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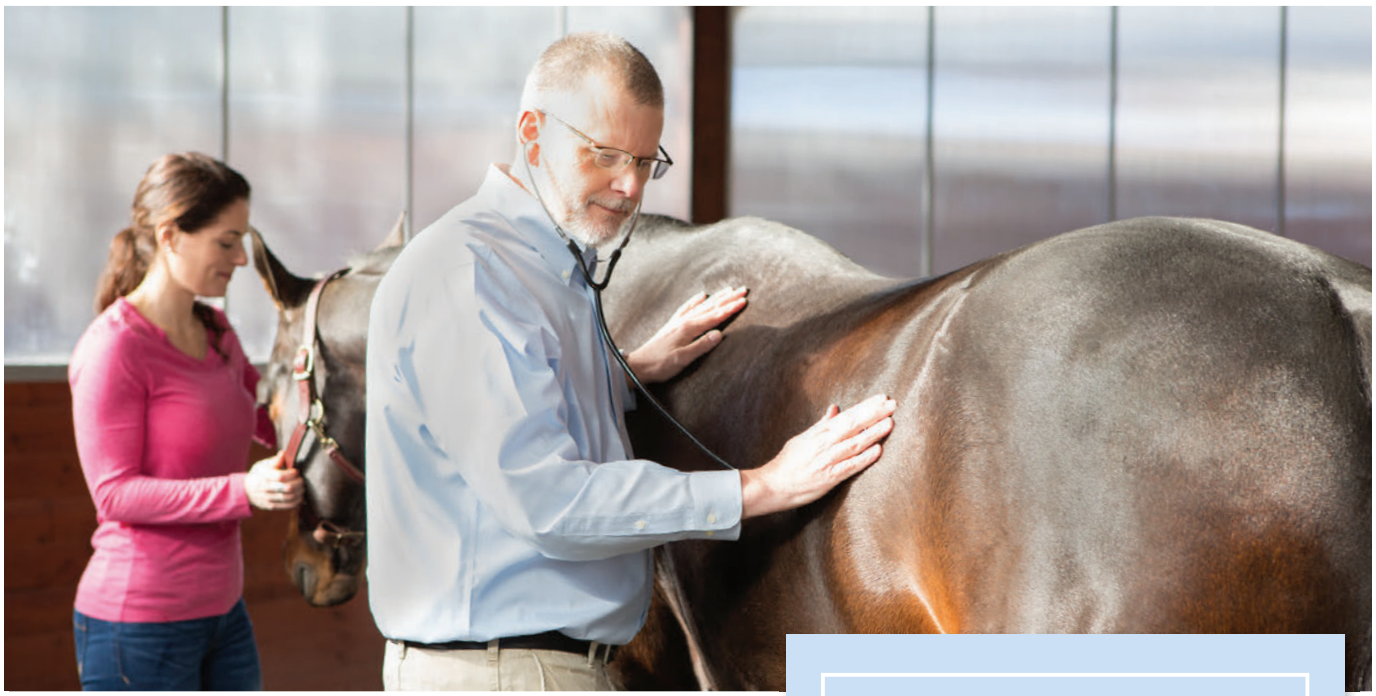

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Inside

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Tildren®

(tiludronate disodium)

BISPHOSPHONATE DRUG FOR INTRAVENOUS INFUSION.

For use in horses only

WARNINGS

Do not use in horses intended for human consumption. **NSAIDs should not be used concurrently with Tildren®. Concurrent use of NSAIDs with Tildren® may increase the risk of renal toxicity and acute renal failure.**

HUMAN WARNINGS

Not for human use. Keep this and all drugs out of the reach of children. Consult a physician in case of accidental human exposure.

CAUTION

Federal law restricts this drug to use by or on the order of a licensed veterinarian.

INDICATION

Tildren® is indicated for the control of clinical signs associated with navicular syndrome in horses.

CONTRAINDICATIONS

Do not use in horses with known hypersensitivity to tiludronate disodium or to mannitol. Do not use in horses with impaired renal function or with a history of renal disease. Bisphosphonates are excreted by the kidney; therefore, conditions causing renal impairment may increase plasma bisphosphonate concentrations resulting in an increased risk for adverse reactions.

PRECAUTIONS

Approximately 30-45% of horses administered Tildren® will demonstrate transient signs consistent with abdominal pain (colic). Horses should be observed closely for 4 hours post-infusion for the development of clinical signs consistent with colic or other adverse reactions. Colic signs can last approximately 90 minutes and may be intermittent in nature. Hand walking the horse may improve or resolve the colic signs in many cases. If a horse requires medical therapy, non-NSAID treatments should be administered due to the risk for renal toxicity. Avoid NSAID use.

Horses should be well hydrated prior to administration of Tildren® due to the potential nephrotoxic effects of Tildren®.

Tildren® should be used with caution in horses receiving concurrent administration of other drugs that may reduce serum calcium (such as tetracyclines) or whose toxicity may exacerbate a reduction in serum calcium (such as aminoglycosides).

Horses with HYPP (heterozygous or homozygous) may be at an increased risk for adverse reactions, including colic signs, hyperkalemic episodes, and death.

The safe use of Tildren® has not been evaluated in horses less than 4 years of age.

Bisphosphonates should not be used in pregnant or lactating mares, or mares intended for breeding. Bisphosphonates have been shown to cause fetal developmental abnormalities in laboratory animals.

DOSAGE AND ADMINISTRATION

A single dose of Tildren® should be administered as an intravenous infusion at a dose of 1 mg/kg (0.45 mg/lb). The infusion should be administered **slowly and evenly over 90 minutes** to minimize the risk of adverse reactions. Maximum effect may not occur until 2 months post-treatment.

For **ADMINISTRATION INSTRUCTIONS** (preparation of the reconstituted solution (20mg/mL) and preparation of the solution for infusion) and for complete product information, please read the insert contained within the product packaging.

STORAGE

Sterile powder (not reconstituted): Store at controlled room temperature 68°F-77°F (20°C-25°C). After preparation, the infusion should be administered either within 2 hours of preparation, or it can be stored for up to 24 hours under refrigeration at 36°F-46° F (2°C-8°C) and protected from light.

HOW SUPPLIED

Tildren® is supplied in a 30mL glass vial as a white, sterile lyophilized powder containing 500mg tiludronic acid (as tiludronate disodium) packaged in a folding carton. For technical assistance or to report suspected adverse reactions, call 1-888-524-6332.

INFORMATION FOR OWNERS

Prior to Tildren® administration, owners should be advised of the potential for adverse reactions in the hours or days following treatment. Adverse reactions within 4 hours post dosing may include signs of colic (manifested as pawing, stretching, getting up and down, sweating, rolling, looking at flanks, kicking at belly, frequent gas, and pacing). Owners should be instructed to contact their veterinarian immediately if any adverse reactions are observed. Owners should be advised to consult with their veterinarian prior to the administration of an NSAID following Tildren® administration.

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Patent information: U.S. patent 6,057,306

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To learn more about Tildren®, ask your Veterinarian or visit **tildren.us**.

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Did You Hear … ?

We at EquiManagement are excited to announce our new veterinary podcast, Disease Du Jour! We have an amazing lineup of guests, and we are looking forward to bringing their episodes to you. Each Disease Du Jour podcast will delve into the research and current best practices for a variety of equine health problems with industry experts. Each podcast will last 30-50 minutes.

You can listen to or download episodes of Disease Du Jour on iTunes, SoundCloud or Stitcher.

The first episode of Disease Du Jour featured Dr. Steve Reed, who talked about equine herpesvirus. This podcast focused on the respiratory and neurologic forms of equine herpesvirus and what veterinarians should know to recognize, prevent and treat this problem.

Also out and ready for listening are "Breeding Season Procedures" with Dr. Tom Riddle and "Equine Influenza" with Dr. Tom Chambers.

The topics for our next episodes will be "Diseases of Foals," with Dr. Bonnie Barr; "Abortive Diseases in Mares," with Dr. Peter Timoney; "Equine Veterinarians Influence Biosecurity on Boarding Farms," with Dr. Roberta Dwyer; "Genes are Management Tools," with Drs. Ernie Bailey and Samantha Brooks; "Respiratory Tips from the Field," with Dr. Rob Holland; "Equine Parasite Control," with Dr. Martin Neilsen; "Lameness Diagnosis," with Dr. Kent Allen; and "Infectious Diarrhea in the Adult and Neonatal Horse," with Dr. Michele Frazer.

New episodes will be available on the second and fourth Thursdays of the month. If you miss an episode, you can go back and listen to or download it on iTunes, SoundCloud or Stitcher.

We will alert listeners to new podcast episodes on EquiManagement.com and on EquiManagement's Facebook page. Or you can search for Disease Du Jour on one of the platforms listed above.

If there is a topic you would like to have covered or a person you would like to hear interviewed, please contact me at kbrown@aimmedia.com.

EquiManagement also is looking to create a second podcast, The Business of Practice, that would cover business and work/life balance topics for veterinarians. Stay tuned for more on that!

Online Education for Equine Vets

Have you visited the new EquineVetEdu.com? This online platform, brought to you by EquiManagement in conjunction with the AVMA PLIT and multiple partners, makes CE and non-CE, on-demand educational courses available to veterinarians, vet students, vet techs and other professionals in the veterinary industry at no charge. The best news about EquineVetEdu.com is that the content is designed for equine veterinarians. You don't have to search through and wonder whether the content will be applicable to your chosen profession!

The two newest RACE CE-approved courses are "Why Fat-Enhanced Lower NSC Diets Help Maximize Athletic Performance" and "Nutritional Support for Select Metabolic Conditions."

The main "buckets" for topics on this educational website are Disease, Lameness, Medical, Nutrition, Reproduction, Sports Medicine, Business and Ethics, and Health and Wellness. New courses are being added regularly, so check back often!

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By Nancy S. Loving, DVM

Glucose and Insulin Responses to Various Pasture Grasses

Managing metabolic responses of horses to forage is an ongoing challenge for horse owners and veterinarians throughout the year.

Spring and late fall grasses are particularly high in non-structural carbohydrates (NSCs) due to photosynthesis outpacing utilization in months when lower temperatures slow plant growth. NSCs tend to elevate glucose and insulin levels in grazing horses.

Alfalfa and teff (an annual warm-season grass) tend to be lower in NSC concentrations due to "a self-limiting carbohydrate storage mechanism."

Editor's note: *Teff is a fine-stemmed, leafy and soft palatable grass, with a forage quality similar to timothy grass. It also called annual bunch grass or Williams lovegrass.*

A Minnesota study looked at the responses in six aged mares (22-26 years old) to a variety of forage types:

- alfalfa versus mixed, perennial cool-season grass (CSG of orchard grass and Kentucky bluegrass) in spring
- CSG versus teff in the fall

When not grazing, the mares had access to alfalfa, CSG and teff in two daily feedings [DeBoer, M.L.; Hathaway, M.R.; Weber, P.S.D.; Sheaffer, C.C.; Kuhle, K.J.; Martinson, K.L. Glucose and insulin response of aged horses grazing alfalfa, perennial cool-season grass, and teff during the spring and late fall, *Journal of Equine Veterinary Science* (2018), doi: https://doi.org/10.1016/j.jevs.2018.10.027].

Evaluation of the results revealed that "there were no differences in the glycemic or insulinemic responses in the spring when comparing horses grazing alfalfa or CSG."

