



Volume 15: Issue 1 Fall 2019

Ambulatory Service Continues to Grow

The equine ambulatory program is in its 18th year, the same number of years I have been practicing veterinary medicine, which seems strange and amazing. I was fortunate to be present for the inception of our ambulatory program and have proudly watched it grow and evolve, just as I have done the same as a practitioner. I find myself speaking of the program with such pride in our services and capabilities. We have a busy, full-service practice, which allows for optimal training for our up-and-coming veterinarians as well as optimal care for our clients. Our client base has grown tremendously and we adore visiting with friends and fellow horse owners as we perform routine and emergency work.

The ambulatory program continues to foster a relationship with Longmeadow Rescue Ranch, for which we thank our dean who has fully supported this endeavor. Each month we send one clinician, one intern and two cars full of students to work on the Longmeadow horses. This relationship has been a win-win situation. We are able to introduce our interns and students to all aspects of equine care, including preventive care, dentistry, lameness and basic surgeries, and in return the horses of Longmeadow benefit from our services. I am proud to be a part of this relationship.

As veterinarians we are asked to maintain a minimum of 10 hours of continued learning per year to stay current in our skills and knowledge. As many of you know, I have a special interest in equine dentistry and have recently returned from a short course focused on recognition of dental pathology along with extraction techniques. It is wonderful to be around other veteri-



narians who are excited about equine dentistry, as well as being introduced to new and valued techniques so we can all improve our skills. I have returned with a renewed excitement and interest in putting these skills to work. This is what it's all about, maintaining excitement for what we do on a day-to-day basis!

Please mark your calendars for Saturday, Nov. 16. We will be hosting another client seminar and we would LOVE to see you all in the audience. You will find the agenda in this newsletter. Last year's client seminar was a huge success due to your great enthusiasm and interest, and we hope for the same this year.

Thank you all for your continued support and friendship over the years. We wish you all the best holiday season and look forward to seeing you in the New Year.

Sincerely,
Alison LaCarrubba, DVM
Diplomate, ABVP (Equine Practice)

Mission Statement:

The mission of our equine ambulatory service is to provide the highest standard of medical and surgical care to our patients while training the next generation of veterinarians.

Meet the MU Equine Ambulatory Team

Alison LaCarrubba, DVM, DABVP

Alison LaCarrubba, originally from New York, grew up riding hunter-jumpers and dressage from a young age. After graduating from Cornell University with a degree in animal science, LaCarrubba moved to the Midwest to obtain her veterinary degree. She graduated from the University of Missouri College of Veterinary Medicine in 2001. LaCarrubba completed an internship in equine medicine and surgery at the university and subsequently spent a year working in an equine exclusive private practice. She returned to the university in July 2003 as a clinical instructor, and in 2009 she completed the specialty boards with the American Board of Veterinary Practitioners in Equine Practice.



LaCarrubba's love of equine dentistry has inspired her to continue her training in this area. In recent years she has attended a variety of advanced equine dental courses, which have allowed her to develop specialized skills and expertise in this field. As the equine dentist for the university, LaCarrubba is excited to see all things dental, from routine work to more complicated extractions. When she is not at work, she is spending time with her husband and three children. The whole family enjoys horses and riding together on Missouri's beautiful trails.

Martha Scharf, DVM, DABVP

Martha Scharf practices equine ambulatory medicine at the Equine Hospital. Scharf was born in Chicago and grew up riding hunter-jumpers in St. Louis. Since moving to Columbia she has continued to ride and started to explore three-day eventing. After earning a DVM at MU, she completed a rotating equine internship at the university. Scharf has obtained certification in equine practice by the American Board of Veterinary Practitioners and completed chiropractic training for large and small animals. She continues to work as an assistant teaching professor for the Equine Ambulatory Service.



Scharf spends the majority of her time instructing senior veterinary students while providing quality medical care for horses within the Columbia area. She is particularly interested in wound management

and emergency care in the ambulatory setting. Scharf works closely with the referral clinicians in the Equine Hospital to provide superior care to horses.

Our interns have a special interest in working with horses and potentially going on to complete a residency specializing in either equine medicine or equine surgery. Every June we welcome a new crop of interns. This year our interns include Amy Brandon, Madalin Ebel and Kelly Sandelin.

Amy Brandon, DVM

Amy Brandon is a 2018 graduate of the University of Georgia College of Veterinary Medicine. Following graduation, she completed a surgical internship at Hagyard Equine Medical Institute in Lexington, Kentucky.



