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March/April 2018

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MERCK
Animal Health

By Kimberly S. Brown

Welcome, New Partners!

We at *EquiManagement* are striving to produce the preeminent equine veterinary business magazine in the world. We provide valuable content in six magazines each year, as well as on our website and social media outlets.

We have talked with the leadership of several prominent veterinary groups who want to provide their members with *EquiManagement*'s business content and life-balance information that is pertinent to the success of today's equine practitioner. The *EquiManagement* brand also provides equine health research findings and industry news in print and on the web.

We are focusing our partnerships to target those veterinarians with practices that have an exclusive or significant equine segment as patients.

Because of that goal, we are pleased to announce that *EquiManagement* is now an official Media Partner of **AVMA PLIT**. The AVMA founded the Professional Liability Insurance Trust (PLIT) in 1962 as a means to ensure that veterinarians would have an advocate in the management of their professional liability claims. PLIT has expanded its program offerings to include veterinary license defense, business owner policies, workers' compensation, employment practices liability, and automobile and comprehensive personal insurance solutions for AVMA members and student AVMA members. Nearly 60,000

veterinarians participate in PLIT-sponsored programs.

EquiManagement also has become an official Media Partner with the **British Equine Veterinary Association (BEVA)**. Its members will be sent a digital link to *EquiManagement* as a member benefit.



In addition, we are pleased to announce that the *EquiManagement* brand is an official Media Partner of the **New Zealand Equine Veterinary Association (NZEVA)**. Members of NZEVA have

been receiving a digital copy of *EquiManagement* magazine for nearly a year, and our two groups made the partnership official in early 2018.

We will also continue to provide relevant content for equine veterinary students, members of the AAEPV and equine practice support staffs.

We invite AAEP members to tell their colleagues how to sign up for the magazine on EquiManagement.com.

As the *EquiManagement* brand continues to expand its reach into the equine veterinary industry, we pledge to continue bringing you content that can be used to better your practice and your life. **EM**

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EquiManagement

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DESCRIPTION: UNIPRIM Powder contains 67 mg trimethoprim and 333 mg sulfadiazine per gram.

UNIPRIM Powder is a combination of trimethoprim and sulfadiazine in the ratio of 1 part to 5 parts by weight, which provides effective antibacterial activity against a wide range of bacterial infections in animals.

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

Escherichia
Streptococcus
Proteus
Salmonella
Pasteurella
Shigella
Haemophilus

Sensitive

Staphylococcus
Neisseria
Klebsiella
Fusiformis
Corynebacterium
Clostridium
Bordetella

Moderately Sensitive

Moraxella
Nocardia
Bruceella

Not Sensitive

Mycobacterium
Leptospira
Pseudomonas
Erysipelothrix

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 folic 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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Equine Rabies

Equine practitioners don't often encounter zoonotic diseases. Yet one that is particularly noteworthy is the fatal disease rabies. There is significant importance in protecting horses and humans from rabies exposure, and veterinarians play an important role in this.

To address vet liability and health risks associated with rabies, a panel of experts spoke at a Zoetis-sponsored Sunrise Session at the 2017 American Association of Equine Practitioners (AAEP) Convention. Bonnie Rush, DVM, MS, DACVIM; Susan Moore, MS, PhD; and Denise Farris, JD, shared their expertise with attendees.

Initial signs of illness don't always definitively form a diagnosis of rabies in a horse, since signs vary at different times in the course of the disease. Usually a bite is not evident at the time clinical signs appear because incubation can take up to four months, depending on location of the bite. For example, virus injected into a distal limb might take one to three months to enter the central nervous system.

Signs of rabies—Rush described a variety of confounding and usually asymmetrical signs seen in horses with rabies:

- abnormal behavior
- reduced appetite
- difficulty swallowing and/or pharyngeal paralysis
- ataxia
- altered vocalization
- fever
- hind-limb lameness that progresses to paresis
- intention tremors
- hyperesthesia
- recumbency

- paralysis
- seizures, usually seen at the end stage of infection

Many of the clinical signs can be confused with other neurologic syndromes, such as West Nile virus or head trauma.

When a veterinarian is called out to examine a horse with neurologic disease that turns out to be rabies, many people become involved: veterinarians, physicians, laboratory personnel and personnel in the local public health system. Handling of tissue must follow strict precautions, such as using personal protective equipment including gloves, gowns, and face and eye protection.

Rabies virus is passed through bites and through wounds or mucous membranes that come into contact with infectious saliva or nervous system tissue.

Diagnostic protocols—For an accurate diagnosis, it is helpful to send the whole brain with brainstem, cerebellum and some spinal column attached. Rongeurs should be used to obtain the head and associated spinal cord. It is important not to use a band saw as that aerosolizes tis-

sue and virus, posing a hazard to humans involved in sample acquisition.

Similarly, it is not suitable to test cerebral spinal fluid, due to increased risks to human health. Sending in only half a section of the brainstem cannot yield a definitive diagnosis. Moore pointed out that brain tissue can test negative for rabies, yet the spinal cord of that same horse can test positive. Direct fluorescent antibody (DFA) testing done on these neurologic tissues is the test of choice.

All lab samples must be marked as suspect for rabies, and the lab should be notified in advance of receipt.

If a horse is suspected of having rabies, it is important to ask the owner about the extent of exposure to facilitate rapid identification of all who had contact with the horse. This enables prompt post-exposure prophylaxis. Anyone in contact with the horse either before or after its death should receive prophylactic vaccines.

Once a horse is examined and there is a suspicion of rabies, but the horse is not immediately euthanized, strict quaran-



Rabies virus injected into a distal limb from a bite might take one to three months to enter the central nervous system.

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tine procedures are put in place. Anyone going in and out of the stall must wear complete personal protective equipment, with no exceptions. A log on the outside of the stall should be used to record every entry and time of entry.

Veterinarians are tasked with following biosecurity protocols when it comes to protecting employees from the risk of potential exposure to rabies. Personal protective gear must be used, and it is prudent to have employees immunized with rabies vaccine if they are working around horses. Post-exposure vaccine costs can run \$2,000- \$7,500.

Liability associated with rabies management—The AAEP, the AVMA and the National Association of Public Health Veterinarians (NASPHV) all have stipulated that equine rabies vaccination is a core vaccine—i.e., it is “a

standard of practice commonly accepted within the industry.” Should a veterinarian be faced with legal action for negligence in regard to mismanaging rabies vaccine recommendations and protocols, this criterion is the legal standard used in court and in front of a jury.

Horses are uniquely at risk because they are housed outside, close to rabies-carrying wildlife reservoirs. It is possible for exposure to occur even if horses are stabled. Farris said there are different protocols in different states, so it is important to know your state regulations for compliance and maintenance of the defined legal standard of care. Rabies-endemic areas are abundant throughout the continental United States, but especially notable in Texas, Oklahoma, Pennsylvania and Kansas.

Thirty-two states require that veteri-

narians buy and administer vaccine; in other states, owners are able to obtain vaccine and immunize their own horses. For information about state regulations and statutes, as well as who is legally allowed to immunize for rabies, refer to www.rabiesaware.org.

Once a veterinarian establishes a veterinarian-client-patient-relationship, he or she now has the responsibility to advise clients about core vaccines, of which rabies is a primary one considered in the established standard of care.

If a client refuses to immunize against rabies, then the veterinarian should get a waiver in writing from the horse owner. The owner must also sign a statement verifying that he or she has read disclosures and warnings about rabies, and that he or she assumes all associated risks should the horse contract rabies.

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Please see Brief Summary of Full Prescribing Information on the following page.



 **BetaVet®**
betamethasone sodium phosphate & betamethasone acetate
INJECTABLE SUSPENSION

INDICATION: BetaVet® 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 cleft palate in offspring and in other congenital anomalies including deformed forelegs, phocomelia and anasarca. Therefore, before use of corticosteroids in pregnant animals, the possible benefits to the pregnant animal should be weighed against potential hazards to its developing embryo or fetus. **Human Warnings:** Not for use in humans. For use in animals only. Keep this and all medications out of the reach of children. Consult a physician in the case of accidental human exposure.

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, such as NSAIDs or other corticosteroids, should be approached with caution. Due to the potential for systemic exposure, concomitant use of NSAIDs and corticosteroids may increase the risk of gastrointestinal, renal, and other toxicity. 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), 1.5% BetaVet® and 1.3% 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.

DOSAGE AND ADMINISTRATION: Shake well immediately before use. Use immediately after opening, then discard any remaining contents.

RX ONLY

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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BRIEF SUMMARY OF PRESCRIBING INFORMATION

(Betamethasone Sodium Phosphate and Betamethasone Acetate Injectable Suspension) 6 mg betamethasone per mL
For Intra-Articular (I.A.) Use in Horses

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

INDICATION: BetaVet® is indicated for the control of pain and inflammation associated with osteoarthritis in horses.

DOSAGE AND ADMINISTRATION: Shake well immediately before use.

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 left palate in offspring. Corticosteroids administered to dogs during pregnancy have also resulted in other congenital anomalies including deformed forelegs, phocomelia and anasarca. Therefore, before use of corticosteroids in pregnant animals, the possible benefits to the pregnant animal should be weighed against potential hazards to its developing embryo or fetus. **Human Warnings:** Not for use in humans. For use in animals only. Keep this and all medications out of the reach of children. Consult a physician in the case of accidental human exposure.

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. Appropriate examination of joint fluid is necessary to exclude a septic process. If a bacterial infection is present, appropriate antibacterial therapy should be instituted immediately. Additional doses of corticosteroids should not be administered until joint sepsis has been definitively ruled out. 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, such as NSAIDs or other corticosteroids, should be approached with caution. Due to the potential for systemic exposure, concomitant use of NSAIDs and corticosteroids may increase the risk of gastrointestinal, renal, and other toxicity. 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) 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; inappetence, 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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AVMA protocols for an owner's refusal to vaccinate against rabies are specific. A waiver may be issued if there is clinical evidence that the horse is at "considerable risk" of harm from the vaccine due to other medical conditions. Geriatric age and/or an owner's antipathy to vaccines are not justifiable reasons for declining rabies immunization recommendations by a veterinarian. It is important to point out to horse owners that currently available killed virus or recombinant rabies vaccines are not able to induce rabies in a horse; these vaccines are safely used, even in immune-compromised horses. Modern rabies vaccines are almost 100% effective and should be given annually.

For any horse that is unvaccinated, the following measures should be taken.

Euthanasia is recommended if an unvaccinated horse has been exposed to rabies. If the client refuses to euthanize, then the horse is confined under strict biosecurity protocols and observed for six months.

For a vaccinated horse exposed to rabies, another rabies booster is given immediately and the horse is observed for 45 days for rabies clinical signs.

For a rabies-exposed horse with an outdated vaccine history, state statutes stipulate the appropriate course of action, and local public health authorities provide guidance on a case-to-case basis.

To date, there have been no reported cases where an equine veterinarian has been held liable, but there are cases of small animal negligence. If you, as a veterinarian, suspect rabies, then it is your responsibility to take specific steps to protect humans in contact with the horse, as well as yourself:

- Advise the owner about potential exposure and recommend that he or she consult with a personal physician and seek treatment.
- Document the conversations in the medical record. There must be specifics in the documented record; it is not sufficient

to make general record-keeping entries. This recommendation is based on small animal veterinarian experiences.

