



EQUINE HEALTH UPDATE

For Horse Owners and Veterinarians
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Avoiding Trailering Troubles

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Trailering your horse may be something you do on a regular basis or something that hasn't occurred in years. In both situations it can be a simple low-stress experience or just the opposite for both you and your horse(s). There are many aspects that affect trailering. Understanding some trailering basics can help create a positive experience for you and your horse(s).

It is important to consider the following factors: the trailer itself, the tow vehicle, your horse(s), any paperwork or vaccinations required by your destination (show grounds, fairgrounds, campgrounds) and legal requirements for interstate travel, and the distance or length of time your horse will be on the trailer.

The Trailer:

Your trailer should be carefully inspected before each use. All running lights, brake lights, and turn signals should be checked for proper operation. All horse trailers should be equipped with properly adjusted auxiliary brakes; usually these are electric and require a brake controller in the tow vehicle. The trailer tires should be inspected for abnormal wear, thinning, and damage and should be a matched set made especially for trailers; car tires are not a good substitute. Trailer tires don't usually wear out due to mileage, but can develop dry rot and other issues just from sitting around. The break-away brake system should be working, with the battery charging when the trailer electrical connector is connected to the tow vehicle. The trailer also must have safety chains attached to the tow vehicle that are rated for the loaded weight of the trailer. In addition to the items mentioned above, the trailer coupler and the ball mount on the tow vehicle must be appropriately rated and of the proper size. Most trailers require a 2-5/16" ball, but there are still some that take a 2" ball.

Ensure the interior is in working order as well—this includes mats, chest and butt bars or slants, and ties. The trailer walls should be inspected for protruding screws, hooks, or bent metal that could cause a laceration. If your trailer has a ramp, that should also be inspected for wear.

Additionally, at least once a year, your trailer should have a full "check-up" by a shop that has expertise in trailer maintenance. This should include brake and tire inspection and repacking of wheels bearings if the trailer has serviceable bearings. Floor mats should be removed, and the flooring should be power washed to remove urine buildup. The trailer floor should be carefully inspected from underneath as well. This is most critical with wood floors, but chronic urine buildup can cause steel and aluminum flooring to corrode, developing weak areas.

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News & Notes

IAD Study

Dr. Laurent L. Couëtil, director of Purdue University's Equine Sports Medicine Center and Equine Research Programs, and Dr. Katy Ivester, post-doctoral research assistant, have been awarded funding by the Grayson-Jockey Club Research Foundation to investigate the link between environment, airway inflammation, and performance in racing Thoroughbreds. Airway inflammation is a common cause of poor performance in equine athletes, and the triggers for the inflammation are poorly understood. The proposed study hopes to determine the effect of the different forms of airway inflammation upon racing performance, while establishing the relative importance of environmental exposures, respiratory bacteria, and viruses in airway inflammation. By identifying the various factors contributing to airway inflammation, this study will lay the groundwork for future investigations into the efficacy of management changes, antibiotics, and immune stimulants in restoring a healthy respiratory tract.

Beginning this summer, volunteers for the study will be recruited from horses racing at Indiana Downs in Shelbyville, IN. Horses enrolled in the study will have a thorough evaluation of the airway performed immediately after racing. In addition, the horses will undergo air sampling to estimate individual exposure to dust, endotoxin, and ammonia during the following week, and airway secretions will be collected to assess presence of viruses and the diversity and number of bacteria using DNA analysis. Testing will be at no cost to the owner and test results from individual horses will be provided to owners/trainers as soon as available.

For more information please call Purdue University Large Animal Hospital at 765-494-8548 and ask for Dr. Ivester or Couëtil.



Trailerling *(continued from cover)*

Trailers are available in many sizes and styles. Make sure your trailer is the appropriate height and width for your horses. Although it has been suggested that slant-load trailers, which place horses at a 45-degree angle to the direction of travel, are easier on the horse, in reality many horses prefer to ride facing backwards if left untied in an open stock trailer.

Proper ventilation is critical for successful trailerling and healthy horses upon arrival. Trailers that are improperly ventilated accumulate dust and ammonia, which can lead to respiratory infections (shipping fever) and secondary pneumonia. Consider adding fans or roof vents if your trailer has small windows. Use screens in drop-down windows to protect your horse's eyes and face from flying debris.

