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The Voice of Veterinary News | July 2012



p. 18
Doggie Fat Camp
Rescue dogs, pampered pooches shed pounds. »

Standardized CPR guidelines developed for dogs and cats

Specialists from ACVECC, VECCS collaborate on new evidence-based tool.

By Heather Biele, DVM
Content Specialist

The survival rate of dogs and cats experiencing cardiopulmonary arrest while in the veterinary hospital is fairly bleak—only 6 percent to 7 percent survive to be discharged and returned to their families, according to the Veterinary Emergency and Critical Care Society (VECCS) and American College of Veterinary Emergency and Critical Care (ACVECC). In an effort to improve those outcomes, more than 100 board-certified veterinary specialists from around the world have collaborated to develop standardized CPR guidelines for companion animals, which were released in June.

The absence of standardized guidelines or training for cardiopulmonary resuscitation (CPR) in veterinary medicine has been cited as a major factor in the historically poor outcomes for dogs and cats in cardiac arrest. In fact, until the advent of evidence-based guidelines and standardized training in human medicine, survival rates in people were similar to animals, say VECCS and ACVECC spokespersons. Now human survival rates are at 20 percent.

In hopes of seeing similar improvement in veterinary patient outcomes, Daniel Fletcher, PhD, DVM, Dipl. ACVECC, assistant professor of emergency and critical care at Cornell

CONTINUED ON PAGE 38 »

No workforce shortage, study finds



But impending gaps are identified in research, public health, industry; panel calls veterinary profession's current direction 'unsustainable.'

By Kristi Reimer
Editor

Four years after originally promised, a panel convened under the auspices of the National Academies of Science has released its report on the current and future workforce needs of the veterinary profession. Its conclusion? While there's no shortage of veterinarians in the profession now, there is a significant imbalance in the types of

CONTINUED ON PAGE 36 »



p. 22
Missing Marilyn
Bulldog statue snatched from her perch atop clinic vehicle in New Hampshire. «

p. 8
A new name for Pfizer
Pfizer Animal Health, soon to be 'Zoetis,' prepares for spinoff as standalone company.

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Tools of the trade
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[1] Dryden MW. Flea and tick control in the 21st century, challenges and opportunities. *Vet Derm.* 2009;20:435-440

† On dogs, only after repeated administration has REVOLUTION been shown to control infestations of a single species of tick (*Dermacentor variabilis*). No tick claim for cats. (Pfizer Inc. Supplemental New Animal Drug Application NADA. Freedom of Information Summary; 2000;141-152.)

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Newsmagazine
Volume 43, Issue 7

NEWS

8 | In the news
Pfizer Animal Health to change name to Zoetis, prepares for IPO

Franck's Pharmacy recalls sterile compound prescriptions

10 | In the news
Infant illness leads to Diamond lawsuit

12 | State news
North Carolina names May 23 Veterinarians Day

14 | In the news
N.Y. veterinarian charged with dumping dead pets

16 | In the news
Tennessee walking horse trainer pleads guilty to soring charges

18 | Stethoscope
Rescue dogs and pampered pooches shed pounds at Doggie Fat Camp in Oregon

20 | In the news
Ohio woman faces charges after acting as veterinarian

Fire hits Washington State veterinary school

21 | In the news
Early a.m. fire at New Mexico veterinary hospital kills 66 pets

Pets Best names top 5 most costