

Equine News

IN THIS ISSUE

- Deworming strategies for healthier horses
- Veterinary Teaching Hospital receives upgraded CT scanner
- Straighten up! Foals with angular limb deformities
- Facts about horse care at WSU's Veterinary Teaching Hospital



Deworming strategies for healthier horses

Deworming is an essential part of good horse husbandry. Due to the variety of products on the market, however, it can be confusing for horse owners to know which products to use and how often. With a veterinarian's guidance and a little knowledge of common equine parasites and how to best target them, owners can easily devise a deworming schedule that best suits their horses.

A primary deworming misconception is that dewormers will kill off the entire parasite load in a horse. In fact, it is nearly impossible to rid a horse of parasites. The main goal of deworming is to reduce the amount of eggs that pass from a horse onto pastureland. By reducing pasture contamination, horse owners disrupt the parasites' life cycles, thereby decreasing the amount of infectious eggs that the herd consumes.

The intestinal parasites that commercial dewormers target are ascarids (roundworms), bots, large strongyles, small strongyles, and tapeworms. Ascarids are common in younger horses and can have migration

patterns through the lungs and liver, in addition to their presence in the small intestine. Bots are fly larvae that reside in the stomach of adult horses. Large strongyles, or bloodworms, live in the large intestine and have the potential to cause anemia, liver damage, and aneurysm of a large artery supplying the intestine. Small strongyles, or cyathostomes, live in the lining of the large intestine, where they form cysts and can remain dormant for extended periods of time. Upon emergence from the cysts, cyathostomes can produce large quantities of eggs and cause damage to the gut wall, diarrhea, and anemia. Tapeworms live at the junction of the small intestine and cecum (a pouch that forms the beginning of the large intestine) and may play a role in formation of intussusceptions, a cause of colic. The term intussusception means the bowel telescopes or rolls onto itself, much like how a sock looks while being pulled or rolled off a foot.

The most common active ingredients in dewormers are ivermectin (multiple brands), moxidectin (Quest®),

fenbendazole (Panacur®), pyrantel (Strongid®), and praziquantel (found in Quest Plus®, Equimax®, Zimecterin Gold®, etc.). By knowing which parasites each product targets and their duration of action, an owner can plan how frequently a horse needs to be dewormed. Veterinarians recommend that dewormers be used on a rotational basis to decrease risk of drug resistance. These recommendations are for adult horses only, as foals and young horses require different deworming schedules and doses.

Ivermectin: Effective for 6-8 weeks. It does not affect encysted small strongyles and tapeworms.

Moxidectin: Effective for 13 weeks. It does not affect tapeworms or bots.

Fenbendazole: Effective 4-6 weeks. It does not affect tapeworms or bots, but will kill encysted small strongyles when used in a double dose for five consecutive days (Panacur Power Pack®).

Continued on last page

WSU Veterinary Teaching Hospital receives upgraded CT scanner

This spring, Washington State University's Veterinary Teaching Hospital installed a new, upgraded spiral computed tomography (CT) scanner for use in both small and large animals, thanks to funds donated by a generous family.

The VTH has had a CT scanner for more than two decades and a magnetic resonance imaging machine (MRI) since 1996. With the new Toshiba Aquilion 16-slice spiral CT unit operational, both MRI and CT in WSU's veterinary college are among the most advanced complementary tools for diagnostic imaging in the profession.

"Before the new CT, we only did a few horses a month, but now I would expect to do 10 times that," said Dr. John Mattoon, a WSU professor and board certified radiologist who is head of WSU's veterinary radiology section. "There were limitations with the old technology that hampered its everyday use, but the new CT is truly state-of-the-art with brand new software that hugely improves its capabilities. Our goal is to examine 100 horses a year with the CT, and several small animals a day."

Speed is one of the CT's main features. A small animal can often be imaged in the new CT scanner in seconds, in many cases without general anesthesia. "A horse was examined with the new CT in early June and it was completed in a couple of minutes," Dr. Mattoon said. "The anesthesia and prep-work it takes to get the horse into the machine takes much longer than the actual exam. By comparison, MRI may take an hour or more. Still, these two imaging modalities are complementary to each other, and one does not necessarily exclude the use of the other."

