The Modern Equine Vet

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Joint Injections in the Field

Tips for Milking Mares

Good Recordkeeping the Best Defense

Tech Update: Broken or Blocked?

TABLE OF CONTENTS

4 **COVER STORY**
Joint Injections in the Field: Are They Safe?

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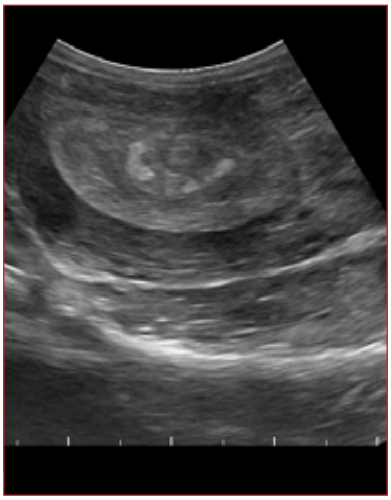

THERIOGENOLOGY
Tips and Tricks for Milking Mares 8

GASTROENTEROLOGY
Getting the Most Out of Your Colic Exam 12

TECHNICIAN UPDATE
Broken or Blocked? The Anejaculatory Stallion 17

PRACTICE MANAGEMENT
Good Recordkeeping Is Your Best Defense 20

NEWS NOTES
Equine Botulism Cases Tied to Alfalfa Cubes 15
GI Surgery Does Not Mean Lower Sales Price or Performance 19

ADVERTISERS

Arenus Animal Health/AssureGuard Gold 3
American Regent/Adequan 7
Arenus Animal Health/Aleira-Releira 9
Merck Animal Health 11
American Regent/BetaVet 13

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JOINT INJECTIONS IN THE FIELD: Are They Safe?

By Marie Rosenthal, MS

Providing joint injections for horses with osteoarthritis is a major part of many equine practices. However, veterinarians frequently wonder if they are safe to do in the field.

"If you're an equine practitioner, it's probably a huge part of your business," said **D. Reese Hand**, DVM, DACVS, a surgeon and partner at Equine Sports Medicine & Surgery, in Weatherford, Texas.

Most field injections are economical procedures that do not require specialized equipment and require little overhead, so they are a good profit center for the practice, according to Dr. Hand.

"It ought to be something that you are doing if you are doing field work," he said at the 68th Annual AAEP Convention.

People often wonder if injections are safe to do in the field, or whether they should always be done in a clinical situation, where the veterinarian can control the sterility of the environment. They can be done on the farm or at a show, he said, but care should be taken to assure as clean an environment as possible.

"If you're an ambulatory practitioner, most of these places have a barn, they've got a wash rack, they've got some sort of stall that is clean," he said.

Dr. Hand explained the at a show or in a barn, the wash rack is usually the best bet to get away from the dust and other environmental hazards.

"You have a more controlled environment [than if you were] injecting them in the middle or front of a barn aisle when the dust is blowing," he said.

If the wash rack is not available, then take them out in the middle of the grass where there is less dust, he suggested.

But in the right situations, with the right prepping, administering injections in the field is acceptable and more economical for the veterinarian and the owner, Dr. Hand explained.

"One of the biggest things that [might make] most people shy away from injecting a horse out in the field is because they are worried about [creating] a septic joint," he said.

However, Dr. Hand pointed to 3 studies that found no significant increase in the risk for septic joints resulting from injections in the field vs in the clinic.

Although biologics are becoming more popular in equine medicine, there is still a place for traditional

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medicine injections, he said. Traditional injections don't require the special equipment or handling that biologics do. Plus, they are less expensive, which makes them more accessible to many owners.

What Others Are Doing

The goal of an intraarticular injection is to provide a disease-modifying effect, usually to control inflammation, so the predominant injection is cortisone. A 2019 survey published in *Equine Veterinary Journal* asked veterinarians about joint injections, and then compared the results to another survey done 10 years earlier.

Of more than 800 respondents in the 2 surveys, 81% practiced strictly equine medicine, so Dr. Hand felt that it was representative of most equine practitioners. Methylprednisolone, triamcinolone and betamethasone were the top 3 drugs injected into joints.

"If you do ambulatory work with lameness, those are probably your top 3 drugs. You've got those in your truck and in your arsenal," he said.

In the survey, 77% of the respondents said triamcinolone was the most common drug for intraarticular injections—usually from 5 to 10 mg per joint. The lower doses are because of its reputation for causing laminitis, he said.

"There's actually never been a study that shows what a safe, true total body dose of triamcinolone acetate is," he said, although up to 40 mg total body dose has been studied.

It was drilled into the heads of many veterinarians in veterinary school that they should not go above a total body dose of 18 mg, and most of the veterinarians in the surveys (72%) still thought that held true.

However, 3 studies done between 2010 and 2021 found no dose-dependent increase in laminitis among healthy horses, he said.

"The words 'healthy horse' make all the difference in the world," he said.

If you are examining a gelding with a cresty neck that also looks pregnant, then a 40 mg dose of triamcinolone is probably not the best option.

"I promise that horse will be back to visit you sooner than you want," he added.

But if the horse is in good body condition and is fairly healthy beside the lameness, triamcinolone can be very effective because it acts quickly and does a good job at reducing inflammation.

He said that he has pushed the dose on some horses, and they've done well.

"But you have to be smart. You have to pick your cases, and you have to be diligent in knowing what is going on with this horse. You just have to be careful," he said, adding the literature helps support its use at higher doses in certain horses.

Methylprednisolone acetate (Depo Medrol) is the second most common drug used for joint injections, according to the survey And the dose ranged from 20 to 40 mg per joint, which is down considerably from the doses used 10 or 20 years ago.

However, there is no published safe maximum dose, he said. The total body dose given is anywhere from 200 to 400 mg total body dose.

"This particular drug doesn't seem to scare as many practitioners," he said, because it hasn't been linked to laminitis, but it does not mean it does not have toxicities.

"You have to be careful with this drug. It can be very hard on the cartilage," Dr. Hand said. It is very dose dependent and has very good anti-inflammatory properties.

"It's used most commonly in lower motion joints. But if you do use it in in higher motion joints, you want to try to keep those concentrations in that 10 to 20 mg range to protect some of the cartilage," he said.

The third most common used drug was betamethasone. Try to keep the doses between 4 to 6 mg up to 6 to 12 mg, he suggested.