However, differences were observed in the fall. Teff-grazed horses had lower glucose and insulin responses compared to CSG-grazed horses.

The study concluded: "Teff appears to offer an alternative pasture forage to CSG in the late fall for horses requiring an attenuated glucose and insulin response."

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Managing metabolic responses to forage is an ongoing challenge for horse owners and veterinarians. Recent research has shown that some types of plants are lower in NSC concentrations.

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Abdominal Wire Foreign Bodies

Although horses tend to be fairly circumspect about eating foreign objects, sometimes it is unavoidable. One dangerous culprit for the risk of colic is from ingestion of wire. In some instances, hay bales were wrapped with wire, although it is more common today to use baling twine. That said, there is always the possibility of wire or metallic foreign body ingestion, especially for inquisitive horses or for those eating out of tractor tire feeders. Also, needles—including acupuncture needles—are dropped accidentally; these and other wire pieces have been found in bedding.

Usual locations where wire foreign bodies are found are in the mouth, tongue, pharynx and cranial cervical region. A study sought to identify the incidence of wire in the equine abdomen as well as assess the diagnosis, treatment and outcome of such occurrences [Marley, L.K.; Soffler, C.; Hackett, E.S. Clinical features, diagnostic methods, treatments, and outcomes associated with ingested wires in the abdomen of horses: 16 cases (2002-2013). *JAVMA* Sept 15, 2018, vol. 253, no. 6, pp. 781-787].

A review of 11 years of medical records was undertaken for horses admitted to the Colorado State University Veterinary Teaching Hospital for colic, abdominal radiographs or exploratory laparotomy. In this retrospective study of 3,293 horses, wire was identified and confirmed in 16 horses via radiography or exploratory surgery. The primary presenting complaints included colic, lethargy and/or decreased appetite. Rectal palpation identified an abnormal abdominal mass in three of the horses.

Half of the horses had peritoneal fluid samples analyzed; all samples revealed median cell counts and protein that exceeded the upper limit of reference values. Bacteria were present in three of eight samples.

Transcutaneous ultrasound on all of the horses failed to identify the wire.

Of the three horses with abnormal abdominal masses, transrectal ultrasonography was performed on two; wire was only detected in one of those.

Abdominal radiography of seven of the horses identified a single wire in four horses and multiple wires in two horses.

The authors noted that of 149 cases of abdominal radiography at the teaching hospital, six had wire, which was sometimes an incidental finding.

Medical treatment (antibiotics, IV fluids) alone was administered to six of the 16 horses. All six were euthanized due to a progression of clinical signs, especially since treatment was unable to address the underlying cause. One of the 16 horses in the study was dead on arrival at the hospital.

Eight of the 16 horses underwent exploratory laparotomy in conjunction with medical treatment. Four of these were euthanized due to adhesions, abscesses or intestinal perforation resulting in abdominal contamination and peritonitis. Three horses had small intestinal perforation and the other had a large colon sand impaction containing a wire.

Of the 16 horses in the study, only four survived, recovered and were discharged. Those four were managed with both surgery and medical treatment. Necropsies on the non-survivors identified wire within sand or abscesses in the large colon, spleen, liver, diaphragm or thorax. The length of the wire foreign bodies ranged from 4-15 cm. Fourteen horses had wire penetration of the GI tract, making tetanus prophylaxis also important when dealing with ingested metallic foreign bodies.

In summary, the overall case fatality rate was 75%. For those treated successfully with surgery and medical intervention, the long-term survival rate was excellent.

While transcutaneous abdominal ultrasound does not necessarily identify

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a metallic foreign body, it is useful for diagnosis of splenomegaly, abdominal effusion, intestinal dilation and soft tissues masses; many of those are associated with ingested wire. The authors urged the use of abdominal radiography for horses with peritonitis or abdominal abscesses in order to enable the definitive treatment with surgery in a timely manner upon identification of a metallic foreign body.

Reporting Animal Abuse

As an equine veterinarian, how many times in your career have you been called upon to either report horse abuse or weigh in on a complaint about horse abuse? Neither is an easy situation.

The National Link Coalition "works together to stop violence against people and animals." Its website has links for each state detailing who you can contact to report suspected animal abuse (go to nationallinkcoalition.org and search "how do I report suspected abuse").

Animal welfare organizations are usually not the best to call initially, as they often have varied and possibly no anti-cruelty law enforcement powers. That said, contacting state or local officials can be a frustrating process.

The National Link Coalition states on its website: "Do not be surprised if you encounter a 'runaround.' In many areas, law enforcement officials do not feel adequately trained to handle animal cases and frequently refer complaints to local animal control or humane officers, who, if they are not sworn law enforcement officers, may in turn refer the caller back to the police or sheriff. Just be patient and keep trying. Insist that animal abuse is a crime, and the law enforcement agency is sworn to investigate it, as they must with any other possible violation." Perseverance is key.

You will need to provide specifics about the abuse concern, such as location of the horse, description, the neglectful or abusive concern, and the date and time of the incident. Most states allow veterinarians to report suspected animal abuse "with immunity from civil and/or criminal liability." In fact, according to the AVMA, veterinarians may be legally mandated to report such concerns to an appropriate authority.

THINKSTOCK

Equine veterinarians are often among the first persons either to notice or to call authorities about suspected animal abuse cases. Getting involved is important, but it can be frustrating.

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The AVMA has also stipulated that it is the vet's responsibility to report when an educational approach is inappropriate. (For more information, visit avma.org and search for "animal abuse resources.")

A comprehensive AVMA guide entitled "Practical Guidance for the Effective Response by Veterinarians to Suspected Animal Cruelty, Abuse and Neglect" is available online. (Go to the above article and, at the bottom of the page, click on the link for the downloadable PDF entitled "Practical Guidance for the Effective Response by Veterinarians to Suspected Animal Cruelty, Abuse and Neglect.")

Effect of Sedatives on Hind Limb Lameness Evaluation

Working up lameness can be difficult with a fractious horse, especially when hind-limb diagnostic nerve or joint blocks are involved. There are times when, for safety reasons for veterinarians and handlers, it is necessary to sedate the horse. Often, there is concern that sedating a horse might mask a horse's pain response and thereby confound interpretation of the results of diagnostic nerve or joint blocks.

A group of Brazilian veterinarians examined the effects of using xylazine alone (0.3 mg/kg) or in conjunction with butorphanol (0.01 mg/kg) on induced lameness compared to a control group of horses that did not receive sedation [Beck, Júnior A.A.; De La Côrte, F.D.; Brass, K.E.; Dau, S.L.; Gabriele, B.S.; Camillo, MdA. Effect of xylazine and butorphanol on experimental hind-limb lameness in horses, *Journal of Equine Veterinary Science* (2018), doi: https://doi.org/10.1016/j.jevs.2018.11.007].

Sixteen adult horses were used in the study. Metal clamps placed around the hoof wall with small screws induced reversible lameness. The screws were tightened just prior to sedation until the horses became Grade 3 or 4 on the AAEP lameness scale (0-5). All the horses received the different treatments—xylazine alone, xylazine plus butorphanol or no sedation—in a crossover design with a 48-hour washout period.

AMY DRAGOO

Recent research on using sedatives and nerve blocks offers guidance for examining fractious horses.

The study concluded: "Xylazine alone or associated with butorphanol at the recommended doses may be used as chemical restraint to turn an anesthetic block of the hind limbs into a safer procedure without masking lameness intensity for at least 40 minutes post administration."

More research is needed to evaluate how detomidine and romifidine might interact with butorphanol during hind-limb lameness evaluations.

This study also did not examine sedative effects on joint anesthesia or neurologic evaluation. EM

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[1]Townsend L. Horse flies and deer flies. University of Kentucky *ENTFACT*-511.

By Amy L. Grice, VMD, MBA

Tips on Practice Marketing

Most veterinarians feel somewhat uncomfortable tooting their own horns and do not think about the value of marketing their brands. They might not even be aware that their practices have a brand identity. But marketing is simply the promotion of the products or goods that you offer—in other words, letting people know what you do.

A brand is an implied promise that the level of quality that people have come to expect from a particular brand will continue with future experiences. Brand identity is how the company wants the brand to be seen.

It can help to imagine your practice as a person whose character, values and attributes create benefits, performance, quality and service support. The brand can be viewed as a personality, a set of values or a position in people's minds. For example, your practice could be perceived by local horse owners as "expensive," "compassionate" or "disorganized." This brand image is determined by the sum of consumer perceptions about the brand or how they see the practice. Every business has a brand image, and most of the time, that brand image is set by your customers, not you.

But there are things you can do to influence the positive aspects of your brand.

Brand management is the application of marketing techniques to increase the practice's perceived value to the customer. In lieu of an image that you deliberately market with intention, could your practice be known as the largest or the most expensive? Or maybe the cheapest, the oldest or known for only serving certain disciplines? Many times what the local equine community believes about your practice is not accurate. That is why marketing is important!

ISTOCK/URBANCOW

Consistently represent "who you are" as a practice with your clients.

Companies have to work hard on the consumer experience to make sure that what customers see and think about a company is what the company owners intend. This is true for veterinary practices, as well.

You must think about looking through the lens of your clientele. What do they see, hear, smell, taste and touch when they interact with your practice? Veterinary practices need branding even more than most businesses, because it can be very hard for a lay person to discern differences in technical skill and clinical knowledge. They just know how they *feel* and the outcome for their animals.

What do you want your practice to be known for?

Make sure that every interaction your clients have with your practice supports that idea—that "brand identity"—across all of your activities.

Veterinarians who own practices should care deeply about strengthening their brands, because establishing a strong, loyal client base takes many years. However, when competition in an area increases, commoditization erodes perceived value, making your brand even more important. Commoditization occurs when the value of routine services erodes due to many providers competing for a limited market.

Consumers want consistency and an

experience they can trust. By having the practice brand linked in the horse owner's mind with the identity that you intend, your clients are much more likely to remain loyal. Also, a prospective client's reaction to an advertisement you have placed is more likely to be supported by what your current clients have said about you.

