



EQUINE HEALTH UPDATE

For Horse Owners and Veterinarians
Vol. 18, Issue No. 2 – 2016

Equine Protozoal Myeloencephalitis: To test or not to test, that is the question!

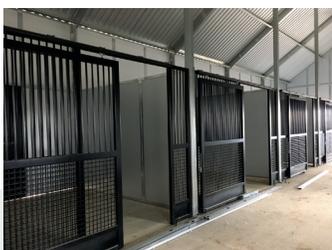
By Juli Eaton, DVM Student (Class of 2017)
Edited by Dr. Sandy Taylor, DVM, PhD, Dipl. ACVIM
Purdue Large Animal Internal Medicine

Equine Protozoal Myeloencephalitis, or EPM for short, is primarily caused by the microscopic protozoal organism *Sarcocystis neurona*. The opossum is the “natural host” for *Sarcocystis neurona*. They shed sporocysts, or eggs, in their feces on pastures, hay, or occasionally get into feed bins. Horses are a “dead end” host for *Sarcocystis neurona* meaning they cannot spread it to other animals, but can be clinically affected by the organism themselves. Infection begins with accidental ingestion of sporocyst-containing feces. The sporocysts mature and further develop in the gut, travel to the blood, and then reach the central nervous system. *Sarcocystis neurona* most commonly sets up shop in the spinal cord where it causes inflammation, resulting in neurologic deficits such as asymmetrical muscle atrophy and ataxia (incoordination). Unfortunately, opossums are very common in the Midwest and Eastern US; keeping them out of barns, out of feed, and eliminating brush close to pasture fence-lines is imperative for EPM prevention.

The most concerning aspect of EPM is the possible permanence of neurologic deficits, even with adequate treatment. Over the last 30 years, researchers have developed tests that enable veterinarians to more accurately diagnose EPM and developed treatments which effectively kill the organism. With new tests and treatments come increased awareness of EPM by veterinarians and horse owners alike. Members of the horse community are asking about screening tests, the most popular being a blood test called an ELISA. This test detects antibodies (“titers”) that the horse’s immune system has made against *Sarcocystis neurona*. However, antibodies only will tell you if a horse has been exposed to a disease, not if it is actively infected. In fact, EPM usually occurs sporadically, seldom involving more than one horse on a farm. Several studies show that 89% of all horses in the Midwest will test positive on a blood test. This does NOT mean 89% of horses actually have an active infection of *Sarcocystis neurona*.

(continued on pg. 4)

New stalls await patients in the *Centaur Equine Specialty Hospital*.



A round pen behind the hospital will be utilized for orthopedic and respiratory diagnoses.

See details inside

Contents...

Health

- EPM Diagnosispg. 1
- Sand Colicpg. 7

Community Practice

- Hock Arthritis.pg. 5

News & Notes

- Centaur Specialty Hospital Update.pg. 2
- Horseman’s Forum.pg. 4
- New LA Medicine Resident - Dr. Gillian Haanen.pg. 3
- New LA Surgery Resident - Dr. Lauren Mundypg. 3
- New LA Intern - Dr. Kira Tysonpg. 3

In Depth

- Hock Arthritis.pg. 5

Visit vet.purdue.edu/ePubs for more information on how to access the newsletter through our PVM ePubs app.

PVM's Centaur Equine Specialty Hospital Nears Completion



Over the past year, workers have transformed a farm field in Shelbyville, Ind., into a state-of-the-art facility for advanced medical treatment of equine athletes. A satellite facility of the Purdue University College of Veterinary Medicine, the Centaur Equine Specialty Hospital is set to open early in 2017, with the mission of maximizing the performance of all horses used for sport, competition, or pleasure by preventing, diagnosing, and treating diseases or conditions that keep equine athletes from achieving their full potential.

The \$8.8 million structure encompasses 17,000 square feet, and is located just a few miles from the track at Indiana Grand Racing and Casino in Shelbyville, and within an hour's drive from Hoosier Park in Anderson, Ind. The Centaur Equine Specialty Hospital will offer advanced diagnostic imaging, shockwave therapy, nuclear medicine, regenerative medicine, endoscopic laser surgery and specialized equine orthopedic and soft tissue surgery.

