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Spring 2019

2018 AAEP CONVENTION COVERAGE

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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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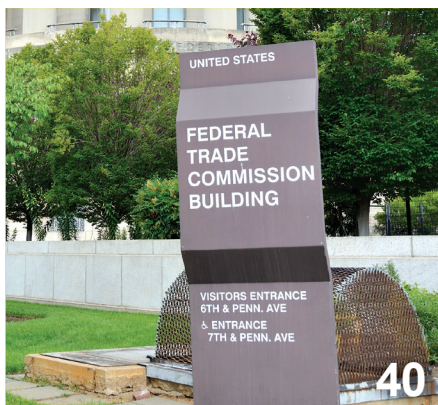
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Despite Our Differences

We live in an age where there often are four (or more) generations in the same workplace. There are the Traditionalists, born between 1928 and 1945; the Baby Boomers, born between 1946 and 1964; the Gen X folks, born between 1965 and 1980; and the Millennials (or Gen Y), born between 1980 and the mid-1990s to mid-2000s. And let's not forget Gen Z, who were born between the mid-1990s to mid-2000s and are either in their first careers or entering the job market soon.

There are many generalities about each of these demographics, and your vet practice is probably living with some of the realities of managing a divergent group of staff members who aren't motivated by the same things. That makes it difficult to design a hiring protocol or benefits package that honors the needs and desires of each of these groups.



Gathering to Learn

The AAEP Convention to the rescue! The world's largest gathering of equine veterinarians of all ages and career stages, the convention offers a vast amount of CE, as well as many learning opportunities in small groups. *EquiManagement* is happy to provide coverage of the 2018 AAEP Convention, and we thank AAEP Partner Zoetis for helping us bring you highlights of some of the equine health presentations.

Four additional health-related convention articles either have been or will be posted on *EquiManagement.com* and are brought to you by Zoetis.

Welcome, WEVA!

EquiManagement welcomes its newest official Media Partner, the World Equine Veterinary Association (WEVA). This international group's mission is "working to advance the health and welfare of horses worldwide by promoting and offering

quality continuing education for equine practitioners, specifically in countries with limited access to high-quality, broad-based professional education."

We are pleased to share *EquiManagement's* content with the 42 local, regional or country associations who are WEVA members.

The WEVA leadership wants to invite all *EquiManagement* readers to the 2019 WEVA Congress on October 3-5 in Verona, Italy. You can learn more about this event and the speakers at weva2019.eu.

We also appreciate our other official Media Partners: AAEP, AVMA PLIT, BEVA, ISELP, NZEVA and AA EVT.

Digital Education

If you haven't yet visited EquineVetEdu.com, make sure you check in soon! This is the new online veterinary education portal brought to you by AVMA PLIT and *EquiManagement* that has many new courses

scheduled to be deployed this spring.

In late March, *EquiManagement* will launch the podcast *Disease Du Jour*. We invite you to visit EquiManagement.com to learn where you can listen to or download *Disease Du Jour*. Each podcast will delve into the research and current best practices for a variety of equine health problems with industry experts.

In the early lineup for the *Disease Du Jour* podcast are: Dr. Steve Reed, on the latest in EHV and EHM; Dr. Peter Timoney, on abortive diseases in mares such as EHV-1, EHV-4 and EAV; Dr. Tom Chambers, on equine influenza; Dr. Bonnie Barr, on diseases of foals; Dr. Roberta Dwyer, on the equine veterinarian's influence on biosecurity; and Dr. Tom Riddle, on breeding season procedures.

Let us know if you have a topic you would like to see covered on either *Disease Du Jour* or the AVMA PLIT's online portal EquineVetEdu.com. **EM**



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¹ PANACUR® (fenbendazole) POWERPAC Equine Dewormer product label.

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Circadian Rhythm of Muscle Cells

When we think of circadian rhythm, we likely focus on the suprachiasmatic nucleus, i.e., the master biologic clock in our brains that aligns with light/dark cycles to mediate metabolism and influence sleep patterns. However, an article in the September 2018 issue of *The Scientist* dis-

discussed the recently appreciated biologic clock within skeletal muscle cells.

Muscle tissue stores up to 70% of a body's sugar uptake. These muscle clocks impact the ability of muscle tissue to take up glucose in response to insulin and muscle contractions: "During an animal's waking hours, feeding—which releases insulin from the pancreas—and physical activity induce the movement of the glucose transporter GLUT4



Research has shown that “muscle clocks” impact the ability of muscle tissue to take up glucose in response to insulin and muscle contractions.

energy production peak just before the active phase begins.”

Depending on an animal's circadian cycle, the muscle clock regulates the type of fuel burned—when muscle is active during waking hours, it burns glucose; when the animal is asleep or at rest and fasting, muscle turns more to lipids and amino acids. Genes involved in metabolism are ex-

pressed at different times of the day based on the circadian rhythm.

There are other peripheral clocks in the body, including those in the liver, pancreas and adipose tissues. For example, a “clock” within the pancreas is responsible for maintaining proper secretion of insulin.

With this newfound construct of circadian rhythms and integrative tissue interaction throughout the body, it might be possible to use this information to help modulate insulin sensitivity, particularly in horses demonstrating insulin resistance and other endocrine aberrations.

Disease Spread From Horse Shows

Biosecurity is an essential strategy to limit the spread of equine disease, both at home and at equestrian events. A Canadian two-day

to the cell membrane.

Studies show that disrupting clock genes in the muscle impairs the transcription of GLUT4 and other key genes involved in this process. Proteins required to metabolize sugars and lipids are also produced in a circadian manner.

Researchers have found that genes that regulate the storage of these fuels reach peak expression levels when animals are preparing for rest, while those involved in breaking them down for

Researchers have found that the muscle's intrinsic rhythms could be tweaked in mice by changing the timing of feeding, which is an important cue for other peripheral clocks. Scheduled exercise also tunes the muscle's clocks, affecting the expression of circadian genes such as those involved in maintaining the muscles' contractile properties.

Alterations in tissue-specific timekeepers might influence sarcomere fiber

dressage horse show was used for a model study on minimizing spread of equine influenza virus [Spence, K.L.; O'Sullivan, T.L.; Poljak, Z.; Greer, A.L. Estimating the potential for disease spread in horses associated with an equestrian show in Ontario, Canada, using an agent-based model. *Preventive Veterinary Medicine*, March 2018, vol. 151; pp. 21-28].

Sixty-nine horses attended the Canadian dressage show, and 710 horses (non-attendees) were impacted at 38 respective barns upon the show horses' return home. Using a simulation model

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1 Data on file.

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3 Burba DJ, Collier MA, DeBault LE, Hanson-Pointon O, Thompson HC, Holder CL: In vivo kinetic study on uptake and distribution of intramuscular tritium-labeled polysulfated glycosaminoglycan in equine body fluid compartments and articular cartilage in an osteochondral defect model. *J Equine Vet Sci* 1993; 13: 696-703.

4 Kim DY, Taylor HW, Moore RM, Paulsen DB, Cho DY. Articular chondrocyte apoptosis in equine osteoarthritis. *The Veterinary Journal* 2003; 166: 52-57.

5 McIlwraith CW, Frisbie DD, Kawcak CE, van Weeren PR. *Joint Disease in the Horse*. St. Louis, MO: Elsevier, 2016; 33-48.

based on that scenario, the researchers “infected” one show participant with equine influenza. Infection in this model occurred only due to direct contact rather than including fomite contact.

Vaccination against influenza virus decreases appearance of clinical signs, probability of transmission and duration of illness. Assuming that vaccination is about 50% effective, this model estimated that vaccinated horses had a 47% probability of transmission per effective contact.

The model also assumed a minimum of at least 36% vaccination rate for horses at the show and, similarly, for non-attendee horses left at home.

The study looked at three possible interventions:

- quarantine of horses attending the show upon return to home facility—two days, five days, or 14 days;
- targeted increases in the initial facility-level vaccine coverage prior to show season, from 36% vaccination of the herd to 50% and 75% vaccination coverage;
- a combination of the preceding two strategies.

Historically, the duration of an outbreak lasts from 18-30 days (Canadian event) or 14-20 days (Japan) in a partially vaccinated population. These attack rates and duration were considered the base-case scenario. Also taken into account was the number of horses at each home facility, along with a different number of potential owners.

Horses quarantined for five or 14 days had a significantly reduced attack rate—by about 91%. As might be expected, the longer quarantine duration yielded



Researchers determined that combining vaccination and quarantine is the best way to reduce disease spread.

the best protection against an outbreak. Quarantine for five days resulted in an illness duration of 8.9 days; a 14-day quarantine resulted in an illness duration of 7.75 days. Increasing vaccination to 75% (but without quarantine) within barns of four or more horses led to the lowest attack rate, at 36% less than the base-case scenario.

If horses were vaccinated but only quarantined for two days, the attack rate decreased by 23% compared to the base-case scenario, although illness duration was similar to the base-case scenario. A combination of quarantine with increased numbers of horses included in herd vaccination resulted in the largest decrease in attack rate.

In summary, while a 14-day quarantine is best, compliance is often an issue and therefore, a five-day quarantine is acceptable, especially when 75% of the herd is vaccinated. These quarantine periods can reduce attack rates by 91%. The report

stated that “A 14-day quarantine period would be most beneficial for facilities with any level of vaccine coverage, or when the vaccination status of individual horses within the facility is unknown. At a higher level of vaccine coverage, two- or five-day quarantine periods could be used to minimize the potential for an outbreak when quarantine for 14 days would not be feasible.”

Fecal Biota of Horses with Colic Compared to Those Admitted for Elective Surgery

Intestinal microbiota of the equine hindgut are important for general health. The presence of healthy intestinal microbes influences immune

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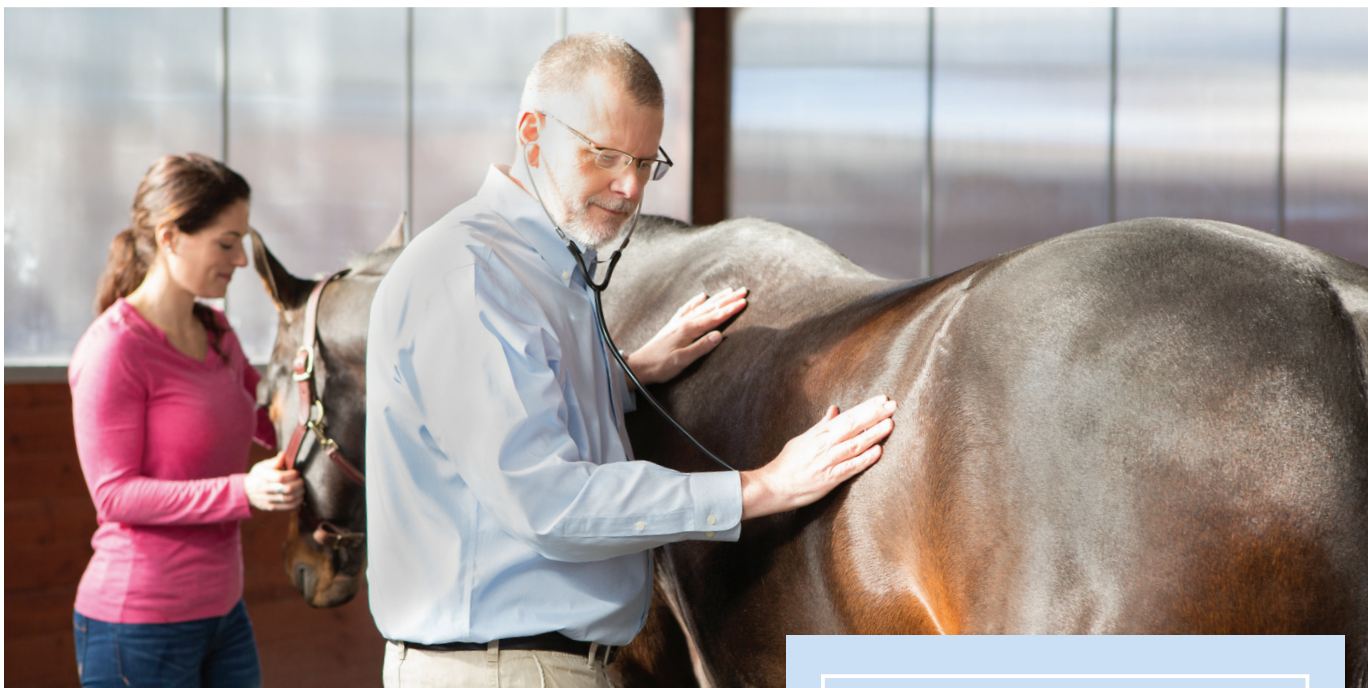
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function and protects against pathogens. In a recent study, fecal analysis was performed on 17 horses presented for colic and 30 horses presented for an elective surgical procedure [Stewart, H.L.; Southwood, L.; Indugu, N.; Vecchiarelli, B; Engiles, J.B.; and Pitta, D. Differences in the equine faecal microbiota between horses presenting to a tertiary referral hospital for colic compared to

an elective surgical procedure. *Equine Veterinary Journal*, Aug 28, 2018].

Those horses admitted to the facility for colic had fewer intestinal microbial species that were also less diverse. The authors point out that “the bacterial community composition in horses presenting for colic was substantially different to that of horses presenting for an elective surgical procedure.” The

predominant commensal gut bacteria numbers were decreased in colic horses while the opportunistic species were increased. The study findings concluded: “Colic in horses is accompanied by significant alterations in gut microbiota with a significant decrease in bacterial richness and diversity.”

It has been suggested that disruption of complex interactions between the host and commensal gut bacteria can lead to gastrointestinal disease. There is some thought that alterations in intestinal microbiota are associated with intestinal inflammation. This information might be incorporated into feeding management recommendations for horse owners to maximize equine digestive health.

Cryptorchid

A poster presented by the University of Barcelona (June 2018) discussed some key facts about cryptorchidism in stallions based on a comprehensive literature review. Failure of testicular descent occurs due to multiple factors and genetics. Incidence ranges from 2-8%. Unilateral cryptorchidism is more common than bilateral. Affected individuals might show signs of nervousness, aggression and/or stallion-like behavior.

It is suggested that if no testicles are present by 1-2 years of age, then a rectal evaluation should be performed. Transrectal or transcutaneous ultrasound can be helpful, but it might not be entirely accurate about the presence or absence of testes. Blood testing of basal testosterone concentration is variable based on season, age and adrenal secretion and therefore is not definitive. Similarly, hCG testing does not give clear results.

The most definitive test for cryptorchidism is with the anti-Mullerian hormone (AMH) as a biomarker for the presence of testicular tissue. A cryptorchid stallion has much higher levels of AMH than an intact stallion. **EM**

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Mission and Vision Statements

Mission and vision statements provide essential foundations for businesses, and veterinary practices are no exception. Organizations summarize their goals and objectives in mission and vision statements, which are often confused with each other.

A mission statement describes what a firm wants to do now, while a vision statement outlines what an organization wants to become in the future.

A mission statement declares an organization's specific focus and remains constant over time. A well-written mission statement is a compass that helps keep a practice's decisions and direction focused on True North. Simply stated, your mission is what you do every day. It's the fundamental reason for your practice's existence.

Properly crafted mission statements 1) serve as filters to separate what is important from what is not; 2) clearly state who will be served and how; and 3) communicate a sense of intention to both the organization and the public.

A mission statement generally answers: "WHAT do we do?," "FOR WHOM do we do it?" and "WHY do we do what we do?" The best mission state-

ments also answer the question "HOW do we bring value to our customers?"

A mission statement is an important part of your practice's business strategy because it captures the essence of your practice's philosophy in a few succinct words or sentences. A properly written mission statement announces what your business is all about to your clients, employees and the community. It's your reason for existing.



Your mission statement should be on display in your practice for clients and employees. Every staff member should be able to clearly communicate the mission of the practice. This public expression of what your practice stands for is valuable for the horse owners with whom you interact every day. It is important that they know who you are as an equine veterinarian, what you believe in and what your values are. It's

the ultimate trust-builder between the horse owner and veterinarian.

A vision statement is a description of what an organization would like to accomplish in the future. It is intended to serve as a clear beacon for plotting future paths of action.

When practice owners articulate the long-term goal to which the practice is aspiring, all staff members then understand what they are trying to achieve.

For team members, understanding the practice's future dream can give meaning to their hard work.

In order to grow the vision into reality, practice leaders first need to communicate the desired future clearly—then they must encourage new ideas to bring it to fruition. When the entire practice team has a clear understanding of the destination,

its members can share in mapping the route. A practice with a shared vision of its future will inspire the team.

Without a clear destination, your practice will struggle to make the changes necessary to grow and improve. A vision helps immensely in the creation of a successful path to the desired end, whether the vision belongs to an organization or an individual.

Many businesses have two vision

statements, one that is focused on the client experience (external) and one that is focused on the workplace and staff members (internal).

An individual also can have a professional and a personal vision statement.

A good vision statement contains the following:

- identifies the destination in a descriptive and inspiring way;
- results in increased commitment, enthusiasm and engagement by all involved in the effort;
- describes an audacious, but attainable, dream;
- is exciting and energizing to contemplate;
- is well articulated, focused and easily understood; and
- reflects the organization's or the individual's strengths.

This vision is a picture of your practice's desired future, supported by its mission and values. A vision timeline might occasionally be as short as one year but more commonly is three to five years. A practice might find that the vision changes as the business accomplishes specific goals or there is a need to adjust to a changing market.

When writing a vision statement:

- project a specific time in the future;
- dream big, be brave and focus on success;
- use the present or future tense to describe the future;
- use clear, concise language; and
- paint a colorful mental picture of the future you want.

Mission and vision statements are important for clearly stating the goals and objectives of a practice. This essential foundation of a veterinary practice will help you chart your future with confidence. **EM**

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Speakers at the Zoetis Sunrise Session at the 2018 AAEP Convention were, from left, Drs. Harold C. McKenzie, III, Thomas J. Divers, Thomas Chambers and Mark V. Crisman.

AAEP Equine Health Coverage

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Presentations about 'hot' topics in equine health from the 2018 AAEP Convention can be found here and online.

By Nancy S. Loving, DVM

The largest gathering of equine veterinarians can be found each year at the annual American Association of Equine Practitioners (AAEP) Convention. The 2018 Convention was held in San Francisco, California, and it was the 64th edition of the annual gathering.

In this article, we bring you selected reports from presentations at the AAEP convention. You can find four additional articles providing coverage of equine

health topics from the AAEP Convention on EquiManagement.com.

Editor's Note: EquiManagement magazine and online coverage of the equine health presentations and discussions from the 2019 AAEP Convention are brought to you by Zoetis.

Infectious Disease Updates

At a table topic session at the 2018 AAEP Convention, Katie Flynn, BVMS, equine staff veterinarian for the California Department of Food and Agri-

culture, and Angela Pelzel-McCluskey, DVM, MS, equine epidemiologist of surveillance, preparedness and response Services at the USDA-APHIS-Veterinary Services, led a discussion on infectious disease updates.

Monitoring Disease—It was mentioned that careful surveillance of infectious diseases in the horse world is ongoing and regularly updated. The Equine Disease Communication Center (EDDC) is available to all veterinarians to help keep track of outbreaks. It also

allows the public to receive current information on disease status and assists veterinarians in providing the best health advice to clients. It is accessible at equinediseasecc.org.

Herpesvirus—Of special interest to equine practitioners are the continued outbreaks of equine herpesvirus (EHV-1) in its neurologic form (equine herpesvirus myeloencephalopathy or EHM). Flynn described some updated guidelines in regard to EHV-1 infection:

- Some horses are not following the textbook expectations. Even though febrile, the individuals test negative until two days later, so it might be necessary to test again.
- In the face of an outbreak, horse owners want all the horses tested, but Flynn emphasized that only those with clinical signs should be tested.
- Some horses with confirmed EHV-1 had temperatures of 100-100.8° F because they were being treated with firocoxib for musculoskeletal issues. Firocoxib lowers temperature longer than flunixin, so it is possible to miss the fever stage. Flynn recommended keeping a temperature log that states that the horse is on NSAIDs. Treated horses might mean that a lower temperature threshold should be considered for EHV-1 testing.
- It is also important to understand the rules and regulations of your state. Samples from private labs must go to the regulatory lab, and this could delay implementation of quarantine. The horse owner must not remove horses from quarantine until the regulatory lab processes the sample and obtains results.
- There is a requirement for two negative tests on a positive horse before it can be released from a barn. Findings suggest that it might take 36 days rather than 10-11 days to confirm negativity for infection.

Bettina Wagner, DVM, has focused on equine immunology and has been

instrumental with her team at Cornell University in developing a diagnostic test for Lyme disease. She commented on a new EHV-1 multiplex assay using nasal swabs and serum samples that might be able to categorize the stage of herpesvirus (EHV-1) infection. While this test is not yet available for field application, it could be helpful in future to determine the exact duration necessary for quarantine.

Wendy Vaala, VMD, DACVIM, of Merck Animal Health, noted that EHM appears to affect multiple organ systems—lungs, spinal cord, eyes, uterus and testes (which can create fertility issues).

Lyme Disease—An updated ACVIM Consensus Statement was published in February 2018 and is available on the ACVIM website.

Ticks and Lyme Disease—There is now a website devoted exclusively to tick surveillance: National Equine Tick Survey at equineticks.org.

The group is asking for practitioners to send in ticks from anywhere in the country; then the website will post monthly updates. Cornell is also PCR testing ticks for *Anaplasma phagocytophilum* and *Borrelia burgdorferi*.

Cystic Lyme Disease—Thomas Divers, DVM, DACVIM, DACVECC, of Cornell University, brought new details to light about Lyme disease. Motile forms of *Borrelia* are susceptible to treatment with tetracycline, minocycline or ceftiofur; however, a cystic form is recognized, which, while not necessarily the cause of a problem, is difficult to treat with antibiotics.

Minocycline is only 22-30% bioavailable in horse, whereas in humans and small animals it is 100% bioavailable and penetrates the CNS. Divers noted that once tetracycline reaches the lower gastrointestinal tract, especially if the tract is filled with forage, there is a limited effect on the microbiome, and it might be safer than previously thought. IV tetracycline can be used for seven to 10 days and renal function monitored; then the horse can be switched to doxycycline or minocycline for the remainder of treatment.

Lyme Vaccine or Exposure?—It is possible to tell the difference between Lyme disease vaccine and exposure—with natural exposure, the OSP-A antigen stays elevated while vaccine OSP-A declines.

Exposure to Lyme disease might not

A new website devoted to tick surveillance is now available to veterinarians who want to send in tick samples.





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necessarily imply disease. It is important to rule out other disease types and causes for noted clinical signs. Some cases treated with doxycycline or minocycline might show improvement because these medications have anti-inflammatory properties even if a horse is not infected with *Borrelia*. Without a confirmed diagnosis, treatment response might lead to a false positive speculative diagnosis of *Borrelia*.

Optimizing Risk-Based Disease Protection

Immunization is a large part of an equine practitioner's horse care regimen, so it helps to know whether one's method of vaccinating is efficacious to minimize risk of disease.

At the Zoetis Sunrise Session at the AAEP Convention, a panel consisting of Thomas Divers, DVM, DACVIM, DACVECC, of Cornell University; Harold McKenzie, DVM, DACVIM, Virginia-Maryland College of Veterinary Medicine; Tom Chambers, PhD, University of Kentucky Gluck Equine Research Center; and Mark Crisman, DVM, DACVIM, part of the Zoetis Professional Services team, discussed updated information about equine influenza and Potomac Horse Fever.

Influenza Immunity—Vaccinations can be administered either as a stand-alone antigen in one syringe, or as a polyvalent combination of multiple antigens in one syringe. One study compared immune responses for equine influenza (EIV) with or without equine rhinopneumonitis (EHV) given separately in a different muscle group from core vaccines (tetanus, West Nile virus and rabies).

The EIV-EHV combo given alone in its own muscle group consistently provided better cross-reactive immune responses compared to its inclusion in

the polyvalent vaccine. This was true regardless of the vaccine manufacturers (Zoetis, Merck, Boehringer-Ingelheim) represented in the products evaluated.

In summary: For better influenza protection, EIV or EIV-EHV is best administered separately in its own syringe apart from core antigens.

Potomac Horse Fever Immunity and Seasonality—A 91-horse study in southwest Virginia compared the use of monovalent versus multivalent Potomac horse fever (PHF) vaccines. Separate, single monovalent PHF vaccine and monovalent rabies in two different injection sites were administered to 45 horses, while a single multivalent PHF and rabies in the same injection was given to 46 horses.

Both vaccine types exhibited poor immunogenicity. Only one-third of the horses seroconverted to a PHF titer >1:4 at any time point post vaccination. Compared to the multivalent product, the monovalent PHF exhibited significantly greater immunogenicity in regard to the number of horses that seroconverted for the first two months following vaccination. However, by three to four months post-vaccination, there was not much difference between the two vaccine methods.

PHF used to occur mostly in late spring and summer, but now cases are extending into fall and early winter. Because the immune response—however much can be achieved—to PHF vaccine lasts only about three months, it is now recommended to booster the vaccine at



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One report noted a five to tenfold increase in geriatric patients seen in referral hospitals.

the end of summer (August).

Another interesting finding about the risk of PHF has to do with insect attractants such as lights. The panel experts recommend turning off night-lights near horses—especially those around water troughs—to avoid luring aquatic insects.

In addition, drought conditions are associated with outbreaks of PHF. Even one wet area in a pasture encourages accumulation of aquatic insects in those areas. Horses also like to congregate around water, where pasture grass might grow better. Keeping horses away from the wet areas might help reduce PHF transmission.

It was also noted that anaplasmosis clinical signs appear similar to PHF clinical signs, and the disease occurs in similar geographic areas. Therefore, it is

important to accurately diagnose illness in horses in regions where both diseases occur.

Endocrine Disease in the Aged Horse

Endocrine disease is front and center in many equine practices as horses are aging well into their golden years. One report noted a five to tenfold increase in recent numbers of geriatric patients seen in referral hospitals.

Middle-aged and older horses are prone to developing pituitary pars intermedia dysfunction (PPID). Any age horse can develop equine metabolic syndrome (EMS), especially if obese. A lot of attention is focused on managing these endocrinopathies because of their high association with laminitis. It is reported that more than 90% of laminitis cases seen in the field (outside of sick horses in veterinary hospitals) are a result of endocrinopathies.

A lot of attention is focused on managing EMS horses.



At the AAEP Convention, an in-depth session revolved around endocrine disease, particularly as it relates to the geriatric horse. Presenters included Elizabeth Tadros, DVM, PhD, DACVIM, of Michigan State University; Dianne McFarlane, DVM, PhD, DACVIM, of Oklahoma State University; and Catherine McGowan, BVSC, MACVSc, PhD, DEIM, DECEIM, FHEA, MRCVS, of the University of Liverpool.

Aging in horses is associated with decreased insulin sensitivity, an increase in inflamm-aging, and decreasing levels of adiponectin, which is important in regulating glucose levels by increasing insulin sensitivity. In many cases, there can be converging endocrinopathies, according to Tadros.

McFarlane described PPID as an age-related disease, with 20-30% of horses greater than 15 years old testing positive for PPID. Prevalence increases with each year of age. In one study of 450 pituitary glands, no horse under 10 years of age had PPID. Thrifty horses without PPID have a more responsive pars intermedia than lean horses.

It has been proposed, but is still lacking evidence, that a horse with equine metabolic disease might be predisposed to pars pituitary intermedia dysfunction, especially if older than 15 years.

PPID comes on over time due to tissue damage from oxidative stress and accumulation of intraneuronal cellular waste products. Affected horses lack energy, experience hair coat changes such as hirsutism, abnormal shedding and color changes. Muscle mass atrophy, secondary bacterial infections and foot abscesses are common, as are changes in mentation. In addition, PPID is also associated with suspensory ligament degeneration, infertility and changes in sweating patterns—50% sweat extensively while a few experience hypohydrosis.

Obesity occurs in 30% of horses worldwide, according to McFarlane. She said, “If obesity, regional adiposity, easy keeper, laminitis of unknown origin or seasonal laminitis are the clinical signs,

one should be concerned with insulin dysfunction (ID).”

The onset of PPID coincides with worsening clinical signs related to obesity, resulting in exacerbation of metabolic dysfunction to lead to hyperinsulinemia. Not all horses experiencing PPID also experience insulin dysfunction (ID), but ID occurs in about 30-60% of PPID horses. PPID concurrent with ID increases the risk for laminitis.

McGowan reported that horses with PPID are 2.7 times more likely to have hyperinsulinemia than age-matched controls. Prolonged hyperinsulinemia is associated with laminitis. In a study of 38 PPID horses and ponies, 29/38 (76%) developed laminitis. Overall, owners recognized only 14/38 (37%) as being laminitic. If the horses were hyperinsulinemic, 63% of owners were more likely to report laminitis. If only mildly hyperinsulinemic, only 18% of owners recognized laminitis.

McFarlane urges client participation to monitor progression of disease via reports of body condition score, shedding patterns, changes in muscle mass and the use of digital photographs for foot health. Observation of hoof rings, widening of the white line, the presence of dropped soles and foot radiographs help to monitor laminitis episodes.

Typical EMS signs include regional adiposity, thriftiness and obesity. These individuals are predisposed to endocrinopathic laminitis due to insulin exposure. Diagnosis of EMS is predicated on testing for ID. It is relevant that obesity is not always present with ID, since an owner might have favorably impacted the horse’s weight with diet and exercise or because a horse suffering from laminitic pain will lose weight. Still, it is important to test for ID, even in the face of managed weight loss, said McFarlane.

Diagnostic testing is important to help define just what you, as the practitioner, might be dealing with in order to implement the best treatment and prevention for laminitis. An initial thorough screening includes a complete

blood profile and chemistries, followed by endocrine testing.

Tadros described different options to detect ID and PPID. Static testing measures a single blood sample at a single time, checking for resting insulin and endogenous ACTH levels. However, it is possible to miss mild cases of hyperinsulinemia this way.

A noteworthy point made by McFarlane: Specificity of the endogenous ACTH test is only 80%; i.e., 20% that test positive don't actually have PPID, especially in the fall months, when ACTH normally elevates. She also pointed out that gray horses have higher ACTH concentrations than non-gray horses in the fall, as do horses under stress, such as occurs with illness.

By contrast, dynamic testing relies on hormonal challenge and evaluation of the endocrine response. One benefit of dynamic testing is that it reveals a horse that might be able to compensate homeostatically until the system is perturbed, as it is with a diagnostic endocrine challenge. The TRH (thyroid-releasing hormone) stimulation test is one such example of a dynamic test for PPID, as it amplifies ACTH response to TRH.

At this time, there are no established fall seasonal reference ranges; therefore, this test is best performed from mid-July to mid-November.

An overnight dexamethasone suppression test is another dynamic test for PPID—failure to suppress ACTH with dexamethasone indicates the presence of PPID. The oral sugar test—Karo syrup given after an overnight fast—looks at the response of glucose levels. The presence of hyperglycemia in the baseline and challenge sample is suggestive of diabetes mellitus, which can occur in horses with PPID.

An in-feed oral glucose test uses dextrose powder administered after an

overnight fast; insulin and glucose are measured before and after feeding the dextrose.

An insulin tolerance test is performed without fasting. Insulin is given IV, blood is collected 30 minutes later, and glucose is measured. Glucose should decrease to 50% or less of baseline in response to the insulin challenge. If it does not, then it is likely that the horse has peripheral insulin resistance, as well as decreased tissue responsiveness to insulin; i.e., a whole body effect of ID.

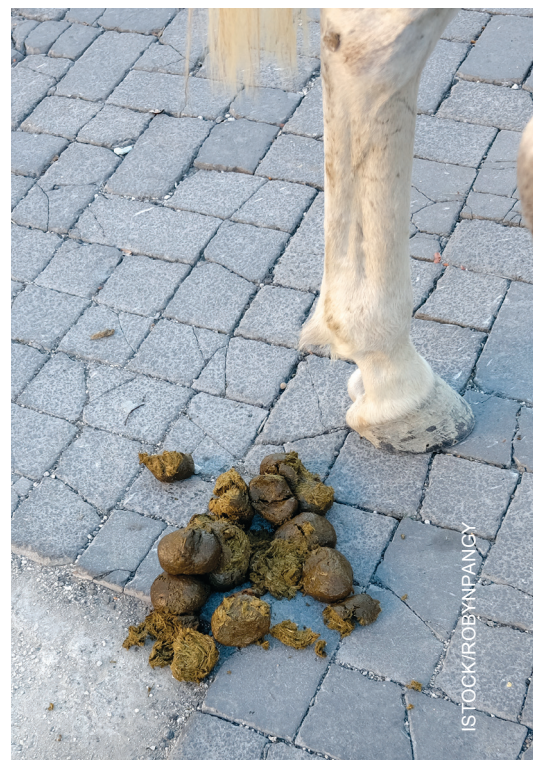
While abnormal shedding and a hirsute hair coat are indicative of PPID, Tadros discussed the practicalities of testing a hirsute horse. This is appropriate to achieve baseline values and compare those to treatment response after one to two months on pergolide, she said. Reports advised that 75% of treated horses respond to pergolide therapy. It is important to counsel clients that a horse cannot compete in some venues while taking pergolide and that there might be a specified withdrawal period from the medication.

Overall, McFarlane stressed an integrative approach to diagnosis of an endocrinopathy. Information should come from multiple avenues: signalment, history, clinical signs and diagnostic testing.

Chronic Diarrhea

It is not uncommon for equine practitioners to be called by a client who is upset that his or her horse is passing loose manure. At the 2018 AAEP Convention, a table topic led by Luis Arroyo, LVM, DVSc, PhD, DACVIM, of the University of Guelph, and Ashley Whitehead, DVM, BSc, DVSc, DACVIM, of the University of Calgary, focused on management of cases of chronic diarrhea. They noted that a true diagnosis is obtained in less than 40% of diarrhea cases and that often it is necessary to work through a process of exclusions.

For diarrhea to occur, Whitehead suggested that there must be a problem in the large intestine in addition to the



Horse owners ask veterinarians about their horses' stools, especially when they aren't normal.

small intestine. It might have to do with aberrations in motility and transit time such that fecal water isn't absorbed and instead goes out through the rectum.

Often diarrhea cases are associated with some form of dysbiosis not necessarily related to primary intestinal pathology, but rather to stress (training, transport, herd dynamics) or to medications. NSAIDs given within the past 30 days are known culprits in modifying the microbiome. Trimethoprim-sulfa antibiotics alter intestinal microflora for a month.

Whitehead explained that horse owners have a couple of options to help track a potential cause and to alleviate loose stools.

A skin test can be performed for dietary allergens, including grass hay. There are times when changing forage (such as occurs when moving a horse from pasture to hay) can upset the intestinal flora. Dietary exclusion testing might find the source of the problem or help remedy the intestinal changes.

Transfaunation is a treatment that has been successful in managing colitis or intestinal dysbiosis that occurs due to changes in microflora from changes in feed.

Feces are collected from a healthy horse and are placed in a stocking net tied at the top. This is added to 10 liters of pre-warmed salt water (salt added to make a physiologic saline solution) in a metal bucket. The manure is “massaged” in the bucket to the color of black tea. The stocking-net of manure is discarded, and about eight liters (if possible) of the supernatant is given via nasogastric tube to the diarrhetic horse. This treatment might be administered daily for three days, although results might be achieved with a single dose.

Human studies have found resveratrol improves insulin sensitivity.



Dietary Supplement Effects on Insulin and Adipokine

High circulating levels of insulin are known to trigger laminitis in horses. One protein, adiponectin, is important to enhancing insulin sensitivity through increased fatty acid oxidation and inhibition of liver glucose produc-

tion. Obese individuals tend to have lower adiponectin levels and are more at risk for insulin dysfunction (ID).

Human studies have found that a plant polyphenol (resveratrol, which is found in foods such as red grapes) improves insulin sensitivity and mimics the effects of calorie restriction. In rats, combining resveratrol with leucine facilitated improvements in insulin sensitivity with smaller amounts of resveratrol.

Jane Manfredi, DVM, MS, PhD, DACVS-LA, DACVSMR, of Michigan State University’s College of Veterinary Medicine, presented at the 2018 AAEP Convention on a supplement for horses with equine metabolic syndrome (EMS) and insulin dysregulation (ID). The supplement contains a synergistic combination of resveratrol and an amino acid complex containing leucine (SPAAB+L).

Fifteen adult horses with EMS and ID were in the study. Body condition scores were 7 out of 9, and the average age was about 10. The SPAAB+L supplement was administered for six weeks at either a high dose or low dose. Testing was done July through August, with analysis pre- and post-supplementation for insulin with an oral sugar test (OST), BCS, weight, adiponectin, triglycerides, non-esterified fatty acids and tumor necrosis factor.

No difference in results was seen between horses fed high or low doses of SPAAB+L supplement. While the horses lost an average of 20 kilograms in weight, there were no changes in body condition score. However, Manfredi suggested that there might have been loss of visceral fat, which is known to contribute to diabetes in humans. Weight loss might be explained by the “browning” of fat, which is fat packed with mitochondria. This is comparable to fat browning triggered by cold temperatures—there is increased metabolic activity and calorie burn.

Manfredi explained that the microbiome of EMS/ID horses is different

from normal horses, and resveratrol alters the gut microbiota with beneficial effects. Supplementation with resveratrol and leucine resulted in higher levels of adiponectin, as well as lower insulin concentrations at 60- and 75-minute time points with the OST. Use of this supplement is meant as a complementary treatment for EMS/ID.

Oral Sugar Test

Obesity in horses is a problem worldwide, ranging from 20-51%. Also noteworthy: It is thought that 89% of laminitis cases might be due to underlying endocrinopathy. An experimental infusion of insulin in healthy horses elicited laminitis. Pasture carbohydrates correlate with high basal insulin levels in the spring and fall. Therefore, it is suspected that grazing horses are likely experiencing hyperglycemia and hyperinsulinemia.

At the 2018 AAEP Convention, Erica Macon, BS, MS, PAS, of the University of Kentucky Gluck Equine Research Center, reported on a study on the seasonal effects on body weight, body condition score (BCS), crest neck scores (CNS) and insulin responses to the oral sugar test (OST). Physical features and OST responses of 11 insulin-dysregulated horses (ID) were compared to 11 healthy non-insulin-dysregulated controls (NID). All horses in the study were tested for ACTH levels, and PPID was ruled out.

The results were informative:

- The body weight of both groups (ID and NID) did not alter with season.
- The BCS and CNS scores were higher in the winter for both the NID and ID horses compared to spring and fall.
- Season did not affect responses to the OST in the NID horses but did in the ID horses. Responses to the OST among ID horses were higher in the winter and spring.
- Pasture protein and NSC (nonstructural carbohydrates) varied between seasons; hay did not. **EM**



The Business of Practice

There were valuable presentations for equine practices of all sizes and types at the 2018 AAEP Convention.

By Amy L. Grice, VMD, MBA

Creating a culture that improves practice performance was the focus of the business sessions at the 2018 AAEP Convention in San Francisco. The sessions began with an excellent presentation by Dr. Tracy Sheffield, who outlined the importance of a positive work environment.

Working from a nine-question survey distributed to veterinarians primarily in Texas, Sheffield said respondents reported that when issues were brought to their attention, more than 50% of the time, practice owners or managers took no action. This management failure

markedly reduced veterinarians' job satisfaction and contributed to associates leaving their positions.

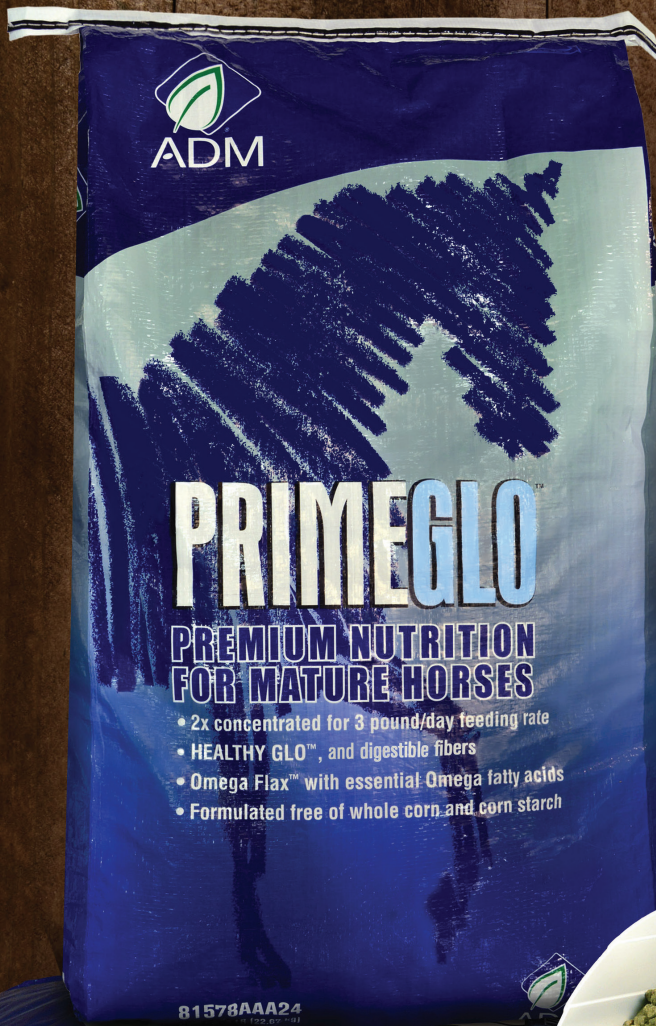
Sheffield suggested that clearly and consistently communicating behavior expectations for all team members and creating a collegial, professional work environment are the keys to improvement in the workplace. Uniform operations and procedures, she said, will also create a consistent client experience.