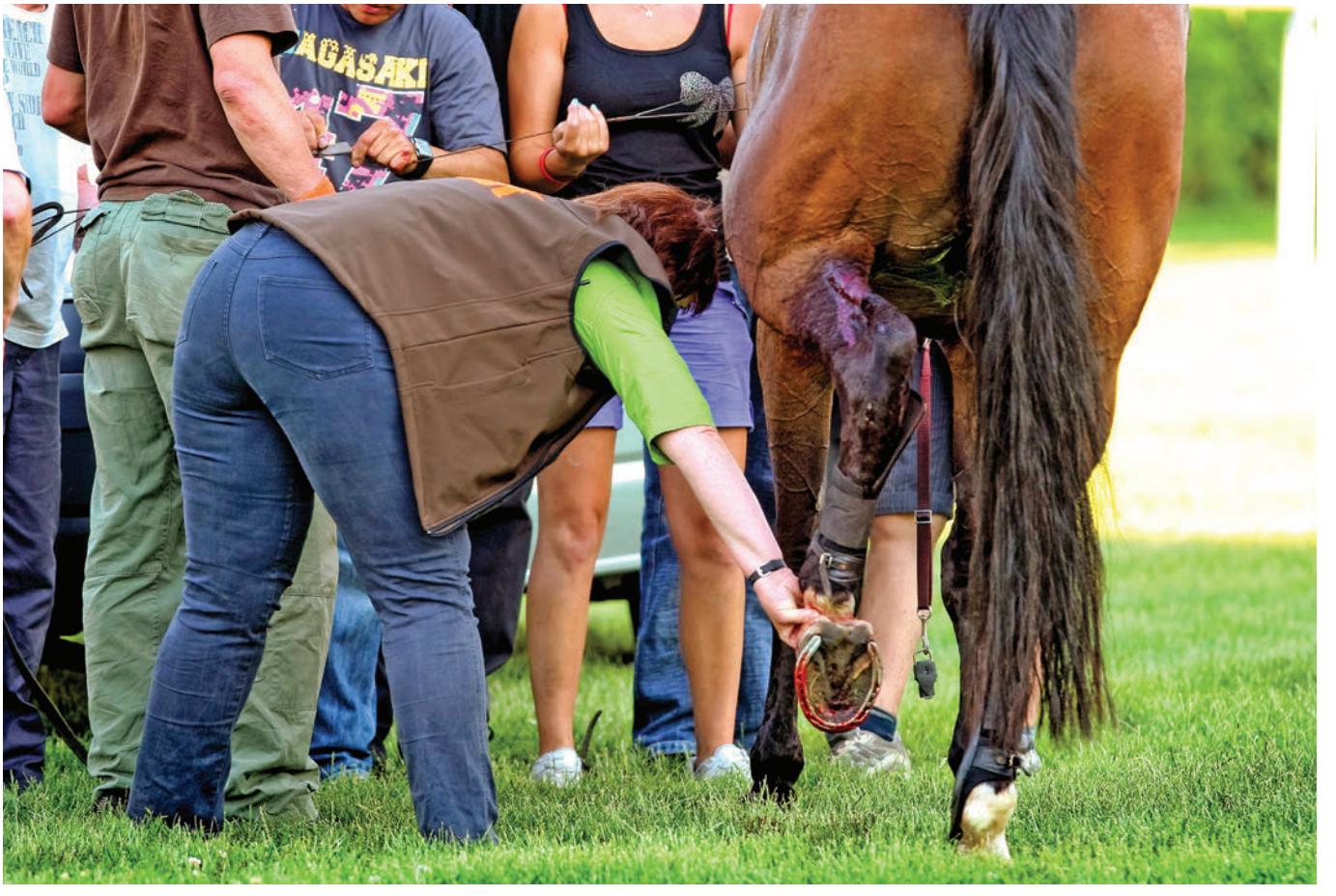
Build Your Identity

To build a strong brand, begin by determining your practice's core identity and what distinguishes you from other practices in your area. Try to boil that "identity" down into a few words that describe the essence of your practice's most important values. Then develop a consistent message and visual representation of that brand, and utilize that representation across all aspects of your interactions with clients and your local community.

Communicate your unique advantages clearly and consistently in everything you do and say. Be careful to only reach out to new markets, add new services and employ new skills when they align with your brand identity.

Use multiple channels to spread your brand message to as many current and prospective clients as possible. This will include email, social media and postal mail. Utilize your logo and practice colors on all materials that you use, whether they are invoices, trip sheets or a banner at a horse show or rodeo.

Consistently and repetitively share "who you are" as a practice in order to cement your brand identity in the minds of your customers. That is how you can stand out from the crowd and drive horse owners who share your values to become or remain your loyal clients. EM



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Emergency Medicine Update

It's not a matter of *if* you'll receive a panicked phone call from a client with a sick or injured horse; it's a matter of how often—and how you'll handle it.

By Katie Navarra

Advances in equine medical care often spring out of developments in human medicine. While human urgent care centers are popping up two and three at a time in some communities across the country, the general equine veterinarian is still the primary responder in equine emergency situations.

There are some equine emergency/referral clinics, but they are far less common and often are attached to veterinary schools. That means most veterinarians and their staffs must be prepared to diagnose and treat emergency situations at the horse's home barn at any time of the day or night.

"The key to providing quality emergency care in many cases is the willingness and the ability to be available when the need arises," said Leslie Easterwood, DVM, a clinical associate professor of equine community practice at Texas A&M University's College of Veterinary Medicine. "This could be counseling a client that the best available care is in the hands of a specialist and helping to get the horse into the best condition for transportation, or it could be actually providing the care that the horse needs to get through the crisis."

Equine emergency care is different from that of small animals. On-call and overnight small animal practices are more readily available to the public. A dog or cat isn't likely to see its regular doctor in the middle of the night, over a weekend or on a holiday. But for horses,

the regular veterinarian or staff from the practice are the ones who respond.

Transporting a horse that is critically ill or injured isn't always a viable option. Therefore, the client relies on his or her veterinarian to visit the barn when the horse needs help. That means emergency services are a necessity for every equine practice, and providing emergency services comes with the territory of the job.

Getting out of bed after midnight in the middle of winter is likely the least favorite part of any veterinarian's job. However, advancements in diagnostic and treatment techniques have enhanced a veterinarian's ability to assess and respond to situations faster—and with better outcomes—on the farm.

In the article that follows, Easterwood and Kentucky-based veterinarian Peggy S. Marsh, DVM, ACVIM, ACVECC, of Equine Medical Associates, PSC, highlight several advancements that have already changed the way veterinarians respond to emergencies. They also point out ongoing research efforts that should radically improve outcomes for horses and their owners in the future.

Enhanced Imaging Technology

Ultrasound isn't just for reproductive or "from-the-hock-down" musculoskeletal diagnostics in racehorses anymore. As the technology has evolved and image resolution has increased, ultrasound has become an invaluable tool for everything from lameness exams to tumor exploration, guided joint injections and much more. And ultrasound has become an important tool for ambulatory care. One example is a focused ultrasound examination of the abdomen that aids in diagnosing the cause of a colic episode.

Besides ultrasound imaging developments, you can add the major advancements in the field of radiographs, especially digital radiographs in the field. "With digital radiographs, an image is seen stall-side at the time of the exam," Easterwood said.

The image quality obtained today is light years ahead of where it was when digital radiographs were first introduced. Portability and image quality will only continue to improve as time goes on. High-quality images were the first major step for this technology. Now with the reliability and availability of wireless technology, it's even possible to view results in the palm of your hand on a tablet or smartphone.

"The technology is getting better and better all the time," she said.

Expanded Specialties

Compared to just a few years ago, there are an increasing number of veterinarians who specialize in large animal emergency and critical care. There are just under 50 of these specialists worldwide, and while many are at universities, some are in private practices, according to Marsh.

"They are an excellent source of information, along with the experienced equine practitioner," Marsh said. "Discussion groups, especially those on social media, have allowed veterinarians to share information and get advice quickly."

In the not-so-distant past, there were few specialists a veterinarian could contact and ask for advice on complicated medical situations. Now, even if the specialist is across the country, it's much easier to find one and receive feedback on a case in a timely manner.

For example, board-certified internists can now use advanced communication technologies to view ultrasound results or digital radiographs that are being done real time in the field.

"Being able to have a specialist 'along for the ride' allows for another set of eyes on a case," said Easterwood. "These consultations will become more common in the near future, and we are already seeing great success in human emergency medicine situations using this type of technology. Our veterinarians know that a specialist is only a phone call or teleconference away from being able to help on a case."

IV Fluids

In Marsh's opinion, some of the most exciting developments for equine emergency care are related to physiology and the scientific world's enhanced understanding of the functions and mechanisms that take place within a living organism. She explained that over the last five years, there have been significant advancements in learning about equine physiology that are changing the protocols for treating certain conditions.

One example is the administration of intravenous (IV) fluids and the impact that saline-based solutions have on restoring the body after injury. As the understanding of physiology increases, especially regarding methods to restore normal function after injury, it is becoming clear that what is in IV fluids is important and will vary based on the situation.

The book "Equine Fluid Therapy," edited by C. Langdon Fielding, DVM, DACVECC, and K. Gary Magdesian, DVM, DACVIM, DACVECC, DACVCP (2014), is a good resource, she said.

While saline is the most widely accepted IV solution of choice and is viewed as a "replacement fluid," new studies are indicating that current practices are not necessarily what practitioners want to be striving for. A better understanding of the amount of—and concentration of—fluids enables greater flexibility in treating a horse that doesn't seem to be responding to treatment. Changing the type of fluids administered means the horse gets back to normal more quickly.

Neonatal Care

Critically ill foals are routinely saved with intensive care that has evolved and is readily accessible. Advances in monitoring equipment that is modified for use on foals has allowed equine neonatal medicine to approach the level of intensive care that is available in human neonatal intensive care units. Often the research in one species leads to advances in treatments for another.

Easterwood pointed to the work of John Madigan, DVM, MS, DACVIM, at the UC Davis College of Veterinary Medicine. Madigan has worked in the area of maladjusted neonatal foals and has posed two important questions:

- What keeps a foal quiet in the womb, so that he doesn't move around?
- What changes happen at the time of birth that allow a foal to rise and walk within a few hours and be able to move with the mare to avoid predators very quickly after birth?

"His work to find new ways to understand and intervene in this process will not only help equine neonates, it could potentially lead to significant breakthroughs in human neonatal medicine," Easterwood said. "Advances in monitoring and intervening in blood pressure, oxygenation, electrolyte balances, etc., has led to many more foals saved when compared to a few decades ago."

Most veterinarians handle the emergencies of their clients 24/7/365.

Blood Substitutes

When a horse needs a blood transfusion, finding a matching donor can be challenging, especially when a lot of blood is needed. If veterinarians had a synthetic substitute that was available in a bag, treatment could be delivered more quickly. Sound otherworldly? While it's not quite viable now, Marsh predicts it's not too far off.

"Research has shown that using synthetic blood replacements have consequences. It's not working as well as researchers hoped, but I have no doubt that it will come to fruition in the future," she said.

Researchers believe artificial blood substitutes might pave the way to a new era in transfusion medicine. The 2016 study Artificial Blood Substitutes: First Steps on the Long Route to Clinical Utility, published in "Clinical Medical Insights: Blood Disorders," highlighted the progress in artificial blood substitutes, focusing on red blood cell substitutes and their potential in humans.

While artificial blood technology is still at the preliminary stages of development, and a greater understanding of how this will work in patients is needed, it has the potential to streamline the blood matching process. Ultimately, once it's proven effective in one species, it can become available in others. This means that in emergency situations, horses might be able to get blood transfusions much faster.

Orthopedic Injuries

Regardless of the horse's discipline, there is an inherent risk for an orthopedic injury. Whether a horse is barreling down the homestretch, performing a sliding stop or completing a jumper course, there's always the chance that fractures or soft tissue damage can occur.

This is one area that has experienced significant changes, according to Easterwood. When it comes to treating an infected synovial structure, many more horses are surviving what would have been fatal infections in the past.

When a horse sustains a potentially catastrophic injury, getting the horse to a referral hospital with a fracture that is still repairable is the first step to having a positive outcome, she noted. In recent decades, the development of new surgical techniques and external support devices, such as the Kimzey splint, has increased survival rates.

When discussing orthopedic advances in horses, Easterwood pointed to Texas A&M colleague Jeff Watkins, DVM, MS, who is working on developing orthopedic implants such as the femoral nail, which has led to advances in repairing previously fatal fractures.

"We have a long way to go before these repairs are as commonplace and affordable as we would like, but through the work of many orthopedic surgeons across the country, we are getting closer," she said.

