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Redefining the animal lover

Are they acting in the pet's best interest—or protecting the rugs? Obenski ruminates.

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Can antibiotics make your patients fat?

Researchers discuss how manipulating the microbiome can affect obesity and other diseases.

By Suzanne Parsel, DVM, MBA

Microorganisms that share the environment with humans and animals—whether symbiotic, commensal or pathogenic—are becoming an increasingly interesting subject as researchers learn more about their influence on health and disease states in the organisms with which they cohabitate. While some researchers use the term "microbiome" to refer to the collective genome of microorganisms that occupy a specific ecological niche, others use "microbiota" when defining a group of microorganisms themselves. Still others use the terms interchangeably.

Researchers may switch up their terminology, but there was much agreement at the 2014 Animal Health Research Symposium, hosted by the Kansas City Area Life Sciences Institute and held in conjunction with CVC Kansas City, that the microbiota has a major impact on human and animal health—much like that of any other organ system. The constituents of the microbiota serve many beneficial functions for the host, includ-

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Appalachia native brings new veterinary school to *the hills of home*

Miner-turned-entrepreneur Pete DeBusk brings a new sensibility to the business of veterinary education. See page 26

By John Lofflin

Serving pets and people of the Lakota tribe

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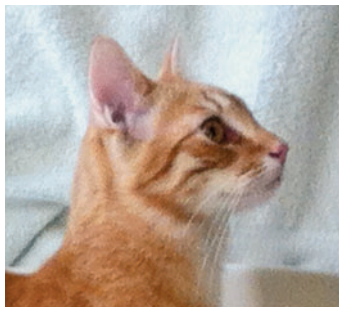

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WHERE DID I GO WRONG?

| Michael A. Obenski, DVM

REDEFINING the *animal lover*

Some clients may think they're acting in their pets' best interest—but we know better.

When a client calls our office with a problem that seems urgent, I usually prefer to speak with that client right away. Such was the case last week when Mrs. Foamlips called. All she would say to my receptionist was that there was an emergency that required my immediate attention. Foolishly, I stopped scrubbing for surgery and picked up the phone.

Her emergency went something like this: "Hello, Doctor, this is Mrs. Foamlips, Tigger's mother. Can you help me find a new home for Tigger? It looks like I won't be able to keep him, and I'm just sick about it. I tried calling some of the farms around here, but they all say no. He's not just an ordinary cat—he's all white! Since I'm such an animal lover, this problem is driving me crazy. What am I going to do?"

At this point I had two questions. First, why did she have to get rid of the cat? And second, why was I wasting time on this phone call when I should have been in surgery? Due to an apparent bout of temporary insanity, I asked the first question.

"Tigger has always been a good cat," she answered. "He always goes in his pan. But a friend told me that when cats get sick they sometimes miss the litter box. Well, I'm getting new rugs in a few weeks. If Tigger ever got sick I might come home from work one day and find poo-poo on the rug. Rather than taking that risk, I'll have to find another home for him. I love him, but I've only had him for two years so it would probably be better to make the change before I get too attached. Plus, he's lived on wooden floors all of his life. Don't you think it would be cruel to make him get used to rugs?"

Yes, it's true: my client Mrs. Foamlips sees herself as a great animal lover. (I don't mean to be sesquipedalian, but she thinks she's an ailurophile.) She is willing to go through thick and thin for her pet, but there had better not be any thick or thin on the rug. The truth is that people see themselves the way they would like to be seen by others, and veterinary clients are no exception.

Take, for example, Mrs. Fixum. She often remarks that she should have been a veterinarian. "Don't worry about the medication, Doctor," she told me recently. "I'm really good at giving pills. We've had so many problems with our animals over the years that I have treated just about everything at one time or another. I always follow instructions carefully too. I know how important it is to give treatments on time and to use the entire prescription until it's gone. By the way, which pills are you going to use this time? I may have plenty of them at home. I save a few from every prescription you've ever given me."

Another example would be Mr. Kindly, who sees himself as a humanitarian. He plays a game that we refer to in our office as "euthanasia innuendos."

"I'm sure worried about Sparky," he said not long ago. "I hope you can save him, but I'll tell you right now that we love him too much to see him suffer. If this broken leg means he'll have pain for a few weeks, I'd rather not put him through it. He's been too good a dog. I don't want him to go through a lot of discomfort or expense. Besides, sometimes fractures don't heal right. Isn't that true?"

If our clients' perception of themselves misses the mark occasionally, so does their characterization of their pets. My favorite case in point comes from my early years in practice. I was making an attempt to trim the toenails of Fangs Gotcha. This pooch had his eyes glued to my fingers as though my wedding band had Oscar Mayer written on it. Mrs. Gotcha could see that I was a little nervous.

"Young man," she said. "Don't be afraid of Fangs. He would never bite."

Moments later something crushed my thumb. Realizing that there were no sharks in the exam room, I deduced that Fangs had gotten me. I had Mrs. Gotcha hold the dog while I washed my hand and bandaged the thumb. She became quite annoyed with me when I told her that we would have to muzzle the pup before proceeding with the toenail trim.

"Now see here young man," she said. "Stop being so timid. I told you he doesn't bite!" **dvm360**

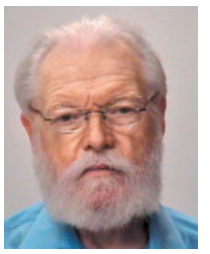
Dr. Michael Obenski owns Allentown Clinic for Cats in Allentown, Pa.

ILLUSTRATION BY RYAN OSTRANDER

Veterinarian charged with animal cruelty requests settlement from veterinary board

Millard Lucien Tierce, DVM, accused of experimenting on sick pets. *By Katie James*

Millard Lucien Tierce, DVM, 71, of Fort Worth, Texas, has filed a motion to settle the complaint against him with the Texas State Board of Veterinary Medical Examiners, according to documents filed with the Texas Office of Administrative Hearings. Tierce's license was suspended in May after his April 30 arrest on suspicion of animal cruelty.


Dr. Millard Lucien Tierce

The Harris family of Aledo, Texas, filed the complaint after finding their 4-year-old Leonberger, Sid, alive at the clinic months after they had been told the dog was euthanized. Upon investigation, police and veterinary board investigators found unsecured controlled substances, bugs and a number of other patients that clients thought had been euthanized.

The licensing hearing previously scheduled in June and rescheduled to Aug. 25 has been canceled. The details of the settlement will instead be discussed at the board's meeting on Oct. 21. The veterinary board's public information officer, Loris Jones, was unable to comment on the details of the settlement. However, the board's Rule 575.29 says that if the board rejects the proposed settlement, the complaint will go before an administrative law judge, or the board may direct the executive director to take other action as appropriate. If Tierce doesn't sign an agreement or respond within 14 days of receiving the agreement, a hearing will be scheduled before the administrative law judge.

The Harrises have filed a $1 million lawsuit against Tierce to recoup medical expenses as well as alleviate the emotional damages the situation has caused. An attorney for the Harris family said it's unclear how this settlement will affect the lawsuit, but at this time Tierce has not made motions to settle regarding that matter.

Kimberly Davis of Dallas County, Texas, filed a second $1 million lawsuit against Tierce in June. Davis' Chihuahua Hercules was recovered from the clinic during the police investigation but was in such poor condition he had to be euthanized. **dvm360**

USDA requires that imported dogs be at least 6 months old, healthy

New regulations authorized in recent addition to Animal Welfare Act.

The U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) has amended Animal Welfare Act regulations to require that dogs imported to the United States meet stronger health and safety standards "to protect Americans and Americans' pets," according to an agency release. The new rule states that dogs imported for resale must be vaccinated and in good health and are required to be more than 6 months of age.

The new regulations are authorized under section 18 of the Animal Welfare Act, which Congress added in the 2008 Farm Bill. "This rule implements new requirements in the Animal Welfare Act to ensure that dogs imported for resale are healthy and vaccinated," says Kevin Shea, an administrator for APHIS. "This will help safeguard the imported dogs, the public, and our pets and other animals."

The rule applies to dogs imported into the United States, including Alaska and Hawaii, from other countries and from U.S. territories. It applies to dogs intended for resale but does not affect dogs imported for research purposes, veterinary medical treatment or for personal companions. **dvm360**

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Ron Brakke, longtime veterinary industry consultant, receives Iron Paw Award

Brakke's career in animal health spans six decades. *By Kristi Reimer*

Addressing a room full of animal health company executives—many of whom could attribute their success to his guidance over the years—Ron Brakke accepted the Animal Health Corridor's Iron Paw Award Aug. 25 at the Corridor's annual Homecoming event in commemoration of his 60 years in animal health.

Ron Brakke, left, accepts the Iron Paw Award from K-State Dean Dr. Ralph Richardson.

Brakke, whose name is almost synonymous with veterinary industry knowledge, is CEO of Dallas-based Brakke Consulting, which employs some of the heaviest of heavyweight consultants in the profession. He was heavily involved in the formation of the Kansas City Animal Health Corridor consortium of companies in 2006.

"The Animal Health Corridor simply would not exist were it not for Ron Brakke," said Ralph Richardson, DVM, dean of the Kansas State University College of Veterinary Medicine—the "western oupost" of the Corridor—in his introduction of Brakke.

A native of South Dakota, Brakke grew up on a farm in the middle of pheasant country. He received a degree in biology from Augustana College in Sioux Falls and worked for various animal health companies before founding Brakke Consulting in 1986, which specializes in the animal health, pet and veterinary industries. The firm's services include executive search; merger, acquisition and due diligence; market research and industry information; veterinary practice management; AnimalHealthJobs.com and a weekly animal health newsletter.

Several of Brakke's noteworthy achievements include:

> Spearheading the 2008 publication of *The U.S. Animal Health Industry: Its Pioneers and Legacy of Innovation*, a book that documents the development of the global animal health industry.

> Assisting in the creation of the first KC Animal Health Investment Forum in 2009, which provides a platform for venture capital firms and animal health companies to learn about new technology opportunities from the entrepreneurs and scientists who are developing those technologies.

> Serving on the advisory board for the Kansas City Animal Health Corridor continuously from its founding in 2006 until 2013. **dvm360**

KU coach Bill Self motivates crowd at industry dinner

Celebrity guest, national champ applies themes of teamwork, talent to work being done in veterinary profession. *By Heather Biele, DVM*

Speaking to a crowd of more than 850 animal health industry professionals, Bill Self, head coach for the University of Kansas men's basketball team, reminded everyone, "The best players don't guarantee a win. The players that play the best together give you the best chance to win."

In an evening with the theme "Talent and Teamwork," Self's inspirational words applied not only to basketball, but also to the work being done in the animal health industry. He spoke of the importance of recruiting talented individuals to be a part of the industry's "team," of having a product that people want to be a part of.


University of Kansas men's basketball coach Bill Self.

But even more important than recruiting a talented team, Self emphasized the need for teamwork—and that includes weathering the hard times together. "The reason we won the national championship in 2008 is because we failed as a team together earlier in the season," he said. "When we were under pressure, down nine points with two minutes left in the championship game, we didn't change our strategy. We knew we'd come this far—we might as well finish the job."

That strategy hasn't changed in subsequent seasons, either. Self continues to aim for success each year by recruiting new talent, focusing on strengthening team bonds and having plenty of patience—goals he recommends that the animal health industry embrace as well.

"This is an impressive group here tonight," he said. "There's a lot to do and offer in the Midwest. Do things right now so you can get a win in the future." **dvm360**

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Serving **pets** and **people** of the Lakota tribe

Volunteers bring care to animals on the Pine Ridge Lakota Sioux Reservation—and learn about coming together for the common good.

By Sarah Moser

Along the southern end of the Badlands in South Dakota sits the Pine Ridge Lakota Sioux Reservation. As the eighth-largest reservation in the United States, it occupies 3,468 square miles. This place, where Kevin Costner starred in the movie *Dances with Wolves*, is also among the poorest counties in the United States. Not a single veterinary clinic calls this place home.

That's where the Lakota Animal Care Project, a 501(c)(3) community-based nonprofit organization, steps in. Relying on mostly volunteer veterinary professionals and community members, the project serves as a mobile veterinary clinic that sets up in churches, gyms and schools around the reservation.

Nora Kleps, DVM, a mixed-animal veterinarian from Long Island, New York, felt called to volunteer her services when she read about the Lakota Animal Care Project in the February 2014 issue of *dvm360* magazine (Veterinarians, techs invited to Pine Ridge Reservation). "I've always wanted to donate my services on a trip, and I wanted to stay within the United States," she says. "When I read about the Lakota project, I immediately called for more information, and I knew it was the trip for me."

Kleps has more than 20 years' experience in mixed-animal practice, and now owns Hooves, Paws, and Claws, a mobile house call practice. Flexibility in her job schedule gave her a chance to get away and to experience a different way of doing medicine.

"Coming from a densely populated New York suburb, I was struck by the peaceful expanse of land on and around the reservation," Kleps says. "The area is so different from where I live and practice." After flying into Rapid City, South Dakota, Kleps drove

>>> Two dogs from the reservation are happy at Donita Little White Man's house. Little White Man is one of the Lakota animal caregivers who helps to provide basic animal healthcare and foster dogs in need on the reservation.

>>> **Inset:** Thecla Two Bears, a Lakota animal caregiver, provides basic animal healthcare, going house to house on horseback in her community on the reservation, treating dogs for mange, fleas, ticks and worms. Fuel is costly, and Lakota animal caregivers are volunteers who often struggle to meet daily living costs. Two Bears, Donita Little White Man, Joyce Elk Boy and other community-based Lakota animal caregivers have been trained to provide basic animal healthcare through the Lakota Animal Care Project and also help at the spay-neuter clinics on the reservation.

PHOTOS COURTESY OF DAVE ENGLAND AND THE LAKOTA ANIMAL CARE PROJECT

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>>> The spay-neuter clinics usually last three days. Volunteer veterinarians have access to state-of-the-art equipment, including autoclave, anesthesia machines and monitors, surgery tables and lamps and everything needed to perform spay-neuter surgeries, including all consumables. The Lakota Animal Care Project does ask visiting veterinarians—for their own comfort and familiarity—to bring their own dissolvable suture materials and preferred anesthesia if possible.

another two hours to reach one of the two motels available on the reservation. All volunteers pay their own travel expenses.

For the next three days, she joined forces with another doctor and a technician to spay and neuter more than 60 dogs and eight cats. Kleps says the clinic was unlike anything she had seen before.

"All of the equipment, from gauze to surgery tables to anesthesia machines, is transported from location to location in two trailers," she says. "I brought my own preanesthetic medication and suture material, while volunteers set up the equipment in a school gym."

Kleps had hoped to interact more with the Lakota people, but found that volunteers transport all the animals to the clinic and back again. Very few of the Lakota residents actually made the trip in to see the clinic. "Many of the Lakota people don't have a way to get to the clinic or are homebound," she says. "It's easier for a volunteer to bring their pets to us."

This strategy gave the doctor and technician more time to do what they do best—care for the animals. Meshing several personalities—total strangers—together in an intense three-day clinic has the makings for disaster written all over it. But most remarkably, Kleps says she and the team worked together beautifully. "For strangers to meet for the first time and work in the same rhythm and flow as each other was extraordinary," she says. "We made our own rules in an unfamiliar working environment, setting up our own system and protocol. I've worked with people in clinics for years that didn't mesh as well as this crew did."

The Lakota Animal Care Project takes place twice a month, and its organizers are always looking for more volunteers to care for pets and improve the quality of animal life on the reservation. The physical pay is nonexistent. In fact, volunteers pay their own way for the opportunity to serve.

"We did receive small gifts from the few residents who came to the clinic," Kleps says. "But the biggest gift was being able to help. And learning that there is a commonality with everyone, no matter where you work. Be it a big city or not, wealthy or not, people love their pets. And we love helping them live healthier lives." **dvm360**

Sarah A. Moser is a freelance writer and editor in Lenexa, Kansas.

A closer look at Lakota

In one of the poorest counties in the United States, there is a great need for many things. And these needs include care for beloved pets and animals on the reservation. Here's a peek into the life of the Lakota people who live on the Pine Ridge Reservation:

- A 2011 census estimates population on the reservation as 28,000 to 40,000. Some members of the tribe live off the reservation.
- Reports estimate that 80 percent of the population is unemployed.
- Residents rely on an informal barter system on the reservation.
- There is no veterinarian on the reservation.
- Life expectancy in 2007 was estimated at 48 for males and 52 for females.

The need is great. Here's how you can help:

✓ Donate money or goods to the Lakota Animal Care Project. All donations to the 501(c)(3) nonprofit organization are tax-deductible. Please send your donations to Lakota Animal Care Project, LACP Treasurer, 12506 Willow Creek Road, Custer, SD 57730.

✓ Volunteer your time and services. For more information, contact founder Virginia Ravndal at lakotaanimalcare@gmail.com or by phone at (505) 252-6767, or Peggy Behrens, DVM, at (605) 394-4873.

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See brief summary on page 12.

Antibiotics and obesity

> From page 1

ing pathogen displacement, immune system development, and vitamin and short chain fatty acid production.

Microbiota and the gut

A presentation by Kelly Scott Swanson, PhD, a nutritionist at the University of Illinois, looked at the impact of probiotics, prebiotics and antibiotics on the canine and feline gut microbiome. For the past 10 years Swanson has been conducting research to understand how microbes affect the health of the host and how altering the microbiome can affect certain disease states.

Studying dog and cat gut microbiomes is important from a One Health perspective because dogs and cats live in close proximity to humans, as do production livestock in many cases. In a home or on a farm, the animals and humans share microbes. And because of their close proximity to people, dogs and cats can serve as sentinels for disease. For example, Swanson expressed concern about feeding raw diets to pets because of the risk of *Salmonella* infection to those companion animals that eat raw food, but an even greater risk exists for immunocompromised people such as seniors or small children in the same household, he says.

In his research, Swanson uses bioinformatics tools and gene sequencing to analyze data from the gastrointestinal microbiomes of dogs and cats to look for patterns and identify relationships associated with conditions like obesity, diabetes and other metabolic diseases. He has noted that trends for such conditions in people are frequently followed by similar trends in companion animals. He also argues that conditions in companion animals such as oral disease, gastrointestinal diseases, inflammatory bowel disease, skin and urinary tract diseases, and *Salmonella* and *Campylobacter* infections are all related to changes in the animal's microbiome.

Until 2013 there wasn't much study of the relationship between these diseases and the microbiome in companion animals, but human research findings have helped investigators understand these relationships better. One challenge researchers face is the high degree of variability in the microbiomes of individual patients based on things like diet, environment and immune function, making establishing a baseline difficult.

Once the relationship of the microbiome to individual health is better understood, Swanson says, future therapeutic options could include manipulating the microbiome with diet to promote production of certain metabolites or changing the constituency

>>> Research in mice has demonstrated that antibiotic therapy disrupts early microbiota development, leading to an increase in fat mass. The earlier in the animal's life this practice is started, the more profound the effect.

GETTY IMAGES/CAMILOTORRES

of the microbiome with prebiotics and probiotics. Prebiotics are a fermentable fiber that selects for advantageous bacteria, while probiotics are microorganisms ingested in order to directly change the constituency of the gastrointestinal tract.

Antibiotics and obesity

Laura Cox, PhD, from New York University's Langone Medical Center, spoke to symposium attendees about the impact of early-life subtherapeutic antibiotic treatment on body composition. According to Cox, a number of researchers have demonstrated that altered microbiota can actually cause obesity, whether through disruption at the intestinal interface (such as weakening of tight junctions between GI endothelial cells), a loss of the inflamasome, or a knockout of TLR5, which senses bacterial flagellum and helps control the microbiota. As a result, bacteria products can be translocated, triggering low-grade inflammation or altering metabolic signaling in the gut. All of these processes together can drive obesity, diabetes and nonalcoholic steatohepatitis.

Other research has demonstrated that antibiotic therapy disrupts early microbiota development, Cox says. Research on subtherapeutic antibiotic use in production animals for growth promotion has shown that the earlier in the animal's life this practice is started, the more profound the effect. This effect has been demonstrated across antibiotic classes with different bacterial targets but was not demonstrated by antivirals or antifungals, Cox says.

This production animal model has been replicated in mice to produce an increase in fat mass, leading Cox to explore this process further. She has demonstrated that early-infancy exposure to subtherapeutic antibiotic levels causes a shift in the composition of the microbiota, leading to an increased vulnerability to disruption. Not only did the mice in her lab gain weight, but analysis of fat composition demonstrated an increase in more metabolically active visceral fat and increases in liver adiposity. Both processes are driven by increased gene expression in genes involved in fat metabolism in the liver, clearly linking antibiotic exposure to changes in metabolic pathways. Additional research has demonstrated that even more weight gain occurs in mice when they are exposed to a high-fat diet in combination with this microbiota disruption and that changes in the metabolic pathways are sustained throughout life.

Not only did the mice in Cox's lab gain weight, but analysis of fat composition demonstrated an increase in more metabolically active visceral fat and increases in liver adiposity.

Cox has demonstrated with her research that subtherapeutic doses of antibiotics early in life can cause changes in microbiota that result in changes in body composition, but, even more importantly, she has shown that the microbes alone can drive fat accumulation. Germ-free mice colonized with microbiota from antibiotic-treated animals gained more weight and fat than those colonized with microbiota from control mice. These studies have been recently published (see the August 14 issue of *Cell*), and Cox is currently investigating the roles of specific bacteria in shaping development and obesity.

