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An Issue of Issues

WOW! We have so much great information in this issue that it is hard to know where to start talking about it. Probably the most pertinent to all of our readers is our COVID-19 survey of equine veterinarians conducted by Dr. Amy Grice and brought to you by Merck Animal Health (p. 14).

As of press time, we have now topped 1 million deaths globally due to COVID-19, with no vaccine available and an upward curve of new cases in multiple countries, according to statistics from Johns Hopkins University of Medicine. The first case of COVID-19 in the U.S. was on January 21, 2020. Since then, our country had reported 7,148,045 confirmed cases and 205,072 deaths.

Much of our country had businesses restricted early in the pandemic, and the survey showed that many veterinarians either were forced to close or make changes in how they provided services. Grice noted some of these changes were related to geographic location.

One of the bright spots in the survey is that while many veterinarians had a downturn in revenues early in the pandemic, they have seen business come roaring back. While 2.9% of respondents said their practice revenues were a great deal worse than before the pandemic, 29.5% said their practices are financially about the same as before COVID-19, and 27.5% said their practices were financially better than before COVID-19.

The pressures of family—especially remote schooling and childcare—caused quite a bit of stress to veterinarians who already deal with a stressful lifestyle. While 14.2% reported no symptoms of stress, almost two thirds of respondents (62.9%) reported “feeling anxious or worried,” more than half (56.6%) reported “feeling exhausted,” and about half (51.2%)

were “feeling overwhelmed.” About 38% reported “feeling sad or depressed,” and 43.9% said they were “short-tempered and irritable.”

Sponsored Content

EquiManagement often partners with industry-leading companies to provide our readers with information. These articles are written by *EquiManagement* staff, and they are not advertising.

I wanted to draw your attention to sponsored articles on “Feeding Metabolic and ‘Easy Keeper’ Horses” (p. 38) and “Helping Horse Owners Understand Gastric Issues” (p. 60), brought to you by ADM.

Covetrus has been sponsoring a “practical medicine” column for our readers in the last few issues. On page 79 you will find a summary of a presentation by Dr. Laurie Goodrich of Colorado State



University’s Equine Orthopaedic Research Center that provides an in-depth look at joint therapies. She presented on this topic at the Lake Tahoe Equine Conference.

On page 68 we bring you a Resources section that provides you with more information from companies who are advertising in this magazine. We encourage you to support the companies that support EquiManagement and the vet industry. We will post the Resources section on EquiManagement.com with hot links to each company to make it even easier to learn more about their products and services.

More Content Online

We invite you to visit EquiManagement.com to stay up to date on news and information pertinent to the equine veterinary industry. There are new research reports and articles posted regularly. Sign up for our monthly newsletters so you don’t miss any information. **EM**



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Platelet-Rich Plasma to Treat Infectious Arthritis

An equine joint infection can result in debilitating osteoarthritis or even euthanasia. Surgical irrigation of an infected joint and systemic and local antimicrobial medications help to resolve joint infection in many cases, but 6-10% of horses still die due to significant joint damage and/or complications following infection. Of the horses that survive, it is reported that nearly half experience chronic arthritic changes.

One of the great difficulties in managing such infections is the formation of biofilms, which resist antimicrobial activity. An *in vitro* study at North Carolina State University investigated use of a highly concentrated amount of platelet-rich plasma (PRP) lysate against infected synovial fluid [Gilbertie, J.M.; Schaefer, T.P.; Schubert, A.G.; et al. Platelet-rich plasma lysate displays antibi-

film properties and restores antimicrobial activity against synovial biofilms *in vitro*. *Journal of Orthopaedic Research* Jan 2020; <https://doi.org/10.1002/jor.24584>].

Within two hours of seeding harvested synovial fluid with bacteria, biofilm aggregates formed in the fluid. PRP harvested from a herd of horses was concentrated 50 times more than the amount normally found in that volume of blood. (Use of PRP for normal orthopedic procedures has platelet concentrations of three times normal.) It was noted that the pooling of PRP from multiple horses rather than just an individual horse, along with lysing of the platelets, had an improved effect on antimicrobial activity. Lysing of platelets releases peptide proteins with antimicrobial properties, and this lysate was tested on the biofilm-producing bacteria *in vitro*.

In the lab, three different formulations were added to the infected synovial fluid: a) aminoglycoside; b) lysate only; and c) aminoglycoside combined with the PRP lysate. Numbers of colony-forming units of bacteria were counted eight hours after treatment with these three different methods. While the antibiotic alone did not achieve any beneficial effect, the lysate alone did reduce bacterial numbers. The best effect was seen using the combination of lysate and antibiotic that achieved complete resolution of both biofilm and bacteria.

The researchers stated: "All PRP formulations displayed antimicrobial properties; however, formulations containing higher concentrations of platelets without leukocytes had increased antimicrobial activity."

These results are promising for the potential to mitigate joint damage and lessen mortality related to synovial



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Researchers suggest that using PRP with higher concentrations of platelets without leukocytes had increased antimicrobial activity in *in vitro* experiments.



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infections, not just in horses but in other animals and humans. *The Morris Animal Foundation is helping to fund this research.*

Feed Hay Before Concentrate to Control Inflammation

It is well known that concentrate feeds contribute to acidification of the equine intestinal tract, with the potential to elicit gastric ulcers, leaky gut syndrome, inflammation and laminitis. Within an hour of eating, high-starch diets elevate plasma concentrations of interleukin-1B (IL-1B) due to changes in intestinal pH. Inflammatory cytokines, such as IL-1B, have adverse effects, including increasing the risk of laminitis.

Yet some horses need the additional calories that are supplied conveniently with concentrate supplementation.

Even if horses don't need the calories, the study below noted that four other studies reported that between 60-96% of horse owners feed concentrate, no matter the work output or body condition of their horses.

This knowledge can help veterinarians coach owners who own metabolic horses.

A group of researchers looked at the effects of feeding two pounds of grass hay 30 minutes prior to offering concentrate and compared the results to horses fed the same concentrate but without pre-feeding hay [Suagee-Bedore, J.K.; Linden, D.R.; Bennett-Wimbush, K.; Splan, R.K. Feeding Grass Hay Before Concentrate Mitigates the Effect of Grain-Based Concentrates on Postprandial Plasma Interleukin-1B. *Journal of Equine Veterinary Science* 2019, vol. 86;

doi.org/10.1016/j.jevs.2019.102899].

Six metabolically normal geldings, fasted overnight, had blood samples taken 30 minutes prior to the hay meal and one, two, four, six and eight hours after hay was offered. Non-structural carbohydrate (NSC) sweet feed (1.2 g/kg body weight) was fed 30 minutes after the horses received two pounds of fairly low NSC grass hay, which was consumed within 20 minutes. General recommendations for equine digestive health limit a single concentrate meal to less than five pounds. Ideally grain meals are split into two to three feedings per day. (Research has demonstrated that postprandial inflammation occurs with consumption of >1.14 g NSC/kg body weight.)

Horses receiving hay 30 minutes prior to concentrate had reduced concentra-



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Researchers recommend feeding a small flake—or about two pounds—of grass hay about 30 minutes before feeding a concentrate meal to blunt the rise of IL-1B concentrations in horses.



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tions of IL-1B compared to the control horses, and this effect lasted as much as eight hours. Similarly, d-lactate concentrations were reduced in hay-first fed horses in the first four hours. D-lactate is produced by microbes in the presence of NSC intake.

The authors concluded: "Feeding a small amount of hay before feeding a meal of moderate starch and sugar content reduced the negative effects of rapid starch and sugar fermentation in the equine digestive tract." They noted that salivary bicarbonate stimulated by eating hay has the potential to serve as a stomach buffer that also protects lactic acid-using bacteria. This has the potential to mitigate declining intestinal pH.

In summary, even just a small flake—or about two pounds—of grass hay can blunt the rise in IL-1B concentrations if fed 30 minutes prior to offering a concentrate feed.

Influenza Vaccine Efficacy

Influenza virus is a tricky pathogen, mutating surface glycoproteins in ways that elude or neutralize immune systems. Vaccine manufacturers need to keep up with the changing complexion of equine influenza virus (EIV) by constantly updating their products.

The World Organization of Animal Health (OIE) Expert Surveillance Panel (ESP) does an annual surveillance review of EIV circulating strains from field outbreaks to inform recommendations for composition of vaccine strains.

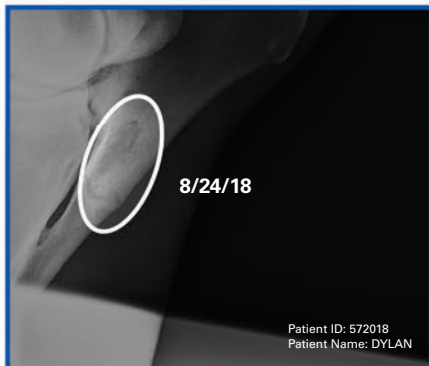
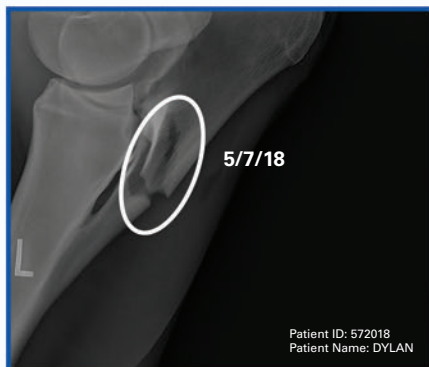
Despite annual booster vaccinations, some horses still contract EIV.

A study investigated EIV outbreaks among vaccinated horses in four Irish racing yards over the course of a month [Gildea, S.; Lyons, P.; Lyons, R.; et al. Annual booster vaccination and the risk of equine influenza in Thoroughbred racehorses. *Equine Veterinary*

Journal 2019, DOI: 10.1111/evj.13210].

Horses had been immunized based on Turf Club Rules of the first two doses given between 21 and 92 days followed by a third dose 150-215 days after the second dose. Then annual boosters are administered. In the study, nasal swabs were taken from 118 horses for PCR testing. Clinical signs were evident in 38% of the horses, and of these 62% tested positive for EIV. Vaccinations were up-to-date in nearly 68% (80/118) horses. Of these 80, 34% (27 individuals) developed clinical signs indicative of vaccine breakdown of protection across all vaccine products, despite containing both Florida Clade 1 and Clade 2 antigens based on OIE 2018 recommendations.

Clinically affected horses had previously received two to six doses of EIV, and the interval from the last vaccination ranged between 156-300 days. Of



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Research has suggested that it might be advisable to increase the frequency of booster influenza vaccinations in at-risk horses as well as using biosecurity to prevent and contain infectious disease outbreaks.

the 27 horses with clinical signs, 18 (or 67%) had not been boosted within the previous six months; nine (or 37%) were due for their annual booster.

Subclinical infection with EIV was identified in about 10% (12 horses), and all of these were up to date on their boosters. These inapparent cases serve as carriers to infect susceptible individuals.

The authors noted: “Partial vaccine compliance and the mixing of racing and other Thoroughbred populations (breeding/pretraining) with inadequate vaccination histories contributed to disease spread, as did the failure to implement appropriate biosecurity measures following the introduction of new arrivals and the return of horses from equestrian events.”

Vaccine breakdown occurred predominantly in young horses that had not received a booster within the previous six months and in horses within the three months after the third immunization, which is considered a high-risk period.

The study suggested that existing EIV vaccines might not provide optimal

long-term protection, particularly in young horses. Annual immunization cannot be relied on as the sole protective strategy.

While events in Europe might differ somewhat from American influenza outbreaks, the problem is similar in both parts of the world—suboptimal protection has been identified in North America due to antigenic drift of EIV. The OIE 2018 vaccine recommendations likely need updating [Durham, A. Choosing an Influenza Vaccine. *In Practice* March 2019, vol. 41; pp. 84-87].

In summary, it might be advisable to increase the frequency of booster vaccinations in at-risk horses, keeping in mind that herd immunity relies on immunization protection of 60-70% of the population. Biosecurity efforts are critically important in preventing and containing infectious disease outbreaks.

EIV Immunization Prior to Importation

Another study surveyed various vaccination technologies on three continents to develop protocols for vaccination

of horses prior to importation. The three vaccine technologies included: a) subunit vaccine; b) canary pox recombinant vaccine; and c) whole inactivated virus vaccine. The objective of ensuring immunization against EIV is to minimize shedding of virus from sub-clinically infected horses [Cullinane, A.; Gahan, J.; Walsh, C.; et al. Evaluation of Current Equine Influenza Vaccination Protocols Prior to Shipment, Guided by OIE Standards. *Vaccines* 2020, vol. 8, 107; doi:10.3390/vaccines8010107].

For countries requiring EIV immunization for entry, their national veterinary authorities tend to require vaccination against EIV from between 15-90 days prior to shipment.

Three international equestrian organizations collaborated on obtaining data in this study to develop an evidence-based vaccination strategy. Currently they differ in timing and are not at all harmonized in their approach. OIE recommends immunization between 21-90 days prior to shipment. FEI (Federation Equestrian International) requires that the last booster be given within six months and 21 days but not less than seven days prior to arrival at an event. The International Federation for Horseracing Authorities (IFHA) wants horses vaccinated within the 60 days prior to export but not within 14 days of export.

The data from the study is based on protective titers across three continents, three vaccine technologies and 220 horses.

The study determined that 14 days is optimal to enable immune responses to boosters in horses older than 4 years of age that have previously received at least four doses of vaccine.

It also determined that for these individuals, vaccination is allowable within six months of shipment. For horses younger than four years, EIV boosters should be required within 90 days of shipment as currently recommended by OIE. **EM**

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Child care issues and remote learning for children during the pandemic have added stress to the already stressful careers of equine veterinarians.

Effects of the COVID-19 Pandemic on Equine Practice

By Amy L. Grice, VMD, MBA

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Animal Health

As of October 1, 2020, more than 34,052,300 cases of COVID-19 had been reported in more than 200 countries and territories, resulting in more than 1,015,500 deaths. In the United States, 7,297,500 cases with at least 207,400 deaths had been reported, according to a New York Times database.

As the virus spread across the U.S. in March, states issued orders to close non-essential businesses and limit group activities. The U.S. stock market plummeted to below 20,000 in mid-March. On the week ending March 21, 3.3 million new unemployment claims were made, followed by an additional 6.6 million

the week ending March 28. At its peak, unemployment rose to more than 14%.

In order to evaluate the effect of these events on equine practices, a 21-question survey was distributed on the closed Facebook groups Women in Equine Practice, Equine Vet-2-Vet, AAEP New Practitioner and AAEP Member Vet Talk. A link also was posted on the AAEP General Communities e-mail Listserv. The survey was open August 9–25, and 207 veterinarians responded.

Demographics

In order to learn some demographic information about the respondents, questions included the year of graduation from veterinary school, whether the

respondent was an associate or an owner, and the gender of the respondent. All of the questions allowed the veterinarians to write comments, and they wrote many to explain their answers.

Almost 12% graduated in the last five years, and about 20% finished veterinary school six to 10 years ago. About 24% of respondents graduated 11 to 15 years ago, around 8% graduated 16 to 20 years ago, and about 35% of respondents graduated more than 20 years ago.

Three quarters of respondents (75%) indicated that they are practice owners, and about a quarter (25%) said they are associates. About 75% of respondents were female, and 25% were male. Respondents were asked for the geo-

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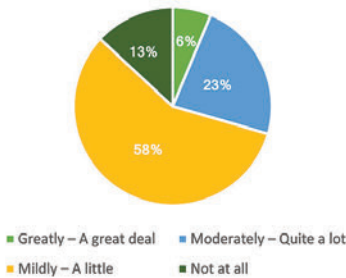
Zone 0	ME, VT, NH, MA, CT, RI, NJ	10.8%
Zone 1	NY, PA, DE	11.3%
Zone 2	MD, WV, VA, NC, SC	12.3%
Zone 3	TN, GA, FL, AL, MS	8.4%
Zone 4	MI, IN, OH, KY	11.8%
Zone 5	MT, ND, SD, IA, MN, WI	7.4%
Zone 6	IL, MO, NE, KS	5.9%
Zone 7	TX, AR, OK, LA	8.9%
Zone 8	ID, WY, CO, UT, NM, AZ, NV	6.9%
Zone 9	OR, WA, CA, AK, HI	16.3%

graphic zone in which they practiced, and results indicated a very uniform participation across regions.

Pandemic Operations

Respondents were asked “In general, how has the pandemic affected your practice’s operations?” 6.3% of respon-

Figure 1. In general, how has the pandemic affected your practice’s operations?



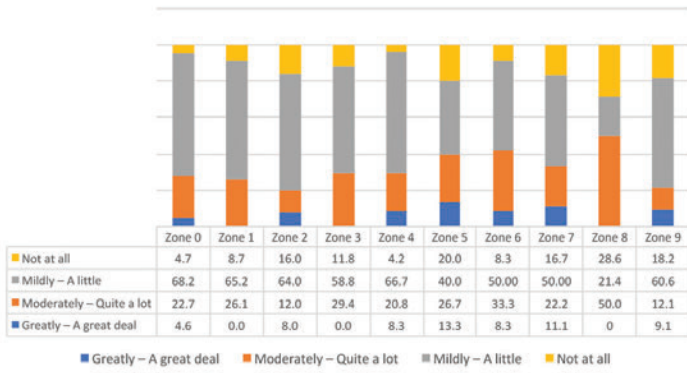
dents said “Greatly—A great deal”; 23.2% responded “Moderately—Quite a lot”; 57.5% responded “Mildly—A little” and 13% responded “Not at all” (see Figure 1).

When looking at this question by zip code zones (the zone number corresponds to the first number of each region’s zip code), there was quite a bit of variation (see Figure 2). This was likely due to variability in the severity of the COVID-19 outbreak in each area and the differing state governmental responses to the pandemic. Zones 5, 7 and 9 had the highest percentage of responses that the pandemic had affected operations “Greatly —A great deal,” with 13.3%, 11.1% and 9.1% respectively.

When looking additively, Zone 5 (40%), Zone 6 (46%), Zone 7 (33.3%) and Zone 8

(50%) had the highest percentage of “Greatly—A great deal” and “Moderately—Quite a lot.”

Figure 2. In general, how has the pandemic affected your practice’s operations?



animal practices in the U.S. was tracked weekly beginning in March by VetSuccess with its Veterinary Industry Impact Tracker. While there were some initial revenue drops, these practices came roaring back with revenues that—as of September—had increased year over year by an average of 11.3% nationally. The survey of equine practices reported in this article sought to qualitatively measure the financial performance of equine practices by asking “Has the pandemic negatively affected your practice’s finances?”

When looking at all respondents, 29.5% said “No, my practice is financially about the same as before COVID-19” and 27.5% said “No, my practice is financially better than before COVID-19.” Only 2.9% said “Yes, greatly—A great deal worse.”

However, not unexpectedly, there were variations when responses were separated by zip code zone (see Figure 3). Practices in Zone 4 (8.3%), Zone 5 (6.7%) and Zone 7 (5.6%) reported the highest percentages of the response “Yes, greatly—A great deal worse.”

Interestingly, 50% of Zone 7 respondents reported “No, my practice is financially better than before COVID-19,” the highest percentage among the zones of this response. Other zones with many responses of higher financial performance included Zone 0 (31.8%), Zone 2 (40%) and Zone 9 (30.3%).

Operational Changes

The survey also asked about changes in operations caused by the pandemic or by state mandates put in place to manage COVID-19.

About 29% of respondents had no changes in their offered services, while another 30% had at least some period of time where they only saw urgent or emergency cases. Almost three-quarters of respondents reported using personal protective equipment while working, and almost a quarter increased their use

Financial Impact
Financial performance of companion

of telemedicine or began to use it for the first time.

About 20% reported that they reduced hours, laid off or furloughed non-DVM staff, but only 7.7% reported that they reduced hours, laid off or furloughed veterinarians. 14% said they split practice members into teams working different days.

When asked “In which areas is your practice “back to normal” now?”, 53.9% of respondents indicated that all areas were operating normally.

Impact on Industry

The equine industry in some areas was subject to specific state mandates that strictly limited activities of horse owners at boarding stables, racetracks and competition venues. Respondents were asked “In general, how has the pandemic affected the equine industry activity in your region (breeding, showing, training, boarding, racing)?” Most respondents indicated that their areas had a mild to moderate decrease in activity. Responses differed somewhat by zip code zone. Those zones that saw the highest effect on the equine industry, answering “Greatly—A great deal,” were Zone 0 (18.2%), Zone 4 (16.7%) and Zone 9 (15.6%). When looking additively at responses of “Moderately—Quite a lot” and “Greatly—A great deal,” Zone 3 was most affected at 70.9%, followed by Zone 3 at 70.6%, Zone 7 at 66.7% and Zone 5 at 66.6%.

Changes in Practice

Practices were uncertain about the economic effects that would endure as a result of the pandemic. The survey asked about the utilization of federal aid. 56.1% of respondents said their practices utilized a federal program for financial assistance (PPP, SBA loan, etc.).

Survey respondents were asked “What changes in your operation or in the industry do you think will be permanent, or maintained as the new normal?”

While a number of veterinarians indicated they thought telemedicine and online pharmacies would be used more frequently, many said they hoped that “we can just return to normal,” with no permanent changes. Others felt that social distancing, increased sanitizing and continuing curbside service might become permanent changes.

Thrive or Survive

When asked “What is the most important thing that you or your practice did or is doing to thrive or survive in 2020?”, respondents had many different responses:

- “Continue to foster a supportive working environment that provides everyone with time they need to take care of themselves/their families.”
- “Going back to our brand and our message. Making sure that each interaction with clients is a true reflection of what we represent.”
- “Posted that we were working and available to clients. But we stressed mask wearing, hand washing, social distance and disinfection.”

Many answers spoke about being available and stressing good communication with staff and clients.

Biggest Concerns

Our COVID-19 survey of veterinarians in the spring of 2020 asked respondents to rank their concerns, the current survey queried “Which concerns you the most?” The ranking of these concerns in the current survey was the same in the spring survey.

Respondents indicated that they were most concerned about their family member(s) getting ill, followed by get-

ting sick themselves. Third-ranked was the effect of the economic downturn on the household’s or personal finances.

Ranked less important in the recent survey were “Your community and the world being sickened and people dying with COVID-19,” “The effect of the economic downturn on your practice or the practice where you work,” “The effect of the economic downturn on your community,” “The effect of the economic downturn on the country and the world” and “The effect of the economic downturn on your continued employment or that of your spouse.”

Stress

Respondents were asked about symptoms of stress that they were experiencing. While 14.2% reported no symptoms of stress, almost two-thirds of respondents (62.9%) reported “feeling anxious or worried,” more than half (56.6%) reported “feeling exhausted” and about half (51.2%) were “feeling overwhelmed.” Insomnia was affecting about a third (31.2%), 38.1% reported “feeling sad or depressed” and 43.9% said they were “short-tempered and irritable.”