Similarly, there are many research studies that date back to the mid-1990s

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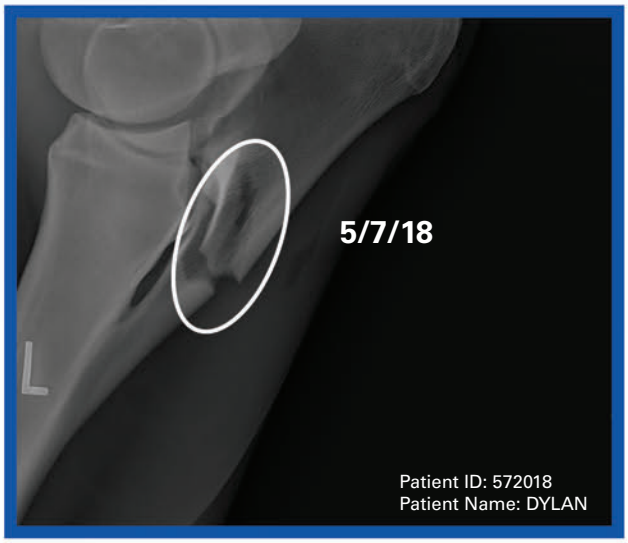

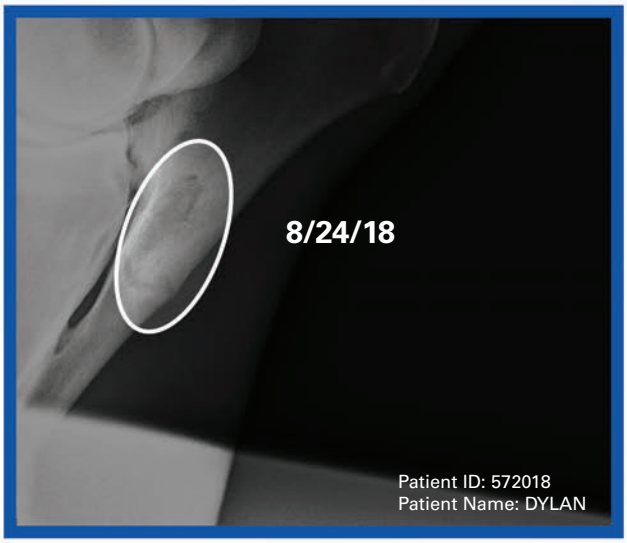

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"As horse owners, you know we will try anything especially when we are desperate.

My 24-year-old Thoroughbred, Dylan, broke his leg (Olecranon fracture) on May 7, 2018. It was a bad break for a 24-year-old and, at that age, you know it's a long road to recovery, if it heals at all.

My vets were amazed at the quick progress after we started Dylan on OCD Pellets. They said the improvement was remarkable and were impressed that he was still alive!

I have to say, going from the first day of injury wondering if I would have to put down my best friend to now trotting him in hand with no sign of lameness... Thank you, Doc's and OCD Pellets! **YOU SAVED MY HORSE DYLAN'S LIFE.**"

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Horse-side tests and instant communication between veterinarians and specialists is common today.

regarding regional limb perfusion, which offers local treatment to damaged structures. Variables such as the optimal volume of fluid, choice and dilution of antibiotic, length of time for the procedure, etc., have all been studied.

Optimal techniques have been developed for a variety of infection types and areas of the horse's body. More frequent regional limb perfusions, higher levels of antibiotics and advanced flushing techniques are a few of the advances that have led to increased survival in horses with severe injuries.

Stall-Side Diagnostics

When a horse spikes a fever at a show, the first question often seeks to determine whether the horse is neurologic. That leads to the question of whether the horse has equine herpesvirus, and if so, how it can be contained.

This is an unfortunate disease reality that is faced at many of today's competitive events. Diagnosing which illness the horse has expedites a veterinarian's response and lets him or her determine what happens next.

Real-time polymerase chain reaction (PCR) testing is so quick that the cause of an illness can be identified within hours instead of the days it might have taken in the past.

The test is so sensitive that even the DNA of dead bacteria can be identified. The technology amplifies even the smallest tissue sample and offers results, often in the same day.

"It's nice to know right away," said Marsh. "We're not yet real-time like Dr. McCoy on Star Trek, but this type of diagnostic technique is faster in helping us know what to look for, and it helps limit the number of horses that will get sick."

Owner Education

Today's horse owners are knowledgeable about the clinical signs associated with illness and injury. The internet, veterinarian-hosted seminars and discussions during routine vet visits have helped educate owners about basic and acute care.

"Owners who know that early intervention increases survivability will experience fewer situations with their horses that result in a catastrophic outcome," Easterwood said.

Veterinarians can compile a list of trusted online resources for clients. A clinic can plan an educational workshop to teach clients more about how to react in specific situations., which can save precious time in an emergency.

Take-Home Message

It's not a matter of *if* you'll receive a panicked phone call from a client with a sick or injured horse; it's a matter of how often—and how you'll handle it. While providing emergency services is part of the job for most veterinarians, it is important to consider what services you can offer with the staff and equipment you have available.

"It's important for veterinarians to remember that the majority of emergency cases they will be called to see are something they are more than capable of handling," Marsh said.

Exploring referral hospitals in the area and forming working relationships with other veterinarians is key for any practice. Establishing relationships with specialists, referral hospitals and other veterinarians in advance of an emergency situation is ideal. That gives both parties time to ask questions and understand how they can best work together and help one another.

"Attend or host a meet-and-greet to open the lines of communication before you're in the middle of treating an emergency," Marsh said. "That way you can provide the client with as much information as possible to help make decisions and provide the best care possible to the horse." EM

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Surviving Your First Year on the Job

New associates and experienced veterinarians alike can use these tips for a successful first year at a new job.

By Katie Navarra

You've finished four years of undergrad, and you're almost finished with your final rotations before heading off to an internship or to your first year as an associate veterinarian. You're leaving behind friends, mentors and a comfortable routine.

The education you've received has given you the practical skills needed to handle just about every scenario you'll encounter. You have knowledge of the latest treatment protocols for common conditions. And you'll be nervous—perhaps you'll even question your abilities.

"In the classroom you are very prepared, and you know what you are going to be tested for," said Kianna Spencer, DVM, who at this writing was nearing completion of her internship at Pine Bush Equine. "In the real world, you get to the appointment without knowing what you are going to encounter."

But it's not the technical skills that you'll find the most challenging, it's the soft skills—the client relationships—that will shake your confidence.

"This is a people business," said Mike Pownall, DVM, MBA, who is part owner of McKee-Pownall Equine Service and a partner with Oculus Insights (a practice management consulting firm). "You still have to have a love for the horse, but

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Trimethoprim is 2,4 diamino-5-(3, 4, 5-trimethoxybenzyl) pyrimidine.

ACTIONS: Microbiology: Trimethoprim blocks bacterial production of tetrahydrofolic acid from dihydrofolic acid by binding to and reversibly inhibiting the enzyme dihydrofolate reductase.

Sulfadiazine, in common with other sulfonamides, inhibits bacterial synthesis of dihydrofolic acid by competing with para-aminobenzoic acid.

Trimethoprim/sulfadiazine thus imposes a sequential double blockade on bacterial metabolism. This deprives bacteria of nucleic acids and proteins essential for survival and multiplication, and produces a high level of antibacterial activity which is usually bactericidal.

Although both sulfadiazine and trimethoprim are antifolate, neither affects the folate metabolism of animals. The reasons are: animals do not synthesize folic acid and cannot, therefore, be directly affected by sulfadiazine; and although animals must reduce their dietary folic acid to tetrahydrofolic acid, trimethoprim does not affect this reduction because its affinity for dihydrofolate reductase of mammals is significantly less than for the corresponding bacterial enzyme.

Trimethoprim/sulfadiazine is active against a wide spectrum of bacterial pathogens, both gram-negative and gram-positive. The following in vitro data are available, but their clinical significance is unknown. In general, species of the following genera are sensitive to trimethoprim/sulfadiazine:

Very Sensitive	**Sensitive**	**Moderately Sensitive**	**Not Sensitive**
Escherichia	*Staphylococcus*	*Moraxella*	*Mycobacterium*
Streptococcus	*Neisseria*	*Nocardia*	*Leptospira*
Proteus	*Klebsiella*	*Brucella*	*Pseudomonas*
Salmonella	*Fusiformis*		*Erysipelothrix*
Pasteurella	*Corynebacterium*		
Shigella	*Clostridium*		
Haemophilus	*Bordetella*		

INDICATIONS AND USAGE: Trimethoprim/sulfadiazine is indicated in horses where potent systemic antibacterial action against sensitive organisms is required. Trimethoprim/sulfadiazine is indicated where control of bacterial infections is required during treatment of:

Acute Strangles	Acute Urogenital Infections
Respiratory Tract Infections	Wound Infections and Abscesses

Trimethoprim/sulfadiazine is well tolerated by foals.

CONTRAINDICATIONS: Trimethoprim/sulfadiazine should not be used in horses showing marked liver parenchymal damage, blood dyscrasias, or in those with history of sulfonamide sensitivity.

ADVERSE REACTIONS: During clinical trials, one case of anorexia and one case of loose feces following treatment with the drug were reported.

Individual animal hypersensitivity may result in local or generalized reactions, sometimes fatal. Anaphylactoid reactions, although rare, may also occur. **Antidote:** Epinephrine.

Post Approval Experience: Horses have developed diarrhea during trimethoprim/sulfadiazine treatment, which could be fatal. If fecal consistency changes during trimethoprim/sulfadiazine therapy, discontinue treatment immediately and contact your veterinarian.

PRECAUTION: Water should be readily available to horses receiving sulfonamide therapy.

ANIMAL SAFETY: Toxicity is low. The acute toxicity (LD50) of trimethoprim/sulfadiazine is more than 5 g/kg orally in rats and mice. No significant changes were recorded in rats given doses of 600 mg/kg per day for 90 days.

Horses treated intravenously with trimethoprim/sulfadiazine 48% injection have tolerated up to five times the recommended daily dose for 7 days or on the recommended daily dose for 21 consecutive days without clinical effects or histopathological changes.

Lengthening of clotting time was seen in some of the horses on high or prolonged dosing in one of two trials. The effect, which may have been related to a resolving infection, was not seen in a second similar trial.

Slight to moderate reductions in hematopoietic activity following high, prolonged dosage in several species have been recorded. This is usually reversible by folinic acid (leucovorin) administration or by stopping the drug. During long-term treatment of horses, periodic platelet counts and white and red blood cell counts are advisable.

TERATOLOGY: The effect of trimethoprim/sulfadiazine on pregnancy has not been determined. Studies to date show there is no detrimental effect on stallion spermatogenesis with or following the recommended dose of trimethoprim/sulfadiazine.

DOSAGE AND ADMINISTRATION: The recommended dose is 3.75 g UNIPRIM Powder per 110 lbs (50 kg) body weight per day. Administer UNIPRIM Powder orally once a day in a small amount of palatable feed.
Dose Instructions: One 37.5 g packet is sufficient to treat 1100 lbs (500 kg) of body weight. For the 1125 g packets and 12 kg boxes, a level, loose-filled, 67 cc scoop contains 37.5 g, sufficient to treat 1100 lbs (500 kg) of body weight. For the 200 g, 400 g, and 1200g jars, and 2000 g pail, two level, loose-filled, 32 cc scoops contain 37.5 g, sufficient to treat 1100 lbs (500 kg) of body weight. Since product may settle, gentle agitation during scooping is recommended.

The usual course of treatment is a single, daily dose for 5 to 7 days.

Continue acute infection therapy for 2 or 3 days after clinical signs have subsided.