- Obtain the horse's vaccine history. Discuss euthanasia or the six-month quarantine required for unvaccinated, but exposed, horses.
- Your professional liability insurance will cover ordinary negligence occurrences. However, Farris stressed that the more a horse presents with rabies signs, and the less a veterinarian does, the more this crosses over into gross negligence, which is not well covered by liability insurance policies.

To sum up, Farris used the example of the "front-page-of-the-newspaper rule." How would you feel if your situation was published on the front page because you didn't follow protocol? This should motivate practitioners to take all precau-

tions and to follow all recommendations regarding horse exposure to rabies.

Editor's note: The British Equine Veterinary Association (BEVA), a new partner of EquiManagement, provided some excellent information at its 2017 symposium. The rest of Keeping Up is based on some of those BEVA presentations.

After-Hours Emergencies

For those practitioners continually tied to emergency duty, do you ever wonder what other colleagues are experiencing with regard to emergency calls? One group in Britain looked at the kinds of after-hours emergency calls to which mobile equine veterinarians from two practices responded over a three-year period (2011-2013). In all, there were 2,602 emergency cases included in the study.



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Not surprisingly, 32% of calls were for colic. Wounds made up approximately 20% of client calls for help, and lameness emergencies averaged around 11%.

Only 4% of wounds and 9% of lameness-affected horses were euthanized.

Consideration of ‘critical’ colic cases— The after-hours emergency study further examined 941 cases of horses with abdominal pain. Of these, nearly 24% were identified as “critical.” Of all the horses with colic pain, 18% were euthanized.

Three “red-flag” variables were associated with a case being considered critical:

- increased heart rate;
- abnormal mucous membrane color;
- absence of borborygmi in at least one quadrant with abdominal auscultation.

These parameters are helpful in determining whether a horse needs to be re-

ferred to a hospital for further evaluation and treatment.

Decontamination of Strangles Infection

Strangles infection with *Streptococcus equi sp. equi* in the horse can spread rapidly through an equine facility. Bioscurity procedures and intense cleaning and disinfection have the potential to make all the difference in containing disease.

A Swedish study (Ryden, A.; Pringle, J.; Fernström, L.-L.; Svonni, E.; Riihimäki, M. Effectiveness of Cleaning And Sanitation Of Stable Environment and Riding Equipment Following Contamination with *Streptococcus equi*, *Equine Veterinary Journal*, Aug. 31, 2017) set out to determine the effectiveness of sanitation and sterilization of the environment



ARNOLD BRONKHORST PHOTOGRAPHY

The type of material contaminated by *Strep equi* can affect how well cleaning and disinfecting work.

and horse and rider equipment following an outbreak.

Using a suspension of *S. equi*, the following areas and equipment were inoculated: wooden stable interior, concrete floor, plastic water buckets, leather halters, polyester-webbed halters and leather gloves.

The results of their study were informative:

- *S. equi* survived poorly on leather halters—all were culture negative after cleaning and sanitation.
- Survival of *S. equi* persisted on most polyester-webbed halters (6/8) despite cleaning and sanitation.
- Cleaning of polyester-webbed halters in a washing machine at 400°C (104°F) did not control contamination, and culture-positive results were found in 14/16 halters.
- Cleaning of polyester-webbed halters in a washing machine at 600°C (140°F) achieved decontamination and resulted in negative cultures for all halters.

This brings to light the fact that the type of material contaminated has a large effect on persistence or elimination of *Strep equi* infection, even in the face of cleaning and disinfection.

Equine Gastric Ulcer Syndrome and ACTH

It has been known for some time that equine glandular gastric ulcer disease (EGGD) is linked to stress. At the Swiss

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Institute of Equine Medicine in Bern, Switzerland, researchers looked into possible changes in ACTH responses in sporthorses identified with gastric ulcer syndrome (GUS) (Scheidegger, M.D.; Gerber, V.; Bruckmaier, R.M.; van der Kolk, J.H.; Burger, D.; Ramseyer, A. Adrenocorticotrophic hormone (ACTH) in sport horses with equine glandular gastric disease (EGGD). *The Veterinary Journal*. Sept. 11, 2017).

International competition-level horses were scoped for gastric ulcer disease and also administered TRH stimulation testing for ACTH levels. Of the 26 horses examined, 15 performed in eventing and 11 in endurance racing. The researchers found that:

- Equine gastric ulcer disease involves two distinct syndromes: equine squamous gastric disease (ESGD)

and equine glandular gastric disease (EGGD).

- ESGD was found in 8/11 endurance horses and 5/15 event horses.
- EGGD was found in 9/11 endurance horses and 9/15 event horses.
- ESGD was unrelated to EGGD in presence or severity.

Horses with moderate EGGD demonstrated larger increases in cortisol concentration from ACTH stimulation than horses with only mild EGGD.

The study concluded: “EGGD might be associated with an enhanced adrenocortical sensitivity.”

Recognizing the physiological changes that occur in response to stress—training, travel and competition—can help practitioners counsel clients on how to best manage their horses in order to reduce stress levels. **EM**

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How to Use a Line of Credit

Due to the seasonality of equine veterinary business, practice owners might need to borrow money to meet financial obligations. One commonly used option to obtain these funds is by securing a business line of credit (LOC). A business line of credit is an arrangement between a financial institution—usually a bank—and a customer that establishes a maximum loan balance that the bank will permit the borrower to maintain.

Like with most loans, borrowers must be approved by the bank through an examination of the borrower's financial position, credit rating and/or relationship with the bank. Some, but not all, banks charge a monthly maintenance fee if you do not use the line of credit, and interest is charged as soon as money is borrowed.

Terms of the LOC are usually annual, with an interest rate based on the prime rate plus one to three percent. Payments are interest-only on the amount borrowed, but typically banks expect to see that the line has been paid down to a zero dollar balance at some point during the year. Once the LOC is established, the borrower can withdraw funds at any time, as long as the cash does not exceed the maximum set in the agreement.

Most small businesses experience cash flow problems from time to time. These cash flow shortfalls can arise from a variety of reasons, ranging from

a large account falling behind in payments to a seasonal variation in revenue production. Day-to-day operations require an uninterrupted supply of cash (capital). While the optimal thing to do is save enough money to weather these times, obtaining a line of credit provides a ready source of funding to keep your business running smoothly. Be sure to make your application for a LOC while you are in a comfortable financial position in order to qualify for

Most small businesses experience cash flow problems from time to time. A line of credit can help bridge those shortfalls.

the credit easily. Don't wait until you desperately need money!

Your line of credit will be there to access whenever you need it, and generally it won't cost you much (if anything) if you don't need to take money out on this loan. Because lines of credit can be drawn on and repaid on an unscheduled basis, some borrowers might find the interest calculations more complicated and might be surprised at the amount they end up paying in interest if they do not repay the principle promptly.

While a line of credit can smooth out a rough patch in earnings until your

business is producing strongly again, note that a line of credit should *not* be used to rescue a practice that is experiencing a serious ongoing financial crisis; it should be thought of only as a tool to use while waiting for accounts receivable to be paid. Lines of credit are meant to be used, paid off quickly, then used again when necessary.

Having cash readily available allows a practice owner to take advantage of an opportunity to purchase inventory at a low price, or to offset anticipated seasonal dips in revenue.

Small practices, especially those that have just started, often have more expenses than revenue in the slower seasons. For example, you might need to purchase vaccines to have on hand before the flurry of spring visits occurs, but you won't be paid for that inventory by clients until you use the vaccines to provide services. You might need more inventory before you have earned and received enough revenue to pay for it. A line of credit can help you meet your obligations in a timely fashion.

In addition, a line of credit can finance projects where it is difficult to ascertain the amount of funds needed until the plan is actually underway, or to help pay your estimated quarterly tax payments. Sometimes even meeting your payroll can be tough if one of your major clients fails to pay his or her invoice in a timely fashion. Having a line of credit can help you sleep better at night! **EM**

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There is positive economic news that could bode well for the equine industry in 2018.



The Business of Practice

‘Back to Basics’ was the theme of the business presentations at the 63rd AAEP Convention.

By Amy L. Grice, VMB, MBA

The theme of the business section at the 2017 AAEP Convention held in San Antonio, Texas, was “Back to Basics.” A number of excellent presentations about finances, inventory, marketing and risk mitigation were on the program, and we have summarized a sampling of those talks.

Business New Hour

Lisa Kivett, DVM, DACVIM, James Bryant, DVM, and Ernie Martinez, DVM, headed up this popular kick-off to the Business Education sessions at the AAEP Convention.

To begin, Martinez reported on current conditions in the racing and breeding industries. He reported that *at the time of his presentation*, North American Thoroughbred yearling sales in 2017 surpassed those of 2016, with an average price of \$76,286 in 2017 compared to \$65,204 in 2016. The median price of \$24,000 was up \$4,000 over last year’s \$20,000. Another positive indicator: The 2017 gross sales figure was higher than in recent years. (*Editor’s note: For up-to-date figures for Thoroughbred sales, visit bloodhorse.com/horse-racing/thoroughbred-sales/state-of-the-market.)*

At the Keeneland 2017 November

Breeding Stock Sale, the highest price was \$6 million, and at the Fasig-Tipton November Sale, two horses sold for astonishing prices (\$9.5 million and \$8 million).

Martinez reported that the number of horses sold in the Standardbred industry declined slightly, but the average price increased modestly. Turning to Quarter Horses, he reported that the Four Sixes fall sale saw the highest gross and sale average in the history of the sale.

In racing news, Martinez reported that average daily purses and average daily overall handle year to date had increased modestly over 2016. He also stated that economic statistics recently released on Kentucky’s international trade showed a

33.1% increase in the value of exported, live purebred horses. These statistics included all breeds, but the percentage of exported Thoroughbreds has historically accounted for at least three-quarters of the number of horses shipped out of Kentucky to other countries. The percentage of exported Thoroughbreds among all breeds in Kentucky was 83% in 2014 and 75% in 2015, according to the U.S. Department of Agriculture.

Nationwide, the total value of breeding stock of all breeds exported from the U.S. totaled nearly \$175.5 million. The total of all other horses exported (which would include yearlings, 2-year-olds, and other racing stock) was more than \$125 million from January through November of 2016, according to the U.S. Census Bureau. The value of the breeding stock rose 22% compared with the same period of time in 2015, while the value of “all other horses” dropped 23%, he said.

Finally, Martinez reported on the substantial financial impact of equine competitions. As an example, the Event at Rebecca Farm in Kalispell, Montana, attracted 10,000 attendees and nearly 600 horses. A recent study by the University of Montana Institute for Tourism and Recreation Research estimated the economic impact of the 2015 event at \$4.4 million.

Turning to the economic outlook, Bryant reported that the total value of economic activity generated from veterinary services has been steadily increasing since 2004. The equine sector has contributed employment of 36,000, a \$1.2 billion income, a \$2.4 billion output and tax payments totaling \$45 million. Bryant continued with good news, indicating that the forecast for the equine industry is positive due to the human-animal bond, the influx of premium products and the growth of horse therapy programs. In addition, the national unemployment rate dropped to 4.1% in November, which

Bryant said signals strong job growth but presages upward pressure on wages.

All of this positive equine industry and economic news should bode well for 2018 veterinary business.

Kivett reported on the many cases of sexual harassment in the news this year and noted the #MeToo outpouring of accounts of personal assaults that flooded social media. She also highlighted the responses to the AVMA's recent sexist gaffe in an article on bovinevetonline.com. (The statement was that “female veterinarians might



Sexual harassment and discrimination were discussed in the Business News Hour.

find it more interesting to work with small companion animals, whereas male colleagues prefer to be outdoors among large animals.”) In the same vein, Kivett noted the *Newsweek* article that pointed out how women physicians are called “doctor” less often than their male peers. She then stated that in a recent study, female surgeons were found to have significantly lower death rates than male surgeons.

Martinez discussed the net value of a veterinary degree, which is higher for females due to the fact that the average

male college graduate earns 55% more than a comparable female. In other words, the male with a bachelor's degree earns 55% more than the female with a bachelor's degree. As a DVM, the male does not get as much of a financial benefit, because his bachelor's degree lifetime earnings are almost the same as those from the DVM. For females, the bachelor's degree lifetime earnings are considerably less than the DVM earnings. So there is less gender wage gap in DVM earners. Because it costs a lot to get the DVM degree, males reap less benefit.

He then changed gears to report on the trend of “machine learning” and its implications, but shared that new research proves that doctors consistently outperform symptom checkers such as WebMD. (“Machine learning” is when computer algorithms are used to determine most effective treatments and most likely diagnoses, with the machine getting “smarter” as feedback is given. Websites where people input symptoms are similar to this.)

Bryant spoke about practice ownership and the need for new graduates to utilize the profits of ownership to rise above their student debt. He shared news about the launch of “The Practice Owner Incubator Internship” with four companion animal graduates of The Ohio State University's veterinary school. This internship offers recent graduates the opportunity to grow their skills as clinicians while simultaneously engaging in one-on-one practice ownership coaching and mentorship.

There is a need for equine veterinarians. Bryant continued with information about the results from a 2017 national study in Britain that involved 5,200 people owning 15,433 horses. The respondents reported that more than a third of the horses had health problems, with the most common issues being lameness and skin disease.

Moving on to Bionic Science, Bryant reported on the growing use of exper-

imental technology that can “smell” disease on your breath.

Next, he shared the UCSF development of an artificial kidney that could replace dialysis and transplant. The project was funded with a \$6-million grant from NIH in 2015, and scientists will be trying to progress to human trials later this year.

In Big Pharma news, Martinez reported that Amazon.com Inc. gained approval to become a wholesale distributor from a number of state pharmaceutical boards, according to a review of public records. It’s unclear, though, whether the e-commerce giant is planning a move into the prescription drug delivery business. In addition, Apple is expanding into several health-related ventures.

Finally, Bryant reported on the acceleration of mergers and acquisitions, with Mars’ \$7.7-billion acquisition of VCA in 2017 leading the way. However, Mars was required to divest 12 specialty and emergency clinics in 10 cities due to the substantial decrease of competition services by eliminating head-to-head competition.

Outside of the companion animal business, Bryant said that Mavana merged 21 mixed animal practices with 105 full-time-equivalent veterinarians and 350 employees. This company has 45 shareholders and is 95% veterinarian owned, he said. He added that it was formed to provide a better platform for mixed animal practices to control expenses, leverage talent and keep operating costs controlled, as well as increase shareholder value and make buying easier and more affordable. (*Editor’s note: In January 2018, Hagyard Equine Medical Institute in Kentucky joined the Mavana group.*)

Inventory Management

Melissa Maudlin, a certified veterinary practice manager, gave two presentations on inventory management. She noted that inventory is a large expense



Inventory is second only to staffing costs as the biggest expense in veterinary medicine.

in veterinary medicine, second only to staffing costs. Because poor management of inventory can lead to poor cash flow and low profitability, she emphasized the importance of good policies and procedures.

Maudlin defined inventory as all goods owned and held for sale or use in the regular course of business. She stated that one person should be accountable for the oversight of inventory, even if multiple staff members are involved in ordering, receiving or stocking.

When considering the costs involved with inventory, she indicated that along with direct costs, there are holding costs and ordering costs. Holding costs include sales tax, building and storage costs, and losses from damage, theft and expiration. Typically, these costs are 8-15% of the unit cost, she said. Ordering costs are primarily due to labor and are 15-20% of the unit cost, she added. By having a streamlined ordering process with appropriate ordering quantities, these costs can be minimized, she said.

To determine appropriate stocking levels of inventory, said Maudlin, reorder points, reorder quantities, par levels and lead times must be considered. This means you will know when to reorder, how much to reorder, the optimal amount to have on hand and how fast you can get it.

To figure reorder points, you can

utilize your management software to run a report to determine the amount of an item sold in a particular time frame, then figure your average daily sales by dividing by the number of days your practice was open for business. Multiply your average daily usage by your lead time to determine your reorder point, she said. Your reorder point will obviously vary by product, but you should try to never have more than 30 days of supply in stock at any time. However, product packaging might make that difficult.

The speaker recommended an inventory turnover of about nine turns per year. She cautioned that increasing this number can increase your ordering costs and make your risk of running out of stock higher. To determine your inventory turnover rate, she said, you must first determine your average inventory, then divide your total annual purchases of inventory by this figure.

Pricing items in your inventory can be by margin or markup, according to Maudlin. Margin is the difference between the total cost of carrying an item and the selling price, which requires that you consider all the holding and ordering costs, as well as the direct cost of the item. In markup pricing, the price is set based on a percentage of the direct cost, she said. In addition, it can be important to price commodity items competitively and make up the difference by pricing other items higher.

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¹ Kaplan RM, et al. Prevalence of anthelmintic-resistant cyathostomes on horse farms. *J Am Vet Med Assoc.* 2004;225(6):903-910.

² Reinemeyer CR. Rational approaches to equine parasite control. *Equine Parasite Control Kentucky Equine Research, Inc.* 64-72.

³ McFarlane D, Hale GM, Johnson EM, Maxwell LK. Fecal egg counts after anthelmintic administration to aged horses and horses with pituitary pars intermedia dysfunction. *J Am Vet Med Assoc.* 2010;236(5):351.

⁴ Kaplan RM. These ain't your father's parasites. An evidence-based medical approach to equine parasite control. *The Practitioner.* October 2008.

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One of the biggest challenges with inventory management in group practices is getting the veterinarians to agree on which items of a particular type (e.g., hyaluronic acid) to stock, as most veterinarians have personal preferences. Obviously, having fewer items will be more efficient and decrease ordering costs. One way to achieve this with dispensed items, Maudlin recommended, is to utilize an online pharmacy. In addition, working regularly with a primary distributor will generally reduce your ordering costs.

Finally, Maudlin recommended having an inventory system with all pharmacy item reorder points and reorder quantities noted, and weekly manual inventory counts performed. She noted that in larger practices, the practice management software might

produce a useful reorder report if the system inventory is accurate. She still recommended regular counts of high-turnover items, and promoted the concept of a central supply with daily stocking of other practice areas.

Although inventory management can be time consuming and requires attention to detail, this large practice asset demands to be managed with care, she concluded.

Financial Basics

In keeping with the theme of “Back to Basics,” the Monday business session was devoted to understanding practice finances. Ann Dwyer, DVM, began with a presentation outlining the utilization of 100 pennies of income to help veterinarians know where their money is coming from. (*Editor’s note: You can find*

this exercise on EquiManagement.com by searching for “100 Penny Exercise.”)

Although equine veterinary practices vary widely in scope and size, they all share a consistent set of expense categories, she said. Because an essential part of understanding practice finances is understanding what happens to the revenue earned, a clear view of expenses is essential.

Dwyer reviewed the importance of utilizing standard accounting software such as QuickBooks and a comprehensive chart of accounts. (Note: You can purchase a chart of accounts from Marsha Heinke, CPA, by scrolling down on this page on her website at www.vpmp.net/products-page.)

She said that practice expenses can be segregated into five categories: cost of professional services (COPS),

Greatness...





facility expense, office expense, labor expense and depreciation expense. When consistent and timely entries of expenses into your accounting software are made, powerful management tools become available. For example, the percentage of revenue used for each of these expenses can be analyzed and compared to previous time periods.

Dwyer explained that COPS includes the practice costs that are directly involved in producing services. These expenses include imaging costs, pharmaceuticals, laboratory testing costs, medical supplies and hospital supplies such as feed and bedding. In the category of “facility expense,” you include rent, taxes and repair or maintenance of any building utilized by the practice. Other facility expenses are telephones, utilities, fuel, business insurance and those costs associated with operating ambulatory vehicles.

The direct costs of running the practice office are considered office expenses, and those entail things that are separate from directly providing veterinary services. In that category are collection costs, advertising, credit card fees, postage, printing, payroll companies and professionals’ fees (attorney, accountant, business consultant).

Labor expenses include all the costs of having employees in the business. These include payroll taxes, salaries, workers’ compensation insurance, professional liability insurance and continuing education costs, she noted. Health insurance premiums and retirement plan expenses are also in this category.

Lastly, depreciation allows for stretching the cost of equipment and other fixed assets over time—primarily for tax purposes, she explained. IRS rules assign an annual portion of the original cost of an item as an expense that accounts for the expected life span of the item. In most cases, the IRS designates the expected lifespan of equipment purchases. It is important for a practice to budget

Approximately 25 cents for every dollar of revenue should be available for veterinary compensation.

for investment in fixed assets each year to replace broken or outdated equipment, offer new services and refresh technology. A well-prepared budget will keep depreciation expenses stable from year to year, she advised.

In discussing veterinary compensation, Dwyer stated that approximately 25 cents of every dollar of revenue should be available for compensation for veterinarians. All of the costs of compensation are included in that 25 cents, she emphasized. These include practice sponsored benefits, payroll taxes, workers’ compensation and continuing education.

To detail the elements of compensation, Dwyer said that wages (W-2 income) are the largest portion of veterinary compensation. This income paid to associates might be as a salary or as a base salary, with the opportunity to earn a production bonus. Benefits provided to associates can include health insurance, retirement account contributions, licenses, professional association dues, paid time off, continuing education allowance, personal use of a practice-owned vehicle and cellphone, and discounted services for personal pets.

Breaking down the different elements of compensation, Dwyer stated that for every \$100,000 of practice income that a practice spends on W-2 wages for an associate veterinarian, an additional \$15,000 is spent on benefits and perquisites. An additional \$11,500 is spent on mandatory federal and state payroll taxes and payroll-related insurance

programs such as unemployment, disability and workers’ compensation.

Out of every \$1 that an employee earns, she added, an additional 6.2 cents for social security and 1.45 cents for Medicare are withheld for the individual’s share of these federal programs. Other state deductions for disability and unemployment vary according to the location of the practice. Individual income taxes are also withheld from the paycheck, with the amount is based on marital status, the number of dependents, and the anticipated applicable tax bracket. Typically, this accounts for an additional 15 to 20 cents of each dollar of pay. Many employees also elect to have their portion of health insurance premiums and retirement contributions deducted from each check.

In summary, Dwyer emphasized that when undertaking negotiations about compensation, it is important to remember that employees take home 25-30% less cash and employers spend 25-30% more cash for each dollar of W-2 wages. In addition, she concluded, a practice can only afford to spend about 25% of the income an individual generates on direct veterinary compensation costs.

Form Successful Partnerships

Partnerships are full of challenges, stated attorney Ky Mortensen, but they can also have great value. The synergies of talent, access to capital and economies of scale available when forming a partnership can help grow your practice, according to the speaker.

Different forms of partnership include the traditional partnership of multiple veterinarians, mergers of existing practices and corporate acquisition. In order to evaluate a potential partnership, it is important to do a careful analysis. Having an alignment of values, well-structured leadership and a strong legal foundation are imperative for success, according to Mortensen.

Maslow's pyramidal hierarchy of needs can be extrapolated to the business world, said Mortensen. First, a business has a basic need to make money to pay expenses and earn profit. But a veterinary workplace also can be a fun place to work, with empowered employees who spend many years of their careers in place and who make a difference in the lives of animals.

In addition, practice owners can have an exit strategy while ensuring the sustainability of their businesses. He asked the question "Which is more important, money or a fabulous culture?" When choosing partners, having an alignment of these values and expectations is essential, he said.

Determining the lines of authority and leadership roles is crucial to having a partnership that thrives. All

of these discussions should take place before the partnership is formalized. Growth of a practice can create new challenges, and owners might be poorly suited to meet them.

Mortensen discussed Founders Syndrome, a pathology that is often seen when original owners of a growing enterprise become unable to adapt to a new paradigm. Their energy and charisma, which originally was a positive force for growth and innovation, shifts to inflexibility and entitlement, leading them to feel they are indispensable and that no one can do things as well as they can.

Difficulty with delegation and a high need for control characterize these toxic leaders, he said. Personalities, egos and poor governance structure can seriously harm partnership ventures and eliminate trust.

Partnerships need a strong legal foundation, said Mortensen. The partnership documents should include non-compete provisions, a valuation methodology for future sales, restrictions on transferability of shares, choice of corporate entity, corporate meeting formalities, management of the practice, voting rights and percentages, managing disagreements and deadlocks, capital contributions, accounting methodology, distributions and compensation strategy, and transfer of ownership under different scenarios and authority.

In summary, good partnerships require careful preparation and excellent communication. By establishing expectations, sharing values and thoughtfully planning structural leadership, success can be within your grasp. **EM**



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Health Coverage From the 2017 AAEP Convention

This article contains medical topics presented at the world's largest conference for equine veterinarians.

By Nancy S. Loving, DVM

The 2017 American Association of Equine Practitioners (AAEP) Convention was held in San Antonio, Texas. In this article, we will highlight some the medical topics that were covered at the convention.

There are four additional articles on

medical topics from the 2017 AAEP Convention available on EquiManagement.com. Click on the Resources>Downloads section at the top of any page on the website.

(Editor's note: The medical coverage in the magazine and online are brought to you by Boehringer Ingelheim Animal Health.)

Kester News Hour

During the Kester News Hour, journal articles were discussed by Elizabeth M. Santschi, DVM, DACVS, who covered surgery topics; Robert J. MacKay, BVSc, PhD, DACVIM, on medicine; and by Regina M. Turner, VMD, PhD, DACT, on theriogenology. The first reports below give some take-homes from those reports.

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¹LEGEND product label and FOI summary.

²Kawcak CE, Frisbie DD, Trotter GW, et al. Effects of intravenous administration of sodium hyaluronate on carpal joints in exercising horses after arthroscopic surgery and osteochondral fragmentation. *Am J Vet Res.* 1997;58(10):1132-1140.

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

INDICATIONS

LEGEND® Injectable Solution and LEGEND® Multi Dose Injectable Solution are indicated in the treatment of equine joint dysfunction associated with equine osteoarthritis.

CONTRAINDICATIONS

There are no known contraindications for the use of LEGEND® Injectable Solution and LEGEND® Multi Dose Injectable Solution in horses.

RESIDUE WARNINGS

Do not use in horses intended for human consumption.

HUMAN WARNINGS

Not for use in humans. Keep out of reach of children.

ANIMAL SAFETY WARNING

For LEGEND Injectable Solution 4 mL and LEGEND Multi Dose Injectable Solution – Not for Intra-articular use. The Intra-articular safety of hyaluronate sodium with benzyl alcohol has not been evaluated.

PRECAUTIONS

Complete lameness evaluation should be conducted by a veterinarian. Sterile procedure during the injection process must be followed. Intra-articular injections should not be made through skin that is inflamed, infected or has had a topical product applied. The safety of LEGEND Injectable Solution and LEGEND Multi Dose has not been evaluated in breeding stallions or in breeding, pregnant or lactating mares.

ADVERSE REACTIONS

No side effects were observed in LEGEND Injectable Solution clinical field trials. Side effects reported post-approval: Following intravenous use: Occasional depression, lethargy, and fever. Following intra-articular (LEGEND Injectable Solution – 2 mL only) use: joint or injection site swelling and joint pain. For medical emergencies or to report adverse reactions, call 1-800-422-9874.

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For customer care or to obtain product information, including a Material Safety Data Sheet, call 1-888-637-4251 Option 2.

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Fungal Control of Nematodes

With limited options for new parasite control medications on the horizon, ongoing nematode resistance to currently available drugs has prompted investigation into alternative control measures.

One method is to add fungal spores (*M. circinelloides* and *D. flagrans*) to the manufacturing process of pelleted feed. (Hernandez, J.A.; Arroyo, F.L.; Suarez, J.; et al. Feeding horses with industrially manufactured pellets with fungal spores to promote nematode integrated control. *Vet Parasite* 2016;229:37-44.)

Three groups of horses were evaluated over a 16-month period. Two groups were treated with pour-on ivermectin prior to the start of the study. One of these ivermectin-treated groups was fed pellets containing fungal spores, and the other was fed pellets without fungal spores. A third group was neither dewormed nor fed pellets containing fungal spores.

Efficacy of treatment with parasiticide fungi was assessed through fecal egg reduction counts, the number of horses shedding parasite eggs in their feces and timing of egg reappearance.

Two weeks following ivermectin treatment, horses in the two groups treated with ivermectin stopped shedding nematode eggs. The horses treated with both ivermectin and parasiticide fungi had an interval of 28 weeks until egg reappearance, whereas it only took eight weeks for egg reappearance in the horses treated with ivermectin but not given fungi in the pellets. Further, the horses fed the fungi-containing pellets had lower egg counts (less than 300) compared to the two groups that did not receive fungal spore treatment.

There was an added benefit in improvement of packed cell volume in the horses treated with fungal parasiticide; those horses not receiving fungal spore treatment were anemic.

The predator fungi are stable in the feed for at least seven months. By

feeding this parasiticide, it is possible to biologically extend the effects of ivermectin deworming.

Treatment of Uterine Infection

Uterine infections with gram-negative isolates are developing increased resistance to antimicrobial medications. Enrofloxacin has the potential to target gram-negative organisms, but it is not safe to use in the uterus, as it can elicit hemorrhagic, ulcerative endometritis.

A study at Colorado State University investigated the extra-label antibiotic use of 600 mg ciprofloxacin infused into the uterus (IU) during estrus. (Trundell, D.; Ferris, R.; Hennes, M.; et al. Pharmacokinetics of intrauterine ciprofloxacin in the mare and establishment of minimum inhibitory concentrations for equine uterine bacterial isolates. *J Equine Vet Sci* 2017;54:54–59.)

The mean inhibitory concentration (MIC) of ciprofloxacin was tested for *P. aeruginosa*, *K. pneumoniae* and *E. coli*. For these Gram negative bacteria, ciprofloxacin concentrations exceeded the MIC for 24 hours in the uterine lumen and endometrium. There were no adverse local or systemic effects.

There might be follow-up studies to determine whether the dose can be decreased to 400 mg. It was noted that it is important to avoid formulations that include dextrose.

The authors advised that this treatment should not be used as a first-line drug, but rather should be reserved only for cases with resistant organisms.

PRP for Uterine Treatment

Therigenologists have found that persistent inflammation longer than 12 hours post-mating results in reduced pregnancy rates. A study evaluated the effects of platelet-rich plasma (PRP) treatment of the uterus on pregnancy rates in mares with persistent mating-induced endometritis (PMIE). (Metcalfe, L. The effect of



Researchers concluded that mepivacaine has a more reliable onset and longer duration of action than lidocaine for diagnostic nerve blocks.

Platelet-Rich Plasma (PRP) on intraluminal fluid and pregnancy rates in mares susceptible to Persistent Mating-Induced Endometritis (PMIE). *J of Equine Vet Science* vol. 34, issue 1; p. 128.)

The study demonstrated significant decreases in markers of inflammation in both treatment groups, where one group was treated with PRP 24 hours prior to breeding and the other group was treated four hours after breeding.

Changes in fertility were marked, as well: The treated groups achieved a 67% pregnancy rate compared to non-treated controls at 19%. The pregnancies were not followed to term, but rather only to 14 days of gestation.

In conclusion, pregnancy rates and uterine inflammation are improved in mares susceptible to post-mating-induced endometritis by intrauterine treatment with PRP.

Diagnostic Nerve Blocks

Diagnostic nerve blocks are commonly used to localize areas of lameness in the horse. Use of a screw shoe enables investigators to induce reversible lameness.

With this technique, the use of regional anesthetic was evaluated using either mepivacaine or lidocaine at a volume of 1.5 ml per injection site at the palmar digital nerves. The study also looked at the skin sensation response by using a force gauge. (Hoerdemann, M.; Smith, R.L.; Hosgood, G. Duration of action of mepivacaine and lidocaine in equine palmar digital perineural blocks in an experimental lameness model. *Vet Surg* 2017, DOI.org/10.1111/vsu.12689.)

Mepivacaine resolved lameness in 8/8 horses; lidocaine resolved lameness in only 3/8. With both anesthetics, reduction of skin sensation occurred before the lameness was resolved. For mepivacaine, 7/8 lost skin sensation at 10 minutes; one horse took 25 minutes. Lidocaine reduced skin sensation in 4/8 at 10 minutes, while the other four horses took 40-85 minutes for skin sensation to diminish.

Lameness resolution can take up to 20 minutes, which is significant, since many practitioners tend to move on to the next nerve block if lameness is not resolved within 10 minutes.

Duration of lameness reduction was up to 10 hours with mepivacaine and under two hours with lidocaine. The researchers conclude that mepivacaine has a more reliable onset and longer duration of action.

Comparison of Emasculators

The best hemostasis possible is ideal when performing equine castrations. A study compared the use of the Reimer emasculator with its two levers and double crush to the Serra, which crushes and cuts at the same time. (Comino, F.; Giusto, G.; Caramello, V.; et al. Do different characteristics of two emasculators make a difference in equine castration? *Equine Vet J* ISSN 0425-1644, DOI: 10.1111/evj.12713.)

Eighty fresh cadaver testes were used in the study. Forty were emasculated with an open procedure, and the other 40 with a closed procedure. Each was cut three centimeters proximal to the epididymis, with a two-minute crush hold. Pressures were measured to determine when leakage occurred at the emasculation site.

The open group had a higher leaking pressure for the Reimer compared to the Serra. Within the Reimer castrations, leaking pressures were higher for the open group than the closed. Both devices produced an average leaking pressure higher than physiologic hemodynamics.

OCD Heritability in Thoroughbreds

A study reviewed radiographic findings of fetlocks, hocks and stifles from 1,671 yearlings aged 14-21 months of age. (Russell, J.; Matika, O.; Russell, T.; et al. Heritability and prevalence of selected osteochondrosis lesions in yearling Thoroughbred horses. *Equine Vet J* ISSN 0425-1644, DOI: 10.1111/evj.12613.)

More than one OCD lesion occurred in 23% of the horses, with stifle OCD (10%) more prevalent than fetlock OCD (8%), which was more prevalent than

hock OCD (6%). Overall, the study concluded that heritability of OCD occurs in about 8% of Thoroughbred horses. Other studies have suggested hock OCD heritability, especially in Standardbred and warmblood horses.

It was also noted that a large percentage of OCD lesions heal by yearling age, so this study applies to permanent lesions only.

In summary, the researchers suggested that a significant, but relatively modest, genetic component of OCD exists.

(Editor's note: The following AAEP Convention presentations were not part of the Kester News Hour.)

Antimicrobial Use Guidelines

The ongoing development of antimicrobial resistance to pharmaceuticals has raised a global concern for surveillance in both human and veterinary medicine. "Resistance somewhere is resistance everywhere," remarked Wendy Vaala, VMD, DACVIM, as she spoke to this topic at the convention. All antimicrobials approved for veterinary use in the past 15 years are derived from known substances. Because very few new drug classes are under investigation or in development, it is essential to ensure efficacy in current antibiotics as long as possible.

The food chain has played a role in the development of acquired resistance genes. In 2015, a Veterinary Feed Directive (VFD) was implemented in the USA that removes use of antibiotics from food-producing animals unless under the professional supervision of a licensed veterinarian. Europe had implemented this policy as far back as 2006. Now, animal producers need a veterinary prescription and VCPR (veterinary-client-patient relationship) to acquire and use antibiotics on their livestock.

In small animals, antibiotic use guidelines have been developed for

urinary and respiratory tract infections, and for bacterial folliculitis. (onlinelibrary.wiley.com/doi/10.1111/vde.12118/abstract). Despite the availability of these guidelines, recommendations have *not* been followed in 33% of urinary tract infections and in 77% of upper respiratory tract infections.

There are apparent reasons for failure to follow recommendations: pressure from clients to dispense medications; the cost of bacterial culture and sensitivity diagnostics; and a simple lack of awareness that guidelines exist.

The American Veterinary Medical Association (AVMA) recommends selection of the right antibiotic administered to the right patient in the correct way. The AAEP is currently working on guidelines for judicious use of equine antibiotics. These will be "best practice" suggestions, not mandates.

A VCPR must be established, and it is recommended that the practitioner rule out non-infectious cases of illness. Identification of the pathogen and selection of the correct antimicrobial drug should be accomplished through bacterial culture and sensitivity testing, using the narrowest spectrum drug for the shortest time possible. Age-related differences in drug metabolism should also be considered.

Concerted efforts on the part of all health professionals are important to limit the development of antimicrobial resistance.

Preventing and Rehabilitating Common Health Care Procedure Aversions

Something all veterinarians and horse owners hate is when a horse has an aversion to treatment. Sue McDonnell, PhD, CAAB, gave specifics on how veterinarians can apply scientific principles of equine learning to gain and maintain patient compliance with veterinary care. (McDonnell not-

ed that the 2000 proceedings of the AAEP Convention included a detailed discussion of rehabilitation of injection shyness. That paper is available on the University of Pennsylvania Havemeyer Equine Behavior Lab webpage.)

McDonnell said that giving the horse the ability to move a little bit—as opposed to being "trapped" by people or devices—typically reduces the risk of explosive escape or defensive aggression. She noted that the veterinarian should survey the environment for possible obstacles. She said that sometimes horses can contact those obstacles (for example, a water bucket) and consider that impact and commotion as punishment (negative consequences). Having skilled assistants is important.

Recognition and well-timed reinforcement of relaxation with each increment of tolerance should be the goal. "Any response that can be perceived as punishment, such as verbal or physical reprimand or punitive restraint, should be avoided," she noted.

McDonnell covered needle sticks, oral dosing, eye medications, intranasal vaccination and rectal temping in her presentation.

Immune-Mediated Myositis

Myositis comes in various forms, one of which is immune-mediated. This occurs predominantly in Quarter Horses, presenting as a rapid and diffusely symmetrical muscle atrophy of gluteal, epaxial, neck and shoulder muscles. Affected horses appear stiff and lethargic.

Laszlo Hunyadi, DVM, MS, PhD, reported on the review of medical records of 68 horses at the University of California's Veterinary Medical Teaching Hospital from 1991-2014. Of these, 76% were Quarter Horses, 14% Thoroughbreds and 8% warmblood breeds. The Quarter Horses were around 5 years old; other breeds were about 10 years of age.

Affected horses had experienced



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Indications

For treatment and prevention of recurrence of gastric ulcers in horses and foals 4 weeks of age and older.

Dosage Regimen

For treatment of gastric ulcers, *GastroGard* Paste should be administered orally once-a-day for 4 weeks at the recommended dosage of 1.8 mg omeprazole/lb body weight (4 mg/kg). For the prevention of recurrence of gastric ulcers, continue treatment for at least an additional 4 weeks by administering *GastroGard* Paste at the recommended daily maintenance dose of 0.9 mg/lb (2 mg/kg).

Directions For Use

- *GastroGard* Paste for horses is recommended for use in horses and foals 4 weeks of age and older. The contents of one syringe will dose a 1250 lb (568 kg) horse at the rate of 1.8 mg omeprazole/lb body weight (4 mg/kg). For treatment of gastric ulcers, each weight marking on the syringe plunger will deliver sufficient omeprazole to treat 250 lb (114 kg) body weight. For prevention of recurrence of gastric ulcers, each weight marking will deliver sufficient omeprazole to dose 500 lb (227 kg) body weight.
- To deliver *GastroGard* Paste at the treatment dose rate of 1.8 mg omeprazole/lb body weight (4 mg/kg), set the syringe plunger to the appropriate weight marking according to the horse's weight in pounds.
- To deliver *GastroGard* Paste at the dose rate of 0.9 mg/lb (2 mg/kg) to prevent recurrence of ulcers, set the syringe plunger to the weight marking corresponding to half of the horse's weight in pounds.
- To set the syringe plunger, unlock the knurled ring by rotating it 1/4 turn. Slide the knurled ring along the plunger shaft so that the side nearest the barrel is at the appropriate notch. Rotate the plunger ring 1/4 turn to lock it in place and ensure it is locked. Make sure the horse's mouth contains no feed. Remove the cover from the tip of the syringe, and insert the syringe into the horse's mouth at the interdental space. Depress the plunger until stopped by the knurled ring. The dose should be deposited on the back of the tongue or deep into the cheek pouch. Care should be taken to ensure that the horse consumes the complete dose. Treated animals should be observed briefly after administration to ensure that part of the dose is not lost or rejected. If any of the dose is lost, re-dosing is recommended.
- If, after dosing, the syringe is not completely empty, it may be reused on following days until emptied. Replace the cap after each use.

Warning

Do not use in horses intended for human consumption. Keep this and all drugs out of the reach of children. In case of ingestion, contact a physician. Physicians may contact a poison control center for advice concerning accidental ingestion.

Adverse Reactions

In efficacy trials, when the drug was administered at 1.8 mg omeprazole/lb (4 mg/kg) body weight daily for 28 days and 0.9 mg omeprazole/lb (2 mg/kg) body weight daily for 30 additional days, no adverse reactions were observed.

Precautions

The safety of *GastroGard* Paste has not been determined in pregnant or lactating mares.

Efficacy

- **Dose Confirmation:** *GastroGard*® (omeprazole) Paste, administered to provide omeprazole at 1.8 mg/lb (4 mg/kg) daily for 28 days, effectively healed or reduced the severity of gastric ulcers in 92% of omeprazole-treated horses. In comparison, 32% of controls exhibited healed or less severe ulcers. Horses enrolled in this study were healthy animals confirmed to have gastric ulcers by gastroscopy. Subsequent daily administration of *GastroGard* Paste to provide omeprazole at 0.9 mg/lb (2 mg/kg) for 30 days prevented recurrence of gastric ulcers in 84% of treated horses, whereas ulcers recurred or became more severe in horses removed from omeprazole treatment.
- **Clinical Field Trials:** *GastroGard* Paste administered at 1.8 mg/lb (4 mg/kg) daily for 28 days healed or reduced the severity of gastric ulcers in 93% of omeprazole-treated horses. In comparison, 32.4% of control horses had healed ulcers or ulcers which were reduced in severity. These trials included horses of various breeds and under different management conditions, and included horses in race or show training, pleasure horses, and foals as young as one month. Horses enrolled in the efficacy trials were healthy animals confirmed to have gastric ulcers by gastroscopy. In these field trials, horses readily accepted *GastroGard* Paste. There were no drug related adverse reactions. In the clinical trials, *GastroGard* Paste was used concomitantly with other therapies, which included: anthelmintics, antibiotics, non-steroidal and steroidal anti-inflammatory agents, diuretics, tranquilizers and vaccines.
- **Diagnostic and Management Considerations:** The following clinical signs may be associated with gastric ulceration in adult horses: inappetence or decreased appetite, recurrent colic, intermittent loose stools or chronic diarrhea, poor hair coat, poor body condition, or poor performance. Clinical signs in foals may include bruising (grinding of teeth), excessive salivation, colic, cranial abdominal tenderness, anorexia, diarrhea, sternal recumbency or weakness. A more accurate diagnosis of gastric ulceration in horses and foals may be made if ulcers are visualized directly by endoscopic examination of the gastric mucosa. Gastric ulcers may recur in horses if therapy to prevent recurrence is not administered after the initial treatment is completed. Use *GastroGard* Paste at 0.9 mg omeprazole/lb body weight (2 mg/kg) for control of gastric ulcers following treatment. The safety of administration of *GastroGard* Paste for longer than 91 days has not been determined. Maximal acid suppression occurs after three to five days of treatment with omeprazole.

Safety

GastroGard Paste was well tolerated in the following controlled efficacy and safety studies.

- In field trials involving 139 horses, including foals as young as one month of age, no adverse reactions attributable to omeprazole treatment were noted.
- In a placebo controlled adult horse safety study, horses received 20 mg/kg/day omeprazole (5x the recommended dose) for 90 days. No treatment related adverse effects were observed.
- In a placebo controlled tolerance study, adult horses were treated with *GastroGard* Paste at a dosage of 40 mg/kg/day (10x the recommended dose) for 21 days. No treatment related adverse effects were observed.
- A placebo controlled foal safety study evaluated the safety of omeprazole at doses of 4, 12 or 20 mg/kg (1, 3 or 5x) once daily for 91 days. Foals ranged in age from 66 to 110 days at study initiation. Gamma glutamyltransferase (GGT) levels were significantly elevated in horses treated at exaggerated doses of 20 mg/kg (5x the recommended dose). Mean stomach to body weight ratio was higher for foals in the 3x and 5x groups than for controls; however, no abnormalities of the stomach were evident on histological examination.

Reproductive Safety

In a male reproductive safety study, 10 stallions received *GastroGard* Paste at 12 mg/kg/day (3x the recommended dose) for 70 days. No treatment related adverse effects on semen quality or breeding behavior were observed. A safety study in breeding mares has not been conducted.

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either a respiratory infection or immunization against influenza and rhinopneumonitis in the three to six weeks prior to development of clinical signs of myositis. In humans, a similar pathology seems to result from lack of tolerance to antigens. In the horse, autoimmunity can occur from days to four weeks after antigenic exposure, particularly to *S. equi zooepidemicus*, *Corynebacterium pseudotuberculosis*, *Anaplasma phagocytophilum*, herpes virus-1 and influenza.

The following clinical signs occurred:

- stiff gait in 74%
- muscle atrophy in 80%
- recumbency in 10%
- fever in 44%
- elevated WBC in 60%
- CK and AST elevated in 97%. (These values are not useful prognostic indicators.)

All muscle biopsies showed lymphocytic infiltration around blood vessels, with macrophages surrounding focal areas of muscle necrosis.

The median hospital stay was 10 days, with an 87% survival rate. Horses were treated with IV fluids and corticosteroids; antibiotics were used only for concurrent illness. In these cases of muscle pathology, it is important to monitor renal function and to use fluids for diuresis. Horses with concurrent illness and fever had reduced chance of survival.

All surviving horses regained muscle mass within three to six months. There is a 32% chance of recurrence of IMM within six months, particularly after a secondary respiratory infection. Relapsing cases survived at a rate of 90% when treated with corticosteroids.

Make Dental Endoscopy Part of Routine Oral Exams

Travis J. Henry, DVM, DAVDC (NSS), DAVDC (EQ), covered the topic of adding an endoscopic exam as part of equine dental procedures. He said,

“Oral endoscopy can allow excellent visualization of the dentition with a convenient method of capturing images.”

He noted that many veterinarians use a digital or cellphone camera to take dental images, often when reflected off of a mouth mirror. Henry talked about technology that is now available to capture images in a wet, poorly lit environment such as the equine mouth.

He suggested that veterinarians ask themselves these questions when considering their goals for adding oral endoscopy equipment:

1. Will the system be utilized in the field?
2. Will the system be utilized primarily to show the client the horse's oral examination?
3. Will the primary use of the system be to capture images for the medical record and/or for publication in medical journals?
4. Do you currently utilize endoscopy in your practice?

Henry concluded by saying, “There are many options for systems to examine and document the oral examination findings. The practitioner should spend ample time and demo several systems to find the system that is right for his/her practice situation.”

A Review of Rear Hoof Imbalance and the Effect on Rear Limb Lameness

In his presentation, Tracy Turner, DVM, MS, DACVS, DACVSMR, noted, “Rear hooves may present with broken hoof axis, underrun heels, or medial-lateral imbalance. Unlike front feet, where these imbalances most commonly cause foot pain, in the rear feet, the changed biomechanics causes pain higher up the limb. Addressing rear hoof imbalance should be as important to treat or prevent lameness as it is in the front leg.”

The purpose of Turner's presentation was to discuss common hoof imbalance-



ARND BRONKHORST PHOTOGRAPHY

Rear hoof imbalances should be considered as important as imbalances of the front hooves.

es in the rear hoof. He compared those to imbalances in the forefoot, discussed possible pathophysiology and talked about the effect those rear hoof imbalances have on lameness of the rear leg. Turner noted that contracted heels and mismatched rear feet are rare compared to the same conditions in front feet.

His discussions revolved around a broken hoof-pastern axis, plantar surface imbalance, medio-lateral imbalance and evaluation of rear hoof imbalance.

In conclusion, Turner said that rear hoof imbalances should be considered as important as hoof imbalances of the front hooves. "Although the imbalances may not cause specific hoof pain, they very likely increase the likelihood of lameness farther up the limb," he said.

Endocrine Testing for PPID and EMS Cases

Teresa A. Burns, DVM, PhD, DACVIM, said in her introduction to this topic, "Endocrinopathic laminitis is reported to be the most common form of laminitis encountered in equine veterinary

practice, and pituitary pars intermedia dysfunction (PPID) and insulin dysregulation (ID)/equine metabolic syndrome (EMS) are frequently complicated by this disease. Practitioners should be aware of diagnostic testing methods for these conditions that are available and clinically useful, as well as how to use them to most strategically manage their patients effectively."

Burns discussed the specifics of testing for equine PPID. She noted that hypertrichosis (formerly hirsutism) has proven effective for diagnosing disease in aged horses (greater than 18 years old).

She said that in younger horses, PPID clinical signs are more variable, and diagnosis is more challenging. Testing is heavily relied upon, with the most reliable means of establishing a diagnosis of PPID being assessment of endogenous ACTH, the TRH stimulation test and the dexamethasone suppression test (DST).

She discussed each of these tests in detail (with information provided in the AAEP Convention Proceedings).

In her discussion of EMS, she noted that it is among the most common endocrine disorders of adult horses. She said it is currently defined as "overweight/obese body condition, clinco-pathologic evidence of ID, and laminitis (historical or current)."

She said diagnostic testing for EMS is primarily related to identification of abnormalities in insulin and glucose dynamics, which she discussed at length.

She noted that horses with EMS commonly suffer from laminitis. She said laminitis often first develops after the horse has been grazing on pasture grass that is rich in nonstructural carbohydrates.

She noted that "owners of horses with recurrent laminitis also report that laminitis episodes occur after changes in season or with the onset of cold weather."

Veterinary Involvement in Biosecurity

Katherine Flynn, DVMS, noted that veterinarians play an important role in biosecurity assessments, development of biosecurity plans and implementation of biosecurity measures. Her presentation provided tools for performing risk assessments and implementing biosecurity measures.

"Veterinarians should routinely perform biosecurity practices to decrease risk of disease transmission (i.e., cleaning and disinfection of equipment between uses, properly disposing of needles and syringes after single use, performing hand hygiene, and assuring the cleanliness of footwear and clothing). However, these individual actions are not currently recognized as the standard of practices by all members of the equine industry."

Flynn discussed actual outbreaks of disease at shows and private equine facilities. She provided an in-depth discussion of risk assessment, which she likened to the physical exam of an individual horse. After the risk is assessed, biosecurity measures need to be formulated and put in place.

You can obtain her information from the Proceedings to use as a blueprint for conducting the assessment and putting specific protocols in place.

She also provided a chart of biosecurity supplies and sources for products that included contact information and approximate cost.

Take-Home Message

This article offers only a small sampling of medical presentations and discussions offered at the 2017 AAEP Convention.

Make sure to check on EquiManagement.com for the four additional AAEP Convention health/research articles, brought to you by Boehringer Ingelheim Animal Health. **EM**



Work-Life Balance and Wellness

Take small steps toward changing your life—and possibly the profession.

By Amy L. Grice, VMD, MBA

The keynote speaker for the 63rd Annual AAEP Convention was Nigel Marsh, whose Ted Talk on work-life balance (ted.com/talks/nigel_marsh_how_to_make_work_life_balance_work) has the cachet of being the most viewed ever of those given outside the United States.

Marsh spoke from the heart, beginning his talk by relating a personal

story about a card his son gave him on Father's Day. He said that, as is often the case with those in kindergarten, cards with the phrase "My father is..." were completed by the small children. He related his surprise to receive a card that said: "My father is...a very short man." This began his realization that his life was imbalanced.

Marsh is English, and at the age of 5 years was sent to boarding school in

another country, as was the custom in his family. Later, he spent three years studying theology in college before joining the advertising industry.

He was married with a young family when his job was moved to Australia. Despite the upheaval to his family, he chose to make the move with them, but was devastated not long after when he was terminated abruptly from his position after a company merger. This crisis

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motivated him to reflect upon his life, and he made a decision to henceforth always have his loved ones at the center of his life. Subsequently, he wrote a number of books and began to share with others his passion about the importance of “living a life you find fulfilling, inspiring and meaningful.”

Marsh said he believes that “work-life balance” is an over-used and trivialized term, and he dislikes the fact that it seems to suggest that there are only two parts to one’s life experience. He continued by explaining three myths about work-life balance.



Nigel Marsh was the keynote speaker on the topic of work-life balance at the 2017 AAEP Convention.

The First Myth

The first myth, he said, is that work-life balance is “soft,” indulgent, not truly serious, and not a life-and-death concern. To the contrary, he said, it is absolutely serious, and that is made very clear in the veterinary profession by the high rate of depression and suicide. That said, he stated that the biggest risk in having poor balance is that a person will have a “living death.”

The speaker recommended the book “The Top Five Regrets of the Dying” by Bronnie Ware as a primer to understanding the risks of an unexamined life. He related that the regrets that were relayed by hundreds of dying people are:

- I wish I’d had the courage to live a life true to myself, not the life others expected of me.
- I wish I hadn’t worked so much.
- I wish I’d had the courage to express my feelings.
- I wish I had stayed in touch with my friends.
- I wish that I had let myself be happier.
- Marsh emphasized how important it is to consider these regrets against how you are currently living your life.

The Second Myth

The second myth, according to Marsh, is that work-life balance is not possible in your profession. No matter whether a person is a politician, a banker, a doctor or in the military, all think that their profession is special in its requirements and stress.

But in fact, he said that achieving balance is about attitude, not the external things. “Your profession is not uniquely hard. It is uniquely different,” he continued. You can choose, he insisted. It is a crisis of choice and imagination, not circumstances.

The Third Myth

The third myth is that if you want to get to the top of your profession, this is just the price that must be paid.

However, Marsh said that many of the most successful CEOs are those with the best balance. In addition, he said, evidence shows that rest and recovery drive creativity and productivity.

Six Lessons

Next, the speaker shared six import-

ant lessons. The first is that technology is *not* the answer. He cited a speech entitled “Economic Possibilities for Our Grandchildren” given by John Maynard Keynes in 1930. It predicted that technology would mean that the grandchildren would only need to work 15 hours a week.

Instead, he said, the *Harvard Business Review* reports that workers now monitor their cellphones and emails 80 hours a week. Because of that, until you have sorted out the fundamental priorities in your life, technology, time management and efficiency are not the answer to your dilemma.

The second lesson is that a proper period of reflection is necessary to “take stock of your miserable existence.” You must determine the gap between your desired life and legacy, and the reality of your current situation.

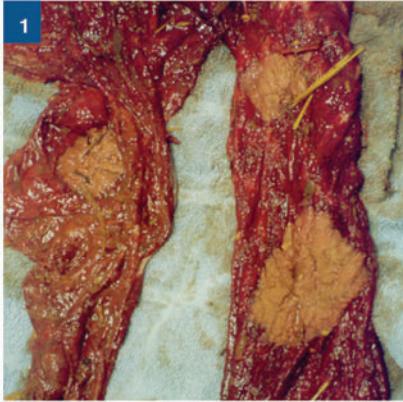
Sadly, Marsh related, most people do not take this step until they suffer job loss, the death of a loved one, disease, divorce or some other life crisis. It is his passion to encourage people to do this reflection before these dark times. Arising from this deep thinking will be recognition of what you are running from, but he said it is more important to know what you want to be running to.