Because a toxic work environment is hard for everyone—practice owners, employees and clients—the speaker discussed how such a “big mess” creates inefficiency and is very costly to a practice.

She urged practice owners to tell those who are acting out that “You may not behave like that here” and “You need to find a way to leave those issues at the door and come here ready to work.”

She relayed that 37% of the stressors reported by survey respondents arose from poor or non-existent management and that communication, appropriate boundaries, training, action and civility were important in the creation of a good work environment.

Sheffield advised against yelling at or belittling any staff member. If correction or discipline is needed, she said that it should be undertaken privately.



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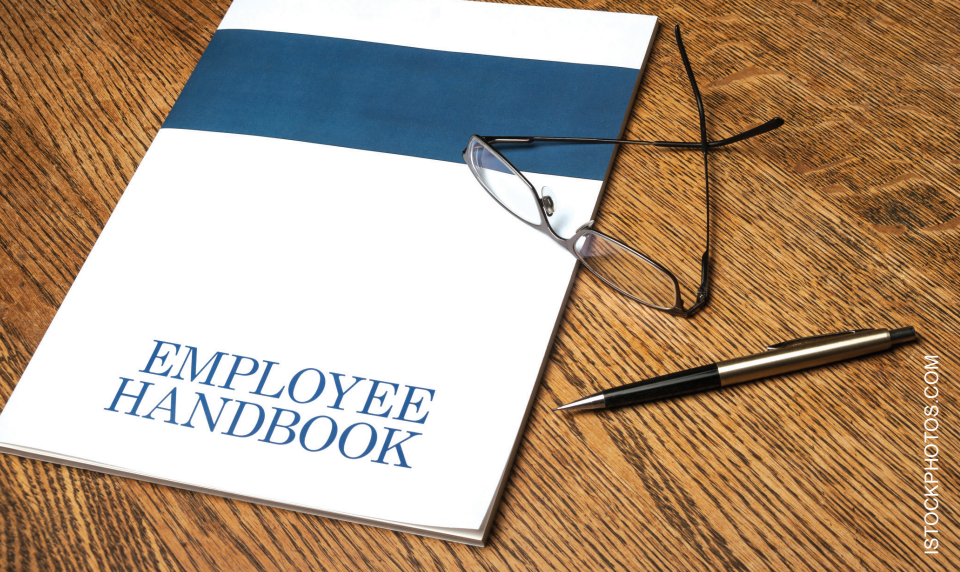


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By providing a document that clearly spells out expectations for employees, legal trouble can often be avoided.

In conclusion, she reminded the audience that what matters is how you are perceived, not how and what you think you communicated.

Employee Engagement

The use of an employment engagement survey to improve practice performance metrics was presented by Mike Pownall, DVM, MBA. After a particularly stressful, busy season, the speaker noted that “there was no longer any laughter” in his practice. Associates were teetering on burnout and lay staff were turning over regularly, he added. Pownall explained how, after reading an article in the *MIT Sloan Management Review*, he developed a 34-question survey with five categories by utilizing the article’s framework. The categories included career development, work engagement, compensation and benefits, relationship to management and work environment.

The speaker detailed the results of the employee engagement survey utilized at his practice and indicated that the open-ended comments that were received were particularly helpful in understanding the concerns of his staff. By acting to mitigate areas of stress for the practice’s employees, particularly the associate veterinarians, employee engagement metrics improved on subsequent surveys given in the next two years.

In summary, Pownall stated that employee engagement has a significant

effect on business productivity, profitability, morale and culture. Companies can improve engagement by improving employee orientation, training, career advancement opportunities, performance evaluations and compensation, he said. Using an employee engagement survey can be a powerful tool to assess areas of needed improvement for a practice, he concluded.

Employee Handbook

Amy Grice, VMD, MBA, shared the steps for creating an employee handbook and opined on the importance of such a document. An employee manual describes all of a business’s policies and procedures while setting expectations for employees, she said. It describes compliance and legal obligations as an employer, but most importantly it forces a practice owner to think through and create policies that he or she might never have considered before.

Because practice owners typically spend most of their time working as veterinarians to produce revenue rather than focusing on business, managing practice issues often only occurs when a situation requires it, meaning the response is reactive rather than proactive.

Once an employee manual is created, the practice owner can more easily manage employees by addressing potentially disruptive issues before they occur.

In addition, Grice said that by provid-

ing a document that clearly spells out expectations for employees, legal trouble can often be avoided. Written policies allow the practice team to understand in advance how different situations will be managed, what the boundaries are and what the consequences are when the boundaries are breached. An employee handbook also provides an opportunity to showcase how the practice values its staff members. Using positive language to describe the business can help create employee pride and motivation.

The essential sections of an employee manual include an introduction and welcome, workplace compliance, company policies and procedures, employment classification, attendance policies, leave policies, work performance, discipline policy, employee benefits and termination policies. She emphasized the importance of having a signed acknowledgement of receipt from each employee.

An employee handbook diminishes the stress and risks of practice ownership, Grice stated. If uncertainty about any part of the employee handbook should arise as it is created, she recommended researching state laws, contacting the proper state or federal agency and/or consulting an attorney. After completion of a draft, all employee handbooks should be reviewed by an attorney to ensure compliance with federal and state laws and regulations, she concluded.

Maternity Leave

Three consecutive maternity leaves by veterinarians at a five-doctor equine practice were described in a presentation by practice owner Miranda Goselin, DVM. By investing in proactive paid parental leave policies, communicating transparently, utilizing creative on-call scheduling and adopting non-traditional scheduling, the practice grew stronger during this period, she reported.

Strategies used to weather this upheaval included hiring a vet assistant,

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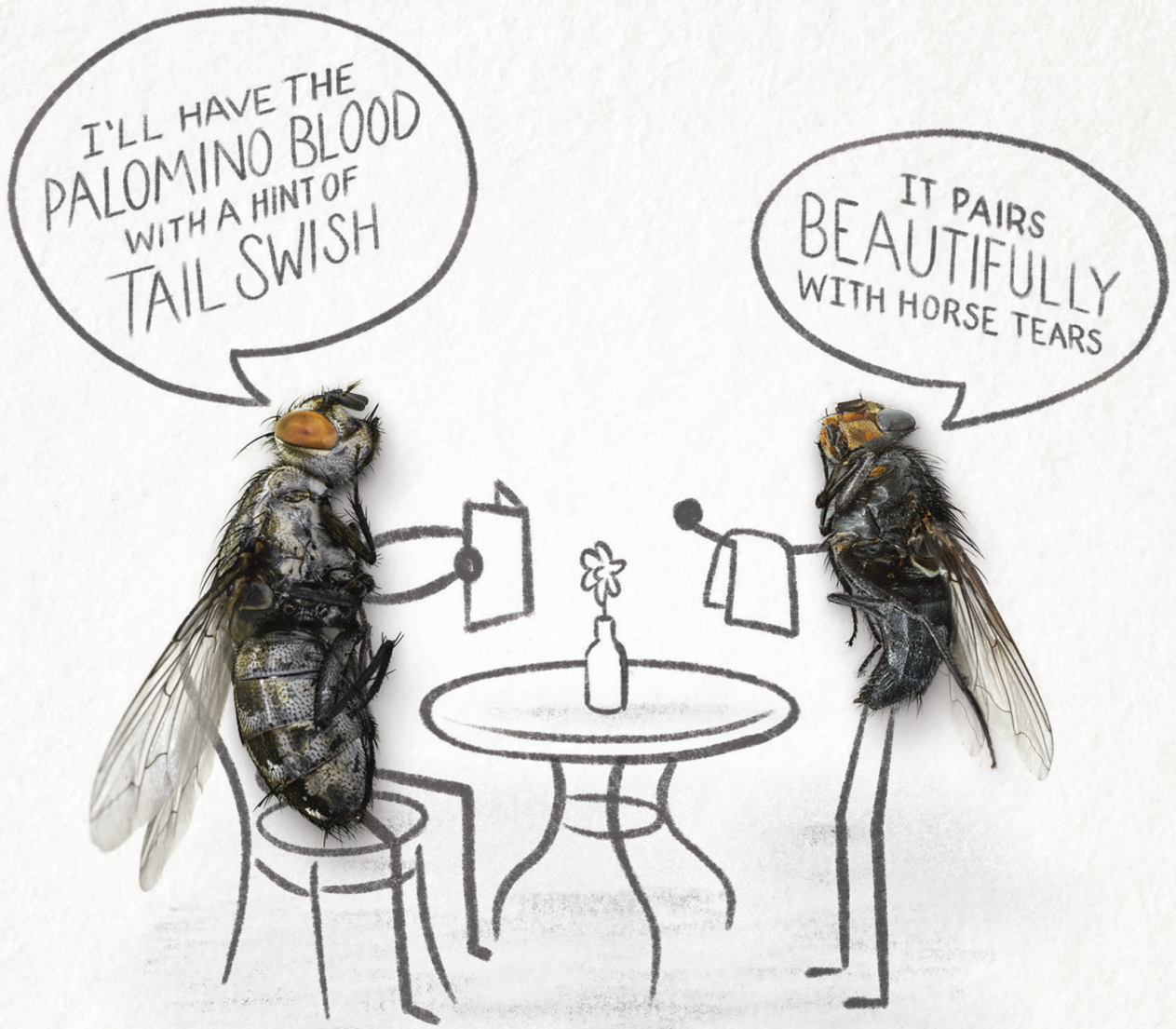
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Maternity leave of a veterinarian needs to be handled properly and fairly.

hiring a temporary relief veterinarian and budgeting carefully for the year ahead. While all the solutions that worked in this multi-doctor practice might not be possible for smaller practices, Gosselin said, being flexible and working as a team is available to all.

Continuing with the topic of maternity leaves, Grice discussed creating maternity leave policies. She emphasized that maternity is considered a temporary disability, and policies for maternity must be materially equivalent to those for any other temporary disability. Employers must provide the same benefits to all employees, whether or not they are pregnant. In other words, employers must treat all workers that are disabled equivalently. This means that if an employer adjusts the workload for a worker who is not pregnant but who has some other disability or mitigating circumstance, the employer cannot refuse to do so for a pregnant employee.

Employers may not forbid a pregnant employee to continue work if she wants to and is physically capable of doing the tasks associated with the position. If a practice allows unpaid leave for other types of short-term disabilities, by law the same policy must be extended to pregnant employees.

Grice recommended writing a general policy for unpaid leave—under what

circumstances it is granted, how long a leave is permitted, whether the practice will continue to pay for employee benefits during the period of leave and what amount of lead time is required to request a leave.

Theft and Embezzlement

Tera Nance, an accountant with Summit Veterinary Advisors, gave a chilling presentation about theft and embezzlement. She cited a 2011 survey indicating that more than two-thirds of a group of 183 practices reported being a victim of fraud, theft or embezzlement by an employee.

Using an actual case, Nance reviewed the characteristics and motives of employees that steal and early warning signs that might be noted. She said that 10% of employees will never steal, 10% will steal at any opportunity and 80% will go either way, depending on how they rationalize a particular opportunity.

Employee fraud continues for an average of 18 months before detection, she reported, and about 33% of veterinary practices will be victimized this year.

In almost all cases, the guilty party will display signs such as living beyond their means, forming excessively close relationships with vendors or clients, having financial problems,



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Even long-term, trusted employees can steal from your practice.

being controlling and/or failing to take vacations or time away from the office, she said. More than half of these people are female, between the ages of 31 and 45 years, and are long-term, trusted employees in management or financial positions.

In order to prevent embezzlement,

Nance recommended strong internal controls with a separation of duties and the limitation of some functions to practice owners. If fraud is suspected, she cautioned, quiet investigation utilizing a forensic accountant is warranted.

Practice Vehicles

Many practice owners struggle with whether to furnish practice vehicles or have

practice veterinarians furnish their own vehicles and get paid standard mileage rates. Jorge Colon, DVM, gave a comprehensive presentation outlining the calculations and steps to determine the most financially efficient decision regarding vehicles.

Because of the new tax laws of 2018, the calculations have changed from those published in the written *AAEP*

Proceedings, but they are available in an updated form on the AAEP website.

Colon emphasized that associates furnishing their own vehicles could be inadequately compensated for their costs if they choose to drive large SUVs with high purchase prices and relatively low gas mileage. He suggested that, under most scenarios, practice ownership of the vehicles is generally more financially favorable than paying reimbursed mileage for associate-owned vehicles. Also, it is important to ensure that the vehicle is purchased in the name of the business and recognize that insurance for business vehicles commonly exceeds that of personally owned vehicles, he said.

He concluded that every practice has individual differences that might alter what is most advantageous, so making a careful analysis is important.

Associate Buy-In

Ky Mortensen, an attorney and business advisor, outlined a program for associate buy-ins during his presentation. He stated that having an advance plan for transition of ownership is important for a practice owner to successfully implement an exit at retirement. Unfortunately, he said, for many practices, the idea of offering an ownership percentage to an associate often is not considered until that veterinarian has become disgruntled, is considering joining another practice or has determined to strike out on his or her own.

An ownership transition is much more than a financial transaction, Mortensen stated, emphasizing that the process requires time, mentorship and trust.

He spoke about the importance of helping the next generation of veterinarians achieve greatness by giving back generously. Along the way, the speaker said, practice owners need to shift their focus from personal production to developing the skills of the next generation. Because the associates that a practice recruits, selects, hires and promotes have a tremendous impact on

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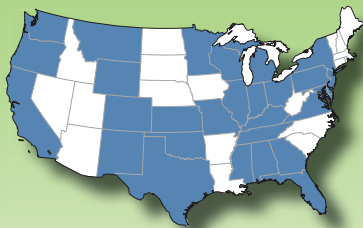
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63%
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of positive farms
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*Participating states in blue

1. Survey of Endophyte Infection and its Associated Toxin in Pastures Grazed by Horses, B. McCluskey, MS, DVM; J. Truab-Dargatz, MS, DVM; L. Garber, MS, DVM; F. Ross, MS, AAEP Proceedings, Vol. 45, 1999

Pregnant mares grazing fescue may exhibit the following clinical signs:

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Contraindication: Horses with hypersensitivity to domperidone should not receive EQUIDONE Gel.

WARNINGS: Failure of passive transfer of immunoglobulins (IgG) may occur when using EQUIDONE Gel even in the absence of leakage of colostrum or milk. All foals born to mares treated with EQUIDONE Gel should be tested for serum IgG concentrations. Do not use in horses intended for human consumption.

HUMAN WARNINGS: Not for use in humans. For oral use in animals only. Keep this and all drugs out of the reach of children. Pregnant and lactating women should use caution when handling EQUIDONE Gel, as systemic exposure to domperidone may affect reproductive hormones. Consult a physician in case of accidental human exposure.

PRECAUTIONS: EQUIDONE Gel may lead to premature birth, low birth weight foals or foal morbidity if administered >15 days prior to the expected foaling date. Accurate breeding date(s) and an expected foaling date are needed for the safe use of EQUIDONE Gel. Do not use in horses with suspected or confirmed gastrointestinal blockage, as domperidone is a prokinetic drug (it stimulates gut motility).

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the practice's success, attention to this process should be keen. Mortensen cautioned that "unsuccessful people make decisions based on current circumstances, while successful people make decisions based on where they desire to be." He suggested following Stephen Covey's advice to "begin with the end in mind."

In order to succeed, the speaker noted that associates must know expectations. This means that practice owners must determine their objectives, communicate their expectations clearly and begin conversations about ownership early in the associate relationship. He recommended providing future owners with opportunities for business education to increase their financial literacy and business skills. At the same time, current practice owners must be well-versed in the financial pictures of their practices and manage for profitability. This will make discussions about practice value much more fruitful.

Mortensen noted that the partnership

agreement and buy-sell agreements must be reviewed and updated in anticipation of an ownership transfer.

In summary, the speaker cautioned that the decisions an owner makes today will shape the prospects that he or she will enjoy later. Planning an ownership transition with intention is essential.

Founders' Syndrome

Kirk Eddleman, MS, MHA, practice manager and business advisor with Inova Partners, gave a presentation on a condition of leadership known as "Founders' Syndrome." He explained that this condition is characterized by a disregard for formal organizational systems, with a reliance instead on the founders' strong personalities, quick decisions and personal motivation of staff.

As these practices experience growth, the speaker said, they frequently careen from one reactive decision to another in response to crises. The founders are generally very resistant to change, involve themselves in routine operational decisions, often suffer from high staff turnover and are suspicious of business management practices that are standard in most other industries. Because of these characteristics, they are generally critical of those who suggest new strategies. Meanwhile, these practices' performances begin to suffer.

In order to mitigate these challenges, Eddleman recommended that practices like this get help to recognize and change their leadership and management styles, develop a board of directors, create a strategic plan and develop comprehensive systems. Failure to grow in these areas will otherwise severely limit the success and profitability of the practice, he concluded.

Take-Home Message

The Business of Practice sessions at the 64th AAEP Convention provided a strong overview of topics important to practice prosperity. The presentations brought value to equine practices of all sizes and types. **EM**



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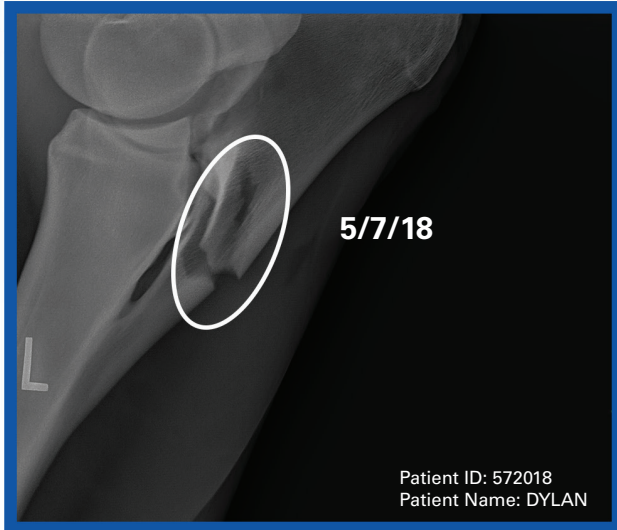
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Lifestyle and Wellness from the AAEP

Substance abuse and addiction were central topics at the 64th AAEP Convention.

By Amy L. Grice, VMD, MBA

Rob Franklin, DVM, DACVIM, chairman of the AAEP Wellness work group, organized an afternoon session entitled “Recognizing and Managing Addiction in Practice.” Leading off the program, Franklin described his experience with an associate veterinarian who overdosed while at work at a small animal practice that he owned. His vacation with his

family was cut short, and he was soon embroiled in a series of interactions with state and federal authorities that threatened his future ability to practice.

Because of his trust in and personal relationship with this employee, he disregarded early warning signs and failed to follow good practices. Thankfully, Franklin was able to weather the storm, correct deficiencies in his controlled substance protocols and continue his

career. His experience was a clear example of the wide ripple effect that drug addiction can create.

Practice owners are responsible for the conduct of all veterinarians practicing as agents using the owner’s DEA number. Strict protocols and procedures for managing controlled substances should be in place at all practices. Franklin’s practices now require applicants for employment to submit

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to drug testing and give permission for random testing throughout the terms of their employment. All prospective employees have a DEA background check performed, as well. Within all of his practices, strict requirements for controlled substance logs are followed, and a monthly audit with a physical count is performed.

Following this sobering introduction to the topic, a courageous and humble veterinarian described his battle with opioid and alcohol addiction and the struggle he continues to live with daily. Now happily married with a family, this doctor understands the risks of relapse and described his efforts to remain alcohol- and drug-free for the rest of his life. The message he felt was important to impart is that recovery is possible, although most addicts relapse at least two to three times along their journeys.

Addiction

Dr. Joseph Garbely, a physician from the Caron Treatment Centers (www.caron.org), based in Pennsylvania, then spoke at length about the neurobiology of the disease of addiction. In 2017, Garbely reported, there were 70,237 drug overdose deaths in the United States. The age-adjusted rate of drug overdose deaths in 2017 (21.7 per 100,000) was 9.6% higher than the rate in 2016 (19.8). Adults aged 25 to 54 had higher rates of drug overdose deaths in 2017 than those aged 15–24, 55–64 and 65 and over. Of the more than 70,000 deaths, two-thirds were from opioids, of which 20,045 were synthetic and 15,448 were heroin. Shockingly, he reported that drug overdose is now the leading cause of death for Americans under 50 years of age.

The primary reason for the recent increase in deaths is the acceleration of illegal imports of fentanyl from China, which does not regulate this drug. Current street drugs such as heroin, cocaine and methamphetamine are frequently “cut” with fentanyl, which is 40-50 times more powerful than heroin and 50-100 times more potent than morphine. It is



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Proper protocols for DEA schedule drugs in your practice can reduce the potential that a veterinarian or staff member can abuse or steal drugs.

no surprise that users are overdosing, as they cannot judge the strength of the drugs they buy, the speaker relayed. In addition, Garbely described how fentanyl powder is processed into pills that resemble prescription products from the opioid family. Overdose death from opioids occurs because of respiratory suppression.

Addiction is a chronic disease with a consistent pattern of signs and symptoms, Garbely explained. It is neither caused by a person being evil nor by lack of moral fiber, he said. According to the American Society of Addiction Medicine (ASAM), addiction is a primary, chronic disease of brain reward, motivation, memory and related circuitry. Dysfunction of these circuits leads to characteristic biological, psychological, social and spiritual manifestations.

This is reflected in an individual pathologically pursuing reward and/or relief by substance use and other behaviors. Addiction is characterized

by an inability to consistently abstain, impairment in behavioral control, craving, diminished recognition of significant problems with one’s behaviors and interpersonal relationships, and a dysfunctional emotional response. Like other chronic diseases, addiction often involves cycles of relapse and remission. Without treatment or engagement in recovery activities, addiction is progressive and can result in disability or premature death.

Garbely explained that addiction affects neurotransmission and interactions within reward structures of the brain, including the nucleus accumbens, anterior cingulate cortex, basal forebrain and amygdala. This causes motivation to be altered and addictive behaviors to replace healthy, self-caring behaviors. Addiction also affects the memory of previous exposures to “rewards,” he said, which triggers craving and/or engagement in addictive behaviors. He further shared that the neuro-

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Addicts continue to engage in substance use and other addictive behaviors despite experiencing adverse consequences.

biology of addiction encompasses more than just the neurochemistry of reward.

“The frontal cortex of the brain and underlying white matter connections between the frontal cortex and circuits

of reward, motivation and memory are fundamental in the manifestations of altered impulse control, altered judgment and the dysfunctional pursuit of rewards seen in addicts,” Garbely said.

Because the frontal lobes are important in inhibiting impulsivity and appropriately delaying gratification, addicts, who have diminished frontal lobe performance, continue to engage in substance use and other addictive behaviors despite experiencing many cumulative adverse consequences. Frighteningly, Garbely reported that because frontal lobe connectivity and functioning are still in the process of maturation until the age of 20 in females and 26 in males, early exposure to substance use is a significant factor in the development of addiction.

Genetic factors account for about half of the likelihood that an individual will develop addiction, said the speaker. Addiction to opioids, cocaine and alcohol have an increased heritability. Environmental factors and acquired resiliencies interact with the person’s biology and affect the extent to which genetic factors exert their influence.

Garbely discussed how people choose to use drugs initially because it makes them feel good or is a social activity, but that those with addictive tendencies might be unable to stop. After the initial use, which gives them a feeling of markedly enhanced well-being, these users can experience lows that are well below their normal baselines. Subsequent use of drugs often occurs in an attempt to feel “normal” again, he said, or to avoid the misery they feel when they are not using.

While tolerance develops to the “high,” tolerance does not develop to the emotional low associated with the cycle of intoxication and withdrawal, he explained. Thus, in addiction, persons repeatedly attempt to create a “high,” but what they mostly experience is a deeper and deeper “low.”

While anyone might want to get “high,” those with addiction feel a need to use the addictive substance or engage in the addictive behavior in order to try to resolve their dysphoric emotional state or their physiological symptoms of withdrawal. Persons with

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addiction compulsively use even though it might not make them feel good—in some cases, long after the pursuit of “rewards” ceases to actually be pleasurable. Addicts develop changes in their brain chemistry that essentially rewire the brain to crave reward and ignore messages from the brain’s executive functioning.

In closing, Garbely gave the hopeful message that recovery is hard work, but it *is* possible. The speaker said that one year of abstinence was necessary before the likelihood of relapse was better than 50%. After five years “clean,” a former addict’s risk of becoming addicted again is similar to the risk of the general population.

Substance Abuse

Dr. Gregory Gable, a clinical psychologist from the Caron Center, spoke about the prevalence of substance abuse in medicine, citing that 15% of physicians are impaired at some point in their lives.

Alcohol is the most addictive substance among physicians, he reported. In his opinion, “substance abuse is an occupational hazard.” As veterinarians share many of the same stressors that physicians face, he opined that substance abuse was likely to occur at similar levels in our profession.

The factors that doctors exhibit that promote their success—such as a drive for achievement, perfectionism, exceptional conscientiousness, the ability to delay gratification and exhibit self-denial—also promote mental health problems such as anxiety and depression, he said. Barriers to doctors getting help include the fact that “doctors have a hard time asking for help. They want to self-help and self-decide,” said Gable.

He reported that impaired medical professionals typically do not exhibit changes to their professional performance until well into their addiction. “The job is the last thing to go,” he said.

The signs that a substance abuse prob-

lem is present include discord in personal relationships, diminished social activities or behavioral changes in social settings. There might also be mental changes in cognition or coordination, or an increase in work shifts to increase access to drugs that they might be diverting. Becoming easily overwhelmed by routine tasks, coming to work under the influence, physical changes such as weight gain or loss, spiritual bankruptcy where values are abandoned and professional performance failures are other signs.

When comparing the average length of drug use to time of intervention by family or colleagues after these signs appear, Gable reported that alcohol is the longest, at 14.5 years. For prescription opioids, it’s about six years, and for fentanyl, three to six months (or death).

Brain scans differ markedly between those with no drug use and those who have addiction. It takes a lengthy period before these scans normalize, he said. Because of the high risk of relapse, the speaker emphasized that treatment for addiction needs to include attention to previous trauma or emotional wounds. These factors might lead a person to feel inadequate, anxious, shamed and “defective,” needing to be perfect, hearing an inner negative voice, and feeling compelled to hide his or her emotions in order to be accepted or loved.

Gable reported that through therapy, patients gain self-acceptance and growth that decreases their risk for relapse. He reported that medical professionals are more likely to reach lasting recovery than the general population if they receive appropriate treatment.

Take-Home Message

There are serious ramifications in our country and across our medical professions with growing substance abuse and addiction. All practitioners need to be well informed and take appropriate actions to protect their practices and help those in need, whether in their own families or their own practices. **EM**

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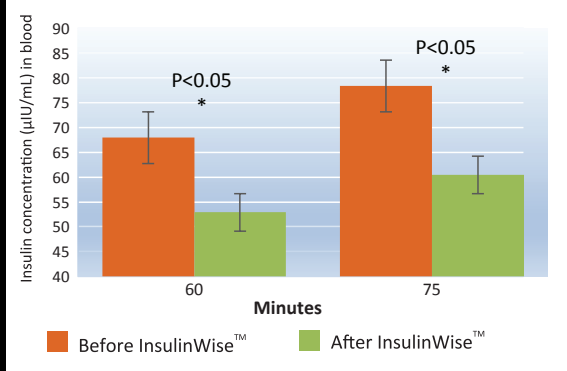


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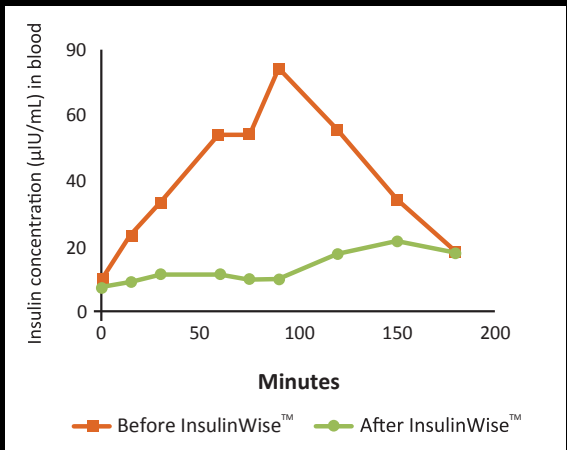
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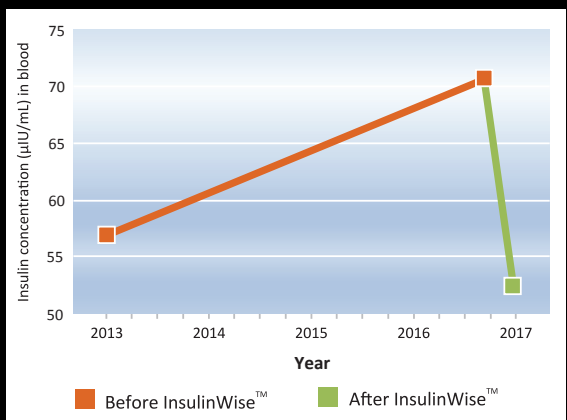
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Insulin Levels at 60 Minutes During Oral Sugar Tests from 2013 to 2017

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Is That Research Real?

Veterinarians should beware of predatory, open-access journals that publish information that isn't properly reviewed.

By Milton C. Toby, JD

During his time as resident veterinarian at Claiborne Farm near Paris, Kentucky, from 1948 through the 1980s, Col. Floyd C. Sager was widely recognized as one of the leading equine practitioners in the world. Late in his career, Sager agreed to a series of interviews with *The Blood-Horse* magazine to discuss the theory and practice of veterinary medicine

and his legacy in the field. Those interviews later were compiled in "Col. Sager, Practitioner," a slim volume that nearly 40 years later still shows up on the bookshelves of prominent researchers and veterinarians.

Sager took a pragmatic approach to new research. He wanted to be far enough ahead of the research curve to take quick advantage of new products and techniques, but not so far in front

that he was the first practitioner to use something relatively untested.

"I always want to be the *second* veterinarian to try something new," he said. It was good advice both then and now.

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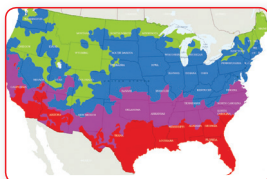
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Spalding's newest product is Bye Bye Insects. This is a principally Essential Oil based Fly Repellent that, for the first time, is comparable to the performance of Pyrethroid synthetic chemical products.

Our goal was to create the best fly repellent, of any kind, for horses and people. In the past, Essential Oils never kept up with synthetic chemicals in performance.

Smells Great

Besides great performance, Bye Bye Insects also smells and feels terrific. Pyrethroid fly sprays warn against use on human skin, and few people like the smell of them. By comparison, Bye Bye Insects has a pleasant scent and can be used on yourself, your family and your horses.

