she gets pregnant?

To start, it is important to recognize that older mares are not as fertile. Mares older than 15 years of age usually have a significantly lower chance of becoming pregnant compared to younger, normal mares that have an approximately 60% pregnancy rate. However, success rates are higher if she has had successful pregnancies recently rather than if she is a maiden mare (never been bred before) or if she has not been bred for several years.

To determine if your mare is ready for breeding, schedule a pre-breeding examination with your veterinarian in early spring. She should be evaluated closely to make sure that it is safe for her to be bred and that her reproductive tract will be able to support a pregnancy. She will need a physical examination to ensure there are no obvious systemic health concerns that could worsen with pregnancy or that could even prevent pregnancy. In some cases, when physical exam findings point to a problem, blood work can be indicated to provide further information. The mare’s reproductive conformation (anatomy and position of her vulva) will be assessed to determine if she is likely to develop an infected uterus based on poor conformation. The veterinarian will also evaluate for evidence of previous breeding or foaling injuries, which may make foaling or breeding more difficult. At this point, a trans-rectal palpation and ultrasound exam can be performed to evaluate the internal reproductive tract (ovaries, uterus, and cervix). This will determine if the mare is actively cycling and if she will be ready for breeding soon. Based on the findings of these exams, further tests may be performed. A culture and cytology of the endometrium (inner lining of the uterus) may be needed to examine the cells of the uterus and to check for the presence of bacteria if fluid is noted within the uterus, if the mare has any vaginal discharge, or if she has poor vulvar conformation. An endometrial biopsy (small tissue sample of the uterine lining) is also a helpful diagnostic test that can evaluate the health of the uterus and its capability to support a pregnancy.

If your older mare is determined to be a good candidate for breeding after examination and testing, it is important to know that she may need multiple breedings in order to become pregnant. A fertile stallion should be selected to help decrease potential problems with conception. Unfortunately, older mares can also have difficulty maintaining a pregnancy, too. Overall, they may have a 15-20% higher risk of pregnancy loss compared to younger mares. At the time of foaling, an older mare is also at higher risk for complications including hemorrhage from the major blood vessels of the reproductive tract and premature placental separation (“red bag” delivery) that would compromise the viability and survival of a foal, although these risks are still fairly low.

When considering breeding older mares, please talk with your veterinarian to discuss the financial investment and potential health risks to your mare. If she has any pre-existing lameness or arthritis, the weight gain she experiences during pregnancy can also make those conditions worse. Each horse is different, but many older mares are able to have healthy, normal foals into their 20s. If problems are encountered that your veterinarian is not comfortable managing, they may suggest referral to a board-certified theriogenologist (a veterinarian that specializes in reproduction). It is also possible to discuss advanced reproductive techniques including embryo or oocyte transfer if your mare is a poor candidate for breeding or pregnancy. By thorough pre-breeding examinations, your veterinarian can help you to determine what you might be able to expect before investing into your special foal.
Controlling Equine Strangles: What Can You Do?
By Ronda Sadler, DVM Student (Class of 2014)
Edited by Sandra D. Taylor, DVM, PhD, DACVIM, Purdue Large Animal Internal Medicine

The mention of a Strangles outbreak in a barn or riding facility can cause panic in many horse owners. It is important to know the facts and the key preventative measures that you can take as a horse owner to protect your horse. This article will briefly discuss what Strangles is and discuss the use of vaccines and potential side effects associated with vaccine administration.

Strangles, or *Streptococcus equi var. equi*, is a highly contagious bacterial disease that can be spread by indirect (feed buckets, water buckets, tack, pastures, stalls, human hands) or direct contact with infected horses. Horses typically get disease by inhaling the bacteria. Strangles can affect horses of any age but younger horses are at higher risk due to a lack of immunity to the bacteria. Clinical signs (symptoms) of the disease include coughing, nasal discharge, fever, lack of appetite, and swollen or abscessed lymph nodes under the jaw (submandibular) or behind the throat latch (retropharyngeal).