Fewer people used dexamethasone—only about 10% said they would use it intraarticularly. Since Dr. Hand consults at the racetrack and shows, he does use dexamethasone.

"When you've got a show horse that needs to compete 2 days from now, and they need some help in a joint as long as there's no drug restrictions, then these are drugs that I think work really well.

"As a surgeon, we put a lot of dexamethasone in joints, 2 to 3 weeks after surgery just to quiet down the joint. And again, these are things that I do in the field. These are horses that I operate on at the clinic, go out to the barns and inject these horses out at the barn. So there is a use for that drug. I think they work really well."

Many veterinarians add amikacin to a joint injection to help prevent a septic joint. Often, they will make the decision to add it depending on the environmental conditions of the horse, usually at between 50 to 125 mg per joint.

However, "the literature has made us step back and take a look at whether we really should be adding this to our joint injections," Dr. Hand said. There are downsides to adding it. There are chondrotoxic effects, as well as concerns about developing drug resistance.

"And so there's a lot of discussion on whether we really even need to be using amikacin in these medications or in these joint injections," he said. **MeV**

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1 Data on file.

2 Adequan® i.m. Package Insert, Rev 1/19.

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TIPS AND TRICKS FOR Milking Mares

By Marie Rosenthal, MS

Mother's milk is good for foals because it is usually better tolerated and provides superior nutrition that helps intestinal development, explained **Scott Austin**, DVM, MS, DACVIM-LAIM, a clinical associate professor who heads the equine medicine and surgery section at the Veterinary Teaching Hospital, University of Illinois, in Urbana.

"Anytime we have a sick foal, our goal is to be able to return that foal to the mare. It makes it a lot easier for owners," Dr. Austin said. "But we have times when we have to keep the foal off the mare and during that time, we have to milk the mare to keep her in milk production."

Dr. Austin likes to keep the mare and the foal together, if possible, if the foal is admitted. This allows the veterinary staff to express milk and feed the foal if feasible. Depending on the health of the horses, they like to keep them in the same stall separated by a small partition, so they can bond. Even though she can't nurse, the mare can smell and nuzzle the foal, which will help when everyone is healthy, and the foal needs to go back to nursing.

Challenges

There are several challenges to milking a mare, especially a shy or maiden mare. Sometimes the mare will have considerable edema and will be in pain or resist handling. If a mare is not used to handling in the flank area, she may become skittish. The

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Above, a handmade milker. Below, a foal feeding.

Milking a mare

mare's teats may also be small and difficult to handle. In these cases, a homemade milker may be easier.

Often the problem is with the humans doing the milking; they are inexperienced and/or rushed, he said.

"I work at a university and so our milkers largely have no experience with horses, let alone milking mares," he said at the 68th Annual AAEP Convention in San Antonio. "We have to deal with teaching them all how to get the milk out, to not be afraid to be back there and to use their common sense to stay out of trouble," he said.

HOMEMADE MILKER

"Limited studies say you get higher milk yield, and you can get the milk out a little faster [with a commercial milker], so, if you're milking a lot of mares, these can be useful, but most of the time we don't have them available when we need them," explained Dr. Scott Austin, of the Veterinary Teaching Hospital, at the University of Illinois.

IF A COMMERCIAL MILKER IS NOT AVAILABLE, ONE CAN BE MADE WITH A MODIFIED 60 ML SYRINGE.

1. Cut off the tip with a hacksaw. (Watch your Fingers!) Keep the plunger in while cutting, so the barrel does not get deformed when you put pressure on the syringe during cutting.
2. Smooth the rough edges with some sandpaper.
3. Reverse the plunger and put it back in.
4. This creates a flange that goes up against the mare to get a tight seal, and suction to express milk.
5. A water-based lubricant around the end helps create a seal around the udder.
6. "Just put enough pressure to where you see the milk start expressing out of the teat into the plunger. That's all you need. And there's nothing to stop you from pulling the plunger out the back, so you need to stop at an appropriate place."

The horse is likely to only provide about 500 to 1,000 mL each time, so diligence is important.

Try to milk in as quiet a place as possible, keep the mare calm, and be gentle while milking."People can get really vigorous and allow the metal milking bowls to make a lot of noise, and some of these jumpy mares will move away, and they end up losing all of your milk products," Dr. Austin said.

"We've taken these mares; we've put them in to a stressful place. Their foals are not up to nursing. They don't get the same udder stimulation. They may be sore, and we must be diligent in milking them on a regular schedule—at least every 2 hours," Dr. Austin said.

It's also important to clean the udder with a warm cloth before milking and to have the mare in as clean an environment as possible to avoid bacterial contamination of the milk.

There are ways to encourage milk production, according to Dr. Austin. Develop a nutritional plan that includes ad lib feeding with hay and supplemental grain.

To make milking go smoother, feed the mare some grain while milking. Get her to relax.

It helps to take her to the foal and let her nuzzle it.

Use a warm compress on the teat to clean it off somewhat and help the mare become habituated to being touched.

"It helps stimulate milk let down. If she has got a lot of edema, it's usually soothing. And this becomes the cue to go ahead and milk," he said.

"And if all those things aren't working, we use oxytocin just to get the milk out of the udder." MeV

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Getting the Most *Out of* YOUR COLIC EXAM

By Paul Basilio

On average, colic cases represent one of the most common emergencies in equine medicine—especially after hours. Clinical signs vary from a mild case of flank watching to severe, uncontrollable, thrashing pain.

A clinician's ability to tease through information quickly to identify an underlying etiology can improve patient outcomes, client satisfaction and the effectiveness of the medical management vs. surgical intervention decision-making algorithm.

Andrew Willis, DVM, DACVIM (LAIM), of the Weatherford Equine Medical Center in Weatherford, Texas, recently gave a rundown of his methods and diagnostic modalities to determine whether his patients have a medical or surgical lesion, as well as how he rules out any non-GI causes of the horse's signs.

