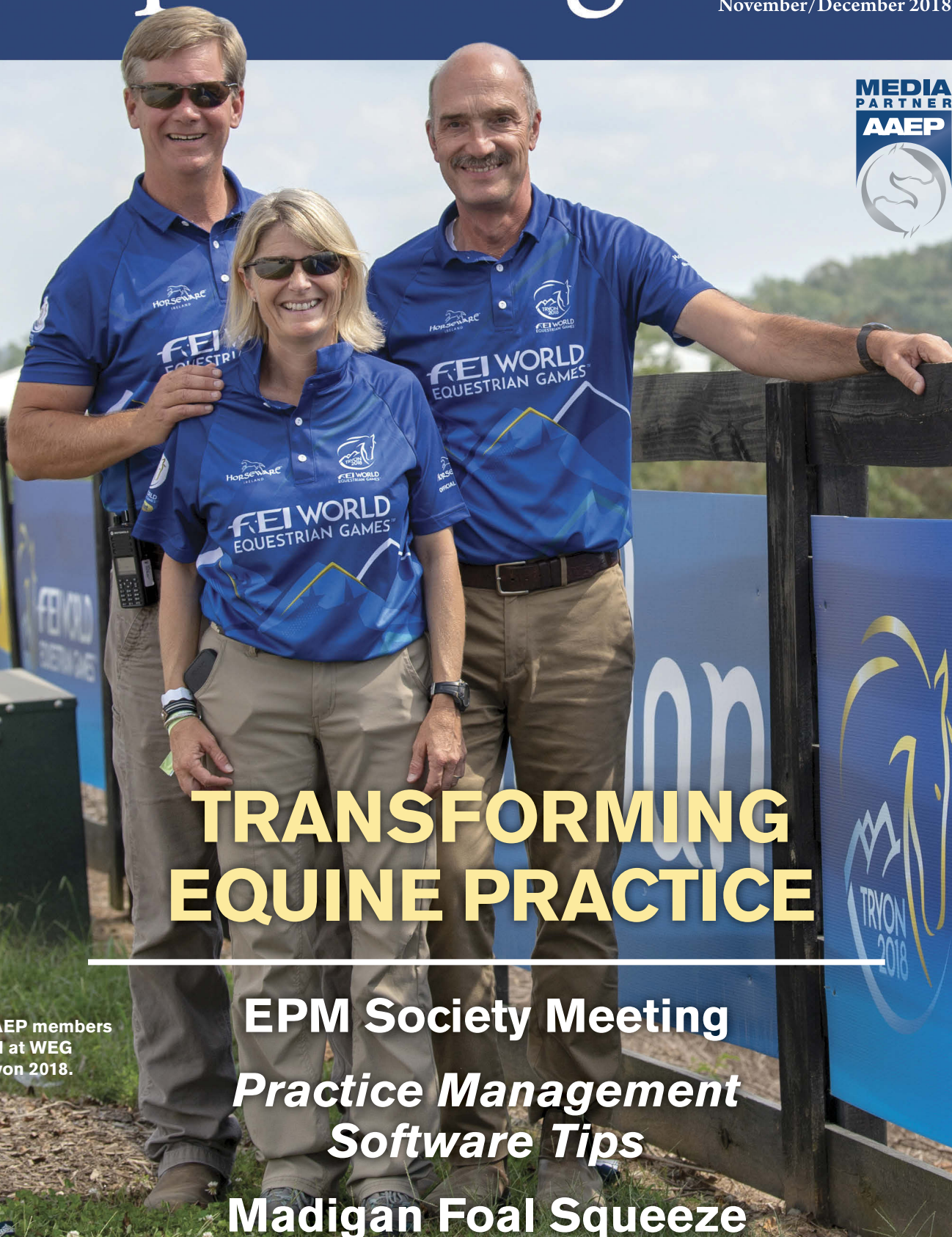


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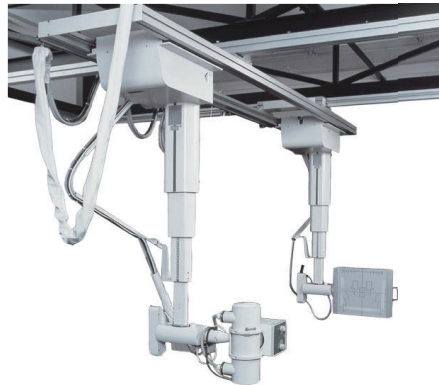


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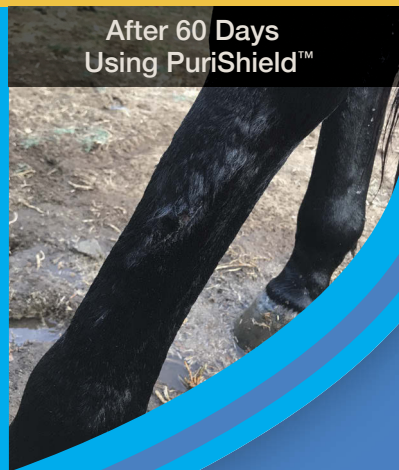
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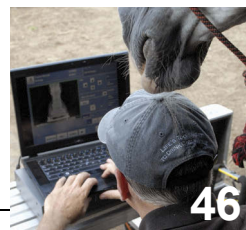
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Cover photo by Amy Dragoo. Drs. Anne Baskett, Bill Hay and Yves Rossier, all AAEP members, were in charge of treating veterinarians at WEG Tryon 2018.

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You Ask, We Deliver

If you look at how things move from one point to another over time, there is gradual evolution over a long period, and there is change—which means quickly responding to the world around you. The EquiManagement brand has been changing based on feedback from the vet industry and the AAEP. This has happened over a fairly short period of time, and change continues to happen.

EquiManagement magazine started as a pretty serious, “I’m-an-equine-veterinarian-and-I-want-to-get-my-MBA-or-close-to-it” sort of publication. Based on feedback, we began delivering content geared toward every veterinarian’s desire to practice good medicine and make a good living at the same time.

Then there was the need for more frequent communication and easier access to past magazine issues, so we launched EquiManagement.com and posted *every issue in full* on the website. We continuously add content not found in the magazine.

Then vet wellness and work/life balance became key AAEP focuses for its members. We have provided articles and links to the AAEP’s website to further the quest for a healthier practitioner, both physically and mentally.

Horse owners want a lot from their vets, but the top three are 24/7 coverage, a vet who listens and cares, and one who is “keeping up” with the advances in veterinary medicine. While equine vets love practicing medicine, it is hard sometimes for them to tie what they know and continuously learn about the “animal health-and-caring” side of their businesses to a better, “client-communication” side.

We launched “Keeping Up” in the magazine and online for two reasons. Besides giving practitioners summaries of the latest veterinarian-written research, the section offers tips on how to use that information to communicate better with clients. We also have a new, monthly newsletter that links back to these research reports, so you don’t have

to miss a thing!

Heading into 2019, you will see some more changes in the EquiManagement brand. We will still provide the only equine veterinary-related business content in the industry. We will still continue adding new equine research and business articles to the website. We will still cover the AAEP Convention to help you get information from the health and business presentations that you might have missed. We will return to a quarterly print format and provide more information on our website and through other digital means.

One of the biggest new educational launches will be EquineVetEdu.com, the AVMA PLIT’s *free* online veterinary education portal created in partnership with EquiManagement. This portal will launch at the 2018 AAEP Convention, then will become more populated as we move forward with courses on the “active interests” of veterinarians, as well as CE.

We know that all veterinarians aren’t interested in all topics; for example, some equine vets don’t provide reproduction services, while others focus *only* on reproduction. The active interests are currently located in the broad categories of: Disease, Lameness, Medical, Nutrition, Reproduction, Sports Medicine, Business and Ethics, Health and Wellness, and ALL CE.

Under each of those will be subcategories of more specific topics. Because of the AVMA PLIT partnership, the reach of this educational portal will include equine-only and equine-mixed practices—potentially the largest group of vets who treat horses in this country.

The content on the EquineVetEdu.com educational portal will change rapidly and expand quickly, so make sure to stay tuned to EquiManagement.com and our Facebook page to know when new offerings are posted. **EM**



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Personal Financial Wellness

Managing your money well can save you stress.

By Amy L. Grice, VMD, MBA

A significant source of stress for practitioners of all ages is managing their money. New graduates often have large amounts of educational debt, while veterinarians established in their careers might be contemplating practice ownership. Others might have tuition payments for children entering college, and those nearing retirement might be concerned about their



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No matter your age or stage of career, you should plan for your retirement.

ability to fund their “golden” years. No matter the cause, financial worries can eat away at a person’s sense of well-being.

The first step to financial wellness is truly understanding your monetary situation. Many—if not most—people only think about their personal financial status when they are forced to do so for a credit application. But having a true

picture of your assets and liabilities will allow you to make informed financial decisions that make sense for you.

To begin, list all the valuable things that you own, such as your car, home, stocks or bonds, savings accounts, etc. Offset these assets by listing amounts that you owe and when the debt will be paid up. For instance, if you have a mortgage on



a practice owner and veterinarian

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your home, list its current market value as the asset and the current amount of remaining mortgage principle as the liability. Add up the value of your assets and subtract the amount of your liabilities. A negative number is very common among young professionals just beginning their careers, so don't despair. Repeating this exercise on an annual basis will help you track your financial progress.

Simply being aware of something will often change behavior and outcomes. If you have been diligent in depositing funds in your 401K plan, and you watch the balance growing, the positive feeling this creates will encourage you to continue to save regularly. If you are contemplating buying a new car but you have recently assessed your assets vs. liabilities and come up with a negative number, a used car might suddenly seem like a better idea.

If you are blissfully unaware of your financial status, the low payment on a new car financed over 72 months might seem like the perfect way to chase your

blues away. NOT!

Making smart financial decisions throughout your life can really make a difference in your future well-being.

Saving for retirement from the time of your very first paycheck is one of those smart financial decisions. The power of compounding means that if you start saving \$5,000 per year at age 25 and do that for only 10 years, you will accumulate more funds by the time you are 65 years old than if you saved \$5,000 per year from age 35 to 60. Financial advisors call this "paying yourself first." Saving \$5,000 a year means putting away \$416 each month. It seems like a lot of money at the beginning of your career, but you will not regret it.

If you are a recent graduate, establishing a plan for paying your student loans as quickly as possible is wise, if you can afford to do so. Others might find that available federal forgiveness programs can work best for them. Because of the tax consequences of loan principal forgiveness, it is imperative that you

carefully evaluate all your options before choosing your path. The AVMA and VIN have excellent resources to explore.

Becoming a practice owner can be a good financial decision if the practice is appropriately priced, because then the profit of your labor flows to you. Although the responsibilities of owning a small business might seem daunting, this is a good way to increase your net worth and annual income. Whether starting your own practice or buying shares in the practice where you are an associate, learn as much as you can about business management in order to maximize your firm's success.

Saving for future expenses, such as for your children's college or for a down payment for a house, requires discipline and avoidance of unnecessary expenses—but the payoff is decreased financial stress.

Life does not need to be focused on the acquisition of things. Experiences that broaden your perspective and relationships that bring you joy and connection can be of greater value. **EM**

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Managing Income

How to make your money work for you without risking the farm

As a new graduate, it has been great to finally have money coming in the right direction. Getting paid a salary is much better than taking out student loans. The big question that comes with that salary, though, is “Where do I put the discretionary income?” Once the bills are all paid, grocery runs made and the minimum loan payments are in, what do I do with what’s left?

The conventional wisdom, and what has been hammered into all graduates since veterinary school, is to put everything extra you have toward paying off the student loan principals. In the short term, this makes solid fiscal sense. Most student loans accrue interest at rates between 5-7%. It stands to reason that if you can’t get a matching or improved return on an investment, then you are losing money, right?

Not so fast. The one thing that we so often fail to consider with any financial decision is the opportunity cost of said decision. Without student loans, the goal is to be continuously decreasing the amount of principal. Over the course of time, the interest gets smaller as the principal gets smaller. This same process works in reverse for any money that we save or invest. As we gradually add to that money over time, the interest amount gets larger and larger. Additionally, this money is still available to you for other purchases down the road, rather than being completely gone toward a loan repayment.

There are a couple of different avenues that are available to young graduates to begin this path of investment. One of the simplest and safest ways to begin making your money work for you is through a high-yield CD or a savings account.

CDs have been around for ages and present the highest interest rates of the safe options. The drawback of the CD is that it requires you to lock up your funds for 12, 24 or 36 months to get the highest interest rates.

A high-yield savings account allows a similar interest rate with vastly increased flexibility when it comes to getting your money out. Many online savings account options are available with variable interest rates from 1.5-1.85%. Most of these accounts don’t have a minimum balance, and many have no fees. This allows you to open an account quickly, without much of an opening deposit, and begin gaining higher interest on your savings than the standard 0.01% interest savings account that comes with most major banks.

The other route that is available for investment comes through a financial advisor. These traditional investment routes come with a higher level of risk but also a larger opportunity for percent yield. I recommend getting in touch with the financial advisor in your team of professionals and working on a medium-risk investment policy toward which you can start putting money.

The biggest benefit that all of us have as new graduates is time. We are at the beginning of our career arcs, and as such, we can absorb a larger amount of risk with our investments than practitioners nearing retirement. This is the time in your career to take charge of your finances and make your money work as hard as you do! **EM**

Zach Loppnow is an associate veterinarian at Anoka Equine in Elk River, Minnesota. He is a member of the AAEP and the MVMA, and has a background in business management and personal finance.

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Transmission of Equine Sarcoids

Bovine papilloma virus (BPV) has been implicated as one etiology for the development of equine sarcoid. Researchers at Belgium's Ghent University School of Veterinary Medicine looked at possible transmission of equine sarcoid via stable flies (*Stomoxys calcitrans*) by evaluating for BPV DNA [Haspeslagh,

M.; Vlamincx, L.; Martens, A. The possible role of *Stomoxys calcitrans* in equine sarcoid transmission, *The Veterinary Journal* 231 (2018), pp. 8-12].

The proboscis of stable flies is able to pierce the skin, particularly in thin-skinned areas like the axilla, inguinal region and the head. In this experiment, 96% of flies caught were stable flies. The study exposed 420 stable flies to both BPV-positive bovine papilloma tissue and equine sarcoid tissue. Their findings using quantitative PCR stated: "There was a significant rise in BPV load after tissue exposure both in sarcoid and papilloma-exposed flies, but the viral load was 10-fold higher and remained high for a longer time after exposure to papilloma tissue compared to sarcoid tissue."

The researchers concluded that transmission occurs shortly after exposure to infected tissue, with viral levels declining quickly, typically within a couple of hours. The rapid decline of measurable BPV DNA indicates that the opportunity for transmission is limited in time, which therefore limits the distance an infected fly can travel to a new host. The authors further suggest that viral spread is more likely from cattle to horses than between horses. That means sufficient separation of horses away from cattle might serve to minimize sarcoid transmission by fly vectors.



ARND BRONKHORST PHOTOGRAPHY

Research suggests that separation between horses and cattle might reduce the spread of the bovine papilloma virus.

Wildfire Smoke Guidelines for Horses

With an increasing number of wildfires occurring throughout the United States, it is inevitable that many equine practitioners will be faced with the need to care for horses that have been adversely affected by smoke. The University of California's Veterinary Medicine department has developed guidelines to help affected horses (go to vetmed.ucdavis.edu and search for "smoke horse").

While the particular compounds in smoke vary depending on the fuel burned, particulates within the smoke contain a mixture of liquid droplets

with solid particles usually less than one micron in diameter. These minute particles can be inhaled deep into airways. The result is significant aggravation of the airways, particularly in horses already suffering from some form of equine respiratory condition. Even horses without previous airway inflammation can develop persistent cough, nasal discharge, wheezing and difficulty breathing. There are also adverse effects on the mucociliary apparatus within the airways and lungs that is essential in removing foreign particles, such as pollen and bacteria. In addition, inflammation interferes with other arms of the respiratory immune system.

The UC Davis School of Veterinary Medicine recommends these practical strategies to protect horses from air pollution during wildfires:

- Limit exercise in times of smoke.
- Provide ample water positioned close to eating areas, as sufficient hydration moistens the airways and assists in clearance of inhaled particles.
- Feed dust-free hay and/or soak hay before feeding to cut down on inhaled dust, molds, fungi, pollen and bacteria.



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The University of California, Davis, vet school has developed guidelines for veterinarians to aid horses affected by wildfire smoke.

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- Other veterinarian-administered treatments might include: IV fluids +/- DMSO, flunixin, Vitamin E as an anti-oxidant, Vitamin C, pentoxifylline, and oxygen. Antibiotics might be necessary to combat pneumonia. A single dose of corticosteroid might be needed to decrease upper airway edema.
- Advise clients to allow sufficient healing time of their horses' airways following smoke exposure—this usually requires four to six weeks for complete healing. Horses should be given at least two weeks of rest once all smoke is eliminated from the environment.
- Air quality index (AQI) measurements can assist in determining when it is safe to exercise horses in outdoor venues. For humans, an AQI greater than 100 should preclude outdoor activity. At higher AQI levels, people and horses should be carefully monitored.

Effect of Pace on Completion of Endurance Racing

At elite levels of FEI (Federation Equestrian International) competition, it is not uncommon to see nearly half the field eliminated from competition for failure to meet metabolic and/or soundness criteria. A recent study evaluated the effect of pace between finishers and non-finishers [Marlin, D., and Williams, J. Equine endurance race pacing strategy differs between finishers and non-finishers in 120 km single-day races, *Comparative Exercise Physiology* in press 2018].

As endurance riding becomes more popular throughout the United States and internationally, understanding the dynamics of the effect of speed on completion rates can help equine veterinarians counsel their endurance clients. Providing riders with data enables them

to make strategic decisions to keep their horses safe while successfully completing competitions.

The study evaluated competition records for 389 horses in 24 races of 75-mile distances in 2016-2017. Of these equine athletes, 56% completed successfully while 44% did not. Nearly three-quarters of the non-completions were disqualified for lameness and gait abnormalities. A broader 2014 review of 30,741 FEI races in 47 countries identified that 30% of non-completions were for lameness and 9% for metabolic issues. Race level of CEI, terrain, fitness, distance and speed have an impact on how much competitors are willing to push their horses.