How you can protect your horse from Strangles

There are many aspects to the prevention of Strangles including isolation of new horses that may be potential carriers of the bacteria, vaccinations, and diligent hygiene. Vaccination for Strangles is not required but is recommended in areas where horses are at higher risk such as boarding facilities, horses traveling for shows or events. However, with any vaccine there are potential side effects that are related to the vaccine administration. There are currently two vaccines available for Strangles prevention. The killed vaccine is an injectable vaccine given intramuscularly. This vaccine contains inactivated bacteria, but can occasionally cause a local abscess to form at the site of administration. It reportedly does not generate as protective of an immune response compared to the other vaccine (intranasal). The intranasal vaccine is a modified live vaccine, which makes it a bit. It is administered within the nasal passage and induces production of antibodies that attack the bacteria as soon as it enters the nasal passage. The disadvantage of using the intranasal vaccine is that since it is a live vaccine, the risk of causing disease is increased. It has been reported that a side effect of using this vaccine can include swelling of the regional lymph nodes. Another disadvantage of the use of the intranasal vaccine is that the vaccine is often aerosolized, and can be sneezed and snorted out of the nasal passages. If other vaccines are to be given in the muscle during the same visit, they should be given first so that there is no chance of picking up the Strangles vaccine bacteria on the needle; this could cause an abscess to form at the site of the other vaccine injection site.

New vaccine on the horizon

Besides the two vaccines that were mentioned above, a new vaccine called “Strangvac” is currently being tested. This vaccine consists of taking genes and proteins directly from the Strangles bacteria itself and using these genes and proteins to make the antigens used in the production of the vaccine. The vaccine is thought to have a higher efficacy in the protection against *Streptococcus equi var. equi* and may have fewer side-effects and complications than current vaccines. This vaccine is still being researched and much more data will need to be collected before this vaccine can be approved and used.

Complications from Strangles

Although uncommon, vaccinating too often can cause a serious complication called purpura hemorrhagica. This occurs if too many antibodies are present (induced by natural infection or vaccination) so that new exposure to the bacteria allows these antibodies and bacteria to bind and then settle in blood vessels. If this happens, it can lead to inflammation of the blood vessels (vasculitis) which results in severe edema or swelling of the head and lower limbs.

Strangles can also spread to other organs such as the spleen and liver or to lymph nodes in the body other than the ones under the jaw or in the throat-latch. These lymph nodes can be located within the chest and abdomen and can abscess and rupture.

The role of antibiotics

It has been shown that the use of Penicillin G is effective in decreasing some of the clinical signs of fever and depression commonly seen in Strangles. However, research has also shown that the use of antibiotics may delay the progression of the disease by limiting drainage of the abscesses (killing some but not all bacteria, allowing the infection to linger and potentially spread to internal lymph nodes). When the abscesses fail to drain the bacteria remains in the trapped area and the length of the disease is prolonged. In many instances, the use of antibiotics is discouraged. Warm compresses which encourage the drainage of the abscesses and also relieve local inflammation in conjunction with the use of non-steroidal anti-inflammatories are encouraged and commonly used for the treatment of Strangles. During this time period, strict quarantine and hygiene is of the utmost importance in the prevention of the spread of disease to other horses in the facility. Talk to your vet before starting any antibiotic therapy if you suspect Strangles.

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Despite many advances in treatment strategies, sepsis in newborn foals continues to be a leading cause of illness and death. Sepsis is defined as whole-body inflammation that occurs secondary to infection, and in foals, the culprit is usually bacteria from the environment. It is crucial that foals nurse within a few hours of being born so that they can ingest antibodies from the mare’s colostrum before ingesting bacteria. These antibodies will help protect them from bacteria that are normally found in dirt, manure and even on their mom’s normal skin. If foals do not get colostrum early in life (or if the colostrum is poor quality), they often develop sepsis, and more specifically, septicemia, which is when bacteria have entered the bloodstream. Only 50–60% of foals with sepsis survive, even with intensive treatment.2,3

The earlier foals are treated for sepsis, the better their chances are to fully recover. Therefore, diagnosis of sepsis early in the course of disease is critical so that treatment can begin quickly.4 The problem is that our currently available diagnostic tests are not very sensitive, meaning that these tests may be negative when, in fact, foals are septic.5,6 Although symptoms and blood work findings often point us in the direction of a diagnosis of sepsis, an accurate, objective test that tells us if foals are septic is necessary. Furthermore, a test that could predict which foals will survive the disease would help owners make decisions regarding treatment, given the high cost of intensive care.