The CT scanner collects numerous images in slices and reconstructs the data in a variety of planes as well as three-dimensional representations of structures, such as a spinal canal with a bulging disc, or a fractured bone in a horse's leg. MRI is best used for imaging soft tissues, such as tendons and ligaments.

Horses are too large to fit entirely in the CT scanner, so only certain areas are eligible for examination. It is useful for imaging the skull, complex dental diseases, tumors of the head, and limb fractures, especially catastrophic ones in need of reconstruction. For small animals, the entire body can be scanned, and it is especially useful for examining the lungs and abdomen.



Tari, a 10-year-old registered Quarterhorse mare, undergoes a spiral CT scan to examine a mass near one of her carotid arteries. Dr. Tania Perez, a WSU anesthesiology resident, monitors her in the college's new CT scanner prior to the exam. Photo by Henry Moore Jr. BCU/WSU

"CT scans are the first choice in human medicine for imaging the lungs and abdomen, and I think it should become the standard of abdominal imaging in small animals as well," Dr. Mattoon said, who has practiced radiology for more than 25 years. "Unfortunately, horses are just too big."

As a result of the CT's speed, animals have to spend much less time under anesthesia, if at all. "For horses, we can use a short-acting anesthetic, and some small animals can just be sedated without undergoing anesthesia," Dr. Mattoon said. "This is an important advancement because there are always risks associated with anesthetizing an animal."

"Overall, CTs should be less expensive because exams take less time and anesthesia," he said. "This particular new CT scanner should also open up a whole new area of research, including vascular and shunt studies. I imagine that in the beginning we will do a lot of cases in which we use both CT and MRI."

The WSU College of Veterinary Medicine received the new CT scanner through a generous donation from Joe and Barbara Mendelson of Santa Barbara, California. Joe and Barbara's family have long been dedicated to Standardbred horses and whippets. They were made aware of WSU's veterinary college by two of its alumni—Drs. John Oplinger ('79) and Ron Faoro ('81).

"We are very privileged to have a 16-slice scanner," Dr. Mattoon said. "The machine collects multiple slices at one time, which is what makes it so fast. There are scanners out there that can collect more data at one time, but to put things in perspective, the CT scanner at Pullman Regional Hospital is currently a 4-slice scanner."

For more information about WSU's CT imaging, or to find information about obtaining a referral to WSU's radiology section, contact Dr. John Mattoon at 509-335-0711 or look online at www.vetmed.wsu.edu/depts-vth/radiology.

Straighten up!

When to treat a foal with angular limb deformities



A foal with multiple angular limb deformities, including fetlock and carpal varus.

No one wants to see a foal with knocked knees or bowed legs, but these types of limb deformities occur commonly in newborn foals, especially thoroughbreds and quarter horses.

These deformities, referred to as angular limb deformities (ALD), may be congenital and present at the time of birth, or develop within the first few weeks of life. In some cases, foals need treatment because

some deformities can worsen over time. In these cases, early intervention is important due to the limited time frame of bone growth, usually within the first couple of months or first year of life, depending on the location. But in most cases, correction may occur naturally without treatment.

"Foals are very rarely born with a conformation that is expected for an adult horse, and some experts believe that overzealous attempts to have a straight conformation in a young foal will result in an adult with deformities, due to the natural correction that will occur," said Dr. Stavros Yiannikouris, a WSU equine clinical instructor who recently completed a three-year surgical residency at WSU. "The key to a good outcome is to have a veterinarian perform an initial early assessment of the problem. It is important

Continued on page 3

Straighten up! *continued*

to recognize and manage foals with ALD because, depending on the horse's potential use, any change in the bone alignment around a joint will affect the health of the joint. Misalignment of bones above and below a joint may predispose the joint to arthritis and limit the extent of the horse's athletic function. It may also affect tendons and ligaments in a limb due to uneven forces placed on them, also resulting in damage to these structures and limiting the use of the horse. "

Deformities are classified as being either valgus or varus, in which a foal's limbs bend either outward or inward, respectively, using the bone above the joint as a reference to describe the direction of the deformity. One common deformity is when a foal's legs bend outward at the knee or carpus (carpal valgus), which gives the foal a knock-kneed appearance. Another common deformity is when a foal's feet grow inward at the fetlocks (fetlock varus). ALD occurs in the back limbs, especially the fetlocks, but is much less common in the hocks.

"The exact mechanism that causes this condition is not completely understood," Dr. Yiannikouris said. "There is a lot of speculation about what causes ALD, but it seems that in the majority of cases, the reasons are complex and involve several factors. The positioning of the foal in the uterus, nutritional factors, placentitis or inflammation of the placenta, trauma, and infections are some of the factors suspected to cause ALD in foals. "

"Trauma to another limb or any other reason causing uneven weight distribution sometimes also leads to ALD," he said. "This is comparable to adult horses that develop laminitis due to uneven distribution, whereas foals most likely will develop ALD."

A veterinarian must determine the location of the deformity in order to provide an accurate diagnosis, which will determine the appropriate treatment, if one is possible. A diagnosis can be made through observation while the foal is standing, with the veterinarian positioned directly in front of the area of the suspected deformity. The veterinarian will watch the foal in motion, walking towards and away, to determine patterns of movement, and manipulate the limb to determine potential laxity of joints, or sensitivity at the growth

plate. Radiographs of the affected limbs are also useful in determining the degree of deformity and localizing the site of angulation (pivot point).

Owners can also aid a veterinarian by providing photos or video images of the limb growth. This gives the veterinarian more information about the natural correction taking place and how the foal is adapting.

"Some degree of deformity may be acceptable depending on the intended use of the horse," Dr. Yiannikouris said. "It is worth noting that some very successful horses did not have ideal geometrical conformation but were still able to perform well without known complications."



A radiograph showing a transphyseal screw surgically placed for correction of a fetlock varus deformity.

A veterinarian usually will decide to intervene if the deformity is too severe for natural correction, if there is slow natural correction that will not finish before the end of the growth period, or if the ALD is causing a secondary deformity or injury to another part of the foal's anatomy.

"An example would be deciding to treat a deformity in the fetlock. Cannon bone growth is known to occur in the first four months of life, so any fetlock deformity should be addressed in the first 1-2 months of life," Dr. Yiannikouris explained. "In contrast, the growth around the carpus and hock usually occurs within 8-12 months of age, which gives a veterinarian a longer period to observe the foal—about 4-6 months—and determine if natural correction is sufficient.

"There are various treatment options available, depending on the degree of deformity and stage of the bone growth," he said. "Some are as simple as daily manual manipulation of the limbs and making some changes in the hoof trimming to promote different force on the limb. Others are as extreme as complete reconstruction of the "bend" bone, which involves surgical cutting of the bone, realignment, and plate fixation."

Some of the most common surgical treatments include procedures that are thought to increase the growth on a slow-growing site, called periosteal transection and elevation (PTE), or retard the growth on a fast-growing site, called bridging.

"The main advantages of the PTE procedure are that overcorrection, or deformity in the opposite direction, almost never occurs, and it is a one-time procedure," Dr. Yiannikouris said. "Correction is slow, however, and in order for a better outcome, it should be performed as early as the decision to intervene is made. Bridging entails placing either a screw and wire around the physis (growth plate), or a single screw through the physis. The main advantage of bridging is that the rate of success is usually higher, more predictable, and can be performed at a relatively later time, allowing more time to observe for natural correction. The main disadvantage is that a second surgery is usually required to remove the surgical implants. More importantly, close monitoring is also necessary since the implants need to be removed before overcorrection develops.

"Some horses with ALD are treated with splints, braces, or other external devices. While these treatments may be indicated or successful in some cases, it should be noted that these treatments are not indicated for the common deformities and can be very detrimental for the foal if not used properly," he said. "In most foals, secondary severe complications occur, including pressure sores and open wounds and/or laxity of the tendons and ligaments in the limb. A veterinarian should always be consulted before any attempt is made to splint a foal, since appropriate case selection—usually deformities originating from the joint—and very close monitoring and observation is key if a good outcome is to be expected.

"As with other aspects of life, keeping the end in mind, as well as a measured approach toward that end, is key when dealing with growing foals," he said. "Observation of growth, veterinary inspection of conformation, good nutrition, and proper hoof trimming are all important in growing a strong future equine athlete."

For more information about ALD, talk with your veterinarian or contact Dr. Stavros Yiannikouris at syiannikouris@vetmed.wsu.edu, or the Equine Medicine or Surgery Services at WSU's Veterinary Teaching Hospital at 509-335-0711.



A radiograph showing screws and a wire surgically placed as a correction for carpal valgus.

Facts about horse care at WSU's Veterinary Teaching Hospital

Every day, veterinarians at Washington State University's College of Veterinary Medicine provide state-of-the-art medical care for animals and crucial information for owners and referring veterinarians. From horses, dogs, and cats to parakeets, cattle, alpacas, llamas, and iguanas, animals of all types are treated in our world-class clinical teaching facilities.

WSU's Veterinary Teaching Hospital operates 24 hours a day, with regular business hours from 8:00 a.m. to 5:00 p.m. Monday through Friday. It is a full service hospital serving the Pacific Northwest and western Canada. The teaching hospital is part of the Department of Veterinary Clinical Sciences, one of three academic departments in the College of Veterinary Medicine. The hospital offers services to both large and small animals, as well as some nearby livestock units.

The VTH is a state-assisted \$38 million facility that opened in September 1996. Each year, WSU treats about 15,000 animals. The nearly three-acre facility encompasses the hospital, clinical laboratory, medical imaging, and epidemiological surveillance services, all under one roof. The central core provides space for surgery suites for small and large animals, clinical pathology, seminar rooms, administrative areas, reception, special medicine and diagnostic areas, and the state's only pharmacy dedicated exclusively to animals.

The VTH enjoys the finest medical imaging capabilities available to veterinary medicine. WSU is one of the most advanced veterinary hospitals in the world with such sophisticated systems as magnetic resonance imaging (MRI), computerized tomography (CT scan), and nuclear scintigraphy (bone scanning). Digital radiography and computer aided radiography are also available. Of note, WSU's MRI equipment is capable of evaluating lameness and neurological disorders in horses.

WSU's VTH also features a linear accelerator, one of the most advanced machines dedicated to cancer treatment in animals. While most commonly used for dogs and cats, it has also been used to treat cancer in horses. Other sophisticated diagnostic and treatment technologies are available as well, including ultrasound, endoscopy, arthroscopy, laser surgery, and therapeutic technologies including surgery, medical management, and radiation therapy.

Client animals are treated by renowned specialists who are in the process of training compassionate and capable future veterinarians. Faculty in the Department of Veterinary Clinical Sciences conduct research to enhance current knowledge of diseases, diagnostics, and treatment. WSU veterinarians lead in many areas of equine research, including sports medicine, joint disease, advanced medical imaging, and new techniques in laparoscopic surgery. Additional work is also being pursued on equine digestive and infectious diseases, as well as the immune responses of horses and foals to disease.

Appointments and Hours

Equine appointments can be made at the WSU Veterinary Teaching Hospital by calling 509-335-0711. Local veterinary care often is important for continuity of care for a patient, but no referral is necessary. Equine medicine appointments are scheduled on an individual basis. Equine surgery consultation appointments are scheduled on an individual basis to be performed later in the week. Equine theriogenology appointments are scheduled on an



WSU's recently installed 16-slice CT scanner can image certain areas of a horse in just several minutes.

individual basis at a time most convenient for both the animal owner and the clinician.

Appointments may be scheduled directly by individual service areas. A 24-hour emergency service is also available for both small and large animals. Please call 509-335-0711 if you are bringing in an animal as an emergency so our veterinarians can prepare for your arrival.

What to expect

A trip to the WSU Veterinary Teaching Hospital is unlike a trip to most veterinary practices. Care will be thorough, but the pace will be slower because of the important teaching that occurs. Upon arrival, clients register at the Admissions Desk. A senior veterinary student, or in some cases an intern or resident, obtains a complete medical history from the owner or caretaker and performs an initial physical examination.

More than one graduate veterinarian will likely examine your horse while it is at WSU. Most of the equine services at WSU function in a team configuration with a senior clinician, intern, and resident—all veterinarians—present, so examinations and treatments generally take more time than they would in the private sector. Since WSU is also home to some of the world's best equipment, most notably medical imaging, there are often delays due to demand for diagnostic and therapeutic procedures.

