

Veterinarian in Texas bow-killing case files motion for partial retrial

Kristen Lindsey moves to strike feline expert's testimony

page 8



85 OSU veterinary students disciplined for cheating

Incident opens discussion on academic misconduct in the digital age and the increasingly blurred lines between cheating and collaboration. *By Rachael Zimlich*

Eighty-five students are under fire at the Ohio State University (OSU) College of Veterinary Medicine for engaging in "unauthorized collaboration on take-home assignments," according to a statement from OSU. This large-scale violation of the school's honor code may have rippling effects for the rest of the 650-student veterinary college.

The investigation was launched after the veterinary college found inconsistencies in student test-taking practices on take-home examinations completed online through a software application offered by the college.

See page 24>



Dark shadows

Drug abuse and addiction in the veterinary workplace

Whether it's suicidal thoughts or drug addiction haunting our colleagues, are we doing enough to protect them from themselves ... and offering them the resources to get the help they need? *By Jon Geller, DVM, DABVP*

See page 26>



Early neutering poses risks for German shepherds **page 6**



While Dr. Codger's away, Dr. Greenskin will pay **page 38**



Feline enrichment: What a cat wants, what a cat needs **page 52**



Could leptospirosis be headed to a town near you? **page 57**

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REFERENCES: 1. Pollmeier M, Toulemonde C, Fleishman C, Hanson PD. Clinical evaluation of firocoxib and carprofen for the treatment of dogs with osteoarthritis. *Vet Rec.* 2006;159(17):547-551. 2. Data on file at Merial.

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See brief summary on page 03

Technological Advances Result in an Innovative Diet for Dogs with CAFR

Cutaneous adverse food reaction (CAFR), or food allergy, is one of the common causes of pruritus in dogs and cats, along with flea allergy dermatitis and atopic dermatitis. Animals with CAFR exhibit varying degrees of scratching, biting and licking and can have complications such as recurrent pyoderma and otitis externa. The pruritus tends to be constantly present and does not wax and wane with the seasons.

The diagnosis of CAFR can be difficult. There are no pathognomonic clinical signs or characteristic skin patterns, and to date, no blood tests or skin tests have been shown to be accurate. An elimination diet trial is the only valid diagnostic test. Diet trials can be inconvenient or even frustrating for owners. They are time-consuming and depend on strict compliance. Therefore, it is important to select the most effective diet the first time to maximize the chances for a successful trial and accurate diagnosis of CAFR.

Traditional options for dietary elimination trials have disadvantages

Diets used for elimination trials fall into three categories: homemade diets using human foods, limited-ingredient diets with novel protein sources, and veterinary therapeutic diets with hydrolyzed proteins. While homemade diets are preferred by some, they are often not complete and balanced and can lead to nutritional complications if fed long term. Limited-ingredient diets are only effective if animals are not sensitive to the protein sources. Formerly unique diets containing venison, rabbit, duck, kangaroo, etc., are increasingly available in pet stores and from Internet retailers. Therefore, a complete diet history of all commercial foods, treats and human foods the animals have been exposed to is necessary before prescribing a limited-ingredient diet.

Hydrolyzed protein diets offer the advantage of being effective even when animals have been exposed to multiple protein sources or when diet histories are not available. Veterinary therapeutic diets based on hydrolyzed proteins such as soy and chicken have been available for over 15 years. While many dogs and cats with CAFR respond favorably to these diets, a subset of animals may continue to have clinical signs or appear to react to the hydrolyzed soy or chicken or other components of these diets.

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A number of feeding trial studies have been performed with Ultamino® to ensure palatability, digestibility and clinical efficacy. In one such study involving 22 dogs with confirmed or suspected CAFR, many of which had not responded to other novel protein and hydrolyzed diets, all of the dogs were fed the Ultamino® diet for three months. All dogs showed clinical improvement with significant reductions in both pruritus and skin lesion scores after one month and further improvement at two and three months.

Because of concerns with cross-contamination or unidentified protein sources in commercial pet food, Royal Canin researchers developed new, proprietary processes involving low molecular-weight chromatography and PCR technology to detect any extraneous proteins or peptides in the diet. In addition, Ultamino® is only manufactured in company-owned and -operated facilities and all equipment is shut down and thoroughly cleaned before any batches are produced.

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MIND OVER MILLER | Robert M. Miller, DVM

Dress to impress—or at least be taken seriously

Dr. Miller unravels an intern's objections to the clinic dress code.

Half a century ago, we had a dress code in our multi-doctor mixed practice. Neat, clean coveralls were required for large animal house calls, and in the hospital, men wore slacks, dress shirts and ties with their lab coats. Women dressed just as conservatively (yes—we had women on our staff 50 years ago!).

Shorts and sneakers: Symbols of sacrifice

Our practice recruited young interns from veterinary schools around the country and around the world. I was on field emergency duty one Sunday when I stopped by our hospital to replenish some supplies. I noticed that our intern, who was on emergency hospital duty, was seeing a patient. He was dressed in shorts, a t-shirt and tennis shoes.

I waited until the client left with her dog before reprimanding the young doctor.

"Bob," I said, "you know we have a dress code in our practice for all doctors on duty."

"Yes," he responded, "but it's Sunday and I want the client to understand that we offer weekend emergency service at some personal inconvenience, so when she sees me dressed this way she'll appreciate it all the more."

"I understand that," I conceded. "However, there is a reason why we require a professional appearance, which begins with the way you dress."

Cracking the (dress) code

"We are in Southern California, and our clientele is very diverse," I continued. "It includes farmers and ranchers, laborers and immigrants, hippies and retirees, young

and old. While young people may be unfazed by your appearance, the older folks expect a professional to look like a professional. Both extremes of the clientele spectrum will accept a conservatively dressed doctor, but the older group may lose confidence in a young doctor seeing patients in shorts and sneakers. Do you know why that is?"

Doctor Bob frowned while thinking for a moment. "Is it because older people are stuck in their ways and less open-minded?" he offered.

"No!" I exclaimed. "Health is a serious matter, and these people

expect their doctor, whether for a human or for a pet, to speak, act and dress in a manner that is congruent with the gravity of the topic. A disheveled, lazy appearance may cause your client to question your knowledge, authority or care."

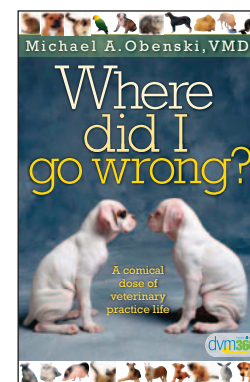
Prefer shorts to slacks? Urine for a surprise

Bob pondered my explanation before pointing at me and saying, "Gotcha! I'll know better next time!"

"Besides," I said, "sooner or later a dog is going to pee on your leg, and when it happens, you don't want to be wearing shorts." **dvm360**



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Study: Early neutering poses health risks for German shepherds

UC Davis research finds that spaying or neutering before age 1 increases the risk of certain joint disorders and urinary incontinence.

A new study conducted by researchers at the University of California, Davis (UC Davis), has found that spaying or neutering German shepherds before the age of 1 triples the risk of one or more joint disorders, particularly for cranial cruciate ligament (CCL) tears, according to a university release.

“Debilitating joint disorders of hip dysplasia, CCL and elbow dysplasia can shorten a dog’s useful working life and impact its role as a family member,” says lead investigator Benjamin Hart, DVM, PhD, DACVB, a distinguished professor emeritus in the UC Davis School of Veterinary Medicine, in the release. “Simply delaying the spay/neuter until the dog is a year old can markedly reduce the chance of a joint disorder.”

Dog owners in the United States typically choose to spay or neuter their dogs prior to 6 months of age, in large part to prevent pet overpopulation or hoping to avoid unwanted behaviors, Hart says in the UC Davis release.

Other recent studies have indicated that spaying or neutering can have adverse health effects for certain dog

breeds. For example, a 2014 study published in PLoS ONE and also led by Hart examined the health records of more than 1,000 golden retrievers and found a fourfold increase in one or more joint disorders associated with spay or neuter before 1 year of age. In the same paper, joint disorders in Labrador retrievers were found to be increased by just twofold in dogs spayed or neutered in the first year.

In the current UC Davis study, researchers looked at veterinary hospital records for a 14.5-year period for 1,170 intact and neutered (including spayed) German shepherds for joint disorders and cancers previously associated with neutering. The diseases were followed through 8 years of age, with the exception of mammary cancer in females, which was followed through 11 years of age. Dogs were classified as intact, neutered before 6 months, neutered between 6 and 11 months, or neutered between 12 and 23 months. Joint disorders and cancers were of particular interest to the researchers because neutering removes male and female sex hormones that play

key roles in processes such as closure of bone growth plates, the release states.

The findings show that:

- > 7 percent of intact males were diagnosed with one or more joint disorders, contrasted with 21 percent of males that were neutered prior to 1 year of age.

- > 5 percent of intact females were diagnosed with one or more joint disorders, while in females neutered before the age of 1 the percentage diagnosed rose to 16 percent.

- > Mammary cancer was diagnosed in 4 percent of intact females, compared with less than 1 percent of females neutered before 1 year.

- > In intact females, urinary incontinence was not diagnosed at all; however, in females neutered before 1 year of age, it was diagnosed in 7 percent of cases.

“In addition to dogs suffering pain from joint disorders, the condition may also disqualify the dog as a working partner in military and police work,” Hart says. “We hope these findings provide evidence-based guidelines for deciding the right age to neuter a puppy to reduce the risk of one or more joint disorders.” [dvm360](#)

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See brief summary on page 8

Kristen Lindsey, veterinarian in Texas bow-killing case, files motion for partial retrial

Fighting for license, Lindsey moves to strike board expert's testimony based on VIN comments, alleges witness not impartial. *By Katie James*

Kristen Lindsey, DVM, the Texas veterinarian at the center of the controversy surrounding the bow-shooting death of a cat that began more than a year ago, has filed a motion to strike testimony from a witness who testified during an administrative hearing to determine the status of her license, according to court documents.

William Folger, DVM, MS, DABVP (feline), feline regent for the American Board of Veterinary Practitioners, testified as an expert witness for the Texas Board of Veterinary Medical Examiners (TBVME) on the pain the cat Lindsey shot may have felt and the immediacy of its death. Lindsey's motion calls into question Folger's ability to give fair and balanced testimony based on statements Folger made on the Veterinary Information Network (VIN) website regarding Lindsey's actions.

The post that started it

In April 2015, Lindsey posted an inflammatory message on Facebook along with a graphic photo of herself holding an orange and white cat with an arrow shot through its head. "My first bow kill ... lol!" the post read. "The only good feral tomcat is one with an arrow through it's [sic] head! Vet of the year award ... gladly accepted."

An Austin County grand jury found insufficient evidence to charge Lindsey with criminal animal cruelty. The TBVME, however, found her in violation of the state Veterinary Practice Act and moved to revoke her license.

After a mediation session to resolve the case was unsuccessful, a hearing before administrative law judges took place April 25-26, 2016. Testimony was heard over two days with witnesses called by both Lindsey and the TBVME.

At the conclusion of that hearing, lawyers for both parties had until June 10 to submit closing arguments. But on June 6, Lindsey's lawyer filed a



>>> Kristen Lindsey and Brian Bishop, her attorney, at an administrative hearing in late April.

motion seeking a partial new trial or to reopen the evidence to supplement the record and to strike testimony of Folger, according to court documents.

During the hearing Folger discussed the markings of the cat in question and the pain and suffering it likely experienced. He also testified that he believed that the cat in the photo was still alive when Lindsey took the picture, based on its body positioning, local media reported. Lindsey had asserted that the cat died instantaneously in her testimony.

New motion

In the June 6 motion, Lindsey's lawyer asserts that Folger's testimony contained "extremely damning and incriminating opinions to support the Board's allegations" and that most of Folger's opinions were "subjective conclusions based on what Dr. Folger testified he believed the 4/15/15 Facebook photograph showed."

The motion alleges that Folger's testimony at the hearing directly contradicted what he'd posted about the situation on the VIN website in 2015. According to the motion, Folger wrote on VIN that "it seems to be a perfect

kill shot through the skull ... a perfect kill shot by a novice hunter with a cat that may be missing part of it's [sic] RR leg = could the cat have been caught in a trap? If the cat was immobilized, it would have made the perfect kill shot by a novice more likely."

Folger also displayed animosity toward Lindsey and her actions in his VIN posts, according to the motion, comparing her to Hannibal Lecter and calling her a lunatic, stating that he hoped for "Texas to be free of Kristen Lindsey. I hope she leaves our great state," that he was ashamed over "how incompetent and lazy the local DA was in this matter," and that he hoped the state board would be more diligent.

Folger also sent an email to the district attorney's office after its decision not to pursue criminal animal cruelty charges against Lindsey, according to the motion. In the email he sarcastically congratulated the attorney for clearing Lindsey and said he hoped she'd leave Texas "right now," the motion states.

Lindsey's lawyer says in the motion that this new evidence "fatally undermines Dr. Folger's credibility and his integrity" and that his testimony should be stricken from the record as

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patently untrustworthy and unreliable. Folger was the primary witness the TBVME called in this case.

Texas board response

The TBVME filed a response to Lindsey's motion on June 20, calling the motion an "eleventh-hour attempt to discredit a highly reliable, informative expert witness," according to court documents. The board states that Lindsey's motion doesn't meet the required elements to reopen evidence, that she hasn't shown good cause for partial new trial and that there's no basis to strike Folger's testimony. The TBVME asks that the motion be denied by the administrative law judges assigned to the case.

In its response the TBVME argues that Lindsey and her lawyer did not do due diligence to obtain Folger's comments before the trial, though they were readily available. "Respondent's motion merely states that Respondent's counsel 'has obtained' the VIN comments. Respondent did not divulge when the comments were obtained," the response states. "If the comments were obtained before the hearing, Respondent cannot introduce them after the fact simply because Dr. Folger's testimony was harmful to her position."

The TBVME alleges that Lindsey and her lawyer had opportunity to research Folger and prepare for his cross-examination, but it appeared that they "simply declined to do so." Lindsey's lawyer could have deposed Folger, requested



>>> Lindsey follows the proceedings during the hearing in April.

a written expert report or asked for a more detailed designation of Folger's expected testimony, but "deliberately declined to do any of these things," according to the court document.

In regard to Lindsey's assertion that Folger's VIN comments were inconsistent and biased compared with his testimony at the hearing, the TBVME states that the comments "clearly reflect a practitioner who is shocked and disgusted by Respondent's actions. However, these statements don't necessarily show bias. In fact, they are entirely consistent with Petitioner's position that Respondent has tarnished the practice of veterinary medicine and should no longer be allowed to practice in Texas."

The TBVME asserts that though Folger may find Lindsey's actions reprehensible, there is no indication that Folger's personal opinions in any way affected the professional, expert

opinions offered in his testimony. It also notes that Lindsey's motion inaccurately states that Folger's testimony is "the only evidence" the TBVME presented to prove that the cat Lindsey shot was not an intact male as she has claimed. The TBVME also presented photography and testimony from the cat's owners and pet sitter.

Other arguments the TBVME makes against granting Lindsey a partial new trial is that the admission of the new evidence at this stage of the hearing process will cause a considerable delay to the already lengthy process and that "Staff has already devoted substantial time and resources in responding to Respondent's copious pleadings and conducting the contested case hearing. Furthermore, Respondent has repeatedly complained that the contested case proceedings have prevented her from finding permanent employment."

What's next

From here, each side has until July 8 (extended from July 1) to respond to the other party's arguments. Should the case follow standard protocol, the administrative law judges will then have 60 days to issue a decision. Both parties will have an opportunity to file written responses and ask the judges for any changes they feel are appropriate. The TBVME will then consider the case at its next open meeting. The TBVME expects that the case will go before the full board at its October 2016 meeting. [dvm360](#)

Georgia Supreme Court rules pet owners can recover treatment costs in negligence cases

One June 6, the Georgia Supreme Court ruled that a pet owner—in this case, a couple who spent \$67,000 on a dachshund's veterinary treatment—may seek to recover treatment costs in negligence cases even if those expenses exceed the pet's fair market value.

"We find that long-standing Georgia precedent provides that the damages recoverable by the owners of an animal negligently killed by another include both the fair market value at the time of the loss plus interest and, in addition, any medical and other expenses reasonably incurred in treating the animal," wrote Chief Justice Hugh Thompson in the court's unanimous opinion.

At issue in the case is the death of Lola, a dachshund owned by Robert and Elizabeth Monyak. The Monyaks boarded Lola and her housemate, Callie, a 13-year-old Labrador, at Barking Hound Village, where, they assert in their original lawsuit, the staff gave the dachshund the anti-inflammatory medication meant for the Labrador. This resulted in renal failure and, despite extensive veterinary care over a nine-month period, Lola's eventual death.

The Georgia Court of Appeals found that, in the absence of an actual "market value," the measure of recoverable damages was the pet's actual value to the owner, which the Supreme Court

reversed. But the court also found the defendant's claim that damages had to be capped at fair market value also to be incorrect.

Referring to a decision from the 1800s involving an injured horse, Thompson states that precedent allows that "when the animal fails to recover, damages are limited to the market value of the animal plus the reasonable costs expended on its care and treatment."

So what do "reasonable costs" entail, exactly? That's for a jury to decide, Thompson says. He also notes that, despite the number of amicus briefs filed, damages based on sentimental value were never an issue in this case. [dvm360](#)

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Jason Johnson appointed dean of new veterinary school in Harrogate, Tennessee

Faculty member replaces most recent dean, Glen Hoffsis, at Lincoln Memorial University; will serve as executive director of CAHA.

Jason Johnson, DVM, DACT, has been named vice president and dean of the Lincoln Memorial University College of Veterinary Medicine (LMU-CVM) in Harrogate, Tennessee, university officials recently announced.

Johnson will step into the role currently held by LMU-CVM's founding dean Glen Hoffsis, DVM, MS, DACVIM, who will continue working to ensure a smooth transition of leadership, according to an LMU release. As a founding faculty member, Johnson was promoted to associate dean of clinical sciences at the university in October 2015. He also served as an associate professor of theriogenology as well as the medical director of the DeBusk Veterinary Teaching Center (DVTC).

"Dr. Jason Johnson has been an integral part of the foundation of the LMU College of Veterinary Medicine, so it is

fitting that the torch is passing to him," says LMU President B. James Dawson in the release. "I am confident that



Dr. Jason Johnson

While teaching at LMU-CVM, Johnson developed a course in clinical skills that has since been incorporated into every semester of the curriculum. He has also led in the development, design, capital campaign, technology implementation and construction of the DVTC, as well as developed a grant acquisition plan procuring approximately \$6 million dollars for the

college of veterinary medicine. He also serves as executive director for the Center for Animal Health in Appalachia (CAHA), which he founded, a program with a mission in economic, animal, and public health research, education, advocacy, and promotion of veterinary practices in underserved areas.

college of veterinary medicine.

He also serves as executive director for the Center for Animal Health in Appalachia (CAHA), which he founded, a program with a mission in economic, animal, and public health research, education, advocacy, and promotion of veterinary practices in underserved areas.

Before joining the faculty at LMU, Johnson worked in private practice and served on the faculty of Ross University School of Veterinary Medicine. In 2012 he participated in the AVMA's Future Leaders Program. He serves in numerous leadership capacities within organized veterinary medicine including the AVMA House of Delegates and Legislative Advisory Committee. A native of Luverne, Alabama, Johnson is a 2003 graduate of the Auburn University College of Veterinary Medicine. [dvm360](#)

King appointed chair of Appalachia advisory board

Lonnie King, DVM, MS, DACVPM, former dean of the Ohio State University College of Veterinary Medicine, has been appointed chair of the Center for Animal Health in



Dr. Lonnie King

Appalachia (CAHA) Advisory Board, according to a center release.

"Dr. Lonnie King's vast experience in the field of veterinary medicine and animal agriculture and his expert knowledge in the One Health arena makes him the ideal leader to guide our team as we work to improve animal and public health issues in Appalachia and beyond," says Jason Johnson, DVM, DACT, CAHA's executive director. "Dr. King's experience and dynamic leadership will guide CAHA to envision the future of veterinary medicine and furthermore, spur us to develop education, research, outreach, advocacy and new markets that ensure a bright future for veterinary medicine."

Lincoln Memorial University-College of Veterinary Medicine (LMU-CVM) formed CAHA at the DeBusk Veterinary

Teaching Center in Lee County, Virginia. CAHA focuses on the unique challenges facing animal and public health in the 13-state Appalachian region. LMU-CVM and CAHA also conduct research and administrative activities on the LMU main campus in Harrogate, Tennessee.

Previously, King served as dean for 10 years at Michigan State University, after 19 years with the U.S. Department of Agriculture in the Animal and Plant Health Inspection Service as both deputy administrator for veterinary services and administrator for the agency. While serving as the agency's chief veterinary officer, he worked extensively in global trade agreements and has testified before Congress on issues of emerging diseases and animal health.

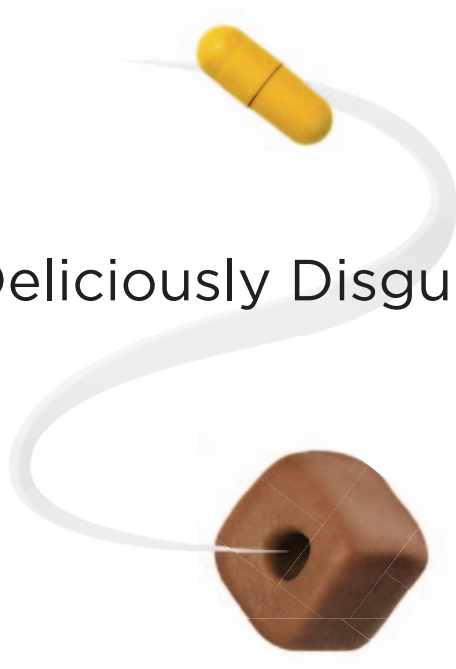
A member of the National Academies of Science, King is also boarded by the American College of Veterinary Preventive Medicine. Most recently he directed the National Center for Zoonotic, Vector-Borne and Enteric Diseases at the Centers for Disease Control, and currently serves as vice chair of the Obama Administration's recently established Presidential Advisory Council on Combating Antibiotic-Resistant Bacteria. [dvm360](#)



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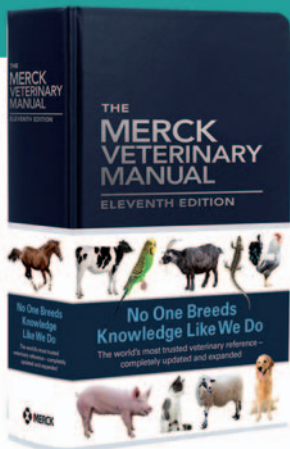
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Rule increasing overtime pay for managers becomes final

U.S. Department of Labor sets salary threshold for overtime pay at \$47,476.

The U.S. Department of Labor has published an update to regulations under the Fair Labor Standards Act in which far more employees will be eligible for overtime pay. Under the new rule, workers earning up to \$47,476 annually or \$913 per week will be eligible for overtime pay, rather than those earning up to \$23,660, which was the previous threshold. The rule will go into effect Dec. 1, according to the Department of Labor website.

A previous proposal, initiated by President Obama in 2014, set the threshold at \$50,440. This drew concern earlier this year from Rep. Kurt Schrader (D-Oregon), DVM, who worried that paying high levels of overtime wages could hurt veterinary practice owners financially. According to the Veterinary Hospital

Managers Association (VHMA), the average salaried practice manager earns \$51,364, and the average salaried office manager earns \$37,765.

“Our practice managers are like family, and they deserve the reward of a good salary,” Schrader told *dvm360* in April. “But jumping straight to \$50,000 is a huge move.”

The VHMA has criticized Schrader’s remarks, stating that practice managers are vital to a veterinary hospital’s success and as such deserve to be compensated accordingly. [dvm360](#)

Elsewhere in [dvm360](#)

The Veterinary Hospital Managers Association weighs in on the new overtime rule. [See page 34.](#)

Torture of a companion animal now a felony offense in Ohio

On June 13, Ohio Gov. John Kasich signed H.B. 60 into law, making the act of knowingly causing pain or physical harm to an animal a fifth-degree felony on a first offense, according to a release from the Humane Society of the United States (HSUS).

Animal cruelty had previously been a misdemeanor in the first offense and a felony in the second in the state of Ohio unless done by a kennel owner, manager or employee. This new law makes the torture of any companion animal by any person a fifth degree felony in the first offense.

The measure also provides for a

state collaborative effort to assist veterinarians in identifying clients who may use their animals to secure opioids for abuse, and modifies the penalty for assaulting a police dog or horse, according to the release.

“The brutal act of torturing a companion animal should not be tolerated in our state, and this new law is a step in the right direction,” says Corey Roscoe, Ohio state director for HSUS. “Ohio now joins 47 states in the nation that punish extreme acts of animal cruelty with felony-level penalties.”

Previously, all companion animal torture crimes in Ohio were misdemeanors, the release states. [dvm360](#)

Zoetis announces Apoquel now in full supply

Manufacturer says no more order limits for atopic dermatitis treatment.

Been itching to prescribe oclacitinib (Apoquel) to your canine patients with atopic dermatitis? The manufacturer, Zoetis, has announced that the product is now available to all U.S. veterinarians without order limits.

Introduced more than two years ago, this new formulation of allergic dermatitis treatment in dogs drew much excitement from veterinarians, which turned to frustration when complications with manufacturing meant Zoetis had to halt new prescriptions, leaving the remaining supply only available to

VetSource to offer home delivery for Henry Schein customers

VetSource, an online veterinary pharmacy, and distributor Henry Schein Animal Health state that they have entered into a strategic relationship to give Henry Schein customers access to VetSource's veterinary home delivery service. This expands VetSource's reach and strengthens its presence in the veterinary industry, company representatives say.

"With this new relationship, VetSource's home delivery services, which offer convenient access to animal health products and pet nutrition, are now supported by over two-thirds of U.S. companion animal distribution representatives, driving even broader awareness of our services," says VetSource CEO Kurt Green in a release from his company.

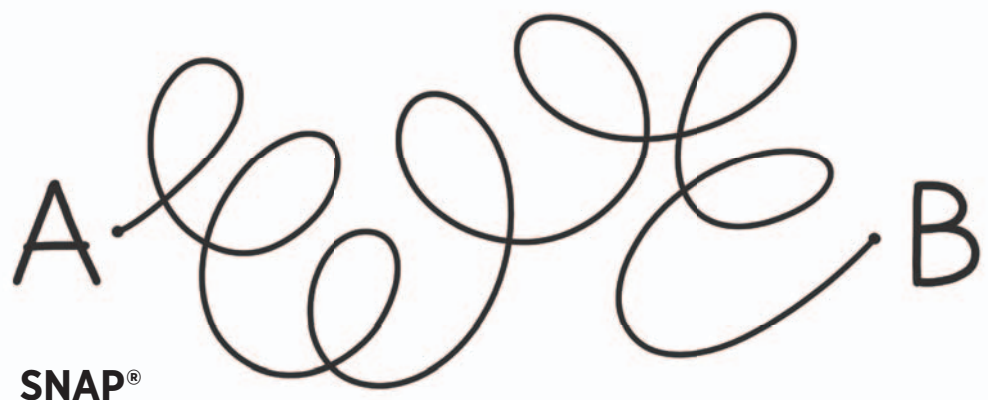
VetSource fulfills orders for more than 1 million animal health products annually across the United States, the release states. With a reported error rate of less than 1 in 20,000, VetSource says it offers redundant safety systems and professional veterinary pharmacy support.

"Henry Schein Animal Health is committed to providing our customers with the products and services they need to operate successful veterinary practices, and we look forward to working with VetSource," says Fran Dirksmeier, president of Henry Schein Animal Health, North America, in the release. [dvm360](#)

dogs already receiving the medication.

Oclacitinib is a Janus kinase (JAK) inhibitor that decreases inflammatory mediators and cytokines that cause pruritus. Initial studies have shown that

it is well-tolerated, results in a rapid reduction in pruritus and alleviates lesions in dogs with atopic dermatitis. For more information on Apoquel and its availability, go to zoetisus.com. [dvm360](#)



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Ground Zero rescue dog's life of service complete

Bretagne, a golden retriever, assisted after 9/11, Hurricane Katrina and Hurricane Rita.

The last known search-and-rescue dog to serve at the World Trade Center site in New York City in the days following the 9/11 terrorist attack has died.

Bretagne, a 16-year-old golden retriever, was euthanized on June 6, 2016, after experiencing kidney failure and other health problems, according to *The New York Times*.

Bretagne (pronounced Brit-nee) joined the Cy-Fair Volunteer Fire Department in Houston, Texas, in 2000 and was the founding canine member of the department's K9 Search and Rescue Team. Certified as a FEMA Disaster Search Dog, Bretagne was just 2 years old when she and her owner and partner Captain Denise Corliss traveled as members of Texas Task Force 1 to Ground Zero. One of around 300 dogs called to duty after 9/11, Bretagne worked 12-hour days for 10 days but found only remains, *The New York Times* reported. Like many others, Bretagne took on a secondary role and served as a therapy dog to weary firefighters in need of comfort.

Despite harsh working



>>> Bretagne, the last known Ground Zero search-and-rescue dog, died in early June.

conditions and exposure to toxic fumes and hazardous debris at Ground Zero, many of the search-and-rescue dogs, like Bretagne, lived long lives with little evidence of ill health caused by their service.

Following 9/11, Bretagne continued her work with Texas Task Force 1 and the Cy-Fair Volunteer Fire Department, adding Hurricanes Katrina and Rita to her impressive search-and-rescue record.

While Bretagne officially retired from search-and-rescue duties at the age of 10, the four-legged hero continued to be actively involved in the community as an ambassador for the local fire department and as a reading assistance dog in a local first grade classroom. Bretagne served students at Roberts Road Elementary school up until the last weeks of her life, offering them "a non-judgmental ear and a soft paw,"

"To the Cy-Fair Volunteer Fire Department, Bretagne was a civil servant, a hero and is family."

—Cy-Fair Volunteer Fire Department

says a release from the Cy-Fair Volunteer Fire Department.

"Some may say that the most a dog could be is a pet," the CFVFD release states. "However, to the over 400 members of the Cy-Fair Volunteer Fire Department, Bretagne was a civil servant, a hero and is family. We will remember her fondly and continue serving the community with her as inspiration." **dvm360**

Heartworm symposium to examine resistance, testing, multimodal prevention

AHS announces the hottest topics on tap for its triennial event, scheduled for September in New Orleans.

The American Heartworm Society (AHS) has announced the topics to be presented at the 15th Triennial Heartworm Symposium. The symposium, titled “Heartworm Disease: The Science, the Practice, the Future,” will be held September 11-13, 2016, in New Orleans and will provide attendees with up to 20 hours of continuing education credit.

“Any veterinary practitioner who is interested in learning more about heartworm disease and its management should seriously consider attending this important symposium,” says AHS president Stephen Jones, DVM, in an AHS release. “We’re going to pack in a lot of great information as well as lively panel discussions.”

Symposium attendees can expect the following topics: **Resistance/lack of efficacy.** Hear findings from researchers on studies involving the genetic analysis of resistant heartworms and ways to prevent their development.

Diagnostic techniques. Learn about new research regarding heat treatment of samples, as well as information on radiographic techniques.

Recent developments in heartworm treatment protocols. Hear the latest information on heartworm treatment, including non-arsenical therapy, and recent developments in heartworm treatment protocols.

Multimodal heartworm prevention. Listen to parasitologists, entomologists and others

discuss vector epidemiology and the role of vector control in heartworm prevention.

Feline heartworm disease. Feline heartworm is an underdiagnosed disease, and only a small percentage of cats are on preventives. Learn the latest regarding feline heartworm disease and heartworm associated respiratory disease (HARD).

“We strive to bring together the brightest minds in the world when it comes to understanding heartworm disease, as well as those involved in the latest research,” Jones says. “It’s an information-packed meeting that is well-suited to veterinarians in practice.”

Register at heartwormsymposium2016.org. [dvm360](#)

Lorin Warnick named dean of Cornell veterinary college

Lorin D. Warnick, DVM, PhD, DACVPM, has been named the Austin O. Hooey Dean of Veterinary Medicine at Cornell University College of Veterinary Medicine, according to a university release. “Lorin is a proven leader who has managed the college effectively and with great thoughtfulness since taking over as interim dean last year,” says Cornell Provost Michael Kotlikoff, VMD, PhD.

Warnick assumed the post of interim dean Aug. 1, 2015, after the college’s previous dean became provost. Prior to that, Warnick served as associate dean for veterinary education since 2007 and director of

the Cornell University Hospital for Animals since 2012. As

interim dean, Warnick has supported the college’s ongoing projects, including the preclinical class expansion construction project, which involved renovating and replacing the center of the college to allow for a larger fall class in 2017.

In his role as dean, Warnick says his overall vision is to “excel in our core missions of research, veterinary education, graduate education and service to the public.” In addition to clinical



Dr. Lorin Warnick

experience, Warnick wants to better prepare students to be engaged in business entrepreneurship and new technology and play a leadership role in the business side of veterinary medicine. He says his administration will continue looking for ways to reduce student debt levels and provide a greater variety of career opportunities.

Warnick received a bachelor’s degree from Brigham Young University in 1984, a DVM degree from Colorado State in 1988, and a PhD with an emphasis on epidemiology and statistics from Cornell in 1994. He is also a diplomate in the American College of Veterinary Preventive Medicine. [dvm360](#)



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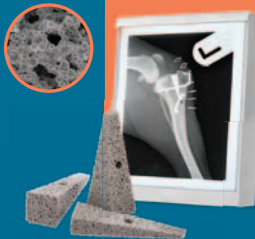


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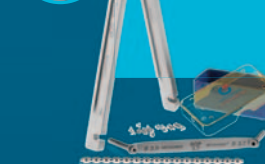


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>>> If you're converting a historic building into a veterinary hospital, take a note from Dr. Harvey Hummel and keep the character of the structure. "The overall barn look was maintained along with keeping the cupolas and silo," he says. The team updated the exterior with maintenance-free siding, added windows and expanded the entryway to make it stand out.

Making history with **veterinary care**

Andover Animal Hospital of Newton, New Jersey, was, in fact, born in a barn. Find out how this team turned a historic landmark into a state-of-the-art veterinary facility. *By Ashley Griffin*

A veterinarian and an architect walk into a barn. Well, actually they drove past it first.

"We commented, 'Wouldn't it be cool to utilize that structure?'" says architect Jeremy Rumph of TWC Architecture and Construction in Willmar, Minnesota. He and Harvey Hummel, VMD, were planning on utilizing the existing lot of Andover Animal Hospital in Newton, New Jersey. How-

ever, zoning challenges detoured those plans—until a new path opened up.

"Lo and behold 'that structure' became available and we forged ahead with a new direction," Rumph says.

"That structure" happened to be an old dairy barn—and when we say old, we mean more than 100 years old. The historic landmark dates back to the early 1900s and converting the space into an 8,034-square-foot veterinary

hospital earned Andover Animal Hospital a 2016 Hospital Design Competition Merit Award.

Make history with your next hospital design project with these timeless tips, courtesy of Hummel.

Redesign history

If you're looking for the perfect building for your hospital conversion, remember that sometimes it pays to think outside



ALLEVIATING ANXIETY ANXIETY

A ROUNDTABLE DISCUSSION ON BEHAVIOR
MANAGEMENT WITH A FOCUS ON SUPPLEMENTS

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Roundtable Participants

Moderator



Gary Landsberg, BSc, DVM, DACVB, DECAWBM (CA)
Veterinary Behaviorist, North Toronto Veterinary Behaviour Specialty Clinic,
Thornhill, ON, Canada

Dr. Landsberg is a board-certified veterinary behaviorist, offering behavior consultations in the Toronto area. He is Vice President of Veterinary Affairs for CanCog Technologies and a VIN consultant, and he serves on the executive committees of the Fear FreeSM initiative and the European College of Animal Welfare and Behavioural Medicine. He has authored more than 100 research papers, articles, and book chapters including *Behavior Problems of the Dog and Cat*, 3rd edition (Elsevier, 2013).

Panelists



Theresa L. DePorter, DVM, MRCVS, DECAWBM, DACVB

Veterinary Behaviorist, Oakland Veterinary Referral Services, Bloomfield Hills, MI
A board-certified behaviorist, Dr. DePorter has been offering behavior consultations in metropolitan Detroit since 2004. She is the author or co-author of several book chapters on the topics of feline aggression, use of pheromones in feline practice, psychopharmacology and nutrition, and prevention and management of stress in pet cats in the home environment.



Lynn Honeckman, DVM

Owner, Veterinary Behavior Solutions, Orlando, FL

Dr. Honeckman has been in small animal and exotic animal medicine practice for 23 years. In 2011, she opened Veterinary Behavior Solutions. She is on the Special Council of the Pet Professional Guild and helped create the Central Florida Force-Free Behavior and Trainers Network, working with other professionals to reduce and treat fear, anxiety, and aggression in pets. She is the Committee Chairperson for AVSAB Position Statements and is on the Advisory Board for Dr. Marty Becker's Fear FreeSM initiative.



Kelly Moffat, DVM, DACVB

Veterinary Behaviorist, Medical Director, VCA Mesa Animal Hospital, Mesa, AZ

Dr. Moffat joined the staff of Mesa Veterinary Hospital in 1994. She later completed a behavior residency and became board certified. Dr. Moffat now serves as the Medical Director at the VCA Mesa Animal Hospital. Because of her interest in the human-animal bond and internal medicine, she remains active in general practice in addition to providing behavior consultations. She is also an adjunct faculty member of Midwestern University, lecturing at the College of Veterinary Medicine.



Sherrie Yuschak, RVT, VTS-Behavior, KPACTP, CPDT

Veterinary Behavior Technician, North Carolina State University, College of Veterinary Medicine, Raleigh, NC

Ms. Yuschak is a behavior technician with NCSU's Behavioral Medicine Service. She collaborates on behavioral research and teaches staff and students low-stress handling techniques. A past board member of the Society of Veterinary Behavior Technicians and an Examination Committee member for the Academy of Veterinary Behavior Technicians, Ms. Yuschak is also a faculty member of the Karen Pryor Academy for Professional Dog Trainers and a module contributor for the Fear FreeSM initiative.



ALLEVIATING ANXIETY ANXIETY

Introduction

Few conditions are more vexing for both veterinarians and pet owners than those related to behavior. Behavioral issues can drain an owner's patience and can lead to the development of various medical conditions, which can significantly reduce a pet's quality of life. Unmanaged or untreated behavioral issues are a leading cause of pet abandonment, relinquishment, or euthanasia. Fear, stress, or anxiety-related conditions are common in pets, and identifying these issues and intervening early to address them not only enhances the human-animal bond, but improves quality of life for pets and families. Addressing

these issues takes a multimodal approach. Advances in calming supplements designed to help support normal behavior in dogs and cats are giving veterinarians new options to assist in managing these cases.

A group of animal behavior experts recently took time to discuss this complex issue, taking a closer look at how to identify and comprehensively manage some of the most common behavioral issues encountered in general practice and discussing the role the veterinary team can play in spotting at-risk pets.

A roundtable discussion on behavior management with a focus on supplements

Dr. Gary Landsberg (moderator): We know that behavioral problems are not always brought to a veterinarian's attention until the situation has become severe, or when an associated medical condition arises. Clearly, our goal is to identify these cases and initiate intervention earlier in the process. To begin, how important are anxiety issues in pets?

Dr. Kelly Moffat: From a medical perspective, anxiety can be a factor in disease. Stress colitis and cystitis are near the top of the list. We've always known about stress colitis associated with boarding, but now we understand that even some of our day-to-day diarrhea cases have a stress component. For example, a pet may develop stress-related diarrhea when the owners are out of town or when guests visit. In cats, inappropriate urination due to cystitis is often stress related.

Dr. Theresa DePorter: The development of colitis in boarding facilities is almost considered "normal," rather than an indication of stress. In fact, the association is so well accepted, that some owners anticipate that their pets will have diarrhea and may lose weight during their stay away. Until we acknowledge that those colitis cases are really anxiety issues, we cannot help.

Dr. Lynn Honeckman: For allergic pets, anxiety can lead to a vicious cycle. Chronic pruritus in allergic pets tends to make them more anxious and more stressed.

Ms. Sherrie Yuschak: Other dermatologic conditions such as excessive grooming can also result from stress or anxiety. In addition, patients with chronic stress conditions have decreased immune function and are at higher risk for nosocomial infections. This should be taken into consideration, especially with surgical patients.

Dr. Honeckman: Medical conditions frequently cause anxiety. Chronic pain, chronic arthritis, and others make pets guarded, anxious, and stressed. That affects their interactions with their environment including family members and other pets.