The study identified several key components to the effects of speed:

- Successful finishers were 7% slower than horses that failed to complete the competition.
- Horses that failed to complete the race traveled Loop 1 at faster speeds (by 5%) than those horses that completed the race. However, the fast Loop 1 horses completed subsequent loops at slower speeds than those horses that did complete.
- Of four loops in the competitions, loop speed decreased sequentially for all horses as they progressed through the loops. Those horses that did not complete had a greater rate of decreased speed through sequential loops.
- Horses eliminated at the first veterinary check for lameness traveled 36% faster than horses withdrawn for lameness at the finish veterinary check.
- Horses eliminated due to metabolic reasons at the finish traveled at a significantly increased speed (by 7%) in the final loop.

In general, the study concluded: "Riders who adopted a more consistent pacing strategy were less likely to be

eliminated for metabolic or lameness-related problems.” Of particular importance is the speed traveled on Loop 1.

Of further importance to success in endurance racing is the act of rider recordkeeping of their horses’ training regimens—only 53% of riders that were surveyed said they monitor training and keep records. Recordkeeping enables a rider to systematically observe his/her horse and to modify training and competition speeds according to how well the horse is coping with demands of the trail.

Correlation of Repository Radiographic Findings and Performance in Cutting Horses

Radiographs are commonly used to assess the presence of pathology in imaged joints and how that might impact a horse’s performance. It is well established that yearling Thoroughbred racehorses are subjected to radiographic review of multiple joints prior to sales. Now, a sim-

ilar strategy of repository radiographs is being employed for Quarter Horse used for cutting.

Collaboration among faculty at Colorado State University’s Equine Orthopedic Research Center and College of Veterinary Medicine and Biomedical Sciences examined the association of radiographic findings with cutting horse performance and money earnings [Bartlett, M.F.; McIlwraith, C.W.; Contino, E.K.; Park, R.D.; Kawcak, C.E.; Frisbie, D.D.; zumBrunnen, J.R. Relationship between repository radiographic findings and subsequent performance of Quarter Horses competing in cutting events, *JAVMA* vol. 252, no. 1, Jan 1 2018; pp. 108–115].

The study reviewed imaging from 458 yearling and 2-year-old Quarter Horses to determine the importance of a variety of radiographic “lesions” on performance, following the horses into their fourth year. The research study conclud-

ed that, in general, radiographic abnormalities of competitive Quarter Horses used for cutting were not significantly associated with subsequent performance.

However, there were a few lesions that did impact performance outcome:

- osteophytosis of the dorsoproximal aspect of the middle phalanx of the hind limb
- osteophytosis of the distal aspect of the tarsal joint, particularly if mild Grade 1 or 2

The researchers were surprised that mild tarsal lesions could impact performance more than more severe tarsal lesions. Previous studies of yearling Thoroughbred racehorses with osteophytes or enthesophytes of the centrodistal and tarsometatarsal joints demonstrated that they were less likely to start a race. However, only 9% of evaluated cutting horses



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Ashley Cashwell

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Salem, Wisconsin

An early love of horses led Ashley to a career in the equine industry, which she began as a stable manager. Ashley joined Bristol Veterinary Service in 2010, where she has grown her knowledge and enthusiasm for equine health. Her passion for horses' well-being also led her to Rotary International, through which she helped a missionary group establish a therapeutic riding center in central Asia. In her spare time, Ashley helps train lower-level dressage riders and their horses and often provides horse owners with important wellness education.

*Nominated by Kevin Nelson, DVM
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Rhinebeck Equine Hospital
Rhinebeck, New York

Lisa has dedicated her life to caring for horses. After earning her degree in equine sciences from Lake Erie College, she spent time managing both thoroughbred and foxhunting stables in multiple states. For the past seven years, Lisa has worked at Rhinebeck Equine Hospital, where her caseload ranges from nursing sick neonates to assisting with emergency colic and fracture repairs. Lisa spends extra time helping teach the clinic's interns and externs and is currently pursuing the Animal Care Technologies certification program through the AAETV.

*Nominated by Jenna Donaldson, DVM
Rhinebeck Equine Hospital*

The Champions of the Cause Award recognizes excellence within the equine veterinary technician/assistant profession. Boehringer Ingelheim, in partnership with *EquiManagement* and the American Association of Equine Veterinary Technicians and Assistants (AAEVT), awards this year's winners with an all-expenses-paid trip to the AAETV Conference in San Francisco, where they will be honored for their accomplishments.

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were diagnosed with Grade 3 or 4 tarsal osteophytes and so represented a low statistical number of those in the study.

Another consideration is that those horses with more advanced tarsal osteophytosis would have likely been treated with intra-articular medication, and such therapy might contribute to improved performance.

Interestingly, in this study, cutting horses with hind limb pastern joint osteophytes were three times as likely to earn money as 4-year-olds compared to horses lacking this radiographic finding. The authors suggested that stresses on this joint from pivots related to training could induce remodeling and radiographic changes.

Also of interest, they found that lameness attributable to radiographic findings of the middle femoral condyle of the stifle joint did not impact performance and earning ability in the early years of a cutting horse's career.

The authors stressed that joint soundness or pathology is only one aspect of a horse's ability to perform. Other factors that affect performance outcome include training methods, horse temperament and innate talent, genetic influences on musculoskeletal structure and metabolic stamina, as well as the variability in cattle behavior.

Blood Sucrose as a Diagnostic Tool for Foal Gastric Ulcer Syndrome

Foals are at risk for development of gastric ulcer syndrome (GUS), and while incidence ranges from 22-57%, not all affected foals are symptomatic. Gastrosco-
py is a definitive tool to aid in diagnosis. A study looked at the use of sucrose permeability testing as a different and relatively minimally invasive means of screening for GUS in foals [Hewetson, *et al.*, Diagnostic accuracy of blood sucrose as a screening test for equine gastric ulcer syndrome (EGUS) in weanling foals, *Acta Vet Scand* (2018) 60:24].

Examination was done on 45 foals,



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A sucrose blood test in older foals might be useful as a screening tool to identify foals that might need gastroscopy to look for gastric ulcers.

aged approximately six months old, with both gastroscopy and sucrose permeability testing one week prior to and two weeks after weaning. The two tests were compared in their sensitivity and specificity to identify gastric lesions, glandular lesions and squamous lesions. After gastroscopy, the foals were intubated with a nasogastric tube and administered 1g/kg of sucrose as a 10-20% solution. Blood was taken at 45 and 90 minutes following sucrose administration.

Prior to weaning, 21% of foals had gastric ulcers, with 9% glandular and 7% squamous lesions. Following weaning, 98% of foals had gastric lesions with 97% squamous and 59% glandular. Severity of lesions was more pronounced after weaning.

Sensitivity of the sucrose permeability test was 85-95% for both 45- and 90-minute blood samples. With this result, the researchers state that a high sensitivity correctly identifies most foals with gastric ulcers, and if the test is negative, then it reliably rules out gastric ulcers. Those identified at risk of GUS via blood sucrose can then be scoped to determine location and severity of lesions.

Specificity was not as useful, ranging from 41-71%, with a high false positive

rate. This could result in unnecessary scoping, but because many weanling foals with GUS are mostly asymptomatic, this enables clinicians to more accurately identify foals in need of treatment.

The sucrose given to fasted foals was well tolerated without any occurrence of diarrhea. Older foals have sucrase activity in the small intestine, whereas neonates do not, so this test works best after six months of age. By six months of age, foals have increased gastric permeability to sucrose due to changes in gastric mucosal epithelium.

The study concluded, "Due to its poor specificity, it is not expected that the sucrose blood test would replace gastroscopy; however, it may represent a clinically useful screening test that can be used to identify foals that may benefit from gastroscopy."

Effect of Diet on ACTH Values

The use of thyrotropin-releasing hormone (TRH) stimulation testing for diagnosis of PPID has been instrumental in effective treatment and management of this disease in aged horses.

A recent study evaluated the effect of age and different diets on ACTH levels measured through TRH stimulation

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and dexamethasone suppression testing procedures [Jacob, S.I.; Geor, R.J.; Weber, P.S.D.; Harris, P.A.; McCue, M.E. Effect of dietary carbohydrates and time of year on adrenocorticotrophic hormone (ACTH) and cortisol concentrations in adult and aged horses, *Domestic Animal Endocrinology*, (2017), doi: 10.1016/j.domaniend.2017.10.005].

Of 16 Thoroughbred and Standardbred mares and geldings in the study, none displayed typical signs of PPID. All received grass hay and one of four feed supplements twice a day:

- control diet of fortified low-sugar and low-starch pellets
- starch-rich with kibbled corn
- fiber-rich with non-molasses sugar beet pulp/soybean hull pellets
- sugar-rich with dextrose powder

Horses were grouped according to age, with one adult group aged 5-13 years and the other group aged 18-24 years old. Each horse received an allotted amount of isocaloric feed supplement based on body condition and weight tape score. All horses received four 7-week dietary “treatments” with each of the four supplements listed above. Each change in feed supplement followed a two-week washout in which they were fed only the control pellet diet and hay. In the final (seventh) week, each horse was administered an overnight dexamethasone suppression test, then 36 hours later the TRH stimulation test. Endocrine testing was performed in March, May, August and October.

Baseline ACTH concentrations were higher in October than in the other testing months, as expected. ACTH increased following TRH-stimulation testing in both age groups; however, ACTH levels were higher in aged horses than the adults. Post-TRH ACTH concentrations were higher in August and October than in March and May.

Diet could be a confounding variable in evaluating testing results. The study found:

- Baseline (resting endogenous) ACTH concentrations were elevated by the starch-rich diet, and especially so in aged horses compared to adults.
- Results following TRH-stimulation did not show any differences in ACTH concentrations between diets other than aged horses having higher post-TRH ACTH concentrations with the control diet compared to adults on the same control diet.
- Aged horses on the starch-rich diet had higher post-dexamethasone cortisol concentrations compared to aged horses on the sugar-rich diet. Control and fiber-rich diets did not modify post-dexamethasone cortisol concentrations. Based on mouse studies, the authors explain that this could be due to “alterations in the gastrointestinal microbiome affecting regulation of neuroendocrine hormones of the hypothalamic-pituitary-adrenal axis.”

While none of these horses underwent post-mortem or histopathological confirmation (or not) of PPID, the researchers report that the effect of diet, age and time of year should be factored into interpretation of ACTH and cortisol level results with testing. Starch-rich diets result in significantly higher endogenous ACTH concentrations and decreased cortisol suppression in aged horses. With this in mind, it is possible for horses on a starch-rich diet to be incorrectly diagnosed with PPID due to an elevation of ACTH above expected cutoff levels. They further state that there might be a need for different reference ranges for aged horses, and especially for different times of the year. Adjusted seasonal cutoff values are appropriate from July to November.

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BRIEF SUMMARY

Before using MARQUIS, please consult the product insert, a summary of which follows:

INDICATIONS

MARQUIS (ponazuril) is indicated for the treatment of equine protozoal myeloencephalitis (EPM) caused by *Sarcocystis neurona*.

WARNINGS

For use in animals only. Not for use in horses intended for food. Not for human use. Keep out of reach of children.

PRECAUTIONS

Prior to treatment, a complete neurologic exam should be completed by a veterinarian. In most instances, ataxia due to EPM is asymmetrical and affects the hind limbs. Clinicians should recognize that clearance of the parasite by ponazuril may not completely resolve the clinical signs attributed to the natural progression of the disease.

The prognosis for animals treated for EPM may be dependent upon the severity of disease and the duration of the infection prior to treatment. The safe use of MARQUIS (ponazuril) in horses used for breeding purposes, during pregnancy, or in lactating mares, has not been evaluated. The safety of MARQUIS (ponazuril) with concomitant therapies in horses has not been evaluated.

ADVERSE REACTIONS

In the field study, eight animals were noted to have unusual daily observations. Two horses exhibited blisters on the nose and mouth, three animals showed skin reactions for up to 18 days, one animal had loose stools, one had a mild colic on one day and one animal had a seizure while on medication. The association of these reactions to treatment was not established.

ANIMAL SAFETY SUMMARY

MARQUIS (ponazuril) was administered to 24 adult horses (12 males and 12 females) in a target animal safety study. Three groups of 8 horses each received 0, 10 or 30 mg/kg (water as control, 2X and 6X for a 5 mg/kg [2.27 mg/lb] dose). Horses were dosed after feeding. One half of each group was treated for 28 days and the other half for 56 days followed by necropsy upon termination of treatment. There were several instances of loose feces in all animals in the study irrespective of treatment, sporadic inappetence and one horse at 10 mg/kg (2X) lost weight while on test. Loose feces were treatment related. Histopathological findings included moderate edema in the uterine epithelium of three of the four females in the 6X group (two treated for 28 days and one for 56 days).

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

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out incurring adverse systemic effects. A study looked at the time it takes to reach a maximum concentration of amikacin in the coffin joint synovial fluid [Kilcoyne, I.; Nieto, J.E.; Knych, H.K.; Dechant, J.E. Time required to achieve maximum concentration of amikacin in synovial fluid of the distal interphalangeal joint after intravenous regional limb perfusion in horses, *AJVR* Mar 2018, vol. 79, no. 3, pp. 282-286].

Two grams of amikacin sulfate was diluted in isotonic saline to 60 ml volume and administered into the cephalic vein with a pneumatic tourniquet placed 10 cm proximal to the accessory carpal bone.

Because amikacin is a concentration-dependent drug with better bactericidal effects the higher the concentration, it needs to have a maximal concentration to treat a distal limb infection. Typically, a tourniquet is left on for 20-30 minutes to ensure sufficient

antimicrobial concentrations. Leaving a tourniquet on longer than necessary creates prolonged discomfort for the horse as well as the need for additional sedation.

Nine sound horses, aged 7-19 years of age, were used in the study. The results indicated that maximal concentration of amikacin in the coffin joint was achieved by 15 minutes.

While none of the joints evaluated experienced any pathology, it is likely that amikacin concentrations could be higher in inflamed joint tissue. No further increase in mean peak concentration of amikacin occurred between 15 and 30 minutes in this study.

The researchers concluded that 15 minutes is the point where the maximal amikacin concentration is achieved in the coffin joint in the least amount of time to avoid horse discomfort from the tourniquet and to avoid the need for added sedation.

Lake Tahoe Equine Conference

The 41st Lake Tahoe Equine Conference, January 28-February 1, 2019, will provide in-depth presentations on medical advancements, lameness diagnosis, diagnostic imaging, molecular diagnostics, nutrition and other important medical and surgical problems. This course is pending approval for 21 hours of CE credit.

Speakers are: Tania Cubitt, Performance Horse Nutrition; Sue Dyson, Head of Clinical Equine Orthopedics, Newmarket, UK; Carrie Finno, UC Davis; Larry Galuppo, UC Davis; Laurie Goodrich, Colorado State University; Isabelle Kilcoyne, UC Davis; Gary Magdesian, UC Davis; Nicola Pusterla, UC Davis; Susan Stover, UC Davis; Mary Beth Whitcomb, UC Davis.

For more information about the Lake Tahoe Equine Conference, please contact Janet O'Brien, 530-756-4899, or e-mail jlo62@comcast.net. **EM**



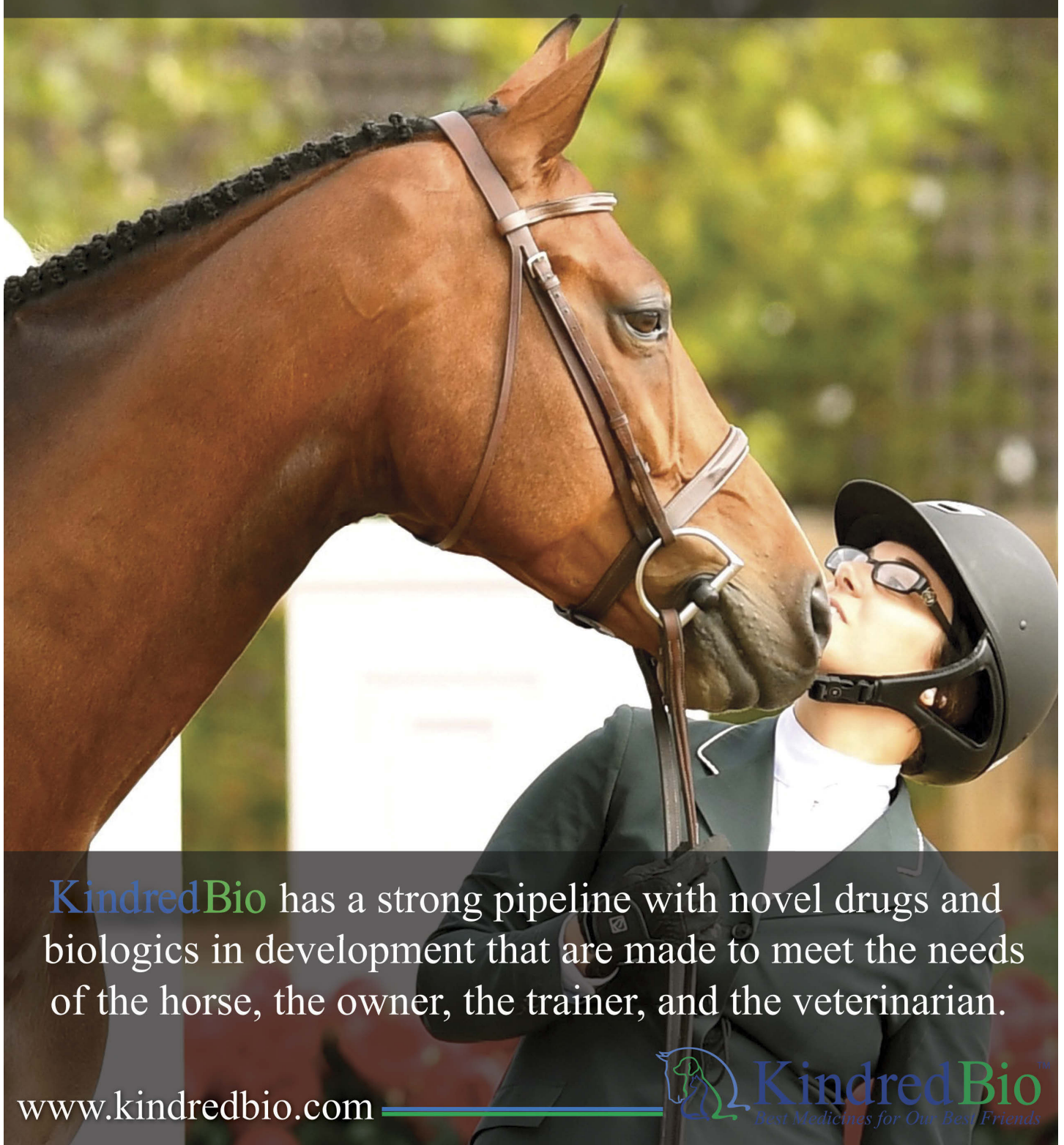
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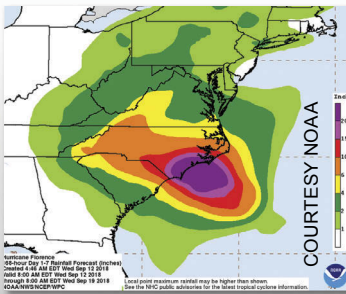
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WEG Health Wrap-Up

Seventy countries, eight disciplines, hundreds of support personnel and the aftermath of a hurricane descended on Tryon for the 2018 World Equestrian Games.