Further research is needed for scientists and practitioners to understand exactly how subtherapeutic antibiotics early in life impact the microbiota and metabolic pathways, producing obesity in humans and animals. But once they do, new therapeutic interventions may be possible—perhaps using prebiotic and probiotic therapies—and policymakers could take a smarter smarter approach to regulating antibiotic use.

According to these and other researchers who spoke at the symposium, the solution to combating bacterial diseases is not developing newer generations of antibiotics. Future management of bacterial diseases will focus on prevention of disease using prebiotics, probiotics, nanotechnology, immunotherapies—and agents for which the Food and Drug Administration currently has no approval process. **dvm360**

Dr. Suzanne Parsel is owner of Caneystone, a consulting firm in Little Rock, Arkansas. She writes about One Health.

See more
Read more of the stories behind these magnificent monikers at **dvm360.com/wackypet**.

A name created out of a brainstorming session of the most common dog names, specifically, bubbles and muffin, resulted in Shawn Smith, Waukegan, Ill., naming his mixed breed pooch Airbubble McMuffin.

20 wacky cats and zany dogs

Veterinary Pet Insurance shares the top 10 amazing animal appellations for policy holders' dogs and cats.

From Hamburger Patty to Count Flufferton, pet owners dug deep this year to find creative, sassy names for their precious pets. VPI revealed its 2014 top picks as well as fun stories about how these pets earned their wacky names. For example, Shuo Yang of Redwood City, California, couldn't resist keeping his feline's "punny" moniker, Walter Croncat.

"We adopted Walter Croncat (and his sister, Cinderella) from a shelter in Berkeley," Yang says. "The name was so interesting and fun that we decided to keep it. Plus, he looks so stately and dignified that I can really imagine him being 'the most trusted cat in America.'"

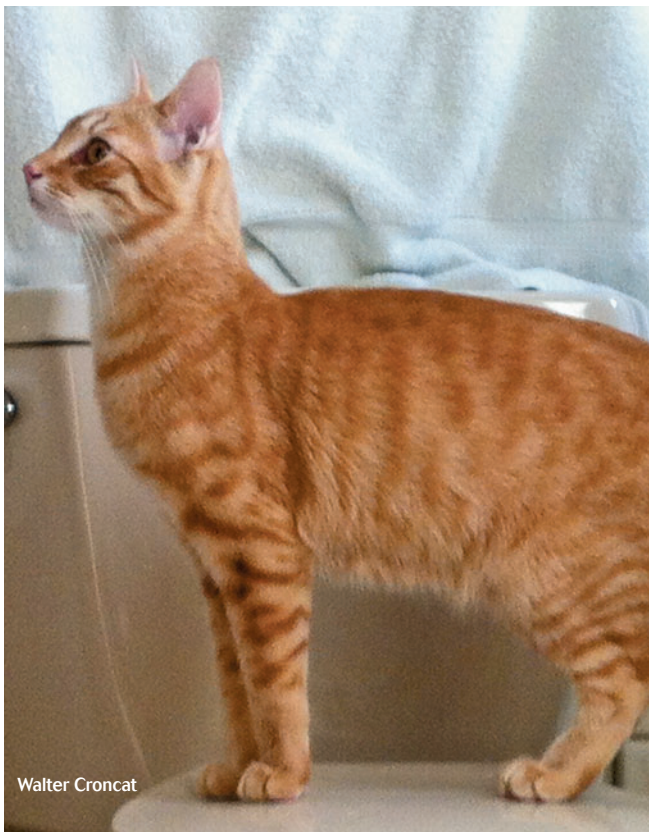
Here's a closer look at the top dogs and fantastic felines who made it to the top of the wacky pet names lists for dogs and cats:

Top 10 dog names

1. Peanut Wigglebutt
2. Sir Hog Knucklehead
3. Sasha Biggiepotamus Fierce
4. Otto Blitzschnell von Longdog
5. Zippity Do Dawg
6. Airbubble McMuffin
7. Hamburger Patty
8. Angus T. Brackencrack
9. Mister Buddy Pickles
10. Waffle Dots

Top 10 cat names

1. Snuggles Butt Le Lee
2. Count Flufferton
3. Katy Purry
4. Walter Croncat
5. Joey Banana Pants
6. Felix Thunder Paws
7. Nuttykitty
8. Señor Meow
9. Sassy Brat Cat
10. Purrscilla dvm360



Walter Croncat

PHOTOS COURTESY OF VPI

Brenda Andresen joins dvm360, CVC as director of marketing

Former Partners for Healthy Pets director brings industry knowledge, marketing expertise to Advanstar Veterinary's convention and media efforts.

Advanstar Veterinary has hired former Partners for Healthy Pets Director Brenda Andresen to lead marketing across its range of products and services. The CVC veterinary conventions group, dvm360 family of print and digital publications and custom businesses are included in her new responsibilities.

Brenda Andresen

A creative marketing, communications and sales strategist, Andresen has extensive experience in both veterinary and human healthcare. With a background that includes publishing sales as well as "client side" and "agency side" leadership experience, Andresen has a strong history of building brands and relationships.

"Brenda knows the veterinary market and its players very well, and she brings to us extensive experience in both marketing and sales," says Becky Turner Chapman, Advanstar Veterinary's vice president and general manager. "She's engaging and enthusiastic, and we're thrilled to add her to the Advanstar team."

Andresen most recently guided the veterinary industry's Partners for Healthy Pets initiative and its "Special Care Instructions" consumer advertising campaign. The campaign, focused on reminding pet owners that regular veterinary visits are as essential as food and love, is currently running in consumer print publications such as *Real Simple*, *Prevention* and *People* magazines, and online at yahoo.com, sheknows.com, and Facebook, among other sites. The campaign also features a public service announcement that is airing on networks such as HGTV.

Andresen lives in the Philadelphia area with her husband, Brian, sons Trevor and Ethan and golden retriever, Wrigley. She and her marketing team will be based in Advanstar Veterinary's Lenexa, Kansas, headquarters. dvm360

Veterinarian becomes sole equine sports medicine specialist in Wisconsin

Associate professor the only veterinarian in the state to be board-certified in equine sports medicine and rehabilitation.

Sabrina Brounts, DVM, MS, DACVS, associate professor at the University of Wisconsin School of Veterinary Medicine, has passed the required examination from American College of Veterinary Sports Medicine and Rehabilitation (ACVSMR) to become the state's only board-certified veterinarian in equine sports medicine, according to a university release. The ACVSMR was developed to meet the needs of athletic and working animals and those in need of rehabilitation. In addition to Brounts being the sole ACVSMR diplomate in the equine track for the state, her certification marks the 23rd certification in veterinary specialties for the University of Wisconsin's clinical arm, more than any other veterinary medical clinic in the state, the university says.

"Many horses are high-level athletes, so it's important to have specialists in this area to help with healing and injury prevention, as they do on the human side of medicine," says Brounts. She has been central in UW-Madison's pioneering method for monitoring tendon injuries, called acoustoelastography, or AEG, which uses ultrasound to evaluate the stiffness of tendons and determine how well they have healed, according to the university. "AEG provides a simple, objective, noninvasive method for monitoring healing progress and helps take the guesswork out of deciding when a horse can safely return to competition," she says. To continue to study AEG, Brounts is currently enrolling horses with acute superficial digital flexor tendon problems in a clinical trial.

>>> Sabrina Brounts (center) and Jennifer Whyard (seated), a specialty intern in large animal surgery, use ultrasound to evaluate a tendon injury in a horse's hind limb.

PHOTO COURTESY OF NIK HAWKINS

State ROUNDUP

A look at the world of animal health

CALIFORNIA

Kimberly Carlson, DVM, DACVS, and her team at VCA Bay Area Veterinary Specialty in San Francisco are seeking candidates for an investigational study of stem cells for dogs suffering from osteoarthritis with the goal to determine if a single injection of donor stem cells into one or two arthritically affected joints can help reduce pain and inflammation. Due to the degenerative nature of the disease, many dog owners turn to anti-inflammatory and pain-relief medications, but Carlson and her team believe a regenerative alternative method for dogs with osteoarthritis might be of great value to both patients and clients.

Candidates who qualify for this study must be dogs that are older than 9 months, weigh more than 5.5 pounds, have osteoarthritis of only one or two leg joints, have had pain or lameness for at least three months, and must not have cancer.

Joints that will be included in the study and injected under anesthesia include the hips, stifles, shoulders, and elbows. Dogs that may be considered must be in good health and undergo a full diagnostic workup before qualifying for the study. Dogs that qualify for the study may not have had previous stem cell therapy of any kind. For more information about the study, Carlson can be reached at (510) 483-7387.

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MICHIGAN

Shelter and private practice veterinarians in Grand Rapids, Michigan, have banded together to care for 37 dogs seized by area animal control in June. The dogs were kept in small travel-sized containers and suffered from severe dental issues, matted fur, urine-stained fur and skin, and damaged paws and toenails. Kent County Animal Control personnel discovered the dogs in the home of Kimberly Savino, who is now charged with felony animal cruelty and faces trial in Kent County Circuit Court according to community news site mlive.com. "I put out a call for vets to 'adopt' a dog," said shelter veterinarian Laurie Wright in a statement issued Sept. 5. "Within minutes, I had veterinarians offering to care for these struggling pets. They wanted to make a difference." Kent County Animal Shelter Supervisor Carly Luttmann said that treatment tabs for each dog would top $10,000, plus costs of boarding, vaccinations and other care if it weren't for the generosity of veterinarians, groomers and the dog-loving public who donated their time, expertise and money to the cause. "We are so incredibly fortunate to have such a caring community," she said.

IOWA

Darrell Trampel, DVM, PhD, a professor of veterinary medicine at Iowa State University passed away unexpectedly on Aug. 31. He served as the ISU Poultry Extension veterinarian and diagnostician for the last 32 years. Much of his recent efforts were focused on developing plans for transport of eggs and egg products from noninfected premises within an avian influenza control area (the FAST Eggs plan). As the primary liaison between ISU's College of Veterinary Medicine and the Iowa Department of Agriculture, the Iowa Poultry Association, and the Iowa Turkey Federation, he played an essential role in regulatory and eradication programs for poultry diseases according to a university release. "There is likely no one who knew more or cared more about the health and success of the Iowa poultry industry than Dr. Trampel," said Patrick Halbur, DVM, MS, PhD, professor and chair of the Veterinary Diagnostic and Production Animal Medicine Department at ISU. "He will be profoundly missed."

UTAH

The U.S. Department of Agriculture's National Veterinary Service Laboratory has confirmed the presence of the highly contagious porcine epidemic diarrhea virus, or PEDv, at the Circle Four Farms, Utah's largest hog farm and one of the largest in the country. Circle Four Farms, owned by Virgina-based Smithfield Farms, raises 1.2 million hogs annually. The USDA has agreed to work with state veterinarians to fund testing "to assure that stringent animal biosecurity practices are in place," according to a Sept. 3 news release. **dvm360**

Veterinary Pet Insurance to adopt Nationwide branding, phase out 'VPI'

Company to launch more services in the future. *By Kristi Reimer*

Mention the word "Nationwide" in conversation, and someone will either hum the jingle or sing it outright: "Nationwide is on your siiide." Now officials at the company have decided to pull Veterinary Pet Insurance (VPI) under the umbrella of the Nationwide brand, hoping this juggernaut of a consumer identity will transform new legions of pet owners into pet insurance policyholders. The upshot? Over the next nine months, VPI will become known as "pet insurance from Nationwide."

The company is calling this initiative, which involves a number of its holdings, "one company, one culture and one brand—Nationwide." It is also adopting an updated version of its historic logo and launching a massive advertising campaign. Nationwide has been VPI's underwriter since it was founded in 1982 and acquired the company outright in 2009.

"The Nationwide board very consciously thought about 'Who do we move into the inner circle; who do we not?'" says Carol McConnell, DVM, MBA, chief medical officer for VPI. "And VPI was on that list. They find real value in what pet insurance can offer the marketplace."

The changes are limited to the new branding, though, company leaders say. "For us, it's business as usual," McConnell says. "There's no change in structure or organization."

However, she does add that in future years the company will introduce more financial services and products for both pet owners and veterinarians. PAWS, VPI's monthly wellness program, is the first such example. "You will see more along those lines," McConnell says. "We're trying to navigate away from just pet insurance to more of a financial services company. Pet owners clearly love their pets, but what's missing is the ability to pay for services in a way they can afford."

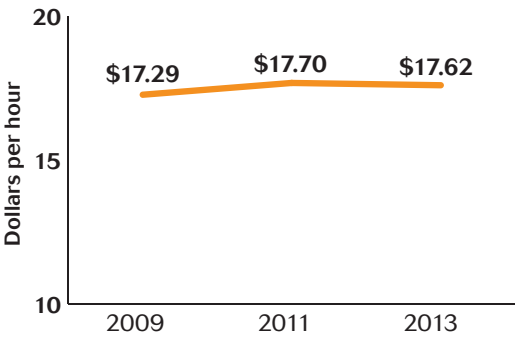
Curtis Steinhoff, director of corporate communications at VPI, says the company's commitment to veterinarians is unchanged. "Uniting under the Nationwide brand does not change VPI's partnership with and commitment to the veterinary community," he says. "We are proud of our passion for pets and of our support of veterinarians." **dvm360**

Study shows sustained **salary slump** for support staff

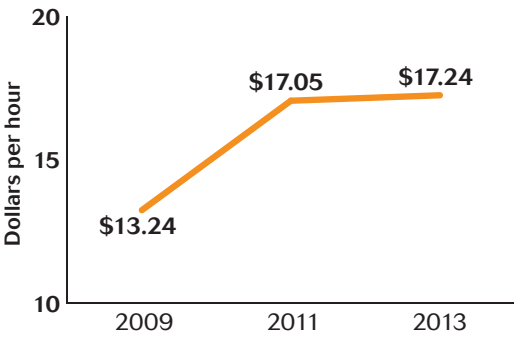
Since 2009, technicians paid by the hour have experienced a bump in pay, but pay for other team members has stayed stagnant, according to data from the 2014 *Firstline* Career Path Study. Here's a look at changes in team pay from 2009 to 2013.

What's your hourly wage?

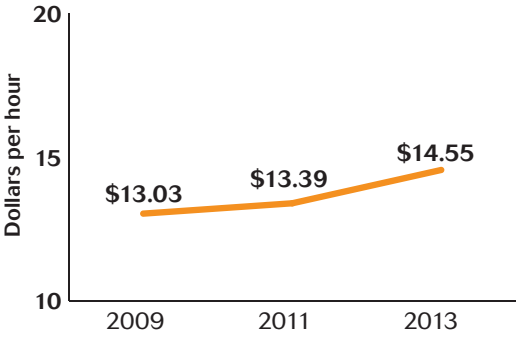
Practice manager/ office manager



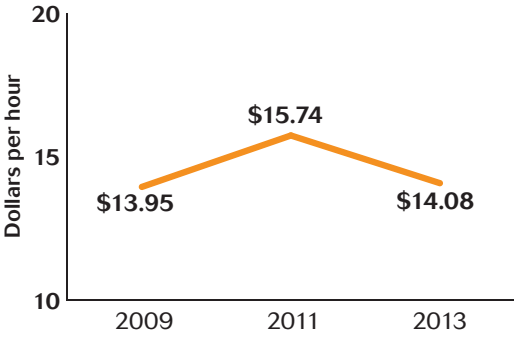
Credentialed veterinary technician



Receptionist



Veterinary assistant/ noncredentialed technician



Tough talk on team pay

Scan this code or head over to **dvm360.com/teampay** to see these dvm360.com editors discussing trends in team pay, including steps veterinarians and team members can take to work together, grow the practice and push team pay higher.

Salaried credentialed technicians made an average of

$34,750

in 2009. In 2013, they reported an average salary of

$36,625.

Sources: 2010 and 2012 *Firstline* Veterinary Team Trends Study, 2014 *Firstline* Career Path Study.

GETTY IMAGES

Veterinary Economics names Practice Manager of the Year

Inaugural winner receives award at CVC Kansas City. *By Katie James*

Shawn Gatesman of Heartland Veterinary Clinic in Harrisonburg, Virginia, has been named the 2014 *Veterinary Economics* Practice Manager of the Year. One of 10 nominees, Gatesman is the first to win the award, which was sponsored by Veterinary Pet Insurance and included a trip to CVC Kansas City, a monetary prize and a seat on the Editorial Advisory Board of *dvm360* sister magazine *Veterinary Economics* for one year.


Shawn Gatesman

Gatesman entered the contest but says he didn't expect to be chosen as the winner. "It's an honor to be selected out of a group of nominees who were all just as deserving as I was," he said at CVC Kansas City. "But I think this is an opportunity to focus on management from the top down."

In his entry Gatesman described how, while revamping his practice's dental services, he "departmentalized" his team, creating specialists in certain areas. "Not only have team members thrived," Gatesman says, "but the practice has seen marked increases in services production and a level of care to go right along with it."

Gatesman says those thriving team members were thrilled by news of his win. "My team came out and said, 'You really deserve this,'" he says. "And I said, 'No, I didn't, but thanks.'" **dvm360**

dvm360 Find it all here.

For more about Shawn Gatesman, head over to **dvm360.com/PMOY**. There you'll also find stories about the other nine final nominees.

Study: TNR reduces feline euthanasia, overpopulation

Shelter intakes also drop drastically during two-year Florida program. *By Julie Scheidegger*

Funded by a $250,000 grant from Maddie's Fund—a foundation dedicated to research and education to further "no kill" solutions—the University of Florida (UF) feline trap-neuter-return (TNR) program found that a targeted approach helped effectively manage the feral cat population and reduce shelter euthanasia rates in that area. While executing the program on a larger scale may be cost-prohibitive, study results show that at the community level the method was a success.

The two-year study was published in *The Veterinary Journal* and run by principal investigator Julie Levy, DVM, PhD, the Maddie"s Fund professor of shelter medicine at the UF College of Veterinary Medicine. The study focused TNR efforts in a region of Alachua County. The 5-square-mile area is adjacent to the UF campus and includes the downtown Gainesville business district, several residential neighborhoods, a mobile home park, two homeless shelters, industrial parks and a veterinary clinic. According to the UF release, the area has higher unemployment and poverty levels as well as lower household income and rates of home ownership than the county as a whole.

By performing a random-digit phone survey of the area, Levy and her team found that 11 percent of families fed an average of 4.3 unowned feral or stray cats each, usually on the property where they lived or worked. With data showing that feeding "community" cats was a common activity in the area, the team collaborated with residents to trap unowned cats for neutering. "We provided traps, carriers and free transportation to the clinic for the cats," Levy says. "Most of the cats were captured by residents, but our team also did some trapping when residents were not available or were unable to carry it out themselves."

The study neutered 2,366 stray and feral cats, estimated to be 54 percent of the feral cat population in that area. As a result, Levy reported a 70 percent decline of animal control cat intake from a baseline of 13 cats per 1,000 residents to four cats per 1,000 residents at the end of the study. Outside the target area, the county saw only a 13 percent decrease in animal control intake.

According to the study results, euthanasia declined 95 percent, from a baseline of eight cats per 1,000 residents to less than one per 1,000 residents. Euthanasia rates dropped 30 percent in the surrounding nontarget area.

In addition, Levy says the adoptions they saw during the program were as incredible as the results. "Adoption wasn't part of the original plan, but it happened organically as residents offered to take in kittens and the friendlier adults," she says. The study also noted that shelter intake of dogs declined in the targeted area as well. Levy's team spent time talking to community members about how to care for their animals and resources available for all their pets.

In all, 1,169 cats were returned to their colonies;,61 cats were relocated to other colonies, 308 cats were adopted in the target area, and 805 were transferred to pet rescue groups for adoption.

However, Levy admits that when the program began, cats didn't arrive in as large of numbers as the team had expected. "They were out there, but this is a community that doesn't take stray cats to a spay-neuter clinic," she says. Levy hired a neighborhood resident to knock on doors and find out what the community needed to participate.

"It's not enough for an agency like ours to just make services available. You must get into a community and talk to people to find out what they need," Levy says. "If we go in with the right resources and attitudes, we can save animals from animal control and from being euthanized.

"The animal welfare community as a whole has realized that we can't be solely shelter-centric," she continues. "The next step in our work is to connect with communities, find out their needs and how we can help."

Levy does acknowledge the financial limitations of expanding this approach to a larger area. "It's not realistic to provide this level of coverage throughout the community in an untargeted way. To expand what we did in the target area to the entire county would cost millions of dollars," she says. "But like all daunting problems, you bite off the greatest need and start there." **dvm360**

Veterinarians from the study are pictures performing spays and neuters on "community" cats from a targeted area in Gainesville, Fla.