About a quarter were “drinking more alcohol than usual,” “overeating or failing to eat,” and “over-focusing on news stories about COVID-19” (see Figure 4). It is not clear how many of these signs of stress are a product of the pandemic and which were simply the result of the day-

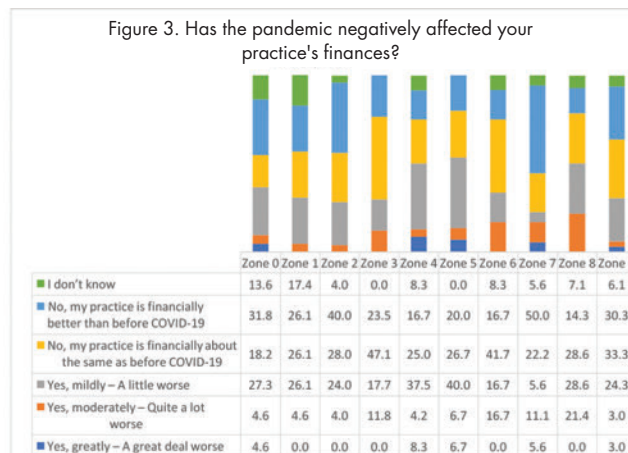


Figure 4. What symptoms of stress are you experiencing? Choose all that apply.

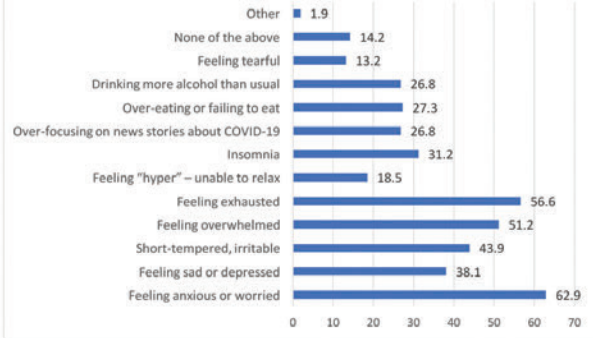
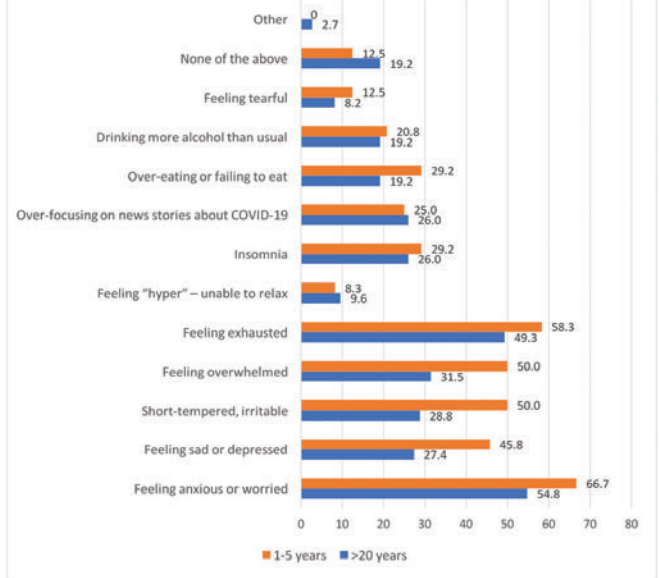


Figure 5. What symptoms of stress are you experiencing? By # of years in practice



to-day work of equine practice. What is clear, however, is that equine practitioners are experiencing a lot of stress.

Multiple comments also spoke of the difficulties of school disruptions with distance learning requiring parental attention, and the challenges of childcare arrangements. The added responsibilities for parents on top of the time-consuming changes to many practices' work schedules seemed to create an almost unbearable burden for many.

When comparing those respondents in practice more than 20 years with those in their first five years, there were differences (see Figure 5).

Almost a fifth of those with more than 20 years of practice were experiencing no signs of stress, compared to a little over a tenth of those early in their careers. Half of those respondents in their first five years reported "feeling overwhelmed" and "short-tempered and irritable," compared to less than a third of the more experienced veterinarians. 58.3% of the younger cohort said they were "feeling exhausted" compared to 49.3% of the older group.

Almost half of those in their first one to five years were "feeling sad or depressed" versus only about a quarter of those with over 20 years in service. Likewise, 66.7% of the younger group reported "feeling anxious or worried" compared to 54.8% of the older.

Recognizing these increased stresses on new practitioners is important for

employers as they navigate managing a busy equine practice. With retention of equine veterinarians already a concern, pressures exacerbated by the pandemic might play a role in continuing this trend.

CE Requirements

Pivoting to practical issues, the survey asked respondents how they were planning to fulfill their CE requirements in 2020. 70% planned to attend virtual continuing education events, 23% were planning to attend a mixture of live and virtual events, 3% indicated they would attend only live meetings and 4.4% said they would be unable to meet their CE requirements in 2020.

Although 79% said they would like to see more online CE because it was very useful during the pandemic, only 6.3% indicated it was their preference at all times. 14.6% responded that they do not like online CE programs. As one veterinarian commented, "I MUCH prefer one-on-one, face-to-face interactions—hugs from old friends, handshakes with new friends. I focus so much better in a room full of people than online, which just doesn't 'feel right' to me."

Industry Support

Respondents were asked "What are manufacturers, distributors and other

industry partners doing—or what could they do—to help veterinarians most effectively at this time?" Many veterinarians answered that they were grateful for online continuing education opportunities, good ongoing communication with their sales representatives despite the challenges of the pandemic, and assistance working through back orders and other supply chain issues.

Take-Home Message

As equine veterinarians continue to work hard to meet the needs of their clients and patients in this difficult time, it is good to know that most are doing well financially despite their increased stress. Finding new, efficient ways to deliver care and communicate with all stakeholders could help ease some of the heavy workload.

Utilization of technicians and office staff for tasks that do not require a veterinarian's attention could ease the strain and often are economically sensible, as well. As time goes on, life will return to a more normal rhythm, and the difficulties of this time will become a distant memory. Let us all hope that time comes soon! **EM**

What Is a P&L Statement?



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A P&L statement is a written record that allows you to diagnose your practice's financial strengths and weaknesses to increase the life and profitability of your company. Complete financial statements are usually prepared annually, but the income statement (P&L) should be reviewed on a monthly or a quarterly basis.

Complete financial statements include:

- Profit and Loss (P&L) Statement (also called Income Statement)
- Cash Flow Statement
- Balance Sheet

These documents provide a story of the financial decisions and results of those decisions for a business during a specific period of time (see Figure 1).

The Profit and Loss statement categorizes the various revenues and expenses that result from operating during a given period—a year, a quarter or a month. As the practice conducts

Figure 1

P&L—Income Statement	Cash Flow Statement	Balance Sheet
Revenues	Operations	Assets
Expenses	Investments	Liabilities
Profit/Loss	Financing	Equity

Figure 2

ABC Equine Practice

Income Statement—Profit and Loss Statement 12/31/2019

Revenue		
Professional Service Revenue	\$ 950,000	95.00%
Drug and Supplies Revenue	\$ 50,000	5.00%
Total Revenues	\$ 1,000,000	100.00%
Cost of Professional Services		
COPS	\$ 240,000	24.00%
Gross Profit	\$ 760,000	76.00%
Operating Expenses		
EMPLOYEE EXPENSES		
Salaries and wages—veterinarians	\$ 209,000	20.90%
Salaries and wages—lay staff	\$ 180,000	18.00%
Payroll taxes	\$ 27,000	2.70%
Employee benefits	\$ 25,000	2.50%
Continuing education	\$ 4,000	0.40%
Other	\$ 2,000	0.20%
TOTAL	\$ 447,000	44.70%
ADMINISTRATIVE		
Computer Software Subscription	\$ 4,800	0.48%
Advertising	\$ 5,000	0.50%
Office supplies	\$ 4,500	0.45%
Travel	\$ 3,500	0.35%
Insurance	\$ 5,000	0.50%
Other	\$ 7,000	0.70%
TOTAL	\$ 29,800	2.98%
COLLECTION COSTS		
Bank & Credit card charges	\$ 12,000	1.20%
FACILITY & EQUIPMENT		
Rent	\$ 36,000	3.60%
Maintenance and repairs	\$ 11,000	1.10%
Telephone	\$ 4,500	0.45%
Utilities	\$ 8,000	0.80%
Vehicle costs	\$ 20,000	2.00%
Other	\$ 7,000	0.70%
TOTAL	\$ 86,500	8.65%
Total Expenses	\$ 803,300	80.33%
EBITDA—Net Ordinary Income	\$ 196,700	19.67%
Interest expense	\$ 4,200	0.42%
Taxes	—	#VALUE!
Depreciation	\$ 15,000	1.50%
Amortization	\$ 2,500	0.25%
Net Income	#VALUE!	#VALUE!



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its business, the accounting system tracks, organizes and records the financial transactions of the business using a chart of accounts. The sum of revenues (+) and expenses (-) represents a company's net income or net loss during the period.

The primary purpose of the income statement is to demonstrate a practice's ability or inability to generate profit and to describe how the profit or loss arose.

The Chart of Accounts is a listing of all the accounts on your financial statements. This is an organized listing of all the income, expense, asset, liability and equity categories present in the business to allow classification of every transaction as it occurs. There is usually a numeric code assigned for each account. You can have as many or as few accounts as the practice needs.

The saying "GARBAGE IN, GAR-

BAGE OUT!" is incredibly true. You must remember that you cannot manage what you are not measuring. Whomever is doing your bookkeeping needs to be careful and consistent. If you serve as your own bookkeeper, take a course in QuickBooks and/or basic bookkeeping.

When total expenses are subtracted from total revenue, the result is Net Ordinary Income, or EBITDA (earnings before interest taxes depreciation and amortization). EBITDA is the best measure of profitability. All loan payments (principal and interest) and equipment bought outright with cash come from EBITDA. Thus, a loan's principal payment is not included on the P&L. Only the interest portion of a loan payment is reported on the income statement, and it is reported as Interest Expense below EBITDA (see Figure 2).

The value of a practice lies in its profitability. Many veterinary business owners look proudly at the amount of gross revenue their practice produces and neglect to look at their profitability. It is best to look at EBITDA when comparing profitability, because it is difficult to make accurate comparisons if the actual bottom line (net income) is used. For example, a practice that has borrowed significant amounts, is paying a lot of interest, and has a lot of depreciation will be hard to compare fairly to one with little debt unless EBITDA is used.

Similar businesses in the same industry in the same location can have very different valuations, because they can have very different profitability. Profitability is highly dependent on the owners' decisions about pricing, inventory management and expense management.

P&L reports provide a lot of information about the operations of a business and ways to improve its profitability. Taking the time to understand and review your income statements is critical to your success. **EM**

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Incorporate SAA testing with Stablelab® into your clinical exams

By Bobby Cowles, DVM, MS, MBA,
Equine Technical Services, Zoetis



Serum Amyloid A (SAA) is a major acute phase protein the liver produces in the face of inflammation caused by infection that's changing the way equine veterinarians practice veterinary medicine. Within hours of the body being exposed to an infectious agent, the liver produces high enough levels of SAA that can be measured in the general circulation. Circulating SAA levels rise rapidly and dramatically into the hundreds and even thousands during infection.

The obvious advantage of SAA is that veterinarians can rapidly diagnose patients with infectious conditions, often prior to visible or outward clinical signs, such as fever, nasal discharge, diarrhea, etc. And, as quickly and dramatically as SAA elevates, its levels also decrease quickly, by approximately 50% every 24 hours, once the infection is resolved, enabling serial monitoring of SAA to monitor the horses' response to treatment over time.^{1,2}

Monitoring response to treatment by measuring SAA daily or every other day is one of the most common ways equine practitioners use SAA. Repeat testing is extremely important to identify and track where within the typical response curve the horse is, in addition to identifying if SAA concentration is increasing or decreasing.

How to Test SAA Using Stablelab®

Because one of the features of SAA is its "real-time" measurement of inflammation caused by infection, stall-side testing with results in 10 minutes is readily available with Stablelab® from Zoetis to provide practitioners with accurate and immediate results.

The rapid stall-side diagnostic test for SAA can help practitioners detect infectious conditions quickly and guide treatment strategies for optimal outcomes and return to function. The faster an infectious condition is diagnosed, the quicker the veterinarian and barn staff can work together, instituting appropriate biosecurity protocols to minimize disease spread.

SAA testing with Stablelab should be added to the physical exam as standard protocol to evaluate health in high-risk horses. If you can detect a horse as early as possible, you might have time to treat the horse to still perform at the highest level. Learn more about testing SAA with Stablelab by talking with your Zoetis representative or visit Stablelab.com.

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¹ Nolen-Walston R. How to Interpret Serum Amyloid A Concentrations, in Proceedings. American Association of Equine Practitioners 2015; 130-137.

² Jacobsen S. Review of Equine Acute-Phase Proteins, in Proceedings. American Association of Equine Practitioners 2007; 230-235.



There is a noticeable change to the business of educating veterinary students in today's world.

Veterinary School Update

We took the pulse of where veterinary education is and what the prospects are for future equine veterinarians.

By Nancy S. Loving, DVM

The wonderful benefit about a veterinary education is that it can provide you with a stepping stone to a number of career pursuits, not just in clinical practice, but also in industry, research, government or leadership roles.

It is a tough process not only to get in to a DVM program, but to finish. Then the job hunt begins. Many practitioners who are reading this might have graduated from veterinary school decades

ago and, in the process of interviewing prospective job seekers, have seen a considerable difference in focus these days. Part of an older practitioner's trial by fire involved 24x7 care in all kinds of weather and working conditions, many similar to the tales of James Herriot.

Those of you more newly graduated see your veterinary education through a different lens that is often clouded by immense educational debt with a trumpet call for work-life balance that obviates being available to clients all the time.

The Current State of Veterinary Education

For older practitioners, there is a noticeable change to the business of educating veterinary students in today's world. There is more focus on veterinary practice using technology and specialization. There is a trend toward clinical practice in urban environments while there remains a shortage of food animal and large animal practitioners in rural locales.

In 1986, 23% of the veterinary

The Science of **TRUSTED**

Trust genuine **REGU-MATE® (altrenogest)**
**Solution 0.22% for proven palatability,
bioavailability and efficacy in every dose.**

From the broodmare to the performance horse,
properly managing your mare's hormones is critical.

- The only FDA-approved altrenogest with more than 50 million doses sold¹
- Delivers safe, predictable control over a mare's reproductive cycle and reduces undesirable mood and behavioral changes
- Easy to administer with REGU-MATE® dosing device

Now that's trusted.

Ask your Merck Animal Health Equine representative
about REGU-MATE® or call 800-521-5767.

IMPORTANT SAFETY INFORMATION: Avoid skin contact. Always wear protective gloves when administering REGU-MATE®. This product is contraindicated for use in mares with a previous or current history of uterine inflammation. Pregnant women, or women who suspect they are pregnant, should not handle this product. For complete safety information, please read product label.

¹Data on file. Merck Animal Health.



Regu-Mate®
(altrenogest)

REGU-MATE®

(altrenogest) Solution 0.22%
InterVet/Merck Animal Health

OVAL PRECISION
EQUINE IN ANIMALS ONLY
SOLUTION 0.22% (2.2 mg/mL)

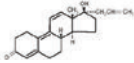
For suppression of estrus in mares.
Suppression of estrus allows for a predictable occurrence of estrus following drug withdrawal in mares with ovarian follicles 20 mm or greater.
Suppression of estrus will facilitate:
• Attainment of regular cyclicity during the transition from winter anestrus to the physiological breeding season.
• Management of prolonged estrus conditions.
• Scheduled breeding during the physiological breeding season.

WARNING: DO NOT USE IN HORSES INTENDED FOR HUMAN CONSUMPTION.

Keep this and all medication out of the reach of children.

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

DESCRIPTION
Regu-Mate® (altrenogest) Solution 0.22% contains the synthetic progestin, altrenogest. The chemical name is 17 α -allyl-17 β -hydroxyestra-4,9,10-trien-3-one. The CAS Registry Number is 850-52-2. The chemical structure is:



Each mL of Regu-Mate® (altrenogest) Solution 0.22% contains 2.2 mg of altrenogest in an oil solution.

ACTIONS
Regu-Mate® (altrenogest) Solution 0.22% produces a progestational effect in mares.

INDICATIONS Regu-Mate® (altrenogest) Solution 0.22% is indicated to suppress estrus in mares. Suppression of estrus allows for a predictable occurrence of estrus following drug withdrawal. This facilitates the attainment of regular cyclicity during the transition from winter anestrus to the physiological breeding season.
Suppression of estrus will also facilitate management of prolonged estrus conditions. Suppression of estrus may be used to facilitate scheduled breeding during the physiological breeding season.

CONTRAINDICATIONS Regu-Mate® (altrenogest) Solution 0.22% is contraindicated for use in mares having a previous or current history of uterine inflammation (i.e., acute, subacute, or chronic endometritis). Natural or synthetic gestagen therapy may exacerbate existing low-grade or "smoldering" uterine inflammation into a fulminating uterine infection in some instances.

PRECAUTIONS Various synthetic progestins, including altrenogest, when administered to mares during the embryonic stage of pregnancy at doses manyfold greater than the recommended equine dose caused fetal anomalies, specifically masculinization of the female genitalia.

DOSE AND ADMINISTRATION While wearing protective gloves, remove shipping cap and seal; replace with enclosed plastic dispensing cap. Remove cover from bottle dispensing lip and connect lock syringe (without needle). Draw out appropriate volume of Regu-Mate® solution. (Note: Do not remove syringe while bottle is inverted as spillage may result.) Detach syringe and administer solution orally at the rate of 1 mL per 100 pounds body weight (0.044 mg/kg) once daily for 15 consecutive days. Administer solution directly on the base of the mare's tongue or on the mare's usual grain ration. Replace cover on bottle dispensing lip to prevent leakage. Excessive use of a syringe may cause the syringe to leak; therefore, replace syringe as necessary.

Approximate Weight in Pounds	Dose in mL
770	7
880	8
990	9
1100	10
1210	11
1320	12

WHICH MARES WILL RESPOND TO REGU-MATE®
(altrenogest) SOLUTION 0.22%: Extensive clinical trials have demonstrated that estrus will be suppressed in approximately 95% of the mares within three days; however, the post-treatment response depended on the level of ovarian activity when treatment was initiated. Estrus in mares exhibiting regular estrus cycles during the breeding season will be suppressed during treatment; these mares return to estrus four to five days following treatment and continue to cycle normally. Mares in winter anestrus with small follicles continued in anestrus and failed to exhibit normal estrus following withdrawal. Response in mares in the transition phase between winter anestrus and the summer breeding season depended on the degree of follicular activity. Mares with inactive ovaries and small follicles failed to respond with normal cycles post-treatment, whereas a higher proportion of mares with ovarian follicles 20 mm or greater in diameter exhibited normal estrus cycles post-treatment. Regu-Mate® (altrenogest) Solution 0.22% was very effective for suppressing the prolonged estrus behavior frequently observed in mares during the transition period (February, March and April). In addition, a high proportion of these mares responded with regular estrus cycles post-treatment.

SPECIFIC USES FOR REGU-MATE® (altrenogest) SOLUTION 0.22%:

- SUPPRESSION OF ESTRUS TO**
1. Facilitate attainment of regular cycles during the transition period from winter anestrus to the physiological breeding season. To facilitate attainment of regular cycles during the transition phase, mares should be examined to determine the degree of ovarian activity. Estrus in mares with inactive ovaries (no follicles greater than 20 mm in diameter) will be suppressed but these mares may not begin regular cycles following treatment. However, mares with active ovaries (follicles greater than 20 mm in diameter) frequently respond with regular post-treatment estrus cycles.
 2. Facilitate management of the mare exhibiting prolonged estrus during the transition period. Estrus will be suppressed in mares exhibiting prolonged behavioral estrus either early or late during the transition period. Again, the post-treatment response depends on the level of ovarian activity. The mares with greater ovarian activity initiate regular cycles and conceive sooner than the inactive mares. Regu-Mate® (altrenogest) Solution 0.22% may be administered early in the transition period to suppress estrus in mares with inactive ovaries to aid in the management of these mares or to mares later in the transition period with active ovaries to prepare and schedule the mare for breeding.
 3. Permit scheduled breeding of mares during the physiological breeding season. To permit scheduled breeding, mares which are regularly cycling or which have active ovarian function should be given Regu-

Mate® (altrenogest) Solution 0.22% daily for 15 consecutive days beginning 20 days before the date of the planned estrus. Ovulation will occur 7 to 10 days following the onset of estrus as expected for non-treated mares. Breeding should follow usual procedures for mares in estrus. Mares may be regulated and scheduled either individually or in groups.

ADDITIONAL INFORMATION
A 5-year well-controlled reproductive safety study was conducted in 20 pregnant mares, and compared with 20 untreated control mares. Treated mares received 2 mL Regu-Mate® (altrenogest) Solution 0.22% (710 to body weight) (2.2 mg/kg recommended for estrus suppression) from day 20 to day 35 of gestation. This study involved the following data:

1. In filly offspring (all ages) of treated mares, distal size was increased.
2. Filly offspring from treated mares had shorter intercal from Feb. 1 to first ovulation than fillies from their untreated mare counterparts.
3. There were no significant differences in reproductive performance between treated and untreated animals (mares & their respective offspring) measuring the following parameters:
 - interval from Feb. 1 to first ovulation in mares only
 - mean interval from first to second cycle and second to third cycle, mares only
 - follicle size, mares only
 - at 50 days gestation, pregnancy rate in treated mares was 81.8% (9/10) and untreated mares was 100% (4/4); after 3 cycles, 10/12 treated mares were pregnant (83%) and 4/4 untreated mares were pregnant (100%).
 - colt offspring of treated and control mares reached puberty at approximately the same age (82 & 84 weeks respectively).
 - stallion offspring from treated and control mares showed no differences in seminal volume, spermatozoal concentration, spermatozoal motility, and total sperm per ejaculate.
 - stallion offspring from treated and control mares showed no difference in sexual behavior.
 - testicular characteristics (scrotal width, testis weight, parenchymal weight, epididymal weight and height, testicular height, width & length) were the same between stallion offspring of treated and control mares.

REFERENCES Shoemaker, C.F., E.L. Squires, and R.K. Shook, 1989.
Safety of Altrenogest in Pregnant Mares and on Health and Development of Offspring. Eq. Vet. Sci. (9), No. 2: 69-72.
Squires, E.L., R.K. Shook, and A.D. McKinnon, 1989.
Reproductive Performance of Offspring from Mares Administered Altrenogest During Gestation. Eq. Vet. Sci. (9), No. 2: 75-76.

WARNING for oral use in horses only. Keep this and all other medications out of the reach of children. Do not use in horses intended for human consumption.

HUMAN WARNINGS:
Skin contact must be avoided as Regu-Mate® (altrenogest) Solution 0.22% is readily absorbed through unbroken skin. Protective gloves must be worn by all persons handling this product. Pregnant women or women who suspect they are pregnant should not handle Regu-Mate® (altrenogest) Solution 0.22%.

Women of child bearing age should exercise extreme caution when handling this product. Accidental absorption could lead to a disruption of the menstrual cycle or prolongation of pregnancy. Direct contact with the skin should therefore be avoided. Accidental spillage on the skin should be washed off immediately with soap and water.

INFORMATION FOR HAZARDOUS:
WARNING: Regu-Mate® (altrenogest) Solution 0.22% is readily absorbed by the skin. Skin contact must be avoided; protective gloves must be worn when handling this product.

Effects of Overexposure
There has been no human use of this specific product. The information contained in this section is extrapolated from data available on other products of the same pharmacological class that have been used in humans. Effects anticipated are due to the progestational activity of altrenogest.

Acute effects after a single exposure are possible; however, continued daily exposure has the potential for more untoward effects such as disruption of the menstrual cycle, uterine or abdominal cramping, increased or decreased uterine bleeding, prolongation of pregnancy and headache. The oil base may also cause irritation if swallowed.

In addition, the list of people who should not handle this product (see below) is based upon the known effects of progestins in humans on a chronic basis.
PEOPLE WHO SHOULD NOT HANDLE THIS PRODUCT

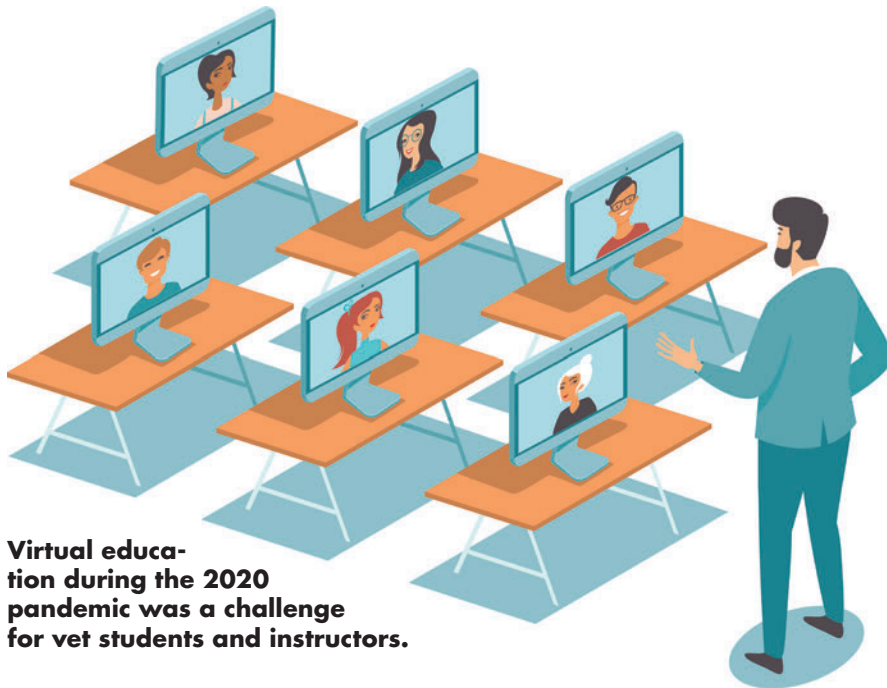
1. Women who are or suspect they are pregnant.
2. Women with thrombocytopenia or thromboembolism.
3. Anyone with a history of these events.
3. Anyone with cerebral-vascular or coronary-artery disease.
4. Women with known or suspected carcinoma of the breast.
5. People with known or suspected estrogen-dependent neoplasia.
6. Women with undiagnosed vaginal bleeding.
7. People with benign or malignant tumors which developed during the use of oral contraceptives or other estrogen-containing products.
8. Anyone with liver dysfunction or disease.

Accidental Exposure
Although it is readily absorbed from contact with the skin, in addition, this oil based product can penetrate porous gloves. Altrenogest should not penetrate intact rubber or impervious gloves; however, if there is leakage (i.e., pinholes, scuffs, etc.), the contaminated area covered by such occlusive materials may have increased absorption. The following measures are recommended in case of exposure:
Skin Exposure: Wash immediately with soap and water.
Eye Exposure: Immediately flush with plenty of water for 15 minutes. Get medical attention.
If swallowed: Do not induce vomiting. Regu-Mate® (altrenogest) Solution 0.22% contains an oil. Call a physician. Vomiting should be supervised by a physician because of possible pulmonary damage via aspiration of the oil base. If possible, bring the container and label to the physician.

Store at or below 25°C (77°F).
HOW SUPPLIED
Regu-Mate® (altrenogest) Solution 0.22% (2.2 mg/mL). Each mL contains 2.2 mg altrenogest in an oil solution. Available in 100mL plastic bottles.

Manufactured for: InterVet Inc., a Div of Merck Animal Health, Kenilworth, New Jersey, NJ 07033
Made in France
NADA # 131-301, Approved by FDA
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Virtual education during the 2020 pandemic was a challenge for vet students and instructors.

workforce treated food animals. This declined to 7% of the workforce by 2007, and today it has further dwindled. Many remaining veterinarians who work with large animals tend to be older practitioners who will likely retire in the not-too-distant future.

The *Canadian Veterinary Journal* (CVJ) posted an op/ed (2018) in which the author (Dr. Bryce Fleming) remarked, “The ever-advancing standard of care combined with the modern concept of personal life balance has created a new standard of professionalism for veterinarians. It is getting nearly impossible to meet current professional expectations anywhere outside of large urban centers. There is an assumption within our own ranks that every case should have specialists with advanced technology and that every veterinarian should be working standardized shifts never to exceed the bureaucratic norm of 40 hours.”

What Are Veterinary Schools Looking For?

For those applying to veterinary school, the AVMA has posted a publication entitled “Vet School Admission 101.” Its opening statements bear repeating

here: “Why are grades important? They indicate intelligence, study habits and dedication and drive to succeed.” The message goes on to say “Veterinary schools are looking for well-rounded students. They’re looking for future leaders. You can make yourself a better candidate by getting good (or great) grades, as well as experience and leadership skills.”

In reply to the aforementioned CVJ op/ed, Dr. H. J. Rumney noted, “I feel that some changes in the admission requirements for veterinary school are warranted. Academic ability is obviously very important, but is a questionable indicator of intellect or intelligence in real-world situations. Students should have a better understanding of the various roles that the veterinary profession plays in the world outside of the urban and academic setting.”

Demographics and Diversity

The Texas Higher Education Coordinating Board compared demographics of students nationwide: In 1999, white students comprised 91% compared to around 79% since 2014. The predominant gender of students now is female. The main focus of graduates is for

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veterinary care of companion animals, especially in urban areas.

Students in the nationwide class of 2024 expressed their desire to practice in a community location of 20% rural, 18% urban and over 60% in the suburbs.

Expansion in student diversity includes outreach to financial and cultural factors, although ethnicity is certainly a major component of diversity. The AVMA is implementing programs to improve diversity outreach to include African-American, Hispanic, Asian and Native American students. The American Association of Veterinary Medical Colleges (AAVMC) is actively working on a national strategic recruitment plan to present veterinary medicine as a

possible career to kindergarten through 12th graders in an attempt to improve diversity and invite more people into the profession. More recruitment efforts by the universities are necessary.

In 2019, the AAVMC reported that students attending U.S. veterinary colleges numbered 71.1% white, 11.1% Hispanic and 2.8% African-American. Clinical faculty is comprised of 10.3% underrepresented people, described by AAVMC as “populations of individuals whose advancement in veterinary medicine has been impacted due to legal, cultural or social climate impediments in the US, specifically by gender, race, ethnicity, geographic, socioeconomic and educational disadvantages.”

There are 101 private and public black colleges or universities (HBCU) in the United States that are accredited. Of these, 17 offer pre-veterinary programs. Less than 1% of the overall national applicant pool for veterinary school comes from an HBCU. Tuskegee University has a higher number of black students than most. The National Association of Black Veterinarians (NABV) is making concerted efforts to increase awareness and to increase the number of African-Americans and other diverse ethnicities within the veterinary profession.

Schools Offering DVM Degrees

There are 30 veterinary schools in 27 states, with Alabama, California and

Summer Vet Student Virtual Research Project

By Maureen Long, DVM, PhD, DACVIM

Editor: Tell us about the summer research you did online with 22 veterinary students this summer.

The students had been selected in February to engage in research under the Florida Veterinary Scholars Program. This is offered to the freshmen. We are funded by Boehringer Ingelheim, which runs the National Scholars Program, plus various other sources.

We had a great summer. The students were in lockdown, but they are enrolled in a course. If there was no enrollment, they would not

have been able to receive financial aid.

So we polled the faculty and asked them if they could modify their research to virtual. The types of research the students performed include what we now call systematic reviews. Three were COVID related.

We had students performing data analysis with big datasets that include parasite burdens of dogs throughout the Midwest and genetic analyses of bacteria. Some of the projects

involved development of computer-assisted diagnostic software for detection of horse head movement and the use of 3-D printed guides to improve accurate placement of fixators in navicular bones of horses.

As a result of this course, all 22 of [the] students wrote manuscripts for publication and gave two professional presentations, one to the College and another to the National Symposium. The presentations were all virtual.

Editor: How did the students cope with the online method of research?

First, the students were fantastic. They were in lockdown and many on their own without any family or ability to see friends. They

were also spread all over the Eastern seaboard. We had twice-weekly meetings within the course. Meeting time was spent with the students and course faculty working to assist students in putting together their manuscripts, posters, data analysis and literature searches. Most faculty met several times a week with students.

The biggest issue was lack of internet consistency, which was important for ZOOM meetings but also very much for the type of research they were engaged in.

Also, the students started with varied computer hardware. These days many work solely on iPads, so several had to buy computers or extra screens to complete their research.

About the author: Dr. Long is a professor of virology/microbiology at the University of Florida. Her teaching and research interests include several equine and large animal infectious diseases, including EIA and West Nile virus.

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In 2019, AAVMC member institutions had a little more than 8,000 applicants for slightly more than 4,000 seats at world-wide vet schools.

Tennessee offering two programs each. These DVM programs are members of the AAVMC. The AAVMC membership includes 44 veterinary colleges and schools around the world, with 30 of them in the United States. The newest U.S. DVM programs are at the Midwestern University in Arizona, which began in 2014, and the Lincoln Memorial University in Tennessee. A three-year DVM program in Tucson just opened at the University of Arizona, with its first class attending in fall 2020.

Other DVM programs currently being developed include the private Long Island University (LIU) College of Veterinary Medicine in New York and Texas Tech University School of Veterinary Medicine. Both have received a “letter of reasonable assurance” that means it is likely that the schools will receive provisional and eventually full accreditation provided they meet the criteria for the plans presented to the AVMA Council of Education. The first DVM students

at LIU begin their program in August 2020; Texas Tech will graduate their first class in 2025.

A report from the Bureau of Labor Statistics predicted that growth in veterinary employment will increase by 18% between 2018-2028. Many in the industry acknowledge the need for more veterinary education to fill the gap created by open veterinary positions with not enough veterinarians to fill the jobs.

Between 2009 and 2016, applicants to U.S. DVM programs remained fairly steady, ranging from 6,143 to 6,789 applications. In 2019, worldwide AAVMC member institutions had over 8,000 applicants for a little more than 4,000 seats. While many U.S. schools have expanded their class size within the capacity of their infrastructure, most programs seat 100-135 students each class. For the class of 2023, U.S. veterinary programs averaged 11 applicants per available first-year seats.

Nearly 80% of 8,152 candidates for

the class of 2024 are first-time applicants; about 18% are applying for the second time; and about 3% are third-time applicants.

Since 1980, available seats for veterinary students throughout U.S. schools and colleges has increased by 2%, and between 2009-2019, seats have increased by 2.4% for first-year applicants. For the 2020 academic year, the total enrollment in U.S. Colleges of Veterinary Medicine is 13,548. In 1980, nearly 70% were male and about 35% female; by 2020, male enrollment averages around 20% with women enrollment exceeding 80% [Annual Data Report 2019-2020. Association of American Veterinary Medical Colleges, Jan 2020; pp. 1-64].

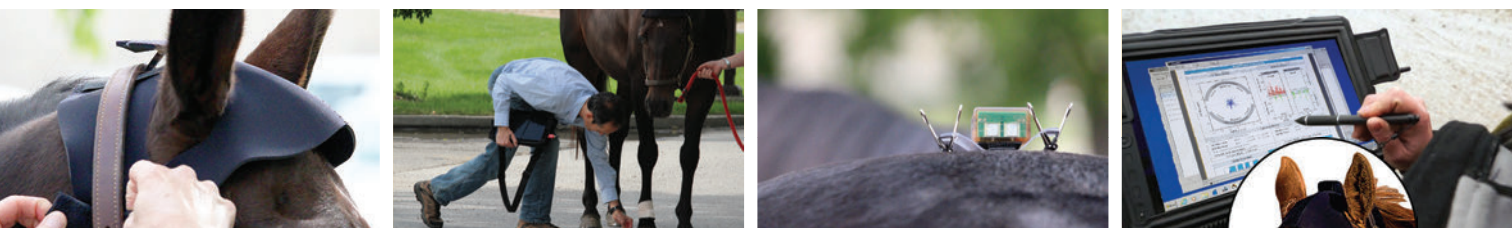
In 2019, a little more than 3,000 students graduated from veterinary schools across the country, with another 1,500 or so graduating from international colleges of veterinary medicine. The U.S. class of 2022 will graduate more than 3,200 students.

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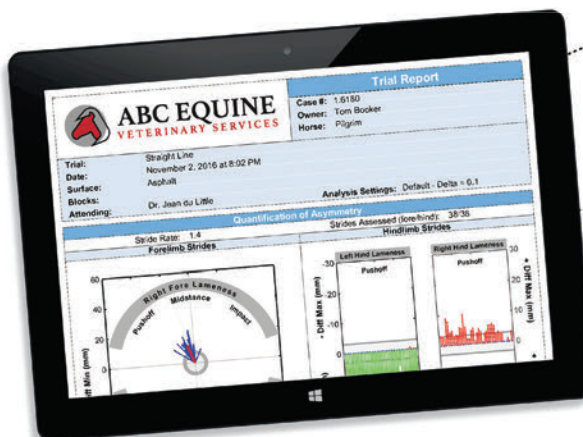
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In 2019, as many as 423 DVM students in the USA enrolled in dual-degree programs that include 66 students in MS/MA; 236 students in Master of Public Health; and 162 students in PhD programs. As an example, Colorado State University offers multiple dual-degree options: DVM + MBA; DVM + MPH; DVM + Toxicology; DVM + PhD; DVM + MS in Animal Science; and Food Animal Veterinary Career Incentive Program. The length of most programs is five years; a PhD is seven to eight years.

Clinical Skills Lab Training

At the Access to Veterinary Care Symposium, students commented that they do not feel prepared for clinical practice. "According to some attendees, the rise of specialists within the veterinary industry has decreased the number of general practitioners in academia and practicing in the field, which has

led to young veterinarians not being exposed to basic care," said Dr. Michael Blackwell, director of the Program for Pet Health Equity at the University of Tennessee-Knoxville, in an interview with *JAVMA News*. "Many veterinary students only learn the gold standard, which doesn't necessarily prepare them to think creatively after graduation when they're practicing, according to some attendees." (To read the entire article, go to AVMA.org and search for "veterinary care for all.")

With this concern in mind, the veterinary schools at Wisconsin and Tufts are providing students the opportunity to practice basic care with animals from low-income owners.

A disquieting experience in vet school 35 years ago centered around having to take dogs from the pound and put them into a clinical shock situation, with the end result of euthanasia. This clinical skills lab on live animals was an inherent part of the learning process of veterinary education decades ago. It was uncomfortable and sad despite the understanding that the experience could help us save many more animal lives over the course of our careers.

Other memories persist of wanting and seeking opportunities to practice suturing live horse tissue, running nasogastric tubes into horses, performing elective surgeries on live animals, experiencing reproductive palpation, castration and a number of basic skills needed to start out in equine practice.

While in vet school in the 1980s, it was difficult to obtain these opportunities as a budding equine practitioner due to the lack of case numbers and the cost of horses, despite only a small percentage of classmates being interested in pursuing equine practice. At the time, it was stated that we would learn many of these skills once at our first job. This put a great burden on potential employers and did little to ensure confidence as a new graduate starting a career as an equine veterinarian.



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Zimeta™ (dipyrone injection) should not be used more frequently than every 12 hours. For use in horses only. Do not use in horses with a hypersensitivity to dipyrone, horses intended for human consumption or any food producing animals, including lactating dairy animals. Not for use in humans, avoid contact with skin and keep out of reach of children. Take care to avoid accidental self-injection and use routine precautions when handling and using loaded syringes. Prior to use, horses should undergo a thorough history and physical examination. Monitor for clinical signs of coagulopathy and use caution in horses at risk for hemorrhage. Concomitant use with other NSAIDs, corticosteroids and nephrotoxic drugs, should be avoided. As a class, NSAIDs may be associated with gastrointestinal, renal, and hepatic toxicity. The most common adverse reactions observed during clinical trials were Elevated Serum Sorbitol Dehydrogenase (SDH), Hypoalbuminemia and Gastric Ulcers. **For additional information, see brief summary of prescribing information on the following page.**

References: 1. Zimeta™ (dipyrone injection). [Full Prescribing Information], Kindred Biosciences, Inc. (Burlingame, CA). Revised: 03/2019. 2. Morressey PR, et al. Randomized blinded controlled trial of dipyrone as a treatment for pyrexia in horses. *Am J Vet Res.* 2019;80(3):294-299.

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**Zimeta™
(dipyrone injection)**

500mg/mL injection
For intravenous use in horses
Non-steroidal anti-inflammatory drug (NSAID)

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

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

Indication: Zimeta™ (dipyrone injection) is indicated for the control of pyrexia in horses.

Dosage and Administration: Always provide the Client Information Sheet with the prescription. Administer Zimeta by intravenous injection, once or twice daily, at 12 hour intervals, for up to three days, at a dosage of 30 mg/kg (13.6 mg/lb). See product insert for complete dosing and administration information.

Contraindications: Horses with hypersensitivity to dipyrone should not receive Zimeta. Due to the prolongation of prothrombin time (PT) and associated clinical signs of coagulopathy, dipyrone should not be given more frequently than every 12 hours.

Warnings: For use in horses only. Do not use in horses intended for human consumption. Do not use in any food producing animals, including lactating dairy animals.

Human Warnings: Care should be taken to ensure that dipyrone is not accidentally injected into humans as studies have indicated that dipyrone can cause agranulocytosis in humans.

Not for use in humans. Keep this and all drugs out of reach of children. In case of accidental exposure, contact a physician immediately. Direct contact with the skin should be avoided. If contact occurs, the skin should be washed immediately with soap and water. As with all injectable drugs causing profound physiological effects, routine precautions should be employed by practitioners when handling and using loaded syringes to prevent accidental self-injection.

Precautions: Horses should undergo a thorough history and physical examination before initiation of any NSAID therapy.

As a class, NSAIDs may be associated with platelet dysfunction and coagulopathy. Zimeta has been shown to cause prolongation of coagulation parameters in horses. Therefore, horses on Zimeta should be monitored for clinical signs of coagulopathy. Caution should be used in horses at risk for hemorrhage.

As a class, NSAIDs may be associated with gastrointestinal, renal, and hepatic toxicity. Sensitivity to drug-associated adverse events varies with the individual patient. Consider stopping therapy if adverse reactions, such as prolonged inappetence or abnormal feces, could be attributed to gastrointestinal toxicity. 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. 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 Zimeta with other anti-inflammatory drugs, such as NSAIDs or corticosteroids, should be avoided. The influence of concomitant drugs that may inhibit the metabolism of Zimeta has not been evaluated. Drug compatibility should be monitored in patients requiring adjunctive therapy.

The safe use of Zimeta in horses less than three years 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 a corticosteroid.

Adverse Reactions: Adverse reactions reported in a controlled field study of 138 horses of various breeds, ranging in age from 1 to 32 years of age, treated with Zimeta (n=107) or control product (n=31) are summarized in Table 1. The control product was a vehicle control (solution minus

dipyrone) with additional ingredients added to maintain masking during administration.

Table 1: Adverse Reactions Reported During the Field Study with Zimeta

Adverse Reaction	Zimeta™ (dipyrone injection) (N=107)	Control Product (N=31)
Elevated Serum Sorbitol Dehydrogenase (SDH)	5 (5%)	5 (16%)
Hypoalbuminemia	3 (3%)	1 (3%)
Gastric Ulcers	2 (2%)	0 (0%)
Hyperemic Mucosa Right Dorsal Colon	1 (1%)	0 (0%)
Prolonged Activated Partial Thromboplastin Time (APTT)	1 (1%)	0 (0%)
Elevated Creatinine	1 (1%)	0 (0%)
Injection Site Reaction	1 (1%)	0 (0%)
Anorexia	1 (1%)	1 (3%)

See Product Insert for complete Adverse Reaction information.

Information for Owners or Person Treating Horse: A Client Information Sheet should be provided to the person treating the horse. Treatment administrators and caretakers should be aware of the potential for adverse reactions and the clinical signs associated with NSAID intolerance. Adverse reactions may include colic, diarrhea, and decreased appetite. Serious adverse reactions can occur without warning and, in some situations, result in death. Clients should be advised to discontinue NSAID therapy and contact their veterinarian immediately if any signs of intolerance are observed.

Effectiveness: The effectiveness phase was a randomized, masked, controlled, multicenter, field study conducted to evaluate the effectiveness of Zimeta™ (dipyrone injection) administered intravenously at 30 mg/kg bodyweight in horses over one year of age with naturally occurring fevers. Enrolled horses had a rectal temperature $\geq 102.0^{\circ}\text{F}$. A horse was considered a treatment success if 6 hours following a single dose of study drug administration the rectal temperature decreased $\geq 2.0^{\circ}\text{F}$ from hour 0, or the temperature decreased to normal ($\leq 101.0^{\circ}\text{F}$). One hundred and thirty-eight horses received treatment (104 Zimeta and 34 control product) and 137 horses (103 Zimeta and 34 control product) were included in the statistical analysis for effectiveness. At 6 hours post-treatment, the success rate was 74.8% (77/103) of Zimeta treated horses and 20.6% (7/34) of control horses. The results of the field study demonstrate that Zimeta administered at 30 mg/kg intravenously was effective for the control of pyrexia 6 hours following treatment administration.

Refer to the Product Insert for complete Effectiveness information.

Storage Information: Store at Controlled Room Temperature 20° and 25°C (68° and 77°F); with excursions permitted between 15° and 30°C (59° and 86°F). Protect from light. Multi-dose vial. Use within 30 days of first puncture.

How Supplied: Zimeta is available as a 500mg/mL solution in a 100mL, multi-dose vial.

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Some vet schools offer ways to learn about animal care without using live animals.

ISTOCK/SERGEY NAZAROV

With today's technology, it is now possible to provide students with learning experiences beyond working on live animals. For instance, clinical skills labs at many veterinary schools use an equine head and neck simulator to practice jugular vein draws, an equine GI tract to practice belly taps, or canine forelegs for insertion of IV catheters. Skin pads allow practice of suture placement and patterns. Plastic limbs provide for practice of bandaging techniques. Computers enable anesthesia simulations, so students learn to correct patient abnormalities as they occur in real time. And besides life-size plastic cows to simulate bovine reproductive tracts and dystocia, a full-size equine simulator allows rectal palpation to familiarize students with the feeling and internal location of intestinal placement, so important for assessment of colic conditions.

Such simulations have multiple advantages—they help students build confidence, relieve anxiety about doing procedures, and help to minimize incorrect techniques before working on live patients. Such simulation labs are available at veterinary colleges at Cor-

nell, Iowa State, University of Illinois, University of Wisconsin, University of Florida, Washington State, Virginia-Maryland, the Ohio State University, Lincoln Memorial and Ross University.

Internships and Residency Programs

About half of new graduates enter private practice (or other veterinary industry pursuits) immediately, while the other half pursue advanced training through post-graduate internships and residencies. Post-graduate training opportunities do not pay well—average salaries for interns or residents range from \$26,000 to \$34,000. Such low wages coupled with educational debt makes these opportunities untenable for many. In 2019, only 28% of veterinary students pursued post-graduate internships—this was the lowest number of interns since 2009.

Companion animal medicine comprises three-quarters of internships. Equine internships make up about 25% and exotic animal internships 1%. For 2020, the total number of intern trainees is 420; the number of resident trainees is 1,228.

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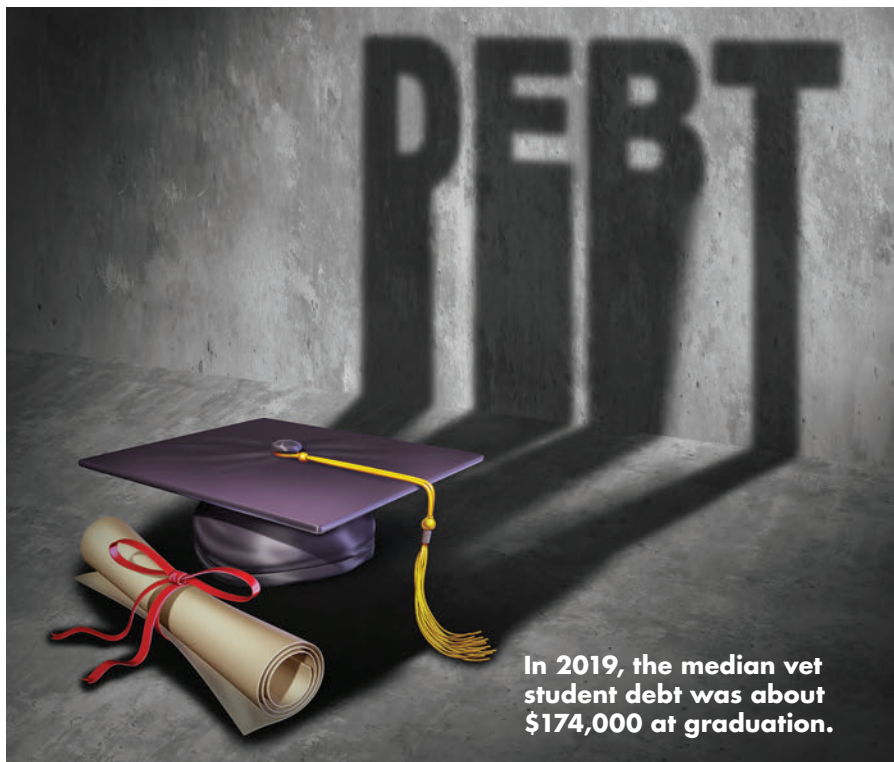
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In 2019, the median vet student debt was about \$174,000 at graduation.

A new bill—the VET MED Act (Veterinary Education and Training Minimizes Educational Debt)—proposed in March 2020 by Reps. Kurt Schrader (D-Ore) and Ted Yoho (R-Fla), can help residents, interns or those in PhD programs to receive a pause in student loan repayment and interest accumulation while they pursue advanced and specialized training. In addition, the Coronavirus Aid, Relief and Economic Security Act (CARES Act) suspended payment and interest on federal student loans through September 30, 2020.

Faculty at veterinary schools has remained relatively constant since 2010, with about 3,800 to 4,500 positions that do not include residents and interns. Of these totals, 18% are tenure or tenure-track faculty, 12.5% are research faculty and 12.8% are administrators.

Gatekeeper aka QPR Training

Despite a lack of previous training in mental health, programs exist for veterinarians and veterinary students to help address the increasing rate of suicides in veterinary medicine, both of students and of practitioners. While availability

of professional mental health assistance is ideal, QPR (question, persuade and refer) training can help as a “gatekeeper” to save lives from suicide.

AVMA, AVMA LIFE and AVMA PLIT have implemented an hour-long, online training program for veterinarians and veterinary students. There is no cost for this program, but only a limited number of QPR training licenses are offered on a first-come, first-served basis for AVMA and SAVMA members.

Tuition

First-year, in-state resident tuition and fees at U.S. DVM programs range from \$20,000 to nearly \$70,000 per year, with an average annual cost around \$35,000. For non-residents, the cost averages \$53,000 (a range of \$38,000 to nearly \$80,000) for the first-year DVM program. Private veterinary schools are markedly more expensive than state schools, with average costs per year of tuition and fees over \$50,000.

Since 2005, tuition and fees have doubled. Within the past decade, in-state tuition has increased by 60%. The AAVMC has posted a website that

provides financial cost information for each U.S. veterinary school and for 11 international schools. Go to aavmc.org and search for “cost of veterinary medical education” for a tool to compare vet schools.

DVM students at several U.S. colleges of veterinary medicine are allowed to establish residency during their first year so that their new residency status enables them to pay in-state tuition for the remaining three years in the professional program. Students applying for residency reclassification must be independent and not receive family support. The schools allowing early residency admission are Washington, California at Davis, North Carolina, Ohio State, Missouri and Illinois.

Debt

There is no way to discuss veterinary school without addressing the “elephant in the industry”—student loan debt. In 2019, the median student debt for veterinary school was estimated around \$174,000 at the time of graduation, with a mean starting salary around \$70,000. By 2025, student debt is expected to reach \$200,000. This kind of debt load also accrues interest over the course of the loan, which can range from \$27,000-\$40,000 on top of the loan repayment.

Currently, only 18-20% of veterinary students are able to graduate without debt, which is a figure that has increased in the past few years compared to earlier in the decade. Still, more than 80% of students will incur student debt by the time of graduation from a DVM program. The debt load for veterinary school graduates has increased three-fold from 2001 to 2018. To pay for veterinary school, about 60% of applicants for the class of 2024 rely on student loans, 18% on family support, 10% will work, and 7% will spend personal savings. Approximately one-third of students borrow \$50,000-\$100,000 while 61% borrow up to \$50,000. Nearly 11% of 2019 graduates have amassed \$300,000 in student loans, and nearly



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1% took loans exceeding a staggering \$400,000.

According to the AAEP, in 2005, those interested in pursuing equine practice numbered 5% of veterinary students; today it is only 1%. A presentation at the 2019 AAEP Annual Convention described a survey that examined why the number of those pursuing equine practice has diminished. Some of this could be attributable to debt versus salary opportunities; some could be due to the on-call lifestyle of equine practitioners or the physical demands of equine practice; some could be based on more urban experiences of veterinary applicants with no focus on large animals.

In 2019, the AAEP surveyed nearly 1,800 veterinarians as to their interest in equine practice. Only 44% (789) said equine practice was their desired career, but of those, 55% (441) said they left, did not pursue or wished to leave exclusive equine practice primarily because of student debt and financial reasons. Graduates reported that 41% are only able to address interest payments on loans with nothing paid toward the principal. A big problem is that repayment rates of loans far exceed the salaries paid to an associate equine practitioner; small animal practitioners are paid considerably more. In the survey, 82% said that their student debt affects their quality of life.

A Texas Higher Education Coordinating Board report pointed out: "To pay off student loans, veterinarians are more likely to gravitate to higher-paying practices dealing with companion animals than they are to lower-paying practices in rural areas of the state."

It seems that there might be a shift from students who must incur student debt to more applicants with other sources of financial support. The AAVMC reported that only about 30% entering for the class of 2024 have debt, with a median debt of \$24,500. Of applicants for the class of 2024 that have limited or no undergraduate debt,

nearly 60% have financial support from family, about 48% earn money working full or part-time; and a similar number receive merit-based scholarships. About 25% are awarded need-based scholarships, and fewer than 5% receive military benefits.

Some possible resolutions for this debt crisis exist. For example, the AVMA Council on Education has accredited several international five- and six-year veterinary degrees, and some U.S. veterinary colleges (such as Iowa State University and Purdue) are accepting students after only two years of undergraduate education instead of the standard four-year pre-veterinary education programs. The new veterinary

Women veterinarians still receive less pay for the same work as their male colleagues, but the gender income gap has dropped from 4% to 3%.

school at the University of Arizona in Tucson is offering a three-year program that runs continuously from the time of start to graduation to enable students to reduce costs of living while in school and also to enter the job (and salary) market sooner than their peers at four-year programs.

The United States Department of Agriculture (USDA) created the Veterinary Medicine Loan Repayment Program (VMLRP), which matches veterinarians willing to work in rural areas with regions identified as high-priority veterinary shortage areas. A veterinarian who services the rural area for three years earns repayment by VMLRP of up to \$25,000 annually of the DVM program loans. For fiscal year 2020, Congress funded \$8 million to this program.

Another option is the Public Service Loan Forgiveness program, which forgives any remaining student debt after 120 on-time payments have been made in conjunction with 10 years of employment at a government entity or non-profit, especially one that provides a public service.

Paychecks

Embarking on a first job is an exciting adventure for a new graduate. Yet mounting student debt looms as a daily concern. In 2019, the mean starting full-time salary was around \$78,000 across practitioners of all species. The COVID-19 crisis of 2020 (and possibly beyond) could radically alter not only salaries, but also the number of available veterinarian positions.

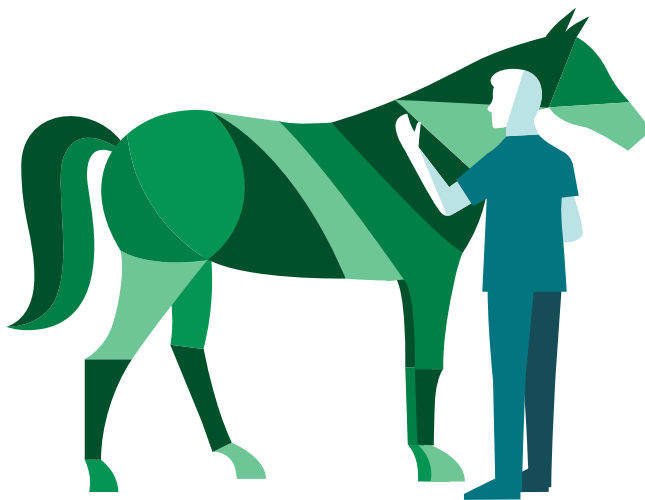
Women are still receiving less pay for the same work as their male colleagues, but the gender income gap has dropped from 4% to 3%, which is an improvement.

The Bottom Line

Veterinary education is continually evolving to meet the challenges of the time. Still, time spent with live horses in real-life settings cannot be replaced by simulation in clinical training labs. Additionally, what students see in equine rotations in veterinary school is often dependent on the time of year of the rotation, as much of equine work is seasonal.

Externships become extremely important as a means to supplement experience and knowledge. Some veterinary schools turn students over to private practices for their fourth-year clinical rotations so they can glean real-life experience—not just caring for the animals, but also dealing with clients and to gain an understanding of how veterinary business works in a private facility or ambulatory practice. Mentoring by experienced practitioners provides an invaluable means of offering veterinary students a broader foundation and practical clinical knowledge. **EM**

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¹ Oertly, et al. The accuracy of Serum Amyloid A in determining early inflammation in horses following long-distance transportation by air. AAEP Proceedings, 2017 460-461.



Many owners don't actually know how much they are feeding their horses each day, and overweight horses are the result.

Feeding Metabolic and 'Easy Keeper' Horses

Here are tips for veterinarians so you can better advise horse owners about feeding these nutritionally at-risk equids.

By Katie Navarra

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Tracking calories, counting points or logging the servings of protein/fruits/vegetables/carbohydrates consumed in a day are part of all human dieting programs. Keeping horses at an ideal weight for their breed, age and level of work isn't all that different—except that it is so tempting to throw horses an extra flake of hay or

another (small) scoop of feed. Convincing horse owners their horses are easy keepers and prone to becoming overweight can be challenging.

For Laurie Lawrence, PhD, one of the best sounds in the world is “munch, munch munch” in the barn. The University of Kentucky professor of equine nutrition feels the pain of horse owners who like to feed their horses and love to

hear their horses chewing happily.

“Some horses will become militant and bang their feed tub when they run out of food,” she said.

Following a strict diet isn't just about controlling weight. Diabetics must watch their sugar levels. People suffering from gout have to avoid certain foods. Similarly, horses diagnosed with mild insulin dysregulation, equine metabolic syn-



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Starting a dialogue is the first step in creating a team approach for establishing a horse's nutritional plan.

drome, PPID or glycogen storage defects require special diets.

“It starts with a conversation about the horse and finding out something about the horse,” said Bob Coleman, PhD, Associate Professor and Equine Extension Specialist at the University of Kentucky. “Instead of guessing, knowing what the horse is eating and what the horse does can guide where to start nutritionally.”

Horse owners might not always be ready for a discussion about changing diets, or they might not know where to start. Lawrence and Coleman offer tips for talking to owners of horses that are easy keepers or have metabolic issues.

Body Condition Evaluation

Having an easy keeper isn't always a bad thing. Depending on the horse owner's situation, an easy keeper can be desirable. Generally, they take less feed or can consume less calorie-dense—often less expensive—feeds, according to Lawrence.

“From an economical standpoint, that is an advantage,” she said. “They may also do better in conditions where resources are scarce. Many easy keeping breeds/types prospered in places with harsh climates or under range condi-

tions where ‘hard keepers’ might not fare well.”

Starting the conversation about nutrition starts with learning about the individual horse, Coleman emphasized. To start the dialogue, he recommended asking the client about the horse. How old is it? What is the horse's activity level? What is the feeding routine like?

“If we have a pasture ornament that doesn't do anything and is an easy keeper, we can use National Research Council nutritional requirements guidelines,” he said.

Coleman said the next step is talking to clients about the importance of getting their hands on their horses. Teaching horse owners to use, and follow, the Henneke Body Condition Scoring system allows them to monitor their horses' condition.

“Encourage them to do this on a monthly basis and to write it down. If they have more than one horse, chances are they won't remember correctly. If they take notes, they can look back and see if a horse was soft over the tail head or if they could feel its ribs,” he said.

The University of Minnesota developed a “Healthy Horse App” for iPhones and iPads to allow owners and professionals to estimate the body weight of

their horses. Coleman contributed input at the development phase, and he says it is one tool veterinarians can encourage clients to use when tracking a horse's health.

Get Specific

The cliché “the devil is in the details” is applicable for developing a nutritional plan for easy keepers or horses with metabolic issues. When you ask your clients for details about rations, get specific.

“People tell me that two horses eat a bale a day,” Coleman said. “A square bale can weigh anywhere from 40 to 60 pounds, so that's not terribly helpful. And how do we know how much they are eating if it's a round bale?”

Feed rations are also often measured in vague terms—the scoop. Does the scoop equal a half-cup or is it five pounds? Many times owners are fortunate enough to not have had problems with previous horses, which makes it challenging to convince them to change their programs. Implementing a new process and taking time to weigh out feed and hay rather than eyeballing the ration can seem like a hassle.

“The conversation needs to be mostly about what the client is doing and why he or she is doing that,” he said. “A lot of owners become very complacent in what they do.”

Once a client is convinced to change, it might not be as easy to get the horse on board. Lawrence said some horses will go on strike, refusing to eat a blend of hay cubes and balancer rather than a concentrate.

“Wait them out,” she said. “It will take about five days, then most capitulate.”

Keeping Up with Changes

Some horse owners are diligent about following recommendations. When their veterinarians, farriers or local extension agents suggest a protocol, these horse owners embrace the advice.

In recent years, a lot of discussions have focused on pasture management for maintaining a “dense” grass crop.

“This advice is fine for cattle and sheep that are heading to market, and for broodmares and foals with high nutrient needs, but it is not great advice for horse owners with easy keeping horses,” Lawrence said. “The plant material in well-managed pastures in central Kentucky has a nutrient value similar to high-quality alfalfa hay.”

Looking at the client’s pasture or asking about the owner’s pasture management plan provides further insight into how best to manage that person’s easy keepers and horses with metabolic issues.

“Part of our problem is that we have done a good job with hay producers producing good hay, and by giving excellent advice on how to create good pasture, now we have horses on pasture that is better and more readily available than what they need,” Coleman said. “In the wild, horses travel a long way to get what they need. Our horses don’t walk very far before putting their heads down to eat.”

Neither Coleman nor Lawrence are suggesting substituting good-quality forage for dusty, moldy rations, but they emphasize the importance of understanding the nutritional content in what is being fed. This is especially important for those who have horses with metabolic issues, as the sugars and starches in grass can trigger a flare-up.

“In the last 10 years or so, our understanding of the different types of equine metabolic disturbances has increased, as have the criteria that are used to classify horses with these issues,” Lawrence said. “Veterinarians need to be familiar with the criteria for horses with mild insulin dysregulation, horses with equine metabolic syndrome or horses with PPID.”

There are also horses with glycogen storage defects, which could be included in metabolic issues.



Modern pastures produce high-quality forage that might be too much for some metabolically challenged horses.

ISTOCK/G. KUCHERA

The criteria for characterizing these issues are evolving with research and with better testing methods.

Equine metabolic issues—especially fat ponies—keep Coleman up at night worrying about laminitis. While some breeds might be more prone to metabolic issues and founder, he stressed the importance of treating every horse as an individual—even if horses are related.

“I had full brothers; one was an easy keeper and he blew his feet off in the pasture,” he said. “It was devastating.”

Getting Horse Owners Involved

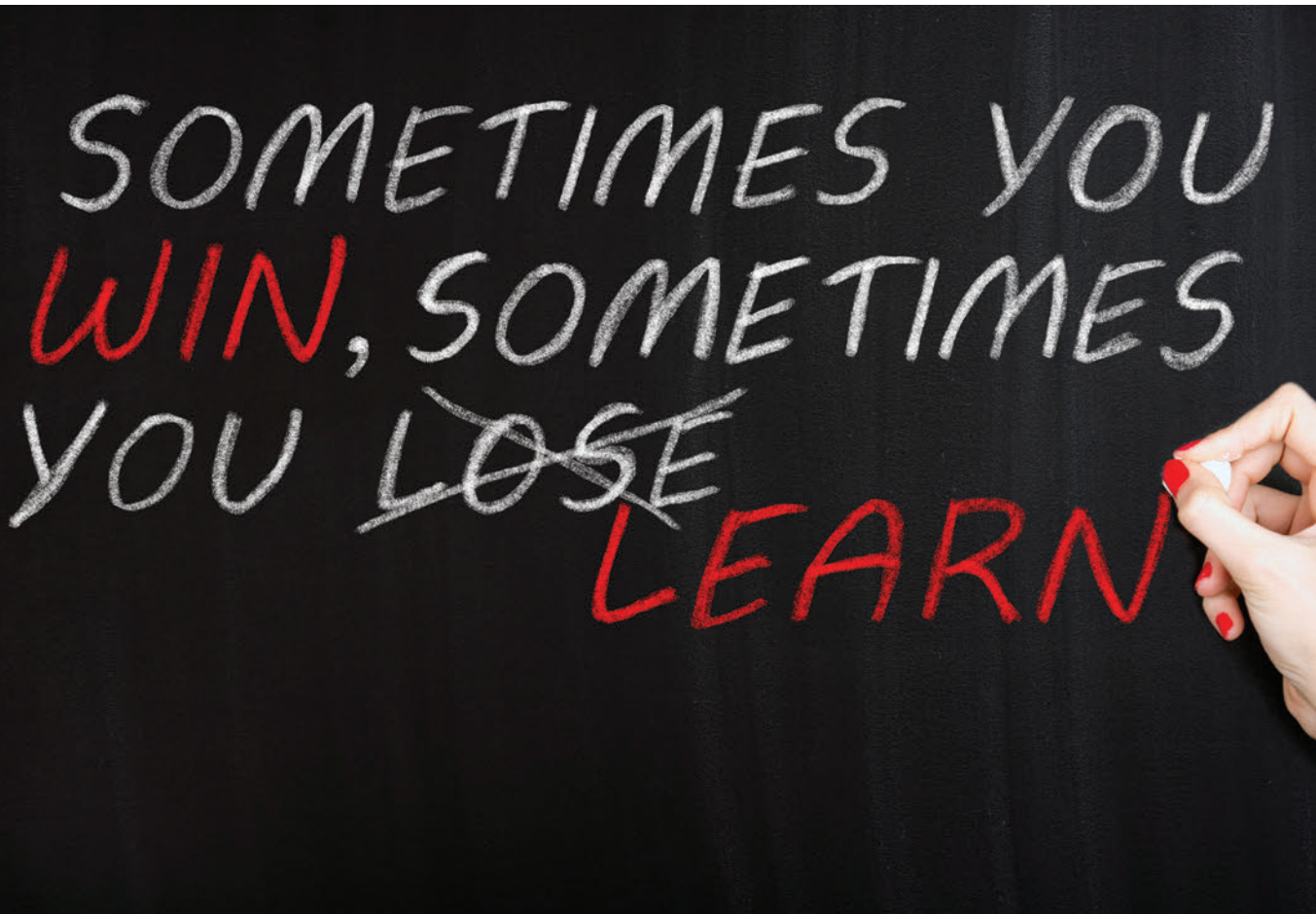
Keeping horses healthy is a partnership between you and the horse owner. Getting the client involved in the horse’s nutrition regardless of whether that person has an easy keeper or a horse with metabolic issues creates opportuni-

ties for quicker responses when a horse’s condition changes.

Vets can recommend customers investigate resources such as extensionhorses.org, an online resource that includes research-driven, university-based, unbiased information on a wide range of topics, including nutrition.

Take-Home Message

Spring and fall visits for equine vaccinations and other routine work are a good time to begin a conversation with owners about the importance of nutrition and a horse’s overall body condition. Caring for a horse is a partnership, Coleman emphasized. Starting a dialogue is the first step in creating a relationship that leads to a team approach in establishing a horse’s proper nutritional plan. **EM**



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How to Embrace and Leverage Growth Mindset

Growth mindset is incredibly powerful and can help you release yourself from the fear that comes along with failure.

By Colleen Best, DVM, PhD, BSCH

As experts in our field, we are accustomed to having a certain level of comfort and confidence in our capacity to provide high-quality care. The uncertainty or worry that comes with a new venture where the learning curve is steep is natural. When we consider expanding into novel areas of care, we might have

increased doubts about our skills or competence, or we might stumble prior to finding our feet. Both of these experiences can be daunting.

As a group, veterinarians are high achievers. We have proven ourselves to be resourceful, intelligent and hard-working individuals. However, somewhere along the way, maybe because we're accustomed to interacting

with so many other high achievers, we have begun to doubt ourselves. Not all the time, of course, but perhaps when faced with a new or particularly challenging situation, we can experience imposter syndrome or overwhelming self-doubt.

One close-held belief that can fuel this doubt is that "fixed mindset" that we have a pre-set amount of knowl-



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One of the most meaningful ways to embrace mindset on a daily basis is to change your self-talk.

edge or aptitude in any given area. If, at any point, we do not succeed, that is interpreted as us hitting the limits of our aptitude. Then, instead of persevering, we take the “hint” and direct our efforts elsewhere.

This reflects a fixed mindset, and it has a number of pervasive and performance-limiting impacts on our professional and personal lives.

What are Fixed and Growth Mindsets?

Carol Dweck is a psychologist who studies the power of people’s beliefs. Her theory of traits states that there are two ways people can view the malleability of a person’s basic characteristics: with a fixed mindset or with a growth mindset.¹

Those with a fixed mindset hold a belief that basic qualities, such as intelligence or musical ability, are fixed and cannot be changed. People with a fixed mindset frequently believe that talent—

not effort—leads to success.

Those with a growth mindset believe that the most basic qualities can be cultivated with hard work and dedication; brains and talent simply provide a foundation.¹

Interestingly, we can hold a fixed mindset for some traits, such as one’s social skills or athletic ability, while holding a growth mindset for others. The power of the mindset we hold is incredible. Dweck’s research has shown that one’s mindset influences one’s capacity for growth, perseverance and willingness to try.² Given the impact of one’s mindset—as well as the fact that we can hold different mindsets for different traits—it is important to question what your beliefs are across different traits and situations.

Mindset and Self-Perception

The mindset that we hold strongly influences how we see ourselves. If we believe that talent leads to success, then if we

struggle to learn a new skill or in a new endeavor, we might quickly perceive that as a failure and, consequently, quit or stop trying.

A growth mindset reduces the fear of trying a new thing, the fear of failing or the fear of making a mistake, because we hold the belief that we can always grow and learn.² This is because one’s sense of self and identity is separate from the outcome.

To a certain extent, growth mindset embodies the Albert Einstein quote “You never fail until you stop trying,” whereas a fixed mindset makes one vulnerable to assaults on one’s sense of self. This is because the outcome of the effort is due to one’s innate capacity for that thing.

For instance, if one considers himself or herself to be an excellent surgeon and holds a fixed mindset about surgical ability, a surgical complication or adverse outcome might be perceived as a threat to one’s sense of self—you’re not



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as good as you thought, you are a failure, you are a bad surgeon. Conversely, if one holds a growth mindset about surgical ability, a failure or unexpected outcome is just that—it is not a comment about one's identity.

Growth mindset facilitates constructive self-talk that is future-focused and centered around learning and doing better going forward. In other words,

you made a mistake, but it's possible to learn from it and do better next time. A growth mindset supports resilience by distancing one's sense of self from outcomes. It keeps one's identity and sense of self more secure and less vulnerable to threat. This is of particular importance in clinical practice, because many things outside of our skill and control influence the outcome of a given patient.

Mindset and Self-Talk

One of the most meaningful ways to embrace mindset on a daily basis is to use it to change your self-talk. We all talk to ourselves far more frequently than anyone else, and yet, often those voices are critical and unsupportive.

When we begin to embrace growth mindset, our self-talk shifts to become more motivating and encouraging.

Consider what you might say to yourself when having a tough time with a new skill.

A fixed mindset might sound like, "I'm bad at this. I'm just going to say 'no' the next time a client calls asking me to do it." Whereas a growth mindset might sound like, "I wonder what I'm missing; maybe I'll call the vet school and see what advice they can give me so I can do better next time."

It might seem like a simple reframe, but when we label ourselves as not good at things, or select away from trying, it can be because we have a fixed mindset. Another shift would be to move from "stifle injections are so easy," which is focused on the outcome, to "my hard work is really paying off," which focuses on the process.

Using Growth Mindset with Clients

Another way to leverage your knowledge of mindset is to use it to contribute to your understanding of interactions with others. One's mindset can act as a lens through which we interpret the actions and intentions of others, just like the mindset we hold of ourselves influences how we view our effort and its outcomes.

Specifically, the mindset one holds influences how one perceives another's actions and motivations.¹ If we hold a fixed mindset about a given characteristic held by a client or colleague, then we are unlikely to believe they are able to change. *As a result, it's less likely that you would dedicate time or energy to teaching that individual because you don't believe change is possible.* In these situations, it's





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Hints and Tips for Metacarpal and Metatarsal Ultrasonography

by Laura Quiney BVSc MRCVS

The metacarpal and metatarsal regions are common sources of pain causing lameness. Ultrasonography is an important imaging modality for the assessment of the soft tissue structures of these regions. However, the diagnostic value of this modality is patient, machine, and user dependent. The aim of this article is to provide practical 'hints and tips' that can improve image quality and therefore the diagnostic value of ultrasonography.

Patient

Good tissue penetration of ultrasound waves is hugely influenced by the transducer-patient interface. Clipping the hair coat, degreasing the skin and applying gel liberally is appropriate for most horses.

- Image quality improves over time as a result of 'soaking in' of the gel. To ensure good image quality from the start, apply gel 5 minutes before starting.
- If clipping is not an option or not required (e.g. Standardbred in summer), apply isopropyl alcohol liberally to a debris-free hair coat. Ensure that the transducer is cleaned with a damp cloth after use.
- Thick-skinned cobs pose an ultrasonographic challenge. Prepare the area carefully and leave the gel to soak in for as long as possible (minimum 15 minutes), with reapplications.

Machine

A high-frequency linear transducer will produce images of high resolution and therefore achieve the best image quality. To optimise image quality, the following functions should be changed for the evaluation of each structure in turn:

- Depth – alters the depth of image displayed. The structure under scrutiny should fill the image as much as possible, up to a maximum of 75% of the image area
- Frequency – high frequencies give the best resolution at the cost of reduced depth of penetration, and vice-versa for lower frequencies. Choosing a high frequency is ideal for superficial structures such as the flexor tendons, however the depth of penetration may be inadequate for imaging deeper structures such as the suspensory ligament, which may require a lower frequency to be selected
- Focal zone position – the focal zone should be positioned at the level (or just below) the structure being scrutinized.

This improves image resolution

- Gain – the manual alteration of amplification of signal. Avoid overly dark (may lead to missed information) or bright images (amplifies 'noise' and reduces contrast). Scanning in a dark environment will allow optimal gain settings to be chosen; scanning in brightly lit areas should be avoided where possible
- Time-gain-compensation – gain alteration at different image depths. Use this function to ensure that there is an even brightness from the top to the bottom of the image

Imaging the tendons

Using a standoff pad is essential for evaluation of the palmar/plantar border of the superficial digital flexor tendon, and the overlying fascia and skin (Image 1). Off-incidence artefact occurs when the transducer is not perpendicular to the tendon fibers (i.e. tilted) whilst held in transverse section. The tendons will appear artefactually hypoechoic (Image 2). However, this artefact can be usefully employed:

- The paratenon and any surrounding fascia, fat or peritendinous fibrosis will remain bright, aiding identification of the borders of an indistinct tendon
- Abnormal tissue such as fibrosis or scar tissue will remain bright, whereas normal tendon will become hypoechoic. This can be a useful technique to employ in follow-up, chronic, or acute-on-chronic cases.

Imaging the suspensory ligament

The suspensory ligament is a relatively deep structure. As such, optimised machine settings (as above) are an important first step.

- For the forelimb, place the transducer at the palmar aspect of the limb, pointing towards the dorsal aspect, for both transverse and longitudinal images (Image 3)
- For transverse hindlimb images, avoid shadow artefacts from the fourth metatarsal bone by placing the transducer on the plantaromedial aspect of the limb, pointing dorsolaterally
- For longitudinal hindlimb images, place the transducer on the plantar aspect, pointing dorsally. From this position, a slight medial shift of the transducer may be required
- A standoff pad is not generally necessary, and may degrade image quality as a result of increased transducer-structure distance



Image 1 - Transverse image of the superficial digital flexor tendon (SDFT), deep DFT (DDFT) and accessory ligament of the DDFT (ALDDFT). A standoff pad (*) has been used to improve visualization of the SDFT palmar border and overlying fascia and skin.

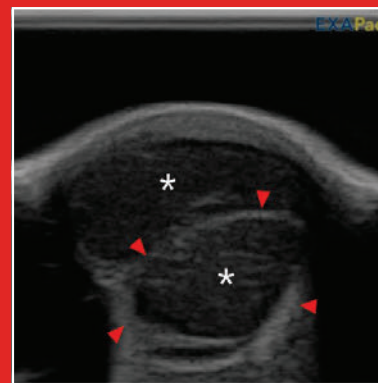


Image 2 - Off-incidence transverse image of the normal superficial and deep digital flexor tendons of a horse free from lameness. They are artefactually hypoechoic (dark; *) whilst the surrounding fascia and paratenons remain echogenic (bright; arrowheads).

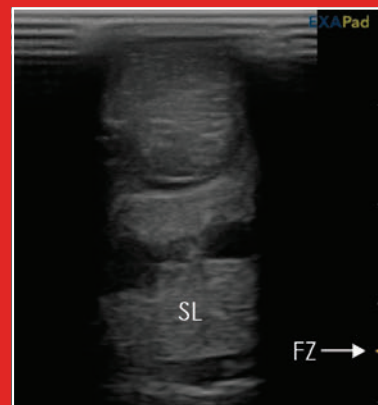


Image 3 - Transverse image of a normal front suspensory ligament (SL) of a horse free from lameness. Correct machine settings are essential for achieving good image quality. Note the position of the focal zone (FZ), which has been correctly positioned at the bottom of the SL.

much easier to try and work around the client's behavior instead of working with the client to gain new skills.

Further, the perception that an individual is unlikely to change might make it more likely that we will dislike him or her as a person, instead of disliking the behavior. Over time, this can erode relationships and influence how we feel about our workplaces and our clients.

Instead, if we hold a growth mindset, then we remain more open to working with others, we are more open to supporting those individuals toward mutual success, and we are more tolerant of mistakes and patient in the face of struggle. *Thus, if a growth mindset is adopted, not only are you increasing your own resilience, but also your compassion and patience towards those around you.*

Consider Your Own Mindset

The concept of growth mindset can be deceptively simple. One of its advantag-

es is that the main thing you can do to adopt a growth mindset is to learn more about it (check out Carol Dweck's TED talk or book for more information).

In order to best leverage the power of growth mindset, some self-reflection and awareness goes a long way.

When I look back, I see a long history of fixed mindset—I used to avoid playing competitive sports because I wasn't good at them. I avoided pathology as much as I could in vet school because I struggled with histology. I certainly passed along as many repro calls as I could. At the time, I told myself I was stewarding my energy and focusing on what I liked. While that was true, it's also true that I didn't like those things because I "wasn't good at them," and I didn't think I ever would be.

Over time, I have grown better at reframing my thoughts and focusing on effort, not outcome. I actively remind myself that I can grow and learn a given

skill if I so choose. My self-talk has changed.

Take-Home Message

Growth mindset is incredibly powerful. When we truly believe that we can do anything we set our minds to, we release ourselves from the fear that comes along with failure. We are able to try and try again until we meet our goals. We open doors that we might have closed long ago, or never opened. What would you try if you knew you couldn't fail? **EM**

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Veterinarians should be prepared to work with other professionals when caring for a client's horse.

One Horse, Many Partners

Navigating relationships with clients and other professionals can prove to be more challenging than diagnosing and treating a horse.

By Katie Navarra

Equine medicine is nearly as specialized as human medicine. Advances in equine veterinary care have opened up countless opportunities for individuals to focus on a specific area of horse care—from sports medicine to orthopedic surgery, integrative medicine, ophthalmology, podiatry and more. General care practitioners play a critical

role in maintaining a horse's health and soundness, but they might have cases that require multiple practitioners to work together on one horse.

Prior to becoming the Equine Safety Director at Keeneland, Stuart E. Brown II, DVM, spent 30 years working at Hagyard Equine Medical Center in Lexington, Kentucky. He, too, often had situations that required working closely

with multiple practitioners, whether it was to find a nutrition solution for a senior horse, a horse with renal disease, soundness issues or other complications. He compared his role as general practitioner to that of the doctor who delivered him as an infant and cared for him through adulthood.

“Without fail, he always showed up in the emergency room, or after surgery for

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Creating a network of practitioners you trust can offer insights into challenging cases and increase the options for care.

a broken arm, or when I was recovering from mono,” Brown said. “I was always impressed by that. As vets, the role of the general practitioner is even more important in horse health—not just the level of care, but in making good economic care for their horses.”

Tracy Turner, DVM, MS, DACVS, DACVSMR, routinely works with professionals from multiple disciplines through his Minnesota-based ambulatory practice, which concentrates on sports medicine and sports surgery. Farriers, chiropractors, acupuncturists, equine dentists, body workers, modality therapists who offer pulsed electromagnetic field therapy and functional electrical stimulation and others might be part of a team effort for one horse.

“With multiple eyes on a horse, it is hard to miss anything. It also brings different perspectives on assessing and treating a problem,” said Turner.

Kim Henneman, DVM, DACVSMR (EQ, K9), FAAVA, DABT, CVA-IVAS, CVA-ACVA, completed her internship in Ireland in the 1980s. She said many interactions played out exactly as James Herriot shared in his tales as a rural veterinarian. But that is not universally the case. In her experience as a sports medicine specialist using integrative therapies, practitioners in New England are more willing to communicate and collaborate than out west. Regardless of location, the key to success, she said, is communication.

“Being able to ask about a perspective and where someone is coming from is the foundation for having a great relationship and collaborating on many cases,” she said.

Navigating relationships with clients and other professionals can prove to be more challenging than diagnosing and treating a horse.

However, creating a network of practitioners you trust can offer insights into challenging cases and increase the options for care. In this article, Brown, Henneman and Turner offer advice for interacting with other practitioners.

Developing Relationships

Coordinating effort among multiple people requires time. Time is a commodity that has a limited supply, so you might have to rely on an owner or trainer to make contact, according to Turner. But when that occurs, issues or findings might be lost in translation.

“Owners and trainers often have their own professionals they want you to work with, and you often find there is a wide variation in the skill level of these different practitioners,” Turner said.

Trust and a commitment to teamwork are essential to best serving the horse and client. Those two elements come



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from getting to know other practitioners through work and casual situations.

Attending equine competitions, local clinics and charity events provides the opportunity to meet practitioners who share similar interests. Participating in events close to your geographic location offers endless opportunities to interact before a case arises.

“I have developed relationships with others who are not reticent to call me and say ‘I’ve had experience with this; I know it’s not what we discussed, what do you think?’” Turner said. “I always trust those people and think about what I can learn from them, too. Horses keep us really humble. You have an opportunity to learn something new every day.”

Not all interactions will occur after you’ve gotten a chance to know someone. Sometimes owners or trainers request that their veterinarians work with another professional. You have to decide if the collaboration can be successful.

Turner has a “smell test.” If a situation does not feel right, he walks away. He avoids situations with a potential for compromising his ethics or integrity. Gut instincts are rarely incorrect. When a scenario doesn’t sit well, consider gracefully bowing out.

“I politely walk away with the simple statement that I am not the veterinarian for them; don’t get into discussions about ‘whys,’” he said. “A veterinarian can spend a lifetime building a reputation for integrity and honesty only to have it smashed by stepping into a situation that does not ‘smell right.’ Do not compromise your personal ethics. No one can make you do something you don’t think is right.”

Differences of Opinion

Differences of opinion make the world turn. It can be an opportunity to learn something new or try a new treatment, but it can also create contentious situations. Before reaching out or agreeing to work with another practitioner, ask yourself, “Can I have a discussion with this person if we have a conflicting ap-

proach to treatment and diagnosis?”

“The tricky part is being able to have differences without it becoming personal and without one person thinking a different approach to treatment or diagnosis is a personal slight,” said Henneman. “The reason you get called in by owner, who is the ultimate arbitrator, is because they want more information to make a decision about the care of their horse.”

Turner said that putting the horse’s welfare and performance goals first opens up opportunities for working with other providers who perform a variety of therapies. He prefers to maintain the leadership in the overall medical well-being of the client’s horse, and he keeps a list of providers with whom he has worked successfully in the past.

“Many owners are very willing to use individuals we have worked with successfully before,” said Turner. “That reduces those uncomfortable conversations. When these disagreements occur, I educate the client as to my position, why I have the opinion I have and why I think that is best for their horse. This strategy has not failed me yet.”

When a client asks Henneman to work on a horse that is seen by another practitioner, she asks for permission to contact the individual and request the horse’s records for a more thorough picture of the horse’s health history.

“Many clients have been derided for using integrative medicine and have asked me not to contact their other vet,” she said. “Ultimately, I’m here for the horse, and if the client gives me permission, I will try and communicate.”

It might be difficult to accept, but just because you might be willing to connect doesn’t mean the other professional will return the effort. Henneman reaches out twice via phone with other practitioners to connect on a shared client, and if no response is received, she proceeds without that person’s input.

On the flip side, Brown said there might be times he has driven people crazy over his level of communication

because he can’t help but follow up, follow up and follow up. It also builds in regular intervals for regular assessment to see how well the approach you’re taking is working or if it should change.

Understanding differences in communication styles and preferences is also part of the equation. While some prefer text or digital dialogue, others appreciate a phone call or in-person conversation. Not understanding how the other people involved in treatment like to share information can create tensions. There also might be the need to compromise on both sides—a blend of virtual and personal conversations.

“Those of us who grew up without internet tended to call on the phone and talk, whereas millennials grew up with texting and visual communication,” Henneman said. “The processing of information is very different.”

The Horse’s Health

Conversations with owners about a horse, the owner’s/rider’s expectations and desires, and engaging with the owner/rider in regard to that horse creates a foundation for a solid relationship with clients. People like to talk about their horses; simply listening can build a stronger relationship with them.

“Conversations with other professionals can do the same in building rapport,” said Turner. “Discussions of education and experience are helpful, but it is important to have knowledge on many topics. So a veterinarian needs to be well-versed in all these topics—farriery, chiropractic, acupuncture, therapeutic devices, etc.”

The horse’s welfare and general health should always be the priority, but Henneman emphasized the importance of remembering that the horse and its owner come as a package deal.

“Sometimes there is even conflict about what is good for the animal and what the owner wants,” she said. “But we have to remember they come as a package, and we have to work through that, too.” **EM**

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The therapeutic properties of honey depend on the type of honey used. Not

Honey used should be medical grade, which is filtered, gamma-irradiated and produced with controlled standards of hygiene.

all honey is equivalent. Manuka honey, derived from the New Zealand tea tree/

bush, has the greatest degree of antimicrobial properties. Other medically useful honey comes from other sources: strawberry-tree honey of Sardinia; lotus honey in India; and honey from the Jirdin valley of Yemen. In addition, the honey used must be medical grade, which is filtered, gamma-irradiated and produced under carefully controlled standards of hygiene. Food-grade honey often contains non-filtered particles and spores such as *Clostridia*, which is killed by gamma radiation.

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— Michael Stewart, DVM



has anti-inflammatory properties that can reduce wound exudate. The moist environment provided by honey helps with autolytic debridement. Its osmotic nature (80% sugar) pulls edema fluid from the tissue, while also pulling lymph into the area to contribute proteases that assist debridement.

In addition, it is thought that honey enables conversion of inactive plasminogen to plasmin, an enzyme that breaks down fibrin that tethers fibrotic and necrotic tissue to a wound bed. The osmotic effect also inhibits bacterial growth.

Wounds that don't smell good often release ammonia and sulphur compounds produced as bacteria metabolize protein. Honey provides bacteria an alternative energy source that minimizes production of these malodorous substances.

Some key properties of honey are important for wound resolution:

- The acidic nature of honey—pH 3.2-4.5—inhibits bacterial growth and assists macrophages in bacterial destruction.
- Glucose oxidase enzymes produce hydrogen peroxide (inhibine), which is an effective antibacterial. The hydrogen peroxide produced is about 1,000 times less than the concentration found in commercially available 3% hydrogen peroxide solution, so it can exert antimicrobial action without fibroblast or tissue damage.
- Honey aids in proliferation of B and T lymphocytes and activation of phagocytes.
- Honey is effective at reducing formation of biofilms.
- Manuka honey has an additional phytochemical anti-bacterial component, methylglyoxal [AIMS Microbiology

2018, 4(4): 655–664. DOI: 10.3934/microbiol.2018.4.655].

- The viscous nature of honey forms a barrier to protect wounds from cross-contamination.

Honey is recognized as having an inhibitory effect against 60 bacteria as well as some fungi and yeast. A study in the Netherlands investigated two formulations of medical grade honey (MGH) *in vitro* against two common skin bacteria: *Staphylococcus* and *Pseudomonas* isolates. One of the two formulations contained Manuka honey, which exerts

Honey is recognized as having an inhibitory effect against 60 bacteria as well as some fungi and yeast.

antimicrobial effects from methylglyoxal; the other formulation exerts antimicrobial activity from hydrogen peroxide [Cremers, N.; Belas, A.; et al. *In vitro* antimicrobial efficacy of two medical grade formulations against common high-risk methicillin-resistant staphylococci and *Pseudomonas* spp. pathogens. *Veterinary Dermatology* 2019; DOI: 10.1111/vde.12811].

Both formulations were effective against these bacteria in regard to both minimum inhibitory concentration and minimum bactericidal concentration. The report stated: “Besides its antimicrobial effects, honey also possesses good wound-healing properties and stimulates tissue growth, has immunomodulatory effects, resolves inflammation, enhances angiogenesis and

epithelialization, and minimizes scar formation.”

Because many infected wounds contain multiple bacterial strains, it is important that the antibacterial agent used has a wide spectrum of activity. Honey was able to fulfill that criteria in this study.

A study in horses examined healing with use of honey on surgical lacerations to minimize infection and dehiscence [Mandel, H.H.; Sutton, G.A.; et al. Intralesional application of medical grade honey improves healing of surgically treated lacerations in horses. *Equine Veterinary Journal* 2020, vol. 52, pp. 41-45; DOI: 10.1111/evj.13111]. The study compared a single intralesional application of medicinal grade honey (MGH) on 69 horses and healing of 58 control horses given no treatment.

Wounds were cleansed and debrided prior to primary closure. The MGH sterile gel was applied intrawound, either a) directly to subcutaneous tissue along the laceration length prior to wound closure; or b) by syringing of gel through an opening left in the proximal or distal part of the wound. The control horses did not receive MGH.

The researchers concluded: “Intralesional application of MGH significantly improved healing, with more wounds reaching complete healing, less signs of infection and higher practitioner satisfaction in the MGH-treated compared to control horses.”

Take-Home Message

With increasing development of multi-drug-resistant bacteria, use of an alternative antimicrobial agent such as medical grade honey has value in treating contaminated or infected wounds in horses. **EM**

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Instead of access to a free-choice buffet, today's horses are fed on a schedule, leaving the stomach empty at times.

Helping Horse Owners Understand Gastric Issues

Veterinarians as trained observers can help horse owners recognize stressful situations in individual horses and offer advice on how to counteract these problems.

By Katie Navarra

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The horse's gastrointestinal system is a beautiful one when allowed to function as intended—in an environment where horses are almost constantly eating. Because their stomach is expecting that food, it is constantly secreting acid. Instead of access to a free-choice buffet, most horses today are fed a couple of times a day, leading to a buildup of acid that can lead to gastric

ulcers. Helping horse owners understand gastric issues is key to developing a plan that supports a healthy gastrointestinal system.

“Much of it boils down to the fact that many horse owners are really unaware that gastric ulcers could even be a big issue,” said equine nutritionist Katie Young, PhD. “There are so many situations where gastric ulcers may not be the first thing that pops into a horse owner's

head until they realize that ulcers can cause symptoms like a poor attitude, poor hair coat or crankiness when the girth is tightened.”

Equine nutritionist Clair Thunes, PhD, agreed that when ulcers are questioned as the cause of “problems,” the diagnostic step of endoscopy is often skipped in favor of going directly to treatment. Little regard tends to be given to what triggered the flare-up.

But unless the likely cause is identified, the chances for recurring issues are higher.

Treating ulcers isn't cheap, with one round of medication costing close to \$1,000. Thunes recently had a client treat a horse for ulcers for the second time this year. The client's expenses were at nearly \$2,000, yet the horse was never scoped, so there was no definitive diagnosis. The horse did scope clean after treatment, but the owner was uncertain the horse had ulcers in the first place. Additionally, the underlying issue hasn't yet been identified, so if it was ulcers, chances are they could return.

"The preventative part is really important," Thunes said. "If a horse is being treated, you've bought yourself a month, maybe two, to try and figure out what things have to change to reduce the risk of a recurrence."

Sometimes the cause will be obvious. For example, if someone buys a horse,

ships it across the country and finds the horse didn't handle the travel well, Thunes said the gastric issues are likely caused by the stress of travel and the new environment and hopefully will respond to treatment.

However, if a horse has lived in the same barn and experienced the same routine for extended periods of time and has gastric issues, it is time for the veterinarian to have a conversation with the owner and to dig a little to try and find the cause.

Accurate Diagnosis

In mid-August, Equine Veterinary & Dental Services, Pty. Ltd. (EVDS) in Australia posted on Facebook: "For the second time in a fortnight this week, our gastroscopy service at EVDS has proved that not every horse with symptoms of gastric ulcers should simply be treated without evidence through scoping."

Young distinctly remembers the post

because she hears many cases where the decision is made to skip the scope and instantly treat for ulcers. Turns out the EVDS patient had a gastric impaction, which they dissolved with 4.75 liters of diet coke given over three tubings and four hours.

"If they had just gone ahead and treated for gastric ulcers, they would not have addressed the real issue," Young said.

Last summer, Thunes also had a client with a horse exhibiting classic ulcer symptoms. Instead of starting in with medication, she explained that \$300 to scope the horse and confirm the issue was prudent for budgetary and treatment reasons. Turns out the horse had delayed gastric emptying. Even though ulcers were the most obvious issue believed to be causing the problem, confirming the diagnosis meant the horse got a better treatment and saved the client money.

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The advertisement features a large background image of a rider on a brown horse in an outdoor setting. A circular graphic with a rainbow border is overlaid on the horse's head. In the bottom right corner, there is a smaller image of a white and green bag of Forage First GS. The bag has the text "FORAGE FIRST EQUINE NUTRITION" at the top, "GS" in a large font, and "SUPPORTS GASTRIC HEALTH" below it. A silhouette of a person with a horse is on the bag. The words "Feed Success" are written in a white, cursive font across the bottom right of the advertisement.



Looking at management practices to reduce the stress in a horse's life is important in avoiding gastric issues.

“Educating the client on why they are spending money for the scope and explaining the importance of knowing what you’re dealing with leads to better, often more cost-effective outcomes,” Thunes said. “When I’ve had that conversation, most clients understand why they need it.”

The Unexpected Ulcer Case

Clients who recognize the risk for gastric issues are taught to expect them in horses that are nervous or anxious. Communicating to customers that even the most easy-going, laid-back horses can experience ulcers is important for keeping horses comfortable.

As an example, Young cites her riding student’s Haflinger pony. Although Haflingers are not known as a nervous breed, he was diagnosed with gastric ulcers after several mild colic episodes.

This easy keeper’s diet is primarily hay with a ration balancer. Pasture is not a good option, as the pony is extremely prone to obesity. While limiting his intake, she uses a hay net with the smallest openings available so his meal lasts longer to limit the amount of time with no feedstuffs in his gut. He also receives a supplement that buffers stomach acid.

Another alternative is recommending

that clients use a tool such as the IFEED Naturally system, according to Thunes. The electronic feeder is programmed to drop predetermined amounts of pelleted or textured feed at specific times.

“Then the client is not dependent on having to hire a barn manager or someone go and put out additional feed or hay,” Thunes said. “It can feed the horse a lot more often while controlling the quantity fed.”

Anything that keeps horses eating longer is a plus.

Thinking about the nutrients within each meal is another approach to supporting horses with gastric issues. Thunes said that starch can ferment in the stomach and the volatile fatty acid bioproducts of that process are acidic.

“That’s why high-starch diets tend to lead to ulcers,” Thunes said. “Moving to a fat- and fiber-based diet, especially for horses that need more calories, helps buffer acid.”

Alfalfa is high in calcium and protein, both of which buffer the stomach. Thunes recommends limiting alfalfa to 25-30% of the overall diet to control protein intake and maintain a good calcium-to-phosphorus ratio in the ration. Alfalfa is also higher in calories than most grass hays, so intake might need to

be controlled in easy keepers.

Finding a supplement for buffering acid is also helpful. Some buffers, such as those with calcium and magnesium, are designed to raise the pH of the stomach so it is less acidic. With a less-acidic environment, the gut wall won’t corrode.

Another approach is using a coating agent containing aluminum, such as Maalox, to coat the lining of the stomach and protect against corrosion. Other supplements such as Seabuckthorn berry pulp can help, she said.

Acidity is especially problematic when working horses on an empty stomach.

“It’s important to educate clients about not exercising horses with an empty stomach, which results in acid splashing around,” Thunes said. “Having some amount of fiber in the stomach before horses are worked is good idea, as it creates a barrier. It can be as simple as offering a ½ scoop alfalfa pellets, a flake of hay or a handful of buffering supplement while grooming.”

Young added that veterinarians should also consider talking to clients about ulcers in a horse that is a “hard keeper” or one that has unexplained weight loss without other symptoms, because it might have ulcers.

“That’s when you may want to check

with a nutritionist,” Young said. “If you evaluate a horse’s feeding program and the diet is providing more than enough calories to support body weight and performance, the teeth have been checked, fecal count reveals no significant parasite load, but the horse is still losing weight, the poor condition may be due to ulcers.”

Getting beyond nutrition to look at management practices to reduce stress in a horse’s life is also important in avoiding gastric issues. Vets might suggest keeping horses on a consistent turnout and exercise schedule and using omeprazole before and during a horse show when they think it is appropriate for a specific horse, according to Young.

Minimizing stress at a horse show isn’t easy. Encouraging clients to provide “normality” away from home can help, said Young. For example, feeding the horse at the same time and stabling near other horses it is familiar with might help reduce off-property stressors.

The Perfect Storm

The horse’s gastrointestinal system relies on a delicate balance that works well in nature, but it can be dramatically impacted by domestic management practices. Because the horse’s stomach continuously produces hydrochloric acid, it relies on food as a buffer.

“Veterinarians know that when a horse is grazing, there is grass and forage in the stomach pretty much all the time, which helps buffer the acid,” Young said. “Today horses don’t usually have that luxury. During extended periods of fasting between meals, the pH of the stomach becomes highly acidic, and that increases the risk of gastric ulcers.” That needs to be explained to owners.

Looking beyond the diet and daily management practices can also give clues to whether a horse is suffering from gastric ulcers. Thunes emphasized the importance of veterinarians asking whether the horse’s work has changed,

whether the horse has exhibited any lameness or maybe is even suffering from saddle fit issues.

Looking to the horse’s environment is critical, and veterinarians can assist in this process. Does a horse feel threatened by its neighbor? Are horses competing for hay, water or space?

“I’ve have had to move horses because they keep picking at each other all day long,” Thunes said. “I’ve worked with owners who don’t necessarily see it because they think it is normal, and they don’t realize it’s a source of stress. Finding what makes that horse feel comfortable is important.” **EM**

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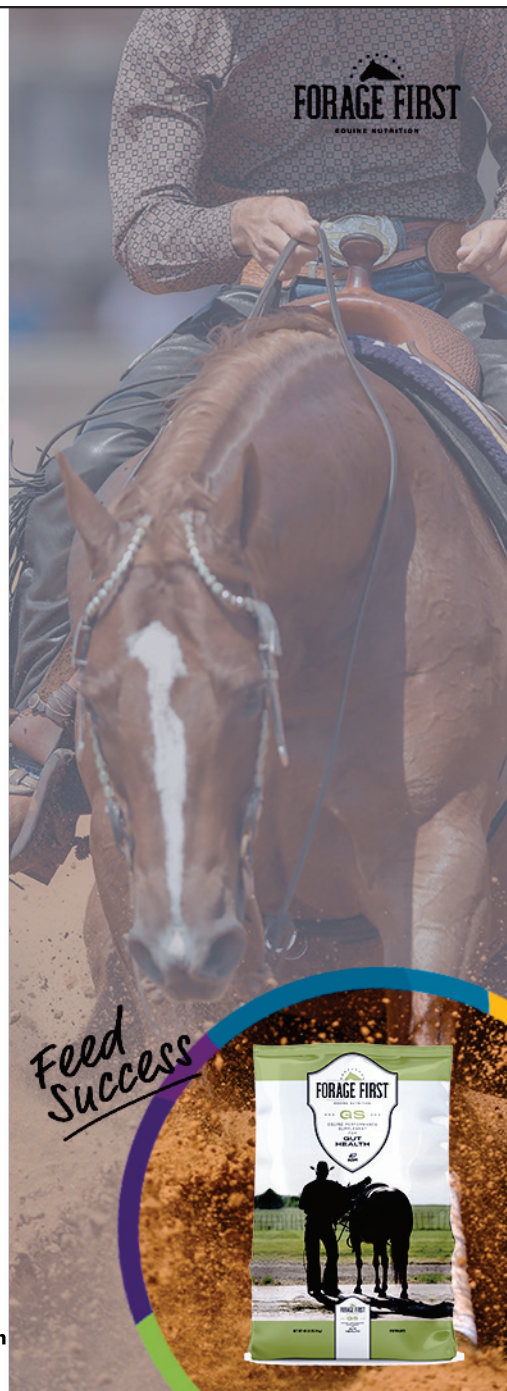
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Professional services, such as tax preparation, might be a legal tax deduction.

10 Tax Write-Offs for Your Business

Overlooked tax savings opportunities often occur because a business owner hasn't engaged in true tax planning.

By Katie Navarra

Tax write-offs could save your business hundreds or thousands of dollars. Whether you're a small solo practice or a clinic with staff, taking all the tax deductions for which you're eligible is essential. It's often easy to overlook deductions that can lower your taxable income.

However, not all deductions are created equal for all taxpayers, cautioned Jennifer M. Braid, an accountant at Veterinary Practice Made Perfect. Just

because something is eligible as a "write-off" does not automatically create an advantageous tax position.

"Congress fiddles with the law regularly, and keeping up with what expense write-offs are allowed this year versus last year or next year can be, well, a taxing ordeal—pun intended," said Marsha Heinke, owner of Veterinary Practice Made Perfect.

Working with a skilled accountant can help any practitioner unravel the complexity of the ever-changing tax

code. The starting point is the law, which defines what deductions are allowed against income and that veterinarians want to consider, although the value and eligibility is based on each situation. IRS publications available at [IRS.gov](https://www.irs.gov) are an important starting point to help taxpayers interpret the tax code and describe how and what deductions can be taken.

"If you don't get your taxable income as low as possible, you're essentially taking money out of your pocket and giving it to the government for free," said



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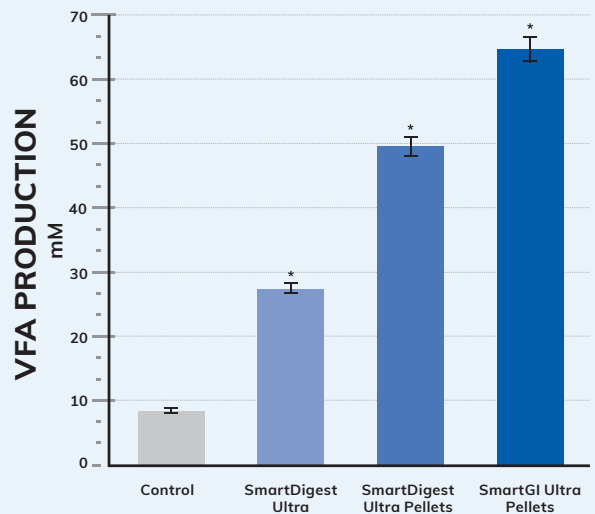
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Understanding what you can legally deduct and keeping proper receipts is key to tax write-offs, no matter your business type.

this can be accomplished through the section 179 depreciation deduction or bonus depreciation, depending on what is allowable in a particular tax year.

“Keeping track of hand instruments and other small pieces of equipment can help you save money in the long run,” Marietti said. “Simple tax knowledge like this can save a client thousands of dollars or more in taxes every year. When that money gets invested back into the business, it makes a large difference.”

3. Office supplies. Medical supplies and related equipment are easy to remember. But you can easily overlook everyday office supplies such as pens, paper and other necessities. Taking the time to organize and manage receipts of these supplies can be worth some savings at the end of the year.

4. Mileage. This can include the clinic’s employees and the mileage taken on a personal vehicle when an emergency call comes through, Marietti said. Tracking the date, time and length of each trip is critical. Apps like MileIQ and others can make it easy to capture and store this information. Remember to include gas, insurance and repairs on business vehicles.

5. Payroll for your children. If done

correctly, the payroll for your children can be done tax free, according to Mike C. Manoloff, PC, a Texas-based accountant. Sole proprietors and spouse-only partnerships can take advantage of this tax break, which allows small businesses to deduct a child’s salary from the business income. In these situations, no Social Security or Medicare is paid on those younger than 17 and no unemployment taxes are charged for those under 21.

6. Continuing education. The cost of conferences, seminars and educational activities, including travel and a portion of meals, can be considered tax deductions. Extending an out-of-town stay by a day or two can also give a much-needed vacation; however, tacking on an extra week doesn’t qualify.

7. Client perks. Prior to the Tax Cuts and Jobs Act (TCJA), businesses could write off entertainment and client appreciation outings. While that is no longer the case, it is still allowable to deduct travel expenses and up to 50% of meals, as long as they are reasonable and have a direct business purpose.

8. Employer contributions to sponsored benefit plans. Health insurance and retirement plans often allow for the practice to deduct the benefit payments while providing those valuable benefits



Whitney Marietti, owner of Marietti Accounting Services. “That, coupled with the fact that a business is likely to get audited at least once during its lifetime, means that the health of the vet clinic could rely directly on the legitimacy and amount of a clinic’s tax write-offs.”

Talk to your CPA or tax preparation service to find out if you’re eligible for these 10 tax deductions in order to maximize your practice’s opportunity to reduce its taxable income.

1. Rent your home to your business. The Augusta Rule is often overlooked, according to Marietti. This allows a business owner of certain entities to rent his or her personal home to the business for qualifying purposes.

“You can’t just throw a large party at your house,” she said. “But when done properly, the rent is deductible to the business and is not taxable to the business owner. You essentially take money out of one pot that is taxable and put it into another pot that is not.”

2. Immediate expensing or deduction of practice equipment. Braid explained

tax-free to their employees—and sometimes to the owners, according to Braid.

9. Professional services. When paying for professional services, it's worth investigating if they can be a deduction. Accounting services, tax preparation, cleaning/janitorial services, legal and consulting fees, and other services might fall into an eligible category.

10. Form an S Corporation. Once a business reaches a certain level of net income, electing to be taxed as a S Corporation can save business owners the 15.3% of FICA taxes on income beyond what is considered reasonable compensation for its owners, Marietti noted. She estimated a savings of more than \$30,000 per year for a clinic making \$200,000 after reasonable compensation.

Keep Good Records

Before you see dollar signs adding up with new-found tax deductions, remember that every expense must be documented. There should be a clear trail showing expenses and cash receipts. Records should be maintained as they occur and never reconstructed after the fact.

IRS revenue officers are trained to closely examine cash sales, according to Marietti. While most veterinarians don't typically handle large sums of cash, it's critical to have a clear trail of cash transactions. Therefore, all cash receipts should clearly be tied to a report from the clinic management program showing daily cash receipts and also to a bank deposit. Daily deposit slips that exactly match these amounts with a reconciliation to the cash drawer are ideal.

"The IRS will accept electronic bank statements as proof that a purchase actually occurred, but those statements don't show exactly what was purchased, and if a revenue officer cannot determine if the purchase is personal in nature, they may disallow the deduction," Marietti said.

The best practice is to keep receipts showing an itemized list of everything that was purchased. Scanned copies are

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Small businesses might be able to deduct a child's salary from business income.

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acceptable. Marietti added that the IRS has a publication dedicated to teaching their revenue officers how to audit veterinary practices.

"Most people don't know this, but it's readily available online, as are other publications detailing the exact audit procedures the IRS uses to train their auditors," she said. "Revenue officers are trained that vets often have numerous personal pets of their own and that the expenses related to the care of those pets is often run through the clinic as a business expense."

The length of time a business is required to retain records varies based on the individual document, Braid said. For example, documents such as deposit slips, invoices and bank statements likely can be purged three years after taxes are filed. However, items such as payroll records should be maintained for at least seven years, with legal documentation and tax returns kept indefinitely.

Tracking expenses is always important, but any practices that have taken advantage of state or federal coronavirus pandemic relief packages must be extra diligent. Whether it's the Paycheck Protection Program or the Small Business Administration disaster loan, it's imperative to track how and when the funds are spent.

"Right now, practices should be taking care to collect and archive all the required records for forgiveness of

loans taken under the Paycheck Protection Program," Heinke said. "The IRS requires borrowers to retain documentation for at least six years after the date the loan is forgiven or paid in full."

Take-Home Message

Tax strategies and management of tax liability are key to running a financially sound veterinary practice. Most veterinary practices capture valid write-offs quite well, Heinke said.

However, strategizing payment timing in a way that mitigates tax cost is often overlooked.

For example, an individual taxpayer bundling charitable contributions or medical payments into a single year can capture more tax deductions if planned correctly.

"Another example is timing write-offs to occur in a year where an owner's marginal tax rate is predicted to be higher. Or timing income, such as selling a veterinary practice, in a year where rates are going to be lower, either due to enactment of new laws or because the taxpayer's other sources of income will be lower."

Overlooked tax savings opportunities often occur because a business owner hasn't engaged in true tax planning. Set aside time to meet with your accountant at least once or twice a year to ensure your estimated tax payments are accurate and to get your taxes prepared. **EM**

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Disease Du Jour Podcast

EquiManagement's Disease Du Jour podcast series was created for equine veterinarians, vet students, vet techs and industry professionals. The podcast mostly focuses on equine health subjects, but it also covers topics of importance to the equine veterinary industry and individual veterinarians. The 2020 season of the Disease Du Jour podcast is brought to you by Merck Animal Health. *You can listen to the Disease Du Jour podcast on EquiManagement.com or your favorite podcast network. Some podcasts have bonus webinars on EquiManagement.com.*





Unconditioned barns are fine for medically healthy horses, as long as they have good airflow for humans and animals.

What We Learned From COVID-19

Equine veterinary design ideas that work better!

By Heather E. Lewis, AIA, NCARB

In 2020, equine businesses have had to adapt quickly to change and challenge, thanks to COVID-19. Fortunately, some of these pandemic-driven adaptations will serve equine veterinarians well in the future. This article will discuss a diversity of fresh concepts to help design and operate equine veterinary hospital facilities better than before. While some of these ideas make us more “pandemic-proof” for times of crisis, many of them are simply better for everyday business.

Let’s look at some of the great design

drivers, systems and solutions that have emerged in this year of change.

Benefits of Telemedicine or ‘Virtual Care’

As the lockdown commenced, veterinary practices developed a sudden interest in telemedicine. The AVMA has good resources for practices interested in virtual care models. Practices interested in this evolution will need to understand the legalities of virtual care, the platforms for performing virtual care and the limitations of virtual care.

While the discussion of virtual care can feel forced upon us, virtual care has the potential to *revolutionize* the equine veterinary business. Because it is laborious to bring a horse to a clinic or to have a veterinarian travel to a client (and has at times this year been impossible), virtual care models can connect a veterinarian and a client more readily and frequently, which allows you to provide a higher quality of care overall.

From an architect’s perspective, virtual care means less brick and mortar for the same revenue. Virtual care is a way of



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Make use of outdoor spaces for client consults or waiting areas. Retrofit some windows so they can be opened to allow airflow.

extending your services with no more investment in physical space. Quite simply, if you don't need more facility, don't build it.

Benefits of Working from Home

Most of us have struggled with sending staff home. The jury is still out on whether "work from home" is beneficial or detrimental, with some workplace analysts brimming with enthusiasm and others promoting caution.

According to "The Long, Unhappy History of Working from Home" from the June 29, 2020, issue of the New York Times, working from home has some place in the future for many businesses. For veterinarians, these are the most promising long-term adaptations:

Remote call centers. Remote call centers are most effective when they are taking calls for more than one location.

Reducing office space. Human hospital groups are making up for some of the inefficiencies of the pandemic by reducing the use of office space. The same concept applies to equine medicine. Equine ambulatory doctors, for example, do not need much space in a physical hospital other than a temporary "touch-down" station.

Other than supply restocking, ambulatory veterinarians can be remote employees. You can take this further; doctors working in the hospital can have

shared office space, with some of them providing virtual care some of the time. The opportunity is for square footage, formerly allocated for non-income generating space such as palatial owners' offices, to be converted to consultation rooms, laboratory space or other uses that support profit-driven operations.

Indoor/Outdoor Environments

With the onset of COVID-19, veterinary hospitals of all types initiated curbside appointments and have been forced to utilize outdoor space that had never been used before. Fortunately, equine veterinarians are already used to working in indoor/outdoor environments. The question is, how can we design indoor/outdoor spaces to be more effective for use all of the time?

We want to promote this idea for several reasons, including:

- Indoor/outdoor space can cost less to heat and cool.
- Indoor/outdoor space is more comfortable for horses, as they are less fearful in quasi-open environments compared to fully indoor space.
- Indoor/outdoor spaces are healthier for people. This is a huge advantage now and should we face a pandemic again. Spaces that can be open to the outdoors can naturally ventilate with fresh, outdoor air in an instant.

The following is a description for how



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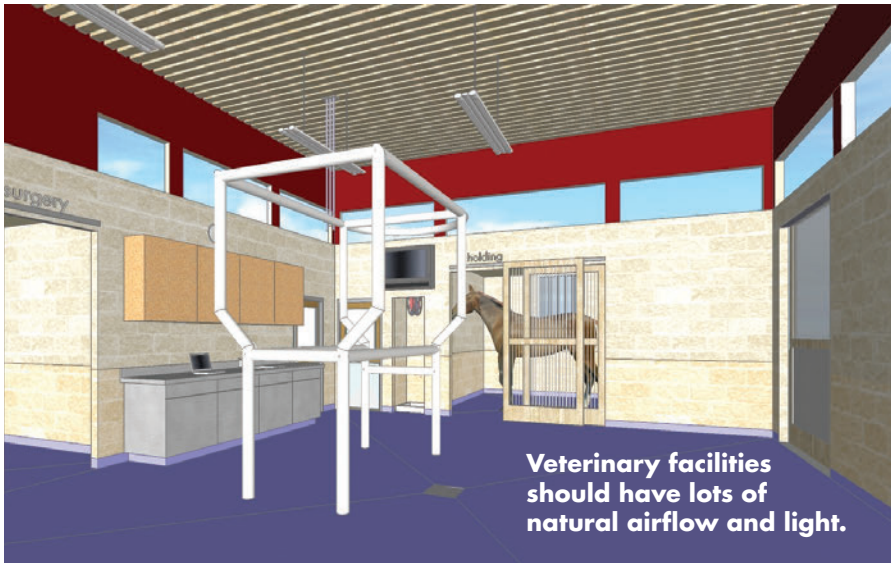
to design an indoor/outdoor exam/treatment space:

- Design your treatment/exam rooms to face the south in cold climates, and to the south or north in hot climates. Avoid east/west exposures.
- The treatment/exam rooms can be outfitted with overhead or rolling barn doors to open to the outside as three-sided enclosures, as weather permits.
- Extend the season by installing overhead fans for summer and radiant heating for winter.
- Install exhaust fans in the space for winter when the doors are closed to allow for proper ventilation.

Beyond exam/treatment, consider indoor/outdoor spaces for these uses:

Covered screen porches with fans for client waiting. When the health crisis is over, you can outfit these spaces with a refrigerator with chilled beverages and/or a coffee station for your clients.

Covered roofed structure for client consultation. Rather than bringing a client inside, a small outdoor pergola can



Veterinary facilities should have lots of natural airflow and light.

be a comfortable location for consultation, weather permitting. Ensure the outdoor areas are WIFI enabled to allow for pulling up a radiograph, etc., on a laptop or tablet.

Covered outdoor triage/assessment spaces. This is a fully outdoor space to assess a horse before it enters a facility.

Unconditioned barns. For medically healthy horses (for example, post-surgical patients), a traditional unconditioned barn can be simpler and less costly. You can still boost ventilation in this space simply by exhausting air without expensive HVAC systems.

Ideas for Air Flow and Quality

Hospitals now need to find inexpensive ways to adapt their buildings for new biological threats from humans, when before this time, we focused on animal health. Fortunately, systems that protect human health also protect animals.

Here are some low-cost solutions that can be used now and forever:

Opening a window. It might sound elemental, but being able to let your building breathe during a time of biological threat is a big advantage. Most commercial buildings are sealed, but few hospitals are designed rigorously enough to ensure that they're both sealed *and* healthy. If you know your hospital is more airtight than it could be, and it is infeasible for you to replace your ventilation systems, look for simple

fixes. Installing some operable windows can give you more ventilation options when you are under threat. This old-school idea is now being incorporated into the most sophisticated new office building designs.

Treat the air. One of the technologies you can consider is air treatment. Air treatment can be integrated with an HVAC design, or it can be an add-on to improve the quality of the air within a space. It is important to use a system that has solid research behind it and is appropriate for our industry. An example of a system is the Upper Air Treatment units from PetAirapy. These stand-alone units are attached to the ceiling in a space and utilize ionization as well as UVGI treatment to reduce airborne pathogen loads. These systems are affordable and easy to install.

New Products for Indoor Environments

Once we address the big ideas from COVID-19, there are a plethora of smaller modifications you can make to create a safer indoor environment. Here are a few of the most useful:

- **Touchless sinks.** As everyone has developed a keen interest in hand hygiene, the product manufacturers have responded. New touchless sinks are less frustrating than their predecessors and can be selected with additional hygienic features, such as a seamless

design and sloped bottoms that prevent splashing.

- **PPE stations.** We are big fans of making PPE easy so it will be used more effectively. Install PPE stations in convenient places in your hospital near areas of animal and human risk. PPE stations are standardized, easy-to-use stations, each with a trash can, a wall-mounted cubby with supplies such as gloves and hand sanitizer, a hand washing sink and clear signage. If you cannot afford to add sinks, set up the PPE stations where sinks exist.
- **Mud rooms.** Mud rooms will be important in our future. A dedicated space to enter and exit, don or shed gear, wash and sanitize your hands, perform temperature checks, log in, etc., will become part of the hospital design for most of our new facilities.
- **Sneeze guard retrofit products.** Clear barriers can be retrofitted on front desks or hung from the ceiling to protect reception staff. Clear barriers are good for other spaces such as at the door of your dispensing pharmacy. Ideally, your sneeze guards can be installed and removed as threats change. You can use them during flu season, even if there is no epidemic.
- **'Offices.'** New offices (office/cubicles) are designed with prefabricated furniture that provide greater enclosure but are still open enough to promote visual connection. Cubicles will come back and will be preferred over closed offices (which take too much space), but cubicle design will improve, using clear panel dividers above desk height to promote a feeling of openness.

Parting Thought

I challenge myself and the veterinarians with whom I work to consider the changes to practice in 2020 that might be a benefit to future business. Equine veterinary practice is innovating in ways that reduce the costs of physical facilities and improve the quality of care. That is the opportunity we have been afforded in this year of change. **EM**

Joint Therapies

By Nancy S. Loving, DVM

Brought to you by **covetrus** 

Each year, the Lake Tahoe Equine Conference hosts equine practitioners from all over the world, with a slate of excellent presenters on topics in their specialty fields. This year, Laurie Goodrich, DVM, PhD, DACVS, of Colorado State University's Equine Orthopedic Research Center, presented an in-depth look at joint therapies, with a particular focus on the use of corticosteroids alone or in conjunction with other medications. She summarized an exhaustive literature review of decades of evidence-based research studies to provide some basic premises for equine practitioners to consider when administering joint therapy.

Triamcinolone (TA): In osteochondral fragment studies, intraarticular (IA) treatment with TA significantly decreased lameness and improved synovial membrane and cartilage scores. TA "protects" cartilage from degeneration, i.e., it is chondroprotective. Only three of 2,000 horses injected with 25-40 mg TA developed laminitis—one at seven days post-injection and the other two at two to three months post-injection.

Betamethasone: Cartilage and subchondral bone were not adversely affected with ~16 mg IA betamethasone, nor were adverse effects seen with exercise post-injection.

Methylprednisolone (MPA): IA injection of 100 mg improved lameness, hyperplasia and vascularity. However, the cartilage experienced deleterious effects. A lower dose (40 mg) does not reduce detrimental effects of MPA. Combining with hyaluronic acid (HA) does not reduce detrimental effects of MPA.

Combination of corticosteroids and IA anesthesia: MPA toxicity is potentiated by lidocaine. Bupivacaine should not


be used with corticosteroids. Mepivacaine did not affect TA or vice versa; TA improves lameness.

Sodium Hyaluronate (HA): HA is particularly effective for acute synovitis. IV administration once weekly for three weeks reduces lameness, synovitis and prostaglandin E2. Combined with Adequan, HA decreases cartilage fibrillation. Combined with TA, the success rate is 64% compared to the 87% success rate of TA alone. HA alone has beneficial effects on proteoglycan metabolism more than HA and MPA combined. Oral HA had no effect on the osteochondral chip model but exerted some clinical effect with hock OCD.

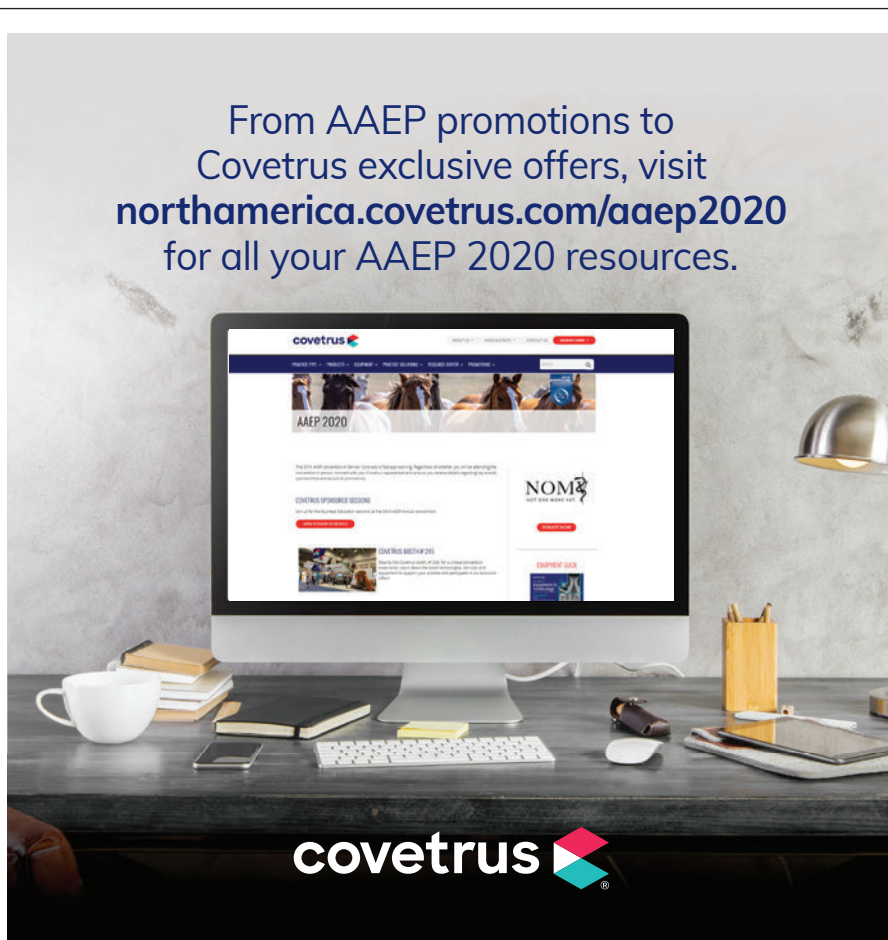
Adequan (Polysulfated glycosaminoglycans, PSGAGs): IA treatment with PSGAGs decreases synovial effusion, vascularity, joint capsule fibrosis and cartilage fibrillation. Infection rate increases with IA administration, but a small dose of amikacin protects against this. Intra-articular TA and Adequan did not achieve better results than IA Adequan alone. PSGAGs given IA three times in the coffin joint achieves better results than one-time MPA. 60% of equine practitioners use IM Adequan for "preventative" therapy for chronic joint disease or post-operatively.


The Bottom Line

These summaries can help practitioners in the field and in clinics to determine the most efficacious treatment protocols to tailor for each equine patient.

Editor's note: Additional literature summaries from Dr. Goodrich can be found with this article on Joint Therapies on EquiManagement.com. 

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When a veterinarian makes a client a partner in a horse's treatment, the outcomes and satisfaction can improve.

Managing Uncertainty in a Certainty-Driven World

Learn to help clients find good outcomes for their horses using the tips in this article.

By Colleen Best, DVM, PhD, BSCH

We spend a tremendous amount of energy trying to make decisions. We look for things that we can be confident in having a positive outcome. Uncertainty can be perceived as risk, and many of us are risk averse, particularly when it comes to health-related decisions for our horses.

One of the many complicating factors of equine practice is the number of individuals who might influence a client's choice of treatment. We compete against many others in the equine world

to provide expert advice and treatment to clients about their horses' health and welfare. Farriers, trainers, barn managers, grooms, feed store employees, lay dentist, saddle fitters ... there is a seemingly endless list of equine industry individuals who provide advice on the best way to manage a lameness, performance issue or disease process.

There are many frustrations that we run into when striving to be heard as an expert voice in the crowd, one of which is that we are ethically obligated to state not only the benefits of our treatment plan, but also the risks. Comparatively,

the other individuals have no obligations to state the shortcomings of their technology, nor to accurately represent the potential "evidence" for their proposed therapy. This unlevel playing ground is frustrating at best, and it puts us at a disadvantage from the start.

The best ways to manage a client's desire for certainty when we are unable to give it is to engage them as partners in the horse's care, educate them about evidence-based care, manage their expectations, and ensure they can clearly see the quality of care you are providing to them.

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In order for us to effectively provide care, we need clients to trust us and believe that we can provide them and their horses with excellent care. In turn, we also need to trust the clients to authentically relay the facts of whatever problems their horses are experiencing, and to follow the treatment plans we devise with their input. In short, there needs to be a partnership between each client and his or her veterinarian.

If we fail to engage with the client as a partner in care, with that person as an equal—though with a different skill set—then we are likely to run into problems with adversarial interactions that compromise patient care. It can seem in-

authentic to listen to and give air time to a client's ideas or theories, particularly when the ideas seem rather "out there." However, when we shut the client down and don't listen to his or her seemingly wacky ideas, we open the door for that person to find another professional who *will* listen. When we spend time meeting the client where that person is and ensuring that he or she feels heard, then that client often becomes a willing partner who is less susceptible to outside—and less reputable—influences.

Support Critical Thinking

A while back, I had the opportunity to teach an online equine anatomy and physiology course to horse owners. The audience varied widely; some were just

out of high school and taking the course as part of a certificate program while others were curious adult horse owners with full-time jobs outside the equine industry. The course had a strong focus on using evidence-based information to support good decision making.

I was amazed at what some of the students presented as "evidence" for their decisions, despite the course providing them with information about what constitutes a reliable source. A handful of students used marketing materials from companies as their evidence. I was shocked; it was obvious to me that marketing materials would be biased, but I realized that was not a sentiment shared by the students, an audience that was quite similar to my client base.

I was pleasantly surprised by how receptive the students were to learning that marketing materials were not generally reputable sources and did not represent impartial assessments of the quality or utility of a product.

Often, we have preconceived notions about what our clients are and are not willing to do, or what they are or are not likely to believe. These beliefs can end up limiting our capacity to provide high-quality care to the horse and to continue having a productive relationship with the client. It can be difficult to remain open-minded or persist in trying to educate a client when that person uses what to us are clearly biased sources of information.

An effective way to manage these situations is to ask questions about what a client knows about a given condition or treatment before you begin to explain your thoughts or what's going on. Doing so can provide valuable insight into what information or misinformation the client is working from. Once you have that knowledge, you can work toward helping that client have a more accurate understanding of what is going on with the horse, ultimately contributing to the client perceiving you as a credible expert with the information needed to solve the issue at hand.



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As equine veterinarians, we spend our days engaged in creative problem solving. Our minds are often working between calls, proactively planning how to tackle the next situation or how to manage a tough case. There is much work that we do that clients never see. While this works to the advantage of many clients, it can also be problematic.

If, in an interaction with a client, we present the end result of our thought process without walking that person through how we got from A to D, then we risk the client underestimating the time, energy and consideration we have afforded to him or her and the problem horse.

The best way to avoid this is to share your thinking with the client—walk that person through how you arrived at the diagnosis and treatment options. Doing so will demonstrate to the client the depth of your expertise and will provide him or her with confidence in the plan and recommendations you make. Further, it will allow the client to be more engaged in the process and demonstrate your commitment to the client being a partner in the care of that horse.

Address Expectations Head-On

We all have expectations of ourselves and others. Regardless of whether they are high or low, realistic or not, the expectations we hold markedly influence how we experience an event or outcome.

One of the trickiest aspects of expectations is that they can be subconsciously held and often only surface once an interaction or experience is over and the expectations are either met or not. The consequences of unmet expectation are that they are often translated into failures.

The best way to avoid the pitfalls associated with unmet expectations is to address them head-on. Simply asking the client what expectations he or she has of a given appointment, treatment or interaction will provide both of you with valuable information. It will also provide an opportunity to proactively manage any unrealistic expectations, which otherwise could become disappointments or failures. Finally, it provides an opportunity to share your expectations based on similar cases, which is another way to show the client your depth of experience and knowledge.



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Educating clients about a veterinarian's professional and ethical obligations is important.

Embrace Being Relatable

Whether you're a new grad or have been practicing for 40 years, we all have a wealth of experience from which to draw.

An effective way to support clients through their decision-making processes and the inherent uncertainties therein is to share your experiences of similar situations with them.

Storytelling is incredibly powerful, because it is relatable and is easy for clients to follow. It also provides a way for clients to see the situation from the outside, which can help provide insight and perspective. Sharing personal experiences can be of particular value because it can transform the way clients

interpret what you are saying. It can highlight your depth of experience with a particular disease process or sport discipline, increase the visibility of your expertise in a gentle way, and strengthen your relationship with the clients by giving them greater information about who you are as a person.

Share Your Professional and Ethical Obligations

It might sound strange, but many clients might not be familiar with what a veterinarian's professional and ethical obligations are. When we are sharing potential risks of a treatment, they might perceive those obligations as a lack of confidence on our part, instead of us executing a professional and ethical obligation.

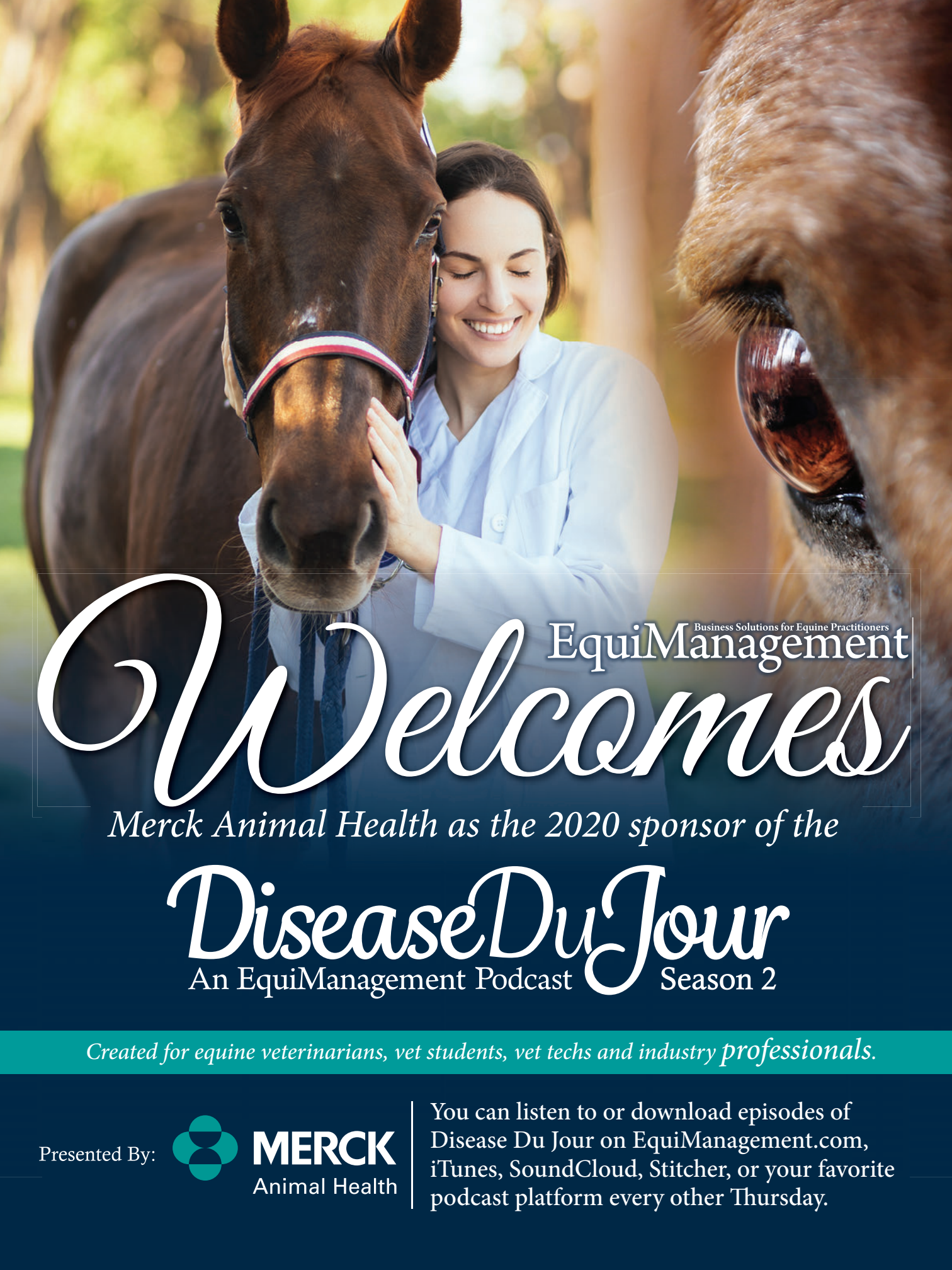
When we work toward educating our clients so they have accurate expectations (in other words, that we share benefits, risks and costs of given treatment options), then they are not put off by this information. In fact, they become more astute and discerning consumers of care and products for their horses. In the

end, it is a win on multiple levels—we have explained part of the safeguards of our profession, which increases confidence, while helping them gain awareness of the shortcomings of others in the equine industry who are not held to the same standards.

Take-Home Message

At the end of the day, most of us know what it's like to struggle to make decisions when there are no guarantees of a good outcome.

We can help clients find their way through the uncertainty by helping them feel heard, empowering them as partners, educating them, and by harnessing the power of storytelling. **EM**



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Stress-resistant practitioners maintain stress-buffering habits that support the body, mind and spirit.

What Resilient Practitioners Know and Do

Understand how you can become more resilient and avoid burnout.

By Jeannine Moga, MA, MSW, LCSW

Compassion fatigue, burnout and moral distress are common complaints in veterinary medicine. Practicing veterinarians increasingly report that work has a negative impact on home life (and work/life balance),^{1,2} and this effect is stronger for women. Job stress from heavy workloads, financial strain, inadequate professional support and client expectations also “prime the pump” for stress-related syndromes and mental health issues to emerge in the veterinary population.^{3,4}

While there is plenty of press covering the pitfalls of veterinary practice, less attention has been focused on the presence of resilience within the profession. This is unfortunate, because it is possible to not only survive, but thrive, in the face of chronic stress.

Teasing out what tends to make the difference between well-being and suffering can be tricky, though, because there is a tangled web of individual and systemic factors that influence human health and wellness.

With that said, we are learning more

every day about the individual behaviors that can buffer stress and produce resilience, even in the most challenging environments. In fact, research in neuropsychology shows that how we pre-empt, respond to and make meaning out of the stressors that arise in the course of our professional and personal lives can make or break our sense of well-being.

Changing the Stress Response

Chronic stress leads our brains to become more reactive and less focused with time.^{5,6} Unchecked stress actually



Dealing with the stresses of clients and difficult cases might require veterinarians to press "pause" occasionally.

ARND BRONKHORST PHOTOGRAPHY

changes neural pathways and significantly impairs our cognitive, emotional, physical and spiritual health.

Resilience, however, is the ability to withstand, bounce back from and even pre-empt stressful situations.⁷ Resilience is both characterized by, and a result of, being able to master your own cognitive, emotional and physical responses to stress. In essence, learning to recognize and moderate arousal in any given situation will allow you to effectively handle unpredictable and uncontrollable situations by maintaining focus as well as the capacity for hope and joy.

Successfully navigating stressful situations is also self-reinforcing, as successes build neural pathways indicative of flexibility and stability.

What Do Resilient Practitioners Do?

The most stress-resilient practitioners are those who maintain stress-buffering habits that support the body, mind and spirit. These habits include:

Hydration, nourishment, and movement. Regulating our system's stress response requires supporting the body first. Hydration and balanced nutrition are keys to well-being, so resilient practitioners learn how to do this on the run by keeping ample water and healthy

snacks in the truck. Mindful movement is also critical for discharging stress-related negative energy, so resilient practitioners make time to engage in physical activities that help them wind down after a busy day or week.

Pressing "pause." Busy, stressed-out people also benefit from finding—and pressing—their "pause" or "reset" buttons. This can be accomplished in a number of ways, including taking breaks and deep belly breaths. Slow, deep breathing triggers a relaxation response and keeps our best tools (such as observation, discernment, decision-making and emotional regulation) "online."⁷

Thinking positively. It isn't healthy to ignore what is tough in our professional and personal lives. But being able to maintain a positive outlook in the face of stress is highly correlated with lower levels of compassion fatigue and higher levels of compassion satisfaction.⁸ Intentionally bringing to mind what is good—or going well—in an otherwise busy or overwhelming stretch counterbalances the brain's natural tendency to ruminate on what has gone wrong. Cultivating positive thoughts is a healthy habit that combats the "negativity bias" and enhances resilience over time.⁹

Staying attuned to what matters most. It's easy to get lost in the shuffle

of lab work, medical records and client callbacks. While those things are important for the day-to-day functioning of a practice, they need not overshadow the sense of purpose and service that inspired most of us to enter the profession in the first place. Vet practice is most meaningful for practitioners who find purpose, social connection, engagement and accomplishment in their work. Not only is veterinary medicine strongly aligned with the eudemonic tradition (a search for meaning, purpose and fulfillment),¹⁰ but we know that when we intentionally live and work in alignment with our values, our ability to tolerate pain and cultivate resilience grows.¹¹

Making time for connection. Research indicates that veterinary professionals are less likely than other professionals to reach outside their informal/professional networks for support.^{2,4} Yet creating and maintaining supportive connections—both at work and at home—is critical for well-being. Veterinary practitioners who create supportive relationships with colleagues benefit in multiple ways: these connections moderate stress, improve the way we appraise (and problem-solve) stressors, and reduce the symptoms of both burnout and compassion fatigue.^{12,13,14} Additionally, maintaining connections



Create supporting relationships with colleagues to help balance the strain of work and remind us of the "why" we are veterinarians.

to friends and family helps to balance out the strain of work and remind us of our "why."

Take-Home Message

Activities that bolster personal resilience tend to buffer the stressors inherent to working in veterinary medicine. While veterinary practice carries with it routine exposure to stress and suffering, disciplined attention to self-care, healthy work-life boundaries, and interpersonal support can help practitioners counteract chronic stress and achieve satisfying, engaging careers over the long haul.

We can all do a little better at taking care of our best tool (which is ourselves). With this in mind, try one or more of these tricks the next time you are feeling depleted:

- **Sip, snack and stretch.** Give your brain the hydration and fuel it needs to cope with the many demands it is juggling. Then stretch and shake out the tension that is accumulating in your muscles.
- **Reframe it.** There is no shortage of struggle in daily life, and we don't have to work too hard to find examples of what is going wrong or how we fear falling short. Resilience comes from focusing instead on what is going well and having more positive thoughts than negative thoughts. The next time

you feel stuck in negativity, try looking at a stressor or problem from a different (more neutral) perspective.

- **Pause.** Breathe deeply in between calls and procedures. Breathing in to the count of four, pausing, then exhaling to the count of six will cue a relaxation response in your body and refresh your mind.
- **Connect.** Call a friend, check in with a trusted colleague, and pay extra attention to your loved ones. Voice-to-voice contact is great, and eye-to-eye contact is even better.
- **Remember what you value.** Our values are the ideals that define how we want to live and work, and they are often the yardstick by which we measure our own happiness. Try to cue in to what drives you—and what drove you to choose veterinary medicine. (Was it mastery? Achievement? Service?) Then make sure you are working in alignment with those values every day. **EM**

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Recognizing and Preventing Bullying at Work

Be proactive to prevent bullying in your workplace, and have a system in place where employees can easily report being bullied.

By Nancy S. Loving, DVM

Bullying has become an oft-discussed topic today. There are many ways a person can feel bullied, and none of them are good for a person's self-esteem or productivity. This has ramifications for a veterinary practice environment, with effects on staff members and clients.

For a practice to implement the most effective treatments for our equine patients, it is important to have good teamwork in the workplace. All staff members should share a good rapport

and demonstrate mutual respect. If even one staff member denigrates or undermines another's performance or philosophy, it transforms the work environment into a toxic atmosphere. This occurs not just for the person being bullied, but for others who might feel involved no matter how far they sit on the periphery.

Some victims of bullies find ways to withdraw and withhold what they are going through when bullied. Preventive strategies should be in place in every veterinary workplace. These preventive measures that curtail bullying behavior

can go a long way toward fostering a productive and comfortable working environment that makes employees excited to get up in the morning and go to work.

What Is Bullying?

Bullying is defined in various terms, including:

- malicious verbal mistreatment of a person that is driven by the bully's desire to control him or her;
- continual and relentless attack on another person's self confidence and self-esteem.

Bullies rely on intimidation, unwarranted criticism, negative peer pressure, blame without facts, and rumors to make the targeted person feel abused and powerless to do anything about it.

While in many cases a bullied individual might become withdrawn, others who undergo bullying lash out with aggression and anger. The withdrawn victim might not perform to optimum if distracted by concern over being attacked, or because he or she is simply unhappy with the working environment. The victim who turns aggressive might start to lash out at coworkers, clients and even family members, leading to a cycle of unhappiness at work and at home.

In either case, performance is likely to suffer, and negative feelings brought into the workplace also often impact a practice's clientele. Additionally, the frustration and isolation that comes from being bullied contributes to professional burnout.

The Effects of Bullying

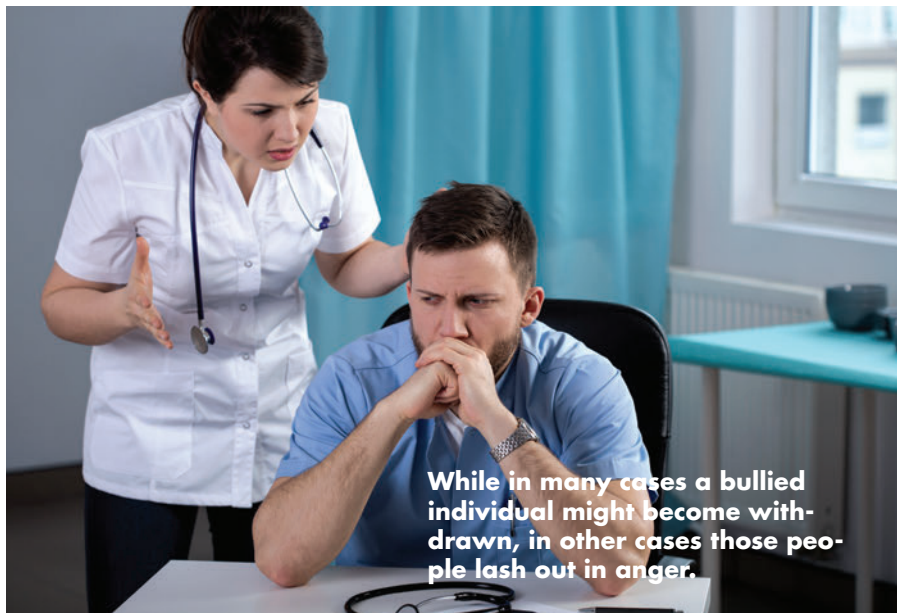
A 2017 U.S. Workplace Bullying Survey identified that 60% of workers felt affected by bullying. Other findings in that survey indicated that women tended to bully women (65%) more than men, although 70% of bullies are men. Superiors, supervisors and co-workers often exhibit bullying when they feel they are involved in a power struggle.

The survey findings further revealed that 46% of those bullied experienced an adverse effect on performance at work as well as a negative impact on their mental health. In addition, about one-quarter of the victims felt adverse physical effects. Being bullied induces stress, damages self-esteem, impairs cognitive function and adversely affects emotional and physical health, all of which can lead to depression, post-traumatic stress and potentially suicide.

Bullying in the workplace has other consequences for the entire practice, such as:

- increased time the victim takes off

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While in many cases a bullied individual might become withdrawn, in other cases those people lash out in anger.

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from work, which affects efficiency of the practice;

- increased staff turnover, which is expensive to the practice in terms of on-the-job training, as well as time involved in orienting a new employee to the practice;
- decreased productivity and motivation by the victim and possibly other staff;
- decreased morale in the general practice culture; and
- impact on client service, as well as how well a veterinarian attends to his or her responsibilities of horse care.

About 20% of all workers leave their jobs because of being bullied. If it is the practice owner who is the active bully, there often isn't much recourse other than to leave that employment situation.

Signs of Bullying

You might be the victim of a bully or you might be a bystander to this behavior. What signs should you be looking for, so you are sensitive to recognizing when this occurs? What can you and your practice do to prevent it?

Equine practitioners are well aware that what you transmit to a horse by your body language helps to shape the horse-human interaction. Horses are exquisitely sensitive to posture and expression, and they react accordingly.

It is not much different between people. A bully doesn't even need to say anything verbally to express disdain for another person or to imply intimidation. This is done through body posture or aggressive eye contact and expressions. Staring, glaring, eye rolling or pushing into someone's personal space are obvious non-verbal indications of bullying.

A more subtle sign of bullying relies on exclusion. While this might not look like bullying at first glance, when a person is pushed aside from the group, they are being excluded for a number of possible reasons. Exclusion is not always just about social interaction; it can also involve exclusion from information or opportunities. It is important to figure out who might have orchestrated exclusion of one member of the practice, if that is the case.

Verbal abuse is much easier to identify because of threatening or loud words, intimidation, malicious teasing even in a veiled form, humiliation, belittling, patronizing or undermining of credibility and performance. There are also instances where someone's work is sabotaged to undermine others' confidence in them. The underlying behavior is filled with disrespect, and in some cases, a bully's overt contempt of the victim.

Social media bullying is a well-known



One study found that 70% of bullies in the workplace are men.

phenomenon. Known as cyber bullying, it has far-reaching effects that exceed the boundaries of the workplace, carrying on well beyond working hours. The pervasiveness of cyber bullying is extremely damaging to the victim's psyche.

Prevention

One effective means of curtailing bullying in the workplace is to hold awareness training. Outline specifics to the team about what bullying entails. Encourage staff to report any adverse discourses and interactions they witness. Discourage gossip. Provide some examples of what might be deemed unacceptable behavior.

It is also important to point out what kinds of behavior are considered normal in the context of a work environment and are not perceived as bullying. The Canadian Centre for Occupational Health and Safety lists a few examples of interactions that are not necessarily representative of bullying:

- respectfully expressing differences of opinion;
- giving constructive feedback and guidance about workplace issues; or
- supervisory personnel undertaking management and direction of staff members to maximize and implement effective practice policies.

The veterinary practice should develop a policy about bullying so all staff

members understand what it is and the consequences of behaving that way toward any member of the practice team.

It is important to advise potential victims of bullying about what they can do: confront the bully head-on and tell that person that his or her behavior is unacceptable, preferably with the boss or another staff member present; or bring the problem to the attention of someone who oversees human resource problems in the practice. One report stated that 29% of people who are bullied keep silent about it and don't bring the situation to anyone's attention. This is why it is important for the whole staff to be involved in preventing bullying.

Victims of bullying should be encouraged to document the occurrences by keeping journals about the incidences in which they feel bullied, including where, when, details of each event, and whether witnesses were present. Any written correspondence by the bully to the victim—such as emails, texts, letters, memos or faxes—should also be retained.

It works best if there is someone responsible and impartial who is available for a bullying victim to come to if they wish to file a claim against another staff member or boss. This impartial person could be an outside employee advocate.

This same independent person could also be the one to deal with delivering

consequences to the offending employee. Hiring outside help with this can relieve stress and ensure that legalities are followed when handling these situations. It also ensures a more objective analysis of the situation. There should also be a no-retaliation clause that protects against retribution of the person reporting the bullying situation.

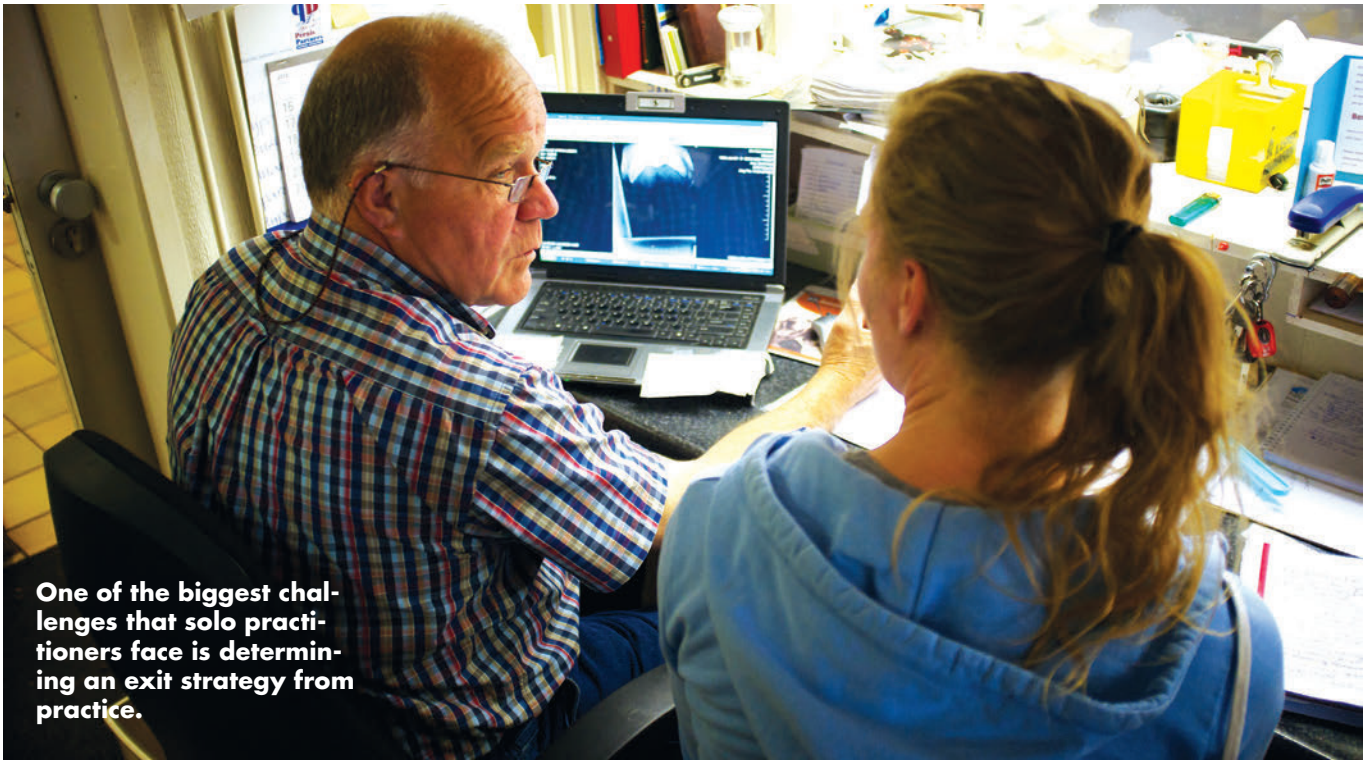
Other preventive strategies rely on positive measures, such as providing staff with more responsibility, commending outstanding efforts, and providing opportunities to improve skills and professional expertise. Rewarding good behavior and accomplishments often serves to positively alter any tendency for bad behavior.

If a bully is persistently toxic to the workplace culture, it is practical to try to find out why he or she is behaving this way. If there can be no resolution to the bully's behavior, the most prudent action could be to suggest that the bully might be happier in a different employment situation. These one-on-one conversations should be documented in writing as to when the conversations occur, who is present and why, along with specifics as to the behavior reported and how the bully reacts to this criticism.

Take-Home Message

Veterinary medicine is a fulfilling profession. The same proactive health care needs to be applied to the veterinary practice culture so that everyone involved is engaged and happy to be in the service of the clients and horses.

Working together as a collaborative team helps to mitigate the stress incurred in the health care industry and can bring positive experiences and excitement to the workplace. Clients will feel it and will be glad to use your practice to care for their horses. Staff will feel it and be happy to work there, giving their best effort. The horses, too, will feel it through the positive care and attention lavished on them. After all, that's the bottom line of why equine vets do what they do. **EM**



One of the biggest challenges that solo practitioners face is determining an exit strategy from practice.

Exit Strategies for Solo Practitioners

Prepare throughout your career to profitably and happily exit your practice life.

By Amy L. Grice, VMD, MBA

For at least the last decade, solo practitioners have made up approximately 40% of AAEP members. These veterinarians have made their careers as sole proprietors for a variety of reasons, but most have prized the independence that working alone provides.

Although providing emergency services 24/7/365 can be tough, many have worked out strategies with colleagues to cover urgent cases when they cannot be available. One of the biggest challenges that solo equine practitioners face is

determining an exit strategy when they are ready for retirement or an alternative career.

Some options when leaving solo practice include informing clients of your departure and referring them to local colleagues; selling your used veterinary equipment; identifying a local practice interested in acquiring your practice; selling or giving your client list to a trusted colleague and actively supporting the transition of your clients; and selling your practice to a new, solo owner.

Finding a veterinarian to buy an exist-

ing solo practice often requires offering a turnkey practice operation with attractive equipment, well-trained clients and strong financial policies. If your existing practice cannot offer an advantage over opening a new one, most practitioners will not be interested in purchasing your business.

That means you must demonstrate that your clients will remain loyal to the new owner; have a well-rounded arsenal of diagnostic equipment; have minimal accounts receivable; and show a reliable stream of profit each year.



It is important that the exiting veterinarian show confidence in the practitioner who will replace him or her.

Transferring Clients

After building strong relationships with clients and patients over decades, the thought of entrusting them to another provider can be very hard. In some cases, the veterinarian has watched a client's kids grow up or a favorite horse grow from a foal to a geriatric patient. Deep bonds are often forged over serious illnesses or injuries when Doc has saved a beloved mount.

While those working in group practices also experience this type of relationship building, it is blunted somewhat by the more frequent substitution of other associates providing care during vacations or attendance at continuing education events.

For solo practitioners, letting those close-knit relationships go can be painful for clients and veterinarians alike. It can be stressful and difficult to find the right person to whom you can entrust your clients. Most important is that the new owner should share your values, because your practice's culture has demonstrated your values for years. Your clients will feel a degree of comfort and immediate familiarity with your successor if your core beliefs are similar.

In order to have a successful transi-

tion to a new owner, it is important that the current veterinarian show a strong degree of confidence in the practitioner who will replace him or her.

This demonstration of trust in the new veterinarian can be achieved by the incoming doctor accompanying or working in tandem with the retiring doctor for an overlap of several months. The exiting practitioner can introduce the new practice owner to as many clients as possible, ask his or her opinion on cases, talk up any new skills that he or she brings to the practice, and tell stories of clients and patients during travel time in the truck to enrich future connections.

It is even better if the departing veterinarian can hire an associate with an agreement to buy the practice. Or perhaps the departing veterinarian can take on a partner who wants to continue after the original owner is retired.

The new doctor then can shoulder more and more responsibility in the practice over a period of years as the owner steps back gradually. That type of a transition often requires banked financial resources to support it, but will typically yield a higher selling price that makes up for the investment.

In cases where a gradual transition is impossible due to circumstances, a letter of introduction from the departing owner that indicates confidence in the incoming veterinarian and recommends that clients continue to use the practice might be all that is possible. Such a letter should be sent by mail as well as electronically in order to reach as many clients as possible.

In the case of a sudden departure, a client list and the accumulated used equipment might be the only assets to sell. The price that the practice fetches will be affected by the degree of support that is available from the former owner.

What's in a Name?

Many solo practitioners have named their practices with variations of their surnames, such as Smith Equine or John Doe Equine Services. While this is a natural tendency when starting a solo practice, it reinforces the building of personal goodwill rather than practice goodwill. For a practice to have value so it can be sold, it has to have an income stream that is independent of an individual doctor. The clients must be bonded to a practice, not just a special veterinarian.

One of the ways to achieve this is to have a practice name that is not associated with the name of a single veterinarian. If you began your practice using your own name, now is the time to change that so you can brand your practice with its own identity independent of you.

Preparing Financially for Sale

Creating a strong practice brand and preparing for the sale of your solo practice can take three to five years, so it is important to have a timeline for retirement in mind. In fact, because health or family crises can arise unexpectedly, it is wise to manage your practice in a way that makes it saleable throughout your career.

The value of a practice rests on its profitability. A potential buyer will typically want his or her accountant or consultant to look at three to five years of financial statements to determine the average profitability of the business. If some of the revenue that was earned will not be likely to continue when the practitioner retires, then the value will be negatively affected. In a practice with clients that will not readily accept another veterinarian because of the sole proprietor's "star power," the practice might have very little value.

It is very common for solo practitioners to have a rather casual attitude toward the financial records of their businesses. In order to minimize taxes, it is also not unusual for some personal expenses to end up mingled with professional expenses. Unfortunately, this has the effect of lowering the practice's profitability—the same profitability on which the value of the business will be based.

It can be difficult to keep business and personal financial records separate, especially in small practices based out of one's home. But every effort should be made to keep accurate books in order to have an asset that can be sold at the end of a career.

Figure 1

Solo Ambulatory Equine Practice		
Income Statement—Profit and Loss Statement 12/31/2016		
Revenue		
Total Revenues	\$350,000.00	100.00%
Expenses		
TOTAL COPS	\$ 98,000.00	28.00%
GROSS PROFIT	\$252,000.00	72.00%
TOTAL Payroll and Employee Costs	\$140,000.00	40.00%
TOTAL Administrative Costs	\$ 10,500.00	3.00%
TOTAL Fee Income Collection Costs	\$ 5,000.00	1.43%
TOTAL Facility and Equipment Costs	\$ 22,750.00	6.50%
Total Expenses	\$276,250.00	78.93%
Net Ordinary Income (EBITDA)	\$ 73,750.00	21.07%
Depreciation	\$ 7,500.00	2.14%
Net Income	\$ 66,250.00	18.93%

One area where financial records typically are inaccurate is in the area of compensation. You should be compensated for your effort as a veterinarian. When you own a practice, you should also receive a return on your investment as an owner that is sufficient to compensate you for the extra time and trouble that running a business entails. This return should be in the range of 10-30% in an ambulatory practice.

But first you must pay yourself as a veterinarian. Typical compensation for equine veterinarians who are paid a percentage of their gross revenue production varies between 18-25%, depending on the benefits they receive and the fixed expenses of the practice.

A commonly used rule of thumb is that the entire salary package—including benefits such as health insurance, PLIT, licenses, memberships, continuing education expenses, 401K match—should not exceed 26% of gross revenue production.

Consider the following example shown in Figure 1. If your work brings in a gross revenue stream of \$350,000 per year and you pay yourself 25% of gross revenue for your compensation as a veterinarian, you will be due \$87,500 in salary.

If you employ one full-time employee at \$15/hour for 2,000 hours a year, that person will earn \$30,000 in wages. After payroll taxes, workers' compensation insurance and other employee-related costs, 40% of gross revenue has been spent for those expenses.

Other expenses for administrative costs, fee income collection costs (mostly credit card fees) and facility/equipment costs will consume another 11% of the gross revenue.

Your net earnings before interest, taxes, depreciation and amortization (EBITDA) will be \$73,750 or 21% of gross revenue. This is the profitability that will determine the value of your practice.

Imagine if your financial statements included many of your personal expenses and failed to account for paying you for your work as a veterinarian. Although experienced accountants could make adjustments to normalize your books, it is hard to expect a buyer to overlook financial records that seem to indicate that very little profit has been made, or to trust financial statements that show excessive net proceeds, but no compensation for the veterinarian. These difficulties can be avoided by having well-segregated personal and

business finances, and by using a standard compensation method.

Work, Live, Sell

Exit strategies for solo practitioners do not always need to rely on a practice sale. Well-managed solo practices can throw off robust profits, which, if invested wisely on an ongoing basis, can yield good long-term gains. Some veterinarians simply harvest as much money from their work as they can over the course of their careers, then simply sell the equipment when they are ready to retire.

As veterinarians age, some begin to limit practice to certain areas in

which they have special competencies, winnowing the client list to slow the practice's growth in order to minimize the number of hours worked each week. In those practices, the legacy of the veterinarian is kept in the memories of the clients that were served.

Take-Home Message

A successful exit from a solo equine veterinary business through the sale of a practice requires ongoing attention to being profitable, maintaining accurate financial records, practicing good business management and mentoring one's successor. Remaining open to, and

up to date with, new developments in diagnostics and treatment will make the practice more attractive to younger veterinarians. Developing a practice brand identity that doesn't focus exclusively on the owner will allow a much easier and more successful transfer to a new owner. Creating policies for the business that encourage payment at the time of service will minimize accounts receivable and train clients to be fiscally responsible.

All of these strategies will assist solo equine practitioners with engineering a rewarding transition out of practice ownership. **EM**

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