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INDICATION BetaVet® (betamethasone sodium phosphate and betamethasone acetate injectable suspension) is indicated for the control of pain and inflammation associated with osteoarthritis in horses. **IMPORTANT SAFETY INFORMATION** For **Intra-articular** (I.A.) use in Horses. **CONTRAINDICATIONS** BetaVet® is contraindicated in horses with hypersensitivity to betamethasone. Intra-articular injection of corticosteroids for local effect is contraindicated in the presence of septic arthritis. **WARNINGS:** Do not use in horses intended for human consumption. Clinical and experimental data have demonstrated that corticosteroids administered orally or parenterally to animals may induce the first stage of parturition when administered during the last trimester of pregnancy and may precipitate premature parturition followed by dystocia, fetal death, retained placenta, and metritis. Additionally, corticosteroids administered to dogs, rabbits and rodents during pregnancy have resulted in congenital anomalies. Before use of corticosteroids in pregnant animals, the possible benefits should be weighed against potential hazards. **Human Warnings:** Not for use in humans. Keep this and all medications out of the reach of children. **PRECAUTIONS:** Corticosteroids, including BetaVet,® administered intra-articularly are systemically absorbed. Do not use in horses with acute infections. Acute moderate to severe exacerbation of pain, further loss of joint motion, fever, or malaise within several days following intra-articular injection may indicate a septic process. Because of the anti-inflammatory action of corticosteroids, signs of infection in the treated joint may be masked. Due to the potential for exacerbation of clinical signs of laminitis, glucocorticoids should be used with caution in horses with a history of laminitis, or horses otherwise at a higher risk for laminitis. Use with caution in horses with chronic nephritis, equine pituitary pars intermedia dysfunction (PPID), and congestive heart failure. Concurrent use of other anti-inflammatory drugs, should be approached with caution. Consider appropriate wash out times prior to administering additional NSAIDs or corticosteroids. **ADVERSE REACTIONS:** Adverse reactions reported during a field study of 239 horses of various breeds which had been administered either BetaVet® (n=119) or a saline control (n=120) at five percent (5%) and above were: acute joint effusion and/or local injection site swelling (within 2 days of injection), 15% BetaVet® and 13% saline control; increased lameness (within the first 5 days), 6.7% BetaVet® and 8.3% saline control; loose stool, 5.9% BetaVet® and 8.3% saline control; increased heat in joint, 2.5% BetaVet® and 5% saline control; and depression, 5.9% BetaVet® and 1.6% saline control. **SHAKE WELL IMMEDIATELY BEFORE USE.** For additional safety information, please see full prescribing information. **CAUTION: Federal law restricts this drug to use by or on the order of a licensed veterinarian.**

References: 1. Trotter GW. Intra-articular corticosteroids. In: McIlwraith CW, Trotter GW, eds. Joint Disease in the Horse. Philadelphia: W.B. Saunders; 1996; 237-256.

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ADVERSE REACTIONS: Adverse reactions reported during a field study of 239 horses of various breeds which had been administered either BetaVet® (n=119) or a saline control (n=120) were: acute joint effusion and/or local injection site swelling (within 2 days of injection), 15% BetaVet® and 13% saline control; increased lameness (within the first 5 days), 6.7% BetaVet® and 8.3% saline control; loose stool, 5.9% BetaVet® and 8.3% saline control; increased heat in joint, 2.5% BetaVet® and 5% saline control; depression, 5.9% BetaVet® and 1.6% saline control; agitation/anxiety, 4.2% BetaVet® and 2.5% saline control; delayed swelling of treated joint (5 or more days after injection), 2.5% BetaVet® and 3.3% saline control; inappetance, 3.4% BetaVet® and 2.5% saline control; dry stool, 1.7% BetaVet® and 0% saline control; excessive sweating, 0.8% BetaVet® and 0% saline control; acute non-weight bearing lameness, 0.8% BetaVet®and 0% saline control; and laminitis, 0.8% BetaVet® and 0% saline control.

CLINICAL PHARMACOLOGY: Betamethasone is a potent glucocorticoid steroid with anti-inflammatory and immunosuppressive properties. Depending upon their physico-chemical properties, drugs administered intra-articularly may enter the general circulation because the synovial joint cavity is in direct equilibrium with the surrounding blood supply. After the intra-articular administration of 9 mg BetaVet® in horses, there were quantifiable concentrations of betamethasone (above 1.0 ng/mL) in the plasma.

EFFECTIVENESS: A negative control, randomized, masked field study provided data to evaluate the effectiveness of BetaVet® administered at 1.5 mL (9 mg betamethasone) once intra-articularly for the control of pain and inflammation associated with osteoarthritis in horses. Clinical success was defined as improvement in one lameness grade according to the AAEP lameness scoring system on Day 5 following treatment. The success rate for horses in the BetaVet® group was statistically significantly different (p=0.0061) than that in the saline group, with success rates of 75.73% and 52.52%, respectively (back-transformed from the logistic regression).

ANIMAL SAFETY: A 3-week target animal safety (TAS) study was conducted to evaluate the safety of BetaVet® in mature, healthy horses. Treatment groups included a control (isotonic saline at a volume equivalent to the 4x group); 1X (0.0225 mg betamethasone per pound bodyweight; BetaVet®); 2X (0.045 mg betamethasone per pound bodyweight; BetaVet®) and 4X (0.09 mg betamethasone per pound bodyweight; BetaVet®). Treatments were administered by intra-articular injection into the left middle carpal joint once every 5-days for 3 treatments. Injection site reactions were the most common observations in all treatment groups. Injection site reactions were observed within 1 hour of dosing and included swelling at the injection site, lameness/stiffness of the left front limb, and flexing the left front knee at rest. The injection site reactions ranged from slight swelling (in many horses on multiple days in all treatment groups) to excessive fluid with swelling, pain, and lameness (4x group only). Injection site reactions were observed most commonly on treatment days, and generally decreased in number and severity over subsequent days. The incidence of injection site reactions increased after the second and third injection (number of abnormalities noted on day 10 > day 5 > day 0). In the BetaVet® treated groups the number and severity of the injection site reactions were dose dependent. The 4X BetaVet® group had the highest overall incidence of and severity of injection site reactions, which included heat, swelling, pain, bleeding, and holding the limb up at rest. The control group and 4X group (which received similar injection volumes) had a similar incidence of injection site reactions; however, the severity of reactions was greater in the 4X group. Absolute neutrophils were statistically significantly higher in the BetaVet® treated groups as compared to the control group. Trends toward a decrease in lymphocytes and eosinophils, and an increase in monocytes were identified in the BetaVet® treated groups after the initial dose of BetaVet®. Individual animal values for white blood cells generally remained within the reference range. BetaVet® treated horses also had a trend toward increased blood glucose after the initial dose. Some individual animals showed mild increases in blood glucose above the reference range.