STORAGE: Store at or below 25°C (77°F)

HOW SUPPLIED: UNIPRIM Powder is available in **37.5 g** packets, **1125 g** packets, **200 g** jars, **400 g** jars, **1200 g** jars, **2000 g** pails and **12 kg** boxes. Apple Flavored UNIPRIM Powder is available in **37.5 g** packets, **1125 g** packets, **200 g** jars, **400 g** jars, **1200 g** jars and **2000 g** pails.

CAUTION: Federal (USA) law restricts this drug to use by or on the order of a licensed veterinarian.

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Practice owners should make sure to check in with new associates and help them integrate into the practice.

you're going to struggle in practice if you think it's all about the horse and its care."

Gaining a client's trust and developing long-term relationships takes time. It also requires solid communication skills for navigating difficult conversations. Here are four tips to help you prepare for your first position.

1. Sharpen the Soft Skills

Many veterinarians go right from high school to undergraduate studies, continuing straight to veterinary school without taking time off or working in another career. For some, that means they have had little experience reading facial expressions, interpreting body language or directing complicated discussions.

It might sound clichéd, but clients are more likely to remember how you made them feel than they are to recall a mistake. It might take a recent graduate longer to tube a horse or complete a dental exam, but if you have an established rapport with the client, he or she won't remember those details.

Pownall said that euthanasia is often the moment clients appreciate the most when it is done well. "Showing empathy and taking the time to answer their questions and provide all of their options makes the client feel like their concerns are being heard, and that goes much farther in building a relationship than using the newest technology to treat a horse," he said.

This type of learning happens on the job.

Observing seasoned veterinarians' interactions with clients is one way to glean effective communication strategies. Some of this develops through pre-visit preparation.

"I try to be prepared with the history of the patient and owner, as well as working alongside the vets they have been working with to build that relationship," Spencer said.

2. Manage Expectations

Interacting with clients might be the most overwhelming aspect of the job for new associates. Learning how to manage a client's expectations can go a long way toward building lasting relationships. It's important to recognize that all clients have some level of expectation related to the outcome of an appointment.

Ask the client what he or she expects in the short-term and the long-term if the horse has an injury or ongoing illness. Listen to what the client says is most important to him or her. That will help you determine how to respond and how to interpret the prognosis. Understanding where the client is coming from provides clues as to how to direct a dialogue so that the client is confident with what's been done, even if the outcome isn't the desired one.

"Sometimes you also have to be humble and ask for help when you don't know what you are dealing with," Spencer said. At the end of the day, the client

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Interacting with clients might be the most overwhelming aspect of the job for new associates.

will appreciate that you've put his or her horse's well-being ahead of your ego.

Develop a network of veterinarians you can trust and turn to in these situations. It might be a mentor from college, a colleague you've met through continuing education programs or online communities designed specifically for veterinarians to communicate.

The hardest realization for new veterinarians to accept is that a client's perception becomes his or her reality. Even when a diagnosis or treatment protocol is textbook-perfect and something goes wrong, there can be the perception by the client that the veterinarian should have done something differently.

Having good communication skills to explain each step of the diagnosis and treatment and to manage expectations can help avoid this problem.

3. Slow Down and Enjoy the Moment

Society has portrayed younger generations as having a lackluster work ethic. Millennials are sometimes described as being less motivated and less committed than their older peers.

Pownall disputes this stereotype—in his experience, newly minted veterinarians are so motivated that they are putting too much pressure on themselves. "Don't put pressure on yourself to be outstanding right away," he said. "We all make mistakes. That's why it's called veterinary practice."

There will be bumps in the road. Instead of panicking and rushing through, go back to the basics of what you do know. Every veterinarian knows how to give a physical exam and take a horse's vital signs. Start there and begin problem solving. Turn to your trusted network of mentors to provide guidance when needed.

Slowing down applies as much to a veterinarian's personal life as it does to his or her professional work. Work-life balance to keep the veterinarian healthy is as important as keeping horses healthy.

Veterinarians are vulnerable to burnout and suicide. Pownall encouraged recent graduates to prioritize their well-being. "These issues aren't talked about enough, but they are as important as professional development," he said. "Make sure you find resources for mental health and self-care when needed."

4. Build Relationships

Developing trust with clients happens over time. It starts with good communication skills and by demonstrating your interest in caring for their horses. Even the seemingly inconsequential actions go a long way toward building client relationships.

"Taking the time to pat the horse on the neck and ask the owner a few general questions about the horse demonstrates how important the animal is to you," Pownall said.

Finding a shared connection—either a compliment about a horse in the barn,

a mutual friend or a shared interest in specific bloodlines, etc.—can support meaningful, long-term relationships.

Last fall, Spencer visited a farm for the first time to work up a colic case. After the initial exam, she and the owners were chatting when a pretty-headed Quarter Horse stallion caught her eye.

She asked about the horse, and the owners revealed that they had purchased him as a weanling 16 years ago. They bought him from a farm several hours away where Spencer's significant other once worked. The clients knew the horse's sire, but couldn't remember the dam.

Later that evening, Spencer asked her significant other about the horse and which mare the stallion could have been out of. "He said, 'You know the horse's dam very well. In fact, I'm looking at her right now—she's sitting in my field!'" she recalled. "As it turned out, the horse was out of my own broodmare. I called the clients the next morning to tell them the coincidence, and we have been great friends ever since."

Take-Home Message

Starting any new career in any profession is nerve wracking. Recent veterinary graduates might feel this pressure more than other professions because a horse's well-being is at stake. It's easy to get wrapped up in the stress of it all.

"Take a step back every now and then and realize that you are living the dream. You made it!" said Spencer. "Veterinary medicine can be extremely demanding and stressful, but there are very few professions as rewarding."

Being resourceful and taking advantage of every learning opportunity that comes along can add confidence and experience. Today's world revolves around instant gratification. Remember that successful professionals build their careers over years.

"Our refuge is the connection with the horse," Pownall said. "Take a breather to enjoy what miraculous animals the horses are." EM

Tips for Practices Hiring New Veterinarians

Mike Pownall, DVM, MBA, a veterinarian and practice management consultant, hosts the American Association of Equine Practitioners (AAEP) Practice Life podcast. His September 2018 episode offered advice for new associates.

Two recent veterinary graduates, Jenna Donaldson of Rhinebeck Equine LLC and Zack Loppnow of Anoka Equine Veterinary Services, and seasoned practitioner Ernie Martinez of Hagyard Equine Medical Institute, dispensed advice that practice owners can use to help new associates feel welcome and have successful starts to their careers.

Present the new associate to the client in a positive light. Donaldson praised her colleagues for talking up the skills she brought to the table as a recent graduate. When experienced veterinarians take time to highlight the experience and talents that the newer individual brings to the table, clients are more likely to trust that person.

ISTOCK

Check in periodically. Loppnow described recent graduates as intensely motivated to succeed. Sometimes that can be done to a fault when they are striving to be perfect and exude confidence. Regular check-ins by practice owners should happen throughout the year. Simply asking "How are you doing?" opens the door for that new veterinarian to ask questions or discuss any challenges.

"We can hide failures and self-conscious moments, because we want to present a confident front," Loppnow said. "New graduates need an opportunity to check in and see how things are going from the owner's viewpoint. It doesn't have to be a formal meeting."

Involve interns in client discussions. Martinez encouraged seasoned doctors to include interns in the process of how he/she explains treatment options and outcomes to the client. If the conversation happens over the phone, use a speaker phone so the intern can hear the client's response and questions.

"That gives interns experience to fall back on the next time they have a similar case," he said. EM

DUSTY PERIN

Who Should Own the Practice Vehicle?

There are business, legal and tax implications surrounding who owns a veterinary practice vehicle.

By Amy L. Grice, VMD, MBA

In the equine veterinary industry, there are many "road warriors." The membership of the AAEP consistently includes 38-40% solo practitioners, most of whom are ambulatory. The results of the 2016 AVMA AAEP Equine Economic Survey revealed that 36.5% of respondents reported they were ambulatory practitioners, and an additional 35.4% reported they were ambulatory practitioners with a haul-in facility. With mobile practice comes decisions about vehicles—what should I drive and who should own it?

The choice of a practice vehicle is a personal one. Equine veterinarians in ambulatory practice often essentially use their vehicles as their offices, carrying a laptop and a printer as well as all the needed equipment and supplies for the day's scheduled and unscheduled (emergency) work.

Having adequate room to work efficiently and comfortably is necessary for a smooth workflow. Having room for an assistant or a truck dog can significantly improve well-being and decrease stress. Comfortable, climate-controlled seats that can be heated or cooled and adjust-

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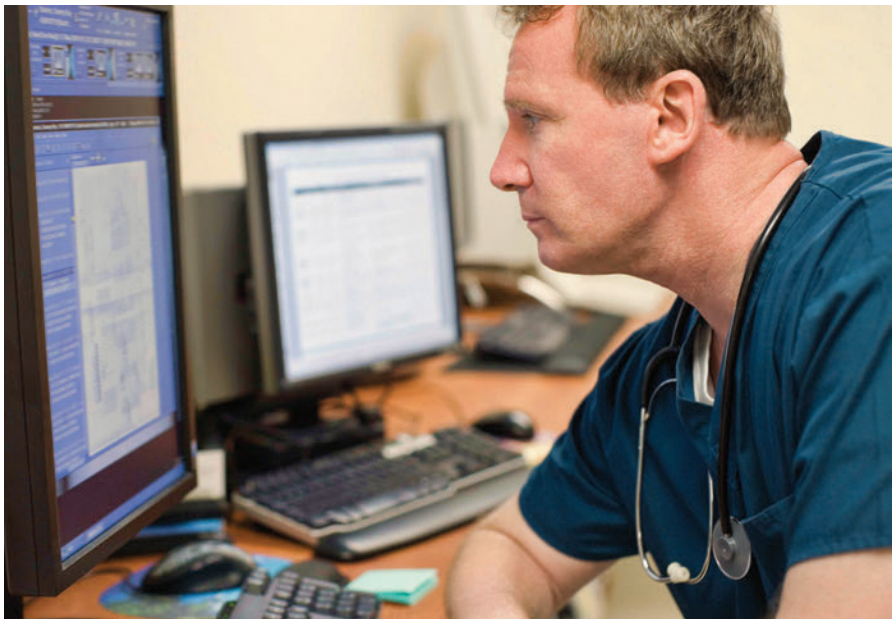

THINKSTOCK

Practice owners need to crunch the numbers to determine if the practice should own vehicles driven by associates.

ed while driving can prevent physical fatigue from long miles. A rear hatch that lifts and provides shade or cover from precipitation at the back of an SUV can be much appreciated.

In many areas, four-wheel or all-wheel drive is essential, and where pastures or poorly maintained roads must be traversed, adequate ground clearance is a must. If a pickup with a Bowie or Portavet unit is chosen, running boards allow much easier access to the contents of the "wings" for shorter people.

Having Choices

Having input or complete control over the choice of vehicle from which they practice can be important for some veterinarians' job satisfaction.

Veterinarians face the question of who should own the practice vehicle—the practice or the individual?

In group practices, owners who provide vehicles sometimes are frustrated that associates fail to treat them with respect. They tell of engine failures due to lack of attention to routine maintenance such as oil changes, diminished value due to excessive wear of the interior and carelessness resulting in body damage from vehicular accidents. Associates who provide their own vehicles are challenged by the need to provide a mileage log and sometimes complain of delayed

payments for mileage reimbursement. There are certainly positives and negatives for both positions.

When a practice wants to have a consistent brand experience for clients, having vehicles that are similar in color and style can contribute to that experience. Some practices have a painted or wrapped logo on each vehicle. Even the inserts in a practice's vehicles can be consistent, offering an opportunity to standardize stocking and organization if a veterinary team shares trucks.

With more practices moving to flexible, four-day schedules and/or employing part-time associates, vehicle sharing can be a cost-saving move. When one vehicle is unavailable due to repairs or maintenance, having a fleet allows veterinarians to use another without disruption of their calls.

Organizing physical counts of inventory and controlled drugs is facilitated with practice-owned vehicles, since they are typically parked at the practice.

Associates with strong vehicle and insert preferences often love the idea of providing their own practice vehicles and being reimbursed for their mileage. They might choose to drive a smaller SUV with excellent gas mileage to earn a little extra compensation from IRS mileage rate reimbursement. By ordering a custom insert, they can arrange their equipment exactly as they wish in a way that suits their workflows.

Because so many practitioners work long hours and have little personal time, having another vehicle for non-work hours might feel unnecessary, and with the reimbursement for work use contributing significantly to the costs for purchasing the work vehicle, this can reduce the associate's overall living costs.

Downsides

There are some potential negatives to consider, however. Along with the difficulties described above, insurance on business vehicles is expensive, as are registration, maintenance and repairs. Practices must protect their businesses from liability by ensuring that their associates carry adequate insurance for the commercial use of the practice's vehicles.

Vehicles purchased new rapidly lose value, particularly if they are not used with care. Mileage rapidly mounts up—47% of respondents in the AVMA AAEP survey reported driving 25,001-50,000 miles each year for their work. If a practice downsizes or changes vehicle type, such as moving from trucks to SUVs, it might struggle to sell a used veterinary insert.

Recent changes to the tax code limit the deductibility for purchase of business vehicles of less than 6,000 pounds gross vehicle weight. However, SUVs, trucks and vans are eligible for 100% bonus depreciation in IRC Section 179 if they are above 6,000 pounds. This is true for both new and used vehicles. Heavy duty trucks and large SUVs fit this criteria, so practices can still benefit from their purchase. But most associates

DUSTY PERIN

For "road warrior" veterinarians whose offices are their vehicles, comfort can be an important aspect of choosing the right vehicle for practice needs.

(who don't own their businesses) do not have this advantage because they will not be depreciating their vehicles.

These new tax laws limit the deductibility of smaller, more fuel-efficient vehicles, which might cause practices to needlessly spend more on gasoline if they decide to purchase heavier vehicles in order to utilize bonus depreciation.

Practices that are interested in maintaining a strong brand identity might wish to have control over the vehicles that are associated with their brands. For instance, if the practice wishes to serve a high-end population of athletes, an associate with an older, somewhat dilapidated or damaged vehicle might not be consistent with their desired image of prosperity and elitism. Purchasing a fleet of color-coordinated or identical vehicles may be more desirable in this case.

Associates who use their personal vehicles for work must be adequately insured for business use. This insurance is considerably more expensive than that for personal use. If a practice-owned truck is involved in an accident, the driver's personal insurance rates and liability are minimized. In addition, associates do not have tax advantages in the purchase of a vehicle and must absorb all the costs of vehicle repair and maintenance without being able to deduct this from income as an expense.

If an associate's vehicle is unusable for any reason, he or she might have to rent a replacement at his or her own expense. Although the reimbursement for mileage driven for work is not taxable, the costs of providing a work truck per mile might exceed the IRS mileage rate provided. Typically, this occurs when the vehicle chosen by the associate is large, has a high-level trim package and/or has poor gas mileage.

The 2017 Tax Cuts and Jobs Act disallowed employees' ability to deduct unreimbursed business expenses for the tax years 2018 through 2025. In addition, all reimbursed business expenses are now taxable to employees, including payments for mileage, unless these expenses are fully documented to the employer. If not "accountable," payments for driving expenses are now considered employee benefits. They are subject to withholding for federal income taxes, FICA taxes and unemployment taxes, and they must be reported on W-2 forms.

However, any payments to employees for vehicle expenses are still deductible to employers as business expenses.

If mileage will be reimbursed, accurate

records must be kept and submitted to the employer. The IRS watches entertainment, travel and vehicle expenses very closely to ensure they are truly for business and not for personal use. The required records must include the date and place of the expense, the amount and a short description of the business purpose. They are expected to be created contemporaneously—at the time the expense is incurred.

Solo Practitioners

When a solo practitioner is considering how to manage ownership of the practice vehicle, there are several considerations. The practice can lease the vehicle from the owner, allowing an expense for the business. Because loan payments are made from profits and are not deductible, but lease payments are, this decreases the taxable proceeds from the business.

However, the lease payments are considered income to the owner, so the benefit of this scenario will depend on the business structure of the practice and the personal financial situation of the owner. Your accountant can advise you. The business then typically pays all associated maintenance expenses, repairs, registration and insurance on the vehicle and expenses these.

Alternatively, the business can simply pay mileage to the owner at the IRS rate, which is adjusted and announced annually. In 2019 this rate is $0.58 per mile. Because these payments can be considered an employee benefit, they will be taxable unless the contemporaneous mileage log is kept and submitted.

This could be a method for reducing the tax burden of the veterinarian, but as with associates, the choice of vehicle size and trim level might result in higher costs than are covered by the IRS mileage rate. A modest SUV with good gas mileage will typically be adequately covered by the proscribed reimbursement.

Take-Home Message

It is possible to do a mathematical calculation to determine the best method for your situation, as outlined by Jorge Colon, DVM, MBA, at the 2018 AAEP Annual Convention.

This determination utilizes information such as the number of miles driven, the size and fuel efficiency of the vehicle, the cost of insurance and an estimate of the tax impact of the various scenarios to determine the most beneficial action.

The interpretation of the details of the 2017 Tax Cuts and Jobs Act have complicated this decision, so your accountant will be the best source for accurate, up-to-date information. EM

ISTOCK

Working Through Ethical Dilemmas in the Field

Veterinary professionals are driven, high-achieving performers who might struggle when ideal patient outcomes are not achieved.

By Jeannine Moga, MA, MSW, LCSW

In veterinary practice, "moral distress" is often triggered by situations that challenge how we think we ought to practice, how patients ought to be treated and how we ought to meet our perceived professional obligations (Crane et al, 2015).[1] Research shows that these challenges occur frequently and with significant impacts on our professional quality of life.

A 2012 study of veterinarians in the United Kingdom revealed that the majority of those surveyed reported facing ethical dilemmas at least once per week, with the most distressing situations involving the euthanasia of "fixable" animals, financial limitations on treatment and clients who wish to continue treatment when doing so is ill-advised.[2]

A more recent study by Moses, Mallowney & Boyd[3] revealed that more than 70% of American veterinarians surveyed reported experiencing obstacles in providing proper patient care.

In that study, 77% reported that ethical dilemmas in patient care have caused them moderate to severe distress, and 70% reported having little to no training in how to resolve these conflicts of care.

It is increasingly evident that ethical dilemmas are a leading cause of work-related stress.

When professional caregivers experience ethical dilemmas that are difficult to adequately resolve, the moral distress that results can cause feelings of apathy, avoidance of difficult interactions, reduced quality of care and symptoms of burnout.[4]

It is imperative, then, that veterinarians learn how to successfully problem-solve these dilemmas as they arise.

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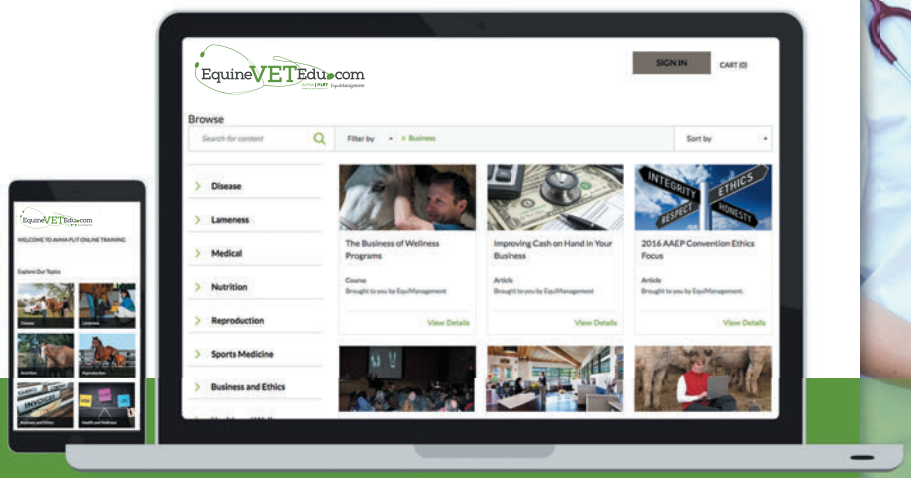

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Jeannine Moga is an "animal-informed" licensed clinical social worker practicing at the intersection of human and animal issues to improve individual and community health. She served as the founding director of Veterinary Social Services at the University of Minnesota's Veterinary Medical Center (2004-2012) as well as the founder of Family & Community Services at NC State University's Veterinary Hospital (2012-2018), where she created the first known veterinary clinical ethics consultation committee. She is now in private practice in southeast Virginia, where she provides practice consultation and education to veterinary providers, also maintaining a clinical practice specializing in grief and loss, chronic stress, burnout and human-animal relationships. She provides training for social services, veterinary medical and animal welfare workers across the country.

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However, training in applied clinical ethics is rare in veterinary training programs, and formal mechanisms for working through ethical dilemmas—such as the ethics consultation services found in most human hospitals—are rare (and particularly absent for those in ambulatory practice).

Thankfully, some of the concepts that are used in ethics consultation services can be adapted for rapid deployment in the field.

Working Through the 'Ought' Factor

Many core concerns tend to underlie ethical quandaries, including concerns about client ability to make sound medical decisions, treatment futility, patient quality of life and challenging client behaviors.

Additional worries about conflicts of interest, the allocation of scarce resources (such as opioid pain medications during drug shortages) and the boundaries of treatment (including experimental/novel treatments) can also arise.

Whenever we feel like we are blocked in some way from practicing as we "ought" to, an ethical challenge is likely at hand. How we think through these situations can either amplify or reduce our moral distress.[4]

A field model for crafting ethical solutions would require that we first press "pause" on our own response in order to accurately identify the core ethical challenge at play.

The "ought" factor often involves deeply held beliefs about what we believe, what we value and our purpose at work. It is critical that we be able to differentiate an automatic (and usually emotional) response to uncomfortable situations from a well-reasoned, neutral and educated one.

Once we are able to press "pause," we can proceed to *clarifying, evaluating and problem-solving* the facets of an ethical dilemma.

This kind of ethical analysis has roots in the constructs and models being used to help medical teams problem-solve dilemmas of care in human hospitals. Four core constructs of biomedical ethics[5] provide the foundation for weighing the needs of your patient, the desires of the client and the tools/treatments available in light of what is possible, probable and/or "the least worst" outcome in any case:[5]

1. Autonomy involves preserving the right of clients to make informed decisions free of coercion and coaxing while maximizing their understanding of the risks and benefits of any potential procedure or treatment.

2. Beneficence involves making sure that we provide care that can plausibly help the patient to achieve a reasonable medical outcome; as such, over- and under-treatment are to be avoided.