Dr. DePorter: Any medical condition can lower the threshold for anxiety, apprehension, and discomfort and influence how the pet makes decisions. The first sign of virtually every medical condition is some change in behavior. And, on the other hand, good emotional well-being appears to be associated with improved health. According to a paper by Dr. N.A. Dreschel, the stress of living with a fear or anxiety disorder can have negative effects on health and the lifespan of dogs.¹

Dr. Landsberg: Clearly a lot of medicine is involved in behavior and a lot of behavior is involved in medicine. Are there other, non-medical reasons to be concerned about identifying and treating anxiety in pets?





“If we ignore an anxiety-related issue, then the relationship between the pet and owner will break down. That relationship is the number one reason we have pets in our lives. Any kind of anxiety-related issue is going to break down that bond and disrupt the relationship.”

— Lynn Honeckman, DVM

Dr. Honeckman: If we ignore an anxiety-related issue, then the relationship between the pet and owner will break down. That relationship is the number one reason we have pets in our lives. Any kind of anxiety-related issue is going to break down that bond and disrupt the relationship. We cannot afford to ignore behavior problems in pets.

Ms. Yuschak: If the human-animal bond is weakened or broken, what kind of care is that owner likely to provide for his pet? An owner dealing with pet behavior problems is more likely to say “no” to many of our recommendations. And, we know that behavior problems lead to an increased risk of pet relinquishment or euthanasia.

Dr. Landsberg: Many owners may not seek help because they do not know where to go or who to ask. Why don't pet owners discuss these problems with their veterinarian?

Dr. DePorter: As a specialist, I often see patients after owners have sought help for the problem at many levels without success. But, I also see owners who are unconvinced that the problem is related to anxiety. Helping them to see the root cause is important.

Dr. Moffat: They may not consider behavioral problems as a health issue, so never think to relate it to their veterinarian. Owners often see a pet's aggressive behavior as something innate or requiring punishment. It is our job to educate owners on the relationship between fear and anxiety and aggressive behaviors.

Dr. Landsberg: How often are pets relinquished or euthanized for behavior problems?

Dr. Honeckman: Per 2016 Humane Society data, it is estimated that 30% to 40% of relinquished pets were given up due to behavior problems.²

Dr. Moffat: A 2015 study by Dr. Emily Weiss explored the re-homing of dogs and cats in the United States. Her study found that 6% of all dogs and cats were re-homed within the past five years, with 36% of these pets ending up at the shelter. Dogs and cats with medical or behavioral issues were the ones most likely to be re-homed to an animal shelter, as opposed to with friends or family members.³

Dr. Landsberg: In general practice, how often are fear and anxiety components of what needs to be addressed during a visit?

Dr. Moffat: Probably every pet owner deals with behavior problems at some point in a pet's life. Problems may not occur every day, but most pet owners experience problem situations. We should look to identify behavior problems at every opportunity.

Dr. Landsberg: Earlier this year a study was presented in which owners were asked about their pets' behavior problems. A large percentage reported issues. Of the 499 owners who completed questionnaires, 450 reported behavior problems.⁴

Dr. DePorter: In another study, 41% of dog owners reported they had owned a dog with anxiety issues at some time, and 29% currently owned dogs being affected.⁵

Anxiety triggers

Dr. Landsberg: What are common triggers of anxiety or situations in which anxiety arises in dogs and cats?

Dr. DePorter: Fear of novel situations or unfamiliar people is not uncommon. Separation anxiety is a big one. Probably 20% of pets have some level of separation anxiety. And, since the anxiety often occurs when no one is around, there are probably many more cases that go undetected.

Ms. Yuschak: Another trigger of anxiety can be living with another species in the household. These pets can be under constant stress, trying to navigate that relationship.

Dr. Honeckman: Dog-to-dog reactivity and aggression is one of the major triggers of anxiety, especially in suburban environments. That may be a product of the modern lifestyle. Often, dogs are not exposed to new experiences with other dogs at an early age, and this trend continues as pets are left at home during the day in many situations. Then, because of the embarrassment or frustration associated with dog-to-dog

behavior problems, owners reduce their time outside more and more and spend less and less time doing fun activities with their dog. The result is a breakdown in the relationship between the dog and owner.

Dr. Moffat: For cats, it is probably a lack of enrichment or the addition of another cat to the household. Cats are very subtle about their stressors and aggressions. Housesoiling and fighting are signs of this stress. A lot of cats hide, and owners often think they are shy, but really they are stressed.

Dr. Landsberg: For a cat, any change in their environment can be a stressor. Are there any other triggers we should mention?

Ms. Yuschak: Many. Thunderstorms, smoke detectors, low battery alerts, doorbells—any loud and unpredictable sound.

Dr. DePorter: Cats are particularly sensitive to the odor of another cat outside the home. And, taking cats to the veterinary clinic is one of the biggest stressors we impose upon them.

Dr. Landsberg: Unfortunately, confrontation- or punishment-related dog training is still being advocated and used all too often. This has been shown to cause fear, anxiety, stress, avoidance behaviors, and less playful dogs.

Dr. DePorter: True. There is not enough anxiolytic, either at the supplement or medication level, to offset the stress of living with someone who punishes on a regular basis. The foundation for treatment of behavioral problems has to be built on positive-reinforcement-based training and interactions. Pets trained using methods that rely on imposing anxiety or a threat really should not be given anxiolytics. They may be subjected to more intimidation since it is harder to startle an animal that has been protected with medication. I believe we can alleviate undesirable behaviors *and* treat animals with kindness, gentleness, and respect. We can and should do both. A good relationship between the pets and their owners is fundamental to success.

General practitioners and identifying behavior problems

Dr. Landsberg: Why aren't more veterinarians adequately addressing behavior problems? And, how can we better identify pets with behavior problems in the general practice setting?

Dr. Moffat: General practitioners have so much to deal with during an appointment that it is difficult to include a behavior assessment. But, over the past several years, the recognition of behavior problems has definitely improved. Although practitioners realize behavior problems are a concern, some may not feel well equipped to successfully treat or manage the issue.



“The foundation for treatment of behavioral problems has to be built on positive-reinforcement-based training and interactions.”

— Theresa DePorter, DVM, MRCVS, DECAWBM, DACVB

Dr. Honeckman: General practitioners who do not have enough of a knowledge base to address these concerns themselves are often open to referral.

Ms. Yuschak: Unfortunately, in some cases, if an owner has not initiated a conversation, the veterinarian may avoid discussing concerns about behavior problems for fear of offending the owner.

Dr. DePorter: There is a stigma associated with having a pet with a behavior problem. So, not unlike having to broach the subject of obesity with owners, veterinarians need to take a tactful approach, and they should make behavior assessment part of their routine evaluation. Veterinarians should always include a comment in the medical record on the pet's behavior during even routine veterinary visits.

Dr. Honeckman: Absolutely. A behavior assessment that is noted in the record should become a standard of care for each and every visit. In general, veterinarians are data driven, so it is easy to talk to an owner about laboratory results but difficult to talk about more subjective things like obesity or behavior problems.

Ms. Yuschak: A standardized checklist at every wellness visit is a great way to normalize discussions about a patient's behavior. (See “Behavior Screening Questionnaire” on page 7.)

Dr. Honeckman: The checklist should be filled out before the veterinarian performs an examination. Then, even if a problem cannot be addressed at that visit, it has been



documented, and it is much easier to say, “Let’s make an appointment to discuss that.”

Dr. DePorter: Even for pet owners that are not experiencing behavior problems, going through the checklist regularly would be beneficial. If they do that every year, when a behavior problem occurs, visiting their veterinarian will seem like the most logical step. And we can catch problems in the early stages.

Dr. Moffat: I like to ask owners open-ended questions, such as, “How is houstraining going?” If the owner says, “Not so well,” we have a discussion, which helps me determine if the problem is behavioral or medical. If there are suspected behavior problems, veterinarians may need to address them in a separate appointment or refer the client to a specialist.

The role of the team

Dr. Landsberg: Which members of the veterinary team are helpful in identifying behavior problems and discussing these issues with owners?

Dr. DePorter: Some issues the receptionist may encounter first. For example, if an owner calls to say that she may not make an appointment because she has difficulty getting her 10-lb dog in the car by herself, the receptionist should ask about possible behavior issues. Team members in the front office have the unique opportunity to identify anxiety in pets as they arrive at the clinic or are waiting in the lobby. It’s important to identify those issues and point them out to the client, and show them how we handle this. In just a few seconds, we can help that pet overcome its anxiety at that moment. In doing so, we also model for the client the way to deal with a pet when it’s anxious.

Ms. Yuschak: It is great for owners to hear the message from the whole team. It starts with the receptionist handing out the behavior questionnaire. Then, a technician who gathers the patient history can scan the questionnaire for any red flags. If the owner identified a behavior problem that will not be addressed that day, the technician can give basic tips on how to manage the problem until the next appointment.

Dr. Moffat: At my practice, each technician studied a particular behavioral issue—housesoiling in cats, jumping up in dogs, play biting. Each of them researched his or her topic and presented it at a staff meeting. It made them more comfortable with these issues. Technicians can counsel owners on mild behavior issues, but a veterinarian needs to be informed of all behavioral concerns and deal with the brunt of them because there are often medical components.

Dr. Honeckman: Yes, team members can address

housesoiling and jumping up and nuisance barking. If it is a more serious behavior problem, such as separation anxiety, thunderstorm phobia, or aggression, then that is a conversation for the veterinarian.

Client education resources

Dr. Landsberg: What resources do you suggest to owners for help in treating undesirable behaviors? And, how do you integrate them into the advice that team members and veterinarians give to pet owners?

Dr. Moffat: As a behaviorist, I am able to suggest a lot of resources for owners to educate themselves. I particularly like the Ohio State University website for cats (indoorpet.osu.edu/cats). Sometimes I just email owners a list of resources, but I prefer that owners go home with something in their hands. It reinforces the idea that their pet has a true problem and we are going to address it.

Dr. Honeckman: It is important that the handouts and the references that we give to owners come from science-based, reputable sources. A good way to provide the best information is to use materials provided by the American College of Veterinary Behaviorists and the CATalyst Council.

Dr. DePorter: In one study, pet owners were found to seek free sources of assistance for pet behavior problems, such as the Internet, rather than pay a fee for a behavior consultation.⁶

Dr. Landsberg: I often recommend that a veterinary clinic’s website be populated with the sites that we want owners to go to for information. If we do not provide specific resources to pet owners, then they are likely to find misinformation on their own.

Dr. DePorter: I have a YouTube page where I put all of my favorite behavior videos, so I can send owners there for safe advice. **(Dr. DePorter posts all of her favorite training, learning theory, and behavior modification videos on her YouTube channel. Browse her playlists at youtube.com/user/drtheresadeporter)**

Ms. Yuschak: If you are going to be referring clients to a trainer, you need to understand the methods that the trainer is using and know that a client’s experience will reflect back on you. When you refer your clients—whether it is to a groomer, a boarding facility, or a dog trainer—you must have confidence in their methods and abilities. Your list of recommended resources should be prepared ahead of time and updated regularly.

Consultations and referrals

Dr. Landsberg: For what type of behavioral issues do owners need a separate consultation?

Behavior Screening Questionnaire

Date: _____

Client's Name: _____

Pet's Name: _____

	Yes	No	Notes
Is your pet behaving in any way that worries you or about which you would like more information?			
Are there any changes in your pet's elimination habits that are of concern to you (such as housesoiling, frequent urination or bowel movements, etc.)?			
Does your pet cause any destruction to your home or environment that you see as a problem or as abnormal (such as chewing or scratching furniture, rugs, doors, or windows, digging, etc.)?			
Does your pet seem fearful or anxious in the car or when going to new places?			
Does your pet seem fearful or anxious when boarding, grooming, or visiting the veterinarian?			
Does your pet seem to be afraid of or affected by certain sounds or noises, such as fireworks or thunderstorms?			
Does your pet exhibit any aggressive behaviors that you consider abnormal or that are a concern to you (barking, snarling, lunging, snapping, or biting for a dog; hissing, growling, swatting, or biting for a cat)?			
Has your pet displayed any signs of aggression toward people or other animals?			
Does your dog chase or show aggression toward moving objects?			
Has your pet ever bitten anyone, regardless of circumstance?			
Have your pet's sleeping or activity habits changed lately?			
Have your pet's eating habits changed?			
Does your pet show fear, anxiety, or avoidance of visitors to the home?			
Does your pet vocalize excessively?			
Do you have a change in lifestyle planned in the near future (such as a move, a vacation, a houseguest, a pregnancy, a pet addition, etc.)?			

Veterinarian's assessment of the pet's stress level today on a scale of 1-5

(1 = Very calm; 5 = Very stressed): 1 2 3 4 5

Notes:

Common Signs of Anxiety or Fear in Dogs and Cats

Anxious or fearful pets may exhibit one or more of these signs.

Tucked tail



Photo Credit: Dr. Theresa DePorter

Freezing/Refusal to move



Photo Credit: Dr. Theresa DePorter

Flattened ears



Photo Credit: Dr. Kelly Moffat

Cats

Vocalization:

- Hissing
- Growling

Body Language/Posture:

- Dilated pupils
- Flattened ears
- Hiding or cowering
- Nails extended
- Crouching low
- Trembling

Other Signs:

- Passive escape behaviors
- Fleeing
- Piloerection (hair standing on end)
- Excessive self-grooming, scratching, or licking
- Inappropriate elimination
- Diarrhea
- Inter-cat aggression
- Loss of appetite

Dilated pupils/Crouching low



Photo Credit: Dr. Theresa DePorter

Dogs

Vocalization:

- Excessive barking
- Whining
- Growling

Body Language/Posture:

- Ears lowered or flattened, or highly erect ears
- Avoiding eye contact or staring
- Tight lips/grimace
- Tucked tail
- Hiding or cowering
- Trembling
- Lifting one front paw
- Hyperactivity
- Freezing or refusal to move
- Aggression—biting, nipping, snapping
- Leaning on or clinging to owner
- Jumping or startling easily
- Disinterested in play activities

Other signs:

- Yawning
- Hypersalivation
- Panting (not related to exercise)
- Inappropriate elimination
- Hypervigilance
- Failing to follow basic commands that have been learned
- Lack of interest in food/treats or snatching treats

Dr. Honeckman: Definitely situations of more extreme fears and phobias, such as separation anxiety, aggression with biting, or any aggression if children are in the household. These are issues that are going to take more time to get into, and a separate visit is necessary.

Dr. DePorter: To help determine the severity of the problem, I ask “For how much of each day is your pet anxious?” If they are describing separation anxiety and the pet is almost never alone, that may not be a severe problem. Whereas with a noise-related anxiety, the dog may be anxious, worried, and distressed 80% of the day. That is a more severe health and welfare issue that we triage. Occasionally running around the room may be only a nuisance behavior in a border collie. But if it is spending three to six hours a day doing that, then it may be a compulsive pattern that needs to be addressed by a behaviorist.

Ms. Yuschak: Listen to the way that owners describe problem behaviors. If they say, “I am at my wit’s end,” or “My husband is ready to take this dog back to the shelter,” they are describing a bond that is breaking down because of behavior problems. It might not be a severe problem, but it is urgent.

Dr. Landsberg: Are there ever behaviors that you observe but owners have not reported that need to be addressed?

Dr. Moffat: Sometimes it is an owner’s behavior. I often see owners punish pets. In those cases, I immediately discuss why punishment can be detrimental and why it often fails. I then explain that we should be looking at the underlying emotion of that pet. A lot of people really do not understand, and they are honestly embarrassed about their pet’s behavior.

Dr. DePorter: Growling at the veterinarian is a behavior that often gets reprimanded and apologized for by owners. We can help owners understand that their dog is fearful, and there is no reason to reprimand it for growling. That becomes a springboard into a deeper conversation. Does this dog growl in other contexts? Does it seem worried in other situations?

Hissing, crouching low, dilated pupils, attempts to get away—these are signs that a cat is distressed. **(See sidebar “Common Signs of Anxiety or Fear in Dogs and Cats” on page 8.)** And we want to help clients understand that we, as veterinary practitioners, are empathetic to the distress the cat is experiencing. The labels we put on the cat are also important. If we identify them on the medical record as being “a bad cat” or “a mean cat,” that suggests it is okay for people to be mean. It is not okay. Instead, if we foster empathy for a cat that is worried or terrified, that sets us up to help the cat feel safe and comfortable. If the cat is showing signs of distress at home, then we can address these concerns. We must first show the family that their pet’s anxiety and distress is a concern and a priority.

Ms. Yuschak: In a dog, signs that we might see include ears pulled back, panting, lowered body posture, tucked tail, attempts to move away, whining, vocalizing, and hypersalivation. **(See sidebar on page 8.)** Again, we want to be cautious about how we label that dog. We can describe its appearance, and we can understand that the pet is stressed, worried, fearful, or terrified. Those are the kinds of words that we want to use as opposed to “evil,” “bad,” or “asserting dominance.” We want to set the stage for empathy and show that we care about that pet’s emotional and physiologic state.

We sometimes see puppies or kittens that are not acting appropriately for their developmental stage. For example, an owner might describe a trembling, hypervigilant 8-week-old puppy as “shy,” but we recognize it as fearful. And so we discuss the concern and what may need to be done to avoid a lifelong problem. At the other end of the age spectrum, a dog more than 8 years old or a cat over 10 that is staring into a corner or exhibiting other despondent behaviors may be exhibiting a behavior problem, and the owner may have assumed the behavior was a normal part of aging.

Dr. Honeckman: I definitely see patients with inappropriate social skills exhibited in the hospital toward other animals or staff that the owner may not be aware of. Certainly these behaviors can be exaggerated in the hospital setting but should be brought to the attention of the owner.

Dr. Landsberg: When and where should practitioners send owners for additional advice about behavioral problems?

Dr. Honeckman: If practitioners are comfortable addressing the concern, they should certainly schedule another appointment to focus on the problem. If they feel unable to address the problem, they should consult with a behavior specialist and discuss referral with the owner.

Dr. Moffat: It is important to look at the urgency of the situation. Specialists may be booking appointments months in advance, which is a real problem if there is a biting dog in a home with a child. General practitioners can call to get advice, but should be able to counsel owners on ways to make the household safer and begin to repair the human-animal bond.

Dr. Landsberg: How receptive are pet owners to behavior counseling in a private practice setting?

Dr. Honeckman: Pet owners are very receptive to behavior information from their general practitioner. Usually, they would rather not be referred if they do not have to be. So the more general practitioners can educate themselves about behavior issues, the more they can offer to receptive pet owners.

Ms. Yuschak: Offering tips to prevent problems before they develop is helpful too. Owners are most receptive to





“If we do not provide specific resources to pet owners, then they are likely to find misinformation on their own.”

— **Gary Landsberg, BSc, DVM, DACVB, DECAWBM (CA)**

quick and easy fixes, which is one reason we need to identify problems early, so that small amounts of information and advice can be really helpful. This approach also helps to establish the practitioner as the person to talk to if a problem develops or worsens.

Dr. Landsberg: Owners are likely to be receptive to receiving behavior information from practitioners that ask about behavior problems and offer information. But, how receptive are owners to referral to a specialist for cases that are beyond the comfort level of the general practitioner?

Dr. Honeckman: It is no different than a neurology or orthopedic consultation. As long as owners trust that the practitioner is giving them the best recommendation, they will likely be receptive.

Dr. Moffat: The willingness to see a specialist can vary by owner. Some are not receptive for socioeconomic reasons. Some may not perceive the behavior issue as a true problem. And some are not that bonded to their pets and are more likely to relinquish them than pursue behavior management.

Ms. Yuschak: There are owners that feel a stigma about taking their pet in for a behavioral consultation. It is a big financial commitment, and if they are getting feedback from friends or family that it is silly, they may be hesitant. It is a practitioner’s responsibility to mitigate this apprehension and communicate that there is a medical and a welfare component to the problem. And, that the pet can only get better if they get help.

Low-stress veterinary visits

Dr. Landsberg: Over the past few years, veterinarians have

been increasing their efforts to reduce pets’ fear of veterinary visits. Why is this important and what can be done?

Dr. DePorter: The fear that some pets experience at the veterinary clinic can become a barrier to providing good veterinary care, either by reduced veterinary visits or by making it difficult to perform a thorough examination or to complete diagnostic tests.

Dr. Honeckman: Owners feel embarrassed when they think their pets behaved badly, and that may keep them away in the future. If owners have positive experiences at the veterinary clinic, they will not delay bringing their pets in, and medical issues will be addressed sooner.

Dr. Moffat: All veterinary team members love animals and want to have fun with them and make their visits as stress free as possible. With these new recommendations, the receptionists are encouraged to come out from behind the desk, greet the animals, and give them toys or treats. It just gets to be a fun environment for all. No one wants the pet’s experience to be one of fear and anxiety.

Dr. Landsberg: Completing a physical examination and obtaining accurate information can be compromised when dealing with anxious or fearful pets. Blood pressure, heart rate, temperature, and respiratory rate can all be abnormal in a stressed pet. What are some of the things veterinarians can do to reduce this behavioral problem in their exam rooms?

Ms. Yuschak: Veterinarians and their teams need to be sure that they identify fearful body language, especially the early signs. They also need to be taught how to use low-stress handling techniques and to have many different tools in their toolbox, such as pheromones, treats, toys, supplements, and medications.

Dr. Moffat: Educating and empowering owners is really helpful. Owners need to understand why their dog growled at me, instead of feeling embarrassed. And then give owners tools. I encourage owners to bring their pet’s favorite toys and treats and to not feed the pet right before coming in. I have a lot of dogs that squeak a little toy in their mouths during the whole visit. That is their stress reliever. And, I will load tongue depressors with peanut butter, and as I administer vaccines, I have the owner put that in front of their dog. It is a distraction, and right there in the office, we are showing owners a way to desensitize their dog. And it’s also surprising how many cats will eat treats in the exam room.

To keep cats as comfortable as possible, I will often examine them in the carrier, taking the top off and placing towels on the cat. We have no-slip mats on all the examination room tables and lots of towels, so the cat can be examined and treated either in the carrier or scooped out with the towels.

Dr. DePorter: For many pets, the anxiety starts at the home, when the owner gets out the cat carrier or the leash. Knowing this, we can utilize different methods the night before or a week before that will help lower the level of anxiety all the way through the appointment. It may require the use of various medications, pheromones, and/or supplements, along with behavior modification strategies.

Dr. Landsberg: Veterinarians can get more information about the Fear FreeSM initiative at FearFreePets.com. There are also some excellent resource materials at dvm360.com/fear-free-veterinary-visits and at CatVets.com.

The role of calming supplements in behavior management

Dr. Landsberg: As a brief summary, Dr. Honeckman, can you explain the components in the management of a behavior case?

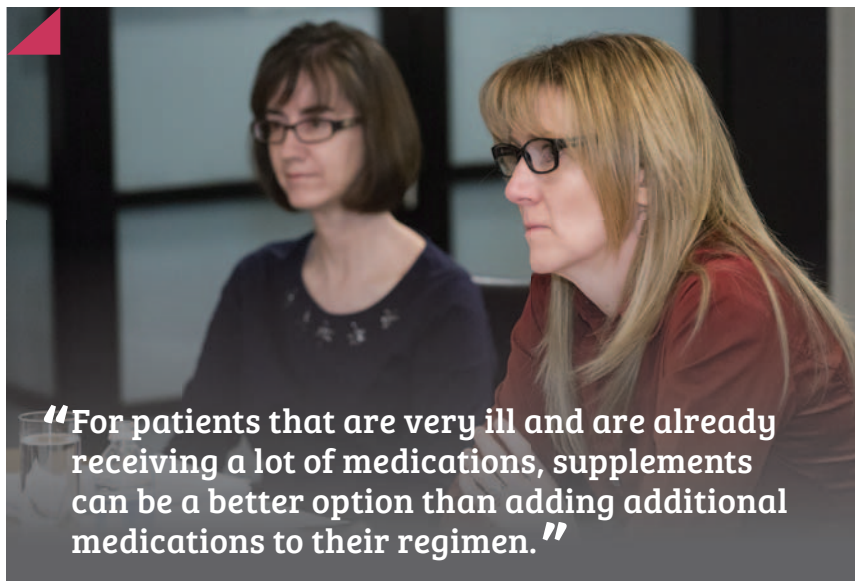
Dr. Honeckman: There are the three Ms of behavior treatment—management, behavior modification, and medication (whether that takes the form of neurochemicals or adjunctive supplements). Management means making and keeping that pet feeling safe. Once the pet feels safe and is no longer threatened, and the triggers are avoided as much as feasible, you're going to see improved behavior. This helps keep all family members safe. Behavior modification comes with reward-based training, stopping all punishment and using calm or relaxation protocols. Of course, we will want to use desensitization and counter-conditioning to whatever triggers there are. As veterinarians, we will want to associate ourselves with high-quality, certified, force-free trainers. We will also want to caution clients to avoid punishment- or dominance-based training that they might see on television programs. I would refer my colleagues to the American Veterinary Society of Animal Behavior's position statement on "How to choose a trainer." (Available at [avsabonline.org/uploads/position-statements/How_to_Choose_a_Trainer_\(AVSAB\).pdf](https://avsabonline.org/uploads/position-statements/How_to_Choose_a_Trainer_(AVSAB).pdf)).

Dr. Landsberg: What role do supplements play in behavior management?

Ms. Yuschak: The role of supplements is to decrease overall anxiety so that the pet is able to learn a new response to a situation that previously elicited undesirable or unwanted behavior.

Dr. Honeckman: Supplements are used in combination with medications and in transition, waiting for a long-term neurochemical to take effect. They play a critical role in multimodal therapy. In early stages of behavioral issues, supplements alone may help.

Dr. Moffat: Supplements are often considered for the milder cases of anxiety and behavior problems. For patients that



— Kelly Moffat, DVM, DACVB

are very ill and are already receiving a lot of medications, supplements can be a better option than adding additional medications to their regimen. And, some owners shy away from pharmaceuticals and want to go with a supplement, at least initially.

Dr. DePorter: There are cases where owners would prefer to go the supplement route, but the severity of the behavior problem requires or would be best addressed by a medication. I let owners know that down the road, as the pet's anxiety is reduced, I may be able to transfer their pet from a medication to a supplement. Having an exit strategy helps some clients become more comfortable with the use of a medication.

Dr. Landsberg: Supplements are generally safe with few side effects or contraindications, so I use them in the early stages of behavioral problems and preventively when a situation is likely to be stressful for a pet.

Dr. DePorter: Prevention is important. It is much easier to prevent a behavior problem than it is to treat it down the road.

Dr. Landsberg: In what specific types of behavior cases do you recommend the use of supplements?

Dr. DePorter: There are many indications: car ride anxiety, thunderstorm phobias, separation anxiety—anxieties that are predictable. Supplements have a broad safety range that allows an owner to make dose adjustments based on the pet's level of distress. I want owners to feel empowered to reduce their pet's anxiety in a variety of stressful situations. Not all anxiety events are the same; for example, some storms are more severe than others. Thus, owners may need to adjust the amount given.



Dr. Honeckman: Supplements are useful for dogs that have anxiety triggers in their environment, such as cars, trucks, or neighborhood cats.

Ms. Yuschak: Any predictable environmental or lifestyle change that can be stressful for people can be stressful for pets, such as moving or the birth of a child or even going back to school. It can be really helpful to provide a supplement during these changes.

Dr. DePorter: Holidays are often stressful for pets. Supplements used preventively may reduce a pet's holiday stress and anxiety and avoid undesirable behaviors.

Dr. Landsberg: Is there a role for supplements in reducing fear of the veterinary clinic?

Dr. DePorter: For anxious pets, there is a benefit to giving a supplement before the veterinary clinic visit or even upon admission. Many of the supplements have some quick-onset benefits, but the effects may vary between pets. I often have owners give some test doses to their pet and note how long it takes the supplement to have an impact. They may report they notice a time of onset at 30, 60, or 90 minutes. The pet should be given the supplement ahead of time so that the effect is felt at the onset of the anxiety. The onset is not necessarily the 10 o'clock appointment. It might start an hour earlier. I have also adopted a protocol in which the owner gives their pet an anxiolytic the night before and then re-doses in the morning before the appointment.

Ms. Yuschak: Also, another benefit is that these supplements have a reduced potential for interaction with medications that we might be giving at a veterinary visit, such as additional sedation.

Dr. Honeckman: Owners want to see the fear and anxiety reduced in their pet, but many do not want to turn the pet into a zombie. By giving a supplement before a veterinary visit, the dog will be walking and alert, but also calm and comfortable. I think many pet owners are receptive to that approach.

Supplement recommendations

Dr. Landsberg: Which supplements have you given and why did you choose them?

Dr. Moffat: Anxitane® (Virbac) has been out for years but we've had availability issues. We have been transitioning patients over to Solliquin® (Nutramax Laboratories Veterinary Sciences, Inc.), and they are doing really well. I give it mostly to cats. They receive a Calm food (Royal Canin Veterinary Diet) and the supplement.

Dr. Honeckman: I have used Anxitane, Zylkene® (Vétoquinol), Solliquin, and pheromones. I always reach for a veterinary-labeled supplement when I can. I would much rather give a product from a company that I trust and can speak with about any adverse effects or problems. (See "Active Ingredients in Behavioral Calming Supplements" on page 15.)

Ms. Yuschak: I, too, prefer giving a veterinary-labeled product. You know that what the label states is in that product is actually what the pet will get.

Dr. DePorter: At pet stores, there are so many products, and the labels are confusing. We need to teach and convince owners that we are knowledgeable in this area, so that they come to us for recommendations. Products that have been specifically formulated for pets from companies that are doing research on those products are preferred. I have used Zylkene, Anxitane, Solliquin, Harmonease® (Veterinary Product Laboratories), and Composure™ (VetriScience Laboratories).

Dr. Landsberg: When choosing a product, it is important to look at the ingredients, the company and the manufacturer. Herbal products are not standardized between companies and unfortunately, with some manufacturers, sometimes not even between batches.

What evidence of efficacy do you expect from behavioral supplements?

Dr. Honeckman: I like to see data on anything that I recommend to owners. I want them to know that if I am recommending a product, there is clear evidence that it is effective. So, I prefer, if possible, that there be results available from placebo-controlled studies and studies, when possible, conducted using large sample sizes and that are peer-reviewed and independent.

Dr. DePorter: There have been studies conducted on supplements at CanCog Technologies (Toronto, Ontario). One of them, a placebo-controlled crossover study, was done with a combination of *Magnolia* and *Phellodendron* extracts (Harmonease). Dogs were exposed to noises and their responses were used to gauge their level of fear and anxiety. In that study, 60% of those dogs improved when treated with the supplement.⁷ Specifically, 12 of 20 dogs (60%) improved from baseline when treated with Harmonease, whereas only 5 of 20 (25%) improved on the placebo.⁷

There was also a placebo-controlled study involving L-theanine that revealed that dogs known to be fearful of unfamiliar people that were given L-theanine were more willing to spend time near people in a room in a controlled setting.⁸

Dr. Moffat: It is difficult to control all the variables when it comes to behavior, so we do give products that do not

have a lot of clinical research studies to back them up. But I definitely prefer to see efficacy evidence that is independent of the company.

Dr. Landsberg: In general, supplements are not on the market unless their safety has been established. I want to see supplement efficacy research conducted involving large cohorts and meta-analysis of species-specific studies. But let's start with one quality, placebo-controlled study, and then hope that more and more studies can be done. Most of the products that we have mentioned have some level of evidence of efficacy in pets.

Dr. DePorter: I had the opportunity to do some of the early work looking at Solliquin. Nutramax did a safety study in a laboratory-controlled setting involving 24 dogs and 24 cats given one, three, or five times the recommended dose or given a placebo. There was a very low incidence of adverse events. There were just a small number of cases of vomiting in both cats and dogs, with most of those at the higher dose range.⁹

I also conducted a prospective Solliquin clinical trial. All subjects displayed signs of fear or anxiety and those signs had previously been favorably ameliorated by administration of a nutraceutical that contained theanine. All 21 subjects (19 dogs, 2 cats) were given Solliquin once daily according to weight, and the owners were advised to administer an additional dose before predictable stressful events. Daily diaries documented doses administered and the benefits or side effects observed. Diaries were reviewed weekly, and five phone interviews were conducted by a research assistant. Participants were encouraged to administer pre-event doses if diary review revealed a pattern of untreated, unresolved, and predictable stress-related events. The product was well tolerated at initial dosing; however, upon dose increase, one dog was reported to be nauseated (eating grass excessively) and another dog experienced a rash. Dose increases were recommended at the discretion of the investigator following diary review. The outcome: 14 of 16 owners (87.5%) reported Solliquin provided a better or equal response to the previously used theanine supplement. When asked to consider their pet's overall response to the supplement, 87.5% (14 of 16) reported they would continue using Solliquin to reduce their pet's fear and anxiety.¹⁰

Short-term and long-term supplement use

Dr. Landsberg: What has been your experience with short-term pre-event administration of supplements for the management of stress and anxiety in dogs and cats?

Dr. Honeckman: The only short-term events I have recommended supplements for are visits to the veterinarian. I suggest that owners of pets with mild or moderate fear give



“We need to identify problems early, so that small amounts of information and advice can be really helpful. This approach also helps to establish the practitioner as the person to talk to if a problem develops or worsens.”

— Sherrie Yuschak, RVT, VTS-Behavior, KPACTP, CPDT

Solliquin to their pets 72 hours before the veterinary visit and continue giving it daily until the visit.

Dr. DePorter: In the Solliquin study, we tracked the animals every day and asked about what stressful events had occurred.¹⁰ There were a number of events that owners did not initially anticipate as stressful events, such as taking the dog for a walk, going to class, riding in a car, but that did cause the dog distress. As we tracked the events, the owners became more aware of the frequency and predictability of their pets' distress. Families also noticed when a pet's anxiety was reduced with ongoing administration. These anxiety-based problems occurred more often and were more predictable than the owners realized. Giving a pet something that reduces its anxiety in advance of that walk or car ride or class can be beneficial.

Dr. Landsberg: Are supplements safe for long-term use?

Dr. DePorter: Yes, available evidence supports the fact that these supplements are not detrimental with long-term use. On the other hand, long-term anxiety likely does have adverse effects on health. Many of the products are intended to be given long term or even lifelong.

Dr. Landsberg: How long do you usually use a product before you decide if it is effective or not?

Dr. Moffat: If we have not seen a positive effect at the end of two months, we move on.



Dr. Honeckman: I like to see small changes within the first two weeks and a big improvement at the end of the first month. If I do not see a big improvement at the end of that first month, then I will make a change.

Dr. DePorter: Many of the products are designed for long-term or potentially lifelong use if needed. Effects may be noticeable immediately after a dose but I look for a reduction in overall anxiety in about two, four, or six weeks. If the pet's anxiety is extreme I don't wait that long. We can use other modalities. But the optimal period for seeing a global change in the pet's overall anxiety and demeanor is at about four weeks.

Dr. Landsberg: Do you have different or specific recommendations for the use of these supplements in cats?

Dr. Honeckman: Make sure the supplement is palatable and that the cat gets the whole dose. A lot of cat households have a communal food bowl. It is important that owners make sure that the cat that needs the supplement is the one that is ingesting it.

Dr. DePorter: Sometimes we cannot control the communal activity of cats. I once treated a multi-cat household that included two cats that hid under the bed. I recommended that the owner put the supplement with food and place it under the bed. Sometimes one cat got it; sometimes they each got a dose. They both stood to benefit and using a natural product with a wide safety range provided a better solution than pulling the cat out to make sure it received the supplement. The high safety profile of these supplements makes that an option.

Success stories

Dr. Landsberg: Since you all have extensive experience treating and managing behavior problems in dogs and cats, can you describe some cases where the use of a supplement was effective?

Dr. Honeckman: Just recently, I had success treating a 10-lb poodle mix that was adopted from a rescue group. The dog was reluctant to be picked up, was fearful of hands reaching toward it, and displayed reactive barking to environmental stimuli. We started giving him Solliquin and performing a lot of behavior modification. The owner sends me a daily report, and in two weeks' time, the dog has made dramatic improvements. There is less barking and less fear, and both the dog and owner are happy.

Dr. Moffat: Most of my patients are cats, and I usually use a combination therapy, so it is hard to tease out the

difference between the effects of the supplement and the drugs. But I have seen inter-cat aggression issues improve quite a bit with just the addition of supplements and a change in diet.

Dr. Landsberg: I have had a few patients with a reported decrease in car-ride anxiety after receiving theanine or an alpha-casozepine product. For me, although anecdotal, good evidence that a product is working is when an owner stops giving the product and there is a relapse of the behavior.

Dr. DePorter: Betty is a 4-year-old Labrador mix that was included in the study I did with Solliquin. Betty was described as being scared in her own skin. On walks, she would come to a complete stop, flatten herself like a pancake, and not go forward. She would tuck her tail. The owner reported that virtually every time they got into the car and Betty was put into the crate, the dog would defecate. Betty had previously been receiving an L-theanine product and her anxiety had improved, but she still showed a lot of fear. Within the first week of the study—of receiving Solliquin—Betty was no longer defecating in the car. And the owner felt that Betty was more comfortable in her own skin. Betty improved more with Solliquin than she had with the previous L-theanine supplement she had been given.

How to introduce the use of behavioral supplements into your practice

Dr. Landsberg: What advice can you give to practitioners looking to add supplements to the management of behavior cases?

Dr. DePorter: Practitioners need to have confidence in the products they suggest and have them available in the clinic so that they can send them home with the client right away. It's better to have the product than to try to send an owner out to navigate all of the products available at the pet store or on the Internet.

Dr. Landsberg: Initially, I would suggest just a few products be chosen, including supplements, pheromones, and dietary products. The practitioner should have confidence in the evidence behind the products he or she recommends and have a good knowledge about each product available in their clinic. And, always keep in mind that these are adjuncts to behavioral management and behavior therapies.

Dr. Moffat: Practitioners cannot expect that giving a supplement will fix severe behavior problems. All components of a behavior issue need to be addressed.

Active Ingredients in Behavioral Calming Supplements

L-theanine is found in black, green, and white tea and is a structural analogue of glutamate, the nervous system's major excitatory neurotransmitter.

Calming benefits appear to be via several mechanisms:

- 1) Binding and blocking glutamate receptors, which decreases both excitatory impulses and glutamate's stimulatory effects.¹¹
- 2) Increasing levels of serotonin, dopamine, and GABA, the stabilizing neurotransmitters.¹¹
- 3) Stimulating production of alpha brain waves. These brain waves cause deep relaxation with mental alertness.¹²

Research in dogs and cats demonstrated calming effects in noise phobia,¹³ travel anxiety,¹³ urine marking,¹⁴ and fear of people.⁸

Magnolia officinalis extract provides the actives honokiol and magnolol. They enhance the activity of synaptic and extra-synaptic receptors in the brain¹⁵ and are believed to do so via selectively binding to certain GABA receptors.¹⁶ They cause calmness without sedation.

Phellodendron amurense extract contains berberine, which inhibits glutamate release by pre-synaptic neurons into the synaptic cleft.¹⁷

Magnolia officinalis extract and Phellodendron amurense extract together act synergistically in lowering stress and anxiety.¹⁸ The combination improved noise-induced anxiety in beagles in a placebo-controlled study.⁷

Milk protein-derived alpha-casozepine (alpha-S1 tryptic casein) is similar to GABA and has an affinity for GABA-A receptors.¹⁹ Blinded, controlled studies showed that alpha-casozepine reduced anxiety in both dogs and cats.^{20,21}

Whey protein concentrate containing alpha-lactalbumin. Alpha-lactalbumin provides essential amino acids in dogs and cats, except for taurine (cats). Of importance to the nervous system, those amino acids include tryptophan, a precursor to serotonin, and cysteine, a precursor to the antioxidant glutathione.²² A study in "stress-vulnerable" humans found that ingestion of whey protein increased the ratio of plasma



Photo Credit: Getty Images

tryptophan to the sum of the other large neutral amino acids. This is believed to help tryptophan cross the blood-brain barrier preferentially over the other large neutral amino acids, which then increases brain serotonin levels. The study found improved cognitive performance in the whey protein group versus the control diet group.²³ Other research showed that L-tryptophan supplementation in dogs and cats decreased anxious behaviors.^{24,25} ■

See References on page 16.

However, if practitioners start giving supplements to patients with mild behavior problems, they will likely be pleased.

Dr. Honeckman: For practitioners who are not completely comfortable with behavior cases, supplements are a good place to start when treating pets with mild anxiety or fear. Successfully reducing anxiety or fear at this level can build a practitioner's confidence, and owners will likely see the veterinarian as a resource for more information and advice on behavior issues.

Ms. Yuschak: Anxious, fearful pets need all the support they can get, so practitioners should encourage owners to give supplements before veterinary visits or car rides or during lifestyle changes. Many pet owners take some sort of supplement themselves, so they are generally comfortable with the idea. Of course, in some

cases, especially moderate to severe cases, a multimodal approach, involving pharmaceuticals and behavior modification or avoidance techniques, is necessary.

The future is bright

Dr. Landsberg: What does the future hold for the alleviation of anxiety issues in pets?

Ms. Yuschak: It is bright. Over the past 10 years, as new products have come onto the market, there has been more awareness of behavior issues in pets and education about it. Of course, I wish we were doing more, but we are getting there. I am excited about the Fear FreeSM initiative and how that is going to educate owners and show them that we really care. We are working toward making veterinary visits better for pets, and we want to involve owners in the process.

Dr. Honeckman: I am excited that pet owners are



becoming aware that many behavior issues are anxiety-based, not just bad behavior. The more awareness there is the more we are going to be able to manage these issues and rebuild the relationships between owners and pets. Fewer pets will be relinquished, and they will have a better quality of life.

Dr. Moffat: The changes that have developed in the 25 years since I graduated are amazing. The Fear FreeSM initiative is pushing veterinarians and their teams to catch up. I think it is good for everybody. Veterinary teams that have made the switch note that it is not really that hard. Actually, most of them enjoy it.

Dr. DePorter: I am excited to watch veterinary practitioners, receptionists, and technicians all get involved in recognizing the anxiety of pets early on and asking the question, “How do we help this pet?” They may not have all the tools yet, but the first part is seeing the anxiety and then looking for ways to help. I agree that there is a promising and bright future for pets and veterinarians.

Dr. Landsberg: I agree. I see positive changes. But we must continue to talk about behavior problems and solutions. We have to educate owners to let them know that it is fear, anxiety, uncertainty, conflict, and stress that are causing a lot of the behavior issues—they do not have bad pets. ■

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>>> Walk inside Andover Animal Hospital and you'll feel as if you were in a modern barnyard fairy tale. The vaulted ceilings, exposed beams and "natural oak" sheet vinyl flooring all work together to create a rustic, welcoming feel. (Note: Hummel can't say enough good things about vinyl flooring: "It's easy to clean and maintain and it holds up well to day-to-day usage.") Granite "autumn harmony" countertops and stonework on the reception desk add to the refurbished barnyard vibe. "My wife has a very creative side to her and with TWC Architecture and Construction's guidance, we developed a great design and interior decor," Hummel says.



>>> The Andover Animal Hospital team made the most of the unique barn silo space. The wood ceilings and floors create a rustic feel, while the added window and couch make clients feel at home.



>>> The dental suite is located next to the treatment area and includes two windows for natural lighting. To create a starker, cleaner feel to the clinical section of the hospital, the vinyl flooring in this suite is Forbo's Smaragd Marble "Gravel" and provides a uniform texture in a lighter color. "All of our client areas (waiting and exam rooms) have the wood flooring vinyl, while the clinical areas have the gray flooring," Hummel says.



>>> Two of the four exam rooms include exterior windows, which create a more calming atmosphere for clients and pets. All but one exam room (the cat-only room) have separate client and doctor entrances, which means staff members can hop in and out of exams from both the reception area and treatment. Wilsonart "Sunstone" laminate was used atop workspaces and counters in the exam rooms and other publically viewed spaces. Pionite "Kingsley" cabinets sit underneath the U-shaped exam table, sink and desk unit, allowing for plenty of storage.

the box—or barn, in this case. Fitting the needs of an animal hospital into the existing footprint of an old dairy barn—with sloping exterior walls, bed-

rock throughout the site, and outdated mechanical systems—definitely wasn't easy. However, Hummel says it was rewarding to be able to revive a trea-

sured building and design a veterinary hospital with character.

"Some of the positives of the conversion included maintaining and saving a local landmark that was in desperate need of repair, and utilizing a building with high visibility on a busy intersection," Hummel says.

Utilize unique spaces

When your new building comes with a concrete constructed silo with 18-inch walls, you take advantage of that bonus space! At least that's what Hummel did. He transformed it into a cozy comfort room, complete with wood ceilings, natural oak sheet vinyl and a window. Now it's his favorite feature in the entire hospital.

"We utilize it for client consults and euthanasia," he says. "With the heavy walls, it gives our grieving clients a quiet space separated from the busier areas of the hospital."

Teamwork makes the dream work

How do you get your veterinary team on board with your new hospital? Ask for their input, Hummel says. Before construction began, he held a special staff meeting.

"We asked all of our staff to list what they wanted most in our new building," Hummel says. "Requests included a staff room with lockers, separate dog and cat cage areas, a dental suite and digital radiography."

Design to your strengths

When brainstorming the look and feel of your new hospital, Hummel says it's best to design to your strengths. While the theme of the hospital was inspired largely by the building itself, his team always felt that one of their greatest strengths was their close client relationships. Now they have a hospital that represents that.

"The exterior embodies our county's rural heritage and the décor of the interior gives our clients a warm, welcoming experience," Hummel says. "We are able to offer all of the advances of veterinary medicine, but still retain the doctor-client-patient relationship that Andover Animal Hospital is known for." [dvm360](#)

Ashley Griffin is a freelance writer based in Kansas City and a former content specialist for dvm360.

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Four dogs in Flint, Mich., test positive for toxic lead levels

Out of 300 dogs tested at Michigan State University clinics, several are found to have high or significant levels of the toxin. *By Rachael Zimlich*

As the fallout from the Flint water crisis continues, veterinarians at Michigan State University are looking deeper into how extensively toxic lead levels in the water supply affected the city's pets.

Daniel Langlois, assistant professor with Michigan State University's College of Veterinary Medicine, offered six lead testing clinics for dogs in Flint over the last few months, aided by monetary gifts and volunteer veterinary professionals.

More confirmed cases

Of the 300 total dogs tested for lead, four were found to have high or significant levels. Two of the dogs were subclinical, one had very mild neurological signs, and the fourth had some neurological signs and possible seizures. Overall, Langlois characterizes the cases as mild and said the source of exposure has been eliminated. The most symptomatic dogs received



dimercaptosuccinic acid, also called succimer, a chelating agent.

Another 15 to 20 dogs tested positive for lead, but the levels were below

the reportable limit of 50 parts per billion. The low levels and lack of clinical signs suggest the dogs had previous or low-level chronic exposure.

No additional testing clinics are currently planned, though Langlois says that despite interventions, there are still some households testing at lead levels above federal guidelines.

Pet-specific toxicity factors

Dogs aren't any more or less susceptible to lead poisoning than people, but they are more likely to experience lead exposure continuously, Langlois says. While people may drink water from different sources or even consume other beverages, dogs are confined to the water in their homes. Another factor that contributes to toxicity in dogs—or any pet—is that they can't verbalize early symptoms like changes in cognition or headaches. "By the time you notice it, it's more severe," Langlois says.

Though there have been isolated reports of acute cases primarily with gastrointestinal or neurologic symptoms, Langlois says blood toxicity today is a very rare condition. "At a minimum,

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Brief Summary: Before using Loxicom Oral Suspension, consult the product insert, a summary of which follows.

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

Description: Meloxicam is a non-steroidal anti-inflammatory drug (NSAID) of the oxicam class.

Indications: Loxicom Oral Suspension is indicated for the control of pain and inflammation associated with osteoarthritis in dogs.

Contraindications: Dogs with known hypersensitivity to meloxicam should not receive Loxicom Oral Suspension.

Do not use Loxicom Oral Suspension in cats. Acute renal failure and death have been associated with the use of meloxicam in cats.

Warnings: Not for use in humans. Keep this and all medications out of reach of children. Consult a physician in case of accidental ingestion by humans. **For oral use in dogs only.** As with any NSAID all dogs should undergo a thorough history and physical examination before the initiation of NSAID therapy. Appropriate laboratory testing to establish hematological and serum biochemical baseline data is recommended prior to and periodically during administration. To report suspected adverse reactions, to obtain a Material Safety Data Sheet, or for technical assistance, call Norbrook at 1-866-591-5777.

Precautions: The safe use of Loxicom Oral Suspension in dogs younger than 6 months of age, dogs used for breeding,

or in pregnant or lactating dogs has not been evaluated. As a class, cyclo-oxygenase inhibitory NSAIDs may be associated with gastrointestinal, renal and hepatic toxicity. Sensitivity to drug-associated adverse events varies with the individual patient.

Patients at greatest risk for renal toxicity are those that are dehydrated, on concomitant diuretic therapy, or those with existing renal, cardiovascular, and/or hepatic dysfunction. Concurrent administration of potentially nephrotoxic drugs should be carefully approached. NSAIDs may inhibit the prostaglandins that maintain normal homeostatic function. Such anti-prostaglandin effects may result in clinically significant disease in patients with underlying or pre-existing disease that has not been previously diagnosed. Since NSAIDs possess the potential to induce gastrointestinal ulcerations and/or perforations, concomitant use with other anti-inflammatory drugs, such as NSAIDs or corticosteroids, should be avoided or closely monitored. The use of concomitantly protein-bound drugs with Loxicom Oral Suspension has not been studied in dogs. Commonly used protein-bound drugs include cardiac, anticonvulsant and behavioral medications. The influence of concomitant drugs that may inhibit metabolism of Loxicom Oral Suspension has not been evaluated. Drug compatibility should be monitored in patients requiring adjunctive therapy.

Adverse Reactions: Field safety was evaluated in 306 dogs. Based on the results of two studies, GI abnormalities (vomiting, soft stools, diarrhea, and inappetence) were the most common adverse reactions associated with the administration of meloxicam. Of the dogs that took meloxicam (n=157), forty experienced vomiting, nineteen experienced diarrhea/soft stool, five experienced inappetence, and one each experienced bloody stool, bleeding gums after dental procedure, lethargy/swollen carpus, and epiphora. Of the dogs that took the placebo (n=149), twenty-three experienced vomiting, eleven experienced diarrhea/soft stool, and one experienced inappetence.

In foreign suspected adverse drug reaction (SADR) reporting over a 9 year period, incidences of adverse reactions related to meloxicam administration included: auto-immune hemolytic anemia (1 dog), thrombocytopenia (1 dog),

polyarthritis (1 dog), nursing puppy lethargy (1 dog), and pyoderma (1 dog).

Effectiveness: The effectiveness of meloxicam was demonstrated in two field studies involving a total of 277 dogs representing various breeds, between six months and sixteen years of age, all diagnosed with osteoarthritis. Both of the placebo-controlled, masked studies were conducted for 14 days. All dogs received 0.2 mg/kg on day 1. All dogs were maintained on 0.1 mg/kg oral meloxicam from days 2 through 14 of both studies. Parameters evaluated by veterinarians included lameness, weight-bearing, pain on palpation, and overall improvement. Parameters assessed by owners included mobility, ability to rise, limping, and overall improvement. In the first field study (n=109), dogs showed clinical improvement with statistical significance after 14 days of meloxicam treatment for all parameters. In the second field study (n=48), dogs receiving meloxicam showed a clinical improvement after 14 days of therapy for all parameters; however, statistical significance was demonstrated only for the overall investigator evaluation on day 7, and for the owner evaluation on day 14.

How Supplied: Loxicom Oral Suspension 1.5 mg/mL: 10, 32 and 100 mL bottles with small and large dosing syringes.

Storage: Store at controlled room temperature 68-77°F (20-25°C). Excursions permitted between 59°F and 86°F (15°C and 30°C). Brief exposure to temperature up to 104°F (40°C) may be tolerated provided the mean kinetic temperature does not exceed 77°F (25°C); however such exposure should be minimized.

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this has certainly raised the awareness for lead poisoning across the state, and especially in Flint,” he says.

Langlois says that while other pets experience just as much risk as dogs, the clinics targeted dogs because they're easier to screen. None of the 20 to 30 cats that were screened along the way tested positive for lead toxicity.

The crisis in Flint

The crisis began in April 2014 when the city of Flint began using treated water from the Flint River instead of Lake Huron. The river water's corrosive properties increased the amount of lead being released from the city's aging pipes, and thousands of people tested positive for toxic levels of lead in their blood. Because lead can cause serious cognitive damage in children and kidney issues in adults, President Obama responded to the crisis by declaring a state of emergency in January 2016.

Residents around Flint have been given bottled water and special filtration systems—particularly those in homes with older pipes that are more likely to leach lead into the water supply. The cost to undo the damage and repair the infrastructure could be in the billions, officials have said.

Not to be forgotten, however, are the pets of Flint homeowners, who may or may not have access to bottled or filtered water.

Jennifer Holton, a spokesperson for the office of James Averill, DVM, Michigan's state veterinarian, says there have been a total of seven confirmed cases of lead toxicosis—a reportable condition—in Michigan since October 2015. She says pet owners with any concerns should work directly with a licensed veterinarian instead of contacting the state veterinarian's office. Holton adds, “Whatever people are doing for themselves, they should be doing for their pets.”

Beyond Flint

Langlois says the lessons learned in Flint extend across the profession. “In terms of clinical signs, [lead toxicity] is vague and nonspecific,” he says. “The index of suspicion had really disappeared because of the rarity of cases, but it's still out there.”

Particularly in areas like Flint that carry high risk factors, such as older homes and poor infrastructure, veterinarians should be mindful to

consider lead toxicity in cases with gastrointestinal and neurological symptoms that have no other explanation, Langlois says. [dvm360](#)

Rachael Zimlich is a freelance writer in Cleveland, Ohio, and former staff reporter for dvm360.



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Photos: David Bird, DVM

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¹Six R, Cherni J, Chesebrough R, et al. Efficacy and safety of cefovecin in treating bacterial folliculitis, abscesses, or infected wounds in dogs. *J Am Vet Med Assoc.* 2008;233(3):433-439.

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OSU cheating scandal

> Continued from cover

Discipline

Citing federal privacy laws, the veterinary college has not released any individual or specific information but says the students were sanctioned by OSU's Student Judiciary Committee and that those sanctions were upheld by the college's Executive Committee. According to the statement, the sanctions were based on the nature and

"I hope this incident will not reflect poorly onto the college as a whole, though it is probably too late."

—an OSU veterinary student

severity of the violation in accordance with the university honor code and standards. Possible sanctions for unauthorized collaboration can include warnings, grade penalties or dismissal from the program. Some students are reportedly appealing the sanctions at the university level.

Ongoing review

"Any form of academic misconduct is unacceptable," the university says in its statement. "The college is reassessing and implementing best practices in instructional and evaluative processes, identified during the investigation, to ensure both an optimal learning environment and academic integrity."

In the wake of the cheating accusations, officials have announced they will review similar exams administered through the same software program going back to its installation two years ago and take any further action necessary. OSU spokesperson Chris Davey told *dvm360* that the college would have no comment beyond its already prepared statement and declined to

answer questions about additional investigations or whether similar infractions have occurred in other degree programs at the university.

Student reaction

Students not involved in the cheating scandal are concerned about how news of it could affect how they're viewed by future employers when they graduate. One OSU student commented on a social media post about the situation, saying she now has "serious concern" for her future. "I hope this incident will not reflect poorly onto the college as a whole, though it is probably too late," she wrote in her post.

A student who spoke with *dvm360* on condition of anonymity echoes these concerns. The student, who

plans to graduate in 2019, says she hopes future employers will consider each applicant on a case-by-case basis, not based on anything that may have happened with other students at their alma mater. While she didn't take the exams in question, she has worked on take-home assignments throughout her studies and says there is a gray area that can leave students vulnerable.

This particular student, who did graduate studies at Rutgers University, participated in a lecture there that eerily foreshadowed the current situation at Ohio State. The Rutgers class was presented with a case study about a student who discussed a take-home exam with a peer. Students were asked to determine the appropriate disciplinary action, and their suggestions ranged from warnings to probation. The instructor told the class that the student in question was ultimately dismissed from the university.

"The entire class was silent at hearing the severity of the punishment for collaboration," the student told *dvm360*. "The lecturer emphasized that even though she could sympathize with the class, the violation of honor code couldn't be overlooked. As I sat in silence at the verdict, I began contemplating why I felt the punishment was too severe, and I feel that it relates to the recent events at OSU.

"Students are encouraged in several classes to discuss case studies with our neighbors," the OSU student continued. "Some professors have taken an innovative approach to giving us collaborative exams. Personally, I was nervous about taking a collaborative exam for fear that no one would study or that I would be relied on as the source for every answer. I found that this wasn't the case, and my other members showed up prepared and ready to discuss our different thought processes pertaining to the questions. I found that the discussions helped me retain the material and also reduced the anxiety of test taking."

Cheating or collaborating?

Some social media commenters have questioned whether the instructions were unclear on the Ohio State exam and whether or not the students knew collaboration was not allowed. Others have said the university should not have been surprised that online take-

Brief Summary of Prescribing Information

convenia®

(cefovecin sodium)

Antimicrobial for Subcutaneous Injection in Dogs and Cats Only
CAUTION: Federal (USA) law restricts this drug to use by or on the order of a licensed veterinarian.

INDICATIONS:

Dogs

CONVENIA is indicated for the treatment of skin infections (secondary superficial pyoderma, abscesses, and wounds) in dogs caused by susceptible strains of *Staphylococcus intermedius* and *Streptococcus canis* (Group G).

Cats

CONVENIA is indicated for the treatment of skin infections (wounds and abscesses) in cats caused by susceptible strains of *Pasteurella multocida*.

CONTRAINDICATIONS: CONVENIA is contraindicated in dogs and cats with known allergy to ceftiofur or to β -lactam (penicillins and cephalosporins) group antimicrobials. Anaphylaxis has been reported with the use of this product in foreign market experience. If an allergic reaction or anaphylaxis occurs, CONVENIA should not be administered again and appropriate therapy should be instituted. Anaphylaxis may require treatment with epinephrine and other emergency measures, including oxygen, intravenous fluids, intravenous antihistamine, corticosteroids, and airway management, as clinically indicated. Adverse reactions may require prolonged treatment due to the prolonged systemic drug clearance (65 days).

WARNINGS: Not for use in humans. Keep this and all drugs out of reach of children. Consult a physician in case of accidental human exposure. For subcutaneous use in dogs and cats only. Antimicrobial drugs, including penicillins and cephalosporins, can cause allergic reactions in sensitized individuals. To minimize the possibility of allergic reactions, those handling such antimicrobials, including ceftiofur, are advised to avoid direct contact of the product with the skin and mucous membranes.

PRECAUTIONS: Prescribing antibacterial drugs in the absence of a proven or strongly suspected bacterial infection is unlikely to provide benefit to treated animals and may increase the risk of the development of drug-resistant animal pathogens.

The safe use of CONVENIA in dogs or cats less than 4 months of age and in breeding or lactating animals has not been determined. Safety has not been established for IM or IV administration. The long-term effects on injection sites have not been determined. CONVENIA is slowly eliminated from the body, approximately 65 days is needed to eliminate 97% of the administered dose from the body. Animals experiencing an adverse reaction may need to be monitored for this duration.

CONVENIA has been shown in an experimental *in vitro* system to result in an increase in free concentrations of carprofen, furosemide, doxycycline, and

ketoconazole. Concurrent use of these or other drugs that have a high degree of protein-binding (e.g. NSAIDs, propofol, cardiac, anticonvulsant, and behavioral medications) may compete with ceftiofur-binding and cause adverse reactions.

Positive direct Coombs' test results and false positive reactions for glucose in the urine have been reported during treatment with some cephalosporin antimicrobials. Cephalosporin antimicrobials may also cause falsely elevated urine protein determinations. Some antimicrobials, including cephalosporins, can cause lowered albumin values due to interference with certain testing methods.

Occasionally, cephalosporins and NSAIDs have been associated with myelotoxicity, thereby creating a toxic neutropenia^a. Other hematological reactions seen with cephalosporins include neutropenia, anemia, hypoprothrombinemia, thrombocytopenia, prolonged prothrombin time (PT) and partial thromboplastin time (PTT), platelet dysfunction and transient increases in serum aminotransferases.

ADVERSE REACTIONS:

Dogs

A total of 320 dogs, ranging in age from 8 weeks to 19 years, were included in a field study safety analysis. Adverse reactions reported in dogs treated with CONVENIA and the active control are summarized in Table 2.

Table 2: Number of Dogs* with Adverse Reactions Reported During the Field Study with CONVENIA.

Adverse Reaction	CONVENIA (n=157)	Active Control (n=163)
Lethargy	2	7
Anorexia/Decreased Appetite	5	8
Vomiting	6	12
Diarrhea	6	7
Blood in Feces	1	2
Dehydration	0	1
Flatulence	1	0
Increased Borborygmi	1	0

*Some dogs may have experienced more than one adverse reaction or more than one occurrence of the same adverse reaction during the study.

Mild to moderate elevations in serum γ -glutamyl trans-ferase or serum alanine aminotransferase were noted post-treatment in several of the CONVENIA-treated dogs. No clinical abnormalities were noted with these findings.

One CONVENIA-treated dog in a separate field study experienced diarrhea post-treatment lasting 4 weeks. The diarrhea resolved.

Cats

A total of 291 cats, ranging in age from 2.4 months (1 cat) to 21 years, were included in the field study safety analysis. Adverse reactions reported in cats treated with CONVENIA and the active control are summarized in Table 3.

Table 3: Number of Cats* with Adverse Reactions Reported During the Field Study with CONVENIA.

Adverse Reaction	CONVENIA (n=157)	Active Control (n=163)
Vomiting	10	14
Diarrhea	7	26
Anorexia/Decreased Appetite	6	6
Lethargy	6	6
Hyper/Acting Strange	1	1
Inappropriate Urination	1	0

*Some cats may have experienced more than one adverse reaction or more than one occurrence of the same adverse reaction during the study.

Four CONVENIA cases had mildly elevated post-study ALT (1 case was elevated pre-study). No clinical abnormalities were noted with these findings.

Twenty-four CONVENIA cases had normal pre-study BUN values and elevated post-study BUN values (37-39 mg/dL, post-study). There were 6 CONVENIA cases with normal pre- and mildly to moderately elevated post-study creatinine values. Two of these cases also had an elevated post-study BUN. No clinical abnormalities were noted with these findings.

One CONVENIA-treated cat in a separate field study experienced diarrhea post-treatment lasting 42 days. The diarrhea resolved.

FOREIGN MARKET EXPERIENCE: The following adverse events were reported voluntarily during post-approval use of the product in dogs and cats in foreign markets: death, tremors/ataxia, seizures, anaphylaxis, acute pulmonary edema, facial edema, injection site reactions (alopecia, scabs, necrosis, and erythema), hemolytic anemia, salivation, pruritus, lethargy, vomiting, diarrhea, and inappetence.

For a copy of the Material Safety Data Sheet, (MSDS) or to report a suspected adverse reaction call Zoetis Inc. at 1-888-963-8471.

STORAGE INFORMATION:

Store the powder and the reconstituted product in the original carton, refrigerated at 2° to 8° C (36° to 46° F). Use the entire contents of the vial within 56 days of reconstitution. PROTECT FROM LIGHT. After each use it is important to return the unused portion back to the refrigerator in the original carton. As with other cephalosporins, the color of the solution may vary from clear to amber at reconstitution and may darken over time. If stored as recommended, solution color does not adversely affect potency.

HOW SUPPLIED:

CONVENIA is available as a 10 mL multi-use vial containing 800 milligrams of ceftiofur as a lyophilized cake.

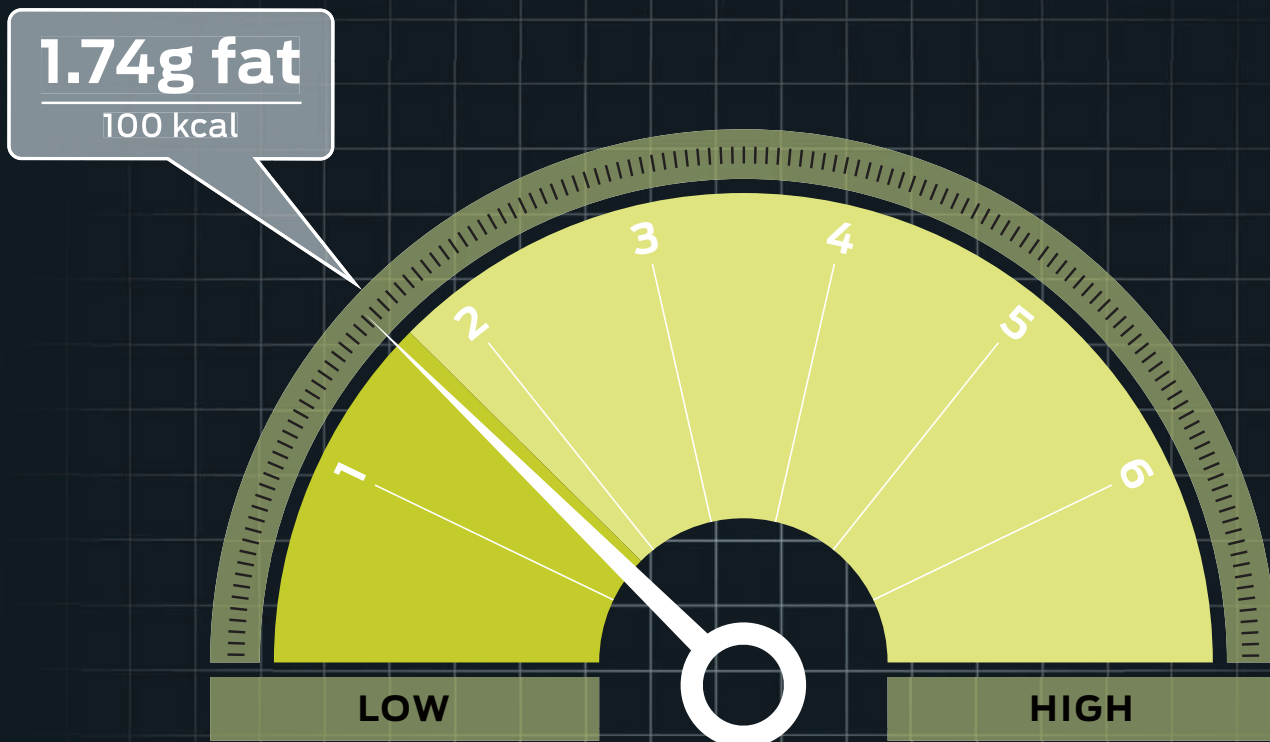
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†Comparison based on values published in PPVD Product Guide 2015 (average nutrient content), Hill's Key 2016 (average nutrient contents), Royal Canin Product Guide 2016 (typical analysis)

* Millward Brown Veterinary Tracker, Fall 2015

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OSU cheating scandal

> Continued from page 24

home exams would open the door to cheating.

The student who spoke with *dvm360* said she understands how there can be confusion on the matter.

“I am unaware whether the testing protocols were clearly stated since I did not take the test,” she said. “However, I feel there is a bigger question to shed light on here, and that is why 85 students have found themselves in violation of honor code. This question may relate back to the many definitions of collaboration that have formed in an age of innovative learning,” she continued, adding that good, collaborative learning requires the same in-depth understanding of course content as one would need for a traditional exam.

“I think the gray area for students is that cheating is associated with an ‘easy’ or ‘lazy way out,’ a definition that hardly characterizes proactive

collaborative discussion,” she said. “It’s possible for a student with this thinking to mentally dismiss collaboration from the grouping of cheating. I think although unfortunate, the violations at the Ohio State College of Veterinary Medicine shed light on a growing problem, which is that students have a blurred definition of the word ‘cheating.’

“While collaboration is tolerated well in academic settings most of the time, there are exceptions, such as when individual knowledge needs to be tested. This distinction is not black and white to many students because collaboration ... can include a very productive out loud discussion, similar to what is promoted in many classes,” the student continued. “I think the cheating cases that occurred at the Ohio State College of Veterinary Medicine open the conversation about what constitutes cheating in

an environment of collaborative learning and will hopefully prevent students from making costly mistakes in the future.”

University response

Changes are already being made at OSU, according to the university’s statement.

In addition to reviewing two years’ worth of exams, the college administrators plan to eliminate all take-home exams and quizzes for which collaboration is not permitted and institute new programming at the student level—including at orientation—about the college’s honor code and university-wide expectations regarding academic conduct. Finally, the college will implement new training for faculty about academic misconduct in the digital age. *dvm360*

Rachael Zimlich is a freelance writer in Cleveland and a former reporter for dvm360.

Drugs in the veterinary workplace

> Continued from cover

There is a dangerous, sometimes fatal paradox at the heart of our veterinary profession. First, veterinarians experience far higher than average levels of workplace stress, depression and suicidal ideation, and they have increased access to potentially addictive and deadly drugs. That said, little drug testing is conducted in veterinary workplaces, drug control procedures are relatively lax, and employee assistance programs are few and far between. Vulnerability and access lead to a high risk of abuse and addiction in the veterinary workplace.

Are we recognizing the danger of this paradox—mental

health problems and access to drugs—that puts our colleagues in harm’s way? And will we do something about it?

25 to 40 times more potent than heroin

You may be familiar with the epidemic in heroin usage in the

and 2014 in the number of heroin users (people who reported using heroin within the last 30 days), and the same agency has reported that heroin seizures have nearly doubled since 2010, from 2,763 kilograms to 5,013 kilograms in 2014.

But it’s not just heroin.

The Centers for Disease Control and Prevention (CDC) reports that fentanyl, a synthetic opioid 25 to 40 times more potent than heroin, has caused more than 700 deaths in the

United States between late 2013 and early 2015. Fentanyl is sometimes added to heroin batches, or sold by itself as heroin, unknown to the user, according to the CDC.

Doctor’s little helper

Veterinarians and their staffs

Don’t believe you could ever have a problem with drug addicts in your hospital? Are you certain you’re so skilled an employer that you would never hire a drug user?

United States. Availability of the drug is up across the country, as are incidents of abuse, overdose and overdose-related deaths. A recent survey by the Substance Abuse and Mental Health Services Administration (SAMHSA) showed a 51 percent increase between 2013

veterinary economics



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have access to a large variety of mind-altering, potentially addictive drugs, including controlled as well as non-controlled substances (see “A DVM’s drug cabinet” at right). They also face well-documented job stresses as a result of long hours, challenging cases, difficult clients, economic challenges and the emotional consequences of performing animal euthanasia.

A groundbreaking study led by CDC researcher Dr. Randy Nett reports that nearly one in 10 veterinarians in the United States may suffer from serious psychological distress and more than one in six may have experienced suicidal ideation since graduation. Nett became interested in the topic when his wife, a practicing veterinarian, told him about the problems of compassion fatigue and burnout in the profession.

These stressors create a significant layer of drug abuse risk in the veterinary workplace in addition to those posed by current drug users seeking employment in a workplace where psychoactive drugs are comparatively available.

In June 2015 I developed a survey with Lori Kagan, PhD, a licensed clinical psychologist at the Colorado State College of Veterinary Medicine. The results were shared in the September 2015 issue of the *Journal of the American Veterinary Medical Association (JAVMA)*, finding that 72 percent of respondents said they had worked with someone in the veterinary workplace they suspected of having a drug problem. More than 40 percent said they knew two or more people who fit that description. A full 68 percent said drug abuse and addic-

tion was at least as big a problem in the veterinary profession as in the general population, if not bigger.

Don’t believe you could ever have a problem with drug addicts in your hospital? Are you certain you’re so skilled an employer that you would never hire a drug user? Let’s take a look at human medicine, where transgressions usually lead to well-publicized disasters. Do not underestimate the power of addiction.

Nurses on narcotics

In January 2016, Rocky Allen, a surgical nurse at Swedish Medical Center in Englewood, Colorado, was preparing a constant-rate infusion (CRI) of fentanyl citrate for a patient for orthopedic surgery, according to local media reports. Allen, 28, took one of the vials of fentanyl and injected himself. He replaced the contents of the vial with saline, with the same syringe and needle he’d just used. During Allen’s time working at the hospital, as many as 2,900 patients may have received saline tainted with his blood and were asked to be tested for hepatitis C. In addition, many of these patients were receiving saline as their primary pain medication during the orthopedic procedures.

Ashton Daigle, a Boulder, Colorado, nurse, was sentenced to 4.5 years in a federal prison after roughly 290 people received what was labeled as fentanyl but was actually saline or tap water, according to local reports. Between Oct. 13 and 17, 2008, Daigle accessed a dispensing machine as many as 25 times in one day. Using the same needle he used to withdraw the fentanyl from the

A DVM’s drug cabinet

An incomplete list of mind-altering, potentially addictive drugs kept on hand in veterinary practices.

Controlled

- > Fentanyl
- > Methadone
- > Morphine
- > Hydromorphone
- > Oxymorphone
- > Buprenorphine
- > Butorphanol
- > Phenobarbital
- > Pentobarbital
- > Euthanasia solution
- > Ketamine
- > Diazepam
- > Midazolam
- > Alfaxalone
- > Tramadol
- > Hydrocodone
- > Naloxone
- > Tiletamine-zolazepam (Telazol)

Non-controlled

- > Naloxone
- > Propofol
- > Dexmedetomidine
- > Gabapentin
- > Amantadine
- > Trazodone

original vials, he injected himself and in turn used that needle to replace the contents of the vials with either saline solution or nonsterile tap water. He then used surgical glue to reattach the tamper-resistant cap prior to replacing the fentanyl vial back in the machine.

The story of drug addiction and dangerous medical care repeats itself in December 2013, when former hospital worker David Kwiatkowski was sentenced to 39 years for using stolen fentanyl syringes to inject himself and then filling the tainted syringes with saline for use in medical procedures. In 2010, Kwiatkowski had been fired from an Arizona hospital after a fellow employee found him passed out in the men’s room with a syringe floating in the toilet, according to CNN.

While many of these kinds of reports have surfaced in the healthcare industry, little is heard in the veterinary world. I suspect that’s not because abuse isn’t happening but rather because abus-

Drug test data: When positivity is a bad thing

Positive results to drug tests are increasing significantly. Quest Diagnostics, which conducts drug testing, has reported that the positivity rate for roughly 6.6 million urine drug tests in the general workforce increased overall by 9 percent—to 4.7 percent positives in 2014 compared with 4.3 percent positives in 2013. This means that for every 20 employees in a practice, one is likely to test positive for illicit drugs. In a practice of 100 employees, expect at least four to test positive—with half of those for drugs other than marijuana.

ers take advantage of lax controls and minimal reporting requirements in the veterinary workplace.

Little testing

Employee drug testing can help deter and screen out drug users and potential addicts yet is seldom conducted in veterinary hospitals. In the survey of veterinarians and staff members I conducted in June 2015, respondents indicated that drug testing was performed in less than 30 percent of hospitals. Compare that to an overall 60 percent of private businesses and almost all federal agencies. Here are five common types of employer-driven drug testing:

- > Pre-employment
- > Random screening
- > Post-accident
- > For reasonable suspicion
- > Return to work.

My survey also showed that 18 percent of veterinary hospitals perform pre-employment testing and testing “for reasonable suspicion,” but only 8 percent of hospitals perform random testing. In 7 percent of hospitals, veterinarians were excluded from

drug testing, although this may violate employment law in some states.

Based on responses to the survey, random drug testing—in which employees are randomly required to undergo a urine drug screen—is considered the most effective form of ongoing monitoring for illicit drug use by many practice owners, but it’s controversial because it can create a culture of distrust within a hospital. Many practice owners consider it not worth the ill will created.

Light drug control

In busy practices—especially 24-hour practices taking emergencies—access to controlled drugs may not be as limited as we’d like. With seizing pets, major emergency surgeries, traumatic injuries and other emergent or urgent cases, controlled drugs are often left out to be ready for immediate use—and, unfortunately, potential theft.

My 2015 survey found that, in veterinary practices, access to drug cabinets or safes was under the control of authorized users 82 percent of the time. The drug cabinet or safe was located in a place with limited access during



How teams help stop drug theft

Kathryn Primm, DVM, shares some tips on better drug inventory control to prevent theft and abuse at dvm360.com/drugtheft. She points out ways veterinary team members can help, too.

normal work hours only 68 percent of the time. Control of refrigerated drugs was particularly lax, with respondents reporting that all controlled substances requiring refrigeration were stored in locked containers securely fastened within a refrigeration unit only 45 percent of the time.

Inconsistent assistance

Employee assistance programs for substance abuse problems differ from state to state. Colorado, for instance, charges veterinary team members for rehabilitative services, but veterinarians are covered at no cost. In other states, employee assistance programs are required to report any issues regarding drug abuse or addiction to the state board, often resulting in license censure or suspension.

Only 26 percent of respondents to my survey last year said an employee assistance program was available in their state, and 40 percent didn’t know either way. A national program, perhaps sponsored by the AVMA, could be created to provide consistent support, without legal or licensure repercussions, to those who qualify.

Veterinary employers have an obligation to their teams to provide a safe and drug-free workplace. Furthermore, they need to provide support to those who have a problem with drug abuse and addiction, especially if that problem is a result of job-related stressors and vulnerability combined with access to psychoactive drugs and medications. It’s time to address this problem head on and bring the stigma of drug abuse and addiction out of the shadows. dvm360

Jon Geller, DVM, DABVP, CVJ, is hospital director at Fort Collins Veterinary Emergency and Rehabilitation Hospital in Fort Collins, Colorado.

The pot problem

In states where recreational or medicinal marijuana is legal, should veterinary practices screen for tetrahydrocannabinol (THC) among medical staff?

Marijuana is by far the most common drug that comes back positive on urine tests, followed by opiates, barbiturates, cocaine and methadone. So is marijuana use among veterinarians, technicians and other staff a problem?

In Colorado, a major test case was resolved in 2015 when courts ruled that an employer was allowed to terminate an employee for testing positive for THC, even though that employee had a valid medical-marijuana usage card and only used marijuana off-hours. This judgment was justified as upholding federal law, which still classifies THC as a schedule 1 controlled substance and considers the use of marijuana illegal.

The question gets even trickier when it comes to healthcare workers. In some states, such as Colorado, physicians are considered “unfit to practice medicine” if they test positive for THC at any time, regardless of permitted medical and recreational usage. In my survey reported in the September 2015 issue of *JAVMA*, 50 percent of respondents agreed that veterinarians should be held to that same standard.

THC users will usually test positive for up to 24 hours after smoking a marijuana cigarette, and in testing done with pilots on simulators, small amounts of THC in the bloodstream were correlated with impaired judgment and slower reflexes, according to a study published in 1985 in the *American Journal of Psychiatry*.

Physicians, like pilots, are considered to be in a safety-sensitive work environment, where public safety concerns trump a physician’s individual rights. Some in veterinary medicine might argue that we are not in a public-safety profession. Perhaps it will be left up to pet owners to decide.

NAVTA/MERIAL TEAM EXPANDS TECHNICIAN SUPPORT INITIATIVES

THE RELATIONSHIP CONTINUES

Three years ago, Merial and NAVTA formed an alliance to help increase the number of dogs protected from heartworm disease and support veterinary technicians in their efforts to provide the best possible counsel and care. The team's first mission, the Merial® Tech Champions (MTC) Program, saw remarkable success, and is now expanding to include other important categories in preventive health for pets.

MERIAL Tech Champions are a coalition of selected veterinary technicians that serve as a rotating council of advocates for heartworm disease prevention, dental health, and flea and tick control.

The expansion of the MTC program will offer continuing education on heartworm disease prevention, intestinal parasite treatment and control, dental health and flea and tick control. All of these courses are scheduled for launch at AVMA in August of this year. The AVMA event will also activate two new MTC members and promote an even larger presence at conferences and veterinary technician gatherings across the country.

Merial and NAVTA remain committed to their role in helping keep pets safe from heartworm disease, dental issues and flea and tick problems. Take advantage of this exciting relationship by staying plugged into the valuable vet tech resources available to your clinic, including frequent networking opportunities, special conference events, and Vet Tech Week promotions.

NO CONFERENCE? NO PROBLEM

Missing a major conference doesn't have to mean missing out on exciting speaker events. MTC speakers will be traveling to a limited number of events across the country, giving your group the chance to experience the same conference lecture in the convenience of your own space. It's just another way the program helps our representatives and your veterinary technicians build relationships for animal health.

BY THE NUMBERS

2287

PEOPLE ATTENDED
A MERIAL/NAVTA
EVENT LAST YEAR¹

90%+

SAID THE CONTENT
WAS **HIGH QUALITY**
AND **VALUABLE**¹

88%

SAID THEY FELT
BETTER PREPARED TO
DISCUSS HEARTWORM
DISEASE PREVENTION
WITH CLIENTS¹

90%

WOULD RECOMMEND
ATTENDING TO OTHERS¹

¹ Data on file at Merial.



Kara M. Burns, Beckie Mossor, Holly Morss, Mary Berg, Julie Legred, Kenichiro Yagi, Janet McConnell, Rebecca Rose

AVMA SCHEDULE

Keep track of the thought-provoking content taking off at AVMA.

TECHNICIAN Sessions	TALK TITLE	ROOM LOCATION	SESSION LENGTH	TIME	DATE
Kara Burns	Hookworms and Roundworms: A Look INSIDE & How to Get the Message OUT	'008	50 MINS	2:00 - 2:50 PM	Saturday, August 6
Mary Berg	Dental Home Care, Let's Make It Easy and Effective	'008	50 MINS	3:00 - 3:50 PM	Saturday, August 6
Janet McConnell	Fleas & Ticks for Techs	'008	50 MINS	4:00 - 4:50 PM	Saturday, August 6
Rebecca Rose	Let's Talk Heartworm: Strengthening the Tech to Pet Owner Conversation	'008	50 MINS	5:00 - 5:50 PM	Saturday, August 6

MOVING FORWARD

Through their teamwork and dedication to the profession, Merial and NAVTA remain committed to helping pets live happier, healthier lives. Follow along in the year ahead to see how Merial, NAVTA and the Merial Tech Champions program will help veterinary technicians everywhere become better at what they love to do!



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Jim Wilson leaves a legacy of learning

This veterinary and legal guru is (mostly) retiring from teaching. *By Mark Opperman, CVPM*

I recently witnessed something quite amazing—an end to an era, really. I was sitting in a classroom at the University of Pennsylvania and watched Jim Wilson, DVM, JD, teach his last class. That’s right. Dr. Wilson has retired from teaching.

Wilson and I first began teaching at veterinary schools more than 20 years ago and together we’ve taught at almost 30 veterinary schools. Wilson, of course, taught legal jurisprudence, and I taught practice management.

Wilson always related well to veterinary students. He seemed to enjoy nothing more than a lively debate on a legal topic or a chance to challenge students to think about things from a different perspective. Once I observed him talking about an animal abuse case, giving the facts of the case, asking students if indeed this was “legal” abuse and what, if any, responsibility the veterinarian had. The students were all

over the place, some saying the veterinarian bore no responsibility and others ready to call the police. There was a twinkle in Wilson’s eye that day. Plainly, he enjoyed seeing the students think the problem through and figure out the correct answer.

Wilson has taught veterinary school students for almost 30 years and has touched thousands of lives. He has written numerous books on legal and ethical issues for veterinarians. Today’s DVMs are better professionals because of Wilson and the impact he has had on them. Few can teach the way he taught.

Wilson is only semi-retired, of course. He continues to consult, and he’ll still drop knowledge at a few schools (Washington State, Iowa State and NC State students are the lucky ones). Otherwise he is passing the teaching baton to Lance Roasa, DVM, JD, and I look forward to continuing to teach future veterinarians with



Dr. Jim Wilson says his goodbyes during a University of Pennsylvania veterinary school visit.

him. But it won’t be the same. I couldn’t let this momentous event go by without acknowledging Wilson and the amazing impact he has had and, through his teaching, will continue to have on the veterinary profession.

Thank you, Jim, for all the hours of preparation, all the travel and the nights spent far away from

home to teach future veterinarians. You have made and will continue to make a difference in this world. I will miss you. [dvm360](#)

Mark Opperman, CVPM, is co-owner of consulting firm VMC Inc. in Evergreen, Colorado, and co-author of The Art of Veterinary Practice Management.

One Health crucial in light of emerging diseases

Almost daily, as a society, we experience the connection and consequences between the health of humans, animals and the environment. The Zika virus—carried by mosquitoes and spreading in many regions in the world—is suspected of causing thousands of human birth defects in Brazil and was declared a public health emergency by the World Health Organization. As much as 75 percent of new or re-emerging diseases affecting humans are of animal origin.

New infectious diseases, climate change and a moving political landscape are some of the changes which veterinarians, physicians, scientists and other health and environmental

professionals must adapt to in meeting these global challenges. That’s where we know the emerging approach known as “One Health” comes in, uniting these professionals in many parts of the world to address complex problems that recognize the vast inter-relationships between human, animal and environmental health.

One Health harnesses the power of collaborative expertise to solve the pressing issues we face in our mobile society. For example, early detection and prevention of the Ebola virus outbreak in Africa in 2014 was aided by a team of UC Davis investigators, including veterinarians. This was not the case in a later African outbreak,

where a later response allowed the virus to spread in other parts of the world. In the 1990s, the first cases of mad cow disease in cattle in the United Kingdom and West Nile virus in birds were first detected or confirmed by astute veterinary pathologists who understood the One Health approach.

Veterinarians may be known for their care of cats and dogs, but they also play a critical role in improving and safeguarding the health of humans and ensuring food safety, according to a new University of California report [see the online version of this letter at [dvm360.com/lairmore](#) for a link] projecting an era of change for the future of veterinary medicine. The report

complements and extends earlier studies conducted by the National Institutes of Health and the National Academy of Sciences and provides perspective on the veterinary workforce, the research enterprise transforming animal and human health, and medical education in California and the nation.

It is critical that community, government and university leaders—together with veterinarians and other health professionals—support a united One Health approach to solving rapidly emerging diseases on a local and global scale. [dvm360](#)

Michael Lairmore, DVM, PhD; dean and distinguished professor, UC Davis School of Veterinary Medicine

Balancing Protein and Sustaining Appetites in Chronic Kidney Disease Patients

Answers to Common Questions

Nutrition is a cornerstone of therapy for pets with chronic kidney disease (CKD). We posed a few of the most common questions on nutritional management of cats and dogs with CKD to our clinical nutritionists, in order to provide you with useful, implementable clinical tips backed by evidence.

Q: Will the protein content in renal foods cause my geriatric patients to lose muscle mass?

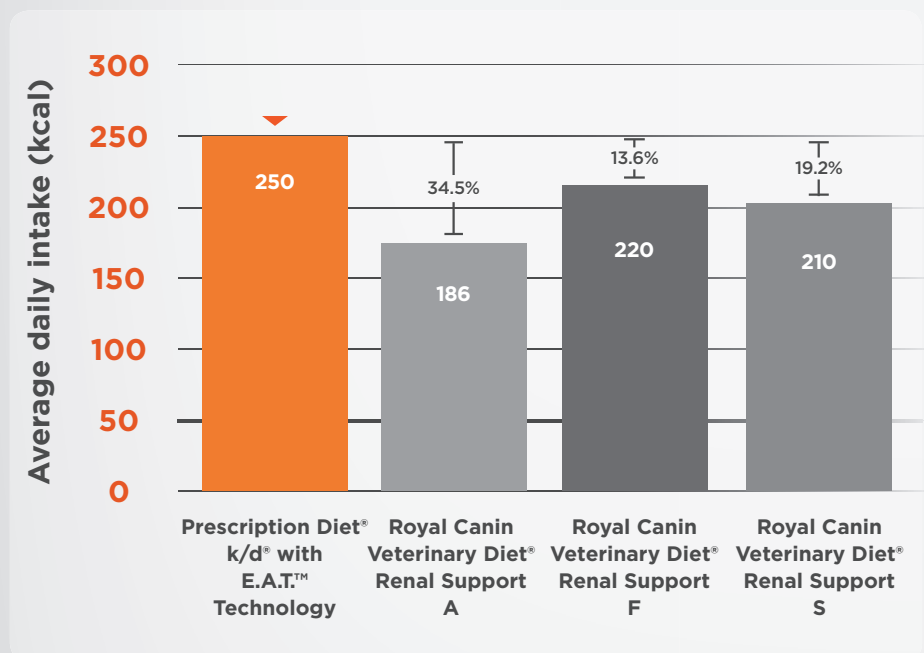
A: While it is essential to avoid excess protein for pets with CKD, it is also important that the animal's daily-recommended protein allowance is met. Cats with kidney disease have been shown to maintain lean body mass and nitrogen balance when fed foods containing between 20- and 24-percent metabolizable energy (ME) from protein.¹

Hill's® Prescription Diet® k/d® Feline and Canine both contain appropriate protein levels above the National Academies' National Research Council's Recommended Dietary Allowances.

Q: What if I am looking for a food that is higher in protein than typical renal foods for patients with decreased muscle mass?

A: Supporting healthy kidney function while maintaining lean muscle mass requires more than just protein.

Therapeutic renal foods are more than controlled protein foods — they are formulated to be calorically dense; contain controlled amounts of phosphorous and sodium, and increased amounts of antioxidants, omega-3 fatty acids, B vitamins and soluble fiber; and have a neutralizing effect on acid base balance.



Q: What is the level of clinical evidence behind a reduced phosphorus food without controlled protein content vs. a therapeutic renal food?

A: While the optimal amount of protein for dogs and cats with CKD is unknown, significant research does exist investigating the impact of renal foods on incidence of uremic crises and survival.

Hill's® Prescription Diet® k/d® Canine is the only food proven to significantly reduce the number of uremic episodes and renal-related mortality when fed to dogs with naturally occurring CKD.² In fact, dogs with CKD live more than 3x longer when fed k/d vs. a typical adult grocery brand.² Hill's® Prescription Diet® k/d® Feline is the only food evaluated in a randomized, controlled clinical study and proven to significantly reduce episodes of uremic crises and renal-related mortality in cats with naturally occurring kidney disease.³

Q: I have concerns about the palatability of therapeutic renal foods — how can I make sure my patients consume enough of the food I recommend to meet their calorie needs?

A: Palatability is critical for CKD patients with metabolic changes that may impact their appetite. Scientists and veterinarians at Hill's worked for years on renal formulas that stimulate appetite of cats with CKD. They measured their unique food preferences, identified the key aromas and flavors that triggers food intake, and mapped the taste profiles against a database of ingredients to create maximum appetite improvement.

This proprietary Enhanced Appetite Trigger (E.A.T.)™ Technology is now available in Hill's® Prescription Diet® k/d® Feline formulas, proven to stimulate appetite of cats with CKD and increase their caloric intake by up to 34%.⁴



¹Kirk CA, Hickman MA. Dietary protein requirement of cats with spontaneous renal disease (abstr). *J Vet Intern Med Assoc.* 2000;14(3):351.

²Jacob F, Polzin DJ, Osborne CA, et al. Clinical evaluation of dietary modification for treatment of spontaneous chronic renal failure in dogs. *J Am Vet Med Assoc.* 2002;200(8):1163-1170.

³Ross SJ, Osborne CA, Kirk CA, et al. Clinical evaluation of dietary modification for treatment of spontaneous chronic kidney disease in cats. *J Am Vet Med Assoc.* 2006;229(6):949-957.

⁴Hill's® Prescription Diet® k/d® with chicken dry vs. Royal Canin Veterinary Diet® Renal Support A, F and S. Only k/d Feline dry contains E.A.T.™ Technology.



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An obvious part of the student debt solution? Fewer graduates

Despite a shrinking number of applicants per veterinary school position, schools have been increasing class sizes and new schools are opening. It's time to stop.

I have hosted fourth-year veterinary students in my practice for over fifteen years. This has allowed me to understand much of what is happening in the pre-graduation minds of the future of our profession. When I became aware of mounting student debt, I was shocked. And, the shock has intensified almost yearly over the past 10 years as the debt load reported to me has increased.

Running parallel with that trend was an increase in veterinary students who stated that they did not care if they ever made a lot of money in veterinary medicine as long as they were happy with their jobs, i.e., they are not expecting their salaries to bode well against their student debt.

The report in the May 2016 issue of *dvm360* (“Come together,

right now, over debt”) added a new set of troubling data. The current ratio of applicants to available positions in veterinary schools is 2.1:1. The ratio was 7:1 for my 1972 Texas A&M class.

Finally, salaries of new graduates have been stagnant for several years and “there is concern that the ratio of student debt to starting salaries is unsustainable.”

When you put all of this together, it should not be surprising that interest in becoming a veterinarian is decreasing, as evidenced by the 2.1:1 ratio. And yet what has happened over the past decade? We have increased class size at several veterinary schools, and three new veterinary schools have opened.

I do not have an MBA, but practice owners understand sup-

ply and demand. We know that if there are six applicants for a position in a practice, we are not going to have to pay as much as if there were a shortage of applicants. We also know that if an employed veterinarian does not work out, there are others readily available. Thus, to expect practice owners to voluntarily solve the student debt problem by paying higher salaries is unrealistic.

I do not claim to have all of the answers to this dilemma, but I know that increasing the number of graduates is counterproductive to the future of our profession. Nowhere in the recommendations is reducing the number of graduates listed. In fact, the “educators” group is recommending shortening the curriculum, resulting in another increase in

new graduates for a few years.

The companion article on the impact of another recession (pages 36-38) adds urgency to finding a solution. Although we don't know if another recession is near, the twofold impact of a recession (increased student debt and lowered practice profits) will be even more detrimental to our profession.

It's time to get serious about solving this problem, and I applaud the summit organizers for taking this step. As they make further recommendations, they should closely consider recommending a reduction in the number of new graduates. To me, it is the elephant in the room. **dvm360**

Gary D. Norsworthy, DVM, DABVP (feline); owner, Alamo Feline Health Center; San Antonio, Texas

‘Concern’ about overtime misses important point

Veterinary practice managers are fundamental, and so is their compensation.

On Dec. 1, 2016, the Department of Labor's final rule updating overtime regulations becomes effective.

Most employees, including veterinary practice managers, who are paid less than \$913 a week will be entitled to receive overtime pay when they work more than 40 hours in a single week.

A recent *dvm360* article quoted Rep. Kurt Schrader, DVM (D-Oregon), on the final rule. He said, “My reaction to this is similar to that of most practice owners: I'm very concerned.”

The Veterinary Managers Association (VHMA) is worried too—worried that comments like Schrader's minimize how vital practice managers are to a practice's success.

VHMA represents more than 2,500 veterinary practice managers in North America and provides education, research, networking and certification to support their commitment to professional excellence.

In a veterinary practice, managers occupy key positions and are vital to the office's success. They direct human resources, hire staff, provide guidance to employees, ensure compliance with laws, regulations and standards, establish protocols, policies and procedures, maintain financial accounts, oversee banking, analyze reports and much more. And, according to VHMA's 2015 Compensation and Benefits Survey, managers carry out these responsibilities working, on average, 37.7

hours per week and earning an average annual salary of \$47,714.

Given their many responsibilities, effective managers can contribute to the gross income and net profits of the practice. By hiring a manager, owners can free themselves up to generate additional income. Practice managers also influence the quality of patient care and client service because they manage and train the support team.

The final rule will undoubtedly impose new requirements on practice owners, especially those whose practice managers work more than 40 hours per week and earn less than \$913 during a 40-hour week. However, there are also a significant number of managers who earn above the

threshold salary and work 40 hours per week and therefore will not be impacted by the final rule.

Practice managers are assets to their practices. They deserve to be recognized for their contributions to the success of the business and paid a living wage for their efforts. While VHMA understands that business owners are concerned about the bottom line, practice managers make good business sense and help practices thrive. It is shortsighted to be “concerned” about the impact of overtime pay at the expense of the employees whose participation and contributions are so vital to the success of the practice. **dvm360**

Christine Shupe, CAE; executive director, VHMA

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¹ Independent market research conducted by Fairfax Agricultural Research and Marketing, 2015

² Muir, W., et al., Cardiorespiratory and anesthetic effects of clinical and supraclinical doses of alfaxalone in dogs. *Vet Anaesth Analg*, 2008, 35(6): p. 451-462

³ Heit, M.C., et al. Safety and efficacy of Alfaxan[®] CD RTU Administered once to cats subcutaneously at 10 mg/kg. in *ACVIM*. 2004

⁴ Alfaxan USA FDA Approved Leaflet

INDICATIONS: Alfaxan[®] is indicated for the induction and maintenance of anesthesia and for induction of anesthesia followed by maintenance with an inhalant anesthetic, in cats and dogs.

Important Alfaxan[®] Risk Information: Warnings, Precautions and Contraindications: When using alfaxalone, patients should be continuously monitored, and facilities for the maintenance of a patent airway, artificial ventilation, and oxygen supplementation must be immediately available. Alfaxan[®] does not contain an antimicrobial preservative. Do not use if contamination is suspected. Strict aseptic techniques must be maintained because the vehicle is capable of supporting the rapid growth of microorganisms. Careful monitoring of the patient is necessary due to possibility of rapid arousal. Alfaxan[®] is contraindicated in cats and dogs with a known sensitivity to alfaxalone or its components, or when general anesthesia and/or sedation are contraindicated. Adverse Reactions: The most common side effects of alfaxalone include respiratory and cardiovascular derangements, such as apnea, hypotension and hypertension. Appropriate analgesia should be provided for painful procedures.

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Alfaxan[®] (Alfaxalone 10 mg/mL)
Intravenous Anesthetic Injection
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See brief summary on page 36



Flex or fire?

Should a practice owner bend over backward to accommodate a rule-bending, boundary-pushing (but brilliant) veterinary associate?



Brief Summary of Prescribing Information

For Animal Use Only NADA#141-342
Alfaxan® CIV [alfaxalone 10 mg/mL]
Intravenous injectable anesthetic for use in cats and dogs.

BRIEF SUMMARY OF PRESCRIBING INFORMATION
This summary does not include all the information needed to use Alfaxan® safely and effectively. See full package insert for complete information.

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

INDICATIONS:
Alfaxan® is indicated for the induction and maintenance of anesthesia and for induction of anesthesia followed by maintenance with an inhalant anesthetic, in cats and dogs.

DOSAGE AND ADMINISTRATION (highlights): Please refer to the complete package insert for full prescribing and administration information before use of this product.

Administer by intravenous injection only. For induction, administer Alfaxan® over approximately 60 seconds or until clinical signs show the onset of anesthesia, titrating administration against the response of the patient. Rapid administration of Alfaxan® may be associated with an increased incidence of cardiorespiratory depression or apnea. Apnea can occur following induction or after the administration of maintenance boluses of Alfaxan®. The use of preanesthetics may reduce the Alfaxan® induction dose. The choice and the amount of phenothiazine, alpha2-adrenoreceptor agonist, benzodiazepine or opioid will influence the response of the patient to an induction dose of Alfaxan®.

When using Alfaxan®, patients should be continuously monitored, and facilities for the maintenance of a patent airway, artificial ventilation, and oxygen supplementation must be immediately available.

Alfaxan® does not contain an antimicrobial preservative. Do not use if contamination is suspected. Strict aseptic techniques must be maintained because the vehicle is capable of supporting the rapid growth of microorganisms. Failure to follow aseptic handling procedures may result in microbial contamination which may cause fever, infection/sepsis, and/or other life-threatening illness.

Once Alfaxan® has been opened, vial contents should be drawn into sterile syringes; each syringe should be prepared for single patient use only. Unused product should be discarded within 6 hours. Alfaxan® should not be mixed with other therapeutic agents prior to administration.

INDUCTION OF GENERAL ANESTHESIA:
CATS: Induction dose guidelines range between 2.2 - 9.7 mg/kg for cats that did not receive a preanesthetic, and between 1.0 - 10.8 mg/kg for cats that received a preanesthetic. The Alfaxan® induction dose in the field study was reduced by 10 - 43%, depending on the combination of preanesthetics (dose sparing effect).

DOGS: Induction dose guidelines range between 1.5 - 4.5 mg/kg for dogs that did not receive a preanesthetic, and between 0.2 - 3.5 mg/kg for dogs that received a preanesthetic. The Alfaxan® induction dose in the field study was reduced by 23 - 50% depending on the combination of preanesthetics (dose sparing effect).

To avoid anesthetic overdose, titrate the administration of Alfaxan® against the response of the patient. The average Alfaxan® induction dose rates for healthy cats and dogs given alfaxalone alone, or when alfaxalone is preceded by a preanesthetic, are indicated in species specific tables found in the full package insert. These tables are based on field study results and are for guidance only. The dose and rate for alfaxalone should be based upon patient response.

MAINTENANCE OF GENERAL ANESTHESIA:
CATS and DOGS: Following induction of anesthesia with Alfaxan® and intubation, anesthesia may be maintained using intermittent Alfaxan® intravenous boluses or an inhalant anesthetic agent. Please review the full package insert for guidance on recommended intermittent doses of Alfaxan and their expected duration of effect. Clinical response may vary, and is determined by the dose, rate of administration, and frequency of maintenance injections.

Alfaxan® maintenance dose sparing is greater in cats and dogs that receive a preanesthetic. Maintenance dose and frequency should be based on the response of the individual patient.

Inhalant anesthetic maintenance of general anesthesia in cats and dogs: Additional low doses of Alfaxan®, similar to a maintenance dose, may be required to facilitate the transition to inhalant maintenance anesthesia.

WARNINGS:
When anesthetized using Alfaxan®, patients should be continuously monitored, and facilities for the maintenance of a patent airway, artificial ventilation, and oxygen supplementation must be immediately available.

Rapid bolus administration or anesthetic overdose may cause cardiorespiratory depression, including hypotension, apnea, hypoxia, or death. Arrhythmias may occur secondary to apnea and hypoxia. In cases of anesthetic overdose, stop Alfaxan® administration and administer treatment as indicated by the patient's clinical signs.

Cardiovascular depression should be treated with plasma expanders, pressor agents, anti-arrhythmic agents or other techniques as appropriate for the treatment of the clinical signs.

HUMAN WARNINGS:
Not for human use. Keep out of the reach of children.

Exercise caution to avoid accidental self-injection. Overdose is likely to cause cardiorespiratory depression (such as hypotension, bradycardia and/or apnea). Remove the individual from the source of exposure and seek medical attention. Respiratory depression should be treated by artificial ventilation and oxygen.

Avoid contact of this product with skin, eyes, and clothes. In case of contact, eyes and skin should be liberally flushed with water for 15 minutes. Consult a physician if irritation persists. In the case of accidental human ingestion, seek medical advice immediately and show the package insert or the label to the physician.

The Material Safety Data Sheet (MSDS) contains more detailed occupational safety information. To report adverse reactions in users or to obtain a copy of the MSDS for this product call 1-844-253-2926.

DRUG ABUSE AND DEPENDENCE:

Controlled Substance: Alfaxan® contains alfaxalone, a neurosteroid anesthetic and a class IV controlled substance.

Abuse: Alfaxalone is a central nervous system depressant that acts on GABA receptor associated chloride channels, similar to the mechanism of action of Schedule IV sedatives such as benzodiazepines (diazepam and midazolam), barbiturates (phenobarbital and methohexital) and fentanyl. In a drug discrimination behavioral test in rats, the effects of alfaxalone were recognized as similar to those of midazolam. These biochemical and behavioral data suggest that alfaxalone has an abuse potential similar to other Schedule IV sedatives.

Physical dependence: There are no data that assess the ability of alfaxalone to induce physical dependence. However, alfaxalone has a mechanism of action similar to the benzodiazepines and can block the behavioral responses associated with precipitated benzodiazepine withdrawal. Therefore, it is likely that alfaxalone can also produce physical dependence and withdrawal signs similar to that produced by the benzodiazepines. Psychological dependence: The ability of alfaxalone to produce psychological dependence is unknown because there are no data on the rewarding properties of the drug from animal self-administration studies or from human abuse potential studies.

PRECAUTIONS:
1. Unpreserved formulation: Alfaxan® injection does not contain an antimicrobial preservative. Do not use if contamination is suspected. Strict aseptic techniques must be maintained because the vehicle is capable of supporting the rapid growth of microorganisms. Failure to follow aseptic handling procedures may result in microbial contamination which may cause fever, infection/sepsis, and/or other life-threatening illness. Any

solution remaining in the vial following withdrawal of the required dose should be discarded. Once Alfaxan® has been opened, any unused product should be discarded within 6 hours. Alfaxan® should not be mixed with other therapeutic agents prior to administration.

2. Rapid arousal: Careful monitoring of the patient is necessary due to possibility of rapid arousal.

3. Preanesthesia: Benzodiazepines may be used safely prior to Alfaxan® in the presence of other preanesthetics. However, when a benzodiazepine was used as the sole preanesthetic, excitation occurred in some dogs and cats during Alfaxan® anesthesia and recovery.

4. Apnea: Apnea may occur following administration of an induction dose, a maintenance dose or a dose administered during the transition to inhalant maintenance anesthesia, especially with higher doses and rapid administration. Endotracheal intubation, oxygen supplementation, and intermittent positive pressure ventilation (IPPV) should be administered to treat apnea and associated hypoxemia.

5. Blood Pressure: The myocardial depressive effects of Alfaxan® combined with the vasodilatory effects of inhalant anesthetics can be additive, resulting in hypotension. Preanesthetics may increase the anesthetic effect of Alfaxan® and result in more pronounced changes in systolic, diastolic, and mean arterial blood pressures. Transient hypertension may occur, possibly due to elevated sympathetic activity.

6. Body Temperature: A decrease in body temperature occurs during Alfaxan® anesthesia unless an external heat source is provided. Supplemental heat should be provided to maintain acceptable core body temperature until full recovery.

7. Breeding Animals: Alfaxan® has not been evaluated in pregnant, lactating, and breeding cats. Alfaxalone crosses the placenta, and as with other general anesthetic agents, the administration of alfaxalone may be associated with neonatal depression.

8. Kittens and Puppies: Alfaxan® has not been evaluated in cats less than 4 weeks of age or in dogs less than 10 weeks of age.

9. Compromised or Debilitated Cats and Dogs: The administration of Alfaxan® to debilitated patients or patients with renal disease, hepatic disease, or cardiorespiratory disease has not been evaluated. Doses may need adjustment for geriatric or debilitated patients. Caution should be used in cats or dogs with cardiac, respiratory, renal or hepatic impairment, or in hypovolemic or debilitated cats and dogs, and geriatric animals.

10. Analgesia during anesthesia: Appropriate analgesia should be provided for painful procedures.

ADVERSE REACTIONS:
The primary side effects of alfaxalone are respiratory depression (apnea, bradypnea, hypoxia) and cardiovascular derangements (hypertension, hypotension, tachycardia, bradycardia). Other adverse reactions observed in clinical studies include hyperthermia, emesis, unacceptable anesthesia quality, lack of effectiveness, vocalization, paddling, and muscle tremors.

Adverse drug reactions may also be reported to the FDA/CVM at 1-888-FDA-VETS or <http://www.fda.gov/AnimalVeterinary/SafetyHealth/ReportProblem/ucm055305.htm>

OVERDOSE: Rapid administration, accidental overdose, or relative overdose due to inadequate dose sparing of Alfaxan® in the presence of preanesthetics may cause cardiopulmonary depression. Respiratory arrest (apnea) may be observed. In cases of respiratory depression, stop drug administration, establish a patent airway, and initiate assisted or controlled ventilation with pure oxygen. Cardiovascular depression should be treated with plasma expanders, pressor agents, antiarrhythmic agents or other techniques as appropriate for the observed abnormality.

HOW SUPPLIED:
Alfaxan® is supplied in 10 mL single-use vials containing 10 mg alfaxalone per mL.
Manufactured for:
Jurox Inc.
American Century Tower II,
4520 Main Street, Kansas City, MO 64111

Alfaxan is a registered trademark of Jurox Pty Limited.
US Patent # 7,897,586

Reed Veterinary Associates has served its greater-suburban-area pet owners for over 30 years. Dr. Reed and his four associates practice cutting-edge medicine and experience very little staff turnover. Dr. Reed credits this low turnover to a pleasant work environment and a flexible approach to staff needs.

Dr. Jen Call is a tenured associate who has devoted her life to veterinary medicine, and to call her an exceptional veterinarian would be an understatement. A fierce anti-war advocate and world-class bridge player with a driving ambition to become a preeminent veterinary diagnostician, she definitely marches to the beat of her own drum, and part of that beat includes an exceptionally high rate of success when it comes to aiding pets with complex medical issues.

Reed Veterinary Associates has experienced significant growth over the last few years, resulting in the addition of several new staff members. And Dr. Call has observed the clinic's transition from a small, laid-back family atmosphere to a large, structured hospital with unease.

The veteran veterinarian can be critical of her coworkers and doesn't hesitate to invade their personal space with discussions of religion and politics—this is something she's always done. However, some newer staff members have reported being uncomfortable with these types of inquiries, and Dr. Call's flexible work arrival time is becoming an issue in the larger business setting.

Dr. Reed arranges a one-on-one meeting with Dr. Call to discuss these issues. He requests that she refrain from the aforementioned behaviors in the interest of both propriety and harmony, but Dr. Call fails to see any wrongdoing on her part. She argues that her personal inquiries are made in the spirit of collegiality and that her variable arrival time is not a detriment to her patients.

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Marc Rosenberg, VMD | THE DILEMMA

Dr. Reed now has a true dilemma on his hands. Dr. Call has been a valued veterinarian in his practice for more than 15 years, and when he weighs her strengths versus her weaknesses, she does come out on the plus side. While she is often inappropriate and late for work, she is also honest and hardworking and a truly gifted veterinarian. Dr. Reed has to decide: Is Dr. Call a slow-growing cancer that needs to be excised, or does he just need to make adjustments so that everyone in his practice can be both happy and successful?

Dr. Reed chooses the later. He reschedules Dr. Call's work shifts to avoid pairing her with staff that find her difficult, and her break period is shifted to the first thing in the morning to allow her some coffee and acclimation moments before

dealing with cases. Finally, he tactfully reminds her to show discretion when broaching sensitive personal discussions with other staff members.

Though Dr. Reed's choice causes extra effort on his part and disappoints some staff members, he feels a very special talent like Dr. Call's is worth accommodating.

Do you agree with Dr. Reed?

Rosenberg's response

Oh, if only things were black and white, decisions would be so much easier. Dr. Reed had to decide whether or not he should remove a clearly dysfunctional veterinary associate and decided to assess her value on an individual level instead of as a member of a group. The pros in this case outweighed the cons, so accommodations were made.

I am with Dr. Reed. I would keep this doctor. After all, in the words of historian Laurel Ulrich Thatcher, well-behaved women seldom make history. Dr. Reed's obligation is to quality medicine, a successful business and a harmonious work environment. In the real world, all staff members are not created equal and certain accommodations can serve the greater good. Babe Ruth often ignored team rules, yet the Yankees were a lot better off with him than without him. [dvm360](#)

Dr. Marc Rosenberg is director of the Voorhees Veterinary Center in Voorhees, New Jersey. Although many of his scenarios in "The Dilemma" are based on real-life events, the veterinary practices, doctors and employees described are fictional.

In the words of historian Laurel Ulrich Thatcher, well-behaved women seldom make history.



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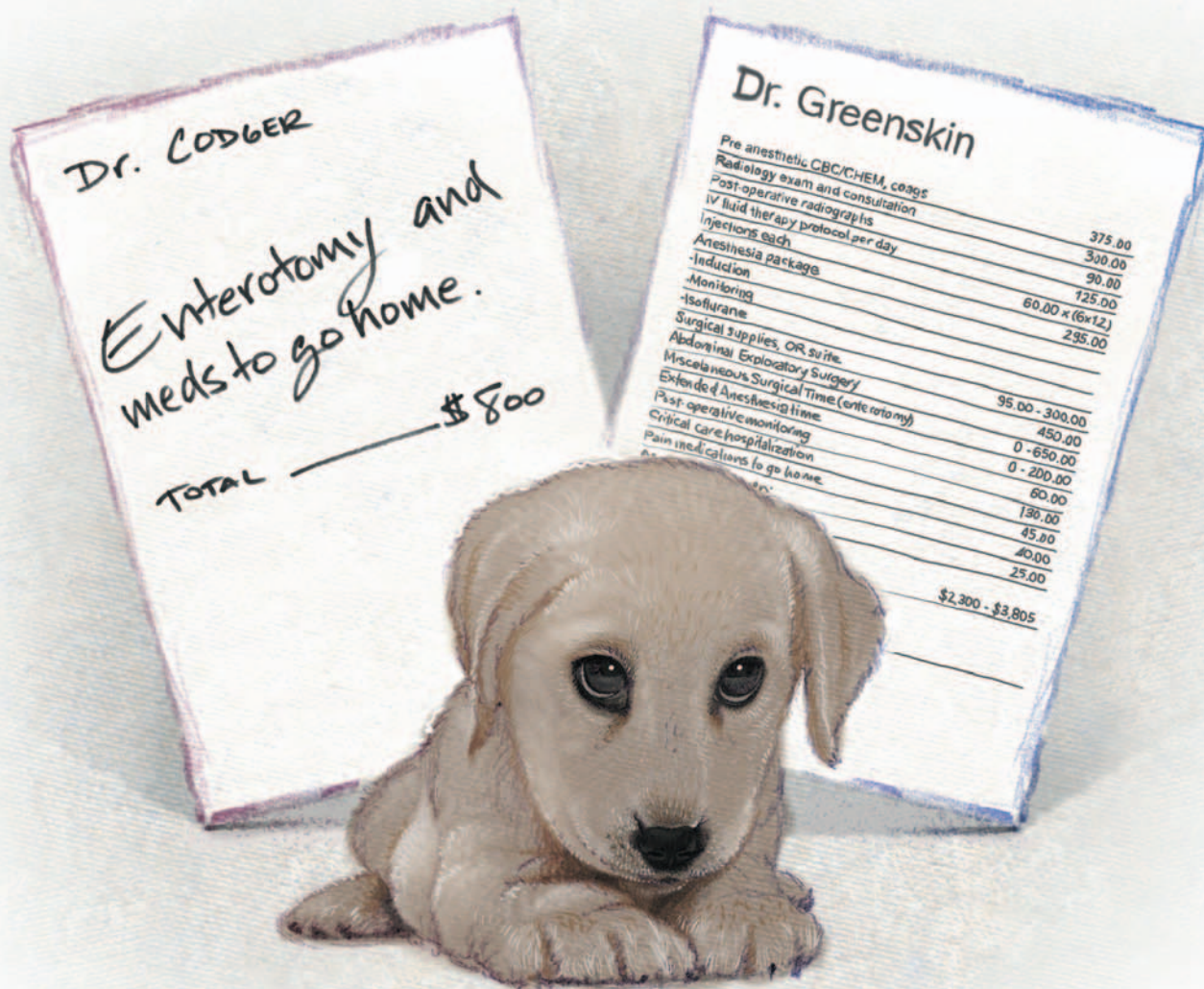


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¹Floerchinger AM, et al. Effects of feeding a weight loss food beyond a caloric restriction period on body composition and resistance to weight gain in cats. *J Am Vet Med Assoc.* 2015;247(4):365-374.

²Kruger JM, et al. Comparison of foods with differing nutritional profiles for long-term management of acute nonobstructive idiopathic cystitis in cats. *J Am Vet Med Assoc.* 2015;247(5):508-517.

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While Codger's away, Greenskin will pay

With Dr. Codger on vacation, Dr. Greenskin must face a client who belittles her abilities and refuses treatment for a puppy in need.

Dr. Codger has left the sacred two-hour radius surrounding his veterinary clinic and is away on a major vacation (i.e., a three-day weekend), leaving Dr. Greenskin in charge of the practice. The young associate is starting to feel like her old mentor is growing more comfortable with her, and the fact that he's trusting her to run things while he's gone speaks volumes.

Dr. Greenskin is taking extra special care of every case that walks in the door so she can make the old vet proud with nothing but glowing reports upon his return. At least, that was the plan.

Things get sketchy

Mr. Sketch is a longtime client of Dr. Codger's but has never been seen by Dr. Greenskin. He's brought all sorts of critters to Dr. Codger over the years, and the old vet has even been out to his place a time or two to help with an injured horse or a sick goat. Mr. Sketch periodically breeds a litter of Labradors that will be groomed into "huntin' dogs."

Upon arriving at the clinic, Mr. Sketch is upset that the "new lady vet" is his only option, but his problems can't wait for Dr. Codger. Boy Pup #3 is very sick and has been vomiting nonstop for two days.

As soon as Dr. Greenskin suggests starting with a parvovirus test and a series of radiographs, the client push-back begins.

Mr. Sketch scoffs, "Dr. Codger would know just what to do. I know this ain't parvo! He just needs some fluid and a shot. I already gave 'im some Pepto!"

Dr. Greenskin maintains composure and explains to Mr. Sketch that she can feel a firm mass in the puppy's abdomen. She is worried about a potential foreign body but definitely doesn't want to miss a parvo diagnosis.

Mr. Sketch reluctantly authorizes the diagnostics. "I don't think all of

this is necessary, and this is more than the pup is worth already. You better not be wasting my money here. When does Dr. Codger get back? Fluids and a shot only cost me 40 dollars last time!”

With results come insults

Dr. Greenskin’s suspicions are confirmed with a negative parvo test and a very obstructive radiograph. And the small intestine appears to be

Dr. Greenskin’s suspicions are confirmed with a negative parvo test and a very obstructive radiograph. And the small intestine appears to be blocked by what looks like a small corncob.

blocked by what definitely looks like a small corncob.

She gingerly reviews the radiographs with Mr. Sketch. “Are you saying I feed my dogs trash?!” he storms. “They get only the best food. I feed ‘em Shmoo Shmuffalo brand until they’re fully grown. Do you know how much that costs?!”

Dr. Greenskin proceeds cautiously but firmly. “I don’t know how the puppy got ahold of the object, but he’s very sick now, and I recommend exploratory surgery. He is at risk of perforating. The longer we wait, the sicker he’ll become and the greater the risk of intestinal rupture.”

Dr. Greenskin works up an estimate for surgical and postoperative services, which comes to between \$2,390 and \$3,905. Mr. Sketch begins to lose his composure (though it wasn’t ideal to begin with). He grabs the sweet, sickly puppy and storms out of the office, leaving Dr. Greenskin and the rest of the staff heartbroken. The defeated receptionist sighs, “Dr. Codger is not going to be happy about this ...”

To be continued!

Editor’s Note

Are you having a tough time adjusting to your old crotchety employer? Is your new inexperienced associate just not fitting in at your practice? Please send stories, ideas and comments to dvmnews@advanstar.com. All emails will be kept confidential, but the scenario may be featured

in an upcoming installment of Old School, New School. [dvm360](#)

Dr. Jeremy Campfield works in emergency and critical care practice in Southern California. This series originally appeared in Pulse, the publication of the Southern California Veterinary Medical Association.



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For nearly 90 years, BD has been partnering with physicians to improve diabetes therapy. Our commitment to improving diabetes management now includes dogs and cats!





A C-section by the sea

When my wife and I were the only hope for a desperate mama goat, we relied on skills learned from a former mentor: Be adaptable and make do.

I recently introduced you to what life is like in Anguilla—a lovely Caribbean island with an abundance of beautiful beaches but limited access to the outside world and its resources. As a result, the island can be slow to get many of the modern conveniences we're accustomed to in the States.

When my wife Georgia and I decided we were going to establish a concierge house call practice in Anguilla, we figured most of our time would be spent on wellness and preventive health. Reality turned out to be a bit different.

You have GOAT to be KIDDING me

Providing top-notch veterinary care with modest resources is a daily challenge, but one recent case takes the cake. One evening, in the middle of my local Rotary Club meeting, I was called to the phone. It was Georgia. She had gotten a call from a local who had a goat kidding. No—I'm not kidding, but the goat was. She had been in labor for some 18 hours and her kid was presenting.

So, off I went. Rotary could wait. I met Georgia on a dark dirt road and we walked into an even darker field where we met Winslow, the goat's owner. Communication with Winslow was difficult, so his friend Lady stepped in to help fill the gaps. With no one else available to help, we reluctantly stepped forward.

An agrarian cesarean

By the time we met the goat and saw the presenting kid, both were in sorry shape. I could feel the kid's head up in her pelvic canal and his front feet were protruding, but he was huge and simply could not budge—in or out. We had to assume that the kid was most likely dead but needed to make some effort to save the distressed and distraught first-time mother. If the kid wouldn't come out, we were going to have to go in and get him.



-  **Fleas**
-  **Heartworms**
-  **Roundworms**
-  **Hookworms**
-  **Ear Mites**



Adds up to unlimited purrs.

REVOLUTION® (selamectin) effectively kills fleas and prevents flea eggs from hatching, while providing broad-spectrum parasite control. Unlike some parasiticides, it's safe for breeding and nursing cats and doesn't require separation from family or other pets after application.

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IMPORTANT SAFETY INFORMATION:

Do not use REVOLUTION on sick, weak, or underweight cats. Use only on cats 8 weeks and older. Side effects may include digestive upset and temporary hair loss at application site with possible inflammation. In people, REVOLUTION may be irritating to skin and eyes. Wash hands after use. See Brief Summary of full Prescribing Information on page 42.

*VetInSite™ Analytics January 2016. Zoetis data on file.

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My wife and I are small animal practitioners, and while we have performed countless C-sections on small animals, we were ill-prepared for a large animal operation in terms of both experience and supplies. We just don't have the setup for sterile abdominal surgery.

Anguillan farmers are amazingly adept at midwifery, and C-sections are

not usually performed on the island's farm animals, so we soon amassed a noisy, excited crowd of spectators who were busy filming the spectacle on their cell phones. It was an event! It was somewhat surreal to be in the middle of the muddle with only the light from a dim overhead bulb and a few cell phones.

C-sections are not usually performed on the island's farm animals, so we soon amassed a noisy, excited crowd of spectators who were busy filming the spectacle on their cell phones. It was an event!