She has a interest in surgery, lameness, and sports medicine. Brandon was born and raised in Virginia, and received a bachelor's degree in animal and poultry sciences from Virginia Tech. She grew up riding hunter-jumpers. During her free time, she loves to go swing dancing. She also enjoys reading and spending time outdoors.

Madalin Ebel, DVM

Madalin Ebel started life as a city girl in Milwaukee, Wisconsin, and Minneapolis, Minnesota, and discovered her love for all things equine during her undergraduate studies at the University of Minnesota. After receiving her bachelor of science in animal science, Ebel moved to Prince Edward Island, Canada, to attend the Atlantic Veterinary College. During her final year of veterinary school, she took courses to become certified in equine acupuncture through the Chi Institute of Integrative Veterinary Medicine in Reddick, Florida.



Ebel's professional interests include equine surgery, sports medicine and neonatology. In her free time, Ebel enjoys reading, the arts, and exploring the great outdoors with her young daughter, Naomi, and her dog, Emma.

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Standing Equine Dental Extractions

Advances in Sedation Mean Anesthesia May Not be Needed

Alison LaCarrubba, DVM, DABVP

There is nothing simple about pulling horse teeth. Horses' teeth were designed to last approximately 25 to 30 years, while continuously erupting 3-5 millimeters per year. Horse teeth are extraordinarily complicated. Horses have hypsodont teeth which means they erupt continuously throughout their lifetime and are incredibly dynamic structures. They must maintain secure attachments to the bone while erupting and simultaneously being worn down as the horses chew.

Trying to remove a tooth in a young horse, or even a horse in its teens, can prove to be a difficult task. Many people have been working on improving our tools and techniques where equine dental extractions are involved. There is no silver bullet when it comes to equine dental extraction, but there are certainly things that we have learned and improved upon over the years to make dental extractions a better experience for the horse, the owner and the veterinarian. Over the past few years we have been able to switch from placing horses under general anesthesia to standing extractions in most cases.

The most common indications for equine dental extractions include a fractured or fragmented tooth, a tooth root abscess or severe periodontal

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Although Hardy, Donkeys and Mules Need Special Care

Martha Scharf, DVM, DABVP

Donkeys and mules are tremendously popular among equine owners, ranging in use from impressive performance animals to excellent, loyal herd companions. Mules specifically have a rich history and a special significance in Missouri as the state animal due to the refinement of draft mule breeding that occurred locally to economize farming at the turn of the century. As anyone who has owned a donkey or mule knows, they are much more than horses with long ears, sometimes necessitating specialized care and training to thrive in a herd.

A male donkey is referred to as a Jack and a female donkey is called a Jenny. Donkeys have many physical differences from horses, including longer ears, larger heads and rougher hair coats. They also have a switch tail (rather than a full tail of long hair), lack chestnuts on their hindlimbs, and generally have different whorl patterns than horses. Donkeys also have a loud echoing bray and are rarely shy about talking.

A mule is the offspring of a jack (male donkey) and a mare (female horse). Male and female mules are referred to as Johns and Mollies respectively. The product of a stallion (male horse) and a Jenny (female donkey) is

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Kelly Sandelin DVM

Kelly Sandelin grew up in Waterloo, Illinois, a small farming community just outside of St. Louis. She started riding horses young, primarily showing in the jumper ring. Sandelin completed her undergraduate studies at the University of Missouri and was a 2019 graduate from Miz-zou's College of Veterinary Medicine. She loves all aspects of veterinary medicine, but has a specific interest in equine internal medicine and ambulatory practice. In her free time, she enjoys spending time with her two Australian shepherds, cooking, and being with friends and family.



Donkeys, Mules, *continued from page 3*

called a Hinny. Hinnies are the less popular hybrid due to a smaller size and poorer vigor, but can still be found throughout the country. Both hybrid animals are almost always infertile due to inheriting an uneven number of chromosomes (63) from their donkey (62) and horse (64) parents. They have intermediate ear length, fully haired tails, and a mixed bray that they are generally shyer about sharing.

Donkeys and mules are tremendously feed efficient. Originating from harsh desert climates, donkeys need less sugar and protein than horses and should be diet restricted in the Midwest to avoid obesity. Once a donkey develops large fat deposits, they are extremely difficult and sometimes impossible to get rid of. Furthermore, overweight donkeys are predisposed to founder (laminitis) and a life-threatening disease called hyperlipemia when they become stressed enough to not eat. Therefore, it's best to restrict their grain and forage intake carefully to simulate their natural environment. Most donkeys often thrive with dry lot or grazing muzzle management.

Medicating donkeys and mules can also be tough. Generally, they have a high pain tolerance and can be very stoic, failing to show clinical signs until pain is severe. They also metabolize medication differently than horses, often requiring higher or more frequently administered doses of medications than horses for everything from pain control to sedation and anesthesia. It is therefore important to consult your veterinarian when medicating your donkey or mule to ensure they receive the medication they need.

Although mules are infertile, they still produce hormones that can produce stallion- or mare-like behavior. It is therefore recommended that all John mules and any Jacks not intended for breeding are castrated to avoid aggressive tendencies. This procedure is often more complicated than in horses due to greater testic-



ular size, high blood flow to the region, and anesthesia needs. The anesthesia and surgery, therefore, may look different to you than a horse castration as your veterinarian accounts for these differences.

Jennies and Mollies also have reproductive differences, often cycling year round rather than pausing when the days get shorter. Donkeys also have a longer average gestation than horses, extending an average of 12-14 months rather than 11 months.

Donkeys and mules are sure-footed with small, hardy feet. However, they are prone to foot problems, such as founder, white line disease, and foot abscess. It is therefore important to keep them on a routine trimming cycle just like the horses and try to prevent obesity whenever possible.

Donkeys and mules are considered extremely hardy. They are not only more feed efficient and have greater strength per body weight than horses, but they often tolerate heat, dehydration, and fatigue far better as well. Most donkeys are also rather

cold resistant but this has more variation among individuals. The robustness of these animals often makes them more disease resistant than horses as well, but there are a few exceptions. Donkeys are actually more susceptible to lungworms, sarcoids, and a rare parasitic disease called besnoitiosis. For this reason, they should be watched closely for any small changes in their well-being just like all equids. Donkeys and mules grow slower than horses, with slower bone growth plate closure. It's therefore also important to avoid hard work until they are fully mature, typically around 4 to 5 years old. Fortunately, donkeys and mules also have a longer lifespan than the average horse and can live into their 30s, 40s or older.

Donkeys and mules make excellent working animals, pets and companions. With proper care and training, they can become an invaluable member of the herd and remain healthy for a tremendously long time. Feel free to call to ask questions or set up an examination for your long-eared friend.

disease. Clinically, owners notice that the horse is dropping grain, having difficulty eating, not eating well or chewing with its head tilted to the side. Owners may also notice weight loss or behavior changes.

Historically, veterinarians have utilized general anesthesia to facilitate dental extractions, which promises the horse will be quiet and still during what can often be a long and arduous task. General anesthesia in horses poses numerous risks and increased cost. Keeping this in mind, equine dental specialists have been honing their skills and techniques, allowing for teeth to be safely extracted in the standing, sedate horse.

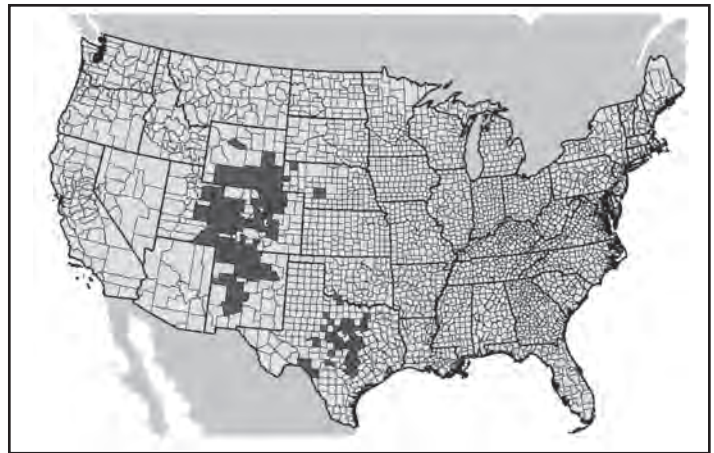
So what has changed? Sedation protocols have improved, but perhaps more importantly, anesthesia of the nerves supplying sensation to the teeth are now blocked with accuracy, allowing the horses to withstand long procedures without associated pain.

Prior to an extraction, the horse is placed in stocks for restraint, support and safety. Once the horse is sedated, we perform the necessary regional anesthetic nerve blocks to numb the area of interest. After the block has taken full effect, we place the horse in a speculum to keep its mouth open and begin the loosening process. It may take one to three hours to extract a tooth. Sometimes the tooth is stubborn enough that we split the procedure into two different days. If the tooth is fractured or difficult to grab, it might be repulsed into the oral cavity. Instead of grabbing the tooth with forceps, we actually line up a pin with the root of the tooth and punch the tooth from the outside of the mouth, into the oral cavity. This is somewhat more invasive, creating a tract from the oral cavity to the outside, which then needs to be filled until it heals. Due to the difficulty of extracting equine teeth, it is not recommended embarking on this procedure without proper education, equipment and support staff. Proper planning via radiographs and a complete oral examination are critical to success of the procedure.

The great news about a standing oral extraction is that after the tooth has been removed there is often little aftercare. The horses are typically on pain relieving medications, antimicrobials, and soft feed for a period of time.

Complications from oral extractions are rare, although they can occur. The complications that arise include fractured roots, retained fragments, sinus infections, and chronic fistulas tracts.

We do not consider equine dental extractions lightly, but with improved sedatives, nerve blocks and extraction techniques, we are having great success. Although the procedures can be long and difficult, it is ultimately extremely rewarding to see the end result, horses that are happy, healthy and eating well.



Counties with premises quarantined for VS since June 21, 2019, are shown in dark grey.

Disease Outbreak Update:

Vesicular Stomatitis

Amanda Trimble BVMS, MS, DACVIM

Vesicular Stomatitis (VS) is a contagious, reportable, viral disease that afflicts horses, livestock, wildlife, and rarely humans. Outbreaks have occurred most frequently in the Southwestern and Western United States. The largest outbreak occurred in 2015.

Outbreaks usually occur during the warmer months. The virus is transmitted via gnats and biting flies or by coming in contact with saliva or fluid from blisters of infected animals. As of Aug. 29, 2019, cases have been reported in Colorado, Nebraska, New Mexico, Oklahoma, Texas, Utah and Wyoming.

Clinical Signs and Diagnosis

Horses tend to develop blister-like lesions on the tongue, gums, nose or lips two to eight days after being infected. Some animals also develop blisters on the coronary bands, udder, and sheath. As the blisters are quite painful, horses are frequently seen drooling or frothing at the mouth, and are reluctant to eat. Potential sequelae include lameness and weight loss. Clinical signs typically resolve in two weeks; however, it may take longer for blisters to heal. Fluid from blisters can infect other horses.

If your horse develops any clinical signs, contact your veterinarian as soon as possible. As this is a reportable disease, your veterinarian will contact state and federal regulatory veterinarians to initiate testing through the USDA National Veterinary Services Laboratory. Diagnostics include serum samples to test for virus antibodies or swabbing the blisters in order to detect the virus.

Treatment

This disease is rarely fatal. Because the blisters can be quite uncomfortable, feeding soft feeds may reduce

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VS, *continued from page 5*

mouth discomfort when eating. Anti-inflammatory medications, such as Bute or Banamine, may be used as to help with associated pain so that a horse will continue to eat and drink. Flushing the mouth regularly with dilute antiseptic solutions, such as chlorhexidine in water, may reduce secondary bacterial contamination of the sores and speed healing.

Prevention

The state of Missouri has implemented strict movement guidelines and control measures to help prevent the spread of VS to our state. Rules restrict movement from an area within 10 miles of any quarantined facilities. The quarantine continues for 14 days after the onset of lesions developing in the last affected animal on those premises. Any animals entering Missouri must not be near there for 30 days prior to entry. Further, all hooved animals entering or re-entering Missouri are required to have a health certificate. If a horse is coming from an affected state, it must be examined and have a health certificate written by an accredited veterinarian from that state prior to being moved.

Other good prevention considerations (adapted from the AAEP guidelines) include:

- Isolating new horses for at least 21 days before introducing them into the herd or stable.
- Effective insect control program: Keep stabling areas clean and dry. Remove manure and eliminate potential breeding grounds (standing water, muddy areas) for insect vectors.
- Clean and disinfect feeders, waterers, horse trailers, and other equipment regularly. Sunlight and heat are known to quickly destroy the virus, but commercial disinfectants such as chlorine bleach or Roccal are also effective.
- Be sure that your farrier and other people who come into direct contact with your animals exercise good biosecurity so as not to spread the disease from one horse or facility to the next.
- If you are hosting an event (horse show etc.) during an outbreak, require a more recent health certificate on every horse entering the venue and consider having a veterinarian visually inspect all horses at check in.

Zoonotic Potential

Humans can rarely contract VS from infected animals. Rather than blisters, VS in humans tends to cause severe flu-like symptoms such as headache, fever, muscle aches and extreme fatigue. If you have concerns that there may be human exposure or illness, contact your physician.

Further information about the current outbreak and affected premises can be found on the Equine Disease Communication Center or at: <https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/animal-disease-information/cattle-disease-information/vsv-reports>.



EEE on the Rise

Eastern Equine Encephalitis
Sometimes Results in Death

Madalin Ebel, DVM

Eastern Equine Encephalitis, commonly referred to as "EEE," is an important viral disease of horses with the ability to incur severe neurologic disease, sometimes resulting in death. With a recent rise in reported incidence of human cases of EEE, many horse owners have increased concern about the risk of their horses contracting this disease, and what they can do to prevent it.

EEE is not a new disease, in fact, it is believed to be responsible for historical outbreaks of equine mortalities along the Eastern American seaboard since the 1800s. In 1831, an outbreak in Massachusetts affected roughly 100 horses, 75 of which died. During the next 150 years, at least six additional outbreaks consistent with the clinical signs of EEE occurred, with the largest event occurring in Louisiana and Texas in 1947 — more than 14,000 equine cases were reported. Since the development of modern vaccines against EEE, veterinarians have drastically reduced the incidence of clinically reported disease.

The virus responsible for EEE is spread through mosquitos, which act as a vector to transmit the infective agent to migratory birds that maintain the virus within geographic populations. Once transferred via feeding mosquitos, the virus multiplies significantly within the bloodstream of affected birds, which then serve as a reservoir for further viral infection within the area. Many birds do not develop signs of infection. Affected mosquitos transfer the virus into the equine bloodstream while

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EEE, continued from page 6

feeding. While transmission from mosquitos to horses and humans occurs, viral replication within the bloodstream in these species is not usually significant enough to allow for additional transmission to other animals (i.e., horses cannot transmit the disease to humans).

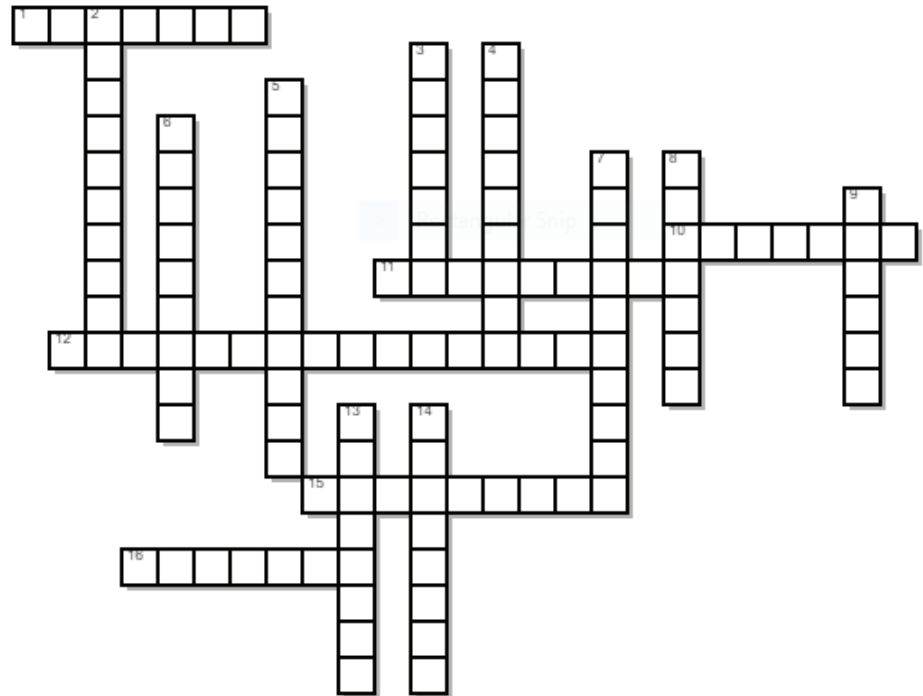
Horses infected with EEE commonly will have a fever within the first week of transmission; some horses may also appear lethargic or stiff during initial infection. As the disease progresses, ataxia (incoordination), inability to appropriately place feet, stiffness of the neck, and compulsive walking or chewing, diarrhea, increased heart rate, and depression commonly develop. Horses may appear disinterested in food or their pasture mates, and advanced involvement of the central nervous system may be accompanied by grinding of the teeth, blindness, inability to swallow, behavior changes, or head tilt. Severely affected horses often become recumbent, and death often occurs shortly thereafter.