3. Justice involves addressing fairness in the distribution of scarce resources, fairly managing competing needs (the needs of the client, the patient and others involved in patient care), fulfilling our rights and obligations as professional caregivers and avoiding potential conflicts of interest.

4. Non-maleficence reflects the edict to "first, do no harm" (to the patient or to others in society).

These constructs can be applied to the following four topics of evaluation/conversation:[5]

1. What are the medical indications in this case? How do we balance potential benefits and potential harm?

2. What are the client's preferences (and limits)?

3. What *quality of life issues* need to be considered, both for the patient and the client?

4. Are there contextual features that need to be considered, such as availability of medications, barn resources, legal considerations (particularly related to neglect, abuse and ownership) or other constraints related to care?

A more succinct model of analysis can be found via the CASES model, which was created by the Veterans' Administration to guide consults on ethical dilemmas in medicine.[6] With CASES, the first order of business is to *clarify* the core ethical question or problem: What is the foundational concern in this case, and what ethical issues are involved?

Next, it is important to *assemble* relevant case information from those who are involved in care; this might require

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Whenever we feel we are blocked from practicing veterinary medicine like we "ought" to, an ethical challenge is likely at hand.

touching base with other care providers to understand the scope of the medical concerns and care.

A *synthesis* of this information should focus on identifying—and deliberating between—ethically justifiable solutions. These solutions might not be ideal, of course, but sometimes identifying the "least worst" solution for the patient helps caregivers to engage clients in more productive problem-solving.

Last, explaining these options to those involved (including the client), and the provision of *evaluation, support* and *follow-up*, helps to bring closure to situations that otherwise feel both daunting and unsolvable.

Brief Analysis in the Field

Not everyone has the time and resources to consult with an ethics team—or even a trusted colleague—when a difficult situation arises in practice. If we distill the tools described above, though, we can still develop a systematic and reliable method to problem-solve ethical dilemmas in the moment. Here are a few tips:

- First, *check in* with yourself and take a breath. Where is the "ought," what is my automatic (emotional) response, and what is a more reasoned response to this problem?
- Collect data. If possible, allow others involved in patient care (farriers, trainers, grooms) to add their two cents, as they might have useful collateral information. When this isn't possible, it can be good to call in a quick consult with a trusted colleague to make sure you aren't overlooking something in your reasoning.
- Delay judgment and assess the objective data. Pay close attention to the patient's condition, treatment options (the good, the bad and the ugly), client preferences, client resources and any other factors that might influence case outcome
- Evaluate evidence. This can determine how you might work with the client to achieve the best outcome—or the "least worst" outcome if the best outcome seems out of reach. Then have an honest discussion with the client about how to work toward that outcome for the patient within the means and constraints of the situation.

Take-Home Message

It goes without saying that veterinary professionals are driven, high-achieving performers who might struggle when ideal patient outcomes are not achieved. The high expectations we set for ourselves and others might not serve us well when the realities of human behavior, life strain and resource allocation are brought to bear on patient care.

Recognizing that we can only do the very best we can—with the tools and teams we have and with the best and clearest of intentions—can help us to find peace with processes and situations that are inherently unpredictable and often flawed.

While we cannot prevent ethically and morally charged situations from arising in the course of practice, we can develop a toolkit that enables us to problem-solve them.

When faced with ethical dilemmas in practice, remember to employ the following tools:

- **PAUSE** and assess the "ought."
- **CLARIFY** the root of the ethical problem.
- **ASSEMBLE** information and evidence related to medical concerns and options in terms of the Core Four constructs. Strive to be systematic and neutral.
- **SYNTHESIZE** what you know, and discuss concerns and options with the client to create a path forward.
- **EVALUATE** the process (what went well and what didn't?), provide support to the client and the patient's other caregivers, and follow up when necessary.
- **ENGAGE** in good self-care to counteract the effects of ethical dilemmas. EM

ARND BRONKHORST PHOTOGRAPHY

Lameness and Laminitis Research Studies

This focus on recent research can help you help your patients.

By Nancy S. Loving, DVM

Historically, laminitis has been associated with a specific inflammatory condition that evokes changes in blood flow and associated injury to the lamellar components of the hoof.

Researchers at the University of Helsinki discuss a different vantage for understanding this crippling malady [Patterson-Kane, J.C.; Karikoski, N.P.; McGowan, C.M. Paradigm shifts in understanding equine laminitis. *Veterinary Journal*, Jan 2018, vol. 232; pp. 33-40]. They noted that rather than being thought of as a discrete disease caused by systemic inflammatory response syndrome (SIRS) events, laminitis should instead be viewed as a clinical syndrome occurring as a sequel to several systemic disease problems. Occasionally, laminitis develops as a supporting limb problem related to severe lameness in the opposite leg.

Specifically, the authors suggested that multiple stimuli might elicit laminitis in horses affected with endocrine problems. This has significant implications for treatment that includes the need for dietary management in addition to treating hoof pathology.

The authors further remarked that endocrinopathic laminitis is "the most common form of naturally occurring laminitis in horses in the United States and Europe." Evaluation of laminitis cases by a USDA study (2000) identified that carbohydrate overload, colic or diarrhea cause only 12% of laminitis

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The dominant endocrinological problems that cause laminitis include equine metabolic syndrome and pituitary pars intermedia dysfunction.

cases, whereas the bulk of laminitis develops due to dietary imbalances and/or obesity.

The dominant endocrinological problems that cause laminitis include equine metabolic syndrome (EMS) and pituitary pars intermedia dysfunction (PPID). Insulin dysregulation is a primary feature of endocrinopathic disorders.

Another paradigm shift elucidated by the authors is that lamellar stretch and elongation might be a key "early and potentially crucial lesion." SIRS events occur acutely and are associated with overt laminitis; however, chronic endocrine disease is often associated with a lengthy subclinical phase. The authors suggest that the term "laminopathy" might be more appropriate for cases of endocrinopathic laminitis, because histological exam of endocrine-elicited lamellar injury demonstrates minimal inflammation despite lamellar tearing. This is different from the histologic picture of SIRS-induced laminitis, which is associated with accumulation of inflammatory white blood cells in the lamellar tissue.

Injury and separation of the basement membrane (BM), particularly due to matrix metalloproteinases, has been the focus of SIRS-induced laminitis. By contrast, in the acute phase of hyperinsulinemic laminitis cases, the BM remains mostly intact and attached, with only subtle changes in the BM. Tearing of lamellae in chronic endocrinopathic lesions tends to be located abaxially (closest to the hoof wall), whereas SIRS lesions involve tearing axially and disruption to the BM.

Of noteworthy importance in this paradigm shift is that chronic endocrinopathic laminitis cases experience a preclinical stage witnessed by divergent growth rings in the hoof, which might provide "a window of opportunity for intervention."

Nerve Block MRI Artifacts

It is not uncommon for a horse to be evaluated for lameness using diagnostic nerve blocks, then fairly quickly undergo an MRI examination. A recent study sought to determine whether recent diagnostic analgesia with mepivacaine—either perineural or intra-synovial—could cause artifacts that could confuse MRI interpretation [Nagy, A. and Dyson, S. Does Diagnostic Analgesia in the Distal Aspect of the Limb of Horses Performed in a Clinical Situation Less than 12 or 36 Hours Before MRI Result in Artifacts? *Journal of Equine Veterinary Science*, Mar 2018, vol 62; pp. 18-24].

The study looked at horses undergoing MRI that had diagnostic analgesia of the distal limb, either on the same day (i.e., less than 12 hours prior to imaging) or on the day before (i.e., less than 36 hours prior to imaging). Control horses had the same region of the limb examined but had not undergone any analgesic injections within the 36 hours prior to the MRI.

In conclusion, the study demonstrated that no artifacts resulted from diagnostic analgesia within 12 or 36 hours prior to examination with low-field or high-field MRI.

Use of Stem Cells and PRP in Laminitis Treatment

Efforts to stabilize the blood supply and to control pro-inflammatory enzymes within a laminitic foot could yield useful therapeutic applications. Stem cells and platelet-rich plasma have demonstrated the ability to positively improve inflammatory conditions.

One study sought to use both regenerative therapies in treating laminitis. The researchers theorized that bioactive factors in the platelets could reinforce stem cell biologic functions [Angelone, M.; Conti, V.; Biacca, C.; et al. The Contribution of Adipose-Derived Mesenchymal Stem Cells and Platelet-Rich Plasma in the Treatment of Chronic Equine Laminitis: A Proof of Concept. *International Journal of Molecular Sciences*, Oct 2017, vol. 18: 2122].

The study used nine laminitic horses that had not previously responded to conventional therapy and would otherwise have been euthanized. Ages ranged from 13-21 years of age. Instead of euthanasia, they were entered into a

clinical trial. Adipose-derived mesenchymal stem cells were suspended in autologous platelet-rich plasma (PRP) and administered into a digital vein. Four horses with laminitis in one foot received three injections; five horses with bilateral laminitis received six treatments. Continual monitoring included clinical examination, radiography and venography.

The results are promising: All horses experienced anatomical and physiologic progress, including hoof quality, with steady improvement in mobility. All returned to an improved quality of life and/or activity by six months after the first treatment. Of the nine, seven remained active at a year post-treatment. Two horses were euthanized due to recurrence of laminitis; three horses died from unrelated causes, such as colic.

The authors admit to limitations to the study based on the small number of patients and the absence of controls. Further exploration is warranted into regenerative treatment modalities for equine laminitis.

Bisphosphonate

Bisphosphonate is a popular medication used to control osteoporosis in humans. This drug has become available for use in horses under the names of Tildren (tiludronate) and Osphos (clodronate).

The intended application is for the treatment of navicular syndrome in mature horses. However, bisphosphonates are being used off-label for a variety of musculoskeletal disorders.

Known for its effects on osteoclasts specifically, there are unintended consequences when used inappropriately [McLellan, J. Science-in-brief: Bisphosphonate use in the racehorse: Safe or unsafe? *Equine Veterinary Journal* 49 (2017); pp. 404-407]. Osteoclasts are important for part of the natural process of bone repair, which is especially relevant for equine athletes such as racehorses that routinely undergo bone remodeling in response to training stresses on the skeleton.

In a normal situation, osteoblasts lay down immature woven bone to begin repair of micro-fissures in bone that occur with training. Then osteoclasts clean up the woven bone through resorption; this process allows the osteoblasts to finish the repair with strong, organized lamellar bone.

The bisphosphonates impair the osteoclasts such that woven bone remains for extended periods. Although on radiographs the bone appears OK, a bone crack is "patched" with layers of woven bone, but not actually repaired and remodeled with strong bone material. This subjects the weakened bone to risk from additional stresses and predisposes it to more significant stress fractures. In addition, bisphosphonates adversely affect cartilage, particularly if given at high doses via intra-articular injection or intravenous regional limb perfusion.

Due to its short half-life in serum and urine, it is difficult to detect bisphosphonate with conventional drug testing. However, the drug might remain in bone for at least six months.

"The drug stays 'buried' within the bone matrix until it is recruited in an area of active bone turnover" (McLellan EVJ). This poses an ethical dilemma in regard to sale horses that might exchange hands with a new owner unaware of potential risks due to extended effects of this medication.

Bisphosphonates should only be used on mature horses that are likely to be rested for convalescence of an injury. The manufacturer label on bisphosphonate states that this drug should not be used on horses younger than four years old.