The Tow Vehicle:

When selecting your tow vehicle, make sure it is rated to haul the weight of your trailer, horses, and tack. Tow vehicles that are too small for the weight of your trailer can be deadly in an emergency situation, where the tow vehicle doesn't have the mass to stabilize the trailer. Consider installing sway bars if you are towing a bumper pull trailer and a weight distribution hitch if the tow vehicle suspension is overloaded by the tongue weight of the trailer. Use a properly installed Class III receiver hitch (e.g., "Reese" hitch) that is mounted to the frame of the tow vehicle (for a bumper pull trailer), rather than mounting a ball to the bumper of the tow vehicle. Make sure your lights and trailer brakes are working, as there are multiple different wiring kits for tow vehicles and trailers. Installing a trailer brake system in the tow vehicle (e.g., Draw-Tite or Reese) will save your vehicle's brakes and also provide improved safety and braking. Finally, take some time to drive your trailer around prior to hauling your horses in it for the first time. Make sure you can back and turn, without damaging the trailer or your tow vehicle, and get a feel for how wide your turns need to be, and how vehicle stopping distance will change when towing. The tow vehicle and the trailer need to be evaluated as a pair for weight, balance, and control. In addition, hauling horses (a "live" load) is very different than hauling a boat or other relatively stationary load. A horse doing something as simple as stomping at a fly can influence the tow vehicle's stability so it is important that the tow vehicle/trailer pair be matched appropriately.

The Horse:

One of the biggest causes of stress for horses with trailerling is loading. Resistance to loading can cause not only stress to the horse and handler, but also is a common cause of injury to both. It is important to practice loading your horse before an unforeseen emergency or a scheduled trip. Additionally, studies have shown that problem loaders can be trained to load more willingly by breaking the act of loading into separate parts that can be practiced without the trailer (e.g., the Tellington-Touch Equine Awareness Method – TTEAM).

Trailerling itself, even for horses that load easily, has been shown to cause systemic stress to the horse. Cortisol (a stress hormone), lactic acid and creatine kinase (a muscle enzyme) increase during transit, as does overall white blood cell count (a measure of immune response but may also be due to stress) and hematocrit and total protein (measures of dehydration). These responses may increase the risk of your horse getting sick and may decrease the energy available for competition at your destination. Increasing the time a horse spends on a trailer also increases these systemic changes. Horses should not spend more than 24 hours on a trailer during any one trip.

Basic rules to minimize the stress response in trailered horses:

- 🌀 Horses should not be transported cross-tied or with their heads tied up. Horses need to be able to drop their heads and cough, clearing dust and debris from their airways. When horses cannot move their heads freely in the trailer, their systemic stress response is significantly increased and normal respiratory defense mechanisms are impaired, putting them at risk of developing life-threatening pneumonia.
- 🌀 Vaccination should be performed more than two weeks prior to trailerling to prevent overload of the immune system at the time of trailerling. Additionally this allows your horse to recover from any adverse vaccine reactions in time for the trip.
- 🌀 Horses should be allowed to move around if possible and be given fresh water to drink every six hours they spend on the trailer.
- 🌀 Use caution when trailerling horses in hot, humid conditions as they can easily become dehydrated on the trailer.
- 🌀 Check with the State Board of Animal Health for your destination state (or any state in which you plan to allow your horses off the trailer, such as an overnight stop) prior to travel. **All** horses traveling across state lines will need a current Coggins test (for Equine Infectious Anemia) and a health certificate (Certificate of Veterinary Inspection – CVI), so please plan in advance to involve your veterinarian.

Taking the time to prepare your trailer, tow vehicle, and horses for trailerling can prevent trailerling disasters, injuries to you and your horse, and help minimize stress for both of you. Additionally, the risk of post-trailerling respiratory disease can be decreased with some simple trailerling changes.

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Autologous Biologic Therapies: PRP and IRAP

By Jake Jensen, DVM Student, (Class of 2014)

Have you ever heard people using the terms "PRP" and "IRAP" when talking about treatments for their horse and wondered what exactly these products are and what the difference is between the two? This article will help you understand each of these interesting treatment options.