Diagnosis of EEE is made by blood test. Cerebral spinal fluid analysis is also diagnostic. Treatment of EEE largely involves supportive care, including anti-inflammatories and IV fluids. Seizures may be managed with anti-consultants. Horses that become recumbent have a poor prognosis, and euthanasia is recommended when the disease progresses to this stage.

Prevention of EEE is highly effective with appropriate vaccination schedules, and EEE is considered a core vaccine by the American Association of Equine Practitioners. All adult horses should be vaccinated against EEE in the spring, prior to mosquito season. Horses receiving their first vaccination against EEE should receive a booster in four to six weeks, then annually in the spring. Foals should be vaccinated at 4 to 6 months of age, and receive two additional boosters every four to six weeks, then annually in the spring.

Horse Lovers' Crossword

Kelly Sandelin, DVM



ACROSS

- 1 When equine strangles spread to other locations within the body, it is called _____ strangles.
- 10 A common test used in equine lameness exams to exacerbate clinical signs of lameness.
- 11 Latin word for hives.
- 12 One of the most common causes of forelimb lameness in the horse, especially quarter horses.
- 15 Fruit that commonly causes gastric impactions in horses.
- 16 Equine recurrent _____ is a common ocular disease in Appaloosas.

DOWN

- 2 Most commonly identified agent in adult equine diarrhea.
- 3 Necrosis of the collateral cartilage of the coffin bone.
- 4 Area on the border of the hoof that is a common place for hoof abscesses.
- 5 Mare reproductive loss syndrome has been associated with ingestion of the eastern tent _____.
- 6 Farrier tool that can open up hoof abscesses and allow for drainage.
- 7 Common active ingredient in deworming products.
- 8 Forage that is high in carbohydrates and is recommended for horses with gastric ulcers.
- 9 Laminitis is the disruption of the blood flow to the laminae that may ultimately cause rotation of the _____ bone.
- 13 Riding discipline that focuses on the art of riding and training a horse in a manner that develops obedience, flexibility and balance.
- 14 Vector of many blood-borne diseases such as West Nile Virus and Eastern/Western Encephalitis.

Solution can be found on page 12.



Fall Open House and Seminar Series

The Fall Equine Hospital Open House and Seminar Series will take place Nov. 16, 2019, at the University of Missouri College of Veterinary Medicine Adams Conference Center in Columbia. There will be a series of educational talks covering a range of current and topical subjects. Participants will also be able to tour the Equine Hospital.

The Missouri Veterinary Medical Board has approved six hours of continuing education credit for veterinary technicians who attend the seminars. The cost is \$20 for attendees who do not need CEUs, or \$50 for technicians interested in CEUs.

Registration and check or cash payment should be mailed by Nov. 8 to:
Attn: Teresa Egbert
900 E. Campus Drive
Columbia, MO 65211
Checks should be made payable to the University of Missouri.

8:15-8:45 a.m. — Registration
8:45 a.m. — Welcome from CVM Dean Carolyn J. Henry, DVM, MS, DACVIM (Oncology)
9 a.m. — Megan McCracken, DVM, MS, DACVS-Large Animal: Equine athletic joint health topic (arthritis in athletes and intra-articular treatments)
9:30 a.m. — Madalin Ebel, DVM: Pregnancy and parturition for horse owners
10 a.m. — Lynn Martin, DVM, MPH, DACVIM-Large Animal Internal Medicine: Update on strangles and what you should do on the farm
10:30 a.m. — Coffee and snacks
10:45 a.m. — Amy Brandon, DVM: Taking colicked horses from the exam room into surgery
11:15 a.m. — Alison LaCarrubba, DVM, DABVP-Equine: Gastric ulcers in the horse
11:45 a.m. — Amanda Trimble, BVMS, MS, DACVIM-Large Animal Internal Medicine: What's the skinny on obesity? An owner's guide to managing the overweight horse
12:15 p.m. — Lunch
1:15 p.m. — Anand Chockalingam, MD: Connecting with Heart and Health: Meaningful living despite the increasing noise
1:45 p.m. — Kelly Sandelin, DVM: Putting together an equine first aid kit
2:15 p.m. — Coffee and snacks
2:30 p.m. — Kile Townsend, DVM: We're all getting older: Problems and solutions for old horses and ponies
3 p.m. — Martha Scharf, DVM, DABVP: Modern approaches to deworming and fecal egg counts
3:30 p.m. — Cathy Vogelweid, DVM, PhD: Horse barn fires - elimination of risk factors
4 p.m. — Hospital tours

The Toxic 10

By Charlie Jane Walrond and Tim Evans

Toxic plants are commonly plants that you may have growing in your pastures or around your barns that may seem harmless. Such as the sweet smelling clover horses love or the maple trees that give us beautiful fall foliage. However these plants can cause symptoms that range

from mild to deadly. Below are common toxic plants in Missouri to help you identify these plants and keep your horses a safe distance away. If your animal displays signs of toxicity you should contact the VMTH immediately. During clinic hours (8 a.m. to 5 p.m.) call 573-882-3513 and after hours call 573-882-4589.