By Kimberly S. Brown

Planning for the health and safety of the equine competitors at the FEI World Equestrian Games (WEG) Tryon 2018 began long before the first horses started arriving through quarantine on September 1. And a tremendous amount of manpower went into keeping the horses healthy, safe and competing on a level playing field despite travel, heat, humidity and the

remnants of Hurricane Florence.

Every team for each country could bring a team veterinarian. Some teams had veterinarians who were "grooms" who kept a watchful eye on the horses. There were 60-70 FEI Vet Services volunteer veterinarians working at any time at the facility (depending on the event). Competitions such as Endurance, the cross-country phase of Eventing and the

marathon phase of Driving all required extra veterinarians on course.

All of those veterinarians were in addition to the specialists (such as the veterinary physiotherapy team, an internal medicine specialist and a dedicated imaging vet) who were manning the equine hospital and laboratory on the WEG competition grounds at the Tryon International Equestrian Center. There



Top row, left to right: The weather was a major player at WEG Tryon 2018. Torrential inland rainfalls from Hurricane Florence hit the Tryon International Equestrian Center and caused some flooding and changes in competition dates; jogs in the rain; and competitors seeking shelter from the weather.

On this page: There was still construction underway as the games began; Dr. Tracy Turner is shown with two of the 37 AAEP senior veterinary students who worked at WEG; and confusion reigned at the Endurance event, which eventually was cancelled.

PHOTOS BY KIMBERLY S. BROWN
UNLESS OTHERWISE NOTED



Bottom row, left to right:

Dr. Mike Tomlinson, president of Veterinary Commission 1; Dr. Emily Sandler-Burtneis, president of Veterinary Commission 2, with Dr. Sonia Wittreck, a veterinary delegate from France serving on Veterinary Commission 2; the Eventing cross-country competition had changes due to heat and humidity concerns; competitors were housed in secure barns; Dr. Anne Baskett was co-head of the FEI Treating Veterinarians with her husband, Dr. Bill Hay; and final-year veterinary students with a passion for equine were selected from each veterinary school in North America and the Caribbean to work at WEG Tryon 2018. They not only worked alongside veterinarians from many countries, but had lectures on the various aspects of veterinary care for horses at this high level of competition.

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were also 37 fourth-year veterinary students, one from each vet school in North America and the Caribbean. They were participating in an AAEP program that allowed them to work alongside treating and regulatory veterinarians to learn more about sporthorse care at the ultimate level.

The group of treating veterinarians at WEG Tryon 2018 was headed by the husband-wife team of Bill Hay, DVM, DACVS, and Anne Baskett, DVM, DACVS, with assistance from Yves Rossier, DMV, DACVIM (who appear on

our cover). Hay and Baskett are partners in Tryon Equine Hospital, which is just a few minutes away from the Tryon International Equestrian Center.

There were many ups and downs in the WEG Tryon 2018 competitions, which began with a false start for nearly half of the Endurance competitors, followed by a restart of all horses. Eventually the event was cancelled because of health concerns due to high heat, humidity and an afternoon rain shower.

Keeping horses (and humans) comfortable and safe given the environmen-

tal conditions was an ongoing concern at WEG Tryon 2018. Then Hurricane Florence landed on the North Carolina coast, bringing flooding inland and rescheduling of events in the middle of the competition.

We hope you enjoy some of the images of WEG Tryon 2018. We invite you to visit EquiManagement.com and search under "FEI World Equestrian Games" for the many articles and news stories surrounding the event. Health coverage of WEG Tryon 2018 was brought to you by KindredBio Equine. **EM**



Transforming Equine Practice

Here are tips to make the most of your trip to this year's AAEP Convention in San Francisco.

By Katie Navarra

The American Association of Equine Practitioners (AAEP) Annual Convention & Trade Show plays a pivotal role in transforming equine veterinary medicine. The Convention dispenses a blend of cutting-edge research, practical ideas and hands-on solutions that foster healthier patients, practices and lifestyles.

When an AAEP Annual Convention concludes, work begins on the next. The Educational Programs Committee and the CE Steering Committee strategically solicit papers and create content based upon input from the members. The con-

tent selected is also a reflection of trends in the industry.

"We try really hard to give practitioners something they can put into use the day they get home," said AAEP board member Leslie Easterwood, DVM, of Texas A&M University's College of Veterinary Medicine. "AAEP is so committed to staying current that the program is never stale."

This will be her 24th trip to the Convention. Her first was in 1993, when she was what she called "a wide-eyed, third-year veterinary student" eager to learn all she could and yet overwhelmed by the sheer size of the Convention.

"It's difficult to fathom all that is offered at Convention until you go," she said.

Even though she's attended the AAEP annual meeting for more than two decades, she looks forward to every event because the program and activities are always evolving. One current example is how presentation topics have changed to reflect the demographic shift of more women than men in the profession. On-site accommodations have similarly been updated to reflect the changing dynamics.

For the first time this year, new mothers will have access to a private and

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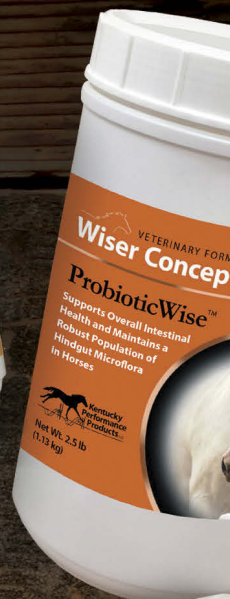
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First-Time Attendees

Attending an educational event for the first time is exciting, but there is a lot to fit into a few short days, and it can be overwhelming. There are seemingly endless educational sessions of interest, hundreds of new people to meet and countless new products and services to explore.

The AAEP Annual Convention has so many offerings on such a wide variety of subjects that it's helpful to look over the program in advance and prioritize which sessions and activities you'd like to attend, recommended AAEP President-Elect Jeffrey T. Berk, VMD, MRCVS, of Equine Medical Associates and the 2018 AAEP Convention program chair.

Prior to leaving home for Convention, identify your goals. Determine whether your goal is to improve your knowledge of a treatment protocol or to meet a clinic owner looking to hire. Knowing what you hope to gain from the Convention experience can guide you in determining which functions to attend.

"It's also such a great opportunity to connect with colleagues and friends, and network for job opportunities that you want to make sure to take time for, as well," Berk said.

Once you arrive, you'll receive a name badge. Often a ribbon or symbol on the name tag will indicate individuals who are attending for the first time. Make particular note of this badge symbol. It is a natural way to begin a conversation with someone you don't know.

Event organizers know that meeting new people is an important part of industry events. Multiple activities are built into the schedule for that purpose. Attend the networking functions as those will give you the most opportunity to meet people.

The AAEP has a networking activity exclusively for first-timers. It is designed to connect newcomers and provide tips for navigating the educational, social and networking opportunities that occur during the five days of the convention. Set a reminder for "Convention 101: Helpful Hints for the First-Time Attendee" at 4:45–5:30 p.m. on Saturday, December 1, so you don't miss this casual program. Afterward, the group walks to the Welcome Reception together.

Relationships make industries go 'round. Post-event, you should have numerous individuals to connect with on LinkedIn and other social platforms.

And don't despair if you can't fit it all in ... much of the material from the convention can be accessed afterward in the "Proceedings" book or online, Berk said.

Do you have any tried and true AAEP Convention survival guide tips? We would love to hear them. Post your tips on EquiManagement's Facebook page before and during the convention using the hashtag #AAEPSanFran. See you in San Francisco!

comfortable nursing mothers' room, sponsored by Boehringer Ingelheim. The area will be available within the Moscone Center for the duration of the Convention, said Sally Baker, AAEP director of marketing.

Any parent has access to on-site childcare for kids ages 6 months through 12 years. The service is being offered through KiddieCorp, a longtime provider of high-quality children's programs to conventions and trade shows.

The multi-day event, scheduled for December 1-5 in San Francisco, features 172 educational presentations and labs, countless activities and plenty of opportunities to interact with exhibitors on the trade show floor. Whether it's your first time attending or you've been going for decades, you'll leave with information that you can use in the field.



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COURTESY AAEP

Make sure to plan some time in the trade show to learn what is new and what deals are being offered this year.

ed has undergone rigorous scrutiny by our Educational Programs Committee in order to present the best equine continuing education in the world,” said AAEP President-Elect Jeffrey T. Berk, VMD, MRCVS, of Equine Medical Associates and the 2018 AAEP Convention program chair. The vast program covers a wide range of equine health topics so that every attendee can find sessions of interest, according to Berk.

“We have an excellent keynote speaker, Dr. Abraham Verghese, who is a well-known physician and best-selling author,” he said.

Verghese emphasizes the importance of bedside medicine and physical examination in an era of advanced medical technology. He contends the “patient in the bed” often has less attention than the patient data in the computer, a topic that is relevant in equine medicine.

“I’m going to read his book ‘Cutting For Stone’ in preparation, and you can see his TED Talk on YouTube called ‘A Doctor’s Touch’ ... no one should miss this!” Berk said.

Presentations provide insight into a wide range of topics on horse health. For example, many equine veterinarians are involved with performance horses of various types, and there is a session called “How to Diagnose Poor Performance in the Equine Athlete” that will be very helpful, Berk added.

There will also be a session dealing with the wild horse situation on the Bureau of Land Management (BLM) land out west. Filmmaker Ben Masters will be in attendance to speak about these horses and “Unbranded,” the film he produced about them.

A session called “Improving the Health & Welfare of Equids Worldwide” showcases speakers from some of the major international charities that do work in underprivileged countries on working and non-working equids.

In addition to topics related to horse health, there is a focus on business practices, veterinarian health and wellness. A sample from this lineup is a session entitled “Lifestyle & Wellness: Recognizing and Managing Addiction in Practice.” It is

designed to help both affected veterinarians and their employers to recognize and deal with what has become an increasing problem in all levels of society.

“There really is something for everyone,” Berk said.

Throughout the presentations, you can listen to the questions, challenges and issues that arise from other attendees. Then you can listen to the solutions, especially those presented by other attendees. You will likely walk away with best practices from those who have encountered the very same hurdles.

A good tip: At the end of each presentation, note the speaker’s name and contact information. There might be a time in the future that you will need that person’s expertise. It might feel intimidating to approach speakers, but they welcome the interaction and your interest in their topics.

The discussion that happens in the lecture rooms is critical to remaining current with breakthroughs in research, advancements in everyday practice and finding balance between

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¹Data on file at Merial, Safety Study, PR&D 0144901.

²Doucet MY, Bertone AL, et al. Comparison of efficacy and safety of paste formulations of firocoxib and phenylbutazone in horses with naturally occurring osteoarthritis. *J Am Vet Med Assoc.* 2008;232(1):91-97.

³EQUIOXX product labels and FOI summaries and supplements.

⁴Data on file at Merial, Clinical Experience Report PHN 471, PR&D 0030701.



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

EQUIOXX[®] (firocoxib) is indicated for the control of pain and inflammation associated with osteoarthritis in horses. Firocoxib belongs to the coxib class of non-narcotic, non-steroidal anti-inflammatory drugs (NSAID).

CONTRAINDICATIONS: Horses with hypersensitivity to firocoxib should not receive EQUIOXX.

WARNINGS: EQUIOXX is for use in horses only. Do not use in horses intended for human consumption. Do not use in humans. Store EQUIOXX Tablets out of the reach of dogs, children, and other pets in a secured location in order to prevent accidental ingestion or overdose. Consult a physician in case of accidental human exposure.

Horses should undergo a thorough history and physical examination before initiation of NSAID therapy. Appropriate laboratory tests should be conducted to establish hematological and serum biochemical baseline data before and periodically during administration of any NSAID. NSAIDs may inhibit the prostaglandins that maintain normal homeostatic function. Such anti-prostaglandin effects may result in clinically significant disease in patients with underlying or pre-existing disease that has not been previously diagnosed.

Treatment with EQUIOXX should be terminated if signs such as inappetence, colic, abnormal feces, or lethargy are observed. As a class, cyclooxygenase inhibitory NSAIDs may be associated with gastrointestinal, renal, and hepatic toxicity. Sensitivity to drug-associated adverse events varies with the individual patient. Horses that have experienced adverse reactions from one NSAID may experience adverse reactions from another NSAID. Patients at greatest risk for adverse events are those that are dehydrated, on diuretic therapy, or those with existing renal, cardiovascular, and/or hepatic dysfunction. The majority of patients with drug-related adverse reactions recover when the signs are recognized, drug administration is stopped, and veterinary care is initiated.

Concurrent administration of potentially nephrotoxic drugs should be carefully approached or avoided. Since many NSAIDs possess the potential to produce gastrointestinal ulcerations and/or gastrointestinal perforation, concomitant use of EQUIOXX with other anti-inflammatory drugs, such as NSAIDs or corticosteroids, should be avoided. The concomitant use of protein bound drugs with EQUIOXX has not been studied in horses. The influence of concomitant drugs that may inhibit the metabolism of EQUIOXX has not been evaluated. Drug compatibility should be monitored in patients requiring adjunctive therapy.

The safe use of EQUIOXX in horses less than one year of age, horses used for breeding, or in pregnant or lactating mares has not been evaluated. Consider appropriate washout times when switching from one NSAID to another NSAID or corticosteroid.

The Safety Data Sheet (SDS) contains more detailed occupational safety information. For technical assistance, to request an SDS, or to report suspected adverse events call 1-877-217-3543. For additional information about adverse event reporting for animal drugs, contact FDA at 1-888-FDA-VETS, or <http://www.fda.gov/AnimalVeterinary>.

Rev 10/2016



COURTESY AAEP

There are many social activities and awards during the AAEP Convention, so check your program and app to make sure you don't miss anything.

work and home. However, Easterwood emphasized the importance of the conversations that happen in the hallway.

“That’s where you find camaraderie,” she said. “It’s those conversations where you meet veterinarians with a variety of expertise. Once you make that connection, you have someone to call if you have a problem and need to talk with somebody about a specific problem.”

Stroll Through the Trade Show

This is a record year for the AAEP Annual Convention’s trade show, which features 620 booths and 315 exhibiting companies. Baker described the exhibitor floor as the one-stop-shop for hundreds of companies serving the equine veterinary industry. The trade show will open on Sunday, December 2, with a reception from 5:00-6:00 p.m. There, attendees can enjoy complimentary wine while checking out the latest products and services available in equine veterinary medicine.

Take time to walk the entire exhibit hall—it doesn’t close until Tuesday, December 4. Visiting the trade show booths shows support for those individuals and organizations that support the event. Not only is it important to express appreciation for the support, visiting the expo can provide an introduction to innovative products and services. You

might not have an immediate need for a featured product, but you never know what might be relevant to you one, three or six months down the road.

Use the AAEP Convention App to review the exhibitor participants prior to your arrival. Baker explained that the AAEP Convention App can be found in your iOS or Android app store by searching for “AAEP Education.”

“We have been enhancing the meeting experience for attendees since 2014,” Baker said. “Users are able to use the dashboard to browse speakers and sessions, view the ‘Proceedings’ papers, create an itinerary and take notes.”

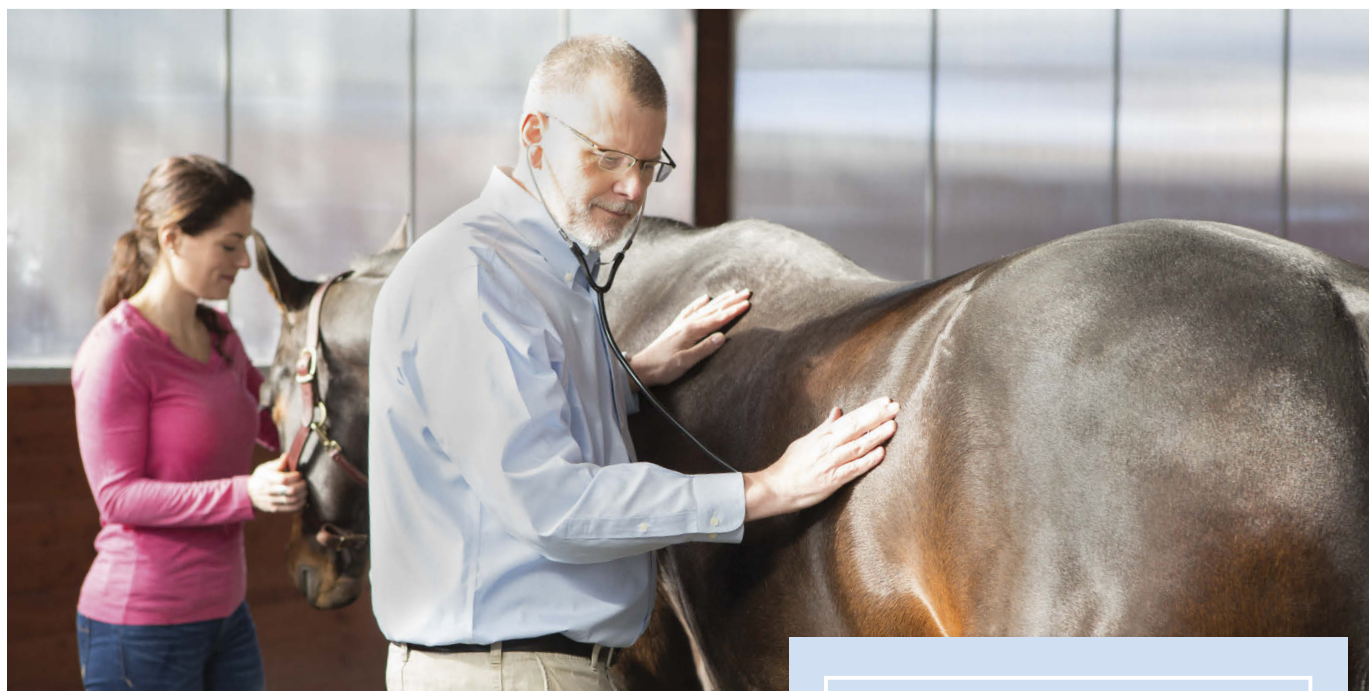
Additionally, you can message exhibitors and fellow attendees to ask questions, swap photos and share experiences. For additional information about the goings-on of the event, the in-app Twitter stream will feature tweets using the hashtag #AAEPSanFran.

Checking out the app before the event helps you determine which booths to visit. With so many exhibitors to see, planning ahead can help you create a list of the top companies you want to see. Then send an email to those companies asking to set an appointment time to meet during the show.

Exhibiting companies welcome this process, and it allows you to keep your daily schedule on track and guarantees

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you will connect with those desired companies.

Scheduling appointments also allows the company the opportunity to have a dedicated representative available at that time. After you've had your appointments, you can walk the floor knowing that your specific goals have been met.

Your expo experience will be rewarding and stress-free when you have a daily agenda/schedule planned in advance.

Respond to Event Surveys

When activities conclude on December 5, you still have one important task to complete. Take time to respond to any surveys that are sent so that your feedback can be taken into account for future events.

“Convention planning is a process that involves creating surveys to get feedback from the AAEP members so that we can understand what topics are of most

importance to them,” Berk said.

This information is then used by the Educational Programs Committee and the CE Steering Committee to solicit papers and create content based upon the members' input. Additionally, survey feedback is used to assess whether or not members are happy with some of the ancillary activities at Convention, and whether there are additional activities that need to be considered, he concluded. **EM**

Five Tips for Getting the Most Out of Your Convention Experience

Whether you're an AAEP Convention veteran, a student participant, first-time attendee or somewhere in between, you can never be too prepared. Here are three ways you can make the most of your trip to San Francisco this December.

1. Think Self-Care. Remember to bring or pick up at the trade show a reusable water bottle to stay hydrated. Hotels are notorious for circulating dry air that can cause lips to crack, something you might not even notice until a day or two later. Remember to pack a tube or two of lip balm (or pick them up in the trade show) and apply the balm regularly throughout your stay. And remember to wear comfortable shoes—you'll be walking a lot.

2. Fuel Up. Breakfast is still the most important meal of the day, but it's often the one meal that is skipped the most when rushing to a session in the morning. Instead of skipping breakfast, bring it with you. Containers of dried oatmeal, available at grocery stores for about \$1 apiece, are a filling snack that's light to pack. These days, all hotel rooms have single-cup coffee makers, but instead of using it to make coffee (you can do that, too), run hot water through the machine and place the dried oatmeal container underneath. Voila, hot oatmeal! Oatmeal is a healthy and filling breakfast.

Or maybe the best option for breakfast is to get up a bit early and attend a

presentation from the AAEP Educational Partners' Sunrise Sessions. They provide a hot breakfast! Check the AAEP Program for dates, topics and times.

To stay energized throughout the day, simple items such as trail mix, energy bars or fruit are an easy treat to throw in your bag for whenever you need them.

The one thing San Francisco has no shortage of is restaurants. There are plenty of options to choose from, but you won't be the only one trying to find a table. If you're up for a little adventure, do some research ahead of time and find a restaurant that's off the beaten path.

If you'd rather stay close to the hotel at the end of a long day, check to see whether any restaurants within walking distance take reservations and make them before you go to the Convention. After a long day, room service is always an option.

3. Plan Ahead. With so many lectures and activities from which to choose, you might not know where to start. Plan your schedule before leaving for the Convention. Knowing what sessions you would like to attend will prevent any last-minute decision-making that could mean the difference between getting into a room before it is full or not making it on time.

Are you attending with a colleague? If so, divide and conquer. There's a wide variety of lectures and discussions that fall into four categories: The Business

of Practice, How-to, In-Depth and Table Topics.

Check out AAEP's Convention App (launched in mid-September). The app provides the most up-to-date resources available, so if there's a last-minute change to a room or if a session speaker is changed, you'll be the first to know.

4. Say 'Thank You.' The AAEP Annual Convention is made possible largely thanks to the generous sponsors and exhibitors. Make time to visit the trade show to learn about the products and services available.

While you're there, let the companies know how much you value this opportunity and their support of AAEP and your profession.

Bonus: Exhibitors give away everything from pens to T-shirts to travel mugs and more. You might have to play a game or answer a few trivia questions, but that's all part of the fun!

5. Stay Active. You don't have to give up your fitness routine just because you're out of town. Regular exercise is not only good for the body, but also for career longevity, which is important for those in a physically demanding occupation such as equine veterinary medicine.

As part of the "AAEP Healthy Practice: Wellness for Work, Well-being for Life" initiative, various group exercise options will be offered during the convention to help you stay focused and healthy.

Health Fair

Sunday, December 2–Tuesday, December 4

Located within the trade show and open trade show hours.

As part of the AAEP Healthy Practice: Wellness for Work, Well-being for Life Initiative, take advantage of a refreshing upper body massage to relieve tension in the neck, back, shoulders and arms. The massage lounge is staffed by licensed, professional massage therapists from BodyWorks. Electronic foot massage stations are also available, as is a healthbot that provides a quick measure of your blood pressure, heart rate and BMI.

AAEP San Francisco 5K Running Tour

Monday, December 3, 6:30-7:30 a.m.

Pack your running shoes for a fun and educational 5K running tour through beautiful San Francisco. At designated landmark stops, running guides will share interesting stories of the city's history. Suitable for all abilities, the group-oriented run will offer four different paces—from under nine minutes per mile to a walking group.

Runners will meet in the registration area of the lobby of the Moscone Center at 6:15 a.m. The \$35 fee includes a water bottle and sling bag. Register at cityrunningtours.com/aaep.

CrossFit, INSANITY and Yoga Fitness Classes

Monday, December 3, 6:30-7:00 a.m.

Tuesday, December 4, 6:30-7:00 a.m.

Awaken your body at morning wellness classes. Proper workout attire recommended. Water and a towel are provided for all classes and a mat is provided for yoga. INSANITY offers multiple options of intensity. Classes will be held at the Marriott Marquis.

Track Your Steps During

#AAEPSanFran

Have some fun and compare your step count to your fellow attendees. Connect to the AAEP Count Your Steps group at bit.ly/AAEPCountYourSteps to connect your FitBit, then download the Count It app.

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EPM Society Meeting at the ACVIM

Discussions centered on where we are with EPM research and what is needed to make progress with this disease.

By Sharon Witonsky, DVM, PhD, DACVIM

The EPM society has organized a Special Interest Group (SIG) gathering at the ACVIM meeting for many years, as it did in 2018. The objectives of the EPM society are: to organize individuals with interests in EPM research to contribute to a greater understanding of disease; encourage cooperative research; promote awareness of current research and new developments; and evaluate guidelines for the diagnosis, treatment and prevention of EPM.

In addition to the SIG, the EPM society has conducted organized focus meetings at Rood and Riddle in Lexington, Kentucky, in October 2014, and Lake Tahoe, Nevada, in October 2017. At those meetings, a small group of dedicated clinicians, researchers and members from industry came together to discuss recent developments in the field and identify a path to advance our knowledge of this devastating disease.

Many of the recent advances were presented at last fall's Focus meeting (visit EquiManagement.com and search for "EPM Society Workshop" for a report), so the agenda for this year's EPM SIG was a bit different.

Steve Reed, DVM, DACVIM, began the meeting with a short eulogy/tribute for Bill Saville, DVM, who passed away this year (to read a tribute to Saville, visit vet.osu.edu and search for "William Saville").

Reed then introduced the new EPM



DUSTY PERIN

Research in mice point to the possibility that there could be a genetic predisposition to a horse getting EPM.

society officers: President: Dr. Sharon Witonsky, Virginia Tech; Vice President: Dr. Amy Johnson, University of Pennsylvania; Treasurer: Dr. Jennifer Morrow, Equine Diagnostic Solutions. And he introduced the Executive Board members: Dr. Nicola Pusterla, UC Davis; Dr. Dan Howe, Gluck Equine Research Center; and Antoinette Marsh, Ohio State University.

Witonsky lauded Reed by saying, "Steve is an incredibly well-known and well-respected person in the field of veterinary medicine with a particular passion for neurology and EPM. He not only oversaw the organization of the annual EPM SIGs, but he and Dr. Jennifer Morrow and Jenny Evans put an incred-

ible amount of effort into both planning and executing the first EPM focus meeting at Rood and Riddle in 2014. He was also instrumental helping Dr. Pusterla in organizing and securing donors for the Tahoe meeting. Steve will continue on the board as the past president."

Mouse Model Research

The focus of this year's SIG was a review of research and an interactive discussion between a panel of EPM experts in immunology and the audience.

In order to provide some background information, Witonsky reviewed the predicted protective immune response to *Sarcocystis neurona*, as well as potential other pathways when infected horses

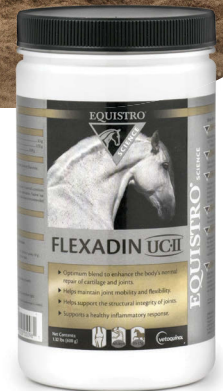
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or experimental models (i.e., mice) are infected. With the initial exposure to a pathogen or antigen, there is initial non-specific recognition by the antigen presenting cells (APC) (i.e., macrophages, dendritic cells) of particular common molecules (i.e., LPS). This activates the antigen presenting cells.

Depending on which common molecules stimulate the APCs, and depending on which other cytokines are present in the environment, the antigen presenting cells then activate T-cells toward a particular response. Different types of T-cell responses produce different cytokines (i.e., IFN-gamma, IL-4, IL-10, IL-17), which are then responsible for helping control the infection (i.e., CD4 Th1 IFN-gamma), allergen (i.e., CD4 Th2 IL-4) and auto-immune response (i.e., CD4 T-regulatory, IL-10).

If the proper immune response is stimulated, the infection or allergen can be controlled. If not, this can lead to ongoing infection, spread of disease and potential death.

The predicted protective immune response to *Sarcocystis neurona* is thought to be macrophage 1, dendritic cell 1, CD4 T-helper 1 IFN-gamma and CD8 IFN-g (M1 DC1, CD4 Th1 CD8 IFN-g) response. There are some data that support this theory from mouse models. The advantages of using a mouse model are that you can control both the genetics and environment of the mouse study.

Those effects cause considerable variation in equine studies. It is much easier to get the number of mice needed for studies and it is often much less expensive. In addition, many of the reagents are readily available to assess many details of the immune response, whereas equine-specific or reagents that work to measure equine-specific responses have been very limited.

Another advantage of the mouse studies is that researchers can use mutant strains (i.e., those strains that have an altered genetic component, such as the IFN-gamma knock out mice). These strains can then be used to assess the role of a specific molecule in disease.

IFN-gamma is one of the most critical cytokines in the cell mediated protective immune response. Lindsay and Dubey performed some of the first infection studies in IFN-gamma knockout (GKO) mice. They found that the mice couldn't live more than about 20 days. They also identified where *S. neurona* was present in the mice. This told investigators that IFN-gamma is critical for protection.

With this as a starting place, investigators performed other KO studies and determined that nude and CD8KO mice get disease, supporting a role for T-cells—and specifically CD8 cells—in protection. B-cell deficient mice don't get disease, suggesting both that B-cells and the humoral immune response (antibodies) are not critical for protection.

Finally, studies in SCID mice, which lack both B- and T-cells but have a strong innate system, demonstrated that the infected BALB/c strain mice don't get disease until they are depleted again with IFN-gamma.

A different strain of mice, SCID mice on C57BL6 background, do get disease when infected with *S. neurona*. IFN-gamma depletion is not needed. This suggests that there could be role for a genetic predisposition to disease.

Some additional information supporting the CD4 and CD8 response is that both immunocompetent mice and GKO mice developed memory CD4 and CD8 responses. This information demonstrates the information and benefits that can be gained from using mouse strains.

However, all of the studies are experimental infection, with specific strains, doses and routes of infection. All of the information might also be applicable to horses, but the data are still being generated. In addition, the ability to generate has been limited due to the limited availability of equine specific reagents, having horses that meet case definitions and resources/funding for the studies.

Equine Research

The majority of information generated from equine studies has been with nat-

urally occurring cases of EPM. Investigators have identified in some studies that EPM-affected horses have decreased antigen specific proliferation responses compared to control horses and seropositive horses (Tornquist, *et al.*, 2001).

Another study identified that there was a decrease in the ability of cells to proliferate in response to SAG1. They also saw a decrease in IFN-gamma expression and an increase in IL-4 expression in EPM-affected horses vs. controls (Spencer, *et al.*, 2004, 2005).

Some studies (Yang, *et al.*, 2006; Wintonky *et al.*, 2008) saw decreased proliferation response to PMA/I in naturally and experimentally infected horses.

EPM-affected horses also had increased CD4 and neutrophils compared to controls. There was a trend for decreased antigen-specific responses in experimentally infected.

Finally, there was additional data indicating that not only might T-cell responses be affected, but that the APCs might not be functioning, either.

An experimentally infected EPM model showed increased ability of CD4 cells stimulated with PMA/I to proliferate (Day 2) but decreased ability to proliferate to PMA/I at Day 28. There also was increased ability of CD8 cells to proliferate in response to PMA/I when stimulated *in vitro* at Day 2, but decreased ability of CD8 cells to respond to merozoites but not to PMA/I (Days 28, 56, 70) (Lewis *et al.*, 2014).

Collectively, these data support that some EPM-affected horses have altered immune responses, but there are critical gaps in current knowledge about protection to *S. neurona*, as well as what happens with the immune response for horses that develop disease.

The question was also raised as to whether there is a difference in the immune response in horses that develop recurrent disease.

EPM and Other Diseases

At the 2014 EPM focus meeting, the question about the role of *S. neurona* in



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Decreased athletic performance. Change in attitude. Abnormal sweating. Regional hypertrichosis. Regional adiposity. Tendonitis.

These are a few of the early signs associated with PPID. If you've recognized any of these signs in your clients' horses, no matter the age, consider testing for PPID.

With timely diagnosis and Prascend® (pergolide tablets), PPID can be effectively managed so that your clients' horses may lead long, happy, productive lives.



Visit PRASCEND.com to learn more about the clinical signs of PPID in horses.

IMPORTANT SAFETY INFORMATION: PRASCEND is for use in horses only. Treatment with PRASCEND may cause loss of appetite. Most cases are mild. Weight loss, lack of energy, and behavioral changes also may be observed. If severe, a temporary dose reduction may be necessary. PRASCEND has not been evaluated in breeding, pregnant, or lactating horses and may interfere with reproductive hormones in these horses. PRASCEND Tablets should not be crushed due to the potential for increased human exposure. Refer to package insert for complete product information.



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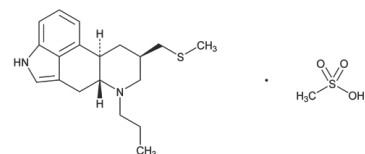
Prascend®

(pergolide tablets)
1 mg

Dopamine receptor agonist for oral use in horses only

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

Description: Prascend Tablets are rectangular light red colored, half-scored tablets containing 1 mg pergolide, as pergolide mesylate. Pergolide mesylate is a synthetic ergot derivative and is a potent dopamine receptor agonist. The chemical name of pergolide mesylate is 8B-[Methylthio] methyl]-6-propylergoline



monomethanesulfonate. The chemical structure is:

Indication: For the control of clinical signs associated with Pituitary Pars Intermedia Dysfunction (Equine Cushing's Disease) in horses.

Dosage and Administration: Administer orally at a starting dose of 2 mcg/kg once daily. Dosage may be adjusted to effect, not to exceed 4 mcg/kg daily. It has been reported that pergolide tablets may cause eye irritation, an irritating smell, or headache when Prascend Tablets are split or crushed. Prascend Tablets should not be crushed due to the potential for increased human exposure and care should be taken to minimize exposure when splitting tablets.

The tablets are scored and the calculated dosage should be provided to the nearest one-half tablet increment (see Table 1).

Body weight	Dosage	
	2 mcg/kg	4 mcg/kg
136 - 340 kg (300 - 749 lb)	0.5 tablet	1 tablet
341 - 567 kg (750 - 1,249 lb)	1 tablet	2 tablets
568 - 795 kg (1,250 - 1,749 lb)	1.5 tablets	3 tablets
796 - 1,022 kg (1,750 - 2,249 lb)	2 tablets	4 tablets

Dosing should be titrated according to individual response to therapy to achieve the lowest effective dose. Dose titration is based on improvement in clinical signs associated with Pituitary Pars Intermedia Dysfunction (PPID) and/or improvement or normalization of endocrine tests (for example, dexamethasone suppression test or endogenous ACTH test). If signs of dose intolerance develop, the dose should be decreased by half for 5 to 5 days and then titrated back up in 2 mcg/kg increments every 2 weeks until the desired effect is achieved.

Contraindications: Prascend is contraindicated in horses with hypersensitivity to pergolide mesylate or other ergot derivatives.

Warnings: Do not use in horses intended for human consumption.

Human Warnings: Not for use in humans. Keep this and all medications out of the reach of children. Prascend should not be administered by persons who have had adverse reactions to ergotamine or other ergot derivatives. **Pregnant or lactating women should wear gloves when administering this product.** It has been reported that pergolide tablets may cause eye irritation, an irritating smell, or headache when Prascend Tablets are split or crushed. Prascend Tablets should not be crushed due to the potential for increased human exposure and care should be taken to minimize exposure when splitting tablets. Consult a physician in case of accidental ingestion by humans.