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Baseline data

Following a thorough physical examination that includes a distance examination to gauge the patient's pain or discomfort, Dr. Willis noted that approaching data collection and diagnostics in a methodical fashion is critical.

The first goal is to obtain a definitive diagnosis as early as possible. However, in many cases a definitive diagnosis will not be possible without exploratory laparotomy or invasive diagnostics.

"We want to categorize these as large intestine lesions, small intestine lesions, or some other type of lesions," Dr. Willis said during a presentation at the 68th AAEP Convention in San Antonio. "We want to determine whether these horses need surgical intervention or if we can manage them medically. Just employing this basic dichotomy can improve your outcome, as well as your treatment."

Baseline clinicopathologic data for assessing colic cases includes packed cell volume (PCV), total solids, and L-lactate. PCV and total solids are interpreted with each other, and they can help assess the hydration status of the patient. L-lactate can also help with perfusion parameters.

Another valuable diagnostic that is often employed is the blood gas analysis.

"The reason I like [blood gas analysis] is to evaluate the electrolytes and look for signs of metabolic changes and changes in electrolyte concentrations," he explained. "Particularly with ionized calcium, as it's employed in the mechanism of smooth muscle contraction. Aggressive correction of these changes can improve your outcomes in terms of medical management, but it can also make the patient a better surgical candidate if needed."

Additional diagnostics

Indications for a complete blood count (CBC) include horses with fever or hyperthermia and/or those patients with loose feces or diarrhea, but it may not be beneficial in every case. However, a CBC on a horse with an elevated rectal temperature and diarrhea on presentation, with thickened small or large intestines on ultrasound, can be helpful in management and in the biosecurity of your patient.

"It can also help determine an underlying diagnosis," Dr. Willis said. "If the patient has a low WBC, it could be the result of neutropenia or lymphopenia with or without immature neutrophils. That may help you render a diagnosis of colitis, enterocolitis, or enteritis."

Examination of the peritoneal fluid via abdominocentesis can be performed in either a hospital or a field setting for horses that are in a high degree of pain or in those with ultrasonographic evidence of dilated small intestine, GI rupture, thickened intestinal walls, intra-abdominal masses, or colonic vasculature in the right hemiabdomen.

Interpreting the results

The gross appearance of the peritoneal fluid should be straw-colored and moderately transparent. If the fluid is red (serosanguinous), a strangulating lesion may be present. In addition, cytologic evaluation of the fluid and measurement of total nucleated cell count (TNCC), L-lactate, total solids, glucose and creatine kinase (CK) can be helpful.

Clinicopathological parameters of normal peritoneal fluid can vary widely in the literature, so Dr. Willis has some personal cutoff values that he finds helpful (see **Table**).

PERITONEAL CUTOFF VALUES

Analyte	Cutoff
TNCC	<5,000 cells/µL
L-lactate	<2 mmol/L
Total solids	< 2.0 g/dL
CK	< 16 IU/L

"The L-lactate concentration—particularly when interpreted with the peripheral L-lactate, is extremely beneficial," Dr. Willis explained. "A cut point of < 2 mmol/L [for peritoneal fluid] is considered normal. When you compare that with the peripheral L-lactate, an increase in abdominal L-lactate that is greater than twice the systemic level may be indicative of a surgical lesion."

Peritoneal glucose levels should roughly approximate the peripheral levels. Some clinicians consider a peritoneal glucose level that is <50% of the systemic level to be indicative of septic peritonitis.

Abdominal ultrasound

Abdominal ultrasonography is particularly helpful for colic cases, and Dr. Willis prefers to perform them in a systematic manner.

"I like to start on the same side every time and work through in a caudal to cranial and dorsal to ventral fashion," he said. "However, this may be limited by the patient's pain or recumbency."

Ideally ultrasonography will be performed without sedation, as alpha-2 agonists can impact GI motility. Dr. Willis recommends a large curvilinear 2- to 5-MHz probe, although a 5- to 10-MHz rectal probe may be used if necessary.

In the right hemiabdomen, the cecum and the right ventral and dorsal colon should be examined for evidence of thickening. The duodenum should be located between the liver and the right dorsal colon and investigated for thickening or evidence of luminal distention and peristalsis. If colonic vasculature is visualized in this area, that could suggest right dorsal displacement of the large colon or a large colon volvulus.

In the left hemiabdomen, the spleen should be located adjacent to the left kidney. If the left kidney cannot be visualized due to gas-filled bowel with visible sacculations, nephrosplenic entrapment may be present.

"Next, look for the small colon within the left paralumbar fossa," Dr. Willis said. "They look sort of like clouds in the sky, and they should roughly mimic the sacculations of normal fecal balls."

The stomach should be visible adjacent to the splenic vein with a normal radius of curvature.

Rectal palpation

Dr. Willis advocates for a systematic approach to rectal palpation, as well. He typically prefers to work clockwise, separating the abdomen into a 4-quadrant window.

"For these cases, the patient should be sedated and well-restrained," he said. "Rectal tears can be a means of malpractice."

Abnormal findings include noticeable impactions, loops of small intestine, any bands coursing in any direction, or gas distension. Anything abnormal findings should be noted and interpreted in light of the other findings.

"At this point in the diagnostic workup, you should have a fairly good indication of what you're managing—whether it's the large intestine, small intestine, or something else," he said. "If the patient were to require surgery, then the surgical team should start preparing, and you should prep your patient to make them the best surgical and anesthetic candidate they can be. If surgery is not indicated, then you should start with aggressive medical management, such as some form of sedation, pain medication, and fluids if indicated." **MeV**

Equine Botulism Cases Tied to Alfalfa Cubes

At least 98 horses in Colorado, Louisiana, New Mexico and Texas showed neurologic symptoms after ingesting, alfalfa cubes, according to the FDA. At least 52 of these horses died or were euthanized.

On Jan. 19, 2023, the FDA finalized laboratory testing of samples of Top of the Rockies alfalfa cubes that confirmed the presence of Clostridium botulinum type C, a bacterium that can lead to botulism.

The FDA issued a warning after horses in several states reported cases of equine botulism that appeared to be linked to Top of the Rockies alfalfa cubes with the date codes 111222, 111322, 111422, 111522, and 111622.