> *"To expand what we did in the target area to the entire county would cost millions of dollars. But like all daunting problems, you bite off the greatest need and start there."*
>
> *—Julie Levy, DVM, PhD*

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New Appalachia veterinary school

> Continued from page 1

Ninety-five veterinary degree hopefuls wound their way this August through Appalachian valleys still hung with fog in the late morning to the opening ceremonies of the first class of the new veterinary college at Lincoln Memorial University (LMU) in Harrogate, Tennessee. LMU sits on high ground across Tennessee Highway 33, just above the pocket of hills bordering Tennessee, Kentucky and Virginia known as the Cumberland Gap. The campus—which President Abraham Lincoln ordered Gen. O. O. Howard to build for the people of Cumberland Gap who kept the Union Army supply route open during the Civil War—consists of four brick buildings on a square, known as The Quad, bounded by historic trees. This part of the campus first opened in 1897. But down the hill to the south rolls a campus of newly minted red brick buildings, dormitories, a field house and soccer and baseball fields, all scattered along seriously winding roads. The new veterinary school is, for now, located in a wing of the Math and Natural Science Building, carved out of the mountain in 2012 with the vision and sweat of the one-of-a-kind chairman of the university's board of trustees, O. V. "Pete" DeBusk.

When DeBusk tells you he built this building, he isn't speaking metaphorically. He really did build them with the help of his seven-man crew and his own small fleet of earth movers. "I've moved 3 million tons of dirt," he says, sweeping his hand across a partially leveled hillside where a yellow grader is parked. He's a man people will tell you is far more comfortable in the khakis and faded work shirt he keeps on a hanger in the back seat of his pickup than in the striped charcoal suit he is wearing this muggy morning in early August. "Truth is, I actually like the blue-collar life," he says.

He certainly grew up blue collar. He went to 13 schools to graduate high school. His family moved from coal mining town to coal mining town in Appalachia. He worked grueling hours each summer in mining camps. The education he received was spotty. But he could play basketball. "I *could* play some basketball," he says with a grin suggesting that at 72 years old he might still be a formidable challenge in one-on-one. In 1961, basketball helped him enroll at tiny Lincoln Memorial University.

When he graduated in 1965, DeBusk went into pharmaceutical sales, a green rookie. "But I was selling in this corner of the Appalachians, country I knew well," he says. "I was very successful."

He was also curious—and he knew how to figure things out. In his autobiography, *The Rabbit's Got the Gun*, he describes figuring out how to build a better boot for foot patients to wear, piecing it together in a rented warehouse from closed-cell rubber sanded to the right pitch and Velcro fasteners, then driving himself crazy trying to keep up with sales. In 1973 he patented the boot, the one you wear today after foot or ankle surgery. Other patents followed.

"Successful" barely describes the subsequent growth of DeRoyal Industries. Today, the private firm holds 70

patents, sells 25,000 different products in more than 70 countries and employs 2,000 people in the United States, Guatemala, the Dominican Republic, Costa Rica and Estonia.

Two weeks until opening day

With the opening ceremony for the new veterinary college at LMU two short weeks away, there is no earth left to be moved, but there is a lot left to finish. DeBusk is taking time out from supervising those final preparations at the DeBusk Veterinary Training Center—otherwise known as The Farm—to give a tour of the university where he has served as a board member for three decades and as chairman for 15 years. DeBusk works his way quickly from the bottom of the building to the top, opening doors on computer-friendly classrooms fitted with sophisticated audio-video equipment and spacious anatomy and surgical teaching labs.

But the smaller details are not lost. He points out the marble walls he acquired from a closed Baptist hospital in Knoxville, the positioning of restrooms away from classroom doors where traffic jams might otherwise occur, the placement of the building's physical plant in a separate area away from classrooms to muffle sound, and the spaces beyond the building where more development is possible. He comments on the value of sunlight to enhance student learning, the need for spaces to study with Internet and computer access, and the availability of all lecture and class sessions on the university's intranet system.

Back in the pickup, he circles the campus, tapping on the outside of the white Tundra door for emphasis talking about the 330 students on campus when he enrolled to the 4,000 students here today, 1,200 residential. "I think we could top out at 6,000," he says. "We own a thousand acres, everything in sight." The university plans to open a new building for the veterinary school in fall 2016 on a plateau DeBusk's crew has already begun to grade. Students and faculty will have a generous view of the rolling landscape south from the campus to the distant horizon.

From the plateau, he winds up the hill to the original campus, but decides against a hot walk up the sidewalk, instead turning sharply off the road and rambling up a grassy hill in the pickup. From here, the effect he's engineered on the campus is visually complete. His idea when he became chairman of the board of trustees was to turn the university in the direction of something he knew well: health sciences. "Coming out of the business world I could see we would have to reinvent ourselves," he says. "You could see the effect baby boomers were having. You could see where the jobs would be. We've had an indication for a long time healthcare would be challenged in this country."

DeBusk discusses the program at the DeBusk Veterinary Training Center—otherwise known as The Farm—where students will get hands-on training. Part of Lincoln Memorial's vision is to bring healthcare to underserved Appalachian communities.

So healthcare became a major emphasis of the new campus. The DeBusk College of Osteopathic Medicine was built in 2007 and graduated a class of more than 600 students last May. Then they added a physician's assistant program and a veterinary medical technology program. The nursing school grew to a current class of 840 students. The university budget went from $12 million when he became chair to $176 million today. "We run this like a business," he says. "And you drive a business by quality."

In their wheelhouse

Nearly six years ago he first asked the question, "Why not a small veterinary school?" After all, DeBusk had chosen Lincoln Memorial in 1961 precisely because that's where he could get the science and math courses he would need for veterinary school. He entered the University of Georgia veterinary school in 1963 before graduating from LMU. But after two years he decided his future wouldn't be as a veterinarian and returned to Lincoln Memorial to finish two classes and graduate with a bachelor's degree in 1965.

PHOTOS BY JOHN LOFFLIN

"Mountain kids never have a chance. We give 'em a chance here."
—Pete DeBusk, Lincoln Memorial University

He could also see the need in the profession, he says, for a veterinary medical school to serve rural Appalachian communities and to provide opportunities for Appalachian students. "Mountain kids never have a chance," he says. "We give 'em a chance here."

Although DeBusk thinks many of the students who enroll in the veterinary school will come from the surrounding mountains, he's also a businessman. To be economically feasible, the school will have to attract students from elsewhere. The largest concentration of students in the first class of 32 people came from Tennessee, Kentucky and Virginia, but most were from other parts of the country. "You just can't find enough students in Appalachia," DeBusk says. "The area is too sparsely populated. And the high schools are often not that good."

DeBusk says he asks new students in the osteopathic program each year to look at the person next them. At an Ivy League school, he tells them, that person would likely not be around for graduation—but that won't be the case at Lincoln Memorial. "We will work you to death. I'm just telling you right off. That's us," he vows. "But you *will* succeed. A little kindness goes far." He promises to deliver the same message to new classes of students in the veterinary college.

For undergraduates, the university has a cornerstone program of courses and mentoring to get at-risk students ready for college. A similar plan is available to some graduate students in the osteopathic program before admittance. They are fully admitted only when they pass the anatomy exam. But after passing they're required to become tutors for the next class. "Who do you think the best anatomy tutors usually are?" he asks.

Students aren't the only ones who have to prove themselves. The accreditation process was difficult for the new veterinary medical school. The university brought in a consultant to help write the self-study and other experts to complete the process. The university received a "letter of reasonable assurance" from the American Veterinary Medical Association Council on Education in July 2013. The next step will be to secure provisional accreditation this fall and full accreditation in 2018, before the initial class graduates.

These days many are raising tough questions about the number of veterinary graduates and the available jobs in the profession. Lincoln Memorial would not release its research on need compiled for the self-study, but in an email Dean Glen F. Hoffsis, DVM, MS, DACVIM, wrote, "What I can discuss are a couple of aspects that relate to veterinary supply. First, we are situated right in the epicenter of Appalachia, and part of the mission of LMU is to be of service to our region. So we have a mission. We have conducted demographic research on our multistate region to determine where there are underserved areas and to quantitate the magnitude of the need. In many regions the need is great. One of our initiatives will be to teach business and professional skills so that graduates will be better prepared to generate new business in the expanding animal health market."

700 acres of teaching space

Pete DeBusk is obviously anxious to get to The Farm, both to show it off and to check on progress toward opening day in two weeks. On Highway 58 into Virginia, he talks easily about life growing up in these parts. He tells the story of his hopped-up '52 Ford with the classic flathead engine and baby moon hubcaps on threadbare tires. "I had three flats along this road," he says, "in front of five of these farms. I own all five today."

This is the same road veterinary students will travel each day after their morning didactic classes on campus in Harrogate. The Farm is a 12-mile drive to the east, past mountains and buffalo herds, churches and farmhouses, crossing lanes such as Flying Pig Road.

The newly named DeBusk Veterinary Teaching Center comes up around the bend

>>> Top left: Jason Johnson and DeBusk check out the new paddocks in the equine classroom at The Farm.

>>> Top right: 81-inch TV screens installed near the ceiling will help students observe a technique before trying it themselves.

>>> Right: DeBusk donated all the land for The Farm, including the farmhouse shown here. The 700-acre site also includes a teaching center, a stable, a bovine clinical skills center and an equine teaching center.

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Please see Brief Summary on following page 10.

Reference: 1. Bravecto [prescribing information]. Summit, NJ: Merck Animal Health; 2014.

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The chemical name of fluralaner is (±)-4-[5-(3,5-dichlorophenyl)-5-(trifluoromethyl)-4,5-dihydroisoxazol-3-yl]-2-methyl-*N*-[2-oxo-2-(2,2,2-trifluoroethylamino) ethyl]benzamide.

Indications:
Bravecto kills adult fleas and is indicated for the treatment and prevention of flea infestations (*Ctenocephalides felis*) and the treatment and control of tick infestations [*Ixodes scapularis* (black-legged tick), *Dermacentor variabilis* (American dog tick), and *Rhipicephalus sanguineus* (brown dog tick)] for 12 weeks in dogs and puppies 6 months of age and older, and weighing 4.4 pounds or greater.

Bravecto is also indicated for the treatment and control of *Amblyomma americanum* (lone star tick) infestations for 8 weeks in dogs and puppies 6 months of age and older, and weighing 4.4 pounds or greater.

Dosage and Administration:
Bravecto should be administered orally as a single dose every 12 weeks according to the **Dosage Schedule** below to provide a minimum dose of 11.4 mg/lb (25 mg/kg) body weight.

Bravecto may be administered every 8 weeks in case of potential exposure to *Amblyomma americanum* ticks (See **EFFECTIVENESS**).

Bravecto should be administered with food.

Dosage Schedule

Body Weight Ranges (lb)	Fluralaner Content (mg)	Chews Administered
4.4 – 9.9	112.5	One
>9.9 – 22.0	250	One
>22.0 – 44.0	500	One
>44.0 – 88.0	1000	One
>88.0 – 123.0*	1400	One

*Dogs over 123.0 lb should be administered the appropriate combination of chews.

Treatment with Bravecto may begin at any time of the year and can continue year round without interruption.

Contraindications:
There are no known contraindications for the use of the product.

Warnings:
Not for human use. Keep this and all drugs out of the reach of children. Keep the product in the original packaging until use, in order to prevent children from getting direct access to the product. Do not eat, drink or smoke while handling the product. Wash hands thoroughly with soap and water immediately after use of the product.

Precautions:
Bravecto has not been shown to be effective for 12-weeks duration in puppies less than 6 months of age. Bravecto is not effective against *Amblyomma americanum* ticks beyond 8 weeks after dosing (See **EFFECTIVENESS**).

Adverse Reactions:
In a well-controlled U.S. field study, which included 294 dogs (224 dogs were administered Bravecto every 12 weeks and 70 dogs were administered an oral active control every 4 weeks and were provided with a tick collar); there were no serious adverse reactions. All potential adverse reactions were recorded in dogs treated with Bravecto over a 182-day period and in dogs treated with the active control over an 84-day period. The most frequently reported adverse reaction in dogs in the Bravecto and active control groups was vomiting.

Percentage of Dogs with Adverse Reactions in the Field Study

Adverse Reaction (AR)	Bravecto Group: Percentage of Dogs with the AR During the 182-Day Study (n=224 dogs)	Active Control Group: Percentage of Dogs with the AR During the 84-Day Study (n=70 dogs)
Vomiting	7.1	14.3
Decreased Appetite	6.7	0.0
Diarrhea	4.9	2.9
Lethargy	5.4	7.1
Polydipsia	1.8	4.3
Flatulence	1.3	0.0

In a well-controlled laboratory dose confirmation study, one dog developed edema and hyperemia of the upper lips within one hour of receiving Bravecto. The edema improved progressively through the day and had resolved without medical intervention by the next morning.

For technical assistance or to report a suspected adverse drug reaction, contact Merck Animal Health at 1-800-224-5318. Additional information can be found at www.bravecto.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.

Clinical Pharmacology:
Peak fluralaner concentrations are achieved between 2 hours and 3 days following oral administration, and the elimination half-life ranges between 9.3 to 16.2 days. Quantifiable drug concentrations can be measured (lower than necessary for effectiveness) through 112 days. Due to reduced drug bioavailability in the fasted state, fluralaner should be administered with food.

Mode of Action:
Fluralaner is for systemic use and belongs to the class of isoxazoline-substituted benzamide derivatives. Fluralaner is an inhibitor of the arthropod nervous system. The mode of action of fluralaner is the antagonism of the ligand-gated chloride channels (gamma-aminobutyric acid (GABA)-receptor and glutamate-receptor).

Effectiveness:
Bravecto began to kill fleas within two hours after administration in a well-controlled laboratory study. In a European laboratory study, Bravecto killed fleas and *Ixodes ricinus* ticks and reduced the numbers of live fleas and *Ixodes ricinus* ticks on dogs by > 98% within 12 hours for 12 weeks. In a well-controlled laboratory study, Bravecto demonstrated 100% effectiveness against adult fleas 48 hours post-infestation for 12 weeks. In well-controlled laboratory studies, Bravecto demonstrated ≥ 93% effectiveness against *Dermacentor variabilis*, *Ixodes scapularis* and *Rhipicephalus sanguineus* ticks 48 hours post-infestation for 12 weeks. Bravecto demonstrated ≥90% effectiveness against *Amblyomma americanum* 72 hours post-infestation for 8 weeks, but failed to demonstrate ≥90% effectiveness beyond 8 weeks.

In a well-controlled U.S. field study, a single dose of Bravecto reduced fleas by ≥ 99.7% for 12 weeks. Dogs with signs of flea allergy dermatitis showed improvement in erythema, alopecia, papules, scales, crusts, and excoriation as a direct result of eliminating flea infestations.

Palatability: In a well-controlled U.S. field study, which included 559 doses administered to 224 dogs, 80.7% of dogs voluntarily consumed Bravecto within 5 minutes, an additional 12.5% voluntarily consumed Bravecto within 5 minutes when offered with food, and 6.8% refused the dose or required forced administration.

Animal Safety:
Margin of Safety Study: In a margin of safety study, Bravecto was administered orally to 8- to 9-week-old puppies at 1, 3, and 5X the maximum label dose of 56 mg/kg at three, 8-week intervals. The dogs in the control group (0X) were untreated.

There were no clinically-relevant, treatment-related effects on physical examinations, body weights, food consumption, clinical pathology (hematology, clinical chemistries, coagulation tests, and urinalysis), gross pathology, histopathology, or organ weights. Diarrhea, mucoid and bloody feces were the most common observations in this study, occurring at a similar incidence in the treated and control groups. Five of the twelve treated dogs that experienced one or more of these signs did so within 6 hours of the first dosing. One dog in the 3X treatment group was observed to be dull, inappetant, with evidence of bloody diarrhea, vomiting, and weight loss beginning five days after the first treatment. One dog in the 1X treatment group vomited food 4 hours following the first treatment.

Reproductive Safety Study: Bravecto was administered orally to intact, reproductively-sound male and female Beagles at a dose of up to 168 mg/kg (equivalent to 3X the maximum label dose) on three to four occasions at 8-week intervals. The dogs in the control group (0X) were untreated.

There were no clinically-relevant, treatment-related effects on the body weights, food consumption, reproductive performance, semen analysis, litter data, gross necropsy (adult dogs) or histopathology findings (adult dogs and puppies). One adult treated dog suffered a seizure during the course of the study (46 days after the second treatment). Abnormal salivation was observed on 17 occasions: in six treated dogs (11 occasions) after dosing and four control dogs (6 occasions).

The following abnormalities were noted in 7 pups from 2 of the 10 dams in only the treated group during gross necropsy examination: limb deformity (4 pups), enlarged heart (2 pups), enlarged spleen (3 pups), and cleft palate (2 pups). During veterinary examination at Week 7, two pups from the control group had inguinal testicles, and two and four pups from the treated group had inguinal and cryptorchid testicles, respectively. No undescended testicles were observed at the time of necropsy (days 50 to 71).

In a well-controlled field study Bravecto was used concurrently with other medications, such as vaccines, anthelmintics, antibiotics, and steroids. No adverse reactions were observed from the concurrent use of Bravecto with other medications.

Storage Information:
Do not store above 86°F (30°C).

How Supplied:
Bravecto is available in five strengths (112.5, 250, 500, 1000, and 1400 mg fluralaner per chew). Each chew is packaged individually into aluminum foil blister packs sealed with a peelable paper backed foil lid stock. Product may be packaged in 1, 2, or 4 chews per package.

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on the left. DeBusk donated the land to the university along with the farmhouse out front. Black wooden fence stretches north from the highway along a curved lane to the brick porch. Behind, crews of workers are busy finishing up construction on four buildings. The main teaching building is 13,080 square feet with a brick front echoing the farmhouse and two long wings for teachers and students. Three other long buildings are to the east—a stable, a bovine clinical skills center and an equine teaching center.

Assistant Professor Jason Johnson, DVM, DACT, medical director for the teaching center, takes over the tour while DeBusk gets busy asking workers about their progress. Johnson points to classrooms, facilities for visiting professors, a secure pharmacy area, a clinical laboratory, showers and lockers for faculty, and a break room, lockers and showers for students.

Outside, he points out the pasture system to channel animals to the teaching unit; 30 horses, a herd of Angus and a recently purchased herd of Jerseys. A welding torch blazes in the stable where stalls are being modified. In the equine center a new set of paddocks specifically designed to solve problems Johnson identified in commercially available units have just arrived, fabricated in DeRoyal's plant and painted LMU blue.

Eighty-one-inch plasma TV screens are being tested in the equine teaching facility, mounted in the middle near the ceiling in a square like a scoreboard in a basketball arena. Students in surgery or anatomy classes or those learning proper exam techniques will be able to watch the professor's hands on those screens before tackling the job at their own stations.

Like DeBusk, Johnson anxiously asks each crew about the progress made thus far. The TV screens were recently moved closer to the ceiling for better visibility. Johnson refers to the 2011 North American Veterinary Medical Education Consortium (NAVMEC) report, the so-called "roadmap for veterinary medical education."

"One of the things NAVMEC challenges us to do in those five key points is to provide innovation in education," Johnson says. "That's really what Dr. DeBusk has done here through the osteopathic program. What we plan to do with this is educate career-ready

Dr. Glen Hoffsis, dean of the LMU veterinary school, was coaxed out of retirement by DeBusk.

veterinarians. We have the land. We have the resources. These students will be hitting out here doing clinical skills on day one."

Similar to the osteopathic program, the veterinary program will feature a distributive model for the students' final three semesters of clinical experience. Students will be assigned clinical work at other area facilities, including the Gluck Equine Research Center at the University of Kentucky Department of Veterinary Science, two hours away.

The distributive model has worked well for the osteopathic program. "We use a lot of rural hospitals for training sites," DeBusk says. "The students get to do five times the amount and variety of work as they would in a big hospital or a teaching hospital. Students want to go where the action is, not be in a static hospital where you have to stand on tiptoes to see what the doctor is doing."

Short retirement, then a start from scratch

Dean Hoffsis has embraced the distributive model, DeBusk says, bringing his own network of associates, colleagues and graduates accumulated across nearly a half century in veterinary medicine to provide clinical experience. DeBusk lured Hoffsis out of retirement to serve as the school's first dean after he consulted with the university on the accreditation process.

Hoffsis wasn't retired long. He stepped down as dean of the University of Florida College of Veterinary Medicine in July 2013, and exactly a year later he stepped in at Lincoln Memorial. Before Florida, he spent 11 years as dean at The Ohio State University College of Veterinary Medicine.

"After 18 years in administration, it was attractive to step outside and start from scratch," Hoffsis says. "There were things I thought could be done better." For example, he thinks more clinical work will better prepare veterinary students for practice as primary care doctors. The curriculum he's helped develop will immerse students in clinical experience in addition to lectures and demonstrations. Students will experience clinical work and work in the animal health center from the beginning, then complete their studies in clinical settings across the region and the country. And he embraces the move at Lincoln Memorial for a more cost-effective education so graduates aren't saddled with heavy debt. The university, he says, will be positioned at the lower end of nonresident tuition nationwide.

"What we have here is a low cost of living environment, a safe environment and a beautiful environment," Hoffsis says, his back to a window opening up on a hillside that appears close enough to touch. "Not many colleges are located next to a national park." Students at Lincoln Memorial hike trails starting on campus that lead into the Cumberland National Historical Park.

DeBusk played no small role in convincing Hoffsis to return to academic administration. Hoffsis puts it simply: "I heard his vision and I sampled some of his energy."