Precautions: Treatment with Prascend may cause inappetence.

The use of Prascend in breeding, pregnant, or lactating horses has not been evaluated. The effects of pergolide mesylate on breeding, pregnant, or lactating horses are not known; however, the pharmacologic action of pergolide mesylate suggests that it may interfere with reproductive functions such as lactation.

Prascend is approximately 90% associated with plasma proteins. Use caution if administering Prascend with other drugs that affect protein binding. Dopamine antagonists, such as neuroleptics (phenothiazines, domperidone) or metoclopramide, ordinarily should not be administered concurrently with Prascend (a dopamine agonist) since these agents may diminish the effectiveness of Prascend.

Adverse Reactions: A total of 122 horses treated with Prascend Tablets for six months were included in a field study safety analysis.

Clinical sign	# Cases	Cases (%)
Decreased appetite	40	32.8
Lameness	22	18.0
Diarrhea/Loose stool	12	9.8
Colic	12	9.8
Lethargy	12	9.8
Abnormal Weight Loss	11	9.0
Laminitis*	10	8.2
Heart murmur	10	8.2
Death	8	6.6
Tooth disorder	8	6.6
Skin abscess	7	5.7
Musculoskeletal pain	6	4.9
Behavior change	6	4.9

*Three new cases and 7 pre-existing, recurring cases

Inappetence or decreased appetite occurred at one or more meals in 40 of 122 horses treated with Prascend. At the baseline evaluation 1.6% of owners reported a history of inappetence or decreased appetite as compared to the 32.8% of horses that experienced inappetence or decreased appetite during the study. Most cases of inappetence were transient and occurred during the first month of treatment; however, some horses experienced sporadic inappetence throughout the study. Two horses required a temporary reduction in dose due to inappetence during the first month of the study. Both horses returned to their original dose within 30 days.

Weight loss occurred in more than half of the horses in this study; however, weight loss that was considered abnormal was only reported in 11 horses.

Lethargy was reported in 9.8% of horses during the study, and was not reported in any horses at the baseline evaluation.

Behavioral changes were noted in 6 horses including aggression, kicking, agitation, nervous behavior and increased activity. One horse required a temporary reduction in dose due to energetic behavior during the first month of the study.

Eight horses died or were euthanized during the study due to worsening of pre-existing conditions (laminitis, dental disease, septic tenosynovitis) or colic (strangulating lipomas, large colon volvulus).

One mare was inadvertently enrolled in the study while pregnant and experienced dystocia resulting in the death of the foal.

To report suspected adverse reactions, to obtain a Material Safety Data Sheet (MSDS), or for technical assistance, call 1-866-638-2226.

Clinical Pharmacology: Pergolide mesylate is a synthetic ergot derivative and is a potent dopamine receptor agonist. As with other dopamine agonists, pergolide inhibits the release of prolactin which suggests that it may interfere with lactation. In horses with PPID, pergolide is believed to exert its therapeutic effect by stimulating dopamine receptors, and has been shown to decrease the plasma levels of adrenocorticotropic hormone (ACTH), melanocyte stimulating hormone (MSH), and other pro-opiomelanocortin peptides.¹

Pharmacokinetic information in the horse is based on a study using single oral doses of 10 mcg/kg in six healthy mares between 3 and 17 years of age.² Pergolide was rapidly absorbed; the mean maximum concentration (C_{max}) was 4.05±2.02 ng/mL with the median time to maximum concentration (T_{max}) being 0.415 hours.

The area under the curve (AUC) was 14.08±7.46 hr·ng/mL. The mean half life (T_{1/2}) was 5.86±3.42 hours; the mean apparent oral clearance (CL/F) was 1204 mL/kg/hr; and the mean apparent volume of distribution (V/F) was 3082±1354 mL/kg.

Effectiveness: An open-label, historical control, field study evaluated the effectiveness of Prascend for the control of clinical signs of PPID. A total of 122 horses with PPID were enrolled in the study, 113 of which were included in effectiveness evaluations. The success of each horse was based on results of endocrinology testing (dexamethasone suppression test or endogenous ACTH test) and/or improvement in clinical signs related to PPID (hirsutism, hyperhidrosis, polyuria/polydipsia, abnormal fat distribution, and/or muscle-wasting) on the Day 180 evaluation. Based on endocrine testing and investigators' clinical assessment scores, 86 (76.1%) of the 113 evaluable cases were treatment successes.

Percent success	Lower bound: one-sided 95% confidence interval
76.1% (86/113)	68.6%

Enrolled horses were diagnosed with PPID based on the presence of hirsutism and an abnormal pre-study endocrine test result. All horses were treated with 2 mcg/kg Prascend (to the nearest one-half tablet) orally once daily for the first three months. If the endocrine test result on Day 90 was normal or adequately improved, the horse continued on the same dose through Day 180. If the endocrine test result on Day 90 was abnormal, the dose increased to 4 mcg/kg given once daily through Day 180. Forty-seven (41.6%) of the 113 horses included in the effectiveness database required a dose increase at Day 90. Improvement was noted in scores for all clinical sign categories and in mean results for endocrine tests.

Clinical sign	Day 90±7 (%)	Day 180±7 (%)
Hirsutism	32.7%	89.2%
Hyperhidrosis	27.4%	42.3%
Polyuria / polydipsia	31.0%	34.2%
Abnormal fat distribution	21.2%	33.3%
Muscle wasting	36.3%	46.0%

Test	# Animals	Baseline	Day 90	Day 180
ACTH (pg/mL)	20	73.53	51.12	45.08
DST** (mcg/dL)	93	3.12	1.39	1.47

** Dexamethasone suppression test: Post dexamethasone cortisol concentration

Animal Safety: In a six month target animal safety study healthy adult horses received Prascend administered orally, once daily, at doses of either 0 mcg/kg, 4 mcg/kg, 6 mcg/kg, or 8 mcg/kg (0X, 1X, 1.5X, or 2X the maximum recommended dose). There were eight healthy horses (four males and four females) in each treatment group. Doses were prepared by dissolving tablets in approximately 10 mL of a 50% sugar water solution.

Prascend treated groups had lower mean heart rates and higher mean temperatures than the control group. Horses in all treatment groups had minimum heart rates within the normal range and maximum temperatures below 101.5°F. One 1.5X horse experienced a mild episode of spasmodic colic on Day 3 that resolved after treatment with flunixin meglumine.

Mean red blood cell counts and hemoglobin values were lower in Prascend treated groups as compared to the control group. Other hematology parameters including hematocrit, white blood cells, absolute neutrophils, and absolute lymphocytes exhibited mild, transient decreases as compared to the control group. The hematology parameters generally decreased over the first 30 to 60 days after treatment initiation and then returned to values similar to pre-treatment levels. No treatment related alterations were identified on histopathology evaluation of bone marrow.

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

How Supplied: Prascend Tablets are available in 1 mg strength - packaged 10 tablets per blister and 60 or 160 tablets per carton. NDC 0010-4489-01 - 60 tablets
NDC 0010-4489-02 - 160 tablets

References:

- Orth, D.N., Holscher, M.A., Wilson, M.G., et al. (1982) Equine Cushing's Disease: Plasma Immunoreactive Proopiomelanocortin Peptide and Cortisol Levels Basally and in Response to Diagnostic Tests. *Endocrinology*, 110(4):1430-41
- Wright A, Gehring R, Coetzee H (2008.) Pharmacokinetics of pergolide in normal mares. *American College of Veterinary Internal Medicine Forum*, Abstract #36, San Antonio, TX.

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Revised 07/2016

other disease was raised. At the time, Tom Divers brought up a study in which he was involved that was finding *S. neurona* in about 50% of the horses being necropsied that weren't treated. In addition, the study found that treatment decreased the percentage of cases in which *S. neurona* was found.

New or Latent Infections?

With *S. neurona*, researchers and veterinarians don't know when the horses are exposed or how long it takes from exposure to develop disease. They also don't know whether the horses have latent infection, which means that when they have some other health event (i.e., shipping, pregnancy, colic, surgery, musculoskeletal disease), the latent infection can become activated to cause disease.

The high seroprevalence to *S. neurona* and the low incidence of disease suggests that most horses are capable of mounting the predicted immune response (i.e., M1, DC1, CD4 Th1, CD8 IFN γ).

For investigators studying this disease, this can be a challenging situation. For the most part, the horses after exposure are trying to make the protective response. When they take samples, researchers have no idea when the horses were exposed or where they are in the schematic of the immune response.

If a veterinarian or researcher could take a sample, such as blood, to accurately measure the immune response to infection, that would be ideal. However, researchers don't know if what is happening in the peripheral immune response is also happening in the brain and spinal cord (central nervous system) of the horse. They know that serum and CSF titers can be quite different, and based on other infectious disease models, they know the peripheral response isn't consistent with the response in the CNS.

Therefore, for some of these studies to gain the required information, researchers need to have necropsies and samples from the CNS to most accurately identify samples and look at

the difference in immune response in horses that develop disease.

Interactive Discussion

David Horhov, PhD, and Witonsky led the audience in an interactive discussion about additional information regarding the following questions/topics. From those questions and answers the actionable items/outcomes were:

1. Witonsky and several collaborators will work on a project to identify the immune phenotype of EPM-affected horses and the role of *S. neurona*. More cases are needed. If you are interested in participating, please contact her at switonsk@vt.edu.
2. The group discussed the need for a potential biobank to store samples. As part of this, it will be critical to decide on case definitions, as well as what additional information is wanted (i.e., geographic location, clinical and treatment response,

outcome) from all submitted cases.

3. Witonsky and others are working with Dr. Carrie Finno to identify whether EPM-affected horses have a genetic predisposition to EPM. More cases are needed. If you are interested in collaborating, please contact Witonsky.
4. There is the potential to provide a retrospective case study about *N. hughesi* cases.
5. Everything being done regarding methodology for *S. neurona* can be applied to *N. hughesi*. If samples are being biobanked, *N. hughesi* samples should also be saved.
6. Morrow and Evans will be developing a website.

Sharon Witonsky, DVM, PhD, DACVIM, is an Associate Professor of Equine Field Service (PMM) in the Department of Large Animal Clinical Sciences at the Virginia-Maryland College of Veterinary Medicine. EM

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- 1 Adequan® i.m. [package insert]. Shirley, NY: Luitpold Animal Health; 2008.
- 2 Burba DJ, Collier MA, DeBault LE, Hanson-Painton 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.
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AMY DRAGOO

Working With Farriers

Veterinarians and farriers need to work together for the welfare of the horse and the horse owner.

By Nancy S. Loving, DVM

Equine practitioners have a critical role in helping horses stay sound enough to perform in their owners' equestrian pursuits. Health of the hoof and the prevention of foot pain is a prerequisite for high levels of performance.

For success in reaching this goal, it is essential that veterinarians and farriers work together as a team in the best interest of the horse. As with anything in life, this brings together a variety of personalities and experience, some of which are in harmony and others that fiercely

clash. Yet with care, respect and consideration, it is possible for even those with the most disparate opinions to find a common ground for collaboration.

Philip Himanka is a hoof care practitioner, which is the current preferred jargon for a barefoot farrier. He is certified with American Association of Professional Farriers (AAPF) as an International Accredited Professional Farrier (IAPF) and with the Pacific Hoof Care Practitioners organization (PHCP), in addition to serving as a member of the Equine Lameness Prevention Organization.

At a recent round table at the Inter-

national Hoof Care Summit in Cincinnati, Ohio, one of the main discussions centered on how to encourage veterinarians to provide specific guidelines to the farrier as to what should be done for each horse. One complaint is that the vets are too busy and don't take the time to do this. Perhaps there is more to this than being too busy. Perhaps vets don't realize that for the farriers to be able to do a job that is satisfactory to the vet and horse owner, while achieving comfort for the horse, they must have guidelines from the vet.

In the round table discussion, it was



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Veterinarians and farriers often deal with the same problem but have two different approaches for a solution. They need to work together as a team.

suggested that veterinarians and farriers should provide each other with a certain set of “rules” or guidelines for how they engage together, stressed Himanka.

“Vets and farriers deal with the same thing, but often with two different approaches,” Himanka said. “If the ‘rules’

aren’t clear, then problems arise.”

It is important to define each professional’s approach to the hoof and clarify who is responsible for what, such as who determines whether the horse is lame. This relies on open communication, which comes easier with a good set of rules, Himanka said.

It is also important to recognize the third ingredient to the horse’s welfare: the horse owner. If agreed-upon approaches to a horse’s foot care are clear between the vet and farrier, then an owner tends to follow suggestions and recommendations. If there are disagreements, a horse owner often turns to the farrier for advice. Farriers visit the farm on a more regular basis and with less expense than a vet. Himanka pointed out that an owner’s tendency to turn to a farrier for assistance might simply be a financial decision.

He believes that everyone has the right to express an opinion, especially when a horse owner asks, “What do you think?” The horse, owner and farrier are all best served by a farrier clarifying that he or she has an opinion but is not in a position to make a diagnosis about the horse’s problem. Instead, the farrier should recommend that the horse owner consult with the veterinarian to pursue a thorough lameness workup to achieve a definitive diagnosis.



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Furthermore, it is a disservice to a horse and owner to label a horse with a specific diagnosis, such as “navicular disease,” without evidence-based facts gleaned from a proper diagnostic work-up. MRI imaging has demonstrated that what was once considered a “complete diagnosis” under the umbrella of navicular disease instead involves a potential number of pathologies within the podotrochlear apparatus. Any of these possibilities might or might not affect solely the navicular bone, and each pathology requires varied therapeutic approaches, not all reliant only on foot care.

In addition to a physical lameness workup by a veterinarian, radiographs are invaluable for both the veterinarian and the farrier. Images help to define the problem and are useful for making measurements and suggestions about what the farrier can do to correct imbalances and ease breakover. They are also useful when following up on the

progress of a case. In particular, lateral and A-P radiographs enable a farrier to execute an appropriate trim and balance of each hoof.

The Blame Game

Problems arise when a veterinarian follows behind a farrier visit and the horse is found to be lame. Himanka urges veterinarians to recognize that in many cases, a farrier shows up to do his/her job and is unaware that the horse is lame until some point in the middle of the job, or not at all. The farrier finishes the work to the best of his or her ability.

A veterinarian might be inclined to cast blame on the farrier for the horse’s “sudden” lameness, but instead it is better if the vet is circumspect and doesn’t jump to conclusions. There is little way to know the soundness or lameness condition of the horse prior to the farrier’s visit.

An ideal approach is for both vet and farrier to collaborate and discuss all the

details in private and decide together what strategies are best to help the horse. Once an agreement is reached, then the horse owner can be apprised of the details.

From an academic point of view, an owner might wish to sit in on the vet and farrier discussion, but if the two have a battle of wills and argue heatedly about the case, it is best done in private. Then, all a horse owner witnesses is the ultimate united front between the vet and farrier regarding methods for the horse’s care.

There are instances where a farrier, especially one starting out, might persistently trim a horse in a manner that causes lameness. Sometimes it is by accident, sometimes it is because of inexperience, sometimes it is because that is as much skill as the farrier has.

Rather than a vet turning to the horse owner and expressing a negative point of view about the farrier’s work, it is more appropriate for the vet to contact the farrier and speak directly to him or her



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about the problem. Veterinarians should look at this as a learning opportunity for the farrier and take the time to communicate the concerns and suggest some solutions.

Guiding Farriers

Many farriers appreciate having a written “prescription” for how each hoof should be addressed. This was a main conversation point at the recent National Hoof Care Summit. Open lines of communication between the vet and farrier help each to learn from the other, and this helps to build trust over time.

Digital images of radiographs or photos, for example, are easily sent via email, but details about specific points are better conveyed in person with both parties standing by the horse to discuss the particulars. If a horse is in immediate need of farrier work, then calling the farrier by phone and also providing a written prescription via email can facilitate the proper attention to the horse in a timely fashion.

It is not uncommon to hear that horse owners feel sandwiched between personality clashes between vets and farriers. Often this occurs because of unclear communication by one or both parties. This is an unfortunate situation, because now the focus is on the wills and egos of individual people rather than solving problems for the horse. This makes the horse owner frustrated.

What works best is if both farrier and vet take the time to explain their views to each other, and also to the horse owner. Care must be taken with wording and phrases to avoid casting aspersions on one another.

If a veterinarian is precise in explaining the proposed therapy plan, then the owner is less likely to be confused, noted Himanka.

Alternatively, if egos get in the way and there is a back-and-forth “discussion” that isn’t based on facts, then the sparring individuals are simply asserting their own dogmas without evidence-based science to substantiate the arguments.

“The farrier or hoof care practitioner’s



AMY DRAGOO

There are many solutions to the same problem, and horse owners often are caught in the middle of disagreements between their vets and farriers.

role is to help the horses have healthier hooves,” said Himanka.

The vet and farrier should work as a team. The focus isn’t just on the mechanics of a trim and application of shoes; it is about the health of the whole horse. Many conditions are considered in this approach—the horse’s breed, equestrian pursuit, exercise demands, environment and climate, housing, nutrition, and the horse’s age, body condition and endocrine status.

Hoof health is a manifestation of a horse’s overall health and also how well an owner does his or her homework. The timing and frequency of farrier visits, feeding strategies, soundness assessment, hoof care and conditioning all play a role.

Take-Home Message

It is critical that both farrier and veterinarian keep an open mind and try to learn from each other. This helps to build trust and promotes a successful working relationship. There are many situations where a horse owner asks a farrier to recommend a vet, and vice versa. This can work to the advantage of both individuals.

The AAPF’s mission statement notes: “The American Association of Professional Farriers will promote the integrity of the farrier industry by strengthening the knowledge and skills of its mem-

bers through continuing education and support at the state, national and international levels while improving overall equine health through collaboration with other industry professionals.”

This covers some key points that are relevant to interaction of farriers and veterinarians. First, there is a call for continuing education, which is laudable; and, secondly there is a call for collaboration with other industry professionals, such as equine veterinarians. With this in mind, members of the AAPF organization state that they are committed to honing their skills to do the best by the horses. This quest for on-going education and improved skills is a familiar refrain, one with which dedicated equine veterinarians are familiar in their quest to become better practitioners.

It stands to reason that by working together in a team effort, farrier and vet together can keep a horse sound and the horse’s owner satisfied with their professionalism. **EM**

Editor’s note: There are other professional farriers’ associations, such as the American Farrier’s Association. Veterinarians and horse owners should look at a farrier’s experience and training, as well as talk to other clients of that professional when selecting a farrier or when looking for a new farrier to work with.

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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:

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Staphylococcus
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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.

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

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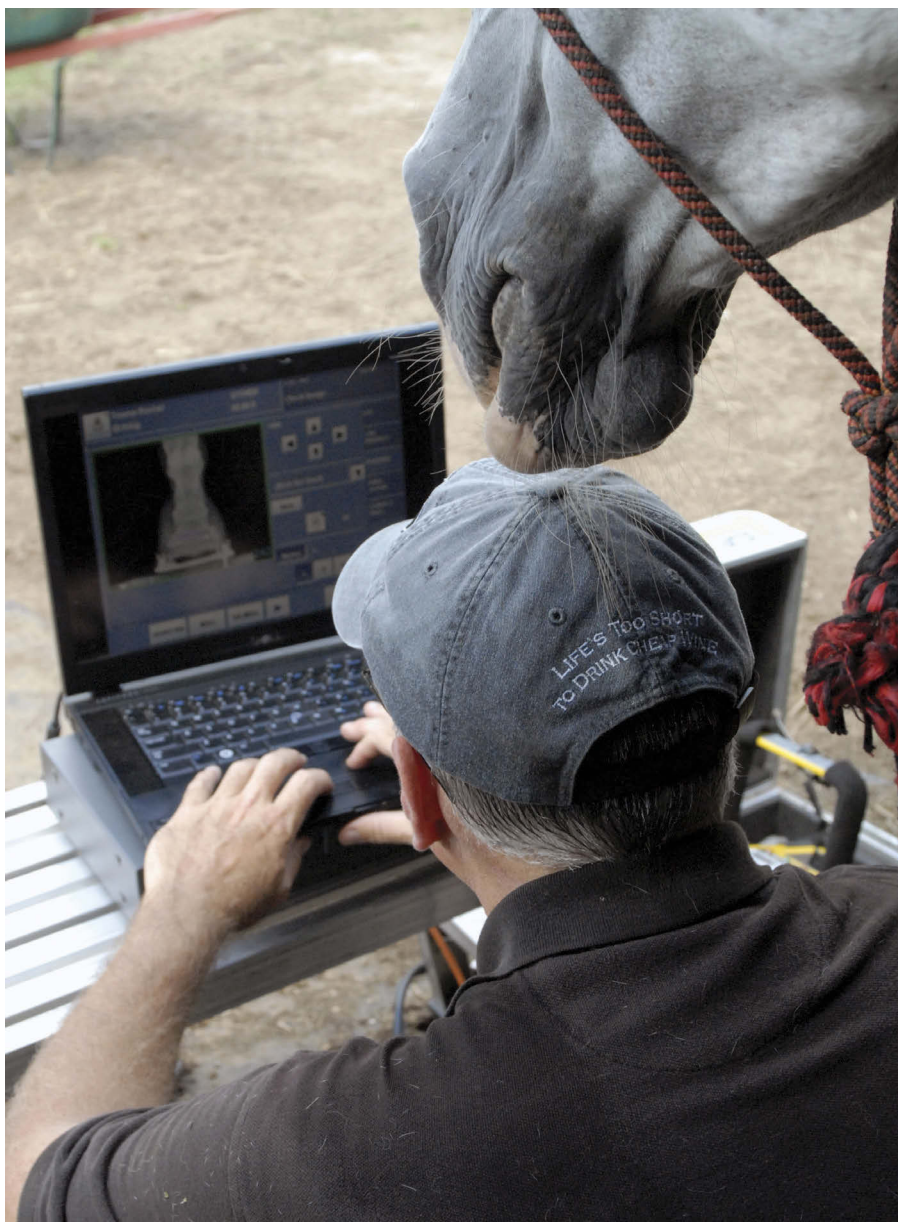
By Nancy S. Loving, DVM

The ongoing ability of businesses to go paperless through electronic means enables instant access of information anywhere, anytime. That is important for on-the-go equine practitioners.

The days of providing space for filing cabinets full of stored records, or hunting for a misfiled paper medical record, or trying to decipher a colleague's handwritten medical notes, are over. A business works best if everything is set up for ease of access through software management programs that integrate the many facets of your practice.

Basic tenets apply when determining which system to purchase. Ideally, it should:

- be easy to use;
- integrate all information, including medical records, imaging, email, text, fax, laboratory reports and PDF communications;
- assist with client and inter-office communications;
- assist with appointment management;



ARND BRONKHORST PHOTOGRAPHY

If you are looking to purchase practice management software, make sure it integrates with your imaging devices, records, lab and email.

- synchronize office and mobile computers;
- have a good "search" program within the system for easy access to information;
- be regularly and easily updatable;
- be designed for easy backup in-house and to the cloud and/or off-site storage;
- have good customer support and training;
- be affordable either to own or rent.

Records, Forms and Images

Maintaining good medical records is critical for state board compliance and

for continuity of cases among practitioners. Retention of medical records of all findings and client recommendations are required for three to five years, and in some cases seven years, depending on the state. You'll want a system that enables thorough recordkeeping without being too onerous to input data or retrieve the record on an individual horse.

Another feature you might find useful is built-in, standard forms or templates for simple data entry of SOAPs (subjective-objective-assessment plans), physical exams, preventive care, lameness evaluations, hoof care recommendations, pregnancy exams, eye exams and surgi-

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cal reports, as a few examples.

Imaging records of photographs, videos, diagnostic ultrasound, digital radiographs, endoscopy, MRI and CT scans are important to integrate into medical records along with written information and laboratory reports about each horse.

Consider whether imaging data is compatible with DICOM, PACS (picture archiving and communication system) and other software platforms that store diagnostic imaging. Also determine whether images are easily uploaded from video cameras, smartphones, tablets, computers, email and the internet. In addition, you'll likely want a system that enables sharing of images with colleagues and clients when appropriate.

Prescriptions and ID

Prescription-writing tools are another possible feature that you will find important to help with the efficiency of daily tasks in your practice and to accurately incorporate prescriptions into medical records.

You might want to include a telephone caller ID recognition system that enables your office staff to know who is calling so they can pull up the client's medical record as they answer the call. This enhances the professional image of the practice while making efficient use of your receptionist's time. The client then finds satisfaction from feeling that he or she is valued as an individual by having questions answered promptly.

Users and Syncing

Other considerations should include how many users can be on the system at the same time and whether information is accessible off-line or requires internet access to proceed. A mobile practitioner might not always have internet or wireless access in all geographic areas, so off-line access might be essential in those cases.

Inventory control is more easily managed when the software syncs with clinic and mobile veterinary units. Practices



AMY DRAGOO

Besides keeping track of inventory, a good practice management software can help you with prescription-writing tools and recordkeeping.

can save money by minimizing duplication of orders and by tracking expiration dates on products so they can be returned for credit before they expire.

Insurance and Cash Flow

Many horse owners cover their horses with medical insurance, so this might be another feature that you would like to include in your software management program—quick access to an insurer's contact information, emergency contact information for a client and/or his or her agent, policy number of the horse and insurance forms readily available to fill out and send.

Businesses run more smoothly when cash flow is maximized, so you'll want a software program that incorporates all billing, invoicing and payment information. Being able to access this information while a client is at your clinic or you are at the farm helps to ensure prompt payment of outstanding invoices. An easy-to-use payment portal that integrates with your software management program is another key feature to expediting payments and cash flow.

Financials and Communication

Many software management programs provide balance sheets, financial reports and data mining to enable practice owners to observe trends in their financial ledgers. Keeping tabs on the financial stability of a practice is key to success.

Another important feature is the ability to send automatic reminders to clients in a timely fashion to maintain their active involvement with your practice. This ensures financial stability while keeping each horse's preventive care up to date.

The presence of a word processing program within the system also facilitates the writing of patient care and discharge instructions, summarization of reports and laboratory findings, release forms, price estimates, and other communication tools for your clients. Word processing further provides an avenue for generating letter updates to referring DVMs, thank-you notes for client referrals, and invitations to client and veterinarian educational seminars your clinic might sponsor.

For a mobile equine practitioner, it is also helpful to have within easy reach, through your software platform, the addresses of the farms you visit and appropriate phone numbers (and texting contact information) for clients, farriers, barn managers and barn offices. Some of you might remember the days when you had to drive far and wide to find a pay phone to call back to your office for information, to get directions to a farm, or to respond to the pager that was forever fastened to your belt.

In today's electronic-based world, we are fortunate to have powerful computers in our pockets and on our laptops or tablets. All we need to do is ask the right

questions of the computing software to receive instant answers. You'll want your practice software program to be just as facile in delivering instant information about your business to save you time and effort. This enables veterinarians to focus on the most important part of their jobs—patient care.

Just as many smartphones enable speech to substitute for typing on the keyboard, some practice software programs are able to integrate voice activation software that allows talking to replace typing. Most people are able to speak three times faster than they write or type. Voice activation makes medical recordkeeping and search functions incredibly easy and time saving. For mobile practitioners, voice input of medical records or search for data contributes significantly to time savings while maintaining safe driving strategies behind the wheel.

A concise schedule of each practitioner's appointments helps manage ev-

eryone's time efficiently. Knowledge of where each practitioner is at any point in the day enables rapid response by office staff to summon the most locally available veterinarian to provide immediate care in the event of an emergency.

Take-Home Message

Remember to ensure that the software management program you choose is compatible with your choice of computer and smartphone operating system—PC versus Mac, Android versus IOS, etc.

Many software management systems are Windows (PC) based and come with appropriate hardware to use the program. Some systems are compatible with both PC and Mac. Keep in mind that with practice management software upgrades often come a requirement for computer operating system upgrades and potential hardware upgrades, which can add to costs.

Do all these features seem too good to

be true? Is there a way to minimize the tedium and chores of managing a busy equine practice—all tasks that don't directly involve you in the administration of horse health care?

The tools you'll want to implement with a software program vary between practitioner needs and business models. Cost of a software management system depends on the number of workstations needed, a need (or not) for a mobile system, and whether you buy the software outright or rent/lease it month-to-month.

When seeking a software management program, it is helpful to make a list of those items you find most important to simplifying your business management tasks. Discuss the many available options and features with the vendor to help you find the most affordable and efficient program for your practice. In this way, you'll be able to customize your purchase to fit the specific needs of your equine practice, **EM**

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COURTESY UC DAVIS

Madigan Foal Squeeze Refresher

Research on neuroinhibitory steroids shows that they work like sedatives in conjunction with other substances during pregnancy and parturition.

By Nancy S. Loving, DVM

It usually evokes a sigh of relief when your client's mare foals successfully and the newborn scrambles to its feet in the first hour or two and begins to nurse. In the course of evolution, such precocious births enabled a foal to rise in the first few hours to obtain valuable nutrition and limb coordination to enable it to run with its mother to escape predators. The scene of a foal rising to its feet—albeit

often a bit clumsy at first—and latching onto the mare's udder is heartwarming to both horse owners and their veterinarians.

But this doesn't always happen. One syndrome that practitioners are on the lookout for is that of the “dummy” foal, one that suffers from neonatal maladjustment syndrome (NMS), which occurs in 1-2% of foal births.

While a foal affected with NMS might

seem normal for a few hours or even as long as a couple of days after birth, progressive signs of nervous system dysfunction appear, with the foal becoming weaker, less interested in nursing and often no longer recognizing its dam. Response to external stimuli worsens with time, and eventually a foal can lapse into recumbency with the potential for seizures or death.

Historically, an explanation of the

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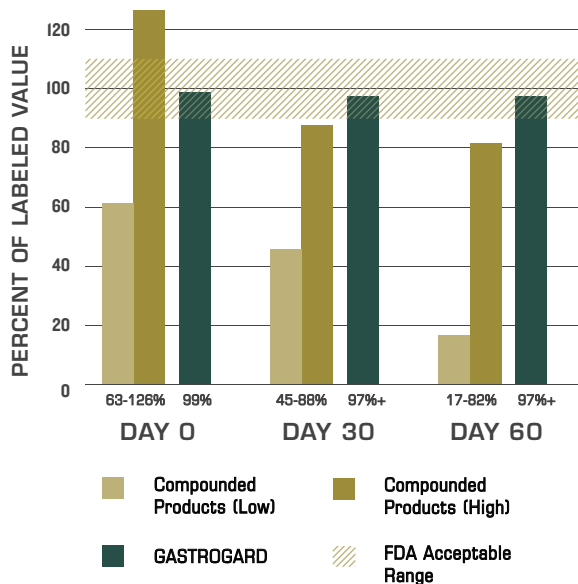
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- ULCERGARD is for use in horses that weigh at least 600 lbs. ULCERGARD is intended for use only in prevention of gastric ulcers in healthy horses. If signs of illness are observed prior to or during the use of this product, consult your veterinarian for appropriate diagnosis and treatment recommendations. Safety in pregnant mares has not been determined

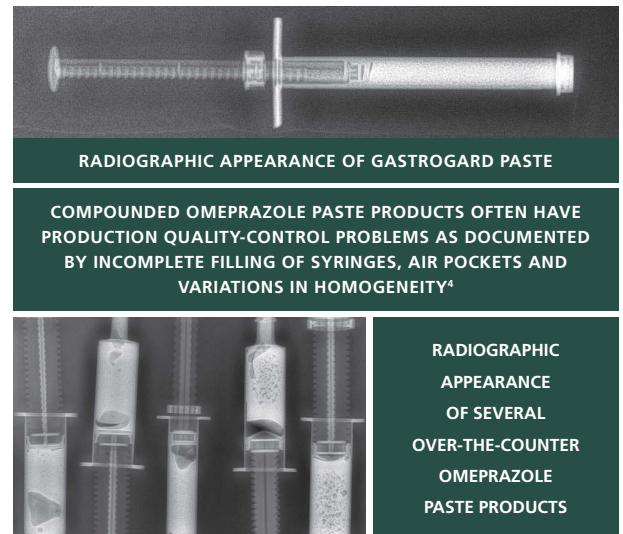
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¹ULCERGARD and GASTROGARD product labels.
²Nieto JE, et al. Comparison of paste and suspension formulations of omeprazole in the healing of gastric ulcers in racehorses in active training. *J Am Vet Med Assoc.* 2002;8:1-5.
³Stanley SD, Knych HK. Comparison of pharmaceutical equivalence for commercially available preparations of omeprazole. *AAEP Proceedings.* 2011;57:63.
⁴Wallace MA. Radiographic evaluation of compounded and illegal over-the-counter omeprazole products. ACVIM Poster Presentation. June 2017.

WARNING: Not for use in humans. Keep this and all medications out of the reach of children. In case of ingestion by humans, contact a physician. Do not use in horses intended for human consumption.

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

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

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Store at 68°F–77°F (20–25°C). Excursions between 59°F–86°F (15–30°C) are permitted.

Indications

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

Dosage Regimen

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

Directions For Use

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

Warning

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

Adverse Reactions

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

Precautions

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

Efficacy

- **Dose Confirmation:** *GastroGard*® (omeprazole) Paste, administered to provide omeprazole at 1.8 mg/lb (4 mg/kg) daily for 28 days, effectively treated or reduced the severity of gastric ulcers in 92% of omeprazole-treated horses. In comparison, 32% of controls exhibited healed or less severe ulcers. Horses enrolled in this study were healthy animals confirmed to have gastric ulcers by gastroscopy. Subsequent daily administration of *GastroGard* Paste to provide omeprazole at 0.9 mg/lb (2 mg/kg) for 30 days prevented recurrence of gastric ulcers in 84% of treated horses, whereas ulcers recurred or became more severe in horses removed from omeprazole treatment.
- **Clinical Field Trials:** *GastroGard* Paste administered at 1.8 mg/lb (4 mg/kg) daily for 28 days healed or reduced the severity of gastric ulcers in 99% of omeprazole-treated horses. In comparison, 32.4% of control horses had healed ulcers or ulcers which were reduced in severity. These trials included horses of various breeds and under different management conditions, and included horses in race or show training, pleasure horses, and foals as young as one month. Horses enrolled in these field trials were healthy animals confirmed to have gastric ulcers by gastroscopy. In these field trials, horses readily accepted *GastroGard* Paste. There were no drug related adverse reactions. In the clinical trials, *GastroGard* Paste was used concomitantly with other therapies, which included: anthelmintics, antibiotics, non-steroidal and steroidal anti-inflammatory agents, diuretics, tranquilizers and vaccines.
- **Diagnostic and Management Considerations:** The following clinical signs may be associated with gastric ulceration in adult horses: inappetence or decreased appetite, recurrent colic, intermittent loose stools or chronic diarrhea, poor hair coat, poor body condition, or poor performance. Clinical signs in foals may include: bruxism (grinding of teeth), excessive salivation, colic, cranial abdominal tenderness, anorexia, diarrhea, sternal recumbency or weakness. A more accurate diagnosis of gastric ulceration in horses and foals may be made if ulcers are visualized directly by endoscopic examination of the gastric mucosa. Gastric ulcers may be treated with omeprazole. If prevention of recurrence is not administered after the initial treatment is completed, use *GastroGard* Paste at 0.9 mg omeprazole/lb body weight (2 mg/kg) for control of gastric ulcers following treatment. The safety of administration of *GastroGard* Paste for longer than 91 days has not been determined. Maximal acid suppression occurs after three to five days of treatment with omeprazole.

Safety

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

Reproductive Safety

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

For More Information

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COURTESY UC DAVIS

Dr. John Madigan demonstrates the foal squeeze technique, which mimics the physical compression of the birth canal and "resets" neurosteroid levels.

cause of NMS suggested some degree of oxygen deprivation and/or systemic inflammation during the period proximate to foaling—before, during or immediately after. This condition goes by other descriptive names: hypoxic-ischemic encephalopathy or perinatal asphyxia syndrome. However, as researchers seek to identify the cause, histologic examination of the brains of dummy foals does not always show evidence of hypoxia, edema or hemorrhage in brain tissue. And nearly 80% of dummy foals recover to full function with treatment, something one wouldn't expect if there was irreparable nervous system injury.