Platelet Rich Plasma (PRP) and IL-1 Receptor Antagonist Protein (IRAP) are both autologous biologic therapies.¹ Autologous means derived from the same individual, so autologous therapies are treatments derived from a horse's own body. In the case of PRP and IRAP, these products are derived from the horse's blood and then injected into or placed on the horse to treat a disease or injury. Let's take a look at the differences between PRP and IRAP.

Platelet Rich Plasma

PRP therapy is based on the fact that the alpha granules of platelets contain over 200 different proteins, including many growth factors, which are helpful for tissue healing.² PRP is produced by concentrating the platelets in the plasma of a horse's blood, and then activating the platelets in order to release the content of their granules. PRP is most commonly used following acute injury to muscles, tendons, or ligaments to enhance tissue healing and is typically injected into a lesion.¹

IL-1 Receptor Antagonist Protein

Interleukin-1 (IL-1) is a cytokine which is a potent mediator of inflammation. IRAP produces anti-inflammatory effects by opposing the actions of IL-1.³ IRAP is produced by incubating a horse's blood with borosilicate glass beads. These beads interact with monocytes, a type of white blood cell, leading to the production of the IL-1 receptor antagonist protein. IRAP is most commonly used as an anti-inflammatory for treating chronic, progressive osteoarthritis and is typically injected into a joint.¹

Conclusion

Both PRP and IRAP are exciting therapies that show promise in treating specific conditions in horses. However, because these therapies are highly individualized to each horse and there are many different preparation options available, the final product and results can be highly variable. Your veterinarian can help you determine if either of these treatment options is appropriate for your horse.

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“Tying-up”: Not *just* a “Monday Morning” Problem

By Kelley A. Krisch, DVM Student (Class of 2014)

Edited by Stacy H. Tinkler DVM, MPH, Dipl. ACVIM, Purdue Equine Community Practice



What is exertional rhabdomyolysis (ER)?

Rhabdomyolysis is the medical term used for “tying-up”, or what was historically known as “Monday Morning Disease” observed in exercising horses after some days of rest. Horses that tie-up develop a shortened, stiff stride, pain and anxiety and eventually the inability to move forward with light exercise. It is caused by a variety of muscle disorders that can be seen during or after exercise, some of which have a genetic basis.

The severity of each episode varies widely and can be mild to severe and result in recumbency or even death in extreme cases. **ER can occur sporadically if it occurs as an isolated or infrequent event in a horse with no history (or family history) of previous performance issues.** Some causes of sporadic ER include: muscle trauma, over-exertion and exhaustion, with dietary and electrolyte imbalances as possible contributing factors. Horses can be of any age, breed or sex and involved in a variety of athletic disciplines. **Horses that have repeat episodes of tying-up from a young age, time of purchase or once put back into training after a long period of rest may have an underlying condition affecting muscle function and a chronic cause of ER should be pursued.**

Some commonly observed symptoms are muscle spasms, firm painful muscles, excessive sweating, or reluctance to move. Sometimes the symptoms are confused with colic as the horse seems extremely painful but the pain during an episode of tying-up comes from muscle cells being broken down. Horses with respiratory disease are also more prone to tying-up, so it is not recommended to train your horse when it has signs of respiratory disease such as nasal discharge or cough; this has been observed in horses with EHV-1 (herpes virus) and equine influenza.

What are some of the muscle disorders causing chronic ER in horses?

There are a number of disorders that cause chronic ER in horses. Some of the following conditions can be diagnosed by genetic testing, blood sampling, or muscle biopsy by your primary veterinarian:

- 🌀 **Recurrent exertional rhabdomyolysis (RER)** – This disorder is most often seen in Thoroughbred and Standardbred race horses. It is more commonly seen in fillies that are of a nervous temperament and is associated with exercise or stress. The specific defect that causes RER is unknown but is thought to be due to defective muscle contraction and relaxation.
- 🌀 **Polysaccharide storage myopathy (PSSM)** – There are two types of PSSM. Type 1 mainly affects Continental European Draft Horse breeds such as Belgians and Percherons as well as Quarter Horses and Quarter Horse-related breeds such as Paints and Appaloosas. A specific genetic mutation has been identified as the cause of this condition and genetic testing is available. Horses affected by type 2 PSSM show symptoms of tying-up but the cause is currently unknown and no genetic defect has yet been identified. Diagnosis is based on symptoms and specific changes found in muscle tissue on a muscle biopsy. It occurs in Quarter Horses but also in Paint, Appaloosa and Morgan Horses as well as Warmbloods. PSSM results from abnormal sugar metabolism by the muscle cells.
- 🌀 **Malignant hyperthermia (MH)** – MH is a rare genetic disorder that occurs in Quarter Horses and related breeds as a result of a genetic mutation. Genetic testing is available. Rhabdomyolysis can be caused by exercise or anesthesia with this genetic mutation. Symptoms of MH are extremely high body temperature, symptoms of rhabdomyolysis, and because symptoms develop rapidly, if they are not treated quickly MH can be fatal. This disorder results from abnormal calcium regulation in the muscle cell resulting in energy depletion and excess heat production. Although this condition is rare, testing for MH is recommended in Quarter Horses and related breeds in case a horse must undergo anesthesia. Horses known to have the genetic mutation can be given medication prior to anesthesia to help reduce symptom severity.

** It is worth mentioning that Hyperkalemic Periodic Paralysis (HYPP) is an important muscle disorder in Quarter Horses, Paints, Appaloosa and Quarter Horse-crosses that has a genetic basis and for which genetic testing is available. However; **HYPP is not a cause of chronic ER and does not cause rhabdomyolysis (muscle breakdown)**, but rather is due to a genetic defect in sodium ion channels in skeletal muscles which causes abnormally high potassium levels in the blood and results in a variety of symptoms such as weakness and muscle spasms. In severe cases, this disorder can lead to paralysis, collapse and can be life-threatening.



What are the first things that need to be done if my horse starts to “tie-up”?

Exercise should be stopped immediately and the horse taken to a well bedded stall with fresh water. If the horse produces brown colored urine soon after, treatment with intravenous fluids and anti-inflammatories by a veterinarian is recommended. In severe cases, muscle damage leading to release of muscle pigments (myoglobin) can lead to kidney damage if the horse is not hydrated adequately, and as they say... *you can lead a horse to water but you can't make it drink!* When you see “coffee-colored urine,” that means that a significant amount of muscle has been broken down and pigments released into the bloodstream. Non-steroidal antiinflammatories such as Banamine can be given after your horse is hydrated to help with pain and inflammation.

Right after your horse recovers from an episode, stall rest him or her for no more than 24-36 hours and then provide turn-out in paddocks of gradually increasing size. Providing horses as much free exercise as possible on pasture is beneficial in the long term. Your horse must return to its normal training schedule gradually, and an initial period of turn-out with no forced exercise is best.

Training should not resume until your horse's muscle enzymes are back to normal, as this could lead to more pain and possibly trigger another episode. Your veterinarian can test for muscle enzyme levels on a blood test.

Are there any management recommendations for horses that “tie-up”?

Specific management recommendations will vary depending on the underlying cause of the ER, and if it is sporadic or chronic, but there are two fundamental components to any management program for horses with ER—diet and exercise. Low starch, higher fat diets are recommended for horses that tie up. Easy access to fresh water, electrolyte supplementation, and vitamin/mineral supplementation are important as well. There are a number of commercial feeds available that are specially designed to provide adequate calories for an equine athlete, but are still lower in the carbohydrates that may trigger an episode; however, **the benefits of the low starch, fat supplemented diet only occur if the diet is introduced along with an incremental exercise program.** Lastly, vitamin E and selenium supplementation may help to protect muscle fibers, especially in selenium deficient geographic areas like the Midwest.

General principles to keep in mind when exercising horses that have a chronic form of ER include: providing adequate time to adapt to a new diet before starting exercise (2 weeks is usually adequate), introducing gradual and consistent exercise, and minimizing days without exercise. **Daily exercise is important in preventing episodes of chronic ER, while stall rest can make it worse.**

Identifying any underlying genetic causes for muscle disorders can spare your horse a lot of pain, poor performance, and possibly even avoid a life-threatening situation. Your veterinarian can help you diagnose muscle disorders, find the right diet and help tailor a specific exercise plan for your horse if it is diagnosed with sporadic or chronic ER.