"The goal is to be one of the premier performance horse hospitals in the country," said Dr. Stephen Adams, Purdue Veterinary Medicine professor of large animal surgery, who helped with planning for the new facility. "To achieve that goal, the hospital will include some of the most advanced diagnostic equipment, including an Equine 4DDI diagnostic imaging system."

The 4DDI machine contains two robotic arms, allowing a horse to walk in between for more efficient processing. "There are only two other places in the United States that currently offer the 4DDI machine and we will be the third," said Dr. Mimi Arighi, associate professor of large animal surgery, who is a member of the College's Department of Veterinary Administration and serves as the lead faculty member on the facility planning committee. The unit can perform all types of diagnostic techniques, including x-rays, fluoroscopy, CT and tomosynthesis. "The big difference with the 4DDI machine is that a horse can stand during the procedure," explained Dr. Arighi. "With all other systems, a horse has to be under anesthesia for procedures like CT, which is always a risky thing to deal with when treating a horse."

The new hospital also will offer nuclear imaging, which works with radioactive iodine to pinpoint where the equine patient's problem might lie and where x-rays should be taken. The system uses a Gamma Camera, just like the kind used for humans, and is capable of a total body bone scan.

The main entrance to the Centaur Equine Specialty Hospital takes shape as construction work nears completion.

"The Centaur Equine Specialty Hospital will accommodate all aspects of equine surgery necessary to optimize the performance of sport horses," said Dr. Timm Gudehus, the hospital's senior veterinary surgeon. Dr. Gudehus started in October in order to help with preparations for the opening of the facility and to get acquainted with area horse owners and veterinarians in all three breeds of the racing industry as well as other disciplines of horses in the region. "We will treat respiratory, orthopedic and every aspect of fracture repair," he said.

Other features of the facility include a canopied entrance that leads into two holding stalls for outpatient work. The lobby has hospitality areas for guests and a private consultation room. A separate barn that is connected by a walkway holds six regular stalls and also features two larger mare and foal stalls and one isolation stall. The isolation stall only has access from the outside and is an essential feature for preventing the spread of infection to other animals. A round pen behind the hospital will be utilized for orthopedic and respiratory diagnoses. In addition, a long hallway constructed on the side of the facility will serve as the "lameness hallway"—an area sheltered from the weather where a horse will be able to step up its gait.

"We are committed to several core values that will characterize the treatment provided," said Dr. Adams. "Those values include excellence in patient care; education of horse owners, trainers, caregivers, veterinarians and veterinary students to optimize the health of horses; improvement of the health and wellbeing of equine athletes through clinical research to advance diagnostics and therapeutics; to act ethically with all clients and exhibit the integrity clients expect and deserve; and to deliver value to each client by providing efficient service and individual care of each patient. The health and welfare of the horse is the highest priority."

The hospital site was purchased by the Purdue Research Foundation with \$2.3 million in support from Shelby County and the City of Shelbyville. Centaur Gaming, which owns and operates Indiana Grand Racing and Casino and Hoosier Park, pledged \$3.1 million to name the facility. An official Grand Opening for the new hospital is planned in the spring, at the start of the 2017 racing season. ↻

Meet the Centaur Equine Specialty Hospital Team



*Dr. Timm Gudehus
Senior Veterinary Surgeon*



*Dr. Kayla Le
Assoc. Veterinary Surgeon*



*Shelby Harber, RVT
Lead Diagnostic Imaging
Technologist & Surgical Nurse*



*Cheryl Boyd, LVT
Chief Anesthesia Technologist*

The Purdue University College of Veterinary Medicine has recruited a team of specialists who will work with horse owners and trainers to provide the most current diagnostic tests and the most effective therapeutics at the Centaur Equine Specialty Hospital. The team is led by Dr. Timm Gudehus, senior veterinary surgeon, who earned his Dr. med. vet. degree from Technische Universitaet Muenchen in Munich, Germany before completing a master's degree and residency program at Louisiana State University's School of Veterinary Medicine. With a love of horses and equestrian sports that dates back to his early childhood, Dr. Gudehus has obtained training and experience on three continents and in every equine discipline. He is board certified by the American College of Veterinary Surgeons and the European College of Veterinary Surgeons, and is accredited as an equine surgery specialist by the Bavarian Equine Board Committee in Germany.