Bye Bye Insects active ingredients are primarily Essential Oils, including Geraniol, Rosemary, Citronella, Peppermint and Lemongrass. All ingredients meet EPA's 25(b) Minimum Risk requirements and for Rosemary, Peppermint, Vanillin and Lemongrass, we use food grade quality.



Have We Made The Perfect Fly Spray?

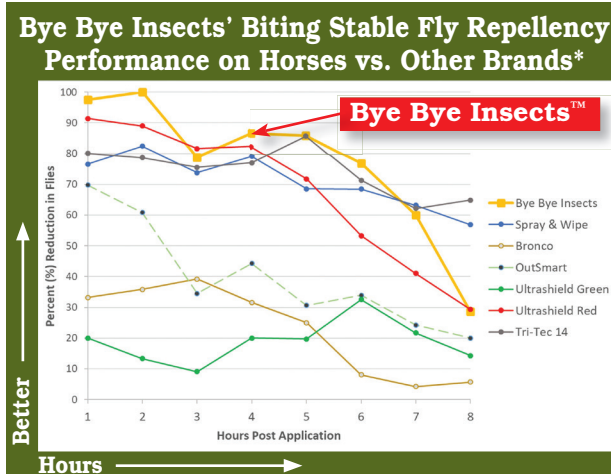
Getting close, but not yet. *One issue is a slight yellow staining on white and grey hair.* If used lightly, the staining is minimal and wears off. Other than on white and grey hair, it's not noticeable. We're working to fix this for next year.

Bye Bye Insects Is A Concentrate And A Super Value

You can adjust its performance to what you need. We expect many will find a 50% dilution will still provide sufficient repellency. After you use up your first quart spray bottle, don't throw it away.

Instead refill it from the 3 quart EZ refill pouch.

The ecological and stay fresh 3 quart pouch costs \$44.95. That's like buying 2 quarts and getting the third one free. Thus, each full strength refilled quart is only \$14.98. Diluted to 50% it's \$7.49 per quart delivered. That's one of the best buys in fly spray. More at: spalding-labs.com/jcsx4



Looking at the graph above of fly repellency, note that Bye Bye Insects (Yellow) has comparable repellency to Farnam's Tri-Tec14, Absorbine's UltraShield Red and Pyranha's Spray & Wipe, three of the "high end" Pyrethrin based sprays. Bye Bye Insects performed far better than the other Essential Oil sprays like Absorbine's UltraShield Green or SmartPak's OutSmart. These tests were for Biting Stable Flies which are harder to repel than House Flies. Chart data as of 10/20/18. Test protocol and full data posted at spalding-labs.com/p97s8



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years, fulfilling the role of Sager's "first user" for prudent practitioners.

However, the academic publishing landscape has changed significantly in recent years with the growth of the internet and the proliferation of "open access" journals, and finding reliable guidance in the literature is harder now than it once was. These are not to be mistaken for the "open-access" articles that legitimate journals often share.

The idea behind open access is a good one: new research distributed quickly online at no cost to readers. Mismanaged, however, open access journals can create more problems than they solve.

Open access journals are published online only and are freely available to anyone with no paid subscription required. These journals often follow a pay-to-play business model. Without subscription fees to cover the publishers' bills, open access journal authors subsidize the journals themselves by paying

high—sometimes exorbitant—publication fees. In the publish-or-perish world of academia, a hefty fee to guarantee publication of research in an open access journal often is a reasonable price to pay for career advancement.

Pay-to-play is not necessarily bad in the research publishing world—traditional subscription publishers might also charge authors a fee to help cover pre-publication expenses. But if an open access publisher relies on collecting hefty publication fees from authors to show a profit and at the same time plays fast and loose with the generally accepted standards for review to increase the number of articles published, there's a credibility problem.

Publications that operate like this are called "predatory journals" for their high-pressure sales tactics and lack of transparency.

This doesn't mean that research published in open access journals is always questionable; the great majority of that

research is reliable.

However, it does mean that research published without the usual editorial oversight and peer review deserves a second look.

FTC Investigation

The Federal Trade Commission (FTC) is taking that second look at one prolific open access publisher with hundreds of journals under its umbrella. The FTC investigation is based on allegations of deceptive business practices and not on the quality of the research being published, an important distinction for practitioners in search of reliable information. But if the allegations prove to be true, and submitted articles were not subjected to the usual peer review before being rushed into publication, distinguishing between good and unreliable research becomes problematic. The result is a new level of uncertainty for veterinarians trying to evaluate research about a new product or technique.

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May 7-8-Menlo Park, CA, USA
Peninsula Equine Medical Center - Advanced
Course-Neck & Back

May 9-11-Menlo Park, CA, USA
Peninsula Equine Medical Center - Stifle & Thigh

June 13-15-Merlino, Italy
Cascina Gufa - Fetlock, Tendon, PSL, Carpus

August 15-17-Newtown, CT, USA
Fairfield Equine Associates - Hock & Crus

September 5-7-Heesch, The Netherlands
Sporthorse Medical Diagnostic Centre
Neck & Back

October 8-10-Lexington, KY, USA
ISELP/Spy Coast Farms - Pelvis

October 11-13-Lexington, KY, USA
ISELP - Sports Medicine & Rehabilitation Module

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Clinique de Grosbois - Proximal Forelimb &
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On August 25, 2016, in the United States District Court for the District of Nevada, the FTC filed a civil complaint against open access publisher OMICS Group Inc. and associated companies iMedPub LLC, Conference Series LLC and Srinubabu Gedela, the companies' founders. Grounds for the complaint are alleged violations of Section 5(a) of the Federal Trade Commission Act, which prohibits unfair or deceptive acts or business practices.

In various court filings, the FTC claims a litany of deceptive business practices, including:

- false or deceptive statements made on the defendants' websites and in solicitations that they follow widely accepted peer-review practices and that all articles are peer reviewed prior to publication;
- false or deceptive statements that their online journals are reviewed and/or edited by thousands of scientists, researchers, academics and

other subject-matter experts;

- false or deceptive claims that their journals have "high impact factors," an industry standard of reliability based on the number of times articles are cited in other research;
- false or deceptive statements alleging that their journals are included in well-established and reputable indexing databases;
- harm from defendants' refusal to allow authors to withdraw articles from publication in their journals because the practice effectively prevented publication in another journal; and
- false or deceptive marketing of academic conferences.

In responsive pleadings, the defendants argue that the FTC's allegations are "misguided and without merit" because there was nothing either unfair or deceptive about their solicitation of articles from qualified authors. Nor, they argue, is there anything either

unfair or deceptive about the way they marketed and conducted international scientific conferences or about the way they disclosed and charged fees for publication in their journals.

On September 29, 2017, U.S. District Judge Gloria M. Navarro issued an order granting the FTC's motion for a preliminary injunction prohibiting misrepresentations by the defendants regarding publishing services and scientific conferences.

On May 1, 2018, both the FTC and the defendants filed motions for summary judgment, arguing that there were no material facts to be decided by the court and that the respective parties were entitled to win as a matter of law. Litigation in the case, including a decision on the competing motions for summary judgment, remained ongoing at the end of 2018.

Dr. Google

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In 2016, the Federal Trade Commission filed a lawsuit against open access publisher OMICS Group Inc. and associated companies.

academic authors and researchers. For practicing veterinarians, these journals raise two related—but probably less obvious—issues. First, distinguishing the good research from the unreliable becomes more difficult. Secondly, practitioners often must deal with clients who request a particular drug or treatment based on internet searches and news reports that promote unreliable or premature research.

In a December 16, 2018, article in *The New York Times*—“Dr. Google Is a Liar”—cardiologist Haider Warraich warned that the proliferation of false medical information and other “fake news” on the internet is dangerous because it steers patients away from evidence-based treatments. While the author was writing about problems with reporting research in human medicine, the things that he said patients find attractive about internet advice equally apply to a veterinarian’s clients. There is no appointment or a long wait to see



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a doctor, the information is free and the websites look reliable and are easy to understand.

For their own professional education, and to explain to a client that the internet is not always correct, a veterinarian's ability to critically evaluate the reliability of published research is invaluable.

Adrian K. Ho, director of digital scholarship for the library system at the University of Kentucky in Lexington, teaches workshops that show authors how to identify and avoid predatory journals. His advice for veterinary practitioners is this: You should "play the role of a reviewer" when evaluating the reliability of an article published in an unfamiliar journal.

When evaluating an article, "look at the authors," Ho advised. "You should ask: Who are they? Where are they from? Are they well known in their fields? Does the content in the article make sense? Are there conflicts of interest?" He added that it's important to look at the data and how it was gathered and handled. If questions remain, Ho suggested that practitioners take advantage of the veterinary community's "collective wisdom" by discussing

the article with colleagues or through a specialty Listserv.

Ho's workshops in journal evaluation and selection include a handout with several red flags often associated with open access journals:

- a lack of information about the scope and policies of the journal on the publisher's website;
- negative comments about the journal from colleagues, researchers and scholars;
- minimal instructions or editorial guidance for authors;
- little or no specific information about the journal's peer review process or alternative procedures for quality control;
- information about copyright ownership of a submitted article;
- contact information that is either missing or difficult to find;
- a website, the journal or communications from the publisher that are "fraught with misspellings, grammatical errors, broken links and/or other signs of subpar site management";
- published articles that are written by repeat authors or editorial staff;

- journal promotion involving spamming potential authors and readers; and
- obtrusive advertising on the publisher's website.

It's worth noting that many of the practices on Ho's warning list are similar to the claims made by the FTC in the agency's complaint against OMICS Group Inc. It's also worth repeating that not all open access journals sacrifice competent peer review, sound editorial guidance and other accepted business practices in return for increased profits.

Ho emphasized that publication in an open access source does not automatically mean that the research is bad. Much of it, in fact, is sound. Some open access publishers take shortcuts with the review and publishing procedures, however, and that possibility makes stricter scrutiny more important for authors, researchers and veterinary practitioners. *To learn more about predatory journals and to help identify reliable open access publications, Ho suggested these websites: the Directory of Open Access Journals (<https://doaj.org>) and the "Think. Check. Submit" initiative (<https://thinkchecksubmit.org/check>). **EM***

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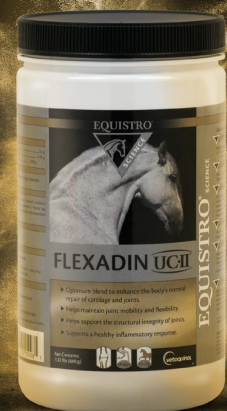
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