In early August, the dean was already composing the remarks he would make to the first class of students at the white coat ceremony in the Tex Turner Arena Aug. 15. Just 29 deans have welcomed an inaugural class to a veterinary school in America. And he plans to remind students they will be just the 30th inaugural class of veterinary students ever.

Pete DeBusk echoed the same idea. "I take great pleasure in growing this thing and growing this community," DeBusk says. "And veterinary medicine has a lot of opportunity in front of it. But they've got to think positive, not negative." **dvm360**

John Lofflin is a freelance writer based in Kansas City, Missouri.

University of Arizona moves forward with veterinary program

Program will begin in 2015 on private, not public funds.

The University of Arizona has received a $9 million grant from the Kemper and Ethel Marley Foundation that will allow a long-awaited proposed veterinary program to begin holding classes in fall 2015, according to a university release.

Previous attempts by the university to raise funds from the state had fallen flat, though in March 2014 the Senate did vote to give the university $2.5 millon to use as it saw fit. Shane Burgess, vice provost and dean of the College of Agriculture and Life Sciences at the university, said in June that the money would not be used to fund the veterinary program.

An American Veterinary Medical Association (AVMA) site visit occurred in January 2014, and the AVMA site visit for accreditation will take place soon. The Arizona Board of Regents was scheduled to consider the degree offering at its meeting last month.

The university promotes a year-round veterinary program that aims to allow students to complete their degrees faster and accumulate less debt. The final two semesters will be spent working in private veterinary practices, government agencies or other community partnerships to receive hands-on learning in communities around the state.

Other training partners will include federal and state animal health labs and regulators, U.S. Border Patrol and Homeland Security, and shelter or rescue agencies, the release states.

"Arizona students pay higher costs through non-resident or private tuition, incur more debt and often stay in, or seek employment with, the out-of-state veterinary practices and companies where they intern as part of the out-of-state education," Burgess says. "We need the smart and dedicated people we train to stay here. Arizona's hard-earned tax dollars need to promote Arizona's future."

While a teaching hospital is not in the plans at this time, facilities will be built, refurbished or renovated at satellite locations in Douglas, Yuma, Maricopa and Verde Valley. Students at those locations will be able to learn about U.S.-Mexico border health issues, rural medicine, food safety and the cattle and dairy industries, according to the release. dvm360

Classes begin at the other veterinary school in Arizona: Midwestern University

In the last week of August, 102 students started classes at Midwestern University's new College of Veterinary Medicine in Glendale, Arizona. Facilities at the school include a 78,000-square-foot classroom/laboratory building on the main campus, the Animal Health Institute (a 109,000-square-foot teaching clinic), and the on-campus Equine and Bovine Center, providing large animal education.

The veterinary students join other professional healthcare students at Midwestern in medicine, dentistry, optometry, pharmacy and other graduate-level health programs.

"Midwestern University has strategically planned for the opening of this new college for a number of years and is committed to providing a quality educational experience for our new veterinary students. [We] have looked forward to the inaugural class as they join the healthcare team ready to serve the needs of our community," says Kathleen H. Goeppinger, PhD, Midwestern's president and CEO, in a university release.

Here are some facts about Midwestern's veterinary class of 2015:

> 24 students in the class are from Arizona; 27 of the 50 U.S. states are represented.

> The majority of the class is female (88 of 102), which is consistent with other veterinary schools. The median student age is 24 years.

> Students expressing a preference cited 17 areas of career interest; the most popular were small animal primary care, specialty medicine and food animal/production medicine.

Midwestern University is a nonprofit graduate and professional school specializing in the health sciences with 10 colleges and two campuses: one in Illinois and one in Arizona. The school offers programs in osteopathic medicine, pharmacy, dentistry, optometry and now veterinary medicine. dvm360

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It's time to promote our profession to the public

I agree with some of the statements by each of the doctors and Mark Cushing in "Too many veterinarians?" in the September 2014 issue. I believe that we are seeing fewer client visits in our clinics because our profession and our professional associations have failed to inform the public of the value of veterinary medical care. We have not educated the consuming public of our formal training and education and that veterinary care is medicine, so it is extremely complicated and it requires professional expertise. Presently, the majority of the consuming public ranks us with groomers and pet store owners. For example, pet owners will have their dogs groomed consistently every three to four weeks all year long but are not receptive to invest about that same annual cost for a professional dental prophylaxis.

Presently, the majority of the consuming public ranks us with groomers and pet store owners. For example, pet owners will have their dogs groomed consistently every three to four weeks all year long but are not receptive to invest about that same annual cost for a professional dental prophylaxis.

I believe that the failure of our professional associations to become proactive in promoting our profession to the public is because most of our leaders have been in multidoctor practices in larger metropolitan areas or in academia. In larger metro areas, median incomes are higher and demographics indicate a higher percentage of "class A" and "class B" clients, while those of us practicing in areas of smaller populous and rural areas are serving a higher percentage of "class C, D and F" clients. We need to elevate our status in the eyes of the public with relentless public relations information.

I have numerous clients who are physicians and nurses in human medicine, and I am amazed at how naive they are regarding our capabilities and expertise. The public needs to be informed as to what it takes to become and continue to be a good veterinarian so that we are seen as true medical professionals with much more education, overhead costs and expertise than the pet store owner or their groomer.

Richard L. Goode, DVM
Pueblo, Colorado

Referring veterinarians and specialists should work together

I believe the referral specialist in the article "A not-so-special specialty referral" in the September 2014 issue should have contacted the referring veterinarian in advance as a courtesy to inform her of the client's request. However, I believe the referring veterinarian should have been willing to let the specialist remove the ulcerated mass on the leg since the owner requested it. This would avoid the patient having to have a second induction/general anesthesia in a short period of time and would have been in the best interest of the patient as well as the client. The referral practices that we have in our city value the relationship with the referral veterinary community and do not purposefully look to do more than what is asked for by the local practitioners. However, when a client has a reasonable request, especially when it may benefit the patient, I think it is reasonable to comply with the owner's wishes.

Sherry Knopp, DVM
Babcock Hills Veterinary Hospital
San Antonio, Texas

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Let's talk about the real problems in veterinary medicine

The article "Too many veterinarians?" in the September 2014 issue was an interesting article, but there are a few important topics missing. No one really identified the serious problem of drug and supply price increases. In the last two years we have had serious supply problems and 1,000- to 1,200-percent generic drug price increases.

I think the alleged oversupply of veterinarians is a myth so far. It is a convenient excuse for a poorly performing practice not adapting fast enough to the new veterinary medicine. For example, as a profession we are not educating clients to the need for wellness care in senior and geriatric patients. I blame myself and my staff for not seeing a senior cat for three years. If we did everything for each client's pet that we should we would all be overwhelmed with business. I think too many 15-minute appointments are contributing to this lack of client education too. We need to evolve ourselves to a pure service-based profession. The days of pumping vaccines and pushing drugs for profit are over. We need to stress prevention and wellness medicine as being more economical in the long run compared to the alternative expensive crisis management medicine.

The more frightening development over the last two decades is the heavy reliance of the veterinary schools accepting corporate funding to keep their doors open as government funding diminishes. For example, I would have to deprogram a new graduate on the entire concept of nutrition, as they are brainwashed in school from freshman year on. Entering students do not have the critical thinking skills or a knowledge base to defend themselves from this corporate influence. Corporations also control the research done at our schools in return for research grant monies. If a researcher publishes the wrong data, they are blacklisted and get no more grant money. This ends their research career. This is an unethical and amoral situation. It prostitutes our noble profession and sacrifices our profession's integrity for corporate profit.

Yes, we have problems in veterinary medicine but they are not what this article illustrates.

Ronald W. Gaskin, DVM
Main Street Veterinary Service
Shakopee, Minnesota

MEDICINE | Surgery STAT

An overview of **medicinal leeching**

Although it sounds like a treatment found in a history book—and it is—the application of leeches has well-defined and scientifically grounded modern uses, especially in helping to reduce surgical complications. *By Nicole J. Buote, DVM, DACVS*

In the 18th and 19th centuries, medicinal leeching was popular for treating a variety of human illnesses, including mental disorders, whooping cough, gout, tumors, headaches and obesity. A lack of documented success led to a sharp decline in the use of leeches in the 20th century—that is, until its application in managing a common postoperative complication of microvascular surgery became evident.

Biology

More than 700 species of leeches are known to exist, but *Hirudo medicinalis* is the leech most commonly used in the medical field. It is a segmented invertebrate that can reach up to 20 cm as an adult and is usually brownish green with a dorsal red stripe (*Figure 1*). Leeches have a large sucker on their caudal end, which is used for crawling and attachment. The cephalad sucker is smaller and tapered and used for feeding. The mouths of these leeches consist of a tripartite jaw, which creates the typical star or Y-shaped bite, with 60 to 100 teeth total, and each mouth has its own secretory opening.

Sanguivorous leeches can store blood inside their bodies for months, and symbiotic bacteria—*Aeromonas* species located in the gut—secrete enzymes that help break down the components of blood. There are at least 100 bioactive compounds in leech saliva.[1] The most commonly found is hirudin, which is responsible for inhibiting thrombin and thus gives the saliva its anticoagulant power. The leeching process is minimally invasive and pain-free because of an anesthetic, histamine-like substance that is found in leech saliva.

Each leech can remove about 5 to 10 ml of blood per feeding, and each site will continue to ooze blood for an additional 24 to 48 hours after detachment, allowing for an additional blood meal (5 to 10 ml) to be lost. An experimental study in pigs found that 90 percent of passive bleeding after detachment occurs within five hours.[2]

>>> Figure 1. *Hirudo medicinalis,* the leech most commonly used in medicinal leeching, is a segmented invertebrate that can reach 20 cm in length and is usually brownish green with a dorsal red stripe.

PHOTOS COURTESY OF NICOLE J. BUOTE, DVM, DAVCS

Clinical uses in human medicine

Medicinal leeching can be used to reduce complications of microvascular (*e.g.,* replantation) or reconstructive surgeries (*e.g.,* skin flaps), to decrease postoperative swelling from damaged venous structures, and to drain hematomas. Nontraditional uses of medicinal leeching include helping in the treatment of osteoarthritis, otitis media and compartment syndrome. The efficacy of leeches in salvaging flaps in human surgical patients has been widely proved, with some studies quantifiably illustrating increased blood flow throughout the leech-treated flap.[3] The mechanism behind this process is thought to be a combination of relieving obstruction and capillary pressure and of increasing microcirculation because of vasoactive compounds injected by the leech.

The most common complication with microvascular surgeries is venous congestion or thrombosis after microvascular anastomosis. Venous congestion can occur any time there is an imbalance between arterial inflow

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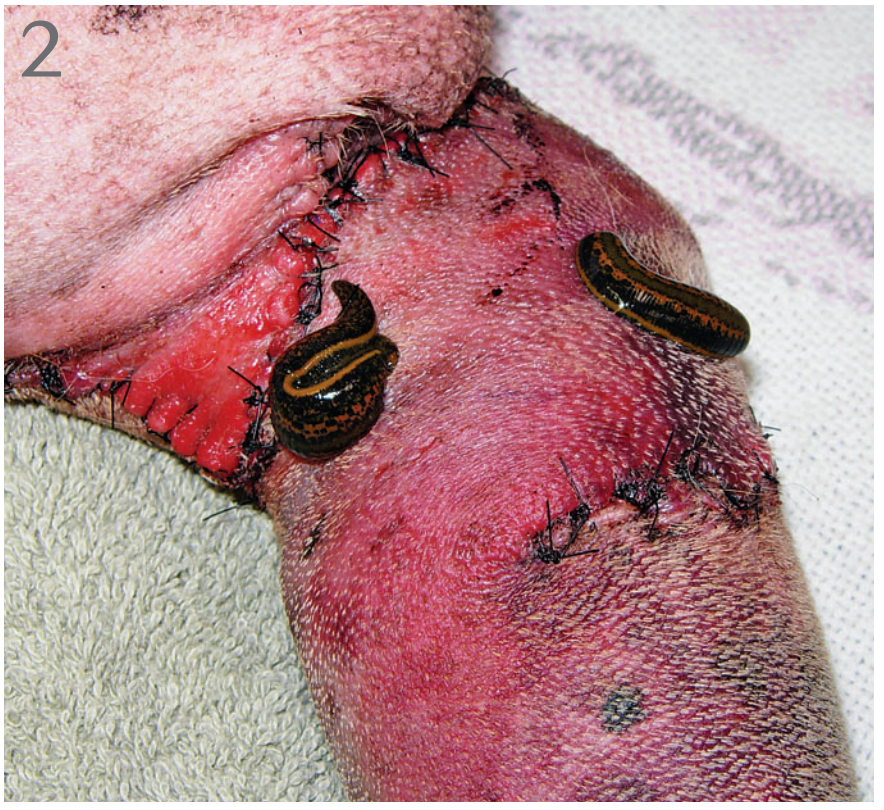
>>>Figures 2 and 3. Venous congestion leads to classic physical signs such as a bluish color, edema, brisk capillary return and warmth in the tissue.



and venous outflow, which results in stasis of the blood in the affected area. Decreases in venous outflow can occur with constrictive wounds because of damage to venous structures during interventional radiography procedures or during reconstruction or replantation procedures because of the thin walls of the low capacitance veins, which are easily collapsed or torn. That results in decreased tissue perfusion, which can cause local hypoxia, acidosis, arterial thrombus formation and tissue necrosis. Venous congestion leads to classic physical signs such as a bluish color, edema, brisk capillary return and warmth in the tissue (*Figures 2* and *3*). Venous congestion is so common in the surgical replantation of auricles that it is considered by some to be an accompanying symptom rather than a complication.

Medicinal leech therapy helps remove venous blood, which reduces the capillary filling pressure, so that damaged veins have time to recover and arterial capillary beds can reperfuse. Leech therapy is especially helpful with auricular replantation because of the challenging aspect of finding and reconnecting vessels of this size and the risk of damage to vessels during attempts at anastomosis. This difficulty is mirrored in many veterinary reconstructive techniques, as microvascular surgical techniques can be extremely difficult if not impossible in small animals.

Clinical uses in veterinary medicine

In veterinary medicine, there is one case report describing the use of leeches in treating polycythemia vera in a cat. Another case report describes using leeches in the treatment of a constrictive wound in a cat.[4,5] The more recent case report also includes a detailed description of the biology of leeches, their clinical uses and application recommendations in small animals. (*Editor's note: To see how medicinal leeching helped one cat, see the sidebar "Leech application to treat toe swelling in a cat" on page M3. And for a guide to leeching, see "Medicinal leeching: Application, monitoring, complications" on page M4.*)

Conclusion

Medicinal leech therapy should be considered an exciting new tool in your medical toolbox for use with challenging wound management and reconstructive surgeries. No complications were seen with this therapy in our patient, but specific recommendations regarding the handling of leeches, monitoring during leeching and patient management after leeching should be followed. Specifically, prophylactic antibiotics must be instituted, and depending on the number and length of leeching treatments, blood transfusions should be expected. dvm360

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Dr. Buote was awarded Diplomate status in the American College of Veterinary Surgeons in 2010 after completing a residency at the Animal Medical Center in New York City. She is a published author on the subject of laparoscopy and heads the Minimally Invasive department at VCA California Animal Hospital Veterinary Specialty Group in Los Angeles, California.

Leech application to treat toe swelling in a cat

A 1-year-old castrated male domestic shorthaired cat was presented to a veterinary clinic for evaluation of acute nonweight-bearing left hindlimb lameness from an unknown trauma. The cat was an indoor-outdoor pet with no other health problems reported by the owner and was receiving no medications.

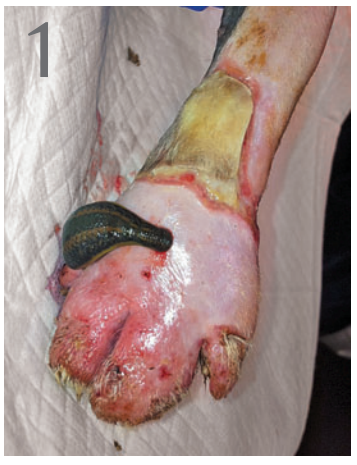
On physical examination, no abnormalities were noted except for left pelvic limb crepitus and swelling over the distal tibia. Radiographs of the limb showed a closed, long, oblique, mid-diaphyseal tibial and fibular fracture. The limb was placed in a bivalve cast, and the patient was sent home with pain medication.

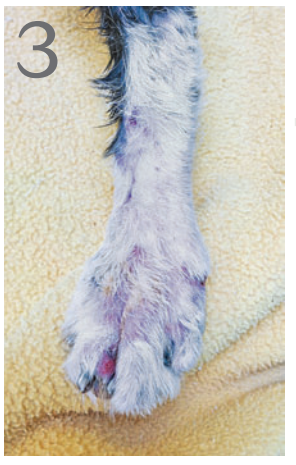
At a cast change about two weeks after the placement of the cast, irritation was noted on the lateral aspect of the tarsus where the tape stirrup was placed. The full cast was replaced, and the owner was told to bring the patient back in two weeks.

Four days later, the owner noticed blood and swelling of the toes and brought the patient in for an evaluation. The patient was sedated, and the cast was removed. There was now medial and lateral skin irritation under the tape stirrups, and all of the digits were swollen, erythematous and oozing a serosanguinous fluid through the skin. No obvious skin wounds were present, so the cast was replaced. The fracture was palpated, and a callus was present.

The next day the patient returned because of swelling of the toes and pain on ambulation. The cast and padding were removed, and partial-thickness abrasions were noted with severe swelling of the digits. The owners reported that the patient had not been using the limb since the third cast change and now was not even getting up. On physical examination, the patient was febrile (104 F [40 C]), growling and exhibiting pain on palpation of the limb. The patient refused to ambulate but had motor function in all four limbs. The entire paw was so swollen that the nail beds were not visible.

There was moderate serosanguinous discharge within the cast padding and partial-thickness wounds along the dorsal and ventral paw and white discolored skin laterally and medially with clear demarcation of healthy vs. unhealthy tissue. There was normal sensation to the paw. The paw was clipped and cleaned with chlorhexidine and sterile saline solution, the partial-thickness wounds were gently débrided and a soft padded bandage with a splint was placed. Twice-daily bandage changes were done the next day, and the patient was discharged with the same antibiotics and pain medication as before.





>>>Figure 1. Two leeches were applied to the dorsal surface of the cat's paw. They fed until they detached spontaneously.
>>>Figure 2. Leech application was performed daily on the cat for the next four days, and the patient's paw size reduced dramatically.
>>>Figure 3. Nine weeks after the initial injury, the cat had full use of its limb. No complications from the leeching procedure were identified.

The cat underwent bandage changes every two days for the next six days. On the sixth day, the wound was found to be a full-thickness, 360-degree skin wound of the distal metatarsal tarsal region with severe swelling of the toes, most likely from constriction from the bandage. The paw still had good motor function and sensation, and the tibial fracture site palpated stable with moderate callus. Because the paw swelling had not resolved even after débridement of the constrictive wound and compressive bandages, the differential diagnosis at this time was venous stasis from the constrictive wound rather than interstitial edema.

A decision was made to try therapeutic leeching because treatments for interstitial edema had failed, and leeching is a well-known treatment for venous stasis in people. The mechanism behind the leeching process and potential complications were explained to the owners, and they consented.

The patient was sedated with dexmedetomidine and buprenorphine. Any remaining questionable tissue was débrided, and the paw was cleaned and dried. Two leeches were applied to the dorsal surface of the paw (*Figure 1*), and they fed until they detached spontaneously. A temporary soft-padded bandage was applied to absorb residual oozing, and then a new soft-padded bandage with a splint was applied two hours later. Leech application was performed daily for the next four days, and the patient's paw size reduced dramatically (*Figure 2*). The patient's limb became weight-bearing after two days of the leeching treatment.

The patient received antibiotics (13.75 mg/kg amoxicillin-clavulanic acid orally b.i.d.) for two weeks. With the leech treatment, bandage changes continued every two to seven days for another two weeks until the wound was healed. The splint was then removed, and a soft-padded bandage was applied for another two weeks until radiography showed adequate healing of the tibial and fibular fracture (nine weeks after the original injury). At that time, the patient had full use of its limb, and no complications from the leeching procedure were identified (*Figure 3*).

Medicinal leeching: Application, monitoring, complications

It is important to correctly discern which patients would benefit from medicinal leech therapy. Edema or cellulitis is not an indication for leech therapy, nor is arterial insufficiency, which is indicated by pale, turgid, cold tissue with a prolonged capillary refill time. Venous congestion is the best indication for leech therapy. The tissue will appear purple (*Figure 1*) and will be engorged and warm. Scarce dark blood will come from pricks to the tissue, and the capillary refill time will be brisk. In human medicine, medicinal leech therapy is contraindicated in immunocompromised patients, patients with bleeding disorders and patients who refuse blood transfusions.

Placing the leeches

First, prepare the site by washing it with gentle soap—we use a chlorhexidine scrub—and rinsing it with saline solution. If there is any soap residue, the leeches will not feed. Leeches are most likely to feed at skin temperatures between 91.4 F and 104 F (33 C and 40 C), so the patient should be in a warm room and the affected area wrapped lightly in gauze or a blanket.

Grasp the leech with smooth or nontraumatic forceps and place it on the proposed site. To keep the leech at the site and encourage feeding, you can place the leech inside a syringe casing, with the open end inverted onto the skin and held in place until attachment occurs. The head of the leech is the smaller end and usually attaches first (*Figure 2*). Generally, the leech's caudal end will attach nearby, creating a *U* shape (*Figure 3*). You can also encourage feeding by placing a drop of dextrose or glucose at the site or by pricking the skin with a sterile needle so a drop of blood is present. Place enough leeches to allow for full coverage of the congested area. A study using laser Doppler has shown that one leech can decongest and increase perfusion in about a 2-cm-square area, which corresponded with the return to normal skin color.[1]

Monitoring during leeching

Leech migration can occur during or after feeding, especially because it is a leech's instinct to hide after a meal. Monitor patients carefully during therapy to ensure that leeches do not travel into open wounds, incisions or healthy tissue. When the leeches are full, they will detach. Never forcibly detach a leech, as teeth may be left behind and become a source of infection.

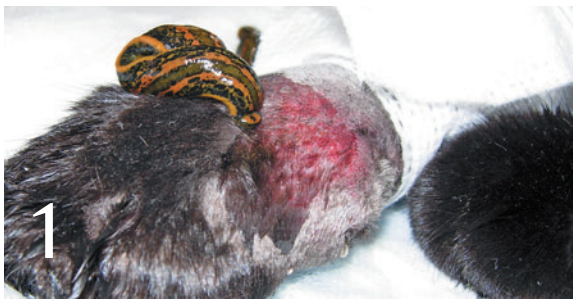
If a leech must be removed before it is done feeding, place a small amount of isopropyl alcohol, saline solution or vinegar on a cotton swab and stroke the leech's head. Applying too much may cause regurgitation of the blood into the bite site, increasing the risk of infection, so apply sparingly. Leeching can take from 20 to 120 minutes. The decongestion is usually appreciated quickly after application, with improvement in tissue color and texture and capillary refill time.

After leeching

When the leeches are satiated, they will detach spontaneously. One leech may extract 5 to 15 ml of blood during the active phase, but the passive oozing after detachment may yield a similar volume. In my experience, applying a soft-padded bandage to the limbs allows for adequate passive bleeding without creating a mess. New leeches are applied when the passive bleeding stops, and the cycle continues until revascularization is confirmed visually (improved color). In human studies, this means leech application may occur every one to eight hours for days to weeks.

Because of the identified time frame for inosculation and peripheral neovascularization of a flap, which can begin as early as three days and would ultimately contribute to appropriate venous outflow for flap survival, the recommended length for medicinal leech therapy is seven to 10 days after surgery. As long as there is evidence of venous congestion between leech applications, therapy should continue.

After use, destroy the leeches by placing them in a 70 percent alcohol solution. Placing the leech in a cup with a screw-on lid will decrease the risk of contamination, as the leech will often regurgitate the blood meal during death. After death, treat the leech as biohazardous waste. Leeches are not reused on a patient because usually a leech will not want to feed again for weeks. Never reuse a leech on a different patient for obvious disease contamination prevention reasons.



>>>Figure 1. Leech application in a patient with venous congestion.
>>>Figure 2. A leech's head attaches first.
>>>Figure 3. The caudal end often attaches near the head.

In human medicine, laboratory testing (complete blood count, prothrombin time, activated partial thromboplastin time) and vital parameter monitoring (heart rate, respiratory rate, capillary refill time) are performed before, during and after leech therapy because of the high incidence of required transfusions. In veterinary medicine, assessing a patient's packed cell volume and total protein concentration before and after treatment would be a minimal database, but consider more aggressive monitoring depending on the number of leeches used and the proposed time frame. Objective criteria such as the leech's weight before and after feeding should be considered if concerns about blood loss exist or the client has financial concerns.

Prophylactic antibiotics are recommended in human and veterinary medicine. Appropriate antibiotic prophylaxis (*e.g.,* fluoroquinolones) has demonstrated a significant decrease in the chance of infection from the leech, length of hospital stay and potential loss of flap or injured tissue. In some reviews, double coverage (fluoroquinolones and third-generation cephalosporins or aminoglycosides) during therapy and single coverage (fluoroquinolones only) for two weeks after the leeching is reported for better control.[2-4]

The most commonly mentioned antibiotic class is fluoroquinolones because of the sensitivity of *Aeromonas hydrophila* to the class, but recent reports have shown resistant strains of bacteria, leading to complications after leeching.[3-5] Multiple other bacteria have been reported.[2,5,6] Whenever an infection is diagnosed after a leeching, obtain appropriate cultures and add a second antibiotic. Recommended choices would be third-generation cephalosporins, aminoglycosides, tetracyclines or trimethoprim.

Complications

The major complication cited for leech therapy is infection with leech gut bacteria or surface bacterial flora. The reported incidence of infection ranges from 2 to 36 percent in human medicine. Infection has been negatively associated with flap survival in many reports and leads to longer hospital stays and greater costs. Other complications include local hypersensitivity reactions to the saliva, anaphylaxis, blood loss, migration of the leech to healthy tissue, scarring from the bite, pain, psychosis and prerenal azotemia.[2,6-9]

The need for blood transfusion during or after leeching therapy depends on the number of leeches used and the length of time the leeching is performed. For small replantations or venous congestion that clears rapidly, blood loss may be minimal, but up to 13 blood transfusions have been necessary for certain human patients.[6,10,11] Other reports illustrate that an average of two to six blood transfusions are needed in 50 to 57 percent of patients.[6,10,11] In my experience, blood transfusions are rarely needed in veterinary patients. That is due to the stark difference in the number of leeches used (far fewer) and the number of leeching sessions (also fewer) commonly needed in veterinary patients. dvm360

View the references for this article at **dvm360.com/leechrefs**.

BOOSTING *canine cognition*

Researchers explore the link between nutritional intervention and behavioral enrichment to ward off cognitive decline in aging dogs. *By Ed Kane, PhD*

Aging dogs demonstrate cognitive impairments and neuropathology that closely model human aging, dementia and Alzheimer's disease, says Bill Milgram, PhD, professor emeritus at the University of Toronto's Department of Pharmacology and cofounder of CanCog Technologies in Toronto.[1-4]

"Most dramatically, older dogs lose their ability to learn, and the more difficult the task, the greater the impairment," Milgram says. "The ability to learn a complex problem deteriorates in dogs before they lose their ability to remember. These changes may not be readily apparent to pet owners or veterinarians, who may simply see signs of confusion and forgetfulness."

Another sign of cognitive impairment is a deficit in executive function, such as decision-making, planning and organizing behavior. A good test for this decline is "reversal" learning, in which a dog is first trained to respond to one object and to avoid another, and then, after the dog has reliably learned the correct responses, the trainer changes the rules. When the first response is no longer correct, the dog has to make a different decision. Aged dogs learn reversal learning more slowly than young dogs.

Compared with younger dogs, older dogs are also deficient in complex discrimination learning, visuospatial learning, memory and allocentric spatial function. They also experience age-related decline in higher-order cognitive abilities. Older dogs commit more errors doing behavioral tasks, require a longer training period and show reduced memory capacity.[2-4]

To identify the benchmarks of canine cognitive decline, veterinarians typically use various behavioral tests, or neuropsychological tests, similar in design to those used to study aging in primates and humans.

Although the exact cause of cognitive decline is unknown, older dogs' brains do offer some clues. Researchers have observed such changes as increased markers of oxidative stress, reduced brain mass, reduction of cerebral volume, alteration of cerebral vasculature, increased ventricular size, meningeal calcification, demyelination, glial changes, a reduction in neurons, neuroaxonal degeneration and an increase in apoptotic bodies and deposition of amyloid-beta plaque.[1-4]

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Putting memory to the test

The delayed non-matching-to-position task can help assess a dog's ability to learn and remember.

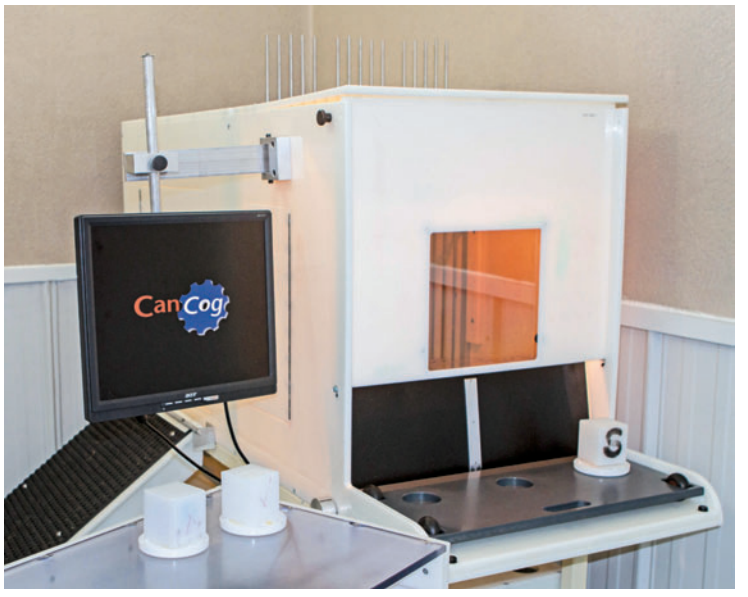
The delayed non-matching-to-position (DNMP) task is a test specifically developed for use in dogs to assess spatial learning, says Bill Milgram, PhD, co-founder of CanCog Technologies in Toronto.

"We wanted to develop a test that requires the dog to learn to respond to a specific location and hold that information in memory," Milgram says. "Human patients with Alzheimer's disease, for example, may totally lose the ability to function spatially, which is commonly seen when they go for a walk, get lost and can't find their way home."

For the DNMP task, an animal enters a testing box (Figure 1) with three food wells positioned outside the box opening: one to the center, one to the left and one to the right. "In the first phase, we present a food reward in one of the food wells, and we cover that reward with an object covering the food well, thus hiding the food," says Milgram. "What the animal has to do is remember where the object was when they received the reward—right, left or center.

"On the second phase of the task, we now test the animal with two identical objects, one at the first location and the second object at a new location," continues Milgram. "In order for the animal to get rewarded during the second trial, they have to respond to the new location—the location that was different from the location in the first phase. The objects used in the second phase are identical to those used in the first."

There are two skills involved in completing the task. First, the animal responds to the new location, which assesses learning. Once the animal has completed the learning portion and knows to select the opposite location during the second phase, researchers can test memory. For example, they will present a single object that the dog must remember to choose the opposite location of during the second phase and wait a variable length of time before presenting the object pair. Some animals can hold the information in memory for only a short time (for example, 20 seconds). Other animals can perform accurately with a memory interval of as long as five minutes.



>>> Figure1. Cognitive test apparatus used in testing dogs' performance on the delayed non-matching-to-position task.

"We can therefore use the DNMP task to look at learning and memory. And it's a beautiful test to look at changes in learning ability with increased age," Milgram says. "As dogs age they perform more and more poorly on this task, which is essentially a 'biomarker' of age. The older the dog, the slower they learn it, while young dogs can learn very rapidly."

Similarly, as dogs age they are more likely to fail or perform poorly in the memory portion of the test. "We can then look at modifiers of memory, including diet or various drugs, to see how they enhance their ability to complete the DNMP task," Milgram states. "For older dogs, as the time is prolonged, their memory is impaired and their ability to properly complete the DNMP task deteriorates sharply. As a basic example, we might assume that while younger dogs can remember where they live and be able to return home from a distance, we would also assume that older dogs would likely become lost like an Alzheimer's patient."

Canine cognitive dysfunction syndrome

Some dogs also experience an aging syndrome called cognitive dysfunction syndrome (CDS), which is typically characterized by the emergence of a specific set of behavioral signs. Those signs can include inappropriate housesoiling, alterations in activity levels, reduced interaction with family members or other pets, alterations in sleep-wake cycles, changes in learned behaviors, disorientation and wandering. Diagnosing CDS in dogs is difficult because it is primarily dependent on the pet owner reporting the appropriate signs.[4,5]

"CDS is different from the type of cognitive-neurophysiological testing that we've done, looking at cognitive decline in dogs," Milgram says. "They're not the same thing. Canine CDS encompasses a range of different functions, not all of which are aspects of cognition. For example, decreased behavioral activity is considered to be a sign of CDS. While activity generally does decrease with age, some of our cognitively impaired animals actually become more active, yet they are showing other signs of cognitive impairment. That's one example of how the two conditions would differ."

Correlates of cognitive decline

Recent studies using the anticholinergic drug scopolamine and the novel acetylcholinesterase inhibitor phenserine suggest some cholinergic involvement in cognitive decline. Aged dogs were found to be more sensitive to the impairing effects of scopolamine than young dogs, suggesting a decrease in cholinergic tone with increasing age.

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Dogs administered phenserine showed improved learning and memory. It was shown that cholinergic decline could result in memory impairment, but this may be secondary to deficits in attention or encoding of new information.[1]

Other studies have assessed various interventions to combat mental impairment. A study in aging beagle dogs, for example, used two interventions: 1) dietary fortification with a broad spectrum of antioxidants and mitochondrial cofactors and 2) a program of behavioral enrichment that included cognitive enrichment, environmental enrichment and extra programmed exercise.[3]

The mixture of antioxidants included dl-alpha tocopheryl acetate (100 vs. 1,000 ppm), L-carnitine (< 20 ppm vs. ~250 ppm), dl-alpha-lipoic acid (<20 ppm vs. ~120 ppm), ascorbic acid (< 30 ppm vs. ~80 ppm), and 1 percent inclusions of each of the following (one-to-one exchange for corn): spinach flakes, tomato pumice, grape pumice, carrot granules and citrus pulp. The three-year study compared young and old dogs receiving the two diets.

Researchers hypothesized that dietary intervention could help combat free radicals and the effect of oxidative stress on the aging brain. The free radical theory of aging associates age-dependent neuropathology with reactive oxygen species formed as by-products of cellular metabolism. Enhanced levels of oxidative damage are observed in both neurodegenerative diseases and in the normal aging canine brain.[3]

Researchers concluded that "age-related cognitive decline in dogs can be partially ameliorated by a combination of maintenance on an antioxidant-fortified food or a program of behavior enrichment, though the combination of the two proved to be more effective than either alone."[3]

An additional study used a different antioxidant "cocktail," a proprietary nutraceutical supplement (Senilife, Milan, Italy). The supplement was administered as one capsule/5 kg BW/day for a 60-day wash-in, and during an additional 10 days of testing. Each capsule contained 25 mg phosphatidylserine, 50 mg *Ginkgo biloba* extract (titrated in ginkosides, 24 percent), 20.5 mg pyridoxine, and 33.5 mg dl-alpha tocopheryl acetate (natural vitamin E).[4]

The results showed that this blend of antioxidants improved canine short-term memory performance when assessed by a delayed-nonmatching-to-position task (*see sidebar "Putting memory to the test" on page M6*). This same antioxidant also has been shown to improve clinical signs of CDS.[4]

In another dietary intervention study, Milgram and collaborators examined the cognitive effects of supplementation with 5.5 percent medium chain triglycerides (MCTs) over eight months on healthy aged dogs.[6] MCTs provide an alternative energy source to the brain as ketones vs. glucose. This study found significantly improved performance in the group receiving the MCT supplement on age-related cognitive function as measured by sequential landmark discrimination learning ability, egocentric visuospatial function and focused attention.[6]

While antioxidants may be beneficial, they're not the "cure" for aging—at least, not yet.

"We also found that dogs consuming MCTs showed elevated blood levels of beta-hydroxybutryate, a ketone, which probably accounts for the observed benefit, as ketones can provide a source of brain energy distinct from the more 'normal' source of energy from glucose metabolism," Milgram says. This fits with a large body of evidence indicating that aging is associated with reduced supply of energy to the brain, partly because of changes in blood flow.

"From the work that we've done, antioxidants alone are not really 'huge' as far as cognition is concerned," Milgram notes. "Alone, antioxidants did not have a big impact, but when dogs had both antioxidants and behavioral enrichment, they did better."

The take-home message from these studies? While antioxidants may be beneficial, they're not the "cure" for aging—at least not yet, says Milgram. "This is a really complicated area, and there are many different kinds of antioxidants and many different pathways where antioxidants can act," he says. "Moreover, some combinations of antioxidants might be more harmful than helpful. This is an area that still requires quite a bit of research. I think supplementation of diet high in antioxidants should be done, but don't expect it to be a magic bullet."

Conclusion

Although further studies are needed, nutritional interventions that reduce the development of brain pathology may have important benefits for aged pet dogs, though environmental enrichment has shown to play a significant role. Similar benefits are shown for aging humans. "The dog may well be the best of all possible animal models for human cognitive aging," Milgram says. **dvm360**

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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.

EQUINE | Imaging

MAKING THE MOST OF equine arthroscopy

Equine arthroscopy is commonly used to manage problems in carpal joints, hocks and stifles. But what about managing a tear in a flexor tendon or navicular bursa? Get your money's worth out of this instrument—and provide optimal patient care—by giving some less conventional uses a try. *By Ed Kane, PhD*

While arthroscopy is often used for stifles, carpal joints, hocks and fetlocks, Carter Judy, DVM, DACVS, of Alamo Pintado Equine Medical Center in Los Olivos, California, thinks equine veterinarians should consider inserting the arthroscope in other locations they might not as readily consider, such as tendon sheaths and navicular bursae.

"Practitioners might think that certain locations are inaccessible or not amenable to such procedures, but they are," Judy says. These procedures have been well-documented, and a number of new indications for arthroscopic surgery have been reported. Many of these procedures have been updated in recent editions of the textbook *Diagnostic and Surgical Arthroscopy in the Horse*.[1,2]

>>> Getting horses back on their feet: Arthroscopy is a good noninvasive tool for diagnosing and treating many equine orthopedic conditions.

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NEWS **E5**
Cornell Ruffian Equine Facility reopens on Long Island

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Equine veterinary news, medicine and business

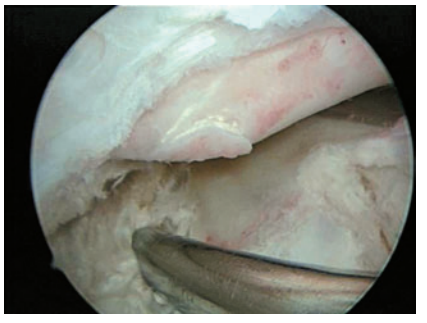
Arthroscopy is a simple procedure and can be used with fairly minimal complication. It also provides a way to more accurately diagnose and subsequently treat some problems not thought to be treatable with this technique in the past.

"Some people might say going into a navicular bursa with a scope might be a concern," Judy says. "It's a small location, and using such a procedure may cause more damage. That's not necessarily so. It's been found to be useful there. Depending on the condition or injury, arthroscopy needs to be selected when it's appropriate."

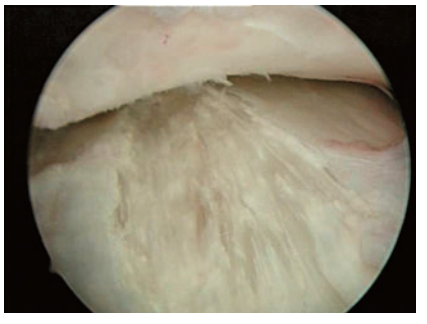
Arthroscopy of small joints

C. Wayne McIlwraith, BVSc, PhD, FRCVS, DSc, DACVS, DECVS, DACVSMR, a University Distinguished Professor and director of the Orthopaedic Research Center at Colorado State University, College of Veterinary Medicine and Biomedical Sciences and the author of *Diagnostic and Surgical Arthroscopy in the Horse*, describes some of the difficulties of small joint arthroscopy and some of the ways it differs from arthroscopy of large joints:

- The exact anatomic positioning of the arthroscope and instrument portals is important in all small joints.
- Limited distention in small joints results in a limited field of view.
- Limited distention and mobility in small joints leads to difficulties in orientation.
- The tip of the arthroscope and the tips of instruments are close together and close to the tissue being operated on.
- The tip of the arthroscope is always close to the tip of the hand instruments, which increases the risk of lens damage.
- Diagnostic inspection of a small joint is done mainly by lateral movement and rotation of the telescope rather than by inserting and withdrawing the arthroscope as in larger joints.
- Re-arthroscopy is almost always performed through the same initial portals.
- It is a delicate surgery with delicate surgical equipment. Equipment breakage or equipment failure can potentially result in irretrievable loss of foreign bodies.[1]



>>>Figure 1. Tearing of deep digital flexor (DDF) tendon within the navicular bursa using the arthroscopic approach from the digital sheath and through the T ligament.



>>> Figure 2. After débridement of the torn fibers in the DDF tendon.

Tendon sheaths

Arthroscopic technique can be used to diagnose and treat problems in tendon sheaths and is particularly useful in managing an undiagnosed flexor tendon tear.

"A particular horse had a tendon sheath effusion that was problematic for a very long time," Judy says. "There were suspicions that it had tendon sheath adhesions. The referring veterinarian passed it to us because he wanted us to débride the adhesions. In reality, once I got in there [with the arthroscope], I was able to find a fairly significant tear of the deep flexor tendon. So the procedure was not only useful in treatment, but it produced a more accurate diagnosis. We were able to deal with the sheath tear appropriately."

Similarly, arthroscopy can be helpful for a variety of tendon sheath treatments. "A combination of arthroscopy and MRI is often the ultimate diagnostic combination, but in some cases, we don't have the option of both because of the cost. There is just one shot at one thing," Judy says. "I've got a case coming up in which we're scoping an extensor tendon sheath in the knee for a large hygroma. With this large swollen knee, we're going in with the scope to ablate the lining of the extensor tendon sheath and help the swelling to come down."

McIlwraith describes tenoscopy of the digital tendon sheaths and the carpal sheaths for the removal of radial osteochondromas and for superior check desmotomy as well as other common procedures.[1]

"The extensor sheaths over the carpus are also sometimes injured on the dorsal aspect of the limb," he says. "Blunt trauma can result in variable degrees of tendonitis and chronic effusion of the sheath. A small number of these cases do not spontaneously resolve but progress to develop intrathecal adhesions and soft tissue masses."

As another example, McIlwraith notes, "Steeplechase horses are predisposed to thorn penetration of the forelimb extensor sheaths, which can lead to obvious lameness and the need for more aggressive surgical and medical therapy." McIlwraith describes the tenoscopic technique for these cases[1] and concludes, "In the author's opinion, tenoscopic treatment of the sheaths of the extensor carpi radialis and common digital extensor and the sheath of the lateral digital extensor of the hindlimb has allowed for more aggressive débridement with good resolution of lameness."

Navicular bursa

Arthroscopy can be helpful in managing problems in the navicular bursa—for example, a tear (Figures 1 and 2). "The old way to manage it might have been to put it in a shoe and wait," Judy says. "In reality, you may be able to be proactive—with arthroscopy, you clean up the tear, débride it as you would any other damaged tissue and expedite the recovery process, thereby increasing the prognosis."

Ian Wright, VetMB, DEO, DECVS, MRCVS, a partner at Greenwood Ellis & Partners in Newmarket, United Kingdom, and a coauthor of *Diagnostic and Surgical Arthroscopy in the Horse*, developed an arthroscopic technique for treating lesions of the deep digital flexor (DDF) tendon in the navicular bursae of 20 lame horses,[3] and there was a second study of 92 cases with various pathologic changes.[4] This transthecal (via digital tendon sheath) approach is useful for evaluating and treating noninfected traumatic problems, particularly tearing of the dorsal surface of the DDF as identified by MRI. A high rate of success with this technique has been reported.[3]

Wright also treated a horse that had stepped on a nail, penetrating the

PHOTOS COURTESY OF WAYNE MCILWRAITH, BVSC, PHD, DSC, FRCVS, DACVS, COLORADO STATE UNIVERSITY SCHOOL OF VETERINARY MEDICINE

navicular bursa and causing infection within the bursa.[5] Rather than using the old street nail procedure, through the bottom of the foot, he used arthroscopy. In their report,[5] Wright and his colleagues state, "In contrast to the street nail procedure, the reported technique is less invasive and postoperative care is simpler. The success rate is also better. Endoscopically guided treatment, therefore, appears to offer an advantage in the treatment of contaminated or septic navicular bursae."

"His procedure resulted in tremendous success of a horse's return to use," says Judy. "Rather than making a large hole in the bottom of the foot, using a scope, making a smaller hole and cleaning everything out works quite well. With the older technique, making a much larger hole, you were not sure whether the horse was going to live because of the complications."

Arthroscopy can also be useful for the bicipital bursa in the shoulder, which has also been presented in *Diagnostic and Surgical Arthroscopy in the Horse*.[2]

Sinoscopy

Another area for arthroscopic use is within the sinus, using standing sinoscopy. "For minimally invasive evaluation of the sinus of a horse, you can stick the scope into the sinus and look around," Judy says. "If there is chronic nasal discharge and you can't determine why and you don't have CT or MRI, you can place a small hole in the head at the upper location of the sinus and view the area."

Using this arthroscopic technique within the upper sinus, you can get quite a bit of information relatively simply. For example, say a horse is presented for evaluation of an intermittent bloody nose. The condition has been localized to the upper respiratory tract. "You're suspecting it's an ethmoid hematoma," Judy says. "You use the common upper respiratory transnasal scope, and you don't see anything. You continue to see blood trickle out of the nose. Since the ethmoid hematoma sits way up high in the frontal sinus, we sometimes can't get our transnasal scopes that far up there. To diagnose and treat the ethmoid hematoma, you place a small hole in the sinus at the higher location through the head and stick a scope in there. Very likely, you can see it from there. Then you can treat it as you would with formaldehyde.

"If there is chronic nasal discharge and you can't determine why and you don't have CT or MRI, you can place a small hole in the head at the upper location of the sinus and view the area."

—Carter Judy, DVM, DACVS

"This [arthroscopic] procedure is much more amenable than using traditional endoscopy," Judy continues. "You can evaluate the ethmoid turbinates with a lot more clarity. I've even treated them like that because it's essentially the only way you can see the problem. Using the needle, stick it into the tumor and put the formaldehyde into it. It eliminates the need for more major surgery, so the outcome is potentially better."

Conclusion

Arthroscopy is not a new procedure, but it is becoming more recognized for its usefulness in managing problems in less common locations. These techniques are well-documented in the literature.

"The general practitioner, as opposed to the surgeon, needs to know of its use and potentially consider it in certain cases," Judy says. "It is minimally invasive surgery, and the recovery time is short. It can be helpful as a surgical procedure and can be diagnostic in cases in which it wasn't considered in the past. There are numerous places to use the scope. Practitioners don't necessarily realize it can be used in many of these places. It should be considered more and more."

However, says McIlwraith, "It should be recognized that this is advanced arthroscopic surgery and practitioners should only be doing it who are specialists in this area and experienced at it."

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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.

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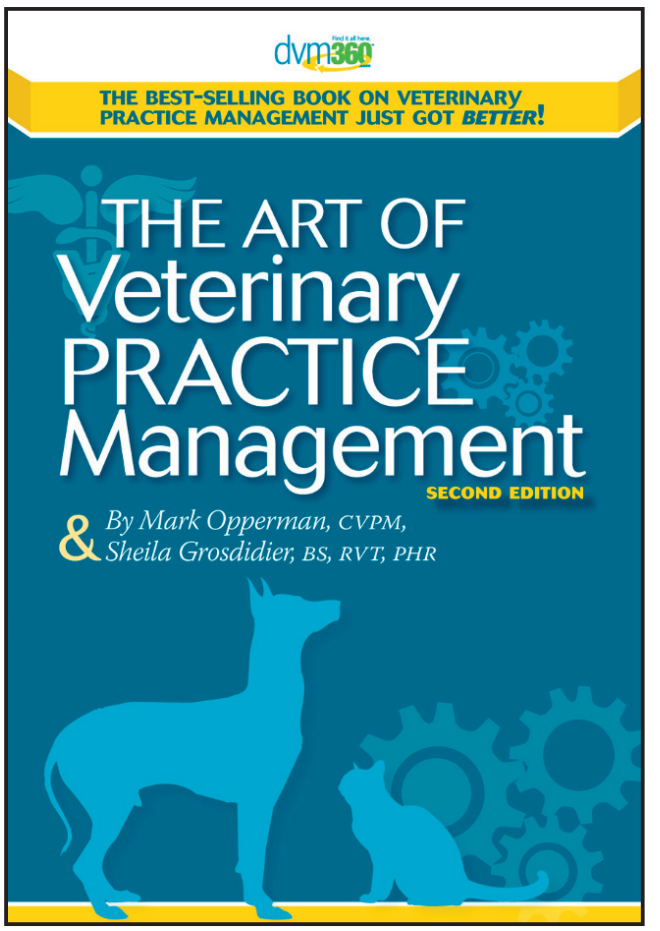

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Cornell Ruffian equine facility reopens on Long Island

State-of-the-art medical center makes a comeback—and honors a racing great.

By Ed Kane, PhD

I was there at Belmont Park that tragic day, along with tens of thousands of others. It was July 6, 1975, and Ruffian, a 3-year-old filly of amazing prowess, was racing for her 11th consecutive win. It was a match race with that year's Kentucky Derby and Preakness winner, Foolish Pleasure.

One of the fastest fillies of all time, Ruffian had won the filly version of the Triple Crown, which in 1975 included the Acorn Stakes, the Mother Goose Stakes and the Coaching Club American Oaks. Even more impressive? During all of her races, even in her final effort versus Foolish Pleasure, she'd never been behind a horse at any call.

As the match race began, Ruffian hit her shoulder hard leaving the starting gate, but she pulled herself together and was on the lead by a nose at the quarter pole, running the first two furlongs in 22.5 seconds. A furlong later, Ruffian was in front by half a length when both sesamoid bones in her right foreleg snapped. Courageously, she attempted to continue, disregarding the jockey's attempts to pull her up, further injuring her sesamoids and tearing the skin and ligaments of her fetlock.

A team of veterinarians quickly tended to her injuries, performing several hours of emergency surgery. However, as the anesthetic wore off, the team watched in horror as Ruffian thrashed about on the padded floor, her feet in stride as if trying to finish the race. Despite the valiant efforts of several veterinarians and attendants, the plaster cast surrounding her fractured leg was severely damaged, and Ruffian was humanely euthanized.

To commemorate Ruffian's legacy, and to give horses at Belmont Park ready access to a modern medical facility, International Acquisitions Equine Holdings (the stable that owned 2008 Kentucky Derby winner Big Brown) built and opened the state-of-the-art Ruffian Equine Medical Center in 2009. The Ruffian Center was a wonderful facility designed to serve Belmont Park, which was a short walk across Plainfield Avenue, not far from Aqueduct Racecourse and Long Island's many pleasure horses. But the center was closed only two years later in 2011 because of financial difficulties.

In addition to its local staff on Long Island, the facility enjoys oversight and assistance from the Cornell Equine Hospital team.

Poised for a comeback

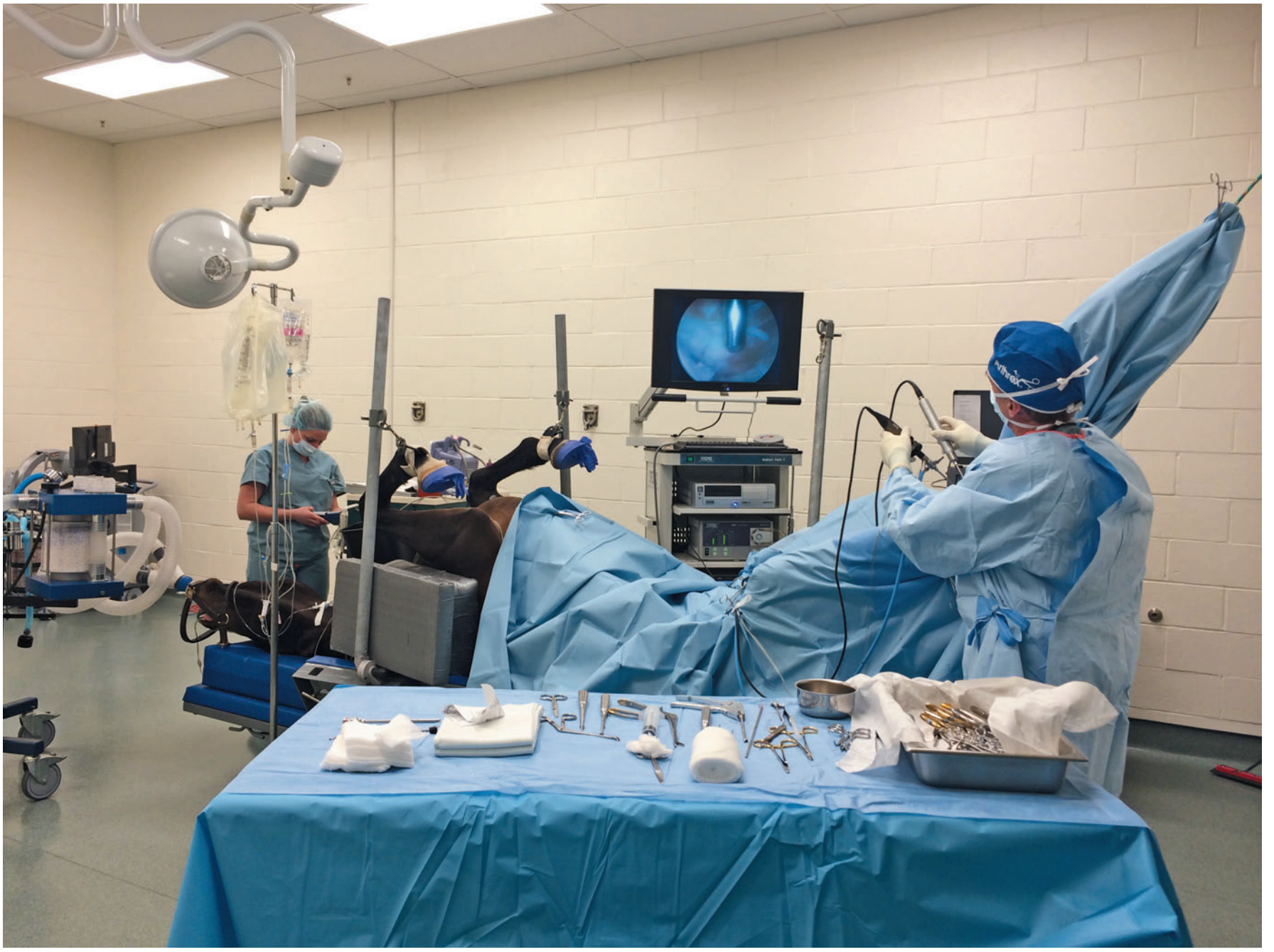
This year, almost 40 years after Ruffian's fatal accident, Cornell University reopened the equine medical center, renaming it Cornell Ruffian Equine Specialists. "We wanted to continue to honor the gallant filly," says Chief Medical Officer Alan Nixon, BVSc, MS, DACVS. "And with the kind permission of Ruffian's owner, Mr. Stuart Janney, we incorporated her name into our new specialty hospital."

The obvious strength of this medical center is its direct tie to Cornell. In addition to its local staff on Long Island, it enjoys university oversight and assistance from the Cornell Equine Hospital team. In fact, several equine practitioners and technicians have made regular commutes between the Ithaca, New York, campus and the Cornell Ruffian center, including Norm Ducharme, DVM, MSc, DACVS, who specializes in throat surgery, as well as Lisa Fortier, DVM, PhD, DACVS, and Nixon, who cover orthopedic surgery.

In early July, four full-time veterinarians joined the Long Island staff, including another board-certified surgeon, Kyla Ortved, DVM, PhD, DACVS, and Sam Hurcombe, BVSc, BMS, MS, DACVIM, DACVECC, a double-boarded specialist in equine internal medicine and emergency critical care, hired from The Ohio State University College of Veterinary Medicine. Hurcombe will offer critical care, including cardiac care and care for pneumonia, colic and other critical conditions. His presence also will allow for the round-the-clock staff to treat emergencies.

Ortved brings seven years of experience in both orthopedic and soft tissue surgery, with a special expertise in minimally invasive orthopedic and gastrointestinal surgery. Another

PHOTOS COURTESY OF ALAN NIXON, BVSC, MS, DACVS, CORNELL RUFFIAN EQUINE SPECIALISTS



>>>A standing surgery and two surgery suites for orthopedic and general surgery provide the facilities for most procedures. Here a 2-year-old thoroughbred is having hock OCD fragments removed arthroscopically.

experienced surgeon, Gabe Cook, DVM (a partner with Bill Bradley, DVM, in New England Equine), is on call to assist with unique cases on an as-needed basis.

Cornell Ruffian Equine Specialists offers a strong mix of surgeons and clinicians, each bringing his or her own in-depth expertise. "Not only do we have an experienced group of surgeons and clinicians at the new facility, but we also benefit from all the expertise at Cornell," says Fortier, "including experts in neurology, ophthalmology and many other specialties."

Nixon adds, "It is also reassuring to have our university anesthesia and imaging staff visit the center to provide expertise in planning, equipping and providing services at the new hospital."

One of the goals of establishing Cornell Ruffian was to enhance the safety of racing by making the most sensitive diagnostic and therapeutic modalities easily accessible to equine athletes, says Cornell Veterinary College Dean Michael Kotlikoff, VMD, PhD. "The practice will have a standing MRI, CT and nuclear scintigraphy within walking distance of the backstretch, which we hope will increase screening and decrease the incidence of serious injuries," he says.

The practice also offers regenerative medicine techniques using platelet-rich plasma, as well as cardiovascular assessment using a high-speed treadmill and telemetry.

Supporting local practices

In addition to treating performance athletes, the new facility also plans to treat other horses on Long Island and in the surrounding communities. "Although we are close to Belmont Park, we treat all horses: standardbreds, warmbloods and backyard horses," says Fortier. "We can help Long Island veterinarians by providing specialty care right here."

The center is primarily a referral institution, assisting community veterinarians when they need specialty diagnostics, an advanced procedure or a unique surgery, Fortier explains.

One of the unique and innovative features of the original surgical suite built in 2009 was a digital video camera mounted above the surgical field, so consulting practitioners can observe the procedure in real time on a cell phone or iPad. "In this heightened digital age," says Fortier, "if I am in surgery and Dr. Ducharme or Dr. Nixon is at the Cornell University

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>>>Racehorse injuries are a big part of the caseload at Cornell Ruffian. Here a horse is having a carpal chip fracture removed arthroscopically.

"We've only been open for a couple of months, and already several horses with mild to moderate injuries were simply walked across the street or taken by ambulance to our Ruffian facility."

—Lisa Fortier, DVM, PhD, DACVS

campus, we can send images to each other for immediate consultation, offering suggestions on various procedures in real time.

"Another example: One of our referring veterinarians, Tara O'Brien, DVM, took a picture today of a horse in atrial fibrillation. We sent an ECG strip immediately to the Cornell cardiologist right from the phone for an immediate response," Fortier says. "We have all the digital technology, plus a direct line to the Cornell Veterinary College campus and to various specialists for immediate assistance day or night."

Handling racetrack emergencies

For Belmont Park, the reopening of this state-of-the-art medical facility is priceless. "We've only been open for a couple of months, and already several horses with mild to moderate injuries were simply walked across the street or taken by horse ambulance to our Ruffian facility," Fortier says. "Within a few minutes we can provide immediate care and begin to stabilize these animals."

Once treated, the athletes can walk back across the street to their barn, avoiding the stress of transport and eliminating the cost of a long-distance shipment.

With the reopening of Cornell Ruffian Equine Specialists, horses from throughout the greater Long Island community will enjoy exceptional veterinary care backed by Cornell University's College of Veterinary Medicine. **dvm360**

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.

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More than 4,500 horses, other animals quarantined in outbreak

While early cases of vesicular stomatitis in Texas sputtered out last month, new cases and quarantines in Colorado were still erupting.

An outbreak of vesicular stomatitis virus (VSV) has forced the quarantine of more than 330 locations in Colorado and Texas, according to the U.S. Department of Agriculture's Animal Health and Plant Inspection Service. More than 4,500 animals were at risk, with 312 showing signs as of Sept. 10.

While cases of animals with clinical signs of the disease began petering out in Texas—27 premises saw quarantines lifted at press time—new cases in Colorado continued to pop up. Colorado State Veterinarian Keith Roehr, DVM, warned veterinarians and horse owners that all disease vectors—mechanical transmission, insect and livestock movement—needed to be contained.

"The number of quarantined premises is actually going down in some counties as horses are healing and the quarantines are released," Roehr says. "[But] we continue to see new cases, so continue to ramp up your fly control."

The disease can be painful for animals and costly for owners. Afflicted animals experience vesicles, erosions and sloughing of the skin on the muzzle, tongue, ears, teats, groin area, and above the hooves. Horses, mules, cattle, bison, sheep, goats, pigs and camelids are all susceptible.

There is a very small risk of zoonotic infection with the disease. In rare cases, humans who handle infected horses can contract vesicular stomatitis and see flu-like symptoms and, on rare occasions, lesions or blisters.

The State Veterinarian's Office is also tracking reports of horse owners who have moved horses out of quarantined facilities. Those horse owners can expect citations for violations and fines, according to Roehr.

Veterinarians and livestock owners who suspect an animal might be infected should contact their state or federal animal health authorities. Livestock with clinical signs of vesicular stomatitis can then be isolated until they're healed and no further threat to other uninfected animals. There is no USDA-approved vaccine.

Roehr reminded veterinarians of their duty to report clinical signs of the disease. He also shared basic details of what practitioners could expect when a state or federal foreign animal disease diagnostician (FADD) finally comes calling. When the virus is suspected, the FADD will gather epidemiological information, take blood samples, collect fluid or tissue from the lesions and take time to inform the reporting veterinarian and the animal's owner on biosecurity and transportation restrictions. dvm360

>>> Horse owners in Colorado who move animals out of quarantined facilities can expect citations and fines, according to State Veterinarian Keith Roehr, DVM.

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New dehorning, castration guidelines put veterinarians in middle of painful discussion

Guidance from the AABP covers age of cattle during time of procedure as well as anesthesia and pain relief protocols.

The American Association of Bovine Practitioners (AABP) has created new castration and dehorning guidelines for beef and dairy cattle that recognize the pain of these procedures and explain methods to control the pain. Veterinarians, however, will still be called to choose the best procedures for their practices and clients, says AABP past-president Nigel Cook, DVM.

"These new guidelines on castration and dehorning represent our combined view on the best approach to be taken for performing these procedures," Cook says, "accepting that the veterinarian of record for the farm is likely the best person to ultimately determine the most appropriate combination of procedures."

Cook stresses that these new rules are "guidelines, not legislation" and that they will be updated regularly "as new science emerges." They also include extralabel uses of anesthetic or pain mitigation drugs.

You can read more about the new guidelines at aabp.org/about/AABP_Guidelines.asp. dvm360

How to **avoid losing** the credit card game

Get over your hangups and start getting ahead of your debt with these dos and don'ts.

You've heard it before: Credit card debt equals bad debt. However, there can be an upside to keeping a choice card or two in your wallet. As a veterinarian earning an average salary—if you have a sustainable monthly budget in order and are getting used to living on less—you are in a prime position to win the credit card game for good.

The key to working this game to your advantage lies in this phrase: *if you have a sustainable monthly budget in order*. If you're in veterinary practice, you're doing pretty darn well in terms of job security, and you're receiving relatively predictable income per pay period compared with the U.S. population as a whole. What this means is that you have the "luxury" of being able to reliably pay off credit cards *before* they become due. Got it? Great. Now let's get started.

> DO start racking up points, miles or whatever rewards you decide to pursue. There are some good options out there, but beware—many

Don't rack up a bunch of credit card debt for stuff you don't need that will cost 19% interest while making minimum payments and allow yourself to become financially crippled for the rest of your life.

of the better rewards cards charge a yearly fee. That 60 bucks or so a year is definitely worth it if you accumulate enough rewards to buy the luxury item you wanted but couldn't budget for, send a little extra cash to your family or go on your dream trip. Find the best card with the rewards that mean the most to you, then use it for every purchase you would make anyway.

> DO NOT rack up a bunch of credit card debt for stuff you don't need that will cost you more than 19 percent interest while making minimum payments and allow yourself to become financially crippled for the rest of your life.

> DO pay the credit card company early every month, before the bill is due, before any interest is applied to the account, for things that you were going to purchase anyway and that fall within your budget. Voilà—free money. This tactic amounted to a super-cheap trip to Europe for me and my wife last year, and I highly recommend it. Another huge plus with this method is that you will be establishing a good credit history. Which leads me to my next point.

> DO NOT opt out of credit cards completely. Whether you like it or not (and I truly don't), you have to play the game if you plan on taking out a loan for a vehicle, home or practice one day. So use credit cards as tools to build credit. Of course, the credit card company still wins, so you need not feel bad for them. They took a piece from every vendor for every transaction. They also have countless indebted individuals who are more than paying for the little perks the company has to give you, thou master of the working-the-credit system.

> DO realize (preferably before you start heating up all that plastic) that all of those little rewards and perks are just a little ante for a much bigger wager. Credit card companies are betting that at some point you—even you, perhaps the most educated and talented individual in your demographic—will eventually fall on some hard times and *need* that credit card. And this is where they get you! If something unexpected happens, if you find yourself in a position of negative fiscal balance (a good analogy for those of you who remember negative energy balance from animal physiology way back in undergrad), then it is time to cut up that card.

> DO NOT allow yourself ever to be in a position where you need a credit card. Remember, you only wanted the points and the good credit. Can't pay them anymore? It's time to get rid of the card and rework your budget. The tables turn quickly when your cozy

GETY IMAGES/BERNARDASV

feelings about using the card to get free stuff lull you into pulling it out during a time when you can't pay it off before getting dinged with the interest. Of course you've read all of my other articles and have a nice emergency fund set aside, so you never actually *need* a credit card—right? (If not, get thee to **dvm360.com/campfield**, stat.)

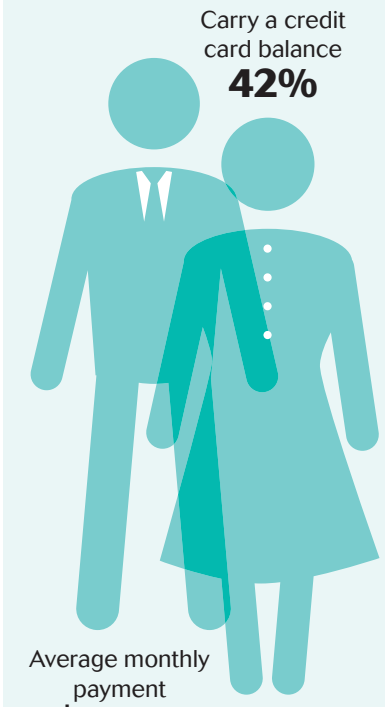
My best advice to avoid losing the credit game? Use the card to your advantage when you can and get rid of it when you foresee a situation when it may become a burden. **dvm360**

Dr. Jeremy Campfield works in emergency and critical care private practice in Southern California.

Veterinarians and credit card debt

Whether practice owners or associates, veterinarians are no strangers to credit card debt. Here's how it breaks down.

Practice owners



Associates

Source: VPI-*Veterinary Economics* Financial Health Study, 2014

You're not the **boss of me!**

This practice owner puts the kibosh on freebies to his veterinary team. Is that fair?

Dr. Lee Hopson is a hard-working veterinarian. He is sole owner of a seven-doctor small animal clinic with eight veterinary technicians and an impressive support staff. His success requires long hours of planning, managing and keeping up with cutting-edge medicine.

Also helping the practice keep up with new medicine are the many pharmaceutical reps who call on Hopson and his team. These reps hold lunch-and-learn events for the veterinarians and technicians. The reps are very attentive because Dr. Hopson's annual purchases are in the six figures.

One day a rep from a large company presents a lunch-and-learn to introduce a new parasite preventive that he would like to see replace the product used by more than 80 percent of Dr. Hopson's 17,000 clients. At the end of the lecture, the sales rep speaks to the technicians and offers to mail them free samples to use for their personal pets. The company, the rep says, likes to assist clinic staff members with their own pets whenever possible. Everyone agrees that the new preventive sounds wonderful and should be incorporated into the hospital's parasite prevention protocols.

Everyone seems thrilled—except Dr. Hopson. He loves the product but not the free medication offering. Keep in mind that Dr. Hopson is far from stingy. Each year he treats his staff members and their families to a Disney World trip. He provides veterinary care to their pets at no charge and sells them medications at cost. He views his staff members as an extension of his veterinary clinic and as representatives to his clientele.

What bothers Dr. Hopson about this rep's actions is that he was given no choice in determining how to reward his employees for their efforts. What if he'd prefer to put that $1,800 worth of product toward his practice's costs and educate his team differently on the parasite protocols? He doesn't want outsiders handing out freebies and benefits to his employees with no insight into his practice protocols.

Dr. Hopson tells the drug rep that the free medication should be sent to the clinic and that he'll determine its ultimate disposition. He congenially tells his staff that at his clinic there will be only one suitor for their affections—and that's him.

The drug company respects Dr. Hopson's wishes, but some staff members grumble a little. Is Dr. Hopson being unreasonable?

GETTY IMAGES/RAFA IRUSTA

Rosenberg's response

Dr. Hopson's veterinary practice is not a public company, nor is it a democracy. It's the owner's responsibility to make management decisions and to abide by the consequences of these decisions.

If staff members feel that Dr. Hopson is a fair and honest employer, there won't be any repercussions from this decision. If the staff feels he's dishonest, this situation will be the least of his problems.

The drug company rep was trying to sell more product, and getting on the staff members' good side is one way to go about it. Nevertheless, Dr. Hopson has to deal with the bottom line and meet the financial needs of his practice. He has every right to intervene in the drug company offer for free employee products.

Get in touch

Do you agree with Dr. Rosenberg? Send us an email at dvmnews@advanstar.com to let us know. **dvm360**

Dr. Marc Rosenberg is director of the Voorhees Veterinary Center in Voorhees, N.J. The veterinary practices, doctors and employees described in this column are fictional.

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Reference: 1. Guaguere E, Bensignor E, Carlotti DN, et al. Clinical practice guidelines on the best use of topical glucocorticoids in canine dermatology. *Prat Med Chir Anim Comp.* 2011;46:S1–S20.

Upset about prices?

DON'T SHOOT THE MESSENGER

Whether on the floor of the NYSE or in veterinary medicine, prices signal changes between and within markets. *By Ross Knippenberg, PhD, and Mike Dicks, PhD*

One look at the trading floor of Wall Street's New York Stock Exchange is enough to make any well-organized professional cringe. It looks like chaos: people in brightly colored jackets cramming into a room waving their hands and shouting endless streams of numbers. It's quite a contrast from an animal hospital that sees 10 to 20 patients per doctor per day. But stockbrokers and veterinarians both use exactly the same signaling process to conduct their businesses. Price is that signal and it coordinates most economic activity.

They may seem worlds apart, but both stockbrokers and veterinarians rely on price signaling to conduct business.

Vertically related veterinary markets

Veterinarians operate in three vertically related markets: the market for veterinary education, the market for veterinarians, and the market for veterinary services. Each market has a unique price. The market for veterinary education uses student effort, faculty and staff time, and school facilities as inputs to produce veterinarians. Tuition, fees, and the sacrifice of four years are the price that students pay to become veterinarians.

The market for veterinarians aligns DVMs to available jobs. Veterinarians are the suppliers; labor hours are their products; and governments, private clinics, industries, academia, and nonprofit organizations are the consumers. Salary is the price these consumers pay to veterinarians.

The market for veterinary services supplies services through the use of veterinarians' time, staff time, and clinic supplies, equipment and facilities. The buyers are animal owners and members of the general public, and the sellers are governments, private clinics, industries, academia, and nonprofit organizations. The price in this market is equal to the cost of the veterinarian's labor, the cost of support staff, and clinic expenses.

How do prices coordinate the markets?

No seller is willing to sell its product for less than it costs to produce: veterinary colleges won't design their programs to lose money, veterinarians cannot work for less than their cost of education and living expenses, and veterinary clinics cannot charge less than what it costs to provide services. These rules can be violated, but only in the near term.

Buyers in any market will not pay more than a good or service is worth to them: veterinary students will not pay more for education than they can gain as working professionals, employers will not pay more for a veterinarian than the additional revenue he or she produces, and clients will not pay more for veterinary services than the perceived benefit received.

Prices within each market mirror

MARK YOUR CALENDAR

AVMA 2014 Economic Summit

To learn more about vertically related markets within the veterinary profession, plan to attend the AVMA's second annual Economic Summit, scheduled for Oct. 28 in Chicago. Attendees will hear about hot topics such as:

> Veterinary compensation
> Unemployment and overcapacity in the profession
> Veterinary student debt
> Supply and demand for veterinary services.

Speakers include Jeff Klausner of Banfield, Paul LaPorte of the U.S. Bureau of Labor Statistics, Stan Johnson of the National Center for Food and Agricultural Policy, and Scott Spaulding of Badger Veterinary Hospitals.
Visit **avma.org** for a complete agenda and to register. Attendees will receive a first look at the AVMA Report on Veterinary Markets, January 2015.

GETTY IMAGES/DAVID W. HAMILTON

the Wall Street trading floor, where the willingness to pay meets the willingness to sell. A price that is too low will force some sellers out of the market, whereas a price that is too high will force some buyers out of the market.

Messaging between markets

If all three veterinary markets use different prices, how can coordination occur? The cost of providing veterinary services is linked to the veterinary living and education costs. The demand for veterinary students depends on the demand for veterinarians and that, in turn, depends on the demand for veterinary services. If the cost of education increases, consumers will become aware of this because the price of veterinary services increases. As the demand for veterinary services declines, veterinary students become aware of this through the declining price for veterinarians. Each change in willingness to sell or willingness to pay in any market will be transmitted via a change in price to all other markets. Thus, each market will adjust as the price change information in one market is communicated to the other markets.

Consider an increase in the cost of living as an example of how prices coordinate across the markets. The immediate effect of a cost of living increase for everyone in the United States is that veterinarians will increase the price for which they are willing to sell their services. As a result clinics will raise the price at which they are willing to sell veterinary services. The increased price for veterinary services will reduce the quantity of services demanded and this in turn reduces the demand for veterinarians and thus veterinary education.

Or what if new technologies are required in the classroom so that educating future veterinarians becomes more expensive? The price at which a college is willing to sell seats would rise, graduating veterinarians would require higher starting salaries and, because veterinarians are paid higher salaries, providing veterinary services is now more expensive so the price must rise and the quantity demanded falls.

Price is the market's messenger. Not only does price convey messages between buyers and sellers within a market, but price also conveys messages between markets. All of the information about conditions within a market as well as between markets is conveyed through prices. This is true whether the subject is the New York Stock Exchange, your animal hospital or a college of veterinary medicine. As such, price is the ideal messenger to transfer information between all market participants. **dvm360**

ECON Veterinary Economics

Dr. Ross Knippenberg is an economic analyst for the American Veterinary Medical Association's Veterinary Economics Division. Dr. Mike Dicks is director of the Veterinary Economics Division.

Crafting an ACE CONTRACT

Associates: Don't leave your contract negotiation up to chance. Understanding protectable interest and including a reasonable deferral period will get you closer to the contract you want.

Immediately after I took the New York bar exam, I decided to apply to the MBA program at New York University to pursue a specialty degree in taxation. But after attending the classes for just a few months, I realized that business school wasn't for me. I usually fell asleep during Basic Accounting. I hated the obligatory "group" projects. And what in the world is a Monte Carlo simulation anyway? So I withdrew from a fantastic business school program and headed off to private law practice.

With that in mind, imagine how bizarre it would have been if NYU's attorneys had subsequently sent me a certified letter stating the following:

"Please refer to your admission letter with our School of Business, which expressly prohibits you from learning anything at any institution located in the five boroughs of New York City or any contiguous county for a period of 3 (three) calendar years. In addition, if you *do* learn anything within such area, you agree that we may obtain a temporary restraining order against you (and/or any complicit educational institution) *and* you agree to pay NYU one year's typical salary offered to an NYU Business School graduate."

Absurd? Probably, but aren't there some striking similarities between that wacky scenario and the terminology used in many veterinary associate employment contracts? The first nutty idea in my imaginary letter is that NYU could be meaningfully injured if I had transferred to another business school. The second nutty idea is that New York University would attempt or be allowed to control my life in a powerful way when I had been "theirs" for only a couple of months.

And just ignore the nuttiest thought of all: that I would ever have the money to pay them what one of their MBA grads makes in a year at Goldman Sachs or Chase.

This example is meant to illustrate two key points, which should be considered by both veterinary hospitals and associate veterinarian applicants as they work through the employment negotiation process. First, both sides should realistically assess what is referred to in noncompete law as the employer's "protectable interest." Second, all parties to a employment

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agreement would be well-served by including a reasonable one- to three-month "waiting period" that would run between the moment work begins and the point where the personal noncompete language kicks in.

Protectable interest

Employment contracts are unique in that they attempt to govern individual human behavior related to pursuit of a fundamental human need. I can sell a plot of land and the contract could specify that the buyer can't develop the land until my death. Why would I do that? It doesn't matter; maybe I like the view from the house I own across the street and want to preserve the view until my death. The point: real estate development is not a fundamental human need or right. People are free to contract away their real estate development rights as they please.

But could I sign an enforceable contract hiring the world-champion frankfurter eater to compete on my reality TV show against Germany's top hot dog glutton? Well, health is a fundamental human need, so the answer is bifurcated: The contract would probably be enforceable if the competition were for a reasonable length of time. The contract would likely be void if the competition were set to end as soon as one contestant fell into a coma due to life-threatening pancreatitis.

Similarly, when a practice seeks to restrict an associate's fundamental right to earn a living through practicing his craft, limits must be set. And they must be reasonable. But what is reasonable is subjective and the devil is in the subjectivity. Consider this:

One of my client DVMs told me recently that he was certain that any 10-mile noncompete term was unenforceable because five miles was the enforceability limit. Really? He might get an argument on that from the associate at an exclusively feline practice at the southern tip of Manhattan. She'd tell you that none of her clients would ever box up their kitty and schlep 5.1 miles on the subway to follow her to a new clinic. Her position: a five-mile noncompete would exceed her boss's protectable interest.

On the other hand, if an associate veterinarian had been working for 20 years as an oncologist (and virtual hero to thousands of clients) on the north shore of Long Island, isn't there a pretty good chance he'd have a solid following if he quit to work 10.1 miles south? His employer would almost certainly feel that his protectable interest extended beyond 10 miles.

In the first instance, five miles is probably unreasonable. In the second example, perhaps the clinic should have negotiated a noncompete radius greater than 10 miles in order to protect itself from losing substantial income when its resident cancer guru left its employ.

Playing the waiting game

How is it possible for a veterinary practice to be so certain a new associate will be a good fit that it decides it must immediately impose a substantial noncompetition contract term? Realistically, it probably isn't.

Consequently, I am a strong believer that employment contract noncompete language should include a brief but practical deferral period of the associate's commitment to abstain from competitive practice with the new employer. That means a waiting period of at least 30 days—60 to 90 days would be even better. Here are just a few reasons that justify postponing the effective date of any prohibition against personal competitive practice:

> Such provisions demonstrate goodwill to the job seeker and reduce the edginess generally associated with signing a noncompete commitment.

> If the practice finds that the associate does not "fit" its culture and team, it's much easier to let the associate go early on. There will be far less resentment and hostility on the dismissed associate's part, as his or her alternative job options are in no way reduced by having taken the job in the first place.

> The enforceability of the noncompete, once it does become effective, may be enhanced through the use of such a trial period. To a court, the noncompete term might seem more "fair and reasonable" if it does not attach until the associate actually spends enough time on the job to have bonded with a significant number of clients. A genuine protectable interest is more likely to have been successfully established in the eyes of the law.

> Some practices just don't turn out to be what they are advertised to be in terms of quality, caseload, collegiality or overarching philosophy. If that job just isn't what it was reputed to be, it serves nobody's interest to tie a disenchanted doctor into the unsuitable work environment. **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.

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I've written before that the services and products we veterinarians provide may not be enough to entice pet owners through our hospital doors (see the June issue of *dvm360*). This month I want to discuss additional trends that will make it harder for veterinary hospitals to prosper. Here are a few—do you see yourself on this list?

Stuck in a strip mall

How many veterinary facilities and pet retail outlets are located in so-called strip malls? Consumers are avoiding these old destination-shopping standbys—and they're likely to continue doing so. What happens to veterinary practices in these malls?

I've got a guess: Drive-by and walk-by traffic will decline, so the veterinary practices there will become less visible. Current occupants of strip malls will find the rent more affordable. The convenience factor of stopping by the veterinarian while going to the dry cleaner will be eliminated as strip malls become ghost towns.

The same goes for bigger malls too. I remember when shopping malls popped up every few miles every few years. They were an investment darling. Today, vacant spaces in malls are common, and the food courts are the busiest operations! In fact, there have been only 10 shopping malls constructed in the last 10 years in the entire country. Meanwhile, existing malls are being demolished, and large department stores are closing. What's happening here? It isn't the economy.

Give them entertainment

Increasingly, people are shopping without leaving home. They buy products online with the click of a keystroke, and in some cases purchases show up at their home in 24 hours or less.

That means when today's consumers shop in the brick-and-mortar world, they want to be entertained. Case in point: A recent news broadcast showed one mall that in addition to selling everything you'd find in a traditional Mexican marketplace also showcased regular concerts and dance recitals. Lots of us remember the mall as a place to hang out—this is just taking the entertainment value of the shopping experience to the extreme.

Give them convenience

Now, if you're like me, the concept of buying a shirt or a pair of shoes without feeling, touching and trying them on is still pretty hard to accept … but I'm getting used to it. The only reason to go shopping seems to be to snag a Starbucks coffee and a salad, and it won't be long before some mobile barista drone

Locked doors and empty storefronts litter today's indoor malls and strip malls—leaving veterinary clinic tenants next door with decreased foot traffic and visits. Where will tomorrow's practice be located?

GETTY IMAGES/SASCHA BURKARD

will be buzzing around your neighborhood just waiting for you to wave your virtual arm.

Think that's unlikely? Consider the Uber smartphone app, which puts together folks who need a ride with other folks who want a little extra money for driving someone to a destination. I have friends who've now sworn off taxis. Better a clean, smoke-free, late-model car that arrives in an instant than a 25-year-old taxi with a driver who keeps you waiting in the rain and sees you as a distraction from a phone call from someone who is clearly more interesting than you are.

Millennials who may not have been born when you built your hospital have little interest in owning a home and probably less in owning a car. Assuming they do want a pet, what makes you so sure they'll drive across town to you, wait a half-hour past their appointed time and fight traffic back home when there are—or will be—alternatives?

Now I'm sure you all are exceptional diagnosticians and surgeons, but how do your clients ever know how good you are? And do they care? They have every right to assume you're more than competent—you went to medical school. But are *you* worth the added time and energy or will they look for more suitable options?

Give them the Internet

James Herriot is being replaced by Dr. Google, and pet owners are already skeptical of the need for and value of what we have historically provided. Will noninvasive diagnostics eliminate the need for blood tests? How many concepts introduced on *Star Trek* are now accepted norms? Will diagnoses be made using testing technology performed at home? Who would have thought that pregnancy confirmation and even HIV tests would be available over the counter? Many drugs and products from parasite control to nutrition could be delivered more easily than through a "trip to the vet."