Dr. Kayla Le will serve as associate veterinary surgeon. She earned her DVM degree at Kansas State University's College of Veterinary Medicine in 2014 and then completed an equine medical and surgical rotating internship at the Louisiana State University School of Veterinary Medicine and a large animal surgical internship at the Cornell University College of Veterinary Medicine. Growing up in Omaha, Neb., Dr. Le participated in western horseback riding. She also owned horses and was involved in the rodeo.

Additionally, two veterinary technologists have joined the team. Shelby Harber, RVT, lead diagnostic imaging technologist and surgical nurse, and Cheryl Boyd, LVT, chief anesthesia technologist, came on board earlier in the year and have been training in the College's Large Animal Hospital during the construction of the facility in Shelbyville. ↻

New Residents



Dr. Gillian Haanen is originally from Weert, the Netherlands. She studied veterinary medicine—Equine track at Utrecht University and graduated in 2013. After graduat-

ing she traveled and visited different equine clinics as an extern. She began an equine internship at Sportpaardenkliniek Wolvega in the Netherlands followed by an equine internship at Moore Equine in Calgary, Canada.

Dr. Haanen started at Purdue University as the large animal medicine intern in February of 2016 and officially began her residency in July of 2016. She will be pursuing her dream to become a large animal internal medicine specialist here at Purdue for the next three years. When she is not working in the clinic she likes out-door activities and exploring the United States!



Dr. Lauren Mundy is originally from Woodbine, Maryland where she grew up riding in Pony Club, 3-day events, steeplechase, and Thoroughbred racehorses. She received her under-

graduate degree from the University of Maryland in Animal Science and her DVM from The Ohio State University. After veterinary school, Lauren interned at Rood and Riddle Equine Hospital in Lexington, Kentucky and rotated through surgery, internal medicine, and anesthesia. She is very happy to be at Purdue for a large animal surgical residency and looks forward to working with all large animals. Her interests include emergency and critical care, soft tissue surgery, and performance medicine.

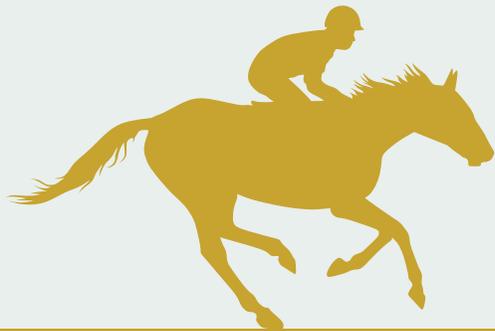
New Intern



Dr. Kira Tyson is originally from Ridgecrest, California. She received her undergraduate degree from Oklahoma State University in Animal Science and her DVM from Purdue Univer-

sity. Kira first became interested in large animal medicine during her fourth year of veterinary school. She stayed at Purdue University to pursue a large animal internal medicine internship. Her interests are ultrasonography, critical care and neonates. She enjoys camping, traveling, and running with her dog, Rylee.

News & Notes



NEW IN 2017!

The Purdue Veterinary Medicine Horseman's Education Forum will be held at Indiana Grand Racing & Casino in Shelbyville, Ind. Mark your calendars for February 11, 2017, and we'll see you at the track!

Come share our passion for horses at PVM!
vet.purdue.edu/ce/horsemans.php

Register now to attend the

Purdue University College of Veterinary Medicine HORSEMAN'S EDUCATION FORUM

Saturday, February 11, 2017 | 9:00 a.m. - 5:00 p.m.
at Indiana Grand Racing and Casino in Shelbyville, Ind.

Attendees will enjoy great educational sessions as well as a sneak peek of Purdue Veterinary Medicine's new Centaur Equine Specialty Hospital!

REGISTER ONLINE NOW!

\$45.00 per person

Discount rates available for active duty military, students, and groups of 5 or more.

Topics this year include:

Equine Asthma

Respiratory Infection Prevention

Balanced Diets

Pleasure and Trail Horses

Research Updates

Race and Performance Horses

Many more great lectures plus tours of Indiana Grand's racetrack and casino, and the new Centaur Equine Specialty Hospital before its grand opening.

EPM (continued from cover)

Similar to how humans can come into contact with an individual who has a cold and not get sick, horses that come into contact with *Sarcocystis neurona* through accidental ingestion of sporocysts rarely get sick; their immune system usually fights it off. For this reason, simply performing a blood titer will only tell you if a horse has come in contact with *Sarcocystis neurona*, and most horses in the Midwest have! It is therefore only recommended to test a horse for EPM if they are having neurologic signs; otherwise, interpretation of the test results is nearly impossible. EPM is an important rule-out for any neurologic horse in geographical areas where opossums are present. The best tests to perform are a combination of a blood titer and a cerebrospinal fluid (CSF) titer. The ratio of blood antibodies to CSF antibodies is arguably one of the best tests with a specificity of up to 97%. If there is an active infection in the central nervous system, antibodies in the CSF will increase compared to antibodies in the blood. A ratio of less than 100 strongly supports a diagnosis of EPM as the cause of clinical signs and in which case immediate treatment is warranted.

So, the answer to the question "to test or not to test" is: test if the horse is showing neurologic signs like ataxia or asymmetrical muscle atrophy, and lives in a geographical area where opossums are common (like the Midwest). If testing, always test both CSF and blood to enable evaluation of the blood serum to CSF ratio for the most accurate results.

References:

Reed SM, Furr M, Howe DK, et al. Equine protozoal myeloencephalitis: An updated consensus statement with a focus on parasite biology, diagnosis, treatment, and prevention. *J Vet Intern Med* 2016; 2:30: 491-502.

Bentz BG, Ealey KA, Morrow J, et al. Seroprevalence of antibodies to *Sarcocystis neurona* in equids residing in Oklahoma. *J Vet Diagn Invest* 2003;15:597-600.

Saville WJ, Reed SM, Granstrom DE, et al. Seroprevalence of antibodies to *Sarcocystis neurona* in horses residing in Ohio. *J Am Vet Med Assoc* 1997;210:519-524.

NAHMS. Equine Protozoal Myeloencephalitis (EPM) in the U.S In: USDA:APHIS:VS, ed. *Centers for Epidemiology and Animal Health*. Fort Collins, Colorado: NAHMS; 2001:1-46.

Animal health diagnostic center. Equine protozoal myeloencephalitis (EPM) Testing, ed. Cornell University College of Veterinary Medicine & NYS Dept of Ag & Markets. Ithaca, NY: 2011.

Calling All Horse Owners in the Tippecanoe County and Surrounding Areas

Equine Community Practice at Purdue University would like to organize a Facebook page or email list of horse owners who would be willing to haul a horse into Purdue University Veterinary Hospital on emergency—for a fee and with a signed hold-harmless waiver, which would be available for download.

Too often, we are called out to see a horse on emergency that needs referral into the hospital, but the client doesn't have a trailer, or the truck or trailer is broken or gone at the time. We are then scrambling to find someone to haul the horse into the clinic rather than have to euthanize because we can't get it in for help.

We are soliciting feedback from horse owners in the area as to interest in involvement and how to best get names on the list and circulated when there's a need.

Please email us at ecp@purdue.edu with your thoughts, comments, and if you are interested in getting on this list.

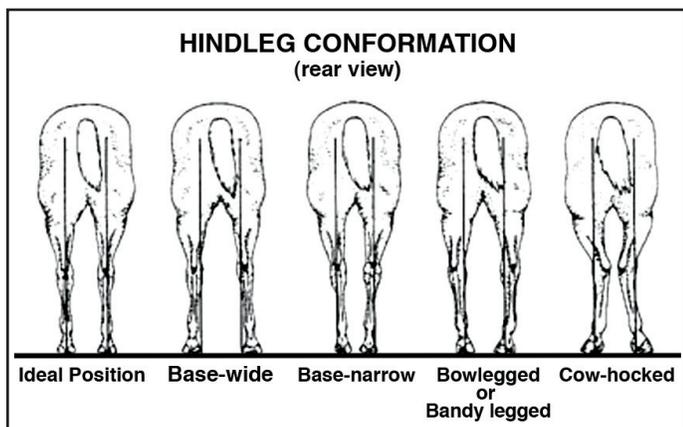
Osteoarthritis of the Hock and Injectable Treatment Options

By Jessica Abernathy, DVM Student (Class of 2017)

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

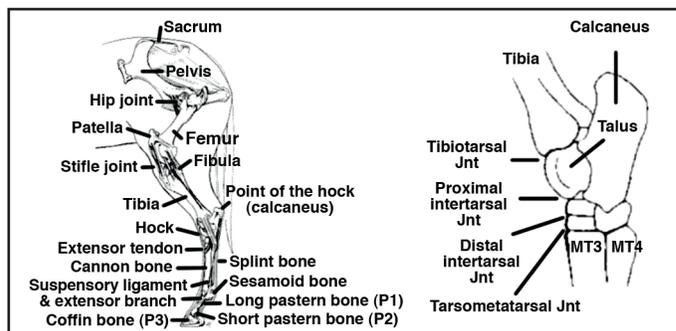
If you do any kind of performance riding with your horse, you know that hocks (tarsus) are the work-horses of impulsion and movement, and are a common site of osteoarthritis (inflammation of the joint and associated bones). The hock consists of 5 joints—tibiotarsal (tarsocrural), proximal intertarsal, distal intertarsal (centrodistal), tarsometatarsal, and talocalcaneal. The high motion joint of the hock is the tibiotarsal joint, whereas the proximal intertarsal (PIT), distal intertarsal (DIT), and tarsometatarsal (TMT) joints are important for shock absorption. The DIT and TMT joints are the most common sites of the hock for osteoarthritis to occur.

Common causes of osteoarthritis include overuse or general use over time, poor conformation, injury, and developmental abnormalities such as angular limb deformities. Some examples of poor conformation include cow-hocked, base-wide, base-narrow, or bowlegged (bandy legged).



<http://mmdt1021a.ridgewater.net/samples/sp02site7/hindlegrear.jpg>

Osteoarthritis (OA, arthritis, degenerative joint disease) occurs with cartilage deterioration in the joint, followed by bone and soft tissue changes in that area. Cartilaginous damage is often the result of damage to the joint and is exacerbated by inflammatory substances the body naturally produces. OA is a painful condition and thus can decrease the performance level of your horse. There are multiple therapies being utilized and it is important to remember that the treatment that helped your friend's horse may not work in your horse. The treatment recommended by your veterinarian will depend on several factors. This discussion will focus on the pros and cons of joint injections and some of the therapies that can be used to aide in relieving your horse's hock pain, decrease the disease progression, and improve performance.



L: <http://hdimagelib.com/horse+leg+bone+anatomy>

R: http://www.atlantaequine.com/pages/client_lib_DistalTars.html

Pros

Veterinarians inject joints in order to medicate them, which decreases active inflammation and pain, improves the synovial (joint) environment and protects what remains of the cartilage (chondroprotective). It is important to understand that this is not a performance-enhancer, but rather an option to allow the horse to have a longer performance career.

Cons

Joint flare (aka reactive synovitis) and joint infections are rare but possible and must be distinguished from one another. Joint flares are less serious than joint infections, but still need to be treated. However, joint flares are not typically career-ending since they are not the result of a bacterial infection but rather an inflammatory reaction to the substance injected. Joint infections can be career-ending and life threatening. Joint infections are due to the introduction and growth of bacteria, usually *Staphylococcus aureus*, within the joint. Signs of infection include pain, heat, swelling, and non-weight-bearing lameness, usually within 3-5 days after injection, although it may be as long as 2 weeks before signs are present. Joint infections must be treated aggressively to limit the damage and eliminate the bacteria.

Joint injections are costly and are usually charged by the joint. The hock is a complex area containing five joints. Of the 5 joints, the lower two joints (tarsometatarsal and distal intertarsal joints) are injected as these are the most common joints in the hock that get osteoarthritis. Some practitioners inject the tarsometatarsal joint only as there is research to support that drugs can diffuse between the two joints. However, there are some veterinarians that will inject both joints to be sure the medication reaches the desired locations. For more information ask your veterinarian.

(continued on pg. 6)



Hock Arthritis *(continued from pg. 5)*

Joint injections may also not give the desired effect. If your horse's lameness was not properly diagnosed, or comes from disease in several structures around the joint, the intra-articular (within the joint) block may not have worked because the pain may be coming from tissues surrounding the joint rather than within. If the purpose of the injection was to medicate prior to performance then it is possible that the injection was not done at the proper time before competition, or the damage may be severe enough that joint injections are not sufficient to improve function.

Articular cartilage degeneration/steroid chondropathy can occur if high doses of corticosteroids are used and a suitable rest time after injection is not followed (such as 3-5 days) as this can lead to further destruction of the cartilage. Steroids are beneficial, but if multiple joints are injected multiple times in a short time then this becomes a concern and different treatment strategies may be needed. Repeated injections may eventually decrease the quality of the remaining cartilage.

Another risk is causing corticosteroid-induced laminitis. This is painful and life threatening. The laminae in the hoof become inflamed and the horse subsequently gets laminitis. This is very rare and is only likely to occur if there is a pre-existing susceptibility to laminitis such as metabolic conditions or an illness. However, dosing precautions taken by your veterinarian are aimed at minimizing the risk of this happening to your horse.

Injectable Therapeutic Options for Hock Pain

Corticosteroids: The most commonly used steroids are methylprednisolone acetate (MPA) and triamcinolone acetonide (TA). What your veterinarian uses depends primarily on their clinical experience, as well as scientific research, the use of your horse, and whether or not the joint in question is a high or low motion joint. The goal of any steroid therapy is to decrease and potentially eliminate the inflammation within the affected joint. This reduces pain and decreases the inflammatory cycle, prohibiting further damage. However, steroids degrade naturally occurring hyaluronic acid (HA), which is an important component of cartilage and joint fluid. For this reason, synthetic HA is commonly injected in conjunction with steroids.

Hyaluronan: Examples of this cartilage and joint fluid component include Legend®, Hylartin-V®, and Hyvisc®. Hylartin-V® and Hyvisc® are most commonly used for acute disease of high motion joints, chronic cases with radiographic changes, or chronic maintenance cases with joint soreness.

Polysulphated glycosaminoglycans (PSGAGs): Adequan® is most commonly given intramuscularly for preventative treatment, maintenance of chronic arthritis, post-operatively in horses starting back into training, or for acute disease in low-motion joints. It can also be administered directly into the joint.

Interleukin-1 Receptor Antagonist Protein (IRAP): Blood is drawn from your horse and incubated so that an anti-inflammatory protein is released from the blood cells which is able to block interleukin-1 (a potent inflammatory mediator in joint

disease). The serum containing the IRAP is then injected back into your horse's affected joint. This is minimally invasive, but it is expensive. However, there are no negative effects on the cartilage and no drug withdrawal times for competition. This treatment is usually reserved for horses that are unresponsive to traditional therapies.

Tildren: This drug decreases the amount of bone resorption by blocking one type of bone cell, similar to the effect of anti-osteoporosis drugs used in people. The performing horse puts a lot of stress on the joints which causes the bones to remodel in response to the exercise loads. Some joint diseases involve the rapid remodeling of bone and Tildren is aimed at modulating this process and reducing pain. There is still debate about the use of Tildren for hock OA.

Polyacrylamide hydrogel: This has been used in human medicine and a 2015 study supports its use in equine lower limb joints, such as the hock. It is non-toxic, longer lasting, and is non-degradable. The mechanism behind its success is unknown but the same 2015 study showed that one injection can alleviate clinical lameness for up to 2 years in the carpal and fetlock joints. This could be a potential use for hock joints, but further studies need to be done to validate its use in any equine joints.