#1 in flea and heartworm protection*



revolution® (selamectin)

Topical Parasiticide For Dogs and Cats

BRIEF SUMMARY:

See package insert for full Prescribing Information.

CAUTION:

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

INDICATIONS:

Revolution is recommended for use in dogs six weeks of age or older and cats eight weeks of age and older for the following parasites and indications:

Dogs:

Revolution kills adult fleas and prevents flea eggs from hatching for one month and is indicated for the prevention and control of flea infestations (*Ctenocephalides felis*), prevention of heartworm disease caused by *Dirofilaria immitis*, and the treatment and control of ear mite (*Otodectes cynotis*) infestations. Revolution also is indicated for the treatment and control of sarcoptic mange (*Sarcoptes scabiei*) and for the control of tick infestations due to *Dermacentor variabilis*.

Cats:

Revolution kills adult fleas and prevents flea eggs from hatching for one month and is indicated for the prevention and control of flea infestations (*Ctenocephalides felis*), prevention of heartworm disease caused by *Dirofilaria immitis*, and the treatment and control of ear mite (*Otodectes cynotis*) infestations. Revolution is also indicated for the treatment and control of roundworm (*Toxocara cati*) and intestinal hookworm (*Ancylostoma tubaeforme*) infections in cats.

WARNINGS:

Not for human use. Keep out of the reach of children.

In humans, Revolution may be irritating to skin and eyes. Reactions such as hives, itching and skin redness have been reported in humans in rare instances. Individuals with known hypersensitivity to Revolution should use the product with caution or consult a health care professional. Revolution contains isopropyl alcohol and the preservative butylated hydroxytoluene (BHT). Wash hands after use and wash off any product in contact with the skin immediately with soap and water. If contact with eyes occurs, then flush eyes copiously with water. In case of ingestion by a human, contact a physician immediately. The material safety data sheet (MSDS) provides more detailed occupational safety information. For a copy of the MSDS or to report adverse reactions attributable to exposure to this product, call 1-888-963-8471.

Flammable - Keep away from heat, sparks, open flames or other sources of ignition.

Do not use in sick, debilitated or underweight animals (see SAFETY).

PRECAUTIONS:

Prior to administration of Revolution, dogs should be tested for existing heartworm infections. At the discretion of the veterinarian, infected dogs should be treated to remove adult heartworms. Revolution is not effective against adult *D. immitis* and, while the number of circulating microfilariae may decrease following treatment, Revolution is not effective for microfilariae clearance.

Hypersensitivity reactions have not been observed in dogs with patent heartworm infections administered three times the recommended dose of Revolution. Higher doses were not tested.

ADVERSE REACTIONS:

Pre-approval clinical trials:

Following treatment with Revolution, transient localized alopecia with or without inflammation at or near the site of application was observed in approximately 1% of 691 treated cats. Other signs observed rarely ($\leq 0.5\%$ of 1743 treated cats and dogs) included vomiting, loose stool or diarrhea with or without blood, anorexia, lethargy, salivation, tachypnea, and muscle tremors.

Post-approval experience:

In addition to the aforementioned clinical signs that were reported in pre-approval clinical trials, there have been reports of pruritus, urticaria, erythema, ataxia, fever, and rare reports of death. There have also been rare reports of seizures in dogs (see WARNINGS).

SAFETY:

Revolution has been tested safe in over 100 different pure and mixed breeds of healthy dogs and over 15 different pure and mixed breeds of healthy cats, including pregnant and lactating females, breeding males and females, puppies six weeks of age and older, kittens eight weeks of age and older, and avermectin-sensitive collies. A kitten, estimated to be 5-8 weeks old (0.3 kg), died 8 1/2 hours after receiving a single treatment of Revolution at the recommended dosage. The kitten displayed clinical signs which included muscle spasms, salivation and neurological signs. The kitten was a stray with an unknown history and was malnourished and underweight (see WARNINGS).

DOGS: In safety studies, Revolution was administered at 1, 3, 5, and 10 times the recommended dose to six-week-old puppies, and no adverse reactions were observed. The safety of Revolution administered orally also was tested in case of accidental oral ingestion. Oral administration of Revolution at the recommended topical dose in 5- to 8-month-old beagles did not cause any adverse reactions. In a pre-clinical study selamectin was dosed orally to ivermectin-sensitive collies. Oral administration of 2.5, 10, and 15 mg/kg in this dose escalating study did not cause any adverse reactions; however, eight hours after receiving 5 mg/kg orally, one avermectin-sensitive collie became ataxic for several hours, but did not show any other adverse reactions after receiving subsequent doses of 10 and 15 mg/kg orally. In a topical safety study conducted with avermectin-sensitive collies at 1, 3 and 5 times the recommended dose of Revolution, salivation was observed in all treatment groups, including the vehicle control. Revolution also was administered at 3 times the recommended dose to heartworm infected dogs, and no adverse effects were observed.

CATS: In safety studies, Revolution was applied at 1, 3, 5, and 10 times the recommended dose to six-week-old kittens. No adverse reactions were observed. The safety of Revolution administered orally also was tested in case of accidental oral ingestion. Oral administration of the recommended topical dose of Revolution to cats caused salivation and intermittent vomiting. Revolution also was applied at 4 times the recommended dose to patent heartworm infected cats, and no adverse reactions were observed.

In well-controlled clinical studies, Revolution was used safely in animals receiving other frequently used veterinary products such as vaccines, anthelmintics, antiparasitics, antibiotics, steroids, collars, shampoos and dips.

STORAGE CONDITIONS: Store below 30°C (86°F).

HOW SUPPLIED: Available in eight separate dose strengths for dogs and cats of different weights (see DOSAGE). Revolution for puppies and kittens is available in cartons containing 3 single dose tubes. Revolution for cats and dogs is available in cartons containing 3 or 6 single dose tubes.

NADA 141-152, Approved by FDA

zoetis

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Thankfully, we were just a couple of miles from home, so off Georgia went to grab supplies and a lantern (cell phone lights weren't going to cut it). Meanwhile, I sat on Winslow's back porch and tried to recall anything I'd ever learned about C-sections in the field. I conjured up images of inverted L blocks and flank incisions ("Let's see ... right flank or left?"), but this was still going to be a challenge with no drapes, no appropriate drugs, and only 3-0 sutures. I was sure we were doomed to failure.

It's a Miracle—literally

Well, to cut to the chase, we got the kid delivered and damn, if he wasn't still alive! Unfortunately, the mama goat was nearly dead and in shock by then, but she revived when we rubbed honey on her gums. We rinsed everything with sterile lactated Ringer's, poured injectable antibiotics into the abdominal cavity, and Georgia made sure I didn't inadvertently tack any loops of bowel into the surgical site. By the time I had the mom closed, she was trying to stand, and the kid, named Miracle by Lady, was trying to nurse.

We had a live goat and a live kid. While both were very weak when

One evening, in the middle of my local Rotary Club meeting, I was called to the phone. It was Georgia. She had gotten a call from a local who had a goat kidding. No—I'm not kidding, but the goat was.

we left them, they were still alive the next morning. We called the owner to check and were told, "She be strong, and he be lively!" We tried desperately to impress upon him the fact that her surgical repair was tenuous at best and that confinement was essential, but he could not be talked out of taking the new family to the beach so they could wade in the sea and benefit from its healing properties.

The 10 percent

Reflecting on the event a week later, Georgia said, "Those two were definitely among the 10 percent." She was told in veterinary school that provided we don't screw things up, 80 to 85 per-



>>> While Drs. Mike and Georgia Paul worked hard to save the lives of Miracle and her mom, they know their former patients are an important part of the Anguillian diet.

cent of patients get better without our help, while around 5 percent will die in spite of our best efforts. But in 10 to

veterinary practice. These are the principles that carried us through Miracle's miracle birth.

Patient today, dinner tomorrow

Unfortunately, Miracle is a ram kid and is thus not particularly valuable in Anguillian agriculture. We heard he is destined to be the guest of honor at dinner in a few weeks. Georgia and I aren't accustomed to saving a patient that is destined for the dinner table. **dvm360**

Dr. Michael Paul is a nationally known speaker and columnist and the principal of Magpie Veterinary Consulting. He lives in Anguilla in the British West Indies.

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San Antonio Fun Fact

San Antonio has a population of approximately 1,436,697 making it the 7th largest city in the United States and the second most populated city in the state of Texas. The Spanish cultural influence is visible in the city's architecture, history, culinary specialties and people. Approximately 54% of the San Antonio metro area population is Hispanic/Latino.

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Yes, female veterinarians earn less. *However ...*

... the AVMA starting salary calculator showing that looks at many factors. And that does *not* mean any female DVM should ask a practice owner for less money than her male peers.

For more than three decades the American Veterinary Medical Association (AVMA) has been publishing the mean starting salary for new veterinarians, and these studies have clearly shown a gender wage gap: Women make less than men, whether

they are new graduates, associates or practice owners.

Some of the gender gap can be explained by type of practice, location of employment and other factors, but not all of the gap can be explained by the factors for which we have data.

For all U.S. veterinary college graduates who have indicated their starting salary in any employment opportunity prior to graduation, we can explain 71 percent of the variation in their salaries with the factors we currently measure. One of those has been, and continues to be, gender.

TABLE 1

AVMA veterinary graduate starting salary calculator

Our example is a 2016 graduate who is 28 years old, female, plans to work 40 hours per week, has \$145,000 in debt and is applying to be a companion-animal-predominant practitioner in Virginia (Region 2).

	Coefficients		Inputs	Example	
	Gender considered	Gender not considered		Female	No gender
Section A: Demographics					
Let's start you off with:	\$54,463	\$49,602		\$54,463	\$49,602
What year are you looking to find work?	\$1,670	\$1,662	16	\$26,714	\$26,599
How old are you?	\$43	\$63	28	\$1,213	\$1,767
Are you male or female? (If female input 1, if male input 0.)	(\$2,407)		1	(\$2,407)	
How many hours do you plan to work/week?	(\$126)	(\$122)	40	(\$5,036)	(\$4,887)
How much DVM debt graduate with?	\$8.02	\$7.69	145	\$1,163	\$1,115
Section B: Region of practice					
Region 0	\$1,599	\$1,426			
Region 1	\$2,588	\$2,468			
Region 2	\$1,444	\$1,294	1	\$1,444	\$1,294
Region 3	0	0			
Region 4	0	0			
Region 5	(\$939)	(\$1,087)			
Region 6	0	0			
Region 7	\$1,191	\$1,234			
Region 8	\$2,059	\$2,029			
Region 9	\$3,873	\$3,729			
Outside of the United States	0	0			
Section C: Type of practice					
Food animal exclusive	\$940	\$1,915			
Food animal predominant	(\$2,769)	(\$1,930)			
Mixed practice	(\$3,986)	(\$3,663)			
Companion animal exclusive	0	0			
Companion animal predominant	(\$1,206)	(\$1,148)	1	(\$1,206)	(\$1,148)
Equine	(\$18,327)	(\$18,244)			
Federal government	(\$2,808)	(\$2,754)			
Uniformed services	0	0			
College or university	(\$26,312)	(\$25,771)			
State or local government	(\$10,191)	(\$10,285)			
Industry	\$8,672	\$9,431			
Not-for-profit	(\$9,457)	(\$9,849)			
Other veterinary employment	0	0			
Starting salary				\$76,348	\$74,343

Source: AVMA Veterinary Economics division

A new guide based on historical data

A new graduate starting salary calculator was first introduced to the profession in April 2015 in the 2015 AVMA Report on Veterinary Debt and Income and in a dvm360 magazine article, "How to predict veterinary compensation." The data is from 2001 to 2015 U.S. veterinary college graduates who provided information about their starting salaries. The tool indicates the degree to which statistically significant demographic variables—things like gender, practice type, region, age, hours intended to work, degree and whether an internship is sought—correlate to starting salaries.

More recently, the AVMA developed a laminated sheet we use to counsel students about their debt-to-income ratio. Use of the calculator for the purpose of determining the starting salary for a specific set of demographic variables makes clear that female graduates have historically been paid \$2,406.97 less than male graduates across the board. This information has been met with a great deal of indignation, because it seems to suggest that women should accept less money than men for the same position. This is not the case.

The introductory paragraph to the calculator states:

This calculator provides the average starting salary for specific segments of the profession and was developed from data collected from graduat-

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against heartworm disease
PLUS hookworms
and roundworms.

- ✓ PREVENTS HEARTWORM DISEASE
- ✓ TREATS AND CONTROLS 3 SPECIES OF HOOKWORMS
- ✓ TREATS AND CONTROLS 2 SPECIES OF ROUNDWORMS
- ✓ #1 RECOMMENDED HEARTWORM DISEASE PREVENTIVE¹
- ✓ SAFE FOR PUPPIES AT 6 WEEKS



¹ Data on file at Merial.

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HGD15PRETESTTRADEADS (01/16).

IMPORTANT RISK INFORMATION: HEARTGARD[®] Plus (ivermectin/pyrantel) is well tolerated. All dogs should be tested for heartworm infection before starting a preventive program. Following the use of HEARTGARD Plus, digestive and neurological side effects have rarely been reported. For more information, please visit www.HEARTGARD.com.

Heartgard[®] 
(ivermectin/pyrantel) **Plus**

ing veterinary students through the AVMA Senior Survey. This calculator was developed to provide you with a starting point for your own salary negotiation. The calculator is a predictive tool and uses values for gender, practice type, region, hours worked, additional degrees and debt load that were found to be statisti-

cally significant predictors of starting salary. The calculator does not provide a guaranteed salary or recommended salary for any individual veterinarian and each veterinarian is responsible for negotiating their starting salary.

“Not a guaranteed or recommended salary”

Unfortunately, our attempt to provide an adequate explanation of—and descriptions for—the use of the tool ap-

graduate who is 28 years old, female, plans to work 40 hours per week, has \$145,000 in debt and is applying to be a companion-animal-predominant practitioner in Virginia (Region 2). The calculator predicts that, based on historical observation, the mean salary for this situation will be \$76,348.

By eliminating the gender factor, we create a misspecified statistical model and the effect of gender is captured in the remaining factors.

However, if we eliminate the gender

The new salary calculator is a tool to help inform new veterinarians about the factors that may affect their salary. It does not provide answers as to why those factors affect starting salary.

parently did not achieve its goal. While the second sentence of the paragraph above suggests that this estimate may provide a starting point for salary negotiations, the last sentence was intended to warn against using this salary tool to define a “recommended” salary.

One might ask, “Why should a female veterinarian start negotiations with a salary \$2,400 below a male counterpart?” Or, “Why should a mixed animal practitioner start negotiations with a salary \$4,000 below a companion animal practitioner?” Or, “Why should a practitioner in the Midwest start salary negotiation at a point less than one on the coasts?”

The new salary calculator is a tool to help inform new veterinarians about the factors that may affect their salary. It does not provide answers as to *why* those factors affect starting salary. The salary, using nearly 30,000 observations from the past 15 years, provides the mean salary for very specific employment opportunities and individual characteristics. Some will make more and some will make less than these mean values.

Eliminating gender distorts other factors

So should the AVMA provide a calculator that contains all factors other than gender? Consider Table 1 (page 44), where the salary calculator provides one column that includes gender and one column that excludes it.

Now, consider the case of a 2016

factor, the calculator predicts that the mean salary will be \$74,343—\$2,000 less than the calculator with the gender factor. Also note the difference in the impact on starting salary of the food animal and industry factors. They are much greater when gender is removed because there are fewer women in these practice types. By eliminating the gender factor, we create a misspecified statistical model and the effect of gender is captured in the remaining factors based on their male-female proportion.

The factors that affect salary have been in place for many years. In most markets, these types of differences would begin to disappear as market participants begin to use them to gain advantages. Higher salaries in one situation would cause more graduates to seek employment in that situation and this would cause those salaries to decline, while allowing the salaries in other situations to increase.

The current salary calculator is a guide to allow graduates to understand what factors have affected past starting salaries. Perhaps in the future, through the use of this tool, we will see the gender gap disappear. Fortunately, we will have new estimates for the salary calculator each year and you will be able to measure the change in the profession’s starting salary gender wage gap. [dvm360](#)

Dr. Michael Dicks is director of the AVMA’s Veterinary Economics division.

Heartgard[®] Plus (ivermectin/pyrantel)

CHEWABLES

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

INDICATIONS: For use in dogs to prevent canine heartworm disease by eliminating the tissue stage of heartworm larvae (*Dirofilaria immitis*) for a month (30 days) after infection and for the treatment and control of ascarids (*Toxocara canis*, *Toxascaris leonina*) and hookworms (*Ancylostoma caninum*, *Uncinaria stenocephala*, *Ancylostoma braziliense*).

DOSAGE: HEARTGARD[®] Plus (ivermectin/pyrantel) should be administered orally at monthly intervals at the recommended minimum dose level of 6 mcg of ivermectin per kilogram (2.72 mcg/lb) and 5 mg of pyrantel (as pamoate salt) per kg (2.27 mg/lb) of body weight. The recommended dosing schedule for prevention of canine heartworm disease and for the treatment and control of ascarids and hookworms is as follows:

Dog Weight	Chewables Per Month	Ivermectin Content	Pyrantel Content	Color Coding On Foil Backing and Carton
Up to 25 lb	1	68 mcg	57 mg	Blue
26 to 50 lb	1	136 mcg	114 mg	Green
51 to 100 lb	1	272 mcg	227 mg	Brown

HEARTGARD Plus is recommended for dogs 6 weeks of age and older. For dogs over 100 lb use the appropriate combination of these chewables.

ADMINISTRATION: Remove only one chewable at a time from the foil-backed blister card. Return the card with the remaining chewables to its box to protect the product from light. Because most dogs find HEARTGARD Plus palatable, the product can be offered to the dog by hand. Alternatively, it may be added intact to a small amount of dog food. The chewable should be administered in a manner that encourages the dog to chew, rather than to swallow without chewing. Chewables may be broken into pieces and fed to dogs that normally swallow treats whole.

Care should be taken that the dog consumes the complete dose, and treated animals should be observed for a few minutes after administration to ensure that part of the dose is not lost or rejected. If it is suspected that any of the dose has been lost, redosing is recommended.

HEARTGARD Plus should be given at monthly intervals during the period of the year when mosquitoes (vectors), potentially carrying infective heartworm larvae, are active. The initial dose must be given within a month (30 days) after the dog’s first exposure to mosquitoes. The final dose must be given within a month (30 days) after the dog’s last exposure to mosquitoes.

When replacing another heartworm preventive product in a heartworm disease preventive program, the first dose of HEARTGARD Plus must be given within a month (30 days) of the last dose of the former medication.

If the interval between doses exceeds a month (30 days), the efficacy of ivermectin can be reduced. Therefore, for optimal performance, the chewable must be given once a month on or about the same day of the month. If treatment is delayed, whether by a few days or many, immediate treatment with HEARTGARD Plus and resumption of the recommended dosing regimen will minimize the opportunity for the development of adult heartworms.

Monthly treatment with HEARTGARD Plus also provides effective treatment and control of ascarids (*T. canis*, *T. leonina*) and hookworms (*A. caninum*, *U. stenocephala*, *A. braziliense*). Clients should be advised of measures to be taken to prevent reinfection with intestinal parasites.

EFFICACY: HEARTGARD Plus Chewables, given orally using the recommended dose and regimen, are effective against the tissue larval stage of *D. immitis* for a month (30 days) after infection and, as a result, prevent the development of the adult stage. HEARTGARD Plus Chewables are also effective against canine ascarids (*T. canis*, *T. leonina*) and hookworms (*A. caninum*, *U. stenocephala*, *A. braziliense*).

ACCEPTABILITY: In acceptability and field trials, HEARTGARD Plus was shown to be an acceptable oral dosage form that was consumed at first offering by the majority of dogs.

PRECAUTIONS: All dogs should be tested for existing heartworm infection before starting treatment with HEARTGARD Plus which is not effective against adult *D. immitis*. Infected dogs must be treated to remove adult heartworms and microfilariae before initiating a program with HEARTGARD Plus.

While some microfilariae may be killed by the ivermectin in HEARTGARD Plus at the recommended dose level, HEARTGARD Plus is not effective for microfilariae clearance. A mild hypersensitivity-type reaction, presumably due to dead or dying microfilariae and particularly involving a transient diarrhea, has been observed in clinical trials with ivermectin alone after treatment of some dogs that have circulating microfilariae.

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

In case of ingestion by humans, clients should be advised to contact a physician immediately. Physicians may contact a Poison Control Center for advice concerning cases of ingestion by humans.

Store between 68°F - 77°F (20°C - 25°C). Excursions between 59°F - 86°F (15°C - 30°C) are permitted. Protect product from light.

ADVERSE REACTIONS: In clinical field trials with HEARTGARD Plus, vomiting or diarrhea within 24 hours of dosing was rarely observed (1.1% of administered doses). The following adverse reactions have been reported following the use of HEARTGARD: Depression/lethargy, vomiting, anorexia, diarrhea, mydriasis, ataxia, staggering, convulsions and hypersalivation.

SAFETY: HEARTGARD Plus has been shown to be bioequivalent to HEARTGARD, with respect to the bioavailability of ivermectin. The dose regimens of HEARTGARD Plus and HEARTGARD are the same with regard to ivermectin (6 mcg/kg). Studies with ivermectin indicate that certain dogs of the Collie breed are more sensitive to the effects of ivermectin administered at elevated dose levels (more than 16 times the target use level) than dogs of other breeds. At elevated doses, sensitive dogs showed adverse reactions which included mydriasis, depression, ataxia, tremors, drooling, paresis, recumbency, excitability, stupor, coma and death. HEARTGARD demonstrated no signs of toxicity at 10 times the recommended dose (60 mcg/kg) in sensitive Collies. Results of these trials and bioequivalency studies, support the safety of HEARTGARD products in dogs, including Collies, when used as recommended.

HEARTGARD Plus has shown a wide margin of safety at the recommended dose level in dogs, including pregnant or breeding bitches, stud dogs and puppies aged 6 or more weeks. In clinical trials, many commonly used flea collars, dips, shampoos, anthelmintics, antibiotics, vaccines and steroid preparations have been administered with HEARTGARD Plus in a heartworm disease prevention program.

In one trial, where some pups had parvovirus, there was a marginal reduction in efficacy against intestinal nematodes, possibly due to a change in intestinal transit time.

HOW SUPPLIED: HEARTGARD Plus is available in three dosage strengths (See DOSAGE section) for dogs of different weights. Each strength comes in convenient cartons of 6 and 12 chewables.

For customer service, please contact Merial at 1-888-637-4251.



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Bob Froehlich, founder of Summit Veterinary Advisors, dies at age 73

Robert E. Froehlich, DVM, MBA, the founder of Summit Veterinary Advisors in Littleton, Colorado, died May 23 after a brief illness at age 73.

Froehlich, a graduate of Iowa State University, served two years in the Army Veterinary Corps before interning at Purdue University. Through his life, he gained over 20 years of experience in private practice, 15 of which were as an owner of Grafton Small Animal Hospital in Milwaukee, Wisconsin. While in practice in 1987, he became one of the first veterinarians to obtain an MBA degree.

Soon after, Froehlich sold his clinic and joined the American Animal Hospital Association (AAHA) in Denver, Colorado, as the first director of management services. There he assumed



Dr. Bob Froehlich

responsibility for development and implementation of the Veterinary Management Institute and Veterinary Management School, among other programs, including hospital accreditation, financial analysis, consulting, insurance, financial services and retirement programs. He then became an adjunct faculty member of Purdue University, soon after becoming an affiliate faculty member of the Colorado State University College of Veterinary Medicine.

After leaving AAHA, Froehlich established Summit Veterinary Advisors in Lakewood, Colorado, where he served as a business consultant for both general and specialty practices for veterinarians worldwide. He also served as president of VetPartners, where he was awarded the VetPartners Distinguished Life Member Award.

Froehlich was a regular speaker for AAHA, the American Veterinary Medical Association, the North American Veterinary Conference and the Western Veterinary Conference, along with state, provincial and local veterinary medical associations and student programs. He wrote the book *Successful Financial Management for the Veterinary Practice* as well as numerous articles and monographs on management is-

sues. He was also an item writer for the National Board of Veterinary Examiners and served for four years as chair of the management section of the North American Veterinary Conference.

He is survived by his wife, Virginia; children Karen and Hartmann, Andrew Froehlich and William Froehlich; several grandchildren and many other family members and friends. [dvm360](#)

Loud noises can be scary.

At least one-third of all dogs in the United States experience noise aversion,¹ a condition that can lead to distress and suffering^{2,3} during noise events. If left untreated, the condition may worsen over time. Now there's SILEO[®] (dexmedetomidine oromucosal gel), the first and only FDA-approved treatment for canine noise aversion. SILEO provides fast and effective at-home treatment that calms without sedating.

Sileo[®]
(dexmedetomidine
oromucosal gel)

Visit sileosoundsolution.com or ask your Zoetis Representative about SILEO.

IMPORTANT SAFETY INFORMATION: Do not use SILEO in dogs with severe cardiovascular disease, respiratory, liver or kidney diseases, or in conditions of shock, severe debilitation, or stress due to extreme heat, cold or fatigue or in dogs hypersensitive to dexmedetomidine or to any of the excipients. SILEO should not be administered in the presence of preexisting hypotension, hypoxia or bradycardia. Do not use in dogs sedated from previous dosing. SILEO has not been evaluated in dogs younger than 16 weeks of age or in dogs with dental or gingival disease that could have an effect on the absorption of SILEO. SILEO has not been evaluated for use in breeding, pregnant or lactating dogs. Transient pale mucous membranes at the site of application may occur with SILEO use. Other uncommon adverse reactions included emesis, drowsiness or sedation. Handle gel-dosing syringes with caution to avoid direct exposure to skin, eyes or mouth. See Brief Summary of full Prescribing Information on page 50.

¹ Based on online survey conducted by Harris Poll on behalf of Zoetis in November 2013 among 784 dog owners.

² Sherman BL, Mills DS. Canine anxieties and phobias: An update on separation anxiety and Noise Aversions. *Vet Clin Nor Amer: Small Anim Pract*, 2008; 38: 1081-1106.

³ Shull-Selcer EA, Stagg W. Advances in the understanding and treatment of noise phobias. *Vet Clin Nor Amer: Small Anim Pract*, 1991; 21: 353-367.

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'My noncompete is just so wordy!'

"... And I have no clue what these words mean." A veterinary attorney helps break the code on these verbose legal clauses.

Every now and again, a veterinarian will submit an employment contract to our office for review, even though she's pretty sure she understands the terms. Sometimes it's because she sees a phrase in the boilerplate that advises her to have a professional review the document. Other times it's just to make sure that the pay and benefits are competitive.

But there's another group who submit their employment agreements for review. Often these veterinarians don't even have an issue with the noncompete details—the length of time or the described noncompete region. They just can't make heads or tails of the paragraphs and subparagraphs dedicated to noncompetition.

There's a reason why such otherwise clear and concise documents get super wordy. The author has used complex language to build a case if the enforcement of the noncompete is litigated or arbitrated. How and why? The answer lies in the politics of jurisprudence.

Let's demystify the court of public policy

Most state laws provide for either the enforcement of employee noncompetition covenants (contractual promises), or they simply don't prohibit their enforcement. For example, Dr. A signs an employment contract that contains a three-year, 15-mile noncompete covenant. When Dr. A violates it, most states will allow his employer to sue to

try to enforce the limitation. (Or if the legislature hasn't spoken otherwise, the suit can go forward.)

But that's the simple view. Practically speaking, courts possess enormous leeway to decide whether to enforce a specific covenant. Let's look at Dr. A's case through the eyes of a typical judge interpreting that covenant.

Assume Dr. A is dragged to court for opening his own shop 12 miles from his old employer's clinic. The state law in the fictional state of Jones says that suits are allowed to enforce covenants not to compete. But Dr. A's dispute is far from the first case ever to come before the courts in Jones.

In one old case, the noncompete covenant went up on appeal and

A few words on the exact words in your noncompete

Consider these terms and phrases commonly written into noncompetition covenants. Each is designed to protect the document against being voided by a judge who leans toward looking out for employees' rights over employers' rights:

- > "Employee agrees that these noncompete limitations are fair ..." These words attempt to prevent associates from claiming that they didn't understand what they were signing, and they got bamboozled into agreeing with unreasonable or outrageous noncompete limits.

- > "Employee shall have the right, upon termination, to work at any humane society or low-cost spay clinic and to do relief veterinary work up to four days a week as long as such work is not performed at the same practice more than four days out of any calendar month." This helps deflect the potential argument that the noncompete would prevent the associate from earning a living without moving out of town.

- > "Any court of competent jurisdiction shall have the right to modify any term of this noncompetition clause in order to re-form it to comply with law and make it enforceable." This is designed to keep the noncompete from being thrown out completely if its original language was overly broad and, as such, contrary to public policy.

- > "This noncompetition clause shall not become effective until the six-month anniversary of the signing of this contract." This language attempts to avoid the doctrine some courts apply to noncompete covenants called "lack of adequate consideration." The theory is that not only must the time, distance and other tests be met reasonably, but that a clinic has not really developed a protectable interest in prohibiting an associate's competition until that associate has spent enough time on the job getting to know clients to present a competitive risk.

was held invalid. In its opinion, the Supreme Court of the state of Jones declared that "while the courts of this state may enforce such covenants, they must apply a multipronged test.

"These are the characteristics that a covenant not to compete must possess for the trial courts of our state to mandate enforcement:

- > The covenant must be reasonable in terms of period.
- > The covenant must be reasonable in terms of distance or region.
- > The covenant must cover only an area from which the complaining business draws its customers.
- > The covenant must balance the needs of the business to protect itself



When noise hurts, SILEO can help

SILEO, the first and only FDA-approved treatment for canine noise aversion, calms without sedating—freeing dogs from fear and anxiety triggered by noise events, including construction, fireworks, thunder and traffic.

Sileo[®]
(dexmedetomidine
oromucosal gel)

Visit sileosoundsolution.com or ask your Zoetis Representative about SILEO.

IMPORTANT SAFETY INFORMATION: Do not use SILEO in dogs with severe cardiovascular disease, respiratory, liver or kidney diseases, or in conditions of shock, severe debilitation, or stress due to extreme heat, cold or fatigue or in dogs hypersensitive to dexmedetomidine or to any of the excipients. SILEO should not be administered in the presence of preexisting hypotension, hypoxia or bradycardia. Do not use in dogs sedated from previous dosing. SILEO has not been evaluated in dogs younger than 16 weeks of age or in dogs with dental or gingival disease that could have an effect on the absorption of SILEO. SILEO has not been evaluated for use in breeding, pregnant or lactating dogs. Transient pale mucous membranes at the site of application may occur with SILEO use. Other uncommon adverse reactions included emesis, drowsiness or sedation. Handle gel-dosing syringes with caution to avoid direct exposure to skin, eyes or mouth. See Brief Summary of full Prescribing Information on page 50.

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zoetis

with the need of the employee to reasonably earn a living in his or her trade or profession.”

Where did the Supreme Court of Jones come up with this set of interpretive rules for the lower courts?

It made them up.

And until the Jones legislature says otherwise, those are the rules courts in

the state of Jones must use to decide whether a covenant is enforceable.

But why? The justices of the highest court of Jones have the duty and power to interpret laws on the books in Jones to allow enforcement consistent with public policy. Public policy means fair, or reasonable, or not unduly harsh or some combination of those things.

So let’s say one case went up to the Supreme Court. The court said the covenant in that case, 35 miles and one year, was void—not reasonable because under the facts of that single case, 35 miles is too far.

Now, armed with that precedent, Judge Wright, the judge in Dr. A’s case, has to apply the “reasonableness” tests to Dr. A’s covenant. Well Judge Wright, a conservative Republican, rules that 12 miles is absolutely fine and falls well within a reasonable balance between rights of the clinic to protect its client base and the ability of Dr. A to pursue his career.

Another judge’s view

Now reimagine the same trial with another judge in Dr. A’s town. Judge Clinton is considered liberal by everybody up to and including Ralph Nader. He hears the facts and doesn’t buy the theory that Dr. A’s old boss has clients driving 12 miles to his practice. The demographic information supplied as evidence leads him believe that virtually all the clients at the practice live within 3 miles of the place.

Surely public policy demands that this poor, innocent employed veterinarian should be able to work anywhere outside a 3-mile radius. And so the noncompete is struck down or modified to encompass a smaller distance that is reasonable. Clearly reasonable minds differ.

The word on wordiness

Folks who know how to draft legal documents also know what hurdles their work will encounter if the validity of those documents is challenged. So good lawyers anticipate an eventual judicial interpretation of any noncompete they prepare. They write them to enhance their appearance of “reasonableness” and to maximize the likelihood that they will fall on the right side of any “balancing of public policy objectives” a judge may apply.

The language must be descriptive of the prohibition it’s designed to enforce and provide a strong defense against challenges. And that, doctor, is why your noncompete is so wordy. **dvm360**

Dr. Christopher Allen is president of Associates in Veterinary Law PC, which provides legal and consulting services to veterinarians. Call (607) 754-1510 or e-mail info@veterinarylaw.com.

Brief Summary of Prescribing Information

NADA 141-456, Approved by FDA

Sileo®

(dexmedetomidine oromucosal gel)

Each mL of SILEO contains 0.09 mg dexmedetomidine (equivalent to 0.1 mg dexmedetomidine hydrochloride).

For oromucosal use in dogs only. Not intended for ingestion.

CAUTION:

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

INDICATIONS: SILEO is indicated for the treatment of noise aversion in dogs.

CONTRAINDICATIONS:

Do not use SILEO in dogs with severe cardiovascular, respiratory, liver or kidney disease, or in conditions of shock, severe debilitation, or stress due to extreme heat, cold or fatigue. Do not use in dogs with hypersensitivity to dexmedetomidine or to any of the excipients.

WARNINGS:

Human Safety: Not for human use. Keep out of reach of children.

Avoid administering the product if pregnant, as exposure may induce uterine contractions and/or decrease fetal blood pressure.

Appropriate precautions should be taken while handling and using filled syringes. **Impermeable disposable gloves should be worn when handling the syringe, administering SILEO, or when coming in contact with the dog’s mouth after application.**

If skin is damaged, dexmedetomidine can be absorbed into the body. In case of skin contact, wash with soap and water. Remove contaminated clothing.

SILEO can be absorbed following direct exposure to skin, eyes, or mouth. In case of accidental eye exposure, flush with water for 15 minutes. If wearing contact lenses, eyes should be rinsed first, then remove contact lenses and continue rinsing, then seek medical advice immediately.

Accidental exposure may cause sedation and changes in blood pressure. In case of accidental exposure, seek medical attention immediately. Exposure to the product may induce a local or systemic allergic reaction in sensitized individuals.

Note to physician: This product contains an alpha-2 adrenoceptor agonist.

The safety data sheet (SDS) contains more detailed occupational safety information. To report adverse reactions in users or to obtain a copy of the SDS for this product call 1-888-963-8471.

Animal Safety: SILEO should not be administered in the presence of pre-existing hypotension, hypoxia, or bradycardia. Sensitive dogs may experience a drop in body temperature and heart rate, and may appear sedated. These dogs should be kept warm and not offered food or water until SILEO’s effects have worn off (usually within a few hours). Do not use in dogs sedated from previous dosing.

PRECAUTIONS:

SILEO is not meant to be swallowed. Instead, it must be placed onto the mucosa between the dog’s cheek and gum. If SILEO is swallowed, the product may not be effective. If SILEO is swallowed, do not repeat the dose for at least two hours. Feeding and giving treats within 15 minutes after administration should be avoided.

The use of other central nervous system depressants may potentiate the effects of SILEO.

As with all alpha-2 adrenoceptor agonists, the potential for isolated cases of hypersensitivity, including paradoxical response (excitation), exists.

SILEO has not been evaluated in dogs younger than 16 weeks of age or in dogs with dental or gingival diseases that could have an effect on SILEO’s absorption. SILEO has not been evaluated for aversion behaviors to thunderstorms.

The safety and effectiveness of SILEO in breeding, pregnant, and lactating dogs has not been evaluated. Administration to pregnant dogs may induce uterine contractions and/or decrease fetal blood pressure.

ADVERSE REACTIONS:

In a well-controlled European field study, which included a total of 182 dogs ranging from 2 to 17 years of age and representing both mixed and pure breed dogs (89 treated with dexmedetomidine oromucosal gel and 93 treated with control), no serious adverse reactions were attributed to administration of dexmedetomidine oromucosal gel.

Table 2 shows the number of dogs displaying adverse reactions (some dogs experienced more than one adverse reaction).

Table 2. Adverse Reactions - Number (%) of dogs

Adverse Reaction	Control N = 93	Dexmedetomidine 125 mcg/m ² N = 89
Emesis	1 (1.1)	4 (4.5)
Gastroenteritis	0	1 (1.1)
Periorbital edema	0	1 (1.1)
Drowsiness	0	1 (1.1)
Sedation	0	1 (1.1)

Pale mucous membranes were frequently seen in dogs treated with dexmedetomidine oromucosal gel. In most cases, the effect was transient and no adverse reactions due to mucosal irritation were reported.

In a second well-controlled European field study which included a total of 36 dogs ranging from 2 to 17 years of age and representing both mixed and pure breed dogs (12 treated with dexmedetomidine oromucosal gel at 125 mcg/m², 12 treated with dexmedetomidine oromucosal gel at 250 mcg/m², and 12 treated with a vehicle control), no serious adverse reactions were attributed to administration of dexmedetomidine oromucosal gel. Table 3 shows the number of dogs displaying adverse reactions (some dogs experienced more than one adverse reaction).

Table 3. Adverse Reactions - Number (%) of dogs

Adverse Reaction	Control N = 12	Dexmedetomidine 125 mcg/m ² N = 12	Dexmedetomidine 250 mcg/m ² N = 12
Sedation	0	2 (16.7)	4 (33.3)
Lack of effectiveness	4 (33.3)	0	1 (8.3)
Urinary incontinence	0	1 (8.3)	1 (8.3)
Emesis	0	2 (16.7)	0
Head tremor	0	0	1 (8.3)
Inappropriate urination	0	1 (8.3)	0
Ataxia	0	0	1 (8.3)
Mydriasis	0	0	1 (8.3)
Anxiety disorder	0	0	1 (8.3)
Tachypnea	1 (8.3)	0	0
Lethargy	1 (8.3)	0	0
Tachycardia	1 (8.3)	0	0

To report suspected adverse events, for technical assistance or to obtain a copy of the SDS call 1-888-963-8471.

For additional information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDA-VETS or online at <http://www.fda.gov/AnimalVeterinary/SafetyHealth>

HOW SUPPLIED:

SILEO is packaged in HDPE dosing syringe enabling doses from 0.25 to 3 ml. The syringe is fitted with plunger, dosing ring and end cap. Each syringe is further packed into a carton with a label and a leaflet.

Package sizes: (1 syringe per carton) 1 x 3 ml, 3 x 3 ml, 5 x 3 ml, 10 x 3 ml, 20 x 3 ml.

Not all package sizes may be marketed.

STORAGE INFORMATION:

Store unopened and opened syringes in the original package at controlled room temperature 20-25°C (68-77°F) with excursions permitted to 15-30°C (59-86°F). Use syringe contents within 2 weeks after opening the syringe.

SILEO® is a trademark of Orion Corporation.

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Orion Corporation
Turku, Finland

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Zoetis Inc.
Kalamazoo, MI 49007

Made in Finland

Revised: April, 2016





A MULTIMODAL APPROACH: Add mosquito control to your canine heartworm protocol

Veterinarians diligently recommend and prescribe heartworm preventives to control heartworm disease. Yet, heartworm infection is an ever-increasing problem. Because mosquitoes are the only known vector of *Dirofilaria immitis*, controlling mosquitoes through the use of an insecticide like Vectra® 3D should help control heartworm transmission much in the same way that targeting vectors has been used successfully to control vector-transmitted diseases in people.

Recently, a group of veterinary practitioners and parasite researchers gathered together to discuss the problem of heartworm disease in dogs and a new multimodal approach that may help to solve it.

New research suggests that a multimodal, Double Defense approach—administering Vectra® 3D (dinotefuran/pyriproxyfen/permethrin) plus a macrocyclic lactone—to target both mosquitoes and heartworms provides an additional measure to protect dogs against heartworm disease transmission.

THE SPREAD OF HEARTWORM

Dr. Elizabeth Hodgkins (moderator): Monthly oral heartworm products have been around since the 1980s. The incidence of heartworm infection has been rising and spreading—in spite of really good products and really good veterinary care. Why do you believe this is the case?

Dr. C. Thomas Nelson: We are a mobile society, moving across the country, moving to areas that were typically not endemic. When I graduated in 1979, the heartworm map showed a few dots out west. Now California ranks tenth in the nation for number of heartworm cases.