These alfalfa cubes have been recalled by Manzanola Feeds of Colorado, which distributes products directly to farms, feed stores and co-ops in 8 states. Further distribution is possible, so it's important to check the date codes if you have these products, the FDA warned.

Top of the Rockies alfalfa cubes are sold in white and tan plastic 50-lb bags with green labeling. The date codes are on the front of the package. The UPC code is 7 9467111345 8.

Veterinarians should consider botulism in any horse that shows signs of neurologic illness after eating this product, the FDA said. Horses have shown symptoms of neurologic illness, including muscle tremors that rapidly progressed to the whole body, weakness, decreased tongue tone, agitation and inability to stand.

The FDA also recommended that veterinarians or owners report the illness to FDA through the Safety Reporting Portal or by calling your state's FDA Consumer Complaint Coordinators. If possible, share the brand name and lot numbers of what the horse's feed.

- Wear disposable gloves and a face mask (preferably an N95 respirator) while disposing of cubes and cleaning containers.
- Clean containers with a bleach solution (¼ cup bleach to 2 cups water).
- Completely cover the container with the bleach solution, place a layer of paper towels on top of the bleach, and let sit for at least 15 minutes.
- Wipe up any remaining liquid with new paper towels and let the containers air dry.
- Clean the area with liquid soap and water to remove the bleach and discard any items that may have encounter the contaminated cubes food or containers.
- Dispose of the face mask and gloves in a secure trash receptacle and wash your hands with soap and running water for at least 2 minutes. **MeV**

Broken or Blocked? The Anejaculatory Stallion

By Katrina LaCaze, BS

VS, a 24-year-old Quarter Horse stallion, presented to the Equine Theriogenology service at Texas A&M Large Animal Hospital in March 2021 for assessment of anejaculation.

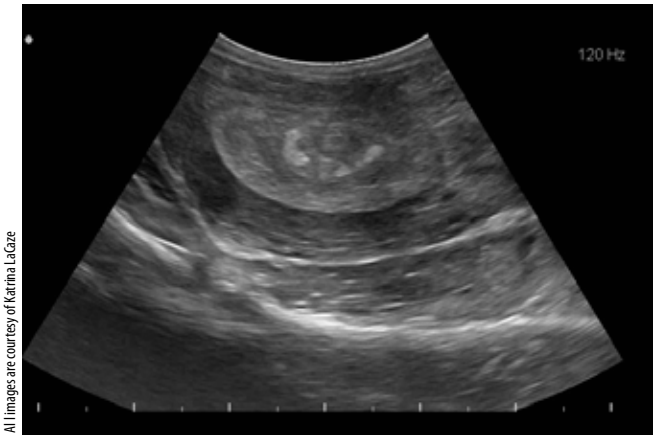
The stallion had been purchased from Canada in October 2020, where he had been a successful breeding stallion with live cover, cooled and frozen semen. The stallion was sold with a semen evaluation from late summer 2020 stating that he had low total sperm numbers but very good motility and morphology. After the stallion was purchased, semen collection was attempted multiple times by the referring veterinarian. An ejaculate was not obtained in these efforts; therefore, the stallion was referred to Texas A&M University for further evaluation.

The owner's goals for this stallion are to breed approximately 5 mares per year via live cover and freeze semen for later use.

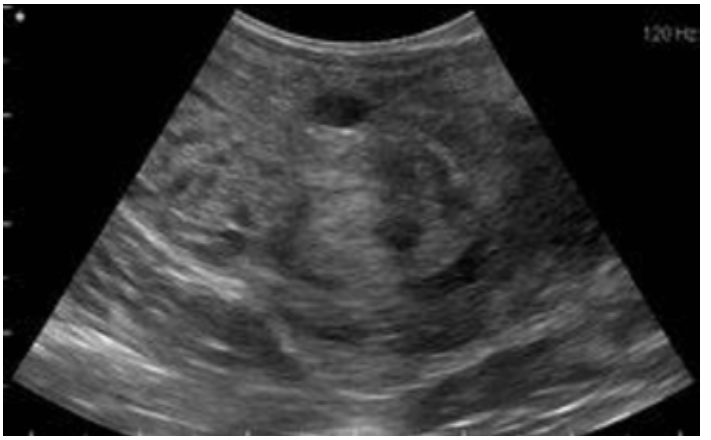
The initial day of semen collection attempts was unsuccessful. The stallion demonstrated normal pre-breeding behavior and libido when he entered the breeding shed. He was teased to an ovariectomized mare, and his penis was rinsed with warm water and dried with clean towels. VS readily mounted the phantom and collection was attempted on 4 separate mounts using an 18-inch (first 2 mounts) or 22-inch (last 2 mounts) Missouri model artificial vagina, and a hot wet towel (final mount). The stallion showed normal intromission and thrust into the artificial vagina approximately 15 to 18 times before dismounting without ejaculating.

On the second day of attempted collection, VS was given 1,000 mg of imipramine orally and 50 µg of IV GnRh (Cystorelin) 2 hours prior to semen collection and 50 µg of IV GnRh (Cystorelin) again 1 hour prior to the collection attempt. The stallion was brought into the breeding shed and placed into stocks for ampullary massage via the rectum to loosen any potential blockage. The stallion was then teased to an ovariectomized mare, and his penis rinsed with warm water then dried. 20 IU of oxytocin was given intravenously immediately prior to allowing the stallion to mount. A low volume (~8mL) sample was collected after the stallion was allowed to mount the tease mare twice, with a 22" Missouri model artificial vagina fitted with a hot wet towel. The sample contained approximately 2 billion sperm, at 64% total motility, 46% progressive motility, and 66% viability. This ejaculate had a large amount of debris suggesting this was part of a blockage that prevented the passage of sperm and, therefore, limited his ability to ejaculate completely.

Following the same protocol, ejaculates were collected on the following 2 days. The next sample contained a much higher volume (~107 mL) and lower quality (~5 billion sperm at 23% total motility, 15% progressive motility, and 41% viability), along with multiple clumps and debris in the sample. The next ejaculate had a more moderate volume, containing approximately 3 billion sperm at 42% total motility, 28% progressive motility, and 5% viability. This ejaculate showed a greatly reduced amount of clumping and debris in the semen filter. Several of the ejaculates had inflammatory cells present, but there was no bacterial pathogen associated with those ejaculates. It is likely that the inflammatory cells were a result of the blockage in the excurrent ducts.