Summary

It can be devastating when your horse is diagnosed with hock osteoarthritis and potentially scary thinking about a needle going into your horse's joints. There are risks with performing joint injections, but fortunately most of them are rare. Precautions taken by your veterinarian should decrease the odds of your horse getting a joint infection or flare, laminitis, or articular cartilage degeneration. There are many treatment options for OA of the hock and it is important to work closely with your veterinarian to find the one that works best for your horse. For more information about OA, its causes, and treatment options, please talk to your veterinarian. ↻

References:

1. Ferris, D. J., D. D. Frisbie, C. W. McIlwraith, and C. E. Kawcak. "Current Joint Therapy Usage in Equine Practice: A Survey of Veterinarians 2009." *Equine Veterinary Journal* 43.5 (2011): 530-35. Web.
2. Marcella, Kenneth L. "Evaluating Treatment options for Equine Tendon, Ligament and Joint Disease." *Dvm360.com*. DVM Newsmagazine, Feb. 2009. Web. 29 June 2016.
3. Oke, Stacey. "Joint Injections: Pros and Cons." <http://www.thehorse.com/articles/22037/joint-injections-pros-and-cons>. *The Horse*. N.p., 01, Sept. 2008. Web. 29 June 2016.
4. Pascoe, Elaine, and Gary Baxter. "Combat Hock Problems in Horses." *Avoid and Treat Hock Problems in Horses*. N.p., June 2008. Web. 07 July 2016.
5. Schlueter, Angela E., and Michael W. Orth. "Equine Osteoarthritis: A Brief Review of the Disease and Its Causes." *Equine and Comparative Exercise Physiology* 1.4 (2004): 221-31. Web.
6. Serena, A., J. Schumacher, M. C. Schramme, F. Degraives, E. Bell, and W. Ravis. "Concentration of Methylprednisolone in the Centrodistal Joint after Administration of Methylprednisolone Acetate in the Tarsometatarsal Joint." *Equine Veterinary Journal* 37.2 (2005): 172-74. Web.
7. Tnibar, Aziz, Hans Schougaard, Linus Camitz, Jonas Rasmussen, Marc Koene, Werner Jahn, and Bo Markussen. "An International Multi-centre Prospective Study on the Efficacy of an Intraarticular Polyacrylamide Hydrogel in Horses with Osteoarthritis: a 24 Months Follow-up." *Acta Vet Scand Acta Veterinaria Scandinavica* 57.1 (2015): n. pag. Web.
8. Walther, Aleta. "DOD: Developmental Orthopedic Disorders." *TheHorse.com*. N.p., 01 Sept. 1996. Web. 08 July 2016.

Sand Colic: Is your horse at risk?

By Annie Van Proyen, DVM Student (Class of 2017)

Edited by Dr. Teresa Buchheit, DVM, MS, Dipl. ACVIM, Purdue Equine Community Practice

Sand colic, also known as sand enteropathy or sand-induced colitis, occurs when abnormally large amounts of sand accumulates in a horse's intestines. Sand usually accumulates gradually over time, and eventually leads to irritation and disruption of the motility of the gastrointestinal tract. This can result in mild signs such as diarrhea, dehydration, and weight loss, but can also cause more serious problems such as impaction of the colon, abdominal pain (colic), and peritonitis (inflammation of the tissue that lines the inner abdominal wall and covers most abdominal organs).

Which horses are at risk?

Any horse that has access to sand is at risk of ingesting sand, which can lead to a sand enteropathy. Areas of particular concern are those with sandy soils such as coastal or desert regions, where sand is ingested when it is torn up with grass roots. Horses housed on sand lots or fed in indoor arenas with sand footing are also at risk. Horses fed directly on the ground in paddocks with no or sparse grass are at increased risk of ingesting sand when it picks its feed off the ground.

How is it diagnosed?

As with any disease, a thorough history and physical exam are important for diagnosis. Occasionally sand can be heard on auscultation of the gastrointestinal tract along the lowest aspect of the abdomen, and is reported to sound like "waves on a beach." Sand can sometimes be felt on rectal palpation as an impaction in the colon, the inner surface of the rectum may feel "gritty", or sand may be noted in the feces or on the rectal exam sleeve after palpation.