Looking for solutions in the media or in the lives of others is a mistake, and that is the third lesson. Marsh said your work-life balance is an individual solution to your hopes and dreams in your own individual circumstance, and cannot arise from a fixed daily solution.

Instead, flexibility in a longer time frame is needed. He described the soul as having intellectual, physical, emotional and spiritual components, and said that all four need attention. By thinking monthly about whether these

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needs have been met, proper attention can be paid, if needed, to prevent neglect of a certain aspect. But all cannot often be met on a daily basis, he said.

The fourth lesson that Marsh imparted was to start with small things on the journey to improving your work-life balance. He cautioned not to replace one singular focus with another, and said that simple, small changes can have a remarkably transformative effect.

He then shared the small thing he had chosen first in his period of change, which was to pick up one of his children after school once a month. He related how he picked up his young son, and after they went home, they had a snack and played a game. Later, at bedtime, his son said, “Daddy, this has been the best day of my life.” The impact of that day was large.

By adding another small change each month, gradually but indubitably his life became very different, and much more fulfilling. He said that too often, when people can’t do everything, they do nothing. His solution? Do a series of small things.

He said that a person’s motivation to change must come from within. This is the fifth lesson. This is because sometimes other people don’t really want you to change, and they might even resent your improvement. You must “listen with the ear of your heart,” he said.

If the motivation for change is only external, it might never be the “right” time to change. However, if the desire is internal, it is always the right time.

Lesson six is the realization that work-life balance is not an intellectual problem. It must be solved in real life, and real life is messy. He recommended being realistic and understanding that life stages create constant change. In addition, he said, all industries have some unchanging realities, so if you are trying to change things that cannot be changed, you need to understand that this path leads to frustration and insanity. Concentrate on changing the things you *can* change.

After relating these lessons, Marsh turned to asking why people persist in overworking. First, he said, some make obscene amounts of money. Others feel intense guilt if they aren’t working. Many see overwork as a twisted status symbol, saying with pride, “I work 130 hours each week!” as though that is laudable. He suggested that we all need to learn to respond to that statement by saying, “Oh, I’m so sorry.” Then he spoke about the responsibility that we all have in fostering lives of fulfillment.

The responsibility, he said, is to model appropriate behavior and legitimize having a good life. As leaders, we model the way, and it is essential that our children and our employees, especially the younger ones, see us living in a balanced way.

That responsibility extends to enabling people to have a reasonably balanced life. He suggested that many people wonder why others should have easier lives than they did. And if you worked 15 hours per day coming up in your career, you might ask yourself, “Why should they get to be successful working 10 hours per day?” Nothing will change if nothing changes, he insisted. “If you can’t do it for the individual,” he said, “do it for the profession. We need to collaborate, and we need other people.”

Take-Home Message

In closing, Marsh said, “Being more balanced doesn’t mean dramatic upheaval in your life. With the smallest investment in the right places, you can radically transform the quality of your relationships and the quality of your life.

“Moreover, I think it can transform society—because if enough people do it, we can change society’s definition of success away from the moronically simplistic notion that the person with the most money when he or she dies wins to a more thoughtful and balanced definition of what a life well-lived looks like. And that, I think, is an idea worth spreading.” 

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New Ideas for Cleaning Your Hospital

Good housekeeping and effective cleaning are important to your equine facility.

By Tony Cochrane, AIA

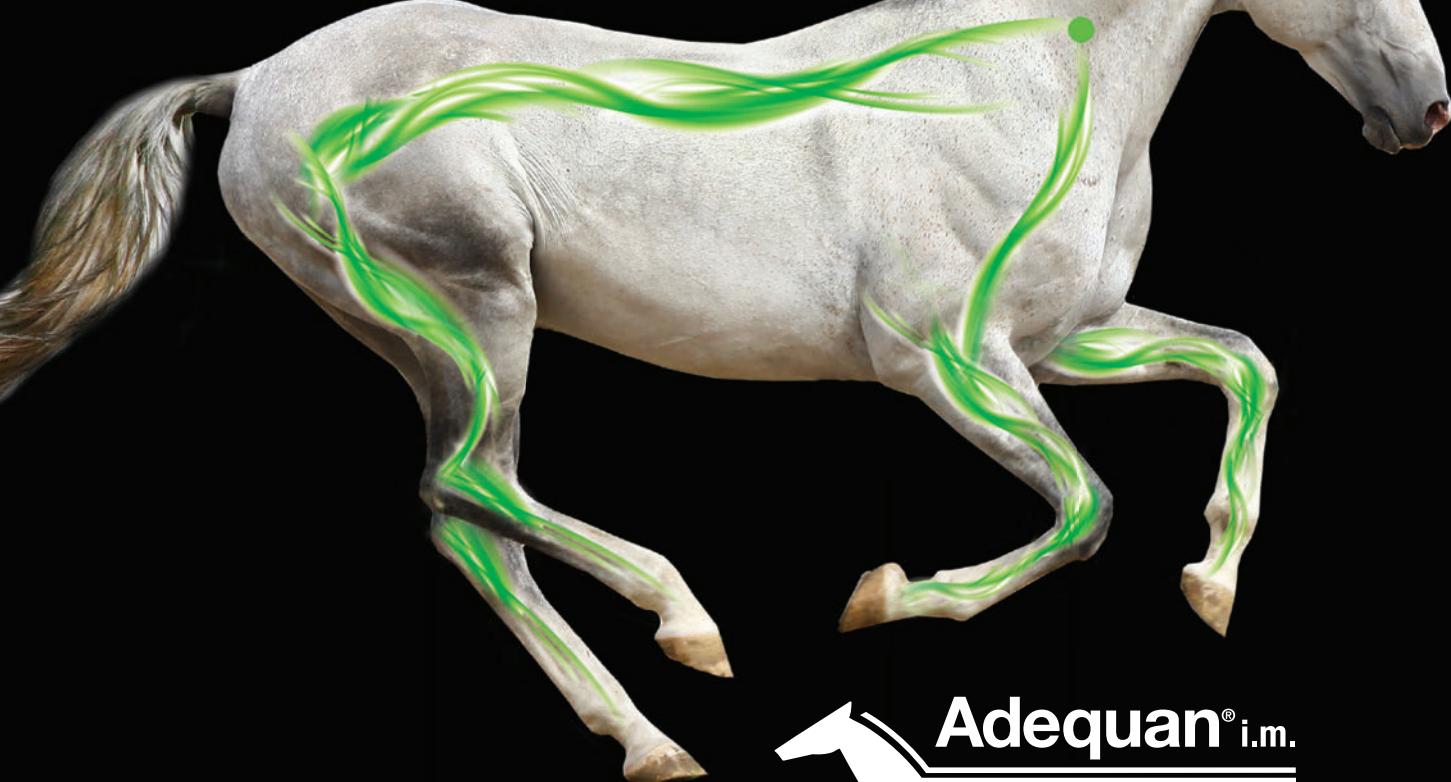
While cleaning is not a topic that equine veterinarians think about often, you have likely heard of high-profile cases in equine medical facilities of resistant bacteria (such as salmonella or other

pathogens endemic in institutional facilities). These resulted in public scares, disruption of services, loss of time and money, and risk to equine patients.

While these dramatic incidents are far less common in private practice, it pays to use the most up-to-date protocols for cleaning and disinfection.

In this article, we will explore modes of disease transmission, methods for cleaning and new ideas for creating healthier equine hospitals.

As veterinarians, you know how diseases spread between horses. The modes of transmission most likely in equine hospital facilities are: 1) fomite trans-



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mission; 2) fecal/oral transmission; 3) direct contact; and 4) aerosol transmission. Diseases are also transferred via vectors, but these are varied and more difficult to discuss within the umbrella of facility design and cleaning methods.

In this article, we will focus primarily on fomite transmission and fecal/oral transmission because they're most easily influenced by excellent cleaning protocols. Direct contact can be managed via other strategies such as good traffic flow. Aerosol transmission is avoided by having properly designed remote isolation facilities for pathogens that spread through the air.¹

Fomites are contaminated objects that spread pathogens from one being to another. In an equine hospital, a fomite could be a contaminated tool, the wheels of a manure spreader, the clothing of a staff member or any number of objects.

While equine hospitals should isolate a contagious patient immediately, it is not always possible to know when a horse is shedding a pathogen. In addition, equine hospitals are subject to the same potential problems that are rampant in human medicine, such as increasingly antibiotic- and cleaning-resistant bacteria, which can lead to hospital-acquired infections.

The best way to have a healthy hospital is to have a tidy one. Keep the floor clean, remove manure immediately and store tools off the floor. If possible, keep your floor surfaces well sealed to make them easier to clean. Once you have created a tidy space, then consider cleaning methods.

One excellent way to attack fomite transmission and fecal/oral transmission is to use a well-formulated hospital cleaner. The best ones destroy the pathogens that we're most concerned about, while also being good at general cleaning. To do both, the chemical formulation must have both a disinfectant and a surfactant.

The best product on the market



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Fecal/oral transmission of pathogens is a common mode of disease spread in equine hospitals.

currently is an accelerated hydrogen peroxide (AHP). The hydrogen peroxide provides safe disinfection while the other ingredients provide the surfactant. AHP is the disinfectant of choice in human hospitals and is also used extensively in companion animal medicine and animal shelters.

The use of a good cleaner such as AHP helps supplement good housekeeping by effectively disinfecting surfaces and by attacking stubborn dirt. In hoseable rooms, AHP can be delivered at the end of a hose with a small dispensing device. In mop-down rooms, it can be delivered onto surfaces with something that looks like a weed sprayer.

In these mop-cleaned spaces, AHP can also be dispensed onto surfaces and removed with a wet/dry vacuum. This system can be portable—in which case it can be purchased for around \$4,000—or it can be centralized. Centralized systems cost more, but they eliminate roll-around equipment, which can itself cause pathogens to travel from space to space. Finally, AHP can be dispensed onto a surface, such as a stainless counter, for spot cleaning.

If you have an existing hospital and

you have not yet used AHP, but you want to try it, you will need to give it some time. The chemical is good at breaking down built-up dirt, so for the first three weeks or so, surfaces will often become slippery until the formerly soiled materials are fully rinsed of their grime.

The only downside of AHP is its cost. While many facilities use it, it does cost significantly more than bleach or some of the other more traditional chemicals. For a quote, contact Virox, the manufacturer of the product. They can put you in touch with a local distributor.

If AHP is out of reach financially for your hospital, there are a variety of other products on the market that can work, including the old standby, diluted bleach. If you do use something traditional such as bleach, consider that you might need a two-step process to scrub then disinfect, because bleach water is not an adequate surfactant. And without a surfactant, your hospital floors will become increasingly difficult to clean.