With that in mind, clinicians John Madigan, DVM, MS, ACVIM, Monica Aleman, MVZ Cert., PhD, DACVIM, and Isaac Pessah, PhD, all of whom are well-versed in neonatal health, neurology and toxicology at the University of California, Davis, School of Veterinary Medicine, looked to other reasons for the syndrome.

Instead of neurologic changes related to hypoxia, the team identified a problem with concentrations of neuromodulating hormones (neurosteroids) of a fetus in the womb and soon after delivery. The presence of such neuroinhibitory steroids works like a sedative in conjunction with other substances (adenosine, progesterone and prostaglandins).

These chemicals keep a foal quiet during gestation so it isn't "galloping" around in the uterus, which could cause significant damage to the mare. The somewhat "sedated" state of the foal *in utero* also reduces oxygen needs and consumption by the foal. The foal also needs to remain immobile as it transitions through the birth canal to the outside world.

The neurosteroids, or pregnanes, are normally in high concentrations at birth and typically begin to decline steadily over the first one to two days. However, the plasma pregnane concentrations in these dummy foals remain elevated as compared to normal foals. Measurements also reveal that pregnanes of dummy foals are elevated at even higher levels than foals affected by sepsis.

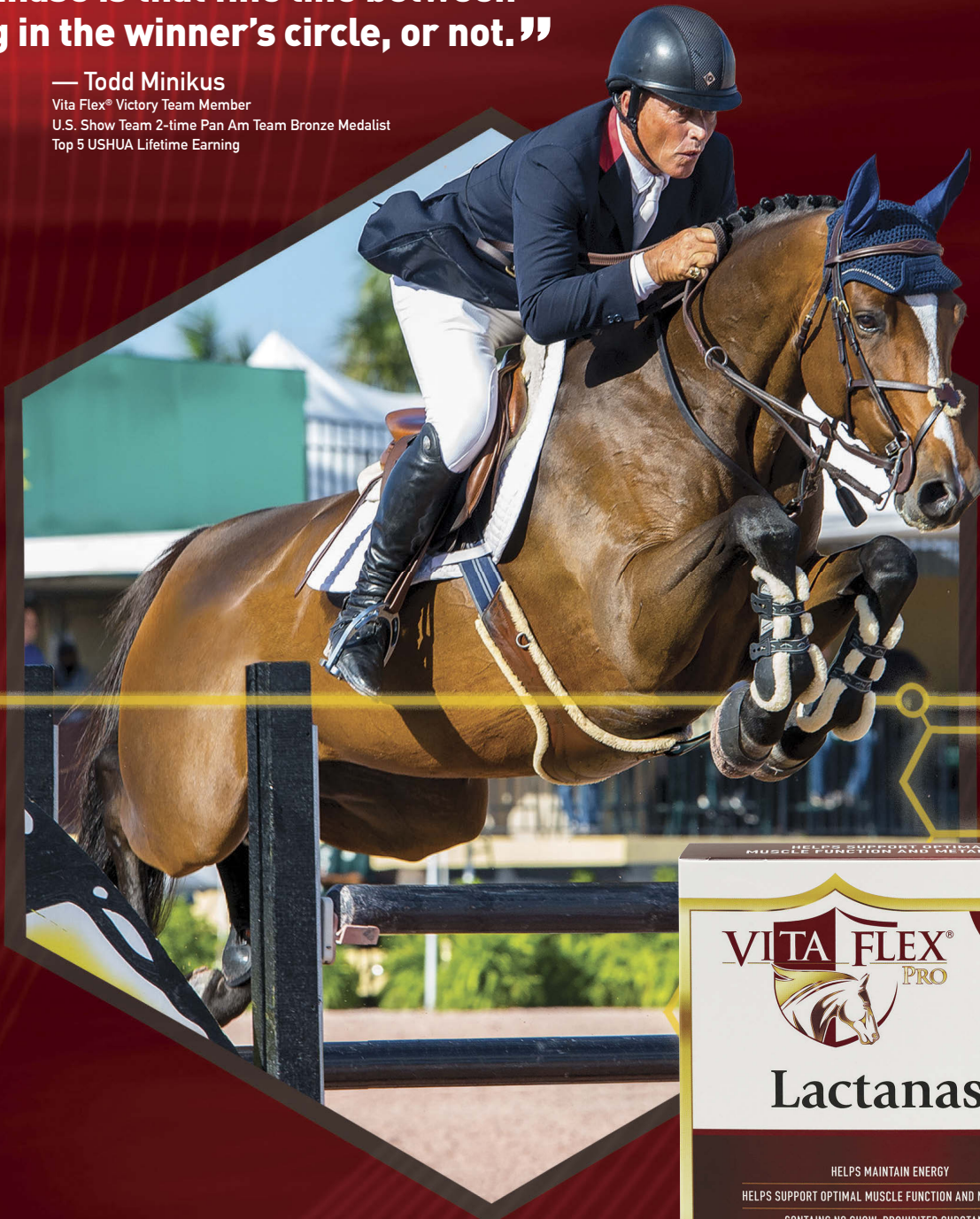
The neurosteroids exert a sedative effect on the central nervous system as they pass through the blood-brain barrier. With ongoing elevated concentrations in the bloodstream and central nervous system, the affected foal fails to "wake up" and interact with the world outside the womb.

Interesting findings resulted from the UC Davis team's test of their theory. Administration of a pregnane (allo-pregnanolone) to healthy neonatal foals elicited transient signs of neonatal maladjustment syndrome, such as confusion and cessation of nursing. During the

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experiment, EEG measurements of brain electrical impulses demonstrated that despite standing, the foals' brains underwent slow-wave sleep. As soon as the pregnane concentrations abated, these foals returned to normal, active behavior.

Under normal foaling circumstances, pressure exerted as the foal passes through the birth canal signals a decrease in neurosteroid levels. A foal born to a mare through cesarean section, or one that passes quickly through the birth canal without being subject to normal uterine contractions and pressure, is more at risk of developing NMS. These individuals retain elevated neurosteroid concentrations in the bloodstream because of a lack of signaling by pressure in the birth canal.

This revelation by the UC Davis veterinarians about signals within the birth canal stimulated them to mimic physical compression of the birth canal through the use of ropes around the foal's thorax.

The foal is fitted with a rope harness. Gentle pressure causes the foal to lie down and enter into a somnolent state. Rope pressure is sustained for about 20 minutes, which is comparable to the time of second-stage labor as a foal passes through the birth canal in a normal delivery. This apparently signals the foal's system to awaken, along with a hormonal surge from the hypothalamic-pituitary-adrenal axis that down-regulates production of pregnanes.

Once the rope pressure is released, the dummy foal immediately converts into an aroused, nursing foal engaged with its surroundings. If done properly, the foal experiences no adverse effects from the procedure.

There are some caveats suggested in Madigan's *Manual of Equine Neonatal Medicine* to achieve the best and safest results:

- The foal must be younger than 3 days old, and it works best if the foal is younger than 24 hours old.
- This is only used on foals that have stood up prior to showing signs of NMS.
- This is not to be used on a foal with respiratory distress, shock, sepsis, rib fracture, prematurity or congenital anomalies.
- A practitioner should be skilled in the procedure, and it should be performed only following a thorough physical examination of the neonate.
- Monitoring the foal following the procedure is important.

The foal squeeze is performed in a softly bedded area, such as a stall. Supplies include a soft, 5/8-inch- to 3/4-inch-diameter rope of 16-18 feet in length that slides easily. Ideally, pressure exerted on the rope harness amounts to 10-20 pounds, which can be measured using a luggage scale pressure gauge for safety. Video demonstrations can be viewed in Madigan's digital book at equineneonatalmanual.com/foalsqueezing.



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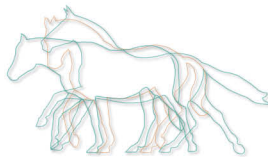
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Detailed instructions with photos of the technique are available from UC Davis at vetmed.ucdavis.edu/compneuro/local_resources/pdfs/mfsm_instructions.pdf.

Survey Results

Aleman and Madigan recently reported on a survey offered to equine veterinarians from September 2015 to April 2016. The survey asked about veterinary observations on NMS foals treated with medical therapy and the foal squeeze method.

The survey asked: “Does the use of the squeeze procedure modify recovery time from NMS compared to conventional therapies?” [Aleman, M.; Weich, M.; Madigan, J.E. Survey of Veterinarians Using a Novel Physical Compression Squeeze Procedure in the Management of Neonatal Maladjustment Syndrome in Foals, *Animals*, Sept 2017].

Of the 51 respondents, 44 were veterinarians. Results were tabulated for 195 foals, with 87 having receiving the squeeze procedure within 24 hours of birth; the other 108 were medically treated without the squeeze.

Of those squeezed, about 67% (58) were squeezed only once; about 27% (23) were squeezed twice; and about 7% (6) were squeezed more than twice.

The results stated: “Foals that received the squeeze procedure with or without medical therapy were 3.7 times more likely to recover faster than foals that did not receive a squeeze. Foals that were squeezed were 15.1 times more likely to recover in less than one hour than foals that were not squeezed. Foals receiving only squeeze treatment were 17.5 times more likely to recover within the first 24 hours than foals treated with only medical treatment.”

The survey reported that 12% of all foals and 14% of squeezed foals did not recover. While recovery rates were similar—86% vs. 87%—between squeezed and non-squeezed foals, the squeeze method significantly hastened the time to full recovery.



COURTESY UC DAVIS

Foals that were squeezed were 15.1 times more likely to recover in less than one hour than foals that were not squeezed.

Take-Home Message: Potential Impact of NMS

NMS is a terrifying situation for a breeder, because it poses a risk of loss of the foal, along with intense treatment and expense. An affected foal is nursed in an intensive care unit with bottle and tube feeding and medications around the clock. The process of recovering might take a week or more. While 12-20% of foals don't recover despite heroic efforts, many of the more than 80% that do might not, in fact, need this level of expensive and drawn-out care if their problems are related to a lack of appropriate signaling as they passed through the birth canal.

Equine practitioners are familiar with the sudden relaxation of a foal when it is “squeezed” in a person's arms to hold it for restraint with one arm around the chest and another encircling the foal's butt. This phenomenon reminds veterinarians just how sensitive foals are to squeeze pressure.

The Madigan Foal Squeeze Procedure achieves an appropriate signaling to a foal's central nervous system to awaken it. The technique is a godsend for rapidly achieving recovery in susceptible foals. It costs little and takes little time. There is no doubt that witnessing an NMS foal responding to this procedure elicits huge sighs of relief by all involved.

An Aside: A Comparison to Autism

This research and solution to a difficult problem has exciting promise for human medicine. Similar to the behavior of dummy foals, autistic children are also detached in their interaction with the environment and stimuli.

At the 2014 AAEP Convention in Salt Lake City, while discussing this novel approach to NMS in foals, Madigan pointed out that spontaneous recoveries of human infants have occurred when a sick newborn baby is placed in the firm embrace of a parent's arms.

In other cases, especially in premature births, a process referred to as “kangaroo care” swaddles the child in a blanket and provides skin-to-skin contact with its mother. This might induce physiologic signals similar to how an infant “feels” in the womb. Kangaroo care causes a baby's heart rate to stabilize, while sleep improves and agitation lessens. The ultimate positive effects echo results from the squeeze-induced stimulation now practiced in NMS foals.

Ongoing research by UC Davis' Comparative Neurology Research Group in collaboration with researchers at the Stanford School of Medicine is examining the effects of persistent levels of neurosteroids in human youngsters as a potential cause of autistic spectrum disorder. **EM**



Courses can help veterinarians focus on their business marketing strategies.

KIMBERLY S. BROWN

Twelve-Month Marketing Plan

A 12-month marketing plan supports your business goals all year long. Start creating yours today using these tips.

By Katie Navarra

Routine equine veterinary care is seasonal in nature. There is a breeding season, a show season, a time for vaccinations, a fall check-up period, and a need to schedule dental exams. This cycle lends itself to a 12-month marketing strategy that can support any practice in its business goals.

Toria Waldron, DVM, the equine medical director of Wisconsin's Badger

Equine Veterinary Services, concurs. "If we can have more opportunities to educate and reach our clientele throughout the year, it leads to healthier horses, happier owners, and it's better for business," she said. "We need as much contact as possible with our clientele to help keep us as their trusted source for information in the health care of their horses."

Marketing is usually involved in the promoting and selling of products or

services. Planned marketing initiatives, even those that educate rather than sell, are important for developing meaningful relationships with clients.

A traditional marketing plan is a formal document that typically is several pages long. Depending on the template used, there are six or seven components. The marketing plan includes sections devoted to market research, a description of the target audience, a "positioning" or



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perception of the business in the marketplace, a competitive analysis, a market strategy, a budget and metrics.

While business plans tend to focus three to five years into the future, a marketing plan is designed to last one year. This is long enough to be effective while providing the flexibility to respond to a changing industry and economic trends.

Devoting the time and resources to developing a multi-page plan might seem difficult for smaller practices. The good news is that even a one-person practice can develop an effective marketing plan to support its business goals.

A simple internet search for “one-page marketing plans” returns multiple options for templates that have already been created. These templates summarize the key components into an easy-to-use format to help you get started.

The most successful plans consider who the target client is, how those clients will be reached and how to retain those customers. In this article, Waldron and her colleagues share insights into the process they follow in creating a year-long marketing plan.

Start Planning

Getting started can be the most challenging part of creating a marketing plan. Templates like those offered by Smallbiztrends.com offer a starting place (go to smallbiztrends.com and search for “one-page marketing plan”).

The planning can even begin in an Excel spreadsheet. A simple way to plot out a year-long plan is to assign each month a column and list the goals and activities for that timeframe.

Waldron and her team plan their marketing initiatives on a month-by-month basis.

When planning the educational information for their blog and social media, they think about what equine health services fall in each season and plan to focus communications on that topic slightly ahead of the need.

“We talk about breeding a little before



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If you include social media in your marketing plan, make sure you actually schedule content to engage your current and potential clients.

spring, and we talk about green grass and laminitis risks right before the grass comes in,” she said.

Her team, which includes doctors and technicians, meets monthly to discuss social media content for the following month. Every team member is assigned different topics and asked to create content for that subject.

“This keeps the team engaged and the topics relevant to what we’re talking about with our clients out in the field,” she said.

Marketing is often thought of through the narrow scope of selling and generating revenue. But marketing strategies are equally important for generating customer loyalty. Badger Equine Veterinary Services’ marketing plan includes annual activities that encourage client participation, which creates a bond. Clients look forward to seeing the staff participate in a Fourth of July parade. The practice also hosts a trail ride in the early fall and a client education event in November.

“All of these events help us make contact with our clients and build loyalty, and they are something we all look forward to every year,” Waldron said.

The Tactical Plan

A marketing plan can look good on paper, but unless it’s implemented, it won’t be worth the time invested to create it. Traditional print ads, mailed postcards or flyers, social media, radio and television advertising are all options for marketing your business or a new service. Choosing the outlet that fits the practice’s budget and reaches the right audience is key.

“Mailed invitations have been the most successful for our client events and social events,” Waldron said. “It feels much more personal and loyal. We haven’t used a lot of mail-out coupons or promotions; however, this could be useful to try in the future.”

Some platforms, including television and radio, can be costly, but creative thinking can sometimes present an opportunity for free air time. Local radio hosts and TV news anchors often include features with an expert on a home or pet care topic. Offering to serve as “the expert” for such a topic can earn quality exposure at little to no cost.

Social media has been the most recent go-to marketing tool because it is free or



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Tildren®

(tiludronate disodium)

BISPHOSPHONATE DRUG FOR INTRAVENOUS INFUSION.

For use in horses only

WARNINGS

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

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

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INDICATION

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

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

PRECAUTIONS

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

Horses should be well hydrated prior to administration of Tildren® due to the potential nephrotoxic effects of Tildren®. Tildren® should be used with caution in horses receiving concurrent administration of other drugs that may reduce serum calcium (such as tetracyclines) or whose toxicity may exacerbate a reduction in serum calcium (such as aminoglycosides).

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

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

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

DOSAGE AND ADMINISTRATION

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

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

STORAGE

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

HOW SUPPLIED

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

INFORMATION FOR OWNERS

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

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

inexpensive to buy an ad—and accessible. Pairing the right type of marketing is the key to success for social media. Waldron has found that social media is most useful for educational purposes. It can encourage client interaction, especially with their “vet truck trivia,” but typically reaches the same crowd of clients who are already engaged rather than new individuals.

Ultimately, an effective marketing plan enables a practice to increase its revenue and reach new clients. However, specials and promotions are most effective when they are valuable to clients.

“We try to promote products and services that our clientele will find useful or want as opposed to things we feel the need or desire to sell,” Waldron said. “Most of our marketing is aimed at trying to build trust with our clientele and educate at the same time.”

What Does a 12-Month Plan Look Like?

The activities included in a marketing plan can be as unique as the practice. Inspiration can be found outside of the equine industry. With creative thinking, an initiative from an unrelated business can be a big success with horse owners.

Unsure of how to start your 12-month marketing plan?

Here are ideas for each month of the year to help you begin the planning process.

January: The new year is often equated with a fresh start. Asking clients for feedback about the services they find most useful, services they would like to see added or what isn't working for them is a good way to encourage interaction and strengthen relationships.



COURTESY THE OAKS

As part of your marketing plan, you might put on a client education program or speak at an industry meeting.

February: Spring is on the horizon. Clients are thinking about spring cleaning and tuning up their cars. Badger Equine Veterinary Services uses this time of year to promote getting ready for spring. Staff created a “Top 10 Spring Checklist” blog that was shared on social media platforms.

March: Spring wellness visits are on most clients' minds this time of year. Promoting a spring check-up package that includes an all-inclusive special price for vaccinations, fecal egg counts, etc. can be attractive to clients.

April: Pick a service for which you'd like to increase sales and offer a discount. For example, 15 percent off of diagnostic exams.

May: In Wisconsin, grazing season begins in May. Badger Equine Veterinary Services uses social media and in-person visits to remind clients that the first lush grass of spring and laminitis can be problematic for some horses.

June: Host a giveaway. For example, offer clients who provide referrals an opportunity to win a free service or product. If you have a new supplement or fly care product you'd like to encourage clients to use, feature it in a giveaway.