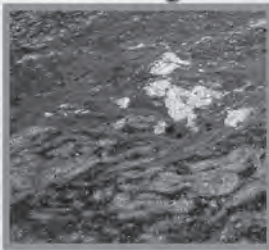
Alsike Clover



Signs of toxicity:

Photosensitization, which is where the skin looks like it is sunburnt.

Blue-Green Algae



Signs of toxicity:

Weakness, depression, shock, colic, photosensitization, muscle tremors, paralysis, sudden death

Fungus Infected Fescue



Signs of toxicity:

Little to no milk production, prolonged gestation length, retained placenta, abortion

Maples



Signs of toxicity:

Dark brown urine, anemia

Milkweed



Signs of toxicity:

Weakness, uncoordinated walking, depression, trouble breathing, increased temperature, convulsions, dilated pupils, GI upset

Poison Hemlock



Signs of toxicity:

Uncoordinated walking, weakness, colic, salivation

Water Hemlock



Signs of toxicity:

Muscle twitches, seizures, convulsions, coma

White Snakeroot



Signs of toxicity:

Pulsing jugular veins, ventral edema, increased heart rate, sweating

Yew



Signs of toxicity:

Nervousness, uncoordinated walking, collapse, GI upset, decreased heart rate, sudden death

Fungus Infected Red Clover



Signs of toxicity:

Excessive salivation, tearing, urination, diarrhea

Photos courtesy: Missouri Department of Conservation, Alabama Department of Conservation and Natural Resources, ASPCA and

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The Importance of Routine Deworming

Kelly Sandelin, DVM

Deworming is a common and important procedure in equine medicine, which is primarily performed by the horse owner. The steps are simple: buy a dewormer, determine the appropriate dose, bribe the horse to lower its head for easy access to the mouth, administer the product (may take multiple attempts) and then bribe your way back into the horse's good favor once the product has been given. Deworming is not only a (seemingly) simple treatment in horse ownership, it is also an important preventive measure.

For most horse owners, deworming occurs once in the spring and once in the fall. This process takes place during these times due to how parasites are transferred. Two of the most common modes of transmission include vectors through flies or ingestion of infested feces or grass.

Flies can cause parasitic infestation in a multitude of ways. The Gasterophilus fly, or botfly, will lay eggs on the skin that horses will then ingest when either grooming themselves or others. In the case of the habronema parasite (stomach worm), flies will deposit eggs at a wound or a mucocutaneous junction. The Culicoides fly, otherwise known as "gnats," "no see ums," and "midges," are most commonly known for causing sweet itch. However, they can also transmit onchocerca or threadworms, which cause itching on the ventrum. Ingestion of feces or grass is the mode of transmission for equine ascarids, strongylids, pinworms and lungworms. For these parasites, being ingested by the horse is important for its continued life cycle and for spread of disease.

Flies and pasture grazing is at its highest during the summer for most horse owners. Because of this, spring deworming can be seen as a preventive and fall deworming can be seen as treating any potential worms acquired during this time.



Type of Shedder	Amount of Eggs per Gram (EPG)	Frequency of Deworming
Low	Less than 200 EPG	Twice per year
Medium	200-500 EPG	Four times per year
High	Greater than 500 EPG	Six times per year

Sometimes, deworming twice a year is not enough to control parasites. When horses are experiencing a severe parasitic burden, common clinical signs that can occur include pruritus or itching, diarrhea, and colic in adult horses and a failure to thrive in foals. However, most often, horses are asymptotically infected with different parasites. This means that the worm burden is not enough to cause clinical signs within the horse, but that they can still shed eggs of the parasites which can cause transmission to barn or pasture mates.

To determine if a horse should be dewormed more frequently, owners can request a fecal egg count. This classifies horses into low, medium and high shedders and allows us to determine if they should be dewormed more frequently.