If you have initiated good housekeeping and an effective cleaning method using both a disinfectant and a surfactant or a combination thereof, you will have taken many steps in the right di-

rection. However, don't forget that lots of little actions will help support your cleaning efforts. These could include:

- providing sinks for staff members and doctors to wash their hands;
- using tools in one space, rather than carrying them from space to space;
- properly disinfecting the tools themselves; and
- cleaning typically forgotten places, such as the mat by the front door to the hospital.

Cleaning Outdoor Spaces

Outdoor spaces are more difficult to clean, but fortunately we don't have to worry about them quite as much. This is because ultraviolet light provides some level of disinfection, except for the most stubborn microorganisms.

The problem with trying to use addi-

tional disinfection techniques outside is that most disinfectants deactivate when in the presence of soil. AHP, for example, readily breaks down into oxygen and water as well as some other mild byproducts, and it quickly loses its powers when applied to soil.

That said, because AHP breaks down into harmless chemicals, it can be sprayed outside onto flat, smooth surfaces such as concrete and asphalt without concern about its potential harm to the environment.

The Future of Cleaning

One of the problems with pathogens is their ability to get together in colonies with diverse species and a food source to form cleaning-resistant matrices. These matrices are known as biofilms. Biofilms are a problem. A biofilm on a floor sur-

face, for example, can practically undo your cleaning efforts, as it can repopulate the surface with new bacteria shortly after cleaning.

One new technology that is being developed to combat this problem is probiotic fogging. The idea is to flood a surface with a harmless (or even beneficial) bacterial cocktail to "take the place" of the pathogenic bacteria that want to repopulate it. The beneficial bacteria assist in breaking down the food source that can be contained in biofilms; it can therefore break down a biofilm over the course of time. While the idea of a probiotic fogging device sounds suspect to many educated people, the technology is more convincing the more one learns about it. Probiotic foggers are now being used extensively in agriculture, with measured benefits for the health of

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food animals. Probiotic foggers are now starting to be used increasingly in universities, and in small animal veterinary corporate practices. They have great potential for application in private equine medicine practices, as well.

Probiotic fogging does not take the place of normal cleaning; it merely supplements cleaning by keeping bacteria at bay. A space can be fogged with a probiotic formula in minutes, and the fog poses no harm to humans or animals. In fact, a space can be fogged when horses are in it, with no ill effects.

Clean Well, but Don't Overdo It

Better disinfectants and other technologies such as probiotic foggers hold tremendous promise for creating healthier hospitals. However, don't overdo cleaning to the point that spaces

are constantly damp or surfaces begin to erode from too much application of water and chemicals.

While we have all seen messy facilities that could use better cleaning, we have also seen over-cleaned spaces. This is most common in institutional facilities, where spaces are cleaned constantly and quite vigorously. Yet you know from your training that microorganisms generally reproduce more readily in the presence of moisture, and therefore too much water can work against your efforts to create healthy work spaces. In fact, some of the most well-known cases of salmonella in hospitals have resulted from water collecting perpetually below rubber mats.

The level of cleaning you should apply might depend on the space. Few barns are designed to be hose cleaned. Yet most equine surgery rooms are. Clean just enough to maximize the facilities you have in place. Maintain them in their optimum states, with neither excess soiling nor constant dampness.

Take-Home Message

In summary, challenge yourself to be more thoughtful about cleaning than you are now. Realize that cleaning properly does make a difference for day-to-day biological risk.

Pay attention to the technologies used by leaders in your own industry and beyond, and you will continue to provide a safe and healthy hospital for the horses in your care for years to come. **EM**

1. For additional information about infection control, see the AAEP's biosecurity recommendations at www.aaep.org/guidelines.

Tony Cochrane, AIA, is an architect at Animal Arts, which specializes exclusively in animal care facility design. The company has designed more than 600 equine and animal facilities in 40 states, Canada and overseas.



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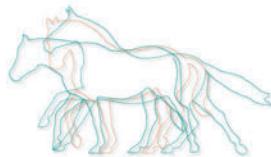
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Vet practices need to protect medical records, client information and employee files.

Hacked!

Don't let your practice become the victim of a cyberattack. Use these tips to protect against a data breach.

By Katie Navarra

You've undoubtedly heard about the cyberattacks on Equifax, Yahoo and other global companies, where computer systems were held for ransom or data stolen or destroyed. Maybe you've received a letter from your bank that said your account

number had been compromised and that a new card had been issued.

Banks, retailers and Fortune 500 companies seem like obvious targets for cyber thieves, but what you might not realize is that small businesses have the potential to be more susceptible to cyberattacks than large ones. Hackers

know that small business owners often don't invest in sophisticated security technology and tend to be more lax about security protocols.

Today, all companies, including equine veterinary practices, are increasingly the targets of cybersecurity threats. These can range from the theft

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of data to the unauthorized release of confidential information, or even a cyberattack. The resulting data breach can interrupt your daily business and damage your reputation.

“Veterinarians should be particularly concerned with these threats. Veterinarians have statutory and regulatory duties to keep certain information confidential,” said Melissa Subjeck, a partner in Hodgson Russ’s Business Litigation Practice. The Buffalo-based attorney is also a horse owner.

The consequences vary depending on your geographic location and the type of data breach. When a breach occurs, your business might be subject to negligence claims, state privacy liability and breach-notification liability.

“Every veterinarian, regardless of size, is obligated to have robust security systems in place to protect against cyberattacks,” said attorney Avery S. Chapman of the Chapman Law Group, PLC, and the Equine Law Group, PLC.

Thinking about your responsibilities to protect data can be overwhelming. In the article that follows, attorney Gary Schober, a partner and cybersecurity expert at Hodgson Russ, Subjeck and Chapman, offers insight into the type of data a veterinarian must protect. He’ll also provided practical advice for increased security practices.

Equine Medical Records

The Health Insurance Portability and Accountability Act (HIPPA) does not cover horses (or any animals). But that doesn’t mean that veterinarians aren’t required to ensure that medical records are protected and properly transferred.

“Pre-purchase exams and other records relating the condition of the horse can affect the marketability and salability of the horse,” Chapman said. “Those are considered confidential and owned by the owner.”

Unless a veterinarian is legally required to release medical records or receives



“Veterinarians have statutory and regulatory duties to keep certain information confidential,” said attorney Melissa Subjeck.

written authorization from an owner to share such records, they must be kept confidential. In today’s digital world, the vast majority of a horse’s medical records are maintained and shared electronically. The notes documenting an emergency visit, MRI or radiographic images taken to assess an injury or facilitate a pre-purchase exam are recorded, stored and shared over the internet.

When transmitting such data, it’s even more critical to establish a procedure that protects such records. Chapman recommended a two-step verification process and the use of an encrypted link for sharing files such as MRIs or radiographs. To achieve this, he advised clients to send one email that contains the link to records—then a second, separate email containing the password to access those files.

Client Information

In addition to protecting a horse’s medical records, a veterinary practice should take steps to maintain the confidentiality of client information. Credit card numbers are the first piece of data most people think of when they think of data theft.

“No one wants to store information that can be stolen, but veterinarians don’t want to chase recurring payments, either,” Chapman said.

A physical swipe of the card is always the most secure method of accepting a credit card payment, but isn’t always practical.

Veterinarians aren’t the only business owners who maintain credit card information for regular or slow-to-pay clients. However, you do have an obligation to use secure software to protect the data that is on file.

In addition to the obvious confidentiality requirements associated with accepting credit cards, businesses are also required to take steps to protect a person’s identifying information. That includes a person’s full name, social security number, bank account number, email address and driver’s license number.

Employee Data

Often the focus of data protection is centered on medical records and client information. But any business is required to protect personnel and employment records. This can include social security numbers, performance reviews and medical information related to employees, Schober said.

One way to limit risk is to keep software, firewalls, virus protection systems and operating systems up to date. Desktops and mobile devices can be programmed to update at the close

of every business day. Hiring an outside technology professional for an audit can provide insight into security threats for your business.

Once recommendations are made, implement those protocols as soon as possible. Be prepared with an explanation if those guidelines are not followed and a security breach occurs.

Don't forget about paper files. Many practices still rely on paper client records and employee applications and files. Make sure filing cabinets are locked and access is limited to those who absolutely need it.

Technology Best Practices

Because most breaches are technology related, utilizing best practices as they relate to technology is key. Chapman, Schober and Subjeck offer several best practices that any veterinarian can implement regardless of the operating system used.

Dual-factor or two-factor authorization is a process for confirming a user's identity. As implied by the name, two different types of verification are required to confirm a person's identity. Chapman's earlier recommendation for sending separate emails with a password and link to medical records is one type of dual-factor authorization method.

For practices that use remote login and/or VPN servers, a dual-factor verification method could include a combination of a password and a biometric marker such as a fingerprint (similar to those that can be enabled on equipped laptops and new smartphones).

Enabling auto-lock on computers and mobile devices can prevent someone from walking away and the work computer staying "open" to prying eyes. Auto-lock causes the computer to shut down behind a log-in wall when no activity is detected for a specified amount of time.

Password protocols are a top priority for Subjeck. At a minimum, all passwords should be reset from their de-

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fault, administrative settings. It's also advantageous to change passwords at least quarterly.

Assigning unique user names and individual passwords comprised of a combination of letters, numbers or characters can help thwart hackers.

"In the public domain, it's considered negligence not to change passwords from the default ones assigned," Chapman said.

Employee training is a critical component for practices that hire employees. First and foremost, employees must understand the importance of protecting the data the practice owns. That includes knowing and following established procedures for sharing data.

Employees should know what information can and can't be shared, or whom they should ask if the occasion arises.

It's also important to train employees to identify and delete questionable emails and attachments without opening them, Schober said. Sometimes the simple act of opening a fake email can alert cyber criminals or put unprotected computers at risk.

Establish record retention protocols. Extraneous data increases a practice's

risk for exposure if a hacker is successful in breaching a security system. "It is important that all businesses purge information that is not needed from a regulatory or business standpoint," Subjeck said.

Data breach and cyber liability insurance can provide coverage for legal and forensic services, public relations and crisis management, notification expenses, and defense and liability expenses.

The American Veterinary Medical Association (AVMA) website notes that according to a study from the Ponemon Institute, the average data breach cost per compromised record is \$214. Take that amount and multiply it by the number of clients you serve and each record you house, and the cost of settling data breach damages can be staggering.

The AVMA PLIT-sponsored Program through The Hartford Group is one way to obtain data breach coverage to protect your practice.

Schober recommended reviewing the insurance policies you currently have to detect any gaps in coverage that might exist.

Hiring an attorney familiar with cybersecurity can be well worth

your time and expense. An attorney or other consultants specializing in cybersecurity can help you develop a comprehensive cyber protection plan for your business.

Take-Home Message

Staying one step ahead of cyber criminals can be challenging. Part of what complicates the process is that there currently are no federal laws that specifically address cybersecurity and a veterinarian's responsibility. The board of veterinary medicine in each state provides the governance, which means requirements and consequences will vary from state to state.

"The ethical rules and privacy laws governing larger practices apply equally to smaller practices," Subjeck said. "Smaller practices can also be subject to allegations of negligence by individuals affected by a security breach."

Taking a proactive approach to protecting the data your practice maintains is your best defense. Work with an attorney or other consultant who specializes in equine and cybersecurity. The American Veterinary Medical Association (AVMA) also offers resources that can help you get started. **EM**

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