'Good ol' days' are gone

I remember when a DVM or VMD degree assured you, at the very least, of a respected community position and a good livelihood. But today's burden of debt and excess capacity is a one-way road unless we take a hard turn.

I'm not sure how the veterinary profession will change in the coming years, but more of us will be delivering care to a declining clientele. Most of us will keep doing things the way they've always done them … until there's no demand at all. A few DVMs will make operational changes to buy some time. A very few will be willing to reinvent veterinary medicine and the client experience. Those few visionaries will thrive and showcase changes that will carry the veterinary profession to its next critical period. **dvm360**

Dr. Michael Paul, @mikepauldvm on Twitter, 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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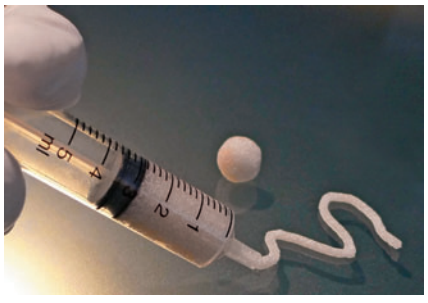

Veterinary Transplant Services

Injectable bone putty

Veterinary Transplant Services has introduced Fusion Xpress, an osteoinductive, injectable bone putty. Fusion Xpress can be injected directly into the defect sight from the syringe, with no handling required. The product easily fills any site, even irregularly shaped or hard-to-reach defect sites, and can be used in both orthopedic and dental applications. Fusion Xpress is a combination of demineralized cortical bone (DBM) with mineralized cancellous chips and a biphasic calcium phosphate (TCP + HA) in a putty carrier.

For fastest response call (800) 558-5223 or vtsonline.com

EDAN Diagnostics

Blood gas and chemistry analyzer

EDAN Diagnostics has introduced the i15Vet blood gas and chemistry analyzer. This system is lightweight (8 lbs) and portable, and it analyzes 50 samples on a charged battery. It features a 7-in color touchscreen to organize patient information, run samples and transmit or print results. The i15Vet has sample cartridges stored at room temperature, built-in tutorial videos and auto-sampling techniques, which reduces the risk of contamination.

For fastest response visit edandiagnostics.com

Patterson Veterinary

Intraoral radiography unit

Patterson Veterinary has announced the launch of the Sirona Heliodent Plus intraoral radiography unit designed specifically for veterinary practices. This unit produces high-quality images that can be viewed at high contrast, thereby reducing the need for retakes and increasing exam efficiency. It is available in three different arm lengths and as a mobile unit.

For fastest response visit pattersonvet.com

Zoetis

PEDv vaccine

The U.S. Department of Agriculture has granted a conditional license to a Zoetis vaccine that fights porcine epidemic diarrhea virus (PEDv). The vaccine will be given to healthy pregnant female pigs (sows and gilts) to help them develop antibodies they can transit to their newborn piglets. Two doses are given three weeks apart, with the second dose given two weeks pre-farrowing, which is typically twice a year.

For fastest response visit zoetispork.com/pedv

Everlast Epoxy Systems

Antimicrobial epoxy flooring

This resin-rich formula seeps into the concrete of wood substrate during the curing process, becoming a part of the subfloor itself and not just a more superficial surface. An additive in the flooring restricts the growth of microorganisms, a perennial problem in veterinary practice hygiene. The epoxy flooring also provides an appropriate level of slip resistance for people and pets while still being sensitive to pet's feet. Available colors range from pristine white to bright tile red.

For fastest response visit everlastepoxy.com

IDEXX LABORATORIES

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Tests for mange, ringworm

The *Sarcoptes* Antibody ELISA and the Ringworm RealPCR Panel are two new tools from IDEXX Laboratories for working up cases of itchy pets with clinical signs of allergies, parasites and infections. The *Sarcoptes* ELISA test confirms or rules out sarcoptic mange in dogs based on clinical signs. The ringworm panel uses PCR to detect dermatophytosis in cats and dogs faster, in one to three working days vs. weeks using traditional methods.

For fastest response visit idexx.com/itchypatients

MiracleCare

Electronic nail clipper

The MiracleCare QuickFinder electronic nail clipper uses QuickSensor technology, lighted cues and a convenient on-off switch to aid veterinary team members, groomers and pet owners in clipping their pets' nails without cutting into the nail quick. Designed for cats and small and medium-size dogs, the QuickFinder projects a green light when it is safe to clip, a yellow light to indicate caution and a red light when it is not safe to clip. The nail clippers line now features new colors of vibrant blue, purple and green.

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Nutritional recovery product

Harrisons' Pet Products has released a new smaller size for Recovery, a complete nutritional formula for sick or injured animals. Recovery is now available in two convenient sizes—57 g and 350 g—and features packaging appropriate for clients with mammals, reptiles or birds. Recovery is easily syringeable and can be tube-fed or spoon-fed to animals transitioning from fluids to solids, recovering from organ failure, experiencing slowed GI emptying or in other nutritionally challenging health situations.

For fastest response call (800) 946-4782 or visit HEALx.com

Sonopath.com

Mobile ultrasound app

Sonopath.com has announced a mobile app for veterinarians and technicians. Available for download through iTunes or the Google store, the app allows customers to access Sonopath's database of clinical ultrasound findings, compare ultrasound images and receive peer-to-peer feedback on cases they have uploaded using their smartphones. The app also allows users the ability to profile their cases based on history and clinical pathology parameters as well as search by pathology to see how those pathologies present clinically.

For fastest response visit sonopath.com

Dechra Veterinary Products

Omega-3 fatty acid caps

Dechra Veterinary Products has introduced Eicosa3FF SnipCats Omega 3 Fatty Acid Capsules to complement its existing fatty acid product line, including Eicosacaps Omega 3 and 6 Capsules and Eicosaderm Omega 3 Liquid. The Eicpsa3FF SnipCaps provide a concentrated source of omega-3 fatty acids in the free fatty acid form. The small SnipCaps are suitable for dogs under 60 lbs and cats, while the large SnipCaps are suitable for dogs more than 30 lbs. Each strength delivers about 180 mg EPA per 10 lbs and 120 mg DHA per 10 lbs.

For fastest response visit dechra-us.com

Jurox Animal Health

Intravenous anesthetic

Jurox Animal Health's anesthetic Alfaxan (alfaxalone 10 mg/mL), an intravenous injectable anesthetic for use in cats and dogs, is now available to veterinary practitioners in the United States. Alfaxan is indicated for the induction and maintenance of anesthesia and for induction of anesthesia followed by maintenance with an inhalant anesthetic. Alfaxan is now available in 20 countries. An independent study commissioned by Jurox reported that Australian veterinarians use Alfaxan for induction as often as 74 percent of the time in cats and 52 percent of the time in dogs.

For fastest response visit alfaxan.com

Washington Laight Business Solutions LLC

Washington Laight Business Solutions

Practice management consultation in NYC

Robert Zeide, former CEO of PCI Animal Health, has launched the new firm Washington Laight Business Solutions. The firm will offer services for new and expanding practices in the New York metropolitan area as well as veterinarians seeking exit strategies. Their services include practice appraisal, valuation and management and assistance with associate buy-ins and life stage planning, as well as tax and financial planning and budgeting. The firm will also offer management appraisals, legal services and financing, leasing, insurance and equipment procurement.

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Advanced Ultrasound Electronics

Ultrasound wipes

Advanced Ultrasound Electronics has released Sono-Wipes, a one-step disinfectant deodorizer wipe specifically made for ultrasound equipment. Sono-Wipes offer a convenient way to clean, disinfect and sanitize transducers and portable and cart-based ultrasound machines, and they have been proven effective against H3N2, HSN1, canine distemper cirus, Newcastle disease cirus, pseudorabies virus and FCV. They can be used without gloves.

For fastest response call (866) 620-2831 or visit auetulsa.com

IDEXX Laboratories

Bovine viral diarrhea virus test

IDEXX Laboratories has launched the IDEXX RealPCR BVDV RNA Test, expanding its bovine viral diarrhea virus (BVDV) portfolio and providing standardization at every level of real-time PCR testing. All components of the IDEXX RealPCR modular system can be ordered separately. The test provides full strain coverage, detecting BVDV types 1 and 2, HoBi-like pestivirus (BVDV type 3) and border disease virus. The test is ideal for use in low-prevalence situations using pooled samples (ear notches, serum/plasma), or to confirm results of other screening tests.

For fastest response visit idexx.com

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Bimeda has introduced XylaMed (xylazine), a sedative and analgesic for use in horses and *Cervidae* species. It is a 100 mg/mL injection supplied in 50-mL multiple-dose vials as a sterile solution. It facilitates the handling of aggressive or nervous animals and has been used in conducting diagnostic, orthopedic and dental procedures and minor short-duration surgical procedures. It can be used as a therapeutic medication for relief of pain following an injury or surgery, as a preanesthetic to general anesthesia or in conjunction with local anesthetics during major surgical procedures.

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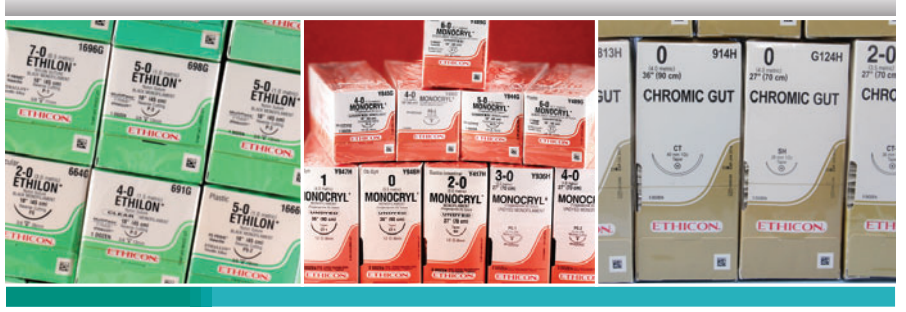

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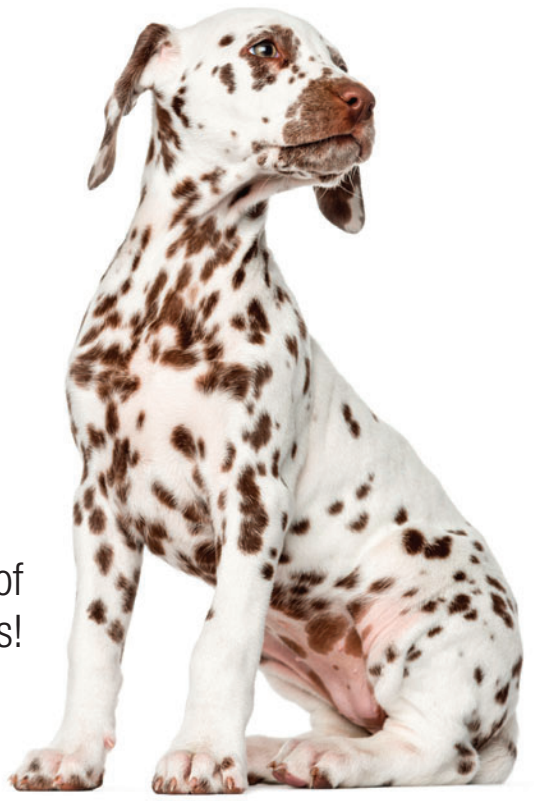

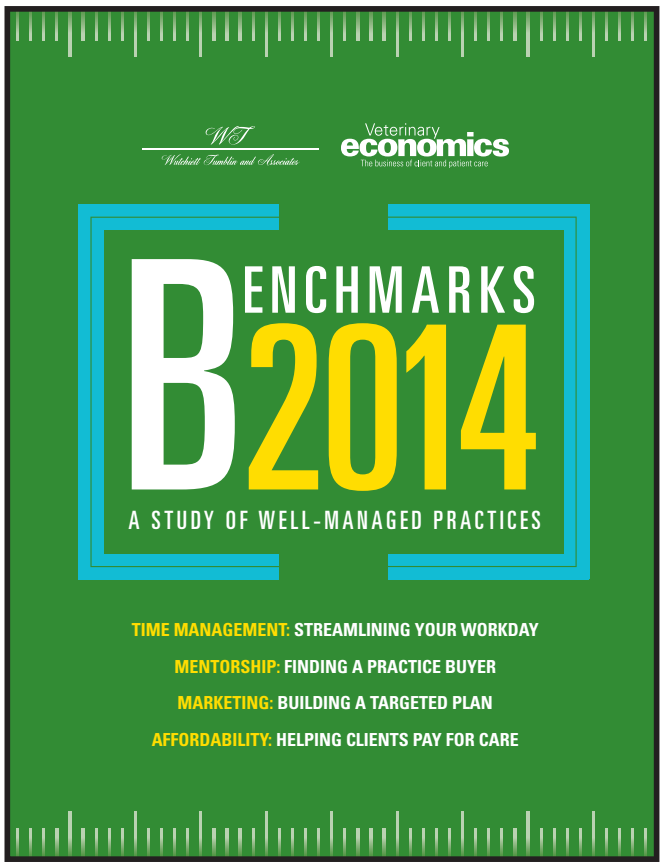

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thecvc.com/sd

August 28-31
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CVC unconventional

National and international meetings

October 5
Veterinary Dentistry & Radiology for the Veterinarian and Technician
Charleston, SC
(941) 268-1019
veterinarydentistry.net/vets

October 8
Autoimmune Diseases: Small Animal Seminar
Plymouth Meeting, PA
(215) 284-7050

October 8-12
Wild West Veterinary Conference
Reno, NV
(800) 775-7062
wildwestvc.com

October 9-11
Veterinary Cancer Society Annual Conference
St. Louis, MO
(573) 823-8497
vetcancersociety.org/conference

October 11-12
Oral Surgery, Pathology and Radiology
Baltimore, MD
(410) 828-1001
animaldentalcenter.com

October 15
Cardiology with Dr. Rebecca Stepien, DACVIM (Cardiology)
Oakbrook, IL
(630) 325-1231
chicagovma.org/civicrm/event/info

October 16-18
American College of Veterinary Surgeons Symposium
San Diego, CA
(301) 916-0200
surgicalsummit.org

October 17-20
Basic Acupuncture
Reddick, FL
(800) 891-1986
tcvm.com

October 17-25
Annual Association of Exotic Mammal Veterinarians Conference
Orlando, FL
aaemv.org

October 18-24
Annual Conference of the AAZV with ARAV and AEMV
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October 18
Annual Fall Technician Conference
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October 19
Basic Small Animal Ultrasound
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October 25-28
CanWest Veterinary Conference
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October 25-26
Small Animal In-Patient Medicine
Athens, GA

October 25
Small Animal Gastroenterology: What's New in Diagnosis and Treatment
Indianapolis, IN
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October 30-November 2
Annual ABVP Symposium
Nashville, TN
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November 1-2
3 Rivers Veterinary Symposium
Pittsburgh, PA
(888) 550-7862
pavma.org

November 4-7
Biennial Caribbean VMA Conference
Grand Cayman Islands
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cbvma.org

Local and regional meetings

October 9-11
Annual Wisconsin VMA Convention
Madison, WI
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October 9-12
North Carolina Academy of Small Animal Medicine Great Smokies Veterinary Conference
Asheville, NC
(910) 452-3899
ncasam.org

October 10-12
California VMA Fall Seminar
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October 11-12
New York State Fall Veterinary Conference
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Massachusetts VMA 2014 Fall CE Conference
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November 12
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gavma.com

November 13
Minnesota VMA Spring Seminar on Feline Medicine
St. Paul, MN
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mvma.org

November 24
Michigan VMA Animal Welfare Conference
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dvm360™ (Print ISSN: 2326-0688, Digital ISSN: 2326-070X) is published monthly by Advanstar Communications Inc., 131 W First St., Duluth MN 55802-2065. Subscription rates: $40 for one year in the United States & Possessions, Canada and Mexico; all other countries $87.50. Single copies (prepaid only): $18 in the United States; $20 in Canada and Mexico; $24 all other countries. Back issues, if available: U.S. $23; Canada/Mexico $28; all other countries $46. International pricing includes air-expedited service. Include $6.50 per order plus $2 per additional copy for U.S. postage and handling. Periodicals postage paid at Duluth MN 55806 and additional mailing offices. POSTMASTER: Please send address changes to DVM360, P. O. Box 6309, Duluth, MN 55806-6309. Canadian GST number: R-124213133RT001, Publications Mail Agreement Number 40612608. Return undeliverable Canadian addresses to: IMEX Global Solutions, P.O. Box 25542, London, ON N6C 6B2, Canada. Printed in the U.S.A.

SAVING THE *pooch in peril*

Be wary of the laconic veterinary client—he just might have your craziest case of the day.

The phone rang around 5:30 a.m. That wasn't too big of a deal; around here many people are up that hour, feeding animals and preparing for the day. But my friend Steve had a strange tone in his voice as my sleepy brain processed his early morning phone call.

"I need you to stop by my house on your way to work. I have a problem with my dog and I can't bring him in. Come by when you can, please." His tone was not that of a man with a huge emergency. He was fairly calm with just a hint of "hurry if you don't mind" sprinkled in. I tried to quiz him a bit about what was wrong with the dog, but he kept saying I would just have to see it—it was hard to explain.

I rolled out of the sack and thought about taking a quick shower. Even though Steve didn't seem to be too up in arms about the problem, something told me I should skip the shower and just head on over there. Steve is not a very emotional fella. I have known him for years and don't believe he would change his expression if his pants were on fire. So I slipped on some clothes and texted I was on the way.

His house is just a few miles down the road from me, and as I arrived in the driveway I found him ambling down the path from his house to the barn. He was moving at the usual snail pace with his arms hanging limp by his waist. I pulled up beside him, managing to get the window down and greet him before he even looked up.

"Where's the dog, buddy? What's wrong? How come you couldn't bring him in? Do you need a ride to wherever we're goin'?" I asked all these questions and even paused between them, waiting for a response. And then he really didn't even say a thing—just pointed toward the barn and motioned for me to follow him.

Now, I'm a hyperactive, "let's-get-things-done" kind of guy. When I get around the laid-back, slow-going people, it just wears me out. I know I need to be more like them and smell the roses a bit, but I just can't. We crept along at the speed of … smell, until we finally rounded the corner of the barn to find his pickup truck parked in the soft plowed dirt on the edge of a freshly worked cotton field.

He pointed over to the pickup with a concerned look, but I couldn't find anything out of order. It did appear to be parked in a strange way, with the front tires turned all the way to the left. I tried to understand how this could involve a dog—the windows were rolled down, so he couldn't be trapped inside. The tailgate was down and no dog was visible in the bed. It just looked like a normal truck. We walked around until the front wheel on the driver's side was visible.

There, pressed under the front wheel, was Steve's dog. He had run over the dog and somehow actually stopped right on top of it. "*What?*" I said. How can someone actually run over anything and stop on top of it? The dog was pinned in the soft dirt and, other than having a pitiful look on his face, appeared to be doing just fine. The problem was if the truck went forward it would crush the dog's head; if it went backward, it would run over his abdomen and hips.

At this moment you might be trying to picture how that dog was pinned, so I'll do my best here: the tire was kind of resting on the skin at the nape of the dog's neck as well as on his back foot. That pooch was curled up in one really strange position.

"I just don't see any way to move that pickup that won't kill that dog, do you, Doc?" Steve asked in his typical monotonous drawl.

I examined the situation closely and determined that he was correct. The dog was in the worst possible place. Steve was hopeless. I, on the other hand, was still trying to figure out how he had done it. How slow must he have been going? I had a picture in my mind of the steamroller scene from that Austin Powers movie.

I went to the back of Steve's truck and got a shovel. I started digging in the soft dirt under the dog. As I moved a shovelful of dirt, the dog would wiggle a bit. I removed another shovelful and he would wiggle some more. After about five minutes of shoveling and wiggling, he finally popped free and ran off, relieved to be free.

Steve was as happy as Steve could be—he smiled and even shook my hand. I asked him how in the world he managed to stop right on top of the dog. He told me that he was going really slow (no kiddin'!) and the dog just ran under the wheel, so he slammed on the brakes. When he got out to check, there was the dog—just what I saw when I arrived.

The lucky dog went on to live happily ever after. Steve went on moving at the speed of a three-toed sloth. I went on and decided I was gonna write a story about how someone could actually run over a dog, stop on top of it and then, after that dog stayed under the tire for an entire hour, go on like nothing ever happened. **dvm360**

Dr. Bo Brock owns Brock Veterinary Clinic in Lamesa, Texas.

ILLUSTRATION BY MATT COLLINS

Murphy the Labradoodle

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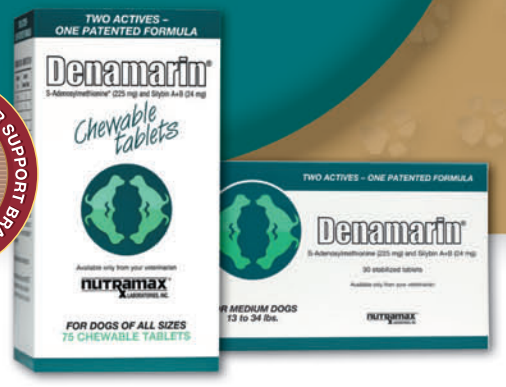

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