The two most important tests for diagnosing sand colic are fecal sedimentation and abdominal radiographs (x-rays). Fecal sedimentation is a simple test that can be performed on the farm by both veterinarians and owners. This test is performed by placing 3-4 fresh fecal balls into an exam sleeve or clear plastic bag filled with water. The fecal balls should be manually broken apart. If present, sand will settle to the bottom after a few hours. If no sand is collected after approximately 8 hours, the test is considered negative. More than ½ tsp of sand is considered significant. Unfortunately, only 48% of horses that have sand enteropathy will have sand on the fecal sedimentation, so a negative test cannot definitively



Figure 1: Fecal Sedimentation: The arrows indicate the line of demarcation between normal fecal material (above) and sand that has accumulated (below).

rule out this disease. In the hospital setting, sand enteropathy is often diagnosed or confirmed with abdominal radiographs. Sand tends to collect ventrally along the abdomen, which can be seen as a radiopaque (bright white) area in the image.

It is important to note that seeing sand on the fecal sedimentation test or on radiographs does not mean sand is the only possible cause of the clinical signs. Though sand may be one contributor to diarrhea or colic, your veterinarian will rule out other potential causes.

How is it treated?

For horses with sand enteropathy, your veterinarian will most commonly treat with a combination of fluids and laxatives. Fluids may be given orally or intravenously depending on the severity of dehydration and other clinical signs. The most commonly used laxatives for sand are psyllium, mineral oil, or magnesium sulfate (Epsom salts). These may be used separately or in combination. Psyllium is a soluble fiber that mixes with the sand in the gut and forms a gel which promotes evacuation. Evacuation can be further enhanced by the addition of mineral oil. Epsom salts overhydrate the gut to help promote excretion of the sand. New studies have shown that mixing psyllium with a probiotic improves sand clearance. The prognosis for medically managed cases is good. In more severe cases, surgical removal of the sand may be required. Horses requiring surgery have about a 60-65% survival rate. If peritonitis has occurred, antibiotics will also be needed.

How can it be prevented?

Removing the horse from sand is the best way to prevent sand enteropathy, but this is not always possible. To reduce the amount of sand consumed: avoid feeding directly off the ground with the use of feeders that are not easily overturned, use rubber mats under feeders in the paddock/stall to prevent sand ingestion with dropped feed, offer grass hay during the day to give your horse something to do, and allow horses to graze only in pastures with adequate growth so that ingestion of sand is less likely. For those horses which live in a sandy environment, psyllium (either as a powder or flavored pellets) can also be used as a preventative. One recommendation is to feed 8 ounces once daily for 7 consecutive days one week per month as a maintenance dose to prevent sand build-up and is best used in combination with other preventative measures.

References:

- Hart KA, Linnenkohl W, Mayer JR, et al. (2012) Medical management of sand enteropathy in 62 horses. *Equine Vet J.* 45:465-469.
- Kendall, A., Ley, C., Egenvall, A. and Bröjer, J. (2008) Radiographic parameters for diagnosing sand colic in horses. *Acta Vet. Scand.* 50:17.
- Ruohoniemi, R., Kaikonen, R., Raekallio, M. and Luukkanen, L. (2001) Abdominal radiography in monitoring the resolution of sand accumulations from the large colon of horses treated medically. *Equine Vet. J.* 33:59-64.

EQUINE HEALTH UPDATE

is published by:

Purdue University
College of Veterinary Medicine
Equine Sports Medicine Center
1248 Lynn Hall
West Lafayette, Indiana 47907-1248

ADDRESS SERVICE REQUESTED

Phone: 765-494-8548
Fax: 765-496-2641
www.vet.purdue.edu/esmc/

With generous support of
Purdue University's Veterinary
Teaching Hospital and the College of
Veterinary Medicine Dean's Office.

Please address all correspondence related
to this newsletter to the address above.

Editorial Board:
Drs. Couétil L., Hawkins J. and Tinkler S.

Design & layout by:
Elaine Scott Design

EA/EOU



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/



Continuum© by Larry Anderson