In summary, using these products according to label specifications is the most prudent and successful use of the drugs. Veterinarians should refrain from using the drugs on young horses. The long-term effects of using bisphosphonates in horses are not yet known and still need science-based scrutiny. EM

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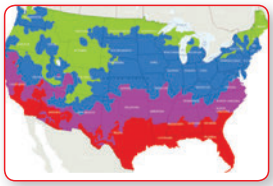

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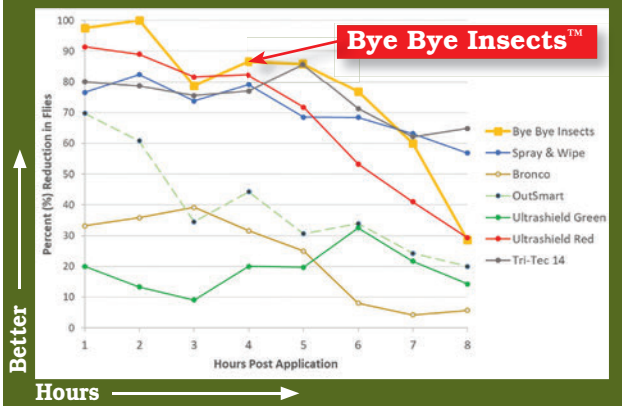
Bye Bye Insects' Biting Stable Fly Repellency Performance on Horses vs. Other Brands*



Looking at the graph above of fly repellency, note that Bye Bye Insects (Yellow) has comparable repellency to Farnam's Tri-Tec14, Absorbine's UltraShield Red and Pyranha's Spray & Wipe, three of the "high end" Pyrethrin based sprays. Bye Bye Insects performed far better than the other Essential Oil sprays like Absorbine's UltraShield Green or SmartPak's OutSmart. These tests were for Biting Stable Flies which are harder to repel than House Flies. Chart data as of 10/20/18. Test protocol and full data posted at **spalding-labs.com/p5ecr**

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Operating Agreements Among Partners

Plan for orderly transitions of ownership in your practice.

By Amy L. Grice, VMD, MBA

Any time there is more than one owner in a veterinary practice, an operating agreement should be in place. An operating agreement spells out the conditions of co-ownership so that all parties can fully understand the expectations of future transactions and behavior.

The intention of the document is to preserve the continuity of the practice through the smooth transfer of ownership and assure fairness in the process. It is similar to a prenuptial agreement, as well as resembling a will in some respects. The recent AAEP AVMA Equine Economic Impact Survey revealed that few practices have an operating agreement, although as the size of a practice increased, the more likely it was that an agreement was in place.

An operating agreement can be titled differently, depending upon the type of business entity under which the practice operates. Partnerships and limited liability partnerships (LLP) often title the document as a Partners' Agreement, while corporations have a Shareholders' Agreement and limited liability companies (LLC) typically have a Members' Agreement. Sometimes a practice simply has a Buy-Sell Agreement with a very narrow scope.

An operating agreement is a binding contract among the parties who sign it. A contract is defined as a written or spoken agreement that is intended to be enforceable by law. Without a well-written operating agreement, each transition of ownership becomes a different negotiation, with results that cannot necessarily be foreseen. Good operating agreements spell out expectations for the transfer of shares under a number of conditions.

Why Have an Operating Agreement?

In order to create an operating agreement, partners must agree on how different scenarios will play out. The objective of the agreement is to determine:

- Who can/will buy a departing owner's interest in the practice?
- What are the triggering events for an

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owner's interest buyout?
- What price will be paid for an owner's interest, and how will that price be determined?

When an owner departs, the purchase of his or her equity can be a *cross purchase*, where the departing partner's shares are bought and sold between individual owners/prospective owners, or *redemption*, where the interest is purchased by the practice. This concept is also known as an "outside" or "inside" purchase.

Cross purchase or redemption is important to consider because there can be a significant impact on the tax basis of the stock owned by the shareholders of a C Corporation. A stock redemption by a C Corporation will not increase the basis of the stock held by the remaining owners. By contrast, stock acquired in a cross-purchase transaction will result in a basis equal to the purchase price. This will result in a higher basis in the stock owned by the purchasing shareholders, allowing them to realize a lower capital gain on any subsequent sale of the stock. This basis issue usually is not a factor for S Corporations, partnerships or limited liability companies. In these types of pass-through entities, the owners will receive a basis step-up whether a redemption or a cross-purchase strategy is used.

What Triggers the Exit of a Partner?

There are a number of events that could trigger a partner's departure. Sometimes the agreement for purchase of the shares of the outgoing owner will differ based on what event is causing the exit.

Triggering events may include:
- death
- disability
- departure (before buy-in is completed)
- departure (early retirement)
- departure (retirement)
- departure (aged out)
- divorce
- dismissal
- disqualification
- disaffection

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Operating agreements are necessary for smooth ownership transition.

- deadlock
- disagreement
- default

Death of a partner is one of the most important reasons to have an operating agreement in place. If you were to die unexpectedly, what would happen to your equity in your practice? Would your family or heirs receive a fair price or be paid at all for your investment in the practice? How would the practice value be determined? Would your family receive that value as a lump sum, or over time with a promissory note? If paid over time, would the note be secured? What would happen if the practice subsequently failed to produce sufficient profit to pay the note?

If your state allows non-veterinary ownership of a practice, would your heirs be locked into practice ownership forever? If they were unable to negotiate a fair sale of your shares, would they be able to collect profits from the practice? Or could the other partner, who might have voting control, decide not to distribute profits?

These same questions could apply for the loss of one of your partners. Could you and your practice afford to pay the value of his/her shares to his/her surviving family members? How quickly could you do this? Many practices choose to carry a life insurance policy on each partner payable to the practice in order to meet these obligations.

Another common reason for the withdrawal of a partner is disability. It is important that an operating agreement define disability and the conditions for determining whether it is present, including a procedure for disagreements about its presence or absence. Typically practices utilize a third opinion if disability is in question.

It is very important to consider unpleasant realities and how you might react to them. If you developed macular degeneration and were becoming blind and it was difficult for you to read radiographs and drive safely, under what circumstances would it be fair for your practice interest to be purchased? What if your partner developed signs of Alzheimer's or dementia in his 50s, but refused to leave practice? Imagine that one of your partners was diagnosed with an aggressive debilitating cancer—what kind of fairness would you want your document to contain?

Remember that an operating agreement can be modified in writing with the agreement of all of the shareholders (or whatever proportion of shareholders you have memorialized in the document). However, it is important to consider multiple scenarios while constructing your agreement.

Aspects to consider with regard to disability include:
- For what length of time will salary and share-of-profits payments continue during disability, and what amount will be paid?
- How will you resolve disagreements about the degree and presence of disability?
- What length of time must a shareholder be disabled before triggering a buyout of equity?

- If a disabled partner returns to work, how long must he or she work before a new period of disability can be declared?
- If buyout ensues, will it follow the process outlined, as for a death?

Departures of partners can occur for a multitude of reasons. Because of the increased number of two-career couples in modern society, departures might follow a relocation of a spouse. In some cases, they could occur before a new shareholder's buy-in is completed. That could cause hardship to an older ownership group, depending on the new blood to secure the practice as they execute their exit strategy. It is worth considering a penalty on buyouts that occur before a 10-year period or the completion of a buy-in. Some practices do not return any equity if the buy-in has not been completed. Others discount the value of the shares in this scenario.

As veterinarians reach mid-life, they might re-assess their dreams for their remaining years, they might have care responsibilities for ailing parents or spouses, or they might face their own serious health crises. It is not uncommon for people to develop new priorities as they age. Sometimes these lead to departure from a practice as an early retirement or career change. Other times a veterinarian is simply "done" with the stresses and demands of a career in equine veterinary medicine.

The agreement should have a stated amount of time for notice required before the departure of a partner—typically 6 to 12 months—in order for the practice to plan an orderly transition.

Retirement is an expected departure, although some veterinarians choose never to retire. Sometimes operating agreements specify an age where owners must sell their shares in order that younger veterinarians can take their places at the table. Some agreements require that owners produce a certain amount of revenue for the practice in order to remain as shareholders. Sometimes retiring partners continue on as associates for a few years.

Divorce can be an upheaval in a partnership in states where a non-veterinarian can own a practice. If the ex-spouse is awarded the equity in a practice, one can imagine the difficulties. Some operating agreements therefore have divorce as a condition triggering buyout.

If a shareholder is dismissed from the practice for cause—malpractice, sexual harassment, embezzlement, conduct unbecoming, addiction to drugs or alcohol, etc.—the operating agreement should specify whether a discount will be placed on the buy-out value. The same is true of disqualification to practice, such as that which follows the loss of a license to practice veterinary medicine.

Although it is not common, occasion-

ally a departure occurs because of disaffection, which is when a person "quits in place." That means he or she continues to draw salary and profits while failing to contribute to the practice in a meaningful way. An operating agreement can set standards for revenue production or "substantially equal time and effort" from partners to avoid this scenario.

In practices with two owners having equal (50%) equity, deadlock must be addressed. Occasionally partners have a dispute and simply cannot come to an agreement with which they both can live. The solution might be to have one partner buy out the other, and the agreement should cover the mechanics of this possibility. Or the partners could agree to accept the decision of a disinterested third party. This arbiter should generally be named in the agreement. When disagreements occur among shareholders in multiple-owner practices, operating agreement decisions on majority, super-majority or unanimous voting can be utilized to arrive at a solution.

Lastly, default on financial commitments (bankruptcy) by an owner might put the assets of the entire practice in jeopardy, so language that defines the buyout of such a partner should be memorialized in the agreement. A discounted value is sometimes specified in these cases.

Other Elements to Consider

A well-written operating agreement will include thoughts about the process of choosing new shareholders/partners, including whether the vote to admit a certain individual must be unanimous. It will often detail the owners' rights to purchase additional shares to maintain or increase their percentage of ownership when shares become available. Details about dispute resolution, dissolution of company, mechanics for deadlock such as mediation or binding arbitration, as well as specifics of voting rights, voting and decision-making (majority, super-majority or unanimous) should be clearly stated in the agreement.

The document should include the mechanics for default in payment of buy-in or buy-out (grace period) under a promissory note. In addition, the expectation for inclusion or exclusion of insurance policy proceeds as a non-operating asset before valuation should be stated. This is important in the case of a death of a shareholder. If the proceeds of the life insurance policy held by the practice on the deceased member are considered practice assets at the time of the valuation, the value of the buyout will be higher.

In addition, the agreement should address the authority of a partner/shareholder to make unilateral buying decisions up to a particular dollar figure and the authority of a partner/shareholder to take on debt. It should include a non-compete clause and a non-solicitation clause for departing partners. When a separate real estate entity exists for a facility, the agreement might specify that a departing owner of the veterinary firm must sell his/her shares in the real estate company.

Because the operating agreement deals primarily with departures and sale of equity, it should include the method of valuation. If the asset method of valuation is chosen, the agreement should specify that "book value" of tangible assets will not be utilized in determining their fair market value. An approach for discounting aging accounts receivable should also be specified in this event.

Finally, the term, down payment, interest rate, whether fixed or adjustable, the form of note (interest only with balloon, equal payments of principle, amortized), the payment schedule (monthly/quarterly/annually), the priority/subordination to other practice debts, collateral/security, prepayment, and default should all be clarified.

Take-Home Message

A well-written operating agreement allows for smooth ownership transitions. Don't leave this to chance! EM

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