Fecal egg counts, along with presence of clinical signs, can also tell owners and veterinarians which type of parasite to treat. Most dewormers have an active ingredient of either an avermectin (ivermectin or moxidectin), benzimidazoles (fen-

bendazole), pyrantel (strongid) or praziquantel. Avermectins are the most efficacious and can treat the majority of the most common parasites, but sometimes resistance can develop. Because of this, rotating between other active ingredients, such as benzimidazoles, or utilizing fecal egg counts to ensure efficacy of treatment, is recommended to prevent resistance. Pyrantel is recommended when treating pinworms and praziquantel is an appropriate add-on dewormer for tapeworms and threadworms. It is generally recommended to deworm in the spring with avermectin and then to repeat avermectin in the fall with additional praziquantel.

Deworming is a simple way to maintain good health for horses. By understanding the timing and types to use, owners can maximize the benefits their horses will receive. Fecal egg counts are a great way to confirm that an owner is using the correct deworming protocol for their horses. For those who would like to confirm that they are appropriately managing parasite burden in their horses, contact your veterinarian.

Use of Biologics in Equine Injury

Amy Brandon, DVM

Some of the most common causes of lameness in the horse include osteoarthritis and tendon injuries. Osteoarthritis has classically been treated with steroid injections, plus or minus hyaluronic acid. While this can provide clinical relief of the lameness, some owners may find that their horses begin to need injections more and more frequently. Additionally, steroids can be somewhat damaging to the cartilage of the joints. It is; however, a fairly cost effective and proven method of treating osteoarthritis. Tendon injuries, such as the type that result from overwork, are typically treated with a long timeline of rest and rehabilitation.

In recent years, other therapies, called biologics, have been explored for treating osteoarthritis and tendon injuries. Biologics are a type of regenerative medicine. They are derived from the horse itself, and may provide enhanced healing and longer lasting results, although they are typically more expensive and have varying reported success rates. Biologic products may decrease inflammation in osteoarthritic joints and help protect the cartilage. In core tendon lesions, they may decrease rehabilitation time by helping provide a scaffold for healing and providing growth factors to the site of injury.

Platelet-rich Plasma

More commonly referred to as PRP, this is one of the first biologic products that was used in horses, and as such has the most research behind it. It is produced by collecting blood from the horse, centrifuging, and filtering it to increase the concentration of the platelets in the final product. The PRP can then be injected into the horse during the same visit that the blood was collected. The high concentration of platelets mimics the physiology of clotting and wound repair when

it is injected into a core tendon lesion, and may help stimulate vessel formation and collagen production to promote healing. It also provides growth factors, several of which are known to participate in tendon and ligament repair. It is used most frequently to treat soft tissue injuries such as core tendon lesions, and is generally a one-time treatment.

Interleukin-1 Receptor Antagonist Protein

More commonly referred to as IRAP, this product is classified as an autologous conditioned serum. It is produced by collecting blood from the horse and culturing it for 24 hours in an incubator with glass beads coated with chromium sulfate to produce the anti-inflammatory protein for which it is named. This protein has been shown to help inactivate inflammatory pathways associated with osteoarthritis. The product also contains increased levels of growth factors to aid in healing. It is typically injected every one to two weeks for anywhere between two to five treatments, depending on the disease process and response to injection. It is most frequently used to treat osteoarthritis.

ProStride

One of the newest biologic products on the market, this is classified as an autologous protein solution. ProStride is essentially a mix of PRP and IRAP, providing concentrated platelets and increased growth factors and anti-inflammatory proteins. It is produced by collecting blood, which is then processed through a specialized centrifuge and system of filtered tubes, and can be injected into the horse within 20 minutes of drawing the blood. It is generally marketed for osteoarthritis, and has been shown to provide significant improvement in lameness in some horses within 14 days post injection. It has also begun to be used for some soft tissue injuries.



Mesenchymal Stem Cells

Everyone has heard of stem cell therapy, but how it actually works and what it doesn't do isn't as widely known. Mesenchymal stem cells are collected via a bone marrow aspirate, usually from the horses' sternum or point of hip, and then processed and cultured for at least three weeks before they are ready for injection.

The theory behind using stem cells to treat an injury is that they have the potential to develop into the particular cell type needed to repair the injury, whether that's new tendon fibers or new cartilage. Cultured stem cells also contain growth factors and anti-inflammatory proteins. In practice, results seem to be mixed — they don't do much to treat osteoarthritis on their own and would need a specific tissue arrangement known as a matrix to facilitate cartilage repair. However, more research is always ongoing.

These are just some of the many options available to treat osteoarthritis and tendon injury, and not every treatment option is right for every injury, horse or owner. We would be happy to help you find the best course for you and your horse!

Crossword puzzle solution