Dr. Nancy Soares: Veterinarians are doing a good job, but we are not making enough headway with this disease. A lot of it falls on the veterinarian in the examination room, talking to owners. As a practitioner myself, I know there is always a lot to talk about with owners, but preventing heartworm disease should start there.

Dr. Nelson: As practitioners, we need to be sure owners understand the importance of giving heartworm preventives every month. I give a lot of talks to veterinarians across the country, and I tell them that my own dog got heartworm disease. I switched from the daily product to a monthly product, and a year later, my dog was positive. I always ask the room—full of

veterinarians and technicians—how many of them give their dogs' heartworm prevention every month, never missing a dose and never late by more than a week. Maybe 10% to 20% raise their hands. We know better, and we are not compliant. Yet, we expect owners to be compliant.

Dr. Susan Little: Compliance is a major challenge and one of the key reasons that we still have a high prevalence of infection in dogs. Another concern is that many dogs are never seen by a veterinarian. Those dogs become infected with heartworm and serve as reservoirs to mosquitoes, which go on to infect other dogs. So infection is a constant risk.

ROLE OF MOSQUITOES

Dr. Little: With changing climate patterns, we have a lot of mosquito activity. And we are confronting more mosquitoes than we did before. More than 70 species of mosquitoes have been confirmed to vector heartworm,¹ with as many as 25 species confirmed to harbor infection in the United States.^{2*} Although not all are considered critical, this creates a greater risk for dogs.

Dr. Robert Wirtz: That represents about 40% of the approximately 180 mosquito species recognized in the United States. Usually only one or two mosquito species are the primary vectors of a specific infection of humans in a geographic region.

Dr. Little: It is also clear that while coyotes are a growing concern, domestic dogs are still the main reservoir for heartworm. We see extremely high prevalence rates in dogs in urban areas, which is surprising to many people. Some veterinarians think of heartworm as a rural disease, but it is more efficiently transmitted when dogs are close together because then the mosquito does not have to carry the infection far. Lots of mosquitoes equal lots of efficient transmissions. The prevalence rate of heartworm in shelter dogs in some areas in the South

*Vectra® 3D repels and kills mosquitoes (*Culex* spp, *Ochlerotatus* spp, *Aedes* spp) which may vector heartworm.

exceeds 50%,³ so there is always an opportunity for a mosquito to find microfilariae and then transmit larvae to another dog just a few weeks later.

Dr. Nelson: Most mosquitoes travel only about 2 km. If you have a heartworm-positive dog in a neighborhood, then 33% of the mosquitoes in the area are infective.⁴ That makes a big difference.

Dr. Little: Yes, if we look at a community-wide survey of mosquitoes, the infection rate may only be 1% or 2%. But around infected dogs, 50% to 75% of the mosquitoes are carrying larvae and creating a risk of infection.⁴

Dr. Wirtz: We see that with malaria, too. It can be very focal, based on the human reservoirs, vector behavior, and topography. If we can recognize that, then we can focus our resources on those higher-risk areas.^{5,6}

VECTOR CONTROL

Dr. Hodgkins: It sounds like there are a variety of challenges that contribute to the spread of heartworm, and many of them seem to focus on the mosquito vector. From a One Health perspective, perhaps it is prudent to consider what we are doing with human vector-borne diseases.

Dr. Wirtz: Vector control has always been at the heart of limiting vector-borne diseases.

Dr. Nelson: The multimodal approach used in human medicine is something we need to embrace more in veterinary medicine. We need to look at how we can decrease exposure to the infection.

Dr. Wirtz: Yes, I think that is the only way forward. The more transmission there is, with parasite exposure to the treatment drug, the quicker resistance is going to develop.⁷ One way to reduce the development of drug resistance is to control the vector.

Dr. Little: There is a natural attraction to vector control that focuses on protecting the dog from mosquitoes. A vector control product with permethrin can help protect

a dog from the misery of being fed upon by multiple vectors, including, of course, mosquitoes, thereby making the dog more comfortable and contributing to its overall well-being. But beyond just repelling these vectors, an insecticide that has the ability to kill 95% of the mosquitoes that come in contact with a treated dog would reduce the population of mosquitoes available to transmit heartworm.

Mosquito-borne diseases are more top of mind for the public than ever before because we are now dealing with the new normal of endemicity of West Nile virus and the introduction of other viruses like the chikungunya and Zika viruses. As long as mosquito-borne infections exist, mosquito control matters.

DOUBLE DEFENSE DATA

Dr. Hodgkins: Dr. McCall, can you speak a bit about your recent research that is the foundation of the new Double Defense standard of care in heartworm control?

Dr. John McCall: Well, I think everyone intuitively knows that if you prevent an insect from biting or if you kill that insect, then you will not have disease transmission. But the main reason we have not taken advantage of that and incorporated it into our veterinary recommendations is that, in the past, we have not had this kind of data showing that a product actually repels and kills mosquitoes and, thus, blocks the transmission of heartworm microfilariae. But, in the past couple of years, we have conducted studies with models to assess the effectiveness of products as repellents and insecticides.

Recently, we conducted a study with two groups of dogs that had circulating *Dirofilaria immitis* microfilariae. We treated one group with Vectra 3D, and the other group was the untreated control. We exposed these dogs to mosquitoes weekly for four weeks. And we found more than 95% repellency with Vectra 3D for the entire month.⁸

Dr. Hodgkins: Can you define repellency for us?

Dr. McCall: Repellency is preventing mosquitoes from biting—so anti-feeding. And in our study, Vectra 3D was 95% effective. But, more importantly, it was also effective



“ Vector control has always been at the heart of limiting vector-borne diseases.”

—Dr. Robert Wirtz

ROUNDTABLE PARTICIPANTS

PARTICIPANTS



SUSAN LITTLE, DVM, PHD, DACVM (Parasitology)

Regents Professor and the Krull-Ewing Chair in Veterinary Parasitology, Center for Veterinary Health Sciences, Oklahoma State University

Dr. Little is active in veterinary parasitology teaching and oversees a

research program that focuses on zoonotic parasites and tick-borne diseases. She is recognized as an international leader in parasitology and vector-borne disease with an emphasis on One Health. She is past-president of the American Association of Veterinary Parasitologists, President of the Companion Animal Parasite Council, and a founding director of the National Center for Veterinary Parasitology. She was instrumental in securing recognition for the subspecialty of veterinary parasitology through the AVMA's American Board of Veterinary Specialists. She has received two Excellence in Teaching Awards from the national Student American Veterinary Medical Association.



JOHN W. McCALL, MS, PhD

Professor Emeritus, Department of Infectious Diseases, College of Veterinary Medicine, University of Georgia

Dr. McCall was a member of the faculty in the College of Veterinary Medicine at the University of Georgia from 1970 to 2006, retiring as

Professor Emeritus of Veterinary Parasitology. For more than three decades, he has been President/Chief Operations Officer of TRS Labs Inc., a contract research laboratory. He is past vice president and editor of the American Heartworm Society and currently serves as associate editor. He was the UGA Director of the National Institutes of Health-funded Filariasis Research Reagent Resource Center from 1973 to 2006. He has published more than 250 peer-reviewed research articles, 50 non-refereed research articles, and 11 book chapters, presented more than 300 lectures, and co-written more than 250 scientific papers and abstracts for scientific meetings.



C. THOMAS NELSON, DVM

Past President and Executive Board Member, American Heartworm Society and Owner and Medical Director of Animal Medical Center, Anniston, AL

Dr. Nelson has been in private veterinary practice for nearly four decades, and he has served as

an executive board member of the American Heartworm Society (AHS) since 2001. He was elected AHS president in 2004. He is the co-author of the AHS guidelines for the prevention, diagnosis, and management of heartworm infection. He has also served on the board of Companion Animal Parasite Council. Dr. Nelson has written or co-written several papers and contributed to several textbooks on the subject of heartworm disease. He is considered a pioneer for his clinical work in the study of heartworm disease in cats.



NANCY SOARES, VMD

2016-2017 President of the American Animal Hospital Association and Owner and Medical Director of Macungie Animal Hospital

Dr. Soares is AAHA's 2016-2017 president. In 2007, Dr. Soares established her own practice, Macungie Animal Hospital, where she

serves as owner and medical director. Her practice was presented with the AAHA-Accredited Practice of the Year Award in 2013, and has grown to include five full-time veterinarians. Macungie Animal Hospital offers an educational lecture series, youth activities, and shadowing opportunities for those interested in animal medicine. Dr. Soares has been published in the *Journal of the American Veterinary Medical Association* and has served as a lecturer for multiple veterinary conferences.



ROBERT WIRTZ, PHD

Retired Chief of the Entomology Branch, Centers for Disease Control and Prevention

Dr. Wirtz has spent a distinguished career in researching and developing solutions to mitigate the impact of insect-transmitted diseases, especially by mosquitoes, on the world's population. In 1997, he began

an 18-year career at the CDC, where he directed activities to reduce the threat of arthropod-borne diseases to humans. He also supervised work on insecticide resistance, analysis of insecticides and anti-malaria drugs, and evaluation and implementation of long-lasting insecticide treated bed net and indoor residual spray programs. His commitment to vector control spanned the globe and touched many countries and worldwide organizations, including the World Health Organization. Dr. Wirtz is also an accomplished author and co-author, with his work appearing in more than 275 publications, including nine book chapters, on worldwide parasite-related health issues. After retiring from the CDC in 2015, Dr. Wirtz continues to assist at the agency as a volunteer guest researcher and also works as an independent consultant.

MODERATOR



ELIZABETH HODGKINS, DVM, ESQ.

Director, Veterinary Services, Ceva Animal Health, LLC

After earning her DVM degree, Dr. Hodgkins served an internship at the Animal Medical Center in New York City and an oncology residency at University of California-Davis. Following her residency, she taught veterinary parasitology at UC-Davis. Dr. Hodgkins then attended law school at the University of Kansas and became a member of the Kansas Bar. She developed and patented a currently marketed food for the management of feline diabetes. In 2003, she built and opened her own cat-exclusive private practice in Yorba Linda, California. In 2009, she joined Summit VetPharm's Veterinary Services group for the Western Region. Currently, she is Director of Ceva Animal Health's Veterinary Services group. She is also the author of *Your Cat: Simple New Secrets to a*

Longer, Stronger Life (Thomas Dunn Books, 2007) and co-author of *Not Fit for a Dog* (Quill Driver Press, 2012).





“ A mosquito that is killed through its contact with Vectra 3D on a treated dog is no longer available to bite any other dog or any other person or any other pet in the area. So it is a form of insecticidal treatment, as well as a repellent.”

—Dr. John McCall

as an insecticide. So if a mosquito touches the dog, the mosquito is not going to survive. In our study, we found that the insecticidal activity was greater than 95% for the month, and none of the mosquitoes exposed to Vectra 3D-treated dogs developed infective larvae [L₃].⁸ These exciting results show that we can actually block the transmission of the infection to mosquitoes. This type of product can both repel the mosquito and kill it before any infective larvae develop.⁸

Dr. Hodgkins: And that would have an impact on the local environment of that dog? Say of the household?

Dr. McCall: A mosquito that is killed through its contact with Vectra 3D on a treated dog is no longer available to bite any other dog or any other person or any other pet in the area. So it is a form of insecticidal treatment, as well as a repellent.

Dr. Wirtz: There is a similarity here with the large bed net and indoor residual spray programs we use for malaria control. We get the most effective control when we have a community effect. We try to make sure that all

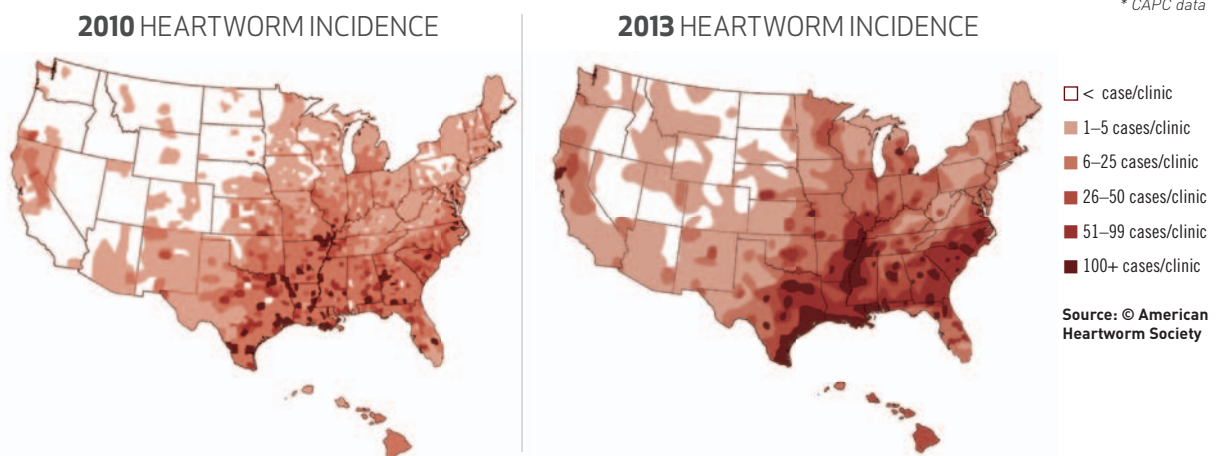
the villagers get their houses sprayed or use a bed net. Not only are they protecting themselves, they are also protecting their neighbors.⁹

Dr. Little: When we talk about controlling intestinal parasites, we talk about fecal pickup and fecal monitoring and making sure the dogs at the boarding kennel are free of parasite infection. We want to reduce transmission as much as possible. For some reason, we have managed heartworm differently over the years. I find the data that Dr. McCall has generated on preventing heartworm transmission to be incredibly compelling and powerful.

What is so exciting about this research is that it says there is more we can do to help prevent heartworm. We still have to administer the preventive—that is foundational and critical—but we can also reduce the number of mosquitoes feeding on treated dogs. The multimodal approach brings a higher level of care and protection to dogs.

Dr. Soares: It is compelling research. It is new, and the numbers are exciting. Honestly, we have not had a

OVER **166%** INCREASE IN REPORTED POSITIVE HEARTWORM CASES FROM 2013 - 2015.*



The severity of heartworm incidence as shown on these maps is based on the average number of cases per reporting clinic. Some remote regions of the United States lack veterinary clinics, therefore we have no reported cases from these areas.

whole lot of new data to talk about on this topic in the examination room in a long time. Dr. McCall's research gives us the opportunity to talk about heartworm prevention and parasite control again. Patients should be receiving an oral heartworm preventive—that is key. They should also receive flea, tick, and mosquito control. But now we can talk about the importance of repellency in heartworm control.

DRUG RESISTANCE

Dr. McCall: In the study, I chose a particular *Dirofilaria immitis* isolate—the JYD-34 strain, which is resistant to macrocyclic lactones.

Dr. Little: It is the strain we are all afraid of.

Dr. McCall: One of my goals over the past several years has been to come up with a way to help reduce the rate of selection for these resistant strains. To me, this multimodal approach is one way of doing that because the mosquito that has the resistant heartworm parasite is going to be repelled and killed just the same as the mosquito that has the susceptible one.

Dr. Little: When I first saw you present these data, I was reassured by the fact that you chose JYD-34 because it is something veterinarians are concerned about. We know how to protect dogs from heartworm. We prescribe preventives as early as the label allows, and we do everything we can to support compliance throughout that dog's life. We can implement this multimodal approach and administer something that repels and kills mosquitoes in addition to the heartworm preventives, and that could be effective as an additional layer of protection.

ADOPTING THE DOUBLE DEFENSE PROTOCOL

Dr. Hodgkins: It sounds like you see real scientific and medical value in moving to a Double Defense multimodal heartworm protocol. How do we change behaviors—both dog owners' and the profession's—to adopt this new approach?



“ We still have to administer the preventive—that is foundational and critical—but we can also reduce the number of mosquitoes feeding on treated dogs. The multimodal approach brings a higher level of care and protection to dogs.”

—Dr. Susan Little

Dr. Wirtz: Changing human behavior is a tremendous challenge in public health. Major portions of the Centers for Disease Control and Prevention's programs focus on behavior change and communication.

I think there is a unique opportunity to educate the local news media.

Dr. Soares: Yes, consumer awareness is huge. Owner communication, education, and support are all key. Owners care that the product is efficacious and affordable, and they want to know that it is something that I, their veterinarian, would administer to my pet.

Dr. Little: Another way to raise awareness is to make the data about the prevalence of heartworm local and timely. The Companion Animal Parasite Council provides a tool that can tell you how many cases of heartworm disease have been diagnosed in your county, and you can get monthly updates. Technicians can put that information on a whiteboard next to the reception desk. That lets owners know it is a risk to their dogs. It underscores the need for heartworm prevention and also the need for mosquito control.

Dr. Wirtz: You might be able to capitalize on the public interest in the chikungunya and Zika viruses by explaining that vector control and personal protection, such as using insect repellents, are the only methods we currently have of reducing these diseases in humans. Similarly, by treating their dogs with Vectra 3D, owners are directly addressing the vector of heartworm transmission.

Dr. Soares: That is a powerful message that we can relay to owners.

Dr. Little: Veterinarians and other team members are already getting questions about Zika virus because there is concern and understandable curiosity about whether dogs are at risk. We do not have any evidence that pets are at risk, but those questions are getting asked. Those questions are a lead-in to the mosquito conversation—an opportunity for team members to say, “We are concerned about mosquitoes, too. Here is what we recommend...”



“ The research is compelling, and we are not asking owners to change what they are doing. We are just adding the fact that we want owners to reach for a product that has repellency and is mosquitocidal.”

—Dr. Nancy Soares

Dr. Nelson: You have to piggyback on the focus on addressing vector control in humans.

Dr. Wirtz: Yes, there is a lot of public education on mosquito control in general. Again, it is a multicomponent approach. It is a matter of using all of the resources available to kill mosquitoes.

Dr. Little: We have all experienced mosquito pressure firsthand. We all know just how horrible it is, not just for health reasons but also for the lifestyle that people have. People want time in their backyards and their communities. They want their kids outside. There are even data linking childhood obesity to the introduction of *Aedes albopictus* because it is difficult for children to play outside when mosquitoes swarm them.¹⁰ So, for veterinarians, the mosquito concern can serve as a catalyst to start a conversation with dog owners. Educating about the risks mosquitoes create and the steps pet owners can take to reduce those risks is one more way veterinarians can serve their community.

Dr. Soares: I think that is a good way to position it. The research is compelling, and we are not asking owners to change what they are doing. We are just adding the fact that we want owners to reach for a product that has repellency and is mosquitocidal.

Dr. Little: And we are not asking veterinarians to recommend an additional product. If pet owners just administer a flea and tick control product that also repels and kills mosquitoes, then their dogs get another layer of heartworm protection and another layer of comfort.

HEARTWORM PREVENTIVE REMINDERS

Dr. Wirtz: It also sounds like reminders could be valuable for pet owners.

Dr. Nelson: There are practice management systems now that can text reminders. We send reminders for heartworm testing—which has higher compliance—but many practices do not send reminders for the monthly preventive.

Dr. Little: There are veterinary pharmacy systems in which heartworm preventive is delivered to an owner once a month and he or she administers it to the pet when it arrives.

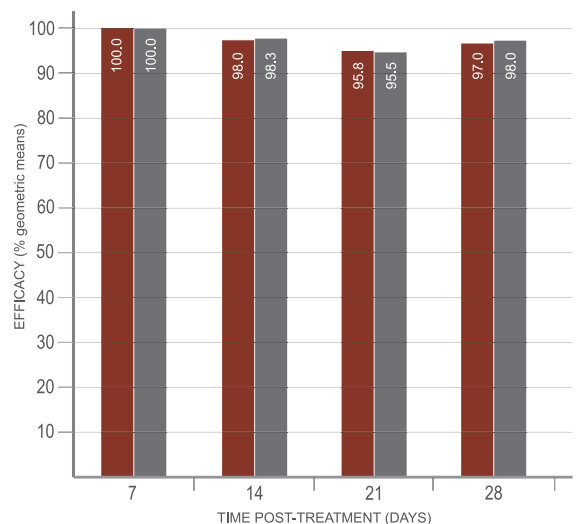
Dr. Nelson: So the technology is there. People just need to use it.

Dr. Soares: Our goal is prevention all year long. If an owner purchases six or 12 months of preventives, once it is time that he or she should be running low, we send a reminder, same as we would for an examination or vaccine. We also offer free delivery; anything we can do to make owners' lives easier.

THE VETERINARY TEAM

Dr. Hodgkins: Affecting positive change is going to require a lot of voices talking about Double Defense as a multimodal approach to heartworms. Talk a bit about the role of the veterinary team.

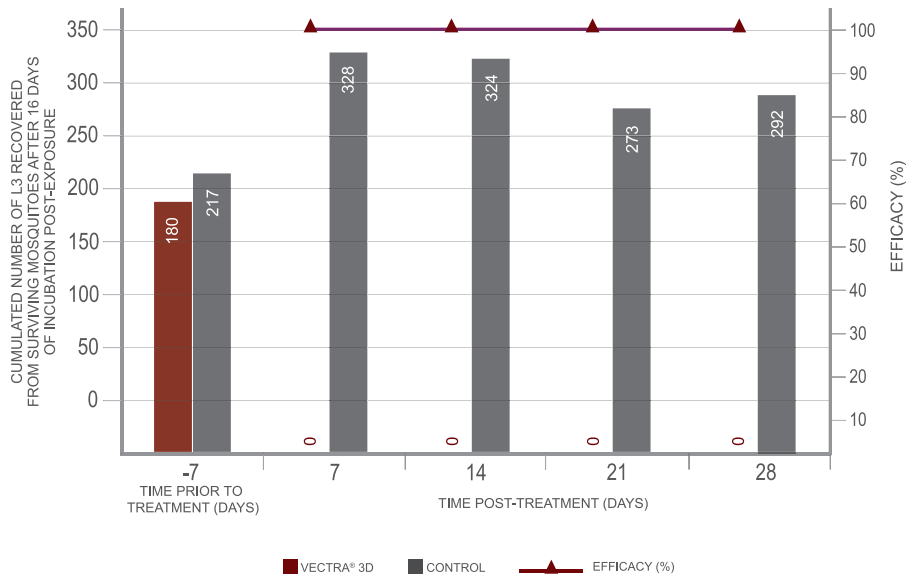
Vectra® 3D was over **95% effective** in anti-feeding and in killing mosquitoes up to 28 days after administration.



Source: See Reference 8.

In this study, the anti-feeding and insecticidal activity of Vectra® 3D in mosquitoes was **over 99% effective** in blocking the development of infective larvae.

Source: See Reference 8.



Dr. Soares: Each department has to be involved, and everybody has to care about it. My team cares about our patients—we want these dogs to be happy and healthy. Heartworm disease is a huge problem that we sort of pushed to the side, but we now have the opportunity to open the discussion with owners again. And there are many good talking points, especially with One Health and what is in the news and how people are being affected by their own mosquito-borne disease risks.

Dr. Little: Technicians are key to this conversation. They are already familiar with the heartworm life cycle and with the risk that mosquitoes pose. I think it's important that they reinforce to dog owners that using a product that kills and repels mosquitoes reduces the risk of those mosquitoes feeding on their dogs. This could make a huge difference.

Dr. Hodgkins: What would you want team members to do when an owner comes in to purchase a refill of heartworm preventive?

Dr. Soares: This situation is an opening for a conversation. If we, as veterinarians, have done our job and educated team members about the products and what is best for patients and their families, then there is going to be a dialogue: "I know you are here to refill the heartworm preventive. What about the topical flea, tick, and mosquito preventive? I see that you have not refilled it."

Dr. Nelson: That is an opportunity to review the patient's record. Instead of just refilling the preventive, team members should ask when was the last time it was refilled? And how many doses has the patient received in the past 12 months? What other products is the owner giving the patient? Is the patient up to date on its immunizations?

Dr. Hodgkins: And would Double Defense become part of that checklist for dog owners?

Dr. Nelson: Definitely.

Dr. Soares: As a veterinarian, I think my job is to offer whatever the standard of care is. Pet owners are seeking answers from us, and they listen to our recommendations. I think the Double Defense message is compelling and would be well received. So I would want my team to reiterate this message.

BEYOND PREVENTION

Dr. Little: What about when we have an infected dog that has been diagnosed with heartworm infection? If the dog is microfilaremic, in addition to receiving a heartworm adulticide, doxycycline, and a macrocyclic lactone, shouldn't this dog also be administered a product that repels and kills mosquitoes so that any microfilariae in the dog do not get ingested by a mosquito, which a few weeks later feeds on that same dog or another dog? It may be that this strategy should become a primary component of the treatment of every heartworm-infected dog.

Dr. Wirtz: It is actually a no-brainer.

Dr. Nelson: It makes sense, and I support anything we can do to reduce the numbers.

Dr. Little: So would you change the way you treat a heartworm-positive, microfilaremic dog, making sure that it receives a product that repels and kills mosquitoes?

Dr. Soares: I will, absolutely.



“ The multimodal approach used in human medicine is something we need to embrace more in veterinary medicine. We need to look at how we can decrease exposure to the infection.”

—Dr. C. Thomas Nelson

Dr. Little: Some pet owners just want to protect their own dogs and are not worried about their neighbors' dogs. So it might be good to reinforce to owners that the mosquitoes that feed on their dogs and ingest microfilariae could come back a few weeks later and reinfect that same dog. There is a cycle of infection.

Dr. Nelson: It is as simple as that, thinking about all the dogs that are at risk.

Dr. Little: Yes, the dog that is infected with heartworms also has to be protected from mosquitoes. Otherwise, the whole community is at risk.

A STRATEGIC MOVE

Canine heartworm disease is a life-threatening parasitic infection that veterinarians and dog owners continue to battle. Heartworm infection is considered the most important vector-borne disease of dogs in the United States and, as such, it remains of utmost importance to add new research and learning to the existing knowledge base and to look for new solutions and approaches to stop the increasing prevalence.

Ceva Animal Health would like to thank Dr. John W. McCall for his groundbreaking study and all of the practitioners and parasite researchers that participated in this roundtable for sharing their expertise and views on the new Double Defense multimodal approach.

LEARN MORE

Be sure to visit **FightHeartwormNow.com** for additional information about heartworm disease and mosquitoes. See Dr. McCall's most recent research results and the new Double Defense heartworm protocol. You can also view video segments from this roundtable and interviews with these roundtable participants.



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[V3D-13-16]

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MEDICINE | Renal disease

Renal diets: What to feed and when to start

Restriction of some nutrients and supplementation with others helps pets with kidney disease live longer lives. *By Cailin R. Heinze, VMD, MS, DACVN*

As one of the most amenable medical conditions to dietary management, renal disease in dogs and cats can be slowed, uremic episodes can be prevented, and patient survival time can be doubled when patients are fed specially formulated renal diets.^{1,2} Dietary modifications for chronic kidney disease (CKD)—restricted phosphorus, protein and sodium—help mitigate many metabolic changes that occur secondary to decreased renal function. Renal diets also promote alkaline urine production and usually contain B vitamins and omega-3 fatty acids.

Phosphorus

The most critical nutritional modification in patients with renal disease is phosphorus restriction. A number of well-designed studies have shown that controlling blood phosphorus concentration through dietary modification slows the progression of CKD. Reduced glomerular filtration rate (GFR) in CKD leads to decreased renal excretion of phosphorus. Hyperphosphatemia in turn leads to increased secretion of parathyroid hormone, leading to increased release of calcium and phosphorus from bone. Soft tissue mineralization, renal damage progression and marked bone loss are potential consequences.

The International Renal Interest Society (IRIS) published guidelines on phosphorus management for renal pa-

tients (www.iris-kidney.com/pdf/IRIS_2009_Treatment_Recommendations_Summary.pdf). Because increased parathyroid hormone secretion can occur when serum phosphorus concentrations fall within the reference intervals,³ it's important to note that all the target serum phosphorus concentrations in the IRIS guidelines fall in the low to middle range of most laboratory reference intervals. As renal disease advances, it's often impossible to maintain phosphorus within the IRIS guidelines' target concentrations using diet alone. In these cases, use phosphate binders in addition to the lowest-phosphorus diet appropriate for the patient.

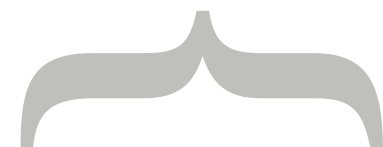
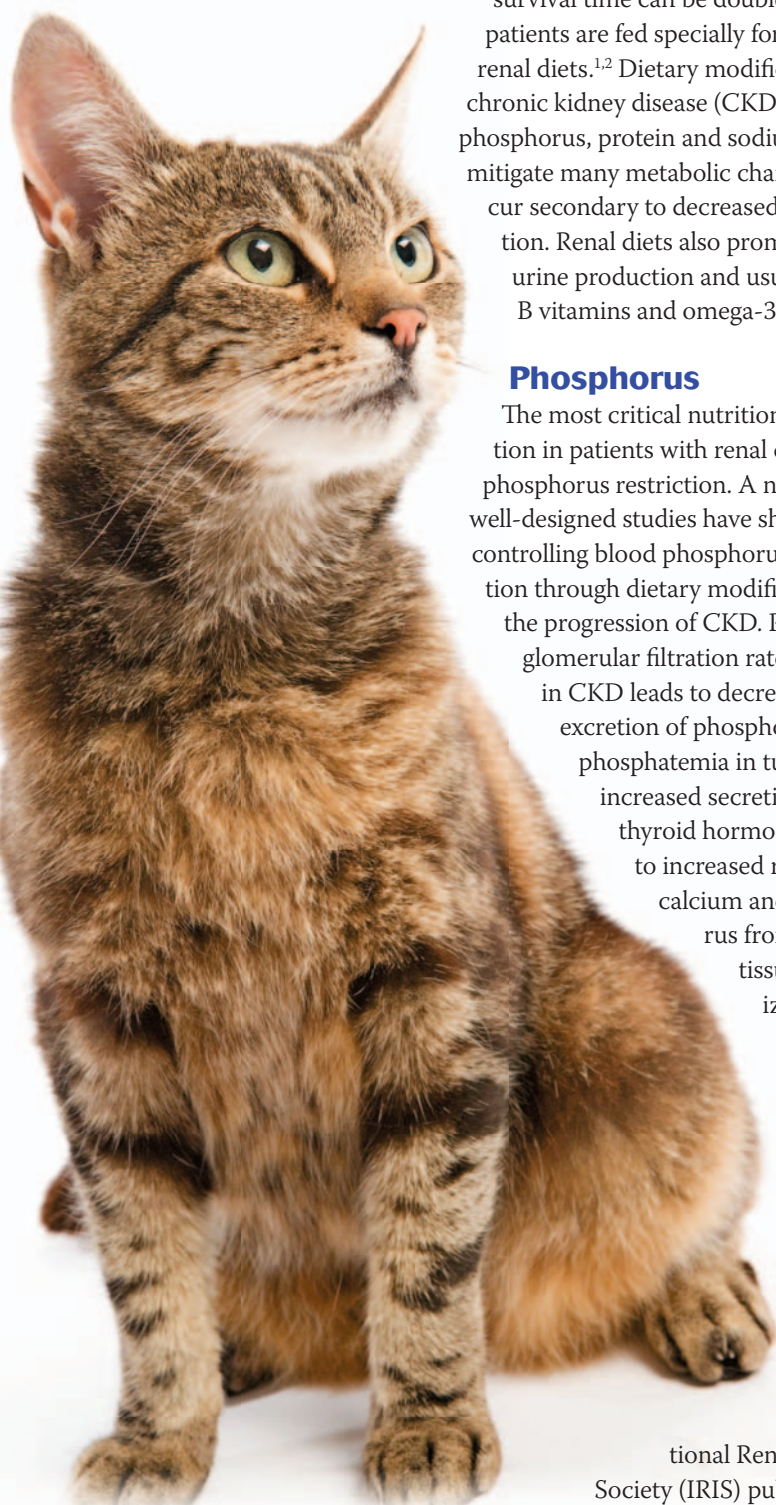
Keep in mind that nearly all diets for dogs and for cats labeled with the statement "formulated to meet AAFCO nutrient profiles" (i.e., primarily over-the-counter [OTC] maintenance or other diets) contain more phosphorus than is recommended for patients with all but the earliest of renal disease.

Protein

Reducing dietary protein is probably the best known and most controversial nutritional modification for patients with renal disease. No evidence exists demonstrating that high-protein diets harm the kidneys per se. However, nitrogenous compounds build up in the bloodstream when GFR is markedly compromised, and decreasing dietary protein can reduce the effects of these toxins on other systems, thus improving patients' quality of life.

Because most meats are high in phosphorus, the limiting factor in dietary phosphorus restriction in commercial diets is often the animal protein content. Determine the degree of protein reduction needed based on a patient's laboratory results and balance protein intake with adequate phosphorus restriction. Reduce protein, when appropriate, by maximizing protein quality to meet physiologic requirements without providing excess that contributes to uremic toxin production.

In contrast to patients with CKD without proteinuria, animals with marked protein-losing nephropathy (with or without concurrent tubular disease) may require as much or more attention to protein reduction as to phosphorus restriction to slow disease progression. In many species, increasing dietary protein exacerbates glomerular protein loss. Albumin is toxic to renal tubules, leading to accelerated degradation of the entire kidney. So although it seems counterintuitive, most animals



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with protein-losing nephropathy respond to reduced dietary protein with lower urine protein:creatinine ratios (UPC) and higher serum albumin concentrations.

Unfortunately, no dose-response data exists to guide the amount of dietary protein that patients with renal disease should receive. For most patients with proteinuria, it is likely appropriate to feed a commercial renal diet, even if azotemia is not present. For dogs or cats consuming high protein/phosphorus diets (such as many grain-free and low-carbohydrate diets, raw diets or numerous meat-based treats) at diagnosis, reducing protein and phosphorus to near AAFCO minimum requirements may be a good initial step. Further dietary modifications can be based on laboratory results and clinical response.

Sodium

The vast majority of commercial pet foods contain sodium in excess of physiologic requirements. Because of primarily theoretical concerns about blood pressure and water balance, excess sodium is generally avoided in diets for veterinary patients with renal disease. The sodium content in all commercial renal diets for dogs and cats is above AAFCO minimum requirements, but less than the sodium content of most OTC diets.

Potassium

Serum potassium concentrations in animals with renal disease can vary dramatically among patients and between dogs and cats. Dogs with CKD are more likely to have hyperkalemia,

especially those receiving ACE inhibitors for glomerular disease, while cats with CKD are more likely to have hypokalemia. Commercial renal diets also vary in potassium content, with feline diets generally containing more than canine diets. The wide range of potassium content in canine diets allows you to select a diet most appropriate for an individual patient. For dogs that have hyperkalemia while receiving a commercial renal diet that contains the lowest potassium content, a home-cooked diet may be an option if medications cannot be altered.

Acid-base

The kidney regulates acid-base balance through hydrogen ion excretion and bicarbonate regeneration; consequently, animals with renal impairment often become acidemic. Thus commercial renal diets are designed to be relatively alkalinizing. In cats, OTC maintenance diets are generally acidifying due to ingredient composition and because they are formulated to help prevent struvite-related urinary problems, so this feature makes them not ideal for cats with kidney disease, in addition to excessive phosphorus and/or protein and sodium.

B vitamins

B vitamins are water-soluble and with rare exception (i.e., vitamin B₁₂) are not stored in the body. They are, however, needed daily for nearly all metabolic pathways. Most commercial renal diets are fortified with additional B vitamins because of the potential for increased renal losses secondary to polyuria, although

there are no current data to support a benefit (or detriment) of supplementation.

Omega-3 fatty acids

Research in dogs shows potential renoprotective effects of supplementation with long-chain omega-3 fatty acids from fish oil (eicosapentaenoic acid [EPA] and docosahexaenoic acid [DHA]). However, conflicting evidence exists, and a clear dose response has not been determined for dogs. Prospective studies on omega-3 fatty acid supplementation in cats with renal disease have not been published. Flax, a good source of the short chain omega-3 fatty acid alpha-linolenic acid (ALA), has not been investigated. As its endogenous conversion to DHA and EPA is poor in dogs and essentially nonexistent in cats, it should be used only as a last resort when fish oil supplementation is not feasible.

Many commercial renal diets contain varied amounts of added fish oil. I use a total dose (DHA plus EPA) of about 300 mg per 10 lb body weight. This amount can be given with a commercial diet that does not already contain a supplement (taking into account the extra calories it provides), or you can calculate the total intake amount from the diet alone and add fish oil to obtain the desired dose. Liquid fish oil may also enhance palatability.

When should a renal diet be started?

In the absence of proteinuria, initial dietary modifications for early asymptomatic CKD (IRIS CKD stage 1 or when CKD is suspected

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but not otherwise confirmed) should be geared toward reducing phosphorus. A handful of OTC and veterinary therapeutic diets not necessarily intended for renal disease that contain phosphorus below 1.5 g/1000 kcal and a moderate amount of protein can be considered. These diets have higher protein content than do renal diets

and may not otherwise be modified as discussed above. Once CKD progresses to IRIS CKD stage 3, or if proteinuria is evident, most veterinary patients should be fed only a commercial renal diet.

What about concurrent diseases?

Recently, new dry diets from Royal Canin have been introduced that combine hydrolyzed soy with low phosphorus and protein, which may be good options for dogs and cats with food allergies in addition to kidney disease. Some patients with early CKD and confirmed or suspected food allergies or intolerances may be

fed a commercial lower protein and phosphorus limited-antigen diet. Alternatively, a few of the regular renal diets can be fed on a trial basis to see if they are tolerated. For confirmed allergies to ingredients that cannot be avoided in the renal diets or for fat intolerance, home-cooked diet formulations may be required.

For dogs and cats with other health concerns, it is important to prioritize the diseases and their response to dietary management. For example, a dog with stage 2 kidney disease but severe chronic pancreatitis may be better off with a diet that has a bit more phosphorus but lower fat, at least until the kidney disease progresses further, at which time a home-cooked diet will likely be needed to manage both diseases.

A cat with stage 3 kidney disease and diabetes can be fed the lowest carbohydrate renal diet it will accept and the insulin dose can then be adjusted accordingly.


What if the pet will not eat a renal diet?

More than a dozen reduced-phosphorus and -protein renal diets (canned and dry) may be options for dogs with various stages of CKD. A slow diet transition is recommended when possible, and low-protein palatability enhancers such as fish oil, homemade low-sodium meat broths, honey, pancake syrup, applesauce and some human enteral nutrition products (for example Ensure Vanilla Nutrition Shake, which is low in both phosphorus and protein) can be added. Avoid meats and other foods high in protein, phosphorus and sodium as they may negate the benefits of the renal diet and make patients feel worse in the short term. Dogs and cats with later stage CKD commonly exhibit cyclical appetites and may not be interested in eating the same food every day. Rotating among several appropriate diets may help overcome this issue. Appetite stimulants such as mirtazapine rarely result in consistent consumption of enough food to meet energy requirements in patients with renal disease over the long-term.

Home-cooked diets may be more palatable to dogs with CKD than commercial diets. However, the vast majority of the recipes in books and online are unbalanced and may not be



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appropriate for renal patients despite assertions to the contrary.⁴ Clients wishing to try a home-cooked diet should obtain a custom recipe from a board-certified veterinary nutritionist, usually through a veterinary teaching hospital nutrition service. Veterinarians can also obtain balanced (although not customized) recipes for home-cooked renal diets for clients' pets from BalanceIT.com.

There are currently more than a dozen commercial canned and dry diet options for cats with various stages of renal disease on the market. Cats tend to be notoriously picky about switching foods and transitioning them to a renal diet can be challenging. However, the potential to double their survival time and improve their quality of life should serve as powerful motivators for pet owners to persevere with feeding.

Cats also seem more likely than dogs to go through a prolonged period of wasting as their appetite decreases and their intake does not meet their energy requirements. Unlike in dogs, appropriate home-cooked diets are rarely more appealing to cats than commercial diets. Use palatability enhancers such as homemade low-sodium meat broths, fish oil and animal fats to encourage intake. CliniCare RF Feline Liquid Diet may be palatable to some cats and can supplement their food consumption.

Assisted feeding

Consider assisted feeding for patients with renal disease that do not voluntarily consume sufficient calories of an appropriate diet for their disease to maintain appropriate body condition. Esophagostomy tubes are most commonly used because a blenderized canned renal diet can be given in adequate amounts, along with certain medications and oral fluids. This reduces the stress associated with mealtimes and helps enhance quality of life for pets and owners.

I find it's often best to place a feeding tube before a patient is severely debilitated, rather than as a last-resort attempt to prolong the life of an emaciated, anorexic, severely uremic animal. I often discuss feeding tubes with clients at the first or second visit after renal disease is diagnosed, and advise them that a feeding tube may be needed in the future and to decide as a family how to handle the situation.

In my experience, clients make better emotional decisions when their pet is not in immediate danger and they have ample time to consider a course of treatment. Also consider keeping a list of clients who've successfully used feeding tubes for their pets and are willing to share their experiences with other clients. **dvm360**

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Cautions: Safe use in pregnant animals or animals intended for breeding has not been proven. If lameness worsens, discontinue use and contact your veterinarian. Administer during or after the animal has eaten to reduce incidence of gastrointestinal upset.

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The ABCs of veterinary dentistry: Brought to you by the letter “D”

The fun continues on our alphabetic journey through the management of our veterinary patients’ oral problems. Here’s a review of dentistry basics. *By Jan Bellows, DVM, DAVDC, DABVP, FAVD*

We’ve only just begun discussing the fundamentals of companion animal dentistry (check out the breakdown of letters “A,” “B” and “C”—anesthesia and basic concepts—at dvm360.com/atoc), and there’s more to come. “D,” of course, stands for “dentistry,” with an honorable mention of “dentin” and “dentigerous cyst” for good measure.

But let’s reflect on dentistry for a moment. What does it do for you in practice, and how can you share your passion to do what’s right for your patients with their caregivers?

Brush up on your terminology

In companion animal practices across the country, dogs and cats receive “dentals” daily. But the term “dental” barely explains what’s involved. Fortunately, the American Veterinary Dental College provides us with the following definitions:

Veterinary dentistry is defined as a discipline within the scope of veterinary practice that involves the professional consultation, evaluation, diagnosis, prevention and treatment (nonsurgical and surgical) of conditions, diseases and disorders of the oral cavity and maxillofacial area and their adjacent and associated structures. It is provided by a licensed veterinarian consistent with the ethics of the profession and applicable law.

Professional dental cleaning refers to scaling (supragingival and subgingival plaque and calculus removal) and polishing of the teeth with power or hand instrumentation by a trained veterinary healthcare provider under general anesthesia.

Periodontal therapy refers to treatment of diseased periodontal tissues that includes professional dental cleaning as defined above and one or more of the following: root planing, gingival curettage, periodontal flaps,

regenerative surgery, gingivectomy or gingivoplasty, and local administration of antiseptics or antibiotics.

Home oral hygiene refers to measures taken by pet owners that are aimed at controlling or preventing plaque and calculus accumulation.

The steps of good dental care

At All Pets Dental my team and I refer to the anesthetized oral exam, dental cleaning and treatment performed under anesthesia, plus any prevention recommendations, as “oral ATP.” Other practices call this COHAT—comprehensive oral health assessment and treatment. Either way, it’s a lot more than “doing a dentistry.”

With guidance from veterinary dentists, certified veterinary dental technicians and hospital managers, the American Animal Hospital Association (AAHA) published the Dental Care Guidelines for Dogs and Cats in 2013. These guidelines outline the steps involved in the professional dental cleaning and the periodontal therapy visit. Our practice uses these guidelines (albeit in a different order) to streamline the workflow as much as possible. Here’s the breakdown:

1. Perform an oral evaluation of the conscious patient (Figures 1A and 1B).

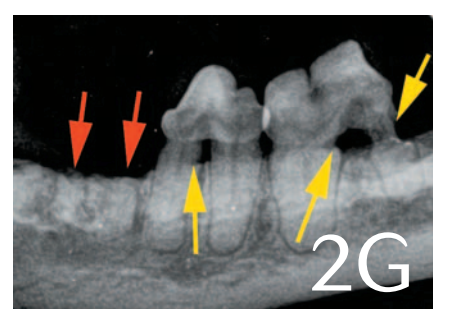
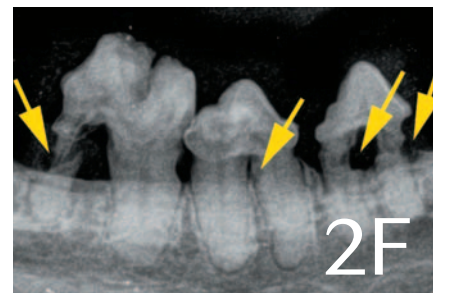
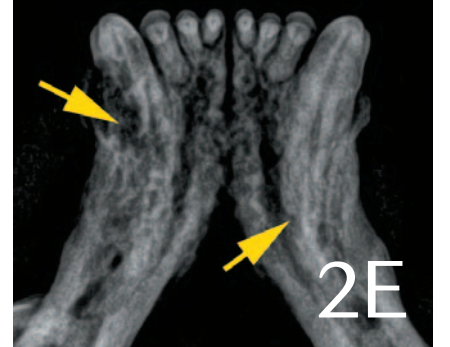
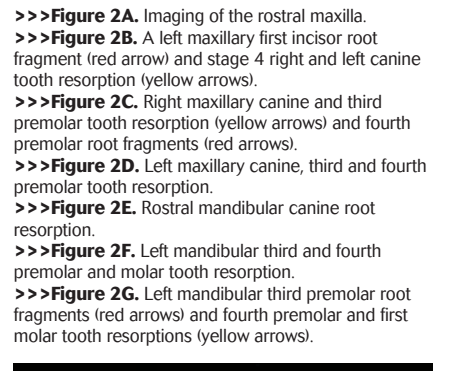
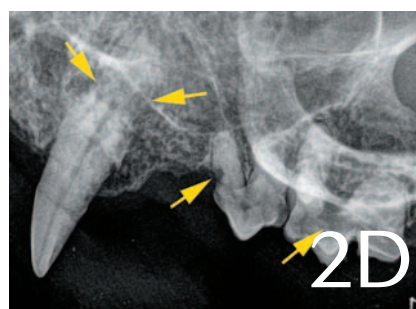
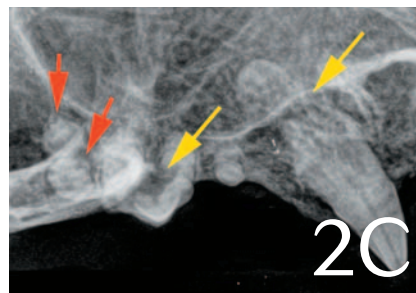
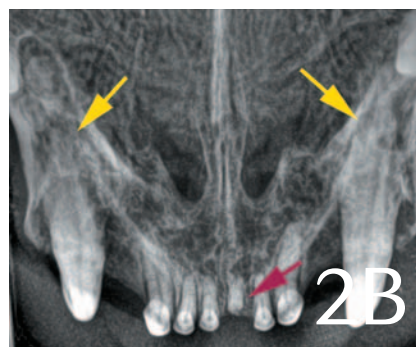
2. Radiograph the entire mouth using an intraoral radiographic system.

Radiographs are necessary for accurate evaluation and diagnosis. In one published report, intraoral radiographs revealed clinically important pathology in 28% of dogs and 42% of cats when no abnormal findings were noted on the initial examination. In patients with abnormal findings, radiography revealed additional pathology in 50% of dogs and 54% of cats. Due to superimposition, standard views of the skull are inadequate when evaluating dental pathology (Figures 2A to 2G).

3. Scale the teeth supragingivally

and, most important, subgingivally using either a hand scaler or appropriate powered device followed by a hand instrument (curette). Do not use a rotary scaler, which excessively roughens the tooth enamel (Figures 3A to 3C, see following page).

4. Polish the teeth using a low-speed handpiece running at no more than 300 revolutions per minute with prophyl paste that is measured and loaded on a disposable prophyl cup for each patient to avoid cross-contamination (Figure 4, next page).



>>>Figure 1A. A doctor placing a thiol diagnostic test strip in a dog’s mouth.
>>>Figure 1B. A strip highly positive for the presence of thiols related to gram-negative bacteria typical in periodontal disease.

>>>Figure 2A. Imaging of the rostral maxilla.
>>>Figure 2B. A left maxillary first incisor root fragment (red arrow) and stage 4 right and left canine tooth resorption (yellow arrows).
>>>Figure 2C. Right maxillary canine and third premolar tooth resorption (yellow arrows) and fourth premolar root fragments (red arrows).
>>>Figure 2D. Left maxillary canine, third and fourth premolar tooth resorption.
>>>Figure 2E. Rostral mandibular canine root resorption.
>>>Figure 2F. Left mandibular third and fourth premolar and molar tooth resorption.
>>>Figure 2G. Left mandibular third premolar root fragments (red arrows) and fourth premolar and first molar tooth resorptions (yellow arrows).

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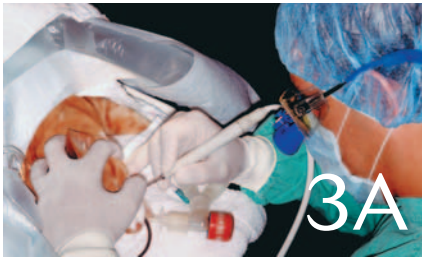
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>>>Figure 3A. Ultrasonic scaling with proper eye, face and hair protection.
>>>Figure 3B. To prevent iatrogenic damage, the side (not the tip) of the scaler is the only part of the instrument that should touch the tooth.
>>>Figure 3C. Side of the ultrasonic scaler correctly placed against the surface of the tooth.



>>>Figure 6A and 6B. Abnormal 2-mm probing depth in a cat.
>>>Figure 6C. Local antimicrobial application to the pocket to help decrease the pocket depth.



>>>Figure 9A. A professional application of plaque barrier gel to the tooth surface.
>>>Figure 9B. Application of plaque barrier gel subgingivally with help of the polishing cup.
>>>Figure 9C. Application of dental sealant subgingivally to help prevent plaque.



>>>Figure 10. Give pet owners careful instructions on home dental care for their pets. Here the client is being instructed on how to use a Q-tip to remove the daily accumulation of plaque from the outside surfaces of her cat's teeth.



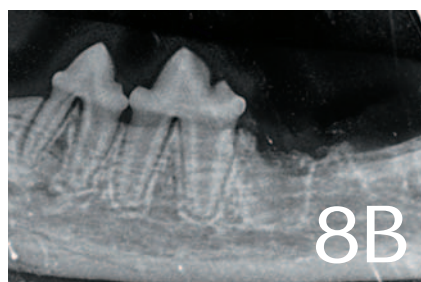
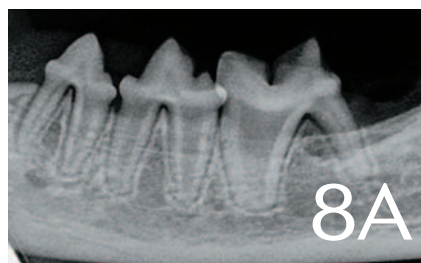
>>>Figure 4. Polishing the teeth using prophylaxis paste.



>>>Figure 5A and 5B. Irrigation and air pressure used to examine for remaining plaque and tartar.



>>>Figure 7. Rongeurs used as extraction forceps.



>>>Figure 8A. A radiograph of the left mandibular first molar distal root affected by advanced periodontal disease.
>>>Figure 8B. A radiograph confirming complete extraction.

5. Perform subgingival irrigation to remove debris and polishing paste and to inspect the crown and subgingival areas (Figures 5A and 5B).

6. Evaluate the patient for abnormal periodontal pocket depths with a periodontal probe. The depth that is considered abnormal varies depending on the tooth and the size of the dog or cat. In medium-sized dogs, the probing depth should not be greater than 2 mm; in midsized cats, the depth should not be greater than 1 mm (Figures 6A and 6B).

7. Perform periodontal therapy based on radiographic findings and probing.

8. Administer perioperative antibiotics when indicated, either parenterally or locally (Figure 6C).

9. Perform periodontal surgery to remove deep debris, eliminate pockets and extract teeth. When either pockets or gingival recession is greater than 50% of the root support, extraction or periodontal surgery is indicated and should be performed by a trained veterinarian or referred to a specialist (Figure 7).

10. Obtain a biopsy sample of all abnormal masses that are visualized

grossly or noted on radiographs. Submit all samples for histopathology to be analyzed by a pathologist qualified in oral tissues analysis.

11. Take postoperative radiographs to evaluate the treatment applied. This is especially important in extraction cases (Figure 8A and 8B).

12. Examine and rinse the oral cavity. Remove any packing or foreign debris.

13. Apply antiplaque substances, such as sealants (Figures 9A to 9C).

14. Recommend referral to a specialist when the primary veterinary practitioner does not have the skills, knowledge, equipment or facilities to perform a specific procedure or treatment.

15. Provide instructions to the owner regarding home oral hygiene (Figure 10).

Veterinary dentistry is what you make it. When it becomes a passion at your practice, everyone wins. Don't miss the next steps along the alphabet of pet dental care—"E" for enamel and "F" for furcation, coming soon! **dvm360**



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American Board of Veterinary Practitioners. He can be reached at (954) 349-5800; email: dentalvet@aol.com.

Paralyzed dog makes strides (literally and figuratively)

A team from UC Davis helps a border collie recover after her skull was dislocated from her spine.

Following a suspected deer kick to the head, Leah, a 4-year-old female border collie, was treated by a local veterinary facility for a facial laceration. Other than the wound, Leah seemed normal and was sent home. But just two days later, she became non-ambulatory and could not sit up on her own.

Leah was treated for tetanus but did not improve. Fearing a spinal cord injury, Leah's veterinarians referred her to the University of California, Davis, veterinary hospital where they finally discovered the cause of her paralysis: Leah's skull had been dislocated from her spine, and her first vertebra and the back of the skull were fractured.

According to a UC Davis release, though faculty neurologists Pete Dickinson, BVSc, PhD, DACVIM, and Karen Vernau, DVM, MAS,

DACVIM, and neurology resident Devin Ancona, DVM, attempted to reduce the dislocation through both surgical and nonsurgical methods, the amount of fibrous tissue buildup since the initial injury three weeks prior made spinal cord decompression surgery imperative.

The surgery was successful, and after a few days of recovery and close observation, Leah was able to go home, already able to support herself while lying sternally, according to the release.

A month after the surgery, Leah had progressed to standing without support and could take a few steps, which meant she was stable enough to begin physical rehabilitation at UC Davis' Integrative Medicine Service. Two weeks later, she was walking on her own. Leah is currently continuing physical rehabilitation at a local facility. [dvm360](#)



>>> Ain't that a kick in the head! Leah, a four-year-old female border collie, is finally back on all fours after a severe neurologic injury from a suspected deer kick that left her paralyzed.



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What a cat wants, what a cat needs

Check out this brief guide to environmental enrichment from feline expert Dr. Ilona Rodan. *By Mindy Valcarcel, Editor, Medicine Channel Director*

Long live cats! That's what everyone wants—you, the cat owner, the cat. But some cat owners may not understand that by bringing these playful yet predatory creatures into a home, the cats may be suffering from lack of enrichment. The problem with that? Less activity can lead to obesity. And these kitties can get really stressed with nothing to do all day, so bad habits might start to pop up—house soiling problems, furniture scratching or destruction, conflict with other cats and overgrooming. Stress can also lead to physical illness, such as feline idiopathic cystitis, the most common problem of the lower urinary tract. Even cats in multicat households can suffer these ill effects.

“Cat owners love their cats!” says Ilona Rodan, DVM, DABVP (feline practice). “Unfortunately, when we don't understand another species, it's not uncommon for us to make a mistake and not give them what they need. Many cats are obtained for free. And a little booklet doesn't come with them explaining what to do to take care of them—that's a big issue.”

Here's your chance to provide said booklet, or at least pass on the bare necessities to cat owners:

Incoming ... Since cats are hunters, a bowl of food placed in front of them takes away the chance to act on natural instincts. “The problem is we put this high-calorie, dense food into a food dish, and there are often other cats

eating nearby. That's not the way cats eat in the wild,” says Rodan. “They eat about eight to 20 small meals each day. Lots of exercise goes into the hunting and catching of these small prey.” To encourage more interactive feeding, Rodan recommends putting the food in food puzzles, providing frequent small meals around the house or tossing kibbles to mimic hunting behavior.

Outgoing ... Litter boxes should be placed in different spots throughout the house and on each floor in a multilevel house so that a cat sitting at the top of the steps doesn't block another cat from getting to the boxes in the basement. “Three litter boxes all in one area are really just one litter box in the cat mind,” says Rodan. This

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See brief summary on page 54

IMPORTANT SAFETY INFORMATION: NexGard is for use in dogs only. The most frequently reported adverse reactions included vomiting, dry/flaky skin, diarrhea, lethargy, and lack of appetite. The safe use of NexGard in pregnant, breeding, or lactating dogs has not been evaluated. Use with caution in dogs with a history of seizures. For more information, see full prescribing information or visit www.NexGardForDogs.com.

¹ Data on file at Merial.



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is particularly important in multicat households so there is no competition for resources. Accidents may happen if a cat doesn't feel safe stepping into a litter box.

A place of my own. Speaking of safe, owners can make sure there are areas for cats to hang out without worry—safe spaces, says Rodan. A safe

place allows a cat to feel protected, such as a cardboard box on its side, a cat bed with high sides or even a cat carrier. Also include places to perch, since cats like to be on high, looking down on us mere humans, so to speak.

The play's the thing. "As hunters, cats need play," says Rodan. "Play is really important to teach them to hunt." Cats can and should play on their own, but at least some of the play should also be interactive, she says. But not with your hands! Wand toys and feathers are great ways to engage cats safely

and bring out their pouncing prowess.

Common scents. Having familiar scents throughout the house can make cats more comfortable. That can mean feline facial pheromones (Feliway—Ceva), which mimic their own scent.

Each cat is unique, as your cat clients will readily point out. But they all have some basics that can help them live comfortably behind closed doors. Rodan leaves you with this: "Cats are just not something to look at and to sit on your lap or to sleep with you. They need play and attention." **dvm360**

Blue Buffalo gives \$6 million to advance clinical trials at Ohio State

Researchers, veterinary practitioners and clients will be able to enhance animal and human health with help of endowment.

Blue Buffalo Co. has donated \$6 million to The Ohio State University College of Veterinary Medicine in order to establish the Blue Buffalo Veterinary Clinical Trials Office, according to a university release from OSU News. The Clinical Trials Office (CTO) is a program that facilitates studies to improve patient care and advance medical knowledge for animals as well as humans.

"This transformational gift from Blue Buffalo will significantly enhance our ability to support clinical trials for a variety of diseases from cancer to heart failure," says director of the Clinical Trials Office and professor of veterinary biosciences Cheryl London, DVM, PhD, DACVIM (oncology). "Clinical trials enhance the health and well-being of pets while also identifying more effective treatments for similar diseases that occur in people."

The CTO supervises clinical trials involving client-owned animals including dogs, cats and horses, among others. Studies done at the CTO have resulted in the development of new treatments for issues regarding cancer, heart disease and arthritis. Pet owners

work closely with veterinary researchers during these trials with the ultimate goal of finding new therapies, diagnostic tests and medical devices that will improve animal and human health, the release states.

"This gift is an important part of Blue Buffalo's efforts to advance veterinary medicine across a wide range of research needs," says Bill Bishop, company founder and chairman. "Blue Buffalo Co. looks forward to supporting the veterinary profession for years to come as passionate clients continue to trust veterinarians who care for their family pets."

Since the company was founded in 2002, Blue Buffalo has supported pet oncology studies in order to gain greater understanding of the causes, treatments and prevention of cancers in pets. The company, in association with its partner Blue Buffalo Foundation, has raised more than \$12 million for pet cancer research and financial support to help pet owners with cancer treatment fees.

For more information about the Clinical Trials Office and study eligibility, visit vet.osu.edu/vmc/cto. **dvm360**

NexGard® (afoxolaner) Chewables

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

Description: NexGard® (afoxolaner) is available in four sizes of beef-flavored, soft chewables for oral administration to dogs and puppies according to their weight. Each chewable is formulated to provide a minimum afoxolaner dosage of 1.14 mg/lb (2.5 mg/kg). Afoxolaner has the chemical composition 1-Naphthalenecarboxamide, 4-[5-(3-chloro-5-(trifluoromethyl)-phenyl)-4, 5-dihydro-5-(trifluoromethyl)-3-isoxazolyl]-N-[2-oxo-2-[(2,2,2-trifluoroethylamino)ethyl].

Indications: NexGard kills adult fleas and is indicated for the treatment and prevention of flea infestations (*Ctenocephalides felis*), and the treatment and control of Black-legged tick (*Ixodes scapularis*), American Dog tick (*Dermacentor variabilis*), Lone Star tick (*Amblyomma americanum*), and Brown dog tick (*Rhipicephalus sanguineus*) infestations in dogs and puppies 8 weeks of age and older, weighing 4 pounds of body weight or greater, for one month.

Dosage and Administration: NexGard is given orally once a month, at the minimum dosage of 1.14 mg/lb (2.5 mg/kg).

Dosing Schedule:

Body Weight	Afoxolaner Per Chewable (mg)	Chewables Administered
4.0 to 10.0 lbs.	11.3	One
10.1 to 24.0 lbs.	28.3	One
24.1 to 60.0 lbs.	68	One
60.1 to 121.0 lbs.	136	One
Over 121.0 lbs.	Administer the appropriate combination of chewables	

NexGard can be administered with or without food. Care should be taken that the dog consumes the complete dose, and treated animals should be observed for a few minutes to ensure that part of the dose is not lost or refused. If it is suspected that any of the dose has been lost or if vomiting occurs within two hours of administration, redose with another full dose. If a dose is missed, administer NexGard and resume a monthly dosing schedule.

Flea Treatment and Prevention: Treatment with NexGard may begin at any time of the year. In areas where fleas are common year-round, monthly treatment with NexGard should continue the entire year without interruption.

To minimize the likelihood of flea reinfestation, it is important to treat all animals within a household with an approved flea control product.

Tick Treatment and Control: Treatment with NexGard may begin at any time of the year (see **Effectiveness**).

Contraindications: There are no known contraindications for the use of NexGard.

Warnings: Not for use in humans. Keep this and all drugs out of the reach of children. In case of accidental ingestion, contact a physician immediately.

Precautions: The safe use of NexGard in breeding, pregnant or lactating dogs has not been evaluated. Use with caution in dogs with a history of seizures (see **Adverse Reactions**).

Adverse Reactions: In a well-controlled US field study, which included a total of 333 households and 615 treated dogs (415 administered afoxolaner; 200 administered active control), no serious adverse reactions were observed with NexGard.

Over the 90-day study period, all observations of potential adverse reactions were recorded. The most frequent reactions reported at an incidence of > 1% within any of the three months of observations are presented in the following table. The most frequently reported adverse reaction was vomiting. The occurrence of vomiting was generally self-limiting and of short duration and tended to decrease with subsequent doses in both groups. Five treated dogs experienced anorexia during the study, and two of those dogs experienced anorexia with the first dose but not subsequent doses.

Table 1: Dogs With Adverse Reactions.

	Treatment Group			
	Afoxolaner		Oral active control	
	N ¹	% (n=415)	N ²	% (n=200)
Vomiting (with and without blood)	17	4.1	25	12.5
Dry/Flaky Skin	13	3.1	2	1.0
Diarrhea (with and without blood)	13	3.1	7	3.5
Lethargy	7	1.7	4	2.0
Anorexia	5	1.2	9	4.5

¹Number of dogs in the afoxolaner treatment group with the identified abnormality.

²Number of dogs in the control group with the identified abnormality.

In the US field study, one dog with a history of seizures experienced a seizure on the same day after receiving the first dose and on the same day after receiving the second dose of NexGard. This dog experienced a third seizure one week after receiving the third dose. The dog remained enrolled and completed the study. Another dog with a history of seizures had a seizure 19 days after the third dose of NexGard. The dog remained enrolled and completed the study. A third dog with a history of seizures received NexGard and experienced no seizures throughout the study.

To report suspected adverse events, for technical assistance or to obtain a copy of the MSDS, contact Merial at 1-888-637-4251 or www.merial.com/NexGard. For additional information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDA-VETS or online at <http://www.fda.gov/AnimalVeterinary/SafetyHealth>.

Mode of Action: Afoxolaner is a member of the isoxazoline family, shown to bind at a binding site to inhibit insect and acarine ligand-gated chloride channels, in particular those gated by the neurotransmitter gamma-aminobutyric acid (GABA), thereby blocking pre- and post-synaptic transfer of chloride ions across cell membranes. Prolonged afoxolaner-induced hyperexcitation results in uncontrolled activity of the central nervous system and death of insects and acarines. The selective toxicity of afoxolaner between insects and acarines and mammals may be inferred by the differential sensitivity of the insects and acarines GABA receptors versus mammalian GABA receptors.

Effectiveness: In a well-controlled laboratory study, NexGard began to kill fleas four hours after initial administration and demonstrated >99% effectiveness at eight hours. In a separate well-controlled laboratory study, NexGard demonstrated 100% effectiveness against adult fleas 24 hours post-infestation for 35 days, and was > 93% effective at 12 hours post-infestation through Day 21, and on Day 35. On Day 28, NexGard was 81.1% effective 12 hours post-infestation. Dogs in both the treated and control groups that were infested with fleas on Day -1 generated flea eggs at 12- and 24-hours post-treatment (0-11 eggs and 1-17 eggs in the NexGard treated dogs, and 4-90 eggs and 0-118 eggs in the control dogs, at 12- and 24-hours, respectively). At subsequent evaluations post-infestation, fleas from dogs in the treated group were essentially unable to produce any eggs (0-1 eggs) while fleas from dogs in the control group continued to produce eggs (1-141 eggs).

In a 90-day US field study conducted in households with existing flea infestations of varying severity, the effectiveness of NexGard against fleas on the Day 30, 60 and 90 visits compared with baseline was 98.0%, 99.7%, and 99.9%, respectively.

Collectively, the data from the three studies (two laboratory and one field) demonstrate that NexGard kills fleas before they can lay eggs, thus preventing subsequent flea infestations after the start of treatment of existing flea infestations.

In well-controlled laboratory studies, NexGard demonstrated >97% effectiveness against *Dermacentor variabilis*, >94% effectiveness against *Ixodes scapularis*, and >93% effectiveness against *Rhipicephalus sanguineus*, 48 hours post-infestation for 30 days. At 72 hours post-infestation, NexGard demonstrated >97% effectiveness against *Amblyomma americanum* for 30 days.

Animal Safety: In a margin of safety study, NexGard was administered orally to 8 to 9-week-old Beagle puppies at 1, 3, and 5 times the maximum exposure dose (6.3 mg/kg) for three treatments every 28 days, followed by three treatments every 14 days, for a total of six treatments. Dogs in the control group were sham-dosed. There were no clinically-relevant effects related to treatment on physical examination, body weight, food consumption, clinical pathology (hematology, clinical chemistries, or coagulation tests), gross pathology, histopathology or organ weights. Vomiting occurred throughout the study, with a similar incidence in the treated and control groups, including one dog in the 5x group that vomited four hours after treatment.

In a well-controlled field study, NexGard was used concomitantly with other medications, such as vaccines, anthelmintics, antibiotics (including topicals), steroids, NSAIDs, anesthetics, and antihistamines. No adverse reactions were observed from the concomitant use of NexGard with other medications.

Storage Information: Store at or below 30°C (86°F) with excursions permitted up to 40°C (104°F).

How Supplied: NexGard is available in four sizes of beef-flavored soft chewables: 11.3, 28.3, 68 or 136 mg afoxolaner. Each chewable size is available in color-coded packages of 1, 3 or 6 beef-flavored chewables.

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Rev. 1/2015



This penguin can see clearly now; the clouds are gone

A pioneering Texas A&M team hopes the successful cataract surgery will serve as a model for future procedures on elderly penguins.

Jeep, a chinstrap penguin from Moody Gardens in Galveston, Texas, successfully underwent cataract surgery recently at the Texas A&M University College of Veterinary Medicine and Biomedical Sciences (CVM) Small Animal Hospital, according to *Texas A&M Today*.

Jeep's surgery took 45 minutes and involved six fourth-year DVM students, as well as members of the school's recently formed ophthalmology team. The penguin was able to return to Galveston the next morning.

According to *Texas A&M Today*, one of the hardest parts of the operation was keeping Jeep from overheating. Because the penguin is accustomed to icy temperatures, the team made sure Jeep's environment was between 8 and 15 degrees Celsius (46 and 59 degrees Fahrenheit) at all times.

The nearly 30-year-old Jeep is one of

“Cataract surgery is the one surgery I would do for any animal at any age because it improves their life so much.”

—Shaman Hoppes, DVM

six Moody Gardens penguins identified as potential cataract surgery recipients by Texas A&M veterinary ophthalmologists and was the first to undergo the operation. While one of the six has since been removed from the group due to an inoperable detached retina, the remaining four will likely follow in Jeep's webbed footsteps over the coming months.

Shaman Hoppes, DVM, a Texas A&M zoological veterinarian and leader of the operation, believes cataract surgery could become a normal procedure for elderly penguins in the future, since their ability to live longer in captivity makes them vulnerable to

NEW DATA

Cerenia[®]
maropitant citrate

Dog owners see the benefits in preventing perioperative vomiting

Study finds comfort outweighs cost

 **99%**

would definitely or probably choose treatment to prevent vomiting

 **90.4%**

had at least some worry about their dog vomiting post-surgery

 **91.3%**

are likely or very likely to opt for treatment even if it requires arriving one hour earlier for their appointment



Make CERENIA[®] (maropitant citrate) part of your surgical protocols— with the flexibility of intravenous or subcutaneous administration.

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IMPORTANT SAFETY INFORMATION: Use CERENIA Injectable for vomiting in cats 4 months and older; use subcutaneously for acute vomiting in dogs 2 to 4 months of age or either subcutaneously or intravenously in dogs 4 months of age and older. Use CERENIA Tablets for acute vomiting in dogs 2 months and older, and for prevention of vomiting due to motion sickness in dogs 4 months and older. Safe use has not been evaluated in cats and dogs with gastrointestinal obstruction, or those that have ingested toxins. Use with caution in cats and dogs with hepatic dysfunction. Pain/vocalization upon injection is a common side effect. In people, topical exposure may elicit localized allergic skin reactions, and repeated or prolonged exposure may lead to skin sensitization. See Brief Summary of Full Prescribing Information on page 56.

¹Kraus B, Cazlan C. Assessment of dog owner concern regarding perioperative nausea and vomiting and willingness to pay for antiemetic treatment [abstract]. In the Proceedings of the International Veterinary Emergency and Critical Care Symposium; Sep 18-22, 2015; Washington, DC.
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zoetis



>>> A chinstrap penguin stretches its wings at the Texas A&M College of Veterinary Medicine.

PHOTO COURTESY OF TEXAS A&M

the development of cataracts.

“Cataract surgery is the one surgery I would do for any animal at any age because it improves their life so much,” Hoppes told *Texas A&M Today*. “To have any animal that’s lost its vision and have their vision back is huge. These are very social animals, and when they’ve lost their vision they

become more isolated and less social. Getting their vision back is going to be key in getting them back into a social network with their other penguins.”

Going forward, the Texas A&M team plans to fine-tune the procedure for the remaining penguins and closely monitor their recovery and reintroduction into the flock. [dvm360](#)

Custom exam tables developed for penguins at Detroit Zoo

When the Detroit Zoo, home to one of the largest penguin facilities in the world, expressed its need for penguin examination tables, one company stepped in and worked with habitat designers to customize, build and donate two penguin-specific tables.

Customized to accommodate the birds’ height, weight and wingspan, the tables were built into the walls of two medical management rooms within the exhibit, giving veterinarians and technicians access to the birds during examinations, according to a release from Mopec, the medical manufacturing company that built the tables.

The new tables allow zoo veterinary staff and zookeepers to provide medical treatments and physical examinations to the penguins without having to transport them to the zoo’s onsite animal hospital.

Four species of penguins live at the Detroit Zoo including macaroni, rockhopper, gentoo and king penguins. Air temperature is kept at about 37 degrees Fahrenheit, while the water is a brisk 40 degrees. [dvm360](#)



>>> Zookeeper Sarah Baer (left) assists Director of Animal Health Dr. Ann Duncan as she examines a rockhopper penguin at the Detroit Zoo.

PHOTO COURTESY OF MOPEC

Brief Summary of Prescribing Information



Antiemetic
For subcutaneous or intravenous injection in dogs and cats

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

INDICATIONS:
Dogs: CERENIA (maropitant citrate) Injectable Solution is indicated for the prevention and treatment of acute vomiting in dogs.
Cats: CERENIA (maropitant citrate) Injectable Solution is indicated for the treatment of vomiting in cats.

DOSEAGE AND ADMINISTRATION:
Use of refrigerated product may reduce the pain response associated with subcutaneous injection.

Dogs:
For Prevention and Treatment of Acute Vomiting in Dogs:
Dogs 2-4 Months of Age: Administer CERENIA Injectable Solution subcutaneously at 1 mg/kg (0.45 mg/lb) equal to 0.1 mL/kg (0.1 mL/2.2 lb) of body weight once daily for up to 5 consecutive days.
Dogs 4 months of Age and Older: Administer CERENIA Injectable Solution intravenously over 1-2 minutes or subcutaneously at 1 mg/kg (0.45 mg/lb) equal to 0.1 mL/1 kg (1 mL/22 lb) of body weight once daily for up to 5 consecutive days.

In dogs that are actively vomiting, it is recommended to initiate treatment with CERENIA Injectable Solution. Thereafter, CERENIA Tablets may be used for the prevention of acute vomiting at 2 mg/kg once daily. (See CERENIA Tablets package insert for complete prescribing information).

For Prevention of Vomiting in Dogs 4 months of Age and Older Caused by Emetogenic Medications or Chemotherapeutic Agents: Administer CERENIA Injectable Solution intravenously over 1-2 minutes or subcutaneously at 1 mg/kg (0.45 mg/lb) of body weight one time, 45-60 minutes prior to use of emetogenic medications or chemotherapeutic agents.

Cats:
For Treatment of Vomiting in Cats 4 Months of Age and Older:
Administer CERENIA Injectable Solution intravenously over 1-2 minutes or subcutaneously at 1 mg/kg (0.45 mg/lb) equal to 0.1 mL/kg (0.1 mL/2.2 lb) of body weight once daily for up to 5 consecutive days. The underlying cause of acute vomiting should be identified and addressed in dogs and cats that receive CERENIA Injectable Solution. If vomiting persists despite treatment, the case should be re-evaluated.

WARNINGS: Not for use in humans. Keep out of reach of children. In case of accidental injection or exposure, seek medical advice. Topical exposure may elicit localized allergic skin reactions in some individuals. Repeated or prolonged exposure may lead to skin sensitization. In case of accidental skin exposure, wash with soap and water. CERENIA is also an ocular irritant. In case of accidental eye exposure, flush with water for 15 minutes and seek medical attention.

In puppies younger than 11 weeks of age, histological evidence of bone marrow hypocellularity was observed at higher frequency and greater severity in puppies treated with CERENIA compared to control puppies. In puppies 16 weeks and older, bone marrow hypocellularity was not observed (see **ANIMAL SAFETY**).

PRECAUTIONS:
The safe use of CERENIA Injectable Solution has not been evaluated in dogs or cats with gastrointestinal obstruction or that have ingested toxins.

Use with caution in patients with hepatic dysfunction because CERENIA Injectable Solution is metabolized by CYP3A, CYP2D15 (dogs) and CYP1A (cats) enzymes (see **Pharmacokinetics**). The influence of concomitant drugs that may inhibit the metabolism of CERENIA Injectable Solution has not been evaluated. CERENIA Injectable Solution is highly protein bound. Use with caution with other medications that are highly protein bound. The concomitant use of CERENIA Injectable Solution with other protein bound drugs has not been studied in dogs or cats. Commonly used protein bound drugs include NSAIDs, cardiac, anticonvulsant, and behavioral medications. Drug compatibility should be monitored in patients requiring adjunctive therapy.

The safe use of CERENIA Injectable Solution has not been evaluated in dogs or cats used for breeding, or in pregnant or lactating bitches or queens.

Adverse Reactions:
DOGS:

In a US field study for the prevention and treatment of vomiting associated with administration of cisplatin for cancer chemotherapy, the following adverse reactions were reported in 77 dogs treated with CERENIA Injectable Solution at 1 mg/kg subcutaneously or 41 dogs treated with placebo:

Adverse Reaction	Placebo (n=41)		CERENIA (n=77)	
	# dogs	% occur	# dogs	% occur
Diarrhea	1	2.4	6	7.8
Anorexia	0	0	4	5.2
Injection site reaction (swelling, pain upon injection)	0	0	3	4
Lethargy	1	2.4	2	2.6

The following adverse reactions were reported during the course of a US field study for the prevention and treatment of acute vomiting in dogs treated with 1 mg/kg CERENIA Injectable Solution subcutaneously and/or CERENIA Tablets at a minimum of 2 mg/kg orally once daily for up to 5 consecutive days:

Adverse Reaction	Placebo (n=69)		CERENIA (n=206)	
	# dogs	% occur	# dogs	% occur
Death during study	4	5.8	10	4.9
Euthanized during study	0	0	2	1
Diarrhea	6	8.7	8	3.9
Hematochezia/bloody stool	5	7.2	4	1.9
Anorexia	2	2.9	3	1.5
Otitis/Otorrhea	0	0	3	1.5
Endotoxic Shock	1	1.4	2	1
Hematuria	0	0	2	1
Excoriation	0	0	2	1

Other clinical signs were reported but were <0.5% of dogs.

Adverse reactions seen in a European field study included ataxia, lethargy and injection site soreness in one dog treated with CERENIA Injectable Solution.

Post-Approval Experience (Rev. 2015)

The following adverse events are based on post-approval adverse drug experience reporting. Not all adverse events are reported to FDA CVM. It is not always possible to reliably estimate the adverse event frequency or establish a causal relationship to product exposure using these data.

The following adverse events reported for dogs are listed in decreasing order of reporting frequency for CERENIA Injectable Solution: Pain/vocalization upon injection, depression/lethargy, anorexia, anaphylaxis/anaphylactoid reactions (including swelling of the head/face), ataxia, convulsions, hypersalivation, tremors, fever, dyspnea, collapse/loss of consciousness, recumbency, injection site reactions (swelling, inflammation) and sedation.

Cases of death (including euthanasia) have been reported.

CATS:

The following adverse reactions were reported during the course of a US field study for the treatment of vomiting in cats treated with 1 mg/kg CERENIA Injectable Solution subcutaneously once daily for up to five consecutive days:

Adverse Reaction	Placebo (n=62)		CERENIA (n=133)	
	# cats	% occur	# cats	% occur
Moderate Response to Injection ^{1,2}	1	1.6	30	22.6
Significant Response to Injection ^{1,3}	1	1.6	15	11.3
Fever/Pyrexia	2	3.2	2	1.5
Dehydration	0	0	3	2.3
Lethargy	0	0	2	1.5
Anorexia	0	0	1	0.8
Hematuria	0	0	1	0.8
Hypersalivation	0	0	1	0.8
Injection site swelling	1	1.6	0	0

¹ The clinician observed and graded each cat’s response to injection.

² Cat objected to the injection by retreating and vocalizing

³ Cat objected to the injection by retreating, hissing, scratching, and vocalization

Post-Approval Experience (Rev. 2015)

The following adverse events are based on post-approval adverse drug experience reporting. Not all adverse events are reported to FDA CVM. It is not always possible to reliably estimate the adverse event frequency or establish a causal relationship to product exposure using these data.

The following adverse events reported for cats are listed in decreasing order of reporting frequency for CERENIA Injectable Solution: Depression/lethargy, anorexia, hypersalivation, pain/vocalization upon injection, dyspnea, ataxia, fever, recumbency, vomiting, panting, convulsion, and muscle tremor.

Cases of death (including euthanasia) have been reported.

To report suspected adverse events, for technical assistance or to obtain a copy of the SDS, contact Zoetis Inc. at 1-888-963-8471 or www.zoetis.com.

For additional information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDA-VETS or online at <http://www.fda.gov/AnimalVeterinary/SafetyHealth>.

STORAGE CONDITIONS: CERENIA Injectable Solution should be stored at controlled room temperature 20-25°C (68-77°F) with excursions between 15-30°C (59-86°F). After first vial puncture, CERENIA Injectable Solution should be stored at refrigerated temperature 2-8°C (36-46°F). Use within 90 days of first vial puncture. Stopper may be punctured a maximum of 25 times.

HOW SUPPLIED: CERENIA Injectable Solution is supplied in 20 mL amber glass vials. Each mL contains 10 mg of maropitant as maropitant citrate.

NADA #141-263, Approved by FDA



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Could **leptospirosis** be headlining in a town near you?

Study indicates the risk for this zoonotic disease can have seasonal and spatial distribution, especially in areas of rainfall. *By Kathryn Primm, DVM*

Leptospirosis is a zoonotic disease that's widespread throughout the world.¹ It can affect all mammals and is maintained in the wild through host urine. Hosts can transmit disease without presenting with clinical illness themselves. Dogs and people are usually infected through contact with contaminated water or contact with infected animals. Multiple serovars have been identified, and dogs can serve as important sentinel species for human infection.^{2,3}

Zeroing in on a deluge of factors

A geographic focal area for leptospirosis was identified in the Pacific Northwest, so a retrospective study was undertaken in Oregon. Seventy-two confirmed cases of leptospirosis were identified, with 65 completed case studies. No consistent agreement on age grouping was found among studies on leptospirosis, but this study indicated that puppies and dogs less than 2 years of age represented the smallest percentage of affected cases (less than 4%). Sex did not seem to statistically affect diagnosis, as 53% of the cases were male and

47% were female. The most commonly reported clinical signs included lethargy, anorexia and vomiting, followed by diarrhea, fever and abdominal pain.