July: July is a good month to create messaging for clients around larger recognition days and national holidays.



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You need to determine the specific audience for your practice's services in order to better target your end users.

Fourth of July, National Farriers' Week and the National Day of the Cowboy are all prime marketing opportunities this month. Letting clients know about these celebratory events isn't necessarily selling a service, but it is supporting a shared passion for the industry and keeping your name in people's minds.

August: Sign up for a speaking engagement. Volunteer to speak on a wellness topic at a county fair or similar gathering where current and potential clients are likely to be.

September: Students are heading back to school. An educational day for clients and/or getting involved with a veterinary program at a local college are well timed around the beginning of the new school year.

October: Host an event for clients. For Badger Equine Veterinary Services, it could be a client trail ride or an educational workshop. Or it could be an open house with a BBQ or sponsoring another local event that is popular among clients.

November: Although mares most likely won't be bred until spring, now is the time mare owners should be thinking about what they need to prepare for the breeding season. Create educational information that can be distributed via print or social media.

December: The last month of the year is filled with holidays that are easily paired with marketing activities. If you have an online store, it's the season for promoting or offering discounts on products clients will likely use.

Take-Home Message

It's important to evaluate your marketing plan every quarter to make sure it's achieving the goals you have in mind. If not, there are opportunities to make adjustments throughout the year. As the year winds down, it's time to begin planning for the next year. Incorporate what has worked, try something new and replace what isn't working. **EM**

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Charitable Contributions Under the 2018 Tax Code

Whether you donate to charities or sit on a charitable board, here are tips on making the most from the new tax code.

By Denise Farris, JD

Many equine businesses and their supporting equine associations traditionally rely heavily on tax benefits for charitable contributions. The quickly enacted revisions to the existing tax code in late 2017 left donors and their respective charities scrambling to take advantage of last-minute itemized deduction credits for fiscal 2017, with resulting head-scratching over how those same donations would be treated in 2018.

The following addresses the most prevalent questions concerning charitable donations under the new tax code.

1. When do the new tax laws kick in?

The new code applies to *all* charitable donations given after January 1, 2018.

2. Does the new tax law increase or decrease charitable donations?

The answer depends on who you ask. A July 2017 study from the Indiana University Lilly Family School of Philanthropy (go to independentsector.org and search for "tax policy charitable giving") estimated the code's higher standard deductions in 2018 would equate to a 4.6% decrease in charitable giving in 2018.

In a similar report, the Brookings Institute Tax Policy Center estimated this decline might be as high as 6.5%, equating to a reduction of \$10 to \$20 billion in 2018 (go to taxpolicycenter.org and



The new 2018 tax code means changes in charitable giving deductions.

search for "tax bill not very charitable").

On the other hand, an article by financial law professor James Russell addressed how the 2018 tax law actually *increases* charitable giving deductions, depending on the sophistication of the donor and the manner in which the donations are treated (linkedin.com/pulse/how-2018-tax-law-increases-charitable-giving-russell).

In summary, if handled correctly, donation benefits for high-wealth, high-income individuals is higher. The

average family taxpayer, on the other hand, might find it difficult to generate donations exceeding the \$24,000 standard deduction and therefore eliminate charitable gifts as part of their tax strategy, while still electing to donate solely from a social support basis.

3. How does the new tax code treat charitable giving?

First, the new code does *not* eliminate deductions for charitable giving. Instead, it nearly doubles the amount of the

standard deduction, leaving taxpayers with a decision whether to: (a) take the standard deduction, or (b) itemize their deductions, *including* those for charitable donations.

Under the prior law, the standard deduction was \$6,500 for single taxpayers and \$13,000 for married taxpayers filing jointly. The 2018 code raises this to \$12,000 single taxpayer and \$24,000 married filing jointly. Thus, for many average- to lower-wealth taxpayers, it will be more advantageous to take the standard deduction and forego itemized deductions, including charitable contributions.

Proponents of the change argue charitable giving will *not* be negatively impacted where taxpayers, receiving double the deduction previously given, will use some of that extra income to support their charities. They additionally argue that the new law creates various new benefits for higher wealth supporters that *increase* incentives to donate as follows:

Incentives to gift appreciated investments, such as stock shares: This allows the donor to deduct the investments' full market value, subject to certain limitations, without having to pay capital gains tax on any appreciation.

For example, if a donor does not wish to change her current investment portfolio, she simply takes the cash she would have donated and uses it to immediately buy stocks, bonds or other assets as a replacement of the ones donated. The portfolio doesn't change, but the new assets now have a 100% basis which—in normal speak—means no capital gains taxes will be paid on any past appreciation. This creates a donation incentive that goes towards “big bucket” donations rather than smaller donations funded from monthly disposable income (see Professor James Randall's article, above, “How the 2018 Tax Law Increases Charitable Giving”).

Contributing directly through Individual Retirement Accounts (IRAs): For



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If you serve on a charitable board, be prepared to change tactics to donors.

donors age 70.5 years or older, direct asset contributions of up to \$100,000 can be counted toward their required yearly IRA distributions and would not be treated as “taxable income.” This would *not* apply to Roth IRAs and is subject again to regulatory restrictions.

Here's another example. Your wealthy supporter under the old tax law received a charitable deduction benefit of 50% of income. They own a \$1 million home, a \$1 million IRA, and a \$1 million stock brokerage account invested in growth stocks. All assets increase by 10% in value in that tax year, growing from \$3 million to \$3.3 million, but how much income do those assets generate? None, unless they are sold.

But now your wealthy supporter spends \$100,000, which he's taken from a fully taxable ordinary income distribution from his IRA. His regular donations previously amounted to 1.5% of his wealth, or \$50,000, and he's considering making an additional \$10,000 gift.

Under the old tax code, he would receive no charitable giving benefit for the additional \$10,000 (i.e., tax benefits were maxed out at 50% of income).

The new tax law raises the limit to 60% and permits unused deductions to be carried over year to year up for to five years. The higher the wealth of the donor, the more advantageous treatment

this change brings to high-dollar contributions.

As another example, you have a married couple who has supported your organization for several years. That couple has \$23,500 of itemized expenses, including a \$2,000 donation to your qualified charity. If the couple donated an additional \$1,000 to your group, they now surpass the \$24,000 standard deduction and may claim the itemized charitable deductions. This serves as an incentive to those on the bubble of the standard deduction to give more.

Create and donate through a Donor Advised Fund: Charitable giving can also be handled through a donor advised fund. This method allows you to create—and contribute—cash, appreciated assets or investments that have been held for a year or more to this Donor Advised Fund without paying capital gains taxes. You can then take one large deduction in the year you make the contribution and spread out distributions to the charities of your choice over multiple future years or when it makes sense to you.

Making numerous substantial gifts: For donors whose total contributions in a year exceed \$24,000, it makes sense to bypass the standard deduction and instead itemize your deductions.

Some tax strategists recommend alternating years—taking the standard



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If you donate to charity, make sure you understand the new tax laws.

deduction in one year while planning to maximize contributions and itemizing in the following.

How can my organization effectively plan for charitable giving with the new laws in place? While change is always uncomfortable, it can also be the basis for positive growth. The law is in place, so organizations must deal with it. This could be an excellent opportunity to examine your current practices on soliciting donor support with your board and your tax accountant or advisor. What old practices still work and will benefit your group, and what new approaches should be considered and implemented?


This also presents an outreach opportunity unique to your high-wealth donors. Organize a special event just for them, including a summary of your organization's history, growth and charitable support, and emphasize their important roles in the organization's future. Include a presentation from a tax advisor on how these supporters can utilize the new code to benefit them and their favorite charities.

Most importantly, don't despair. In many instances, supporters who have traditionally supported an organization with goods or money gifts strongly be-

lieve in that organization. That support doesn't disappear with the code change, and many supporters will continue their support. But at the same time, many organizations have higher wealth supporters who might not truly understand the tax benefits of higher giving. The organizations that become proactive in education and outreach will be the organizations benefitting the most under the new law.

So study this article, then pull out your pencil and schedule a meeting with your accountant and membership chairs to plan this important Member Support Outreach event! You might be pleasantly surprised at the results. **EM**


Author Denise E. Farris is recognized nationally for her expertise in equine and animal law. She is listed in Fortune Magazine's "Leaders in Law," EQUUS Magazine's "Leaders in Equine Law," the Kansas City Business Journal's "Best of the Bar," and Lawyers Magazine's "SuperLawyers/Top 100 Attorneys/Top 50 Female Attorneys MO/KS. Farris may be contacted at Denise E Farris, 20355 Nall Avenue, Stilwell KS 66085; 913-220-6203; denise-farris2@gmail.com.




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Buying in Bulk

You might wonder when it makes sense to buy pharmaceuticals or medical supplies in bulk.

Learning of a great deal if you buy a large quantity can make even the most frugal practice owner want to sign on. Deciding whether it is the right decision for your practice requires answering a few questions:

- How long will it take you to use up the proposed quantity?
- What is the expiration date on the items?
- Are the items about to be made obsolete by a new improved product?
- When do you need to pay for the items?
- Can you return any unused stock if you overestimated your order?
- How much are you really saving?

Many practitioners are unaware of the costs associated with the inventory that they carry in their pharmacies.

Those costs include holding, ordering and shrinkage (loss of product without income).

Holding costs of inventory include having dedicated heated and lighted storage space in a building, insurance to cover the inventory from loss, OSHA compliance, and personnel to dust stock

and maintain an orderly pharmacy. The estimated holding cost is 8-15% of the true total cost of each item.

Ordering costs include the hourly wages, payroll taxes and benefits of the staff member who orders, unpacks, stocks, enters the shipment into the computer and counts the stock to generate an inventory list. Ordering costs are estimated to be 15-20% of the true total cost of the item.



Trade shows can be great places to get deals on pharmaceuticals or medical supplies, but make sure you are getting a good deal for your practice before signing up.



COURTESY AAEP

So even before any shrinkage, each \$1 of inventory costs the practice another 23-35 cents.

Pharmaceuticals, medical supplies and other necessary supplies that are sitting on shelves are subject to shrinkage. This occurs because of expiration, breakage, theft or damage. It can add significantly to the cost of having inventory. If the pharmacy is unlocked and management is lax, the additional cost of shrinkage could be substantial. Having larger quantities of inventory increases the chances of shrinkage.

Because COPS (cost of professional services) is the second-largest operating expense for a practice after employee costs, and pharmaceuticals and medical supplies are the major component of COPS, managing inventory is critical to a successful business. Careful attention to inventory can have a significant effect on profitability. There is a substantial amount of the practice assets invested in inventory at any given time, and this is a common cause of poor cash flow. Carrying inventory for months and needing to pay for it before it is sold or used in providing services can cause

financial struggles.

If you have high confidence that you will use the items in a bulk order within the next three to six months, can get delayed billing, and the cost savings is substantial, taking advantage of this opportunity could be a good decision.

An example would be buying 70-80% of your previous year's vaccine totals during the AAEP Convention, as industry partners typically have excellent deals at the trade show and during the month of December. Careful examination of your projected vaccine needs in the upcoming year might cause you to alter your order in a positive or negative direction. Think carefully about whether you have added a new, large boarding farm as a client or lost a busy breeding farm. Then hedge your projection by reducing it by 20-30%.



KIMBERLY S. BROWN

If you order products in bulk and they expire before you can sell/use them, can you return them?

Other deals might revolve around free goods, as in “buy two, get one free.” These can be excellent opportunities if the medication or product in question is one that you use frequently. Keep in mind that packaging ages during too much time on the shelf or traveling in the truck. It can be hard to sell scuffed-up merchandise. Utilize your veterinary management software to investigate your use of items before making your decision on a bulk purchase.

Many practices carefully set up procedures where the invoice costs for arriving items are added to the software to automatically update prices. Be sure that the savings that you receive for a bulk buy are adding to your profit, not being passed on to your clients unwittingly. Your procedures for adjusting drug and supply prices should typically require a practice owner to sign off on any lowering of standard prices.

If you analyze bulk buying opportunities carefully and only take advantage of those that will definitely bring benefit to your practice, you can find meaningful savings without ending up with a pharmacy full of unneeded items. Take the time to make wise choices. **EM**



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Even before you calculate shrinkage of products, they can cost you 23-35 cents per dollar in ordering and holding costs.



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www.horse-dental-equipment.com
800-525-5614

Products: Veterinary equipment, instrumentation, treatments, sundries and HDE Horse Dental Equipment
Profile: Jorgensen Laboratories Inc. has served the veterinary profession for 53 years by providing innovative veterinary equipment and products while also providing excellence in value and service to the profession. The partnership with HDE Horse Dental Equipment brings this to the next level with the availability of world-class equine dental equipment.

► **Kentucky Performance Products LLC**
www.KPPusa.com • 859-873-2974

Products: OTC line: Neigh-Lox®, Elevate®, EquiJewel®, EndurExtra®, Summer Games® Electrolyte, Joint Armor™, Contribute™, Micro-Phase™ and Ker-A-Form™. Vet-only line: BoneWise™, ElectrolyteWise™, FootWise™, JointWise™, NutrientWise™, ProbioticWise™, Weight-GainWise™, Elevate® W.S. and Elevate® Concentrate, InsulinWise™
Profile: Kentucky Performance Products (KPP), maker of BoneWise, Elevate and

Neigh-Lox, has a complete line of affordable, high-quality supplements. New for 2018: Wiser Concepts' InsulinWise. It's research-proven to decrease insulin resistance in EMS and PPID horses. Available through all major veterinary distributors. Stop by our booth to learn more, or visit KPPvet.com. AAEP booths #1115/1214.

► **Luitpold Animal Health**
www.adequan.com

Profile: Luitpold Animal Health, a division of Luitpold Pharmaceuticals, Inc., is committed to advancing animal health with proven FDA products, including Adequan® i.m. (polysulfated glycosaminoglycan) and BetaVet® (betamethasone sodium phosphate and betamethasone acetate) injectable suspension. Adequan i.m. has been relied on for nearly three decades by equine practitioners, while BetaVet is the only dual-ingredient I.A. corticosteroid for horses. As the manufacturer of Adequan® Canine (polysulfated glycosaminoglycan), the company recently returned marketing and distribution of the product to its portfolio, reflecting its position as a leader in health care for horses and dogs. Luitpold Animal Health is proud to be an AAEP Educational Partner since 2006. For more information, visit us at AAEP booth 2021 or adequan.com.

► **Neogen Corporation**
<http://animalsafety.neogen.com/en>
800-525-2022

Profile: Neogen's Animal Health team is devoted to providing veterinarians and horse owners with the tools they need to keep horses healthy and safe. From our veterinary products like UNIPRIM®, EqStim® and BotVax® B to our extensive biosecurity line, you can trust Neogen to deliver effective disease prevention and treatment for your horse.

► **Oculus Insights LLP**
www.oculusinsights.net

262-424-7625

Products: Veterinary business management and education
Profile: At Oculus Insights, we care about animals, but we also care about the health of your business and our profession. Clients use us for our signature Human Resource Program, as well as our complete business management solutions, consulting and educational services to help them achieve their business goals. Our team is a combination of experienced veterinarians with advanced business training, certified human resource professionals and certified professional coaches. All of our teams have significant hands-on experience managing veterinary practices. Visit us at AAEP booth #2014/2016.

► **Shank's Veterinary Equipment Inc.**
www.shanksvet.com • 815-225-7700

Products: Shank's® Dorsal/Lateral Equine Table, Shank's® Floor Model Surgery Table, Shank's® Large Animal MRI Table, Shank's® Looped Hobbles, Shank's® Recovery Hood
Profile: Shank's Veterinary Equipment, Inc. was founded in 1957 on the principles of producing quality, versatile and affordable surgery tables for the large animal veterinarian. Over the years, the company has developed other tables, equipment and ancillary products that can be utilized for transportation, examination, surgery and necropsy of large animals.

► **SmartPak**
www.SmartPak.com • 800-461-8898
Products: Supplements, tack, equipment and supplies

Profile: For six years, SmartPak has been supporting healthy horses with ColiCare, its free colic surgery reimbursement program, which combines annual wellness services from the veterinarian along with daily administration of select digestive support supplements from SmartPak. ColiCare puts veterinar-

AAEP Resources

ians back at the center of their patients' care. Visit the SmartPak booth at AAEP #636 to learn more about the program.

► Sound®

www.soundvet.com • 800-268-5354

Products: Digital radiography, ultrasound, CT, regenerative laser therapy

Profile: Sound®, the pioneer of veterinary DR and creator of NEXT Equine DR, is the exclusive provider of GE Ultrasound and Samsung portable CT systems for the US veterinary market. Sound also innovated Regenerative Laser Therapy, which has helped countless horses get back to work and into the winners circle.

► Sox for Horses Inc.

www.socksforhorses.com

850-907-5724

Products: Bandage socks for equine

Profile: Silver Whinnys®, the proven bandage sock for equines, allows oxygen

to benefit the tissue. Silver acts as an antimicrobial barrier, inhibiting bacteria from reaching the skin while wicking away exuding material from the wound surface. The double-layered construction protects against UV exposure and stops biting insects from reaching the skin.

► Standlee Premium Western Forage®

standleeforage.com • 208-825-5117

Products: Forage and forage-based products

Profile: Standlee Premium Western Forage® provides a large variety of forage in a wide range of product formats, including pellets, cubes, chopped and bales. Quality is evident in our products and the way we do business. After all, our family name is on every package! Come visit us at AAEP booth 2528.

► Vet-Ray Technology by Sedecal

www.vetray.com • 800-920-9525


Products: Portable Digital X-ray

Profile: Sedecal, manufacturer of veterinary-specific X-ray products, has grown to be the world's largest veterinary provider of over 20 different digital and analog configurations for small and large animal applications. Sedecal specializes in products for companion animals, equines, zoo animals and universities across the world. Visit us at AAEP booth 1719.

► Vetsource

vetsource.com • 877-738-8883

Products: Home Delivery Pharmacy

Profile: Vetsource® provides veterinary practices with tools to run a better business and deliver better care. As the primary industry-endorsed provider of Home Delivery Pharmacy services, Vetsource helps practices increase revenue, boost compliance and enhance client relationships. Stop by booth #2205 to learn more at the 2018 AAEP Convention. 

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