Resources:

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Shockwave Therapy: What is it? And what can we use it for?

By Marymir Miranda, DVM Student (Class of 2014)

Edited by Tim Lescun, BVSc, MS, Dipl. ACVS, Purdue Large Animal Surgery

Shockwave therapy has gained vast popularity over the past 10-15 years as a treatment for many disease processes in horses. It is currently being used as an important component of treatment for tendon injuries in many veterinary practices. Multiple veterinarians have reported success in stimulating suspensory desmitis to heal and decrease lameness. But, do we really know what it is, how it works, and what we can use it for?

The effect of shockwaves was first discovered during World War II when the lungs of castaways were noted to be damaged without any superficial evidence of trauma. Shockwaves created by depth charges created the internal injuries. This discovery triggered a lot of interest and research into the biological effects of shockwaves on live tissue. The original use of shockwave therapy was to fragment bladder stones. Interestingly, it was noted that following treatment, the density of a portion of the pelvis within the treatment area had increased. Later, the musculoskeletal applications were noticed when shockwaves were used to stimulate fractured bones to heal. The FDA has approved the use of extracorporeal shockwaves to treat heel spurs and tennis elbow in humans.

A clinical shockwave is a controlled explosion that creates a sonic pulse. Its primary effect is a direct mechanical force. The pressure waves generated are brought to a focal point by lenses or a parabolic reflector. This allows the energy in the wave to aim at a specific point within the tissue. The exact mechanism by which shockwave therapy acts to treat tendon pathology is not known. The leading explanation is based on the inflammatory healing response. The shockwaves cause microscopic trauma to the damaged tissue, which in turn results in inflammation and the release of growth factors, which allows the body to send healing cells and increase the blood flow to the injured area. It has also been shown to stimulate the development of new blood supply in tissues ranging from bone to the heart muscle.

Humans that have been treated with extracorporeal shockwaves report an initial decrease in pain in the area treated that lasts up to a week, then some return of the original pain that gradually decreases as the underlying problem heals. A study at Iowa State University found that in the horse, a period of analgesia appears to be present for about 4 days after treatment. There was a significant analgesic effect following therapy from 8 to 48 hours after treatment. Because of this, racing jurisdictions in the US and the FEI have adopted regulations that require a withdrawal period after treatment before horses are allowed to perform. Extracorporeal shockwave therapy is not permitted during competition and for a period of five days prior to the first horse inspection. These regulations should not be difficult to follow, since the most important treatment for tendon injuries is strict rest!



Another application for shockwave therapy is the enhancement of wound healing. Where there is chronic inflammation there is a tendency for horses to produce exuberant granulation tissue (proud flesh) which further delays healing. In a study evaluating the effects of shockwave therapy on wounds on the distal (lower) limb in horses, the time for wound healing was shorter following shockwave therapy. It is understood that the healing process seems to be more organized following stimulation with shockwaves, thereby decreasing the formation of proud flesh. Lastly, shockwave significantly decreases the initial inflammatory response in burn wounds and has been shown to promote their healing.

It is important to note that these treatments should be performed by a veterinarian, since different disease processes require different strength and number of shockwaves per treatment, and time intervals between treatments. Tissue necrosis has been reported due to the use of very high-energy shockwaves. Typical treatment protocols for musculoskeletal injuries involve 3-4 separate treatments 3-4 weeks apart, combined with appropriate rest periods depending on the injury being treated. It appears shockwave is here to stay as a treatment option for injuries in horses.

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Sunshine and Squamous Cell Carcinoma of the Skin

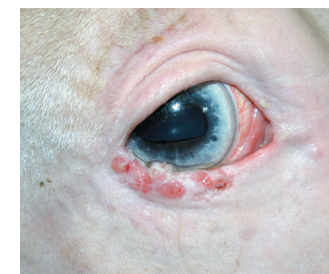
By Megan McGlothlin, DVM Student (Class of 2015)

Edited by Sandra D. Taylor, DVM, PhD, Dipl. ACVIM, Purdue Large Animal Internal Medicine

With modern advancements in equine medicine, nutrition, and vaccines, horses are living longer than ever before. Because we are seeing a greater number of horses in advanced stages of life, we are unfortunately diagnosing cancer more often as well. One of the more common cancers in horses is squamous cell carcinoma, or SCC, for short. It is the second most common cancer in the equine, making up about 30% of the cancers that veterinarians diagnose.