Seasonal and spatial distribution coincided with rainfall patterns for the area, with most cases diagnosed in the spring and in the western part of the state. Almost 25% of the cases included contact with environmental water, and another 14 cases related to contact with wildlife. Almost half of the cases had no history of known exposure risk. Of the 65 dogs, 44 recovered, 12 died and nine were lost to follow-up. Dermatologic conditions were also present in 14% of the dogs with leptospirosis, but the relationship between the two needs more investigation. Of the dogs in which vaccination status was known, 95% had not been vaccinated against leptospirosis in the previous year.

Exam-room application

This study indicates spatial clustering, so if you identify a case of leptospirosis you may need to be on the alert for others. Most of the dogs with leptospirosis had not been vaccinated and seemed to be located in certain

geographic areas, that seasonally coincided with rainfall. Risk factors were not easily identified in every case, and affected dogs suffered from a variety of clinical signs including anorexia, lethargy and gastrointestinal signs.

Although this study only examined records of dogs in Oregon, the findings may indicate that if you see an adult, unvaccinated dog with these signs, especially in the spring (or times of increased rainfall), your index of suspicion should be higher. The presence of other cases in your hospital also increases the likelihood of infection, and you should be aware of any increased risk in your geographic region. But on the sunny side: Most of the dogs were able to recover with appropriate medical care. [dvm360](#)

References

1. Hartskeerl RA, Collares-Pereira M, Ellis WA. Emergence, control and re-emerging leptospirosis: dynamics of infection in the changing world. *Clin Microbiol Infect* 2011;17:494-501.
2. Ghneim GS, Viers JH, Chomel BB, et al. Use of a case-control study and geographic information systems to determine environmental and demographic risk factors for canine leptospirosis. *Vet Res* 2007;38:37-50.
3. Major A, Schweighauser A, Francey T. Increasing incidence of canine leptospirosis in Switzerland. *Int J Environ Res Public Health* 2014;11:7242-7260.



WhiskerCloud Cloud-based websites

WhiskerCloud's new online hub, whiskercloud.com, offers Web platforms that enhance the way veterinarians market themselves online. With a cloud-based platform, WhiskerCloud builds custom websites, with security features, search engine optimization, analytics and seamless site management. WhiskerCloud builds beautiful, mobile-responsive websites for veterinarians incorporating existing pet portal integrations in addition to customized features. There are three different site management packages available.

For fastest response visit
whiskercloud.com



VPN Staffing Job search database

VPN (Veterinary Professional Network) Staffing has launched its on-demand staffing website in its home market of St. Louis with other markets coming soon. VPN Staffing brings on-demand matching of skilled veterinary professionals to veterinary hospitals, boarding facilities and doggy day care facilities by utilizing information provided in the staffer's profile and the employer's job posting. One-stop shopping for job searches allows "try before you buy" through temporary, relief or temp-to-hire positions.

For fastest response visit vpnstaffing.com
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Engler Engineering introduces the Infinite O2 Oxygen Booster. It is compatible with Engler's ADS 1000/2000 anesthesia machines as well as bellows-type anesthesia ventilators and can be used in clinics equipped with or without piped in oxygen. The unit is compact, unobtrusive and very quiet. It can supply 50 PSI for up to four traditional anesthesia machines or two Engler ADS 1000/2000 units. The booster, sold separately, will connect to 5-L, 10-L or 15-L oxygen concentrators.

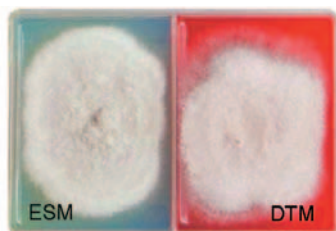
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or call (800) 445-8581



Merck and Co. Reference manual

Merck and Co. has published the 11th edition of the Merck Veterinary Manual, its animal health reference. First published in 1955, the reference has been updated to cover all species and disorders of veterinary interest worldwide. Nearly 400 veterinary experts from academia, government, research and specialty practice contributed to the 11th edition. It features a section dedicated to public health, additional information on heart disease, expanded coverage of fish and aquaculture and new chapters on backyard poultry, among others.

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The DermatoPlate Duo culture system is available in a two-chamber rectangular plate containing dermatophyte test medium (DTM) and enhanced sporulation agar (ESA). The compact rectangular shape facilitates inoculation and harvesting of growth for microscopic examination and, unlike plates used for bacteriology, the plate features a tight-fitting removable cover that helps prevent drying of the media during prolonged incubation. DermatoPlate Duo is also available as DermatoPlate S-Duo, replacing ESA with sabaroud dextrose agar.

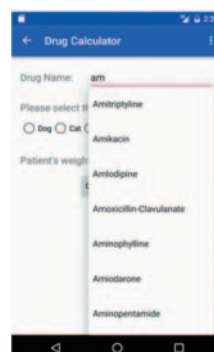
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Royal Canin Therapeutic treat line

Royal Canin has unveiled a new line of veterinary-exclusive treats designed to support special dietary needs of cats and dogs on therapeutic diets. The new line works with therapeutic diets to enable clients to bond with their pets without compromising the efficacy of nutritional therapy. The treats are available in four different formulations: Urinary, Gastrointestinal, Hydrolyzed Protein and Satiety and come in both dog and cat versions. The company's original treat has been redesigned to be thinner and contain fewer calories per treat, though the formulation has not been changed.

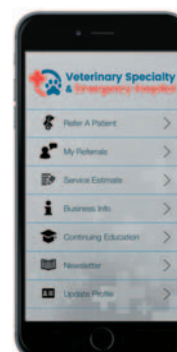
For more information visit
royalcanin.com/treats



MobiVet Formulary app

The MobiVet Veterinary Formulary App is designed to make drug calculations and prescribing faster, easier and safer. Designed by a small animal practitioner, the app contains dose rate and interval data for more than 250 drugs commonly used in small animal practice. The database is searchable by drug name or trade name, with species-specific dosing information. It calculates doses based on patient type, weight or body surface area as appropriate. The app also provides a checklist of known relevant drug interactions for each medication. It is available for download on Android devices, with iOS in production.

For fastest response visit
mobivetapps.com



JSI Group Referral app

JSI Group, the developers of rVetLink, are announce the upcoming release of a new iPhone and Android app for referring veterinarians (rDVMs). The app can be white-labeled by specialty and emergency practices and downloaded for free by rDVMs on the App Store and Google Play. The new app will provide integrated functionality allowing rDVMs to quickly and seamlessly refer cases to their preferred specialty practice. Refer-A-Patient, document and image upload, sharing of case studies and CE registration are just some of the features available.

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EQUINE | Performance horse health

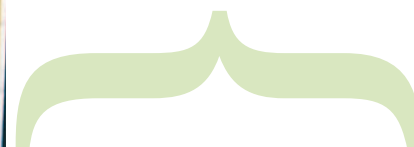
Veterinarian, trainer, owner: Who's looking out for the racehorse's health?

The answer, of course, should be all of them—but things can get tricky in this triangulation of communication. *By Ed Kane, PhD*

In a 2009 white paper, the American Association of Equine Practitioners (AAEP) makes a fairly pointed statement about its current level of satisfaction regarding

the veterinarian-owner-trainer relationship:

“Open and consistent communication between the owner, the trainer and the veterinarian will develop a relationship



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SYRINGE CONTAINS FLUNIXIN MEGGLUMINE EQUIVALENT TO 1500 mg FLUNIXIN FOR ORAL USE IN HORSES ONLY

ANADA 200-581, Approved by FDA

NOT FOR USE IN HUMANS
KEEP OUT OF REACH OF CHILDREN

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

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

INDICATIONS:
For the alleviation of inflammation and pain associated with musculoskeletal disorders in the horse.

ACTIVITY:
Flunixin meglumine is a potent, nonnarcotic, nonsteroidal, analgesic agent with anti-inflammatory and antipyretic activity. It is significantly more potent than pentazocine, meperidine, and codeine as an analgesic in the rat yeast paw test. Oral studies in the horse show onset of flunixin activity occurs within 2 hours of administration. Peak response occurs between 12 and 16 hours and duration of activity is 24 to 36 hours.

CONTRAINDICATIONS:
There are no known contraindications to this drug when used as directed.

PRECAUTIONS:
The effect of flunixin meglumine on pregnancy has not been determined. Studies to date show there is no detrimental effect on stallion spermatogenesis with or following the recommended dose of flunixin meglumine.

SIDE EFFECTS:
During field studies with flunixin meglumine, no significant side effects were reported.

DOSAGE AND ADMINISTRATION:
The recommended dose of flunixin meglumine is 0.5 mg per lb of body weight once daily. The Flunazine® Equine Paste syringe, calibrated in twelve 250-lb weight increments, delivers 125 mg of flunixin for each 250 lbs (see dosage table). One syringe will treat a 1000-lb horse once daily for 3 days, or three 1000-lb horses one time.

Syringe Mark*	Horse Weight (lbs)	Flunazine® Equine Paste Delivered (g)	mg Flunixin Delivered
0	---	---	---
250	250	2.5	125
500	500	5.0	250
750	750	7.5	375
1000	1000	10.0	500

* Use dial edge nearest syringe barrel to mark dose.

The paste is orally administered by inserting the nozzle of the syringe through the interdental space, and depositing the required amount of paste on the back of the tongue by depressing the plunger.

Treatment may be given initially by intravenous or intramuscular injection of Flunazine Injectable Solution, followed by Flunazine® Equine Paste on Days 2 to 5. Flunixin meglumine treatment should not exceed 5 consecutive days.

TOXICITY:
No toxic effects were observed in rats given oral flunixin meglumine 2 mg/kg per day for 42 days. Higher doses produced ulceration of the gastrointestinal tract. The emetic dose in dogs is between 150 and 250 mg/kg. Flunixin was well tolerated in monkeys dosed daily with 4 mg/kg for 56 days. No adverse effects occurred in horses dosed orally with 1.0 or 1.5 mg/lb for 5 consecutive days.

STORAGE:
Store at 20°C - 25°C (68°F - 77°F); excursions permitted between 15°C - 30°C (between 59°F - 86°F).

APPLE FLAVORED

HOW SUPPLIED:
Contains: 12 - Flunazine® (flunixin meglumine) Equine Paste Syringes 30 g each (syringe contains flunixin meglumine equivalent to 1500 mg flunixin).

To obtain an MSDS or for assistance, contact Bimeda, Inc. at 1-888-524-6332.

built on trust and shared philosophies. The result will be decisions that are made in the best interest of the horse. The current reality of racetrack operations is that the owner is often excluded from the communication chain, and we as veterinarians would like to change that. Veterinarians also are sensitive to the costs of services that are provided. It is important for owners to know that veterinary care is not given to any racehorse without the trainer's direct or implicit approval and that their trainer is acting as their legal agent when requesting veterinary services for their horses. Without open communication, differing management philosophies often result in confusion and dissatisfaction."

Although veterinarians have to try to approach problems systematically, it's an individual horse's signs that determine the right course of action. That means a whole team of people—owner, trainer, riders and veterinarian—need to be looking out for the horse's health.

In order to provide complete transparency for the veterinary-owner-trainer relationship, the AAEP recommends the following:

- > Trainers should include horse owners in all aspects of the horse's healthcare decisions.
- > Horse owners should have a thorough understanding of the medication and training philosophy of their trainer with particular emphasis on the level of medical care provided to their horses.
- > Veterinarians should provide unfettered access to owners and trainers for consultation and discussion of medical treatments.¹

An on-the-ground perspective

Scott Hay, DVM, a racetrack veterinarian with Teigland, Franklin, and Brokken in Fort Lauderdale, Florida, and a member of the AAEP task force that created the white paper, lives in this murky reality every day. "There is some difficulty in the communication stream between some veterinarians and some owners, particularly in racing, because often the owners are

absent from the racetrack," Hay says. "They are not always fully engaged in the communication stream with their veterinarian or even with their trainer."

Hay explains that it's common for horse owners to leave health-related decisions to their trainers after offering some general guidance. In those cases, practitioners work closely with the trainers who are on the grounds to determine what's best for the horse. "It's a matter of involvement," Hay says.

Still, Hay continues, many of those absentee owners like to know what's going on with the horse, so the veterinarian and trainer will spend time communicating with them about healthcare decisions more often, "and all can still work in concert as a team

for the healthcare of the horse," he says.

Other owners are present on the racetrack themselves and are thoroughly involved with their horses' care, staying in direct communication with the veterinarian to make medical decisions, Hay says.

In addition to level of involvement, there is also variation in owners' approach to their horses' health. "For example, some owners want their horse to be vaccinated for a myriad of diseases, although the horse would rarely come in contact with many of those diseases," Hay says. "Others think more about economics; they only want the veterinarian to administer those medications that are absolutely necessary." Owners also vary over things like preventive medications for joint health and oral supplements.

Typical care for performance health

When it comes to the veterinary care of the racehorse, owners, trainers and veterinarians are primarily focused on two areas of concern: respiratory issues and lameness.

Respiratory issues. "We are always

From the AAEP: Rules to protect racehorse health

- > A period of rest for all horses provides an opportunity to refresh and diminish the volume of persistent cyclic loading that occurs in the absence of rest.
- > No horse shall be permitted to race within 10 days of its last start.
- > Every horse entered to race must be on association grounds early enough to have a pre-race veterinary inspection for racing soundness by the regulatory veterinarian.
- > Standardization and enhancement of pre-race and post-race veterinary examinations with mandatory cross-jurisdictional sharing of information are essential.
- > There must be uniform participation by all jurisdictions in injury reporting for both racing and training injuries.
- > There must be investment by all racing venues in capital improvements of the racing oval that will enhance horse along with rider and personnel safety such as safety rails and padded starting gates.
- > All racing jurisdictions should immediately adopt ARCI riding crop and shoeing standards.

Source: Adapted from American Association of Equine Practitioners. Putting the horse first: Veterinary recommendations for the safety and welfare of the thoroughbred racehorse. 2009; www.aaep.org/custdocs/RacingIndustryWhitePaperFinal.pdf.

evaluating the horse's respiratory system for issues such as EIPH [exercise-induced pulmonary hemorrhage], for inflammatory airway disease and for functional abnormalities of their airway," Hay says. But how owners and trainers go about evaluating the horse with their veterinarian again varies significantly.

"I deal with some trainers and owners who want endoscopic examinations done every time after a horse works at high speed or races," Hay says. "I deal with other groups of trainers and owners who only want to do an endoscopic

exam when they think their horse has a problem.”

While economic considerations are often a factor in how frequently veterinarians do endoscopic examinations, Hay says it doesn't necessarily make financial sense to do them less often. “They give us a tremendous amount of information when we do numerous observations,” he says. “Therefore the economics can often play in favor of examining more often. It's important to get ahead of a respiratory condition a particular horse might be experiencing. ... If you can diagnose these issues earlier and treat them at the early stage, you can help that horse's performance.”

Lameness. Of course, the other condition equine veterinarians are primarily concerned about is lameness. “The more a practitioner is able to assess the horse for lameness issues, the more likely it is that he or she will discover even a subtle lameness issue—a lower-grade abnormality that might not be as apparent,” Hay says. “If you're not allowed to do frequent examinations with these horses, you're not going to discover some of these subtle lameness issues.”

Hay says some trainers would rather discover a lameness issue for themselves, then bring it to the attention of the veterinarian. Others like to have their veterinarian by their side when they're evaluating the horse for lameness. Others want more frequent or thorough exams as they trot a horse for soundness evaluations. “Those are the horses you can get ahead of as far as discovering some new or oncoming problem,” Hay says.

The owner's philosophy about testing and diagnosing lameness issues and cost sensitivity often affect how a veterinarian will go about diagnosing lameness issues, Hay says. “That's a discussion the practitioner needs to have with owners, so they're clear about how they want the veterinarian to go about his or her work,” he says.

Not only is a veterinarian looking for overt lameness, notes Hay; the practitioner is also trying to discover potential warning signs: filling, heat or swelling of a joint; signs of joint disease; or soft tissue issues.

“We want to try to determine what's causing the problem so that we can do something to prevent it from getting worse,” Hay says. “Whether it be rest, more diagnostic tests, or possibly a joint injection to try to reduce inflammation, there are various ways to try to reduce potential lameness problems.”

Besides walking and jogging the horse, palpating the joints and soft tissues and doing flexions, a racetrack veterinarian will also talk to the horse's handlers. “We'll ask the trainer what they're seeing, what they're observing on the racetrack,” Hay says. “We'll talk to the exercise rider about what they're feeling. Is there something they're concerned about? It's a little bit of an investigation to determine the subtle issues the horse might have.”

Or, on the other hand, maybe the horse is 100 percent healthy—“that's important to determine as well,” Hay says. “In some cases we have to observe and test the horse multiple times in order to determine what the problem is and what the answer is—if there is one. We might have to watch the horse on the racetrack and do some diagnostic tests if we don't see something overt that is causing the lameness.”

Bottom line, Hay continues, “every individual horse and every exam is different.” Although veterinarians have to try to approach lameness, airway and other problems systematically, it's an individual horse's signs that determine the right course of action. And in the horseracing world, that means a whole team of people—owner, trainer, riders and veterinarian—need to be looking out for the horse's health. **dvm360**

Reference

1. American Association of Equine Practitioners. Putting the horse first: Veterinary recommendations for the safety and welfare of the thoroughbred racehorse. 2009; www.aaep.org/custdocs/RacingIndustryWhitePaperFinal.pdf.

Ed Kane, PhD, is a researcher and consultant in animal nutrition. He is an author and editor on nutrition, physiology and veterinary medicine with a background in horses, pets and livestock. Kane is based in Seattle, Washington.

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DVMs save miniature horse with prosthetic

Colorado State veterinarians save a miniature horse named Shine using a foam-lined ski boot ending in bike-tire treads.



Horse owners Jacque Corsentino and Lee Vigil think it was dogs. What else could have left puncture wounds on the face and bloody tears in a lip, a knee and the left rear fetlock like Shine had?

It was early morning, before the sun was up, Dec. 29, 2015. One of the owners went out to feed Shine and her two other miniature horses. She thought he was standing funny and swung a flashlight beam onto Shine.

“He was covered in blood,” Jacque Corsentino told the Colorado State University *Source*.

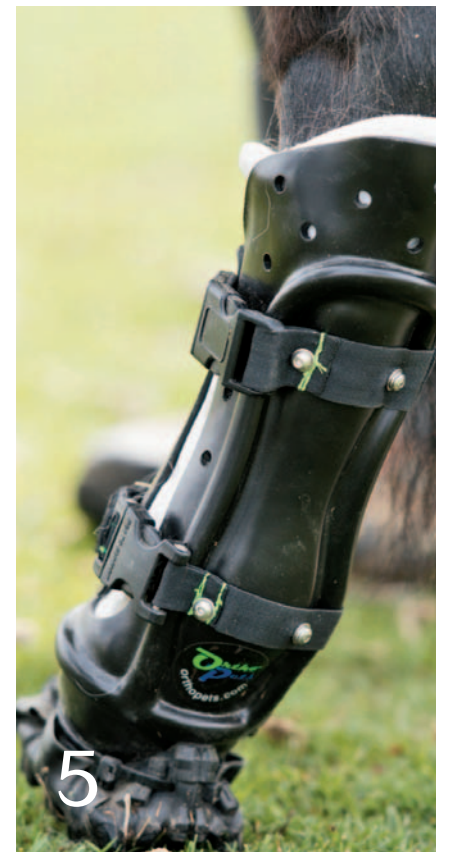
The 3-year-old miniature horse was whisked away to the university’s teaching hospital, where injuries to his leg and the resulting infection might have meant euthanasia. But thanks to work by a staff orthopedic surgeon and a prosthetic from a Colorado company, the miniature horse was able to recover and now walk.

Associate professor of equine orthopedics Laurie Goodrich, DVM, performed a two-hour surgery in March to remove the infected hoof and distal limb below the fetlock. Armed with radiographs, the veterinary team was able to use a 3-D printer to create an exact replica of the hoof for Shine during healing and before the prosthetic.

Full-sized horses weigh between 800 and 2,000 pounds, typically making it all but impossible to outfit a severely injured horse with an artificial limb that will successfully bear the weight. Horses in a condition similar to Shine’s—with broken bones and dangerous infections—are usually euthanized when treatment fails.

But that wasn’t the case for Shine. His petite size made him a remarkably good candidate for amputation and prosthesis. It’s an uncommon approach, even for Goodrich, a practic-

>>>After braving a suspected attack from dogs, Shine was left with serious injuries to his left hind leg. Thanks to the pioneering team at Colorado State, Shine’s new prosthetic has allowed him to get back on his feet.



>>>Figure 1. A radiograph showing Shine's injured lower-left hind leg. There were fractures in the coffin bone and lower pastern bone, crucial to extension of the lower leg into the hoof.

>>>Figure 2. Associate professor of equine orthopedics Laurie Goodrich, DVM, performed a two-hour surgery to remove the infected hoof and distal limb below the fetlock.

>>>Figures 3 and 4. The team was able to use a 3-D printer to create an exact replica of the hoof during healing and before the prosthetic.

>>>Figures 5 and 6: Shine's new hoof looks like a ski boot, and walking is easier with every step.

ing veterinarian for 25 years.

The site healed nicely. "It's the first [amputation and prosthesis] I've done, but I've always wanted to try," Goodrich told a Colorado State University reporter. "We had no way of preserving that limb. So we had to take it off, and this was the only option to preserve his life."

Fourth-year veterinary student Jessica Carie told a Colorado State

University reporter that the transition from cast to prosthetic improved with the first steps: "He's already so much more comfortable than with the cast."

Shine's co-owner Jacque Corsentino believed the miniature horse was headed for life as a show horse. Now, he said in a recent news report, plans for Shine have changed. "I think he would make an amazing therapy horse for wounded warriors or kids with disabilities," Corsentino said. "You know when you have horrible days? Shine is my therapy." [dvm360](#)

Horse receives honorary veterinary degree from UC Davis

19-year-old thoroughbred honored for being a “Master Equine Educator” while helping veterinary students learn.

This spring the University of California, Davis, School of Veterinary Medicine (UC Davis) not only conferred DVM degrees on more than 100 veterinary students, but it also awarded an honorary degree to a special equine patient, a 19-year-old thoroughbred named Teddy, according to a university release.

“Dr. Teddy” helped students learn equine health through more than two dozen appointments ranging from the routine, like vaccinations and deworming, to the more complex, such as stem cell treatments and a neurological

disorder, over a yearlong stay at the university’s teaching hospital.

“Signing up for your first patient is quite a nerve-racking experience as you try to figure out how to go through the motions of being a fourth-year student and integrating all of the medicine you have learned up to that point,” says 2016 DVM graduate Carin Stevens in the release. “Teddy was the perfect patient.”

Teddy consistently led students through various lessons in equine medicine including lameness evaluation, medication administration,

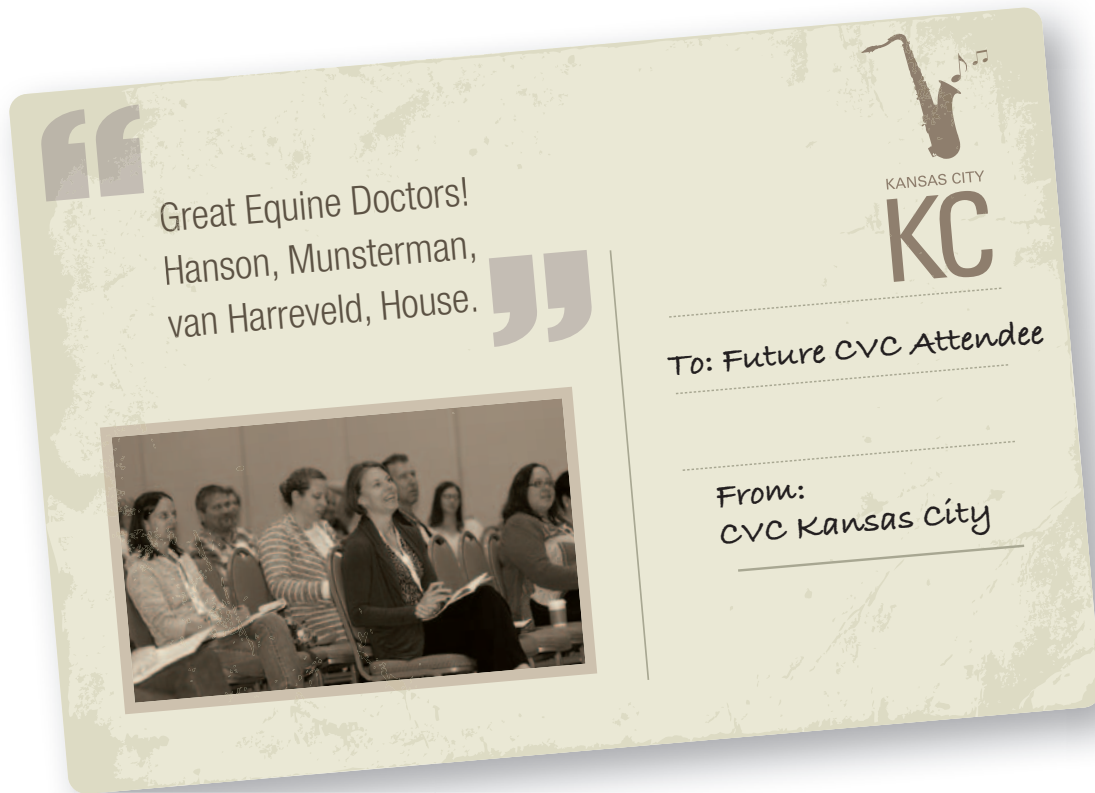
behavioral and postural assessment, grooming, hand walking and much more, the release states. He received recognition for his comfort and cheerfulness soon after his yearlong stay ended, becoming the first equine to “graduate” from UC Davis.

“Teddy provided an exceptional educational experience for staff, students, residents and faculty from many hospital services,” says Larry Galuppo, DVM, DACVS, chief of the Equine Surgery and Lameness Service at the university. “His care truly touched so many.” [dvm360](#)

>>> “Dr. Teddy” receives his mortar board on graduation day at UC Davis this spring.



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>>> A rendering of the future Institute for Biologic Translational Therapies at Colorado State University.

\$20 million donated for Colorado State stem cell research facility

Veterinarians, physicians will benefit from collaboration funded by horse health enthusiasts.

An anonymous racehorse breeder has reportedly donated \$20 million to Colorado State University (CSU) to build a state-of-the-art regenerative medicine research facility, fulfilling a \$65 million matching challenge from lead donors and fellow horse aficionados John and Leslie Malone, according to a release from CSU.

In December 2014, the Malones pledged \$42.5 million, which was the largest cash gift in CSU history, for the planned facility. The gift was prompted by their interest in stem cell therapy and its effectiveness in treating equine joint problems.

The donations allow construction of the CSU Institute for Biologic Translational Therapies, which promises to develop next-generation remedies based on living cells and their prod-

ucts. These include patient-derived stem cells to treat musculoskeletal disease and other ailments. Ground-breaking will occur later this year.

Faculty with the Orthopedic Research Center in the College of Veterinary Medicine and Biomedical Sciences developed the vision for the institute as part of their focus on equine musculoskeletal problems. Other CSU faculty with interests in regenerative medicine then became involved.

Veterinarians at Colorado State have a history of investigating medical treatments for animal patients then providing knowledge gained to boost human medical advancements. The progression is known as translational medicine and is successful because of similarities between animal and human physiology and disease.

The leader in planning the new

research institute has been Wayne McIlwraith, BVSc, MS, PhD, DSc, FRCVS, DACVS, DECVS, DACVSMR, a professor, research chair and pioneer in arthroscopic surgery and joint disease research in horses. McIlwraith is the founding director of CSU's Orthopedic Research Center and has worked with other faculty in the center to pursue regenerative treatments to augment surgery and hasten recovery from injury and joint disease. His work has involved stem cell and gene therapy, specialized tissue replacement and use of novel proteins. McIlwraith and his veterinary colleagues have treated joint problems in horses owned both by the Malones and by the anonymous donor. The new building will feature laboratories, specialized surgical suites, and conference space for veterinarians and physicians. [dvm360](#)

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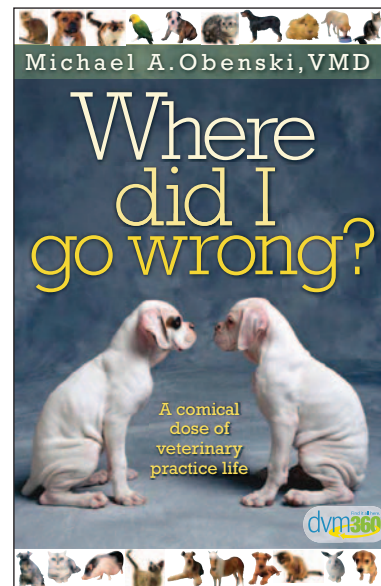
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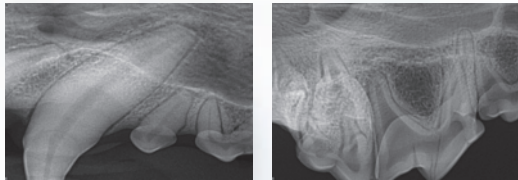
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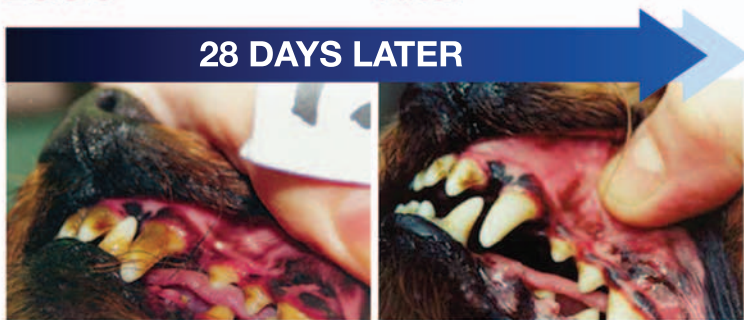
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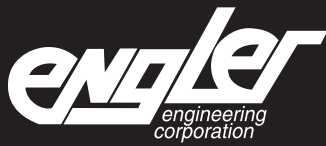


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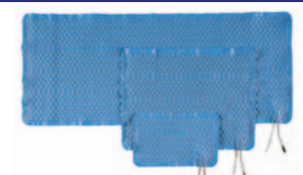
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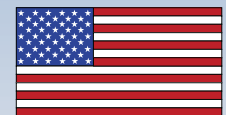
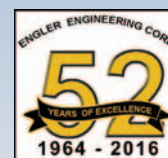


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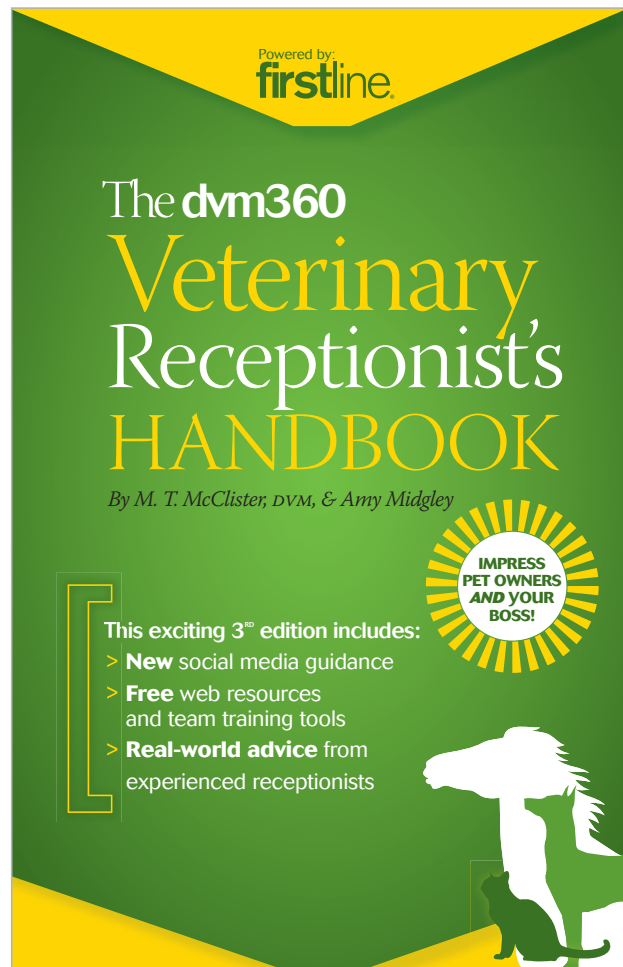
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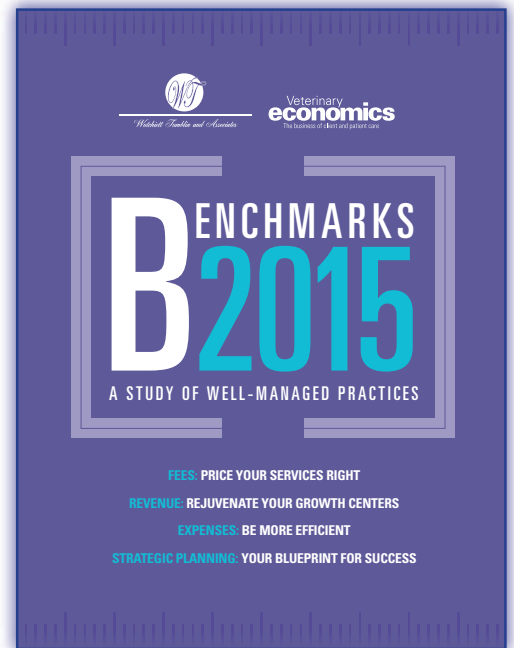


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December 8-11
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Here are the CE opportunities coming in the next few months

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cvma-acmv.org</p> <p>July 15-17
Animal Chiropractic Program Module 5 of 6
Dallas, TX
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ce.parker.edu/programs/animal-chiropractic-program</p> <p>July 27-30
2016 Therio Conference
Asheville, NC
(334) 395-4666
therio.org/event/2016Asheville</p> <p>July 29-31
2016 Fred Scott Feline Symposium
Ithaca, NY
(607) 253-3200
cvent.com/d/ffqp4v</p> <p>June 30 to August 2
AAHA Pack Trip
Jackson Hole, WY
(720) 963-4424
aaha.org/professional/education/adventure.aspx</p> <p>August 11-14
10th Keystone</p> | <p>Veterinary Conference
Hershey, PA
(717) 220-1437
keystonevetconference.org</p> <p>August 12-14
Animal Chiropractic Program Module 6 of 6
Dallas, TX
(800) 266-4723
ce.parker.edu/programs/animal-chiropractic-program</p> <p>August 13
Laser Therapy Symposium
Annapolis, MD
(410) 268-1311
mdvma.org</p> <p>September 7-11
International Veterinary Emergency & Critical Care Symposium
Athens, GA
vet.uga.edu/events/lasertherapy</p> <p>September 7
North Carolina Academy of Small Animal Medicine Meeting
Sanford, NC
(910) 452-3899
ncasam.org</p> <p>September 8-9
Montana Veterinary Medical Association Fall Symposium
Miles City, MT
(406) 447-4259
mtvma.org</p> | <p>September 11
Fall Vet Derm Seminar
Portland, OR
(503) 352-3376
skinvetclinic.com</p> <p>September 14-17
Veterinary Management School (VMS)
Lakewood, CO
(800) 883-6301
aaha.org/vms</p> <p>September 23-25
105th Annual KVMA Meeting/43rd Mid-America Veterinary Conference Symposium
Louisville, KY
(502) 226-5862
kvma.org</p> <p>September 24-25
Infectious & Vector Borne Disease for the General Practitioner Conference
San Diego, CA
(619) 640-9583
sdcvma.org</p> <p>September 27-30
41st World Small Animal Veterinary Association Congress
Dundas, Ontario, Canada
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wsava2016.com</p> <p>September 30 to October 2
California VMA Annual Fall Seminar,
Palm Springs
Indian Wells, CA</p> | <p>(916) 649-0599
cvma.net</p> <p>September 30 to October 2
Alaska VMA Annual Symposium
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akvma.org</p> <p>October 6-8
ACVS Surgery Summit
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acvssurgerysummit.org</p> <p>October 6-9
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The 32nd Muller-Ihrke Veterinary Dermatology Seminar on Maui
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2016 American Association of Feline Practitioners Conference
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catvets.com/education</p> <p>November 4-6
AAVMC Veterinary Health and Wellness Summit
Fort Collins, CO
(970) 491-1642
conferences.colorado-state.edu/</p> |
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The final rest gone awry

Just what does a dog funeral entail? Here's the time I found out.

Mrs. Adams had a rowdy little spaniel named Sassy that had made her life wonderful for 18 years. We had done all we could to keep her going, but Father Time finally won the battle and it was now time for the funeral.

When I came to Lamesa I hadn't considered that if you stay in one place, everyone's dog will eventually die. All of the puppies I had vaccinated when I first came here in 1992 have passed on. That's a tough pill to swallow.

Sassy was special. Mrs. Adams was special. And there was no way my technician Jo and I were gonna miss the funeral. In fact, Mrs. Adams had called upon us to help out with the ceremony. Mrs. Adams asked if she could leave Sassy with us until the next day when she would be by with the burial gown and casket she'd had made.

Mrs. Adams arrived the next morning and asked me to get the casket and burial gown out of her truck. She gave Jo a set of handwritten instructions and said the funeral would be at her house Saturday morning at 10 o'clock. I went out to the truck to perform my part of the assignment and found a wooden casket of unbelievable size in the back. It was solid wood and must have weighed 100 pounds. It had a purple satin pillow lining the bottom and a separate ornate lid.

The casket was not very deep, and the pillow rose above the wooden edges. There was a groove in the rim that the lid rested in. It took me two trips to get the thing in the clinic and I noticed the same look of astonishment on Jo's face as I had felt on mine when she saw it.

Once the casket was safely in the

clinic, Mrs. Adams thanked us and told us she would see us Saturday morning. Jo had a strange look on her face. It was a cross between a giggle and fright.

"Just wait until you read our assignments, dude," she said.

"I'm to dress Sassy in the burial gown after I've bathed her and blown her hair dry. The collar on the burial gown needs to be facing yellow side out and Sassy's hind legs need to be under her belly, with her front legs facing forward. Her nails are to be painted purple like the pillow," Jo said. "You and I are to carry the casket, and Brother Rand is gonna perform the funeral. I'm supposed to get some of those paper eulogy things printed up and ready to hand out as people arrive."

She handed me a separate piece of paper with the words that were to be printed to eulogize Sassy. I giggled a bit and was thankful my part was only carrying the casket. I guess Jo noticed my smirk, because she responded with one of her own.

"Get that grin off of your face, Dr. Brock. Just wait until you hear about your other assignment."

It seems my second job was to dig the hole. The note said there was a roped-off plot in Mrs. Adams' backyard under a willow tree. It even had dimensions for the hole, but all I noticed was the required depth of four feet.

I took a helper with me. We dug in that hard dirt, battling willow roots and June heat for two hours, but we got the hole dug to specification.

There were 30 or so people at the funeral. We all cried and talked about how wonderful Sassy was. Brother Rand did a smashing job, and it was

time to have the graveside service next to the giant hole. Jo and I were to carry the casket with Sassy in full view, and Brother Rand was to carry the lid. We had about a 50-yard walk from the living room where the service was held to the gravesite.

We were going to walk out first and everyone else would follow. I was walking backward holding one end and Jo was going forward with the other. We came to the sliding glass door and as I was walking backward and lining up, I forgot that the screen was still closed and ran into it at full speed. It gave a little—just enough to recoil and push me back toward Jo, who also had no idea the screen hadn't been opened.

Between the slick satin of the purple pillow and the low sides of the casket, there was nothing to keep Sassy on the pillow during the jolt—so off she flew. She slid off the casket, down the steps that led to the glass door, onto the tile floor of the kitchen and under the dining room table.

As Jo reached up to try and steady the dog, she let go of her end to the casket and it smashed into the step and broke into two pieces.

The elderly women all let out a combined yodeling shriek. I was mortified, and Jo was red-faced and breathing fast.

After 30 minutes of casket repair in the garage, we finally laid Sassy to rest under the willow tree. I went back that evening and shoveled the dirt into the grave. Mrs. Adams thanked me profusely and, once again, I marveled at the life of a small-town veterinarian. [dvm360](#)

Dr. Bo Brock owns Brock Veterinary Clinic in Lamesa, Texas.

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