Hyperechoic area in the ampulla.



Cyst near the seminal colliculus.

All images are courtesy of Katrina LaCaze

Subsequently, 2 more ejaculates were collected from the stallion without the use of imipramine and GnRh. These ejaculates were collected using a 22" Missouri model artificial vagina fitted with a hot wet towel and an ovariectomized mare as a mount. IV oxytocin was given immediately prior to the stallion being allowed to mount the mare. While total sperm number stayed fairly consistent (~5 billion sperm), sperm quality parameters improved with each ejaculate. The stallion had a high percent of morphologically normal sperm in all ejaculates. The final ejaculate was processed with a cushion centrifugation and then divided and frozen in 4 different cryopreservation extenders as part of a test freeze.

The owner was told there was a chance the blockage could return if not managed properly.

An ultrasound examination was performed on the stallion's testicles and internal genitalia. The stallion's total testicular volume was 196 cc, which is small for an adult Quarter Horse stallion, but was not surprising considering his age. Based on his testes volume, this stallion's estimated daily sperm of 3.5-3.9 should be satisfactory to fulfill the owners' breeding goals. No indication of testicular tumors or other abnormalities were noted. Transrectal ultrasonography of the stallion's accessory sex glands were also performed. Two cysts were identified: One between the caudal ampulla and the other cranial to the seminal colliculus, where the sperm exit the excurrent ducts and enter the pelvic urethra. In addition, there were hyperechoic structures in this area that were abnormal and suggestive of blockage of the sperm ducts. The associated cyst in this area may have been a cause of the blockage. We were able to unblock these structures during the treatment period and allow sperm passage.

The stallion's owner and referring veterinarian were advised there was potential for VS to return to being blocked if not managed correctly. It was recommended that the stallion be collected at least once a week, even when it is not the breeding season to assist in maintaining patency of the reproductive tract. The owners were able to breed 3 of their personal mares in 2021, 2 with fresh, cooled semen, and 1 with frozen semen. All 3 mares were checked in foal; 1 lost the pregnancy, but the remaining 2 were due to foal in June 2022.

In late April 2022, the stallion returned to the hospital for a recurrence of failure to ejaculate. On the first collection attempt, VS was teased to an ovariectomized mare, his penis was rinsed with warm water and dried with clean towels, then givenIV oxytocin before mounting the tease mare. A 22-inch Missouri AV was used, fitted with a hot, wet towel. After 3 mounts, two low volume samples were collected. A full ejaculation was not obtained. The samples contained a small number of sperm, with little to no motility. Large, amorphous debris were noted within the semen filter.

Cyst located between the caudal portion of the ampullae.

Thick layer of debris/sediment in an ejaculate.

On the 2nd day, the stallion was put into the stocks and the internal reproductive tract evaluated via ultrasonography. The size of the 2 cystic structures identified in 2021 appeared similar to the previous year, and there were multifocal hyperechoic foci in the body of the ampullae and within the seminal colliculus of the ampullae. The ampullae were vigorously massaged via rectal palpation for 10 minutes. Collection was then attempted using the same methods as the previous day, administering 20 IU oxytocin just prior to mounting the tease mare. After 3 mounts, a low volume sample was obtained. Evaluation of the sample was similar to the previous day.

On the third day, VS was once again treated with 10 minutes of ampullary massage. After teasing and washing the penis, the stallion was given 5 mg butorphanol and IV oxytocin before mounting the tease mare. A 22-inch Missouri AV with a wet, hot towel was used for two mounts, then changed to an 18-inch AV for the third mount. A full ejaculate was obtained on the 3rd mount containing 11 billion sperm, at 76% total motility, 45% progressive motility, and 80% viability. The stallion owner chose to freeze the semen, and a total of 5 doses were obtained.

Over the next 5 days, 2 more collections were performed, and the ejaculate obtained utilizing this method: ampullary massage, butorphanol, oxytocin, and an 18-inch AV with a hot, wet towel. A total of 20 breeding doses were frozen for the owner.

When the stallion was taken home, it was stressed once again to the stallion owner and referring veterinarian that VS would require frequent semen collections to prevent another blockage from forming. The referring veterinarian continued frequent, twice-a-week collections through the end of the season and was successful in freezing more doses of semen from the horse. One mare was bred and is currently in foal for 2023.

The two mares due to foal in June 2022 both had healthy fillies. The owner reported that the stallion started becoming sore when mounting the phantom and has now been given a couple months off from collection. **MeV**

About the Author

Katrina LaCaze, BS, is the Equine Theriogenology Technician Supervisor at the Texas A&M University Large Animal Hospital. Ms. LaCaze completed her Bachelor of Science degree in Animal Science at Texas A&M University in 1997. After graduation, Katrina managed a sport horse breeding farm for 6 years before joining Theriogenology in 2003. Katrina takes great pride in helping teach the new generation of veterinarians while sharing her passion for reproduction with them. She spends her free time gardening, showing rabbits and cheering on her son at baseball games and track meets.

GI Surgery May Not Mean Lower Sales Price or Performance

A new study suggests that young Thoroughbreds that require surgery for a large colon displacement do not necessarily suffer in terms of sales price or racing performance compared with their maternal siblings.

Researchers from the University of Georgia, Athens, wanted to know if having a large colon displacement corrected by surgery affected the sales price or racing performance of the animal, which could decrease the return on the owner's investment.

They retrospectively looked at the medical records of 110 horses that received surgery for large colon displacement and compared them with the sales and racing records of 299 maternal siblings that did not. The horses were younger than 2 years old and the surgeries occurred between 1998 and 2016.

The researchers found no significant difference in the median sales price between the 2 groups. There was also no significant difference in the number of starts during the 2-to-4-year period that was reviewed. However, horses that underwent surgery had a lower number of starts in the 2-year-old year compared with their siblings (1 start vs. 2.32 starts; $P<0.001$).

"With this information, it will be easier to make informed decisions to take young horses to surgery," the researchers wrote. **MeV**

For more information:

Edwards VL, Loux S, Embertson R. Sales and race performance of juvenile Thoroughbreds with surgically corrected large colon displacements. *Equine Vet J.* 2022 Dec 26.https://doi.org/10.1111/evj.13914

https://beva.onlinelibrary.wiley.com/doi/10.1111/evj.13914

Good Recordkeeping Is Your Best Defense

By Tom Rosenthal

Good medical recordkeeping is a veterinarian's best defense against malpractice, license and regulatory complaints, **Cynthia G. MacKenzie**, DVM, said in a presentation at the American Association of Equine Practitioners Annual Convention 2022.