Q: What does SCC look like?

A: SCC can occur anywhere on a horse, but it is most commonly found on the non-pigmented areas of horses. These common locations include the eye, eyelid, nose, mouth, ears, genitalia, and around the anus. The light-pigmented breeds, like Appaloosas, American Paints, Pintos, and some draft horses, particularly Belgians, are more prone to developing SCC. SCC can be a slow-growing, benign tumor, or sometimes, it can grow very rapidly and be highly malignant. It can appear on a horse as just a little bump on the skin, a thin layer on the eyeball, or even an ulcerated, dark-colored tumor that has a foul odor. Occasionally, SCC will metastasize, which means that the cancer cells are spread from the original site where the tumor is to another location in the horse, like an internal organ, for example. SCC is a locally invasive type of



SCC on the lower eyelid.

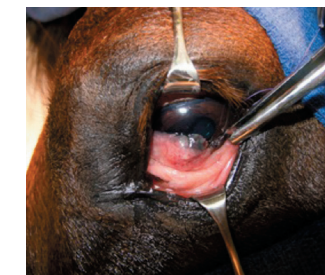
(Source: ckequinehospital.com)

Q: Why do horses get SCC?

A: There are certain factors that can contribute to a horse developing squamous cell carcinoma. Exposure to sunlight is a major contributor, while inflammation from burns or wounds, and papilloma infection are linked to SCC as well. Carcinomas that develop due to sunlight exposure will first start out as a precancerous area, called actinic keratosis. An actinic keratosis will appear as reddish thickening of the skin with some crusty patches. These are easy to treat in their early stages, but if left untreated they can progress into a carcinoma, which can be much more of a challenge to remove. Recently, a virus called *equine caballus papillomavirus-2* has been linked to the development of squamous cell carcinoma. Current research leads us to think that some horses that have this virus will develop SCC at some point in their life. Extensive research is being pursued to see how significant this link between the virus and SCC is, and we are also exploring the possibility of a vaccine to prevent the virus, thus preventing SCC.

Q: How is SCC diagnosed?

A: Although SCC has a very characteristic look on a horse, we still have to do something called a histopathology to be certain that SCC is present. Histopathology is where we obtain a sample of the tumor (or even the whole tumor) via surgical excision, and then we send the sample out to a pathologist, where they can take a look at it under a microscope and determine whether or not the cells are consistent with SCC.



A horse with a third eyelid SCC.

(Source: vetmed.vt.edu)

Q: How is SCC treated?

A: If your horse does develop SCC, there are several ways in which we can treat it. We can remove the mass by surgical excision. Another option is cryotherapy, which is used to kill the cells by freezing. Hyperthermia is another alternative; this is the use of extreme heat to "burn" off the mass. Radiotherapy can also be used, which uses radiation to kill the cancer cells. Chemotherapy is the use of chemical compounds that are toxic and result in the death of cancer cells. Finally, photodynamic therapy is another alternative, which utilizes a photosensitizing drug to make the cancer cells sensitive to ultraviolet light; exposure to light then causes damage to the cancer cells. It is important to realize that we often use a combination of these therapies to treat SCC. Your veterinarian will be able to tell you the available treatments, and which one is best for your horse. As stated before, the chances of any of these treatments working are far greater if we can treat a mass early on, before the mass involves a lot of tissue and structures and is difficult to completely eliminate.



Flymask

(Source: cashelcompany.com)

Q: Are there things I can do to prevent my horse from getting SCC?

A: One way to help prevent your horse from developing SCC, especially if you have a lightly-pigmented horse, is to protect him or her from the sun. This can be done by using fly-masks that block UV light, or applying baby sunblock to the lightly pigmented areas, especially on the face. Frequent grooming is a good habit because it makes you aware of abnormal marks on the skin or new bumps that may arise on your horse over time. If you notice an abnormal area on the skin or eye of your horse that persists for an extensive amount of time, contact your veterinarian as soon as possible. It is ideal to try and prevent the development of SCC, but if it does occur, the key to successful treatment of SCC is early recognition and treatment by a veterinarian.

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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:

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