As with any medical facility, horses with true medical and surgical emergencies take priority over regularly scheduled appointments. In most cases, the hospital staff can give a reasonably accurate estimate of the approximate time necessary to adequately evaluate your horse and provide service. Because teaching is an integral part of the services we provide, most people accept some delays in order to obtain the most thorough and comprehensive examination for their horses that is available anywhere in the world.

Owners may stay with their horses during most initial examinations and some diagnostic procedures. However, there are some procedures, such as radiographs, nuclear scintigraphy, and surgery, where owners are not permitted because of safety, sterility, or infection control concerns. Daily visitation is allowed for hospitalized horses, but the timing and length of the stay may

Continued on page 5

Facts about horse care *continued*

be limited and should be scheduled with the attending clinician. In some instances in which a horse is in intensive care or an isolation unit, owners are not allowed to visit except with special arrangements through the hospital staff for the same reasons noted above. All visitors need to check in at the front desk at the time of arrival.

Payment Policy

Fees comparable with private practices are charged for all services provided by the VTH, with payment due in full at the time of service. Clients with animals treated as outpatients will be given an estimate of the cost before the service is provided, with payment due upon completion of the visit.

Clients with hospitalized animals will also be given an estimate, with prepayment of half the estimate due upon admission. The other half is due when the animal is discharged.

Directions

The WSU Veterinary Teaching Hospital is located on the Washington State University campus in Pullman off Stadium Way and Grimes Way across from Lighty Student Services Building. To get to the hospital, turn off of Stadium Way heading east onto Grimes Way. Then take the second right hand turn heading south on Ott Way where a brown sign on the corner says Veterinary Hospital.

Maps to the WSU College of Veterinary Medicine can be found at www.vetmed.wsu.edu/maps. Washington State University campus maps can be found at www.wsu.edu/campusmap.

Transportation and the "Horse Van"

Horse owners often choose to bring their horses to the WSU Veterinary Teaching Hospital themselves. But for convenience, WSU also offers a horse van service that transports horses to and from western Washington to the Veterinary Teaching Hospital in Pullman on a weekly or bi-weekly basis. The main pick-up point for horses west of the Cascade Mountains is at Donida Farms,



Dr. Claude Ragle performing a laparoscopic ovariectomy in a standing sedated horse. The surgery took approximately 30 minutes.

with directions posted at www.donidafarm.com. For more information about this transportation option, contact the Veterinary Teaching Hospital at 509-335-0711.

Parking

Space for short- and long-term parking is available at the hospital for all sizes of horse trailers and vans. Due to construction on the School for Global Animal Health building, traditional parking spaces for horse trailers and vans may be disrupted. Usually, agricultural animal and equine owners may pull their trailers through the security gate to park on the east side of the hospital.

If this is not possible, or to make sure you are in the right area, stop on the drive near the main entrance to the VTH and ask the receptionist in the front lobby about the best place to park. Also sign in at the reception desk when parking during regular business hours.

If parking for several hours, clients will be directed to a "longer term" lot. For those with RVs, parking is not allowed overnight, but the receptionist can recommend an appropriate place to park on campus or nearby.

Self-Referrals or Veterinarian Referrals

Owners may seek treatment for their own horses without a referral. If a private veterinary practitioner refers a client, he or she should call WSU and speak to the accepting service regarding the animal's physical condition, where it is coming from, anticipated arrival time if an emergency, and any other pertinent information. If the case is not an emergency, the accepting veterinarian may transfer the caller to make an appointment.

We welcome referrals from our colleagues in private practice for a variety of reasons, but most importantly because it is an invaluable part of our professional veterinary education program. Referring practitioners are encouraged to keep updated on the progress of the animals they refer to our hospital, and there are a number of ways this can be done.