The Purdue University College of Veterinary Medicine has collaborated with Hagyard Equine Medical Institute in Lexington, Kentucky during the last few years to study blood proteins that may increase in septic foals. By recruiting a private equine practice that admits > 200 foals every foaling season, we increase the power of our studies. After obtaining client consent to draw one extra blood tube from their sick foals, we have collected helpful data in the pursuit of a better diagnostic test for sepsis. The proteins that we have tested so far include adrenomedullin (AM), C-reactive protein (CRP) and haptoglobin (Hp). All of these proteins have been shown to increase in humans and laboratory animals with sepsis.7–10 We found that AM increased significantly in foals with critical illness compared to healthy foals, but this was not specifically associated with sepsis. In other words, foals that were sick for any reason (including those with a ruptured bladder, perinatal asphyxia [“dummy foal syndrome”], neonatal isoerythrolysis, etc.) had increased blood levels of AM. This test may therefore be useful in evaluating general foal health. Preliminary studies looking at CRP in the same population of sick foals indicated that in early stages of sepsis, CRP had not had time to rise above normal levels. We will look at serial measurements of CRP in an upcoming study to see if this rise occurs several hours after symptoms appear. Surprisingly, blood haptoglobin levels were decreased in septic foals, but the reason for this is unclear. Further studies will be done to evaluate possible mechanisms.

We are very excited to work with Hagyard Equine Medical Institute to continue exploring improved diagnostic tests for sick foals, including additional blood proteins such as serum amyloid A. We plan to investigate better treatment options, including stem cell therapy, in the near future. Until we have identified a way to cure all foals diagnosed with sepsis, it is critical that foals be checked for adequate blood levels of antibodies by 12 hours of age! Call your veterinarian for a “healthy foal” examination and rapid antibody detection test that can be done at the farm; treatment with colostrum or intravenous antibodies may prevent sepsis and save your foal’s life!

References:

Strangles (continued from pg. 5)

Re-introduction to the herd

Once a horse has recovered from Strangles, it is recommended that a series of three negative nasal swab tests (cultures or bacterial DNA detection through polymerase chain reaction) be obtained prior to re-introduction into the herd. This is because some horses become persistent shedders of the bacteria and can look healthy but still be very contagious to other horses. These tests help identify these horses before they mix with the herd again.

Strangles is a very contagious disease that can spread like wildfire, but luckily, it is rarely fatal. Vaccination may be warranted to prevent outbreaks, but it is very important that you consult with your veterinarian regarding vaccine strategies for your horse.

References:
**Q and A: Does my horse need a Coggins test?**

By Lisa Fry, DVM Student (Class of 2014)
Edited by Stacy H. Tinkler, DVM, Dipl. ACVIM, Purdue Equine Community Practice

Spring is around the corner and the trails and shows that are far from Indiana may already be calling to you and your horse. Remember there are a few things you will need in order to cross state lines, let alone compete in a race, show or maybe even a fair. One of those documents is a negative Coggins test.

**Q: What is it?**

**A:** Coggins test is a blood test, named after Dr. Leroy Coggins who invented it, to determine if your horse has antibodies to the virus that causes equine infectious anemia (EIA). EIA or “Swamp Fever” is a potentially life threatening viral disease of horses, mules, and donkeys that infects the horse’s immune cells and then uses the genetic material in these cells to make more virus particles. When an animal becomes infected and the virus is then present in the horse’s cells, the disease can be transmitted to other horses by blood contamination.