The best offense is a good defense, and that means keeping meticulous records.

"Whether you're a new practitioner or an older practitioner," Dr. MacKenzie said, "my take-home message is very simple: Document, document, document. I can't say that enough."

Dr. MacKenzie is with the AVMA Trust, which has tracked malpractice claims since 1960. In just the last 2 years, the AVMA Trust program has seen a 13% increase in the number of professional liability claims submissions for all species. "The trust is on track to review more professional liability malpractice claims this year than ever before," she said.

"We think it's mainly because of licensing boards going to an online form of submission, so it makes it really easy for an angry or upset owner to file a complaint now against a veterinarian's license," Dr. MacKenzie said.

Equine professional liability malpractice claims are increasing at a rate of about 15% a year, she said.

While equine claims are a small percentage of the total number of claims, they represent the highest payouts, Dr. MacKenzie said, adding that poor recordkeeping is the leading cause for state licensing boards to issue fines.

"In this current environment, veterinarians are under attack," she said.

"The purpose of medical records is to document the patient's condition and medical care," she added. "It is also there to document your standard of care. It's part of the continuation of care. Any veterinarian should be able to pick up your medical records, understand the horse's condition, and pick up where you left off treating that horse."

The records belong to the practice, she noted.

Items to include in the medical records are written consent forms, anesthesia logs, surgery reports, physical exam findings, diagnostic tests and diagnosis. Record not only what was recommended, but whether the owner accepted or declined the recommendations.

"What our attorneys tell us is those declined estimates are some very powerful pieces of evidence," Dr. MacKenzie stressed.

Keep any estimates of treatment provided to the owner, as well as proof if the owner declined the proposed procedures with the medical record.

Additional records to keep in a client's file: Lab results, estimate sheets, and all communications including emails, voice messages, and records of conversations.

"Right or wrong, the quality of care will often be judged on the quality of your medical records," she said.

Dr. MacKenzie also stressed that records should be accurate, legible and timely. She recommended that the records should be updated on the same day or within 24 to 48 hours. "I know that most of you are running faster than the pace of these racehorses every single day and that it can be difficult to document everything in a timely manner. I totally understand that you're running nonstop all the time."

However, Dr. MacKenzie said that the longer a veterinarian waits to document treatment and services, the more likely items may be forgotten. After a hectic week, "you're spending your weekend trying to remember, 'What did I do to that horse, you know, back on Monday?' And you're likely to forget things," she said.

Dr. MacKenzie cited the case of a veterinarian who performed a pre-purchase exam on an 8-year-old Warmblood mare in the Northeast. "Historically, the horse had shown some lameness and some intermittent fevers, but on the day of the exam, none of that was seen," she said. "The buyer was offered bloodwork, but declined. That decision was documented in the pre-purchase exam report."

Six months later, after the horse was purchased and shipped to the southern part of the U.S., the horse came down lame. The new owner had another veterinarian diagnose the horse with a titer test that showed Lyme disease. "The owner was upset; she retained an attorney and made a demand for the purchase price of the horse," Dr. MacKenzie said.

Since the veterinarian could document that there was no lameness or fever on the day of the pre-purchase exam and that the buyer declined bloodwork, "the claim was denied and the client was not paid anything," Dr. MacKenzie said.

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Establishing a culture of recordkeeping and documentation also ensures compliance with legal and regulatory standards.

Clients are entitled to a copy of their horses' records within a reasonable time, which usually is designated within the state's practice act, Dr. MacKenzie said. "You want to consult your practice act for specifics on what is to be included in the medical record and realize that that's a minimum requirement," she noted.

Each state's practice act is different, Dr. MacKenzie said. "Each practice act stipulates certain requirements for recordkeeping from how long you maintain medical records to the minimum requirements that should be maintained. If you haven't read your practice act recently, I would highly encourage you to do so." She stressed that practice act requirements are constantly changing.

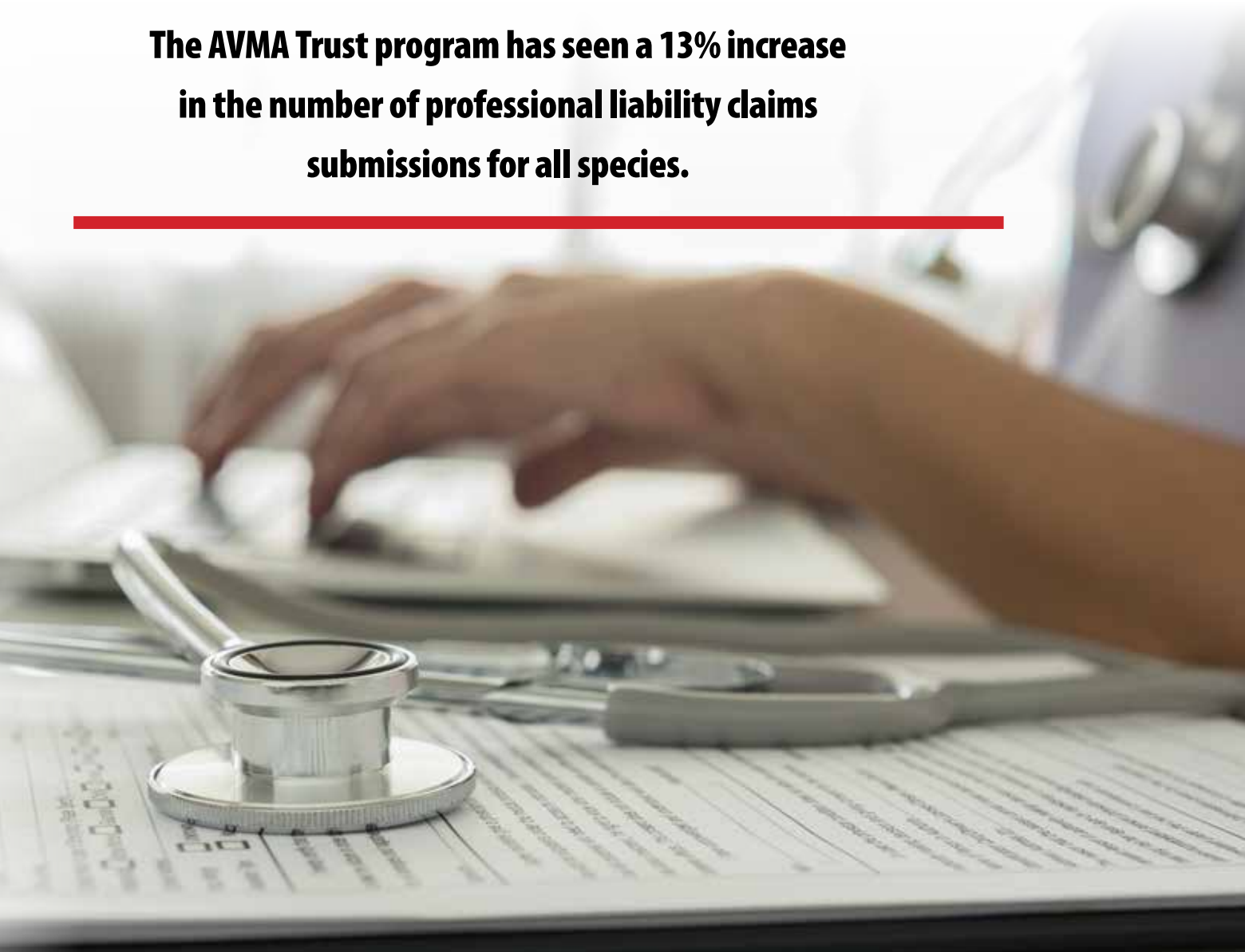
In addition to the state licensing boards, other regulatory agencies mandate good recordkeeping, including the DEA, USDA, the Horseracing Integrity and Safety Authority, and the Performance Horse Organizations.

"This is really the reason why we're giving this talk," Dr. MacKenzie said. "Your records are your defense. And it is crucial in the defense of a malpractice lawsuit or a license or a board complaint. This is what it boils down to: Appropriate documentation is not only needed to support your standard of care, but also to protect against false allegations of negligence."

Not only are there ethical considerations for maintaining good medical records, it is also a good business practice, she said.

Dr. MacKenzie said, "The rule of thumb is if it was not recorded in the record, then it was not performed. If you document well, if you ever need them, your records will defend you." **MeV**

The AVMA Trust program has seen a 13% increase in the number of professional liability claims submissions for all species.



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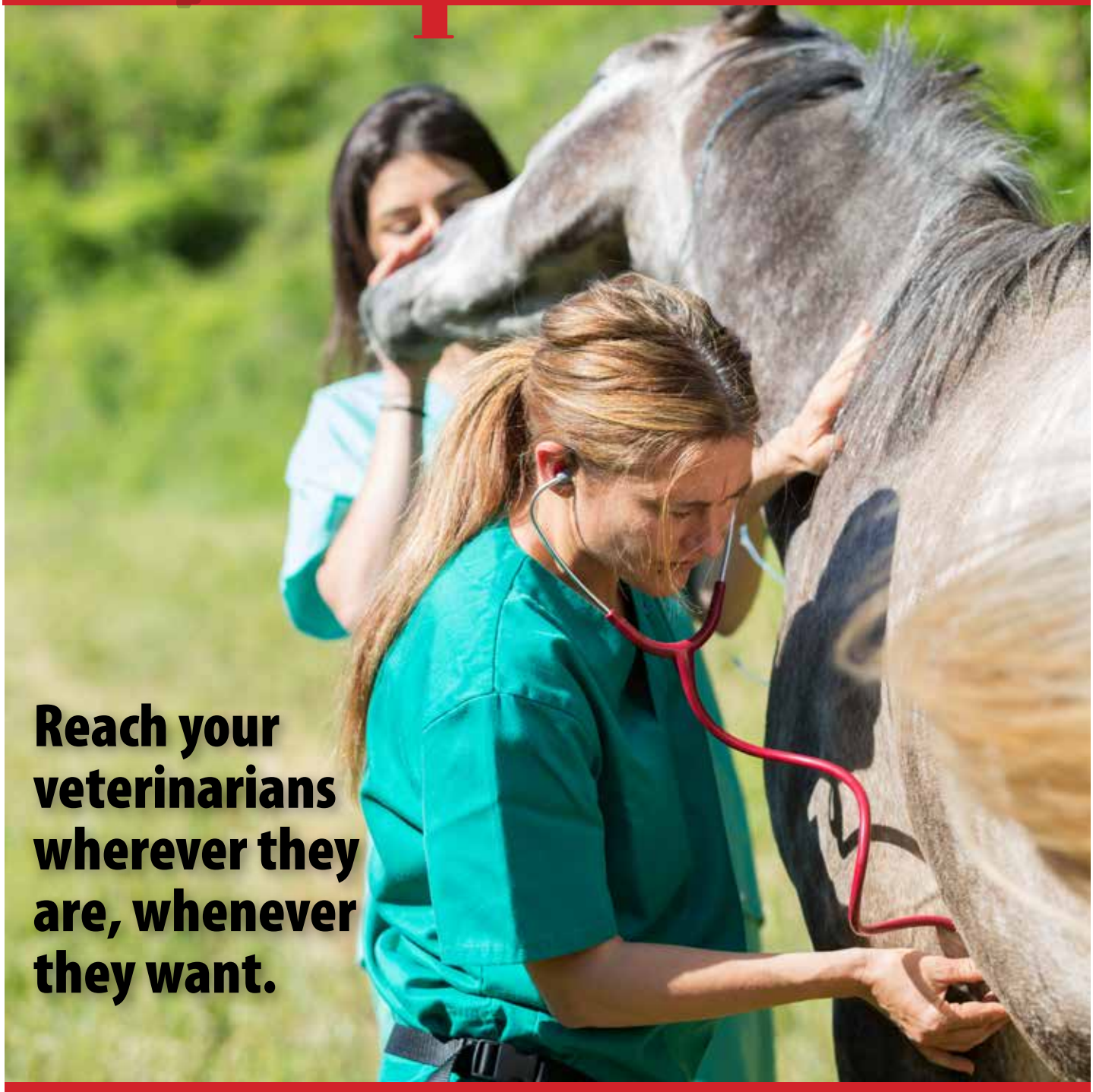

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