WSU Veterinary Teaching Hospital Switchboard

Main Hospital Switchboard and Emergencies 509-335-0711
 Equine Appointments 509-335-0711
 Agricultural Animal Appointments (Non-Therigenology)..... 509-335-5377
 Therigenology (Equine and Ag Animal)... 509-335-0741
 Small Animal Appointments..... 509-335-0711

Dean's Office 509-335-9515
 VTH Fax Number 509-335-3330
 Billing 509-335-0711
 Pharmacy 509-335-0736
 Pet Partnership Program 509-335-7347
 Pet Loss Hotline 509-335-5704

Want to know more about our equine clinical services, research, and accomplishments, or receive our quarterly newsletter online? Visit the equine website at www.vetmed.wsu.edu/depts-vth/equine or the WSU Veterinary Teaching Hospital website at www.vetmed.wsu.edu.

To subscribe to the online newsletter, go to www.vetmed.wsu.edu/depts-vth/EquineNews.

Deworming strategies *continued*

Pyrantel: Sold as a paste (Pyrantel pamoate) or as a daily feed-through (Pyrantel tartrate). The paste is effective for four weeks. It does not affect migrating large strongyles, encysted small strongyles, ascarids, or bots. It will kill tapeworms when given as a double dose. The feed-through does not affect encysted small strongyles, ascarids, or bots.

Praziquantel: Effective against tapeworms only, and found in combination with other dewormers. Use once per year in spring or fall.

“The best way to assess the egg load your horses are producing on pasture is to submit a fecal sample to a laboratory for a fecal egg count, a test commonly performed at WSU at the Washington Animal Disease Diagnostic Laboratory (WADDL),” said Dr. Lisa Pearson, a WSU equine resident specializing in large animal theriogenology (reproduction). “By evaluating each horse individually, a tailored deworming program can be implemented, as some horses might not need to be treated as frequently, sometimes only a few times per year.”

A laboratory can also perform a fecal egg count reduction test on feces after a deworming product has been administered to demonstrate the effectiveness of the product in reducing egg production.

“A good time to perform this test is in the spring, after we are done experiencing winter’s freezing temperatures and encysted parasites emerge from the gut wall,” Dr. Pearson said. “First, a fecal sample is submitted for egg counts. The horse is then dewormed with a product of the owner’s choice. Two weeks after deworming, another fecal sample is evaluated. If the reduction of eggs is not greater than 90%, we categorize the parasites in that horse as resistant to that deworming product, and that product should not be used on that farm anymore.”

Parasite resistance to dewormers is a very important issue in horse care. Over the last decade, widespread parasite resistance to fenbendazole, moderate resistance to pyrantel, and a few reports of resistance to ivermectin have been documented in North America, Europe, Australia, and South America. Despite

these findings, these dewormers continue to be effective in areas that have not yet experienced resistance. Fenbendazole remains a good dewormer in foals and young horses, and when used as a double dose for five consecutive days.

Parasite resistance to dewormers develops much the same way as antibiotic resistance in bacteria. The dewormer kills off all the susceptible parasites, except parasites with mutations that make them resistant to the dewormer. They then repopulate the horse and pass on those mutations. When the horse passes these eggs out onto pasture, it spreads the resistant parasites to other horses.

“It is imperative that horse owners recognize the emerging problem of anthelmintic (dewormer) resistance and not arbitrarily deworm their horses without fecal egg count reduction tests,” Dr. Pearson said. “This is especially important because few new dewormers have been developed over the last few decades. And once widespread resistance sets in, we will be up the proverbial creek, with increasing numbers of horses with clinical parasitism. This can cause weight loss, lethargy, poor hair coat, colic, diarrhea, and, in extreme cases, death. Large breeding or training facilities often deworm all horses on the farm with the same product on a set schedule, usually every few weeks, regardless of the individual horse’s parasite burden or resistance pattern. If these practices continue, it is likely that these farms will have resistance problems in the near future, if they don’t already.”

Good management practices can enhance a good deworming program. In the Northwest, the freezing temperatures of winter kill parasite eggs on pasture. Additionally, pastures that have been vacant for at least several months, were used to grow hay, or that have been recently grazed by cattle are all considered safe, non-contaminated pastures for horses. Pastures should only be harrowed when not occupied, and manure from stalls and paddocks should be composted for several weeks before being spread.

For more information about dewormers, deworming schedules, and good management practices regarding parasite control, contact your veterinarian or call the Equine Service at WSU’s Veterinary Teaching Hospital at 509-335-0711.



Roundworm