Most often the transfer of disease occurs due to biting insects such as horse flies or due to the sharing of needles between horses or through blood-contaminated (non-sterile) equipment. Some other possible modes of transmission are through semen when breeding, across the placenta in pregnant mares to their foals, and through lactating mares’ colostrum or milk.

**Q: What symptoms does a horse with EIA have?**

**A:** Horses infected and shedding the virus may have high fevers (105-108°F), small hemorrhages, leg swelling, weight loss, disorientation, anemia (low red blood cells) and low platelets. They may go off feed and act lethargic too. The challenging part of this disease is horses may only have intermittent fever, and some show no obvious signs of illness at all. This is why EIA is of such concern…a surviving infected animal will be a normal-looking carrier for the rest of its life and will serve as a reservoir (chronic source) of the disease. These carrier horses pose a constant threat of infection to other horses.

**Q: So, can we treat EIA?**

**A:** Unfortunately, there is no treatment for this viral disease or a vaccine to prevent it, making it very important to keep this disease out of our equine friends. Vaccines have not been able to produce protective antibodies due to the ability of the virus to mutate rapidly, meaning that it is constantly changing, and this prevents its recognition by the infected animal’s immune system.

**Q: How common is EIA?**

**A:** The good news is that EIA isn’t very common. EIA is a federally regulated disease and thanks to testing and elimination measures, the number of cases of EIA has reduced from over 10,000 cases in 1975 to less than 36 cases in 2012. In 2012, of horses that were tested for EIA, there were 36 positive horses in the US, with only one positive horse in Indiana. It is important to note that the vast majority of horses in the US are not tested, so it is likely that we are underestimating the number of infected horses since most show no symptoms.

**Q: This sounds like a big deal…what happens if my horse has a positive Coggins test for EIA?**

**A:** Government officials, veterinarians, and horse owners have been working together for years to decrease the spread of EIA through Coggins testing and removal of positive animals from the population. If your horse tests positive, a re-test will be done with the AGID antibody test to confirm it. If the re-test results are positive, your options are not great—1) euthanasia, 2) lifetime quarantine, or 3) donation to a research facility. Quarantine requires keeping infected horses several hundred yards from any other horse to keep them outside the feeding range of insects that transmit disease. Horses that are stalled must be enclosed in fly-proof screening. Exact details vary from state to state. Under most state laws the horse will have to be physically identified with a 2-digit number via a brand on the left side of its neck.

**Q: Does my horse need a Coggins test? Are there any special Indiana requirements?**

**A:** The short answer is—it depends. Only if your horse is crossing state lines is it required by Indiana state law; it is not required by federal law. In order to enter the state of Indiana horses must have been tested within 12 months prior to entry. Positive horses may not enter Indiana. There are some special considerations when testing foals of a certain age. Coggins testing requirements vary state to state, some require it for private sale and some require testing annually, while it may be mandated at some equine events in order to participate—shows, rodeos, races or just as a precaution at boarding facilities. A negative Coggins test is not required for Indiana horses exhibiting in Indiana.

**Q: How does my vet test for it?**

**A:** EIA is a reportable disease in the US. This means that a licensed veterinarian takes a blood sample, and fills out a form describing the horse in detail and also identifies the owner and stable where the horse is kept (the Coggins form). The sample and form are then sent to an approved lab for testing, and the completed forms are returned to the veterinarian within a few days with a result, which is then communicated to the owner. Talk to your veterinarian if you have any questions about Coggins testing or EIA.

Sources:
The Equine Sports Medicine Center

Purdue’s Equine Sports Medicine Center is dedicated to the education and support of Indiana horsemen and veterinarians through the study of the equine athlete. The Center offers comprehensive evaluations designed to diagnose and treat the causes of poor performance, to provide performance and fitness assessments, and to improve the rehabilitation of athletic horses. Other integral goals of the Center are to pioneer leading-edge research in the area of equine sports medicine, to provide the highest level of training to future equine veterinarians, and to offer quality continuing education to Indiana veterinarians and horsemen. For more information visit our website:

www.vet.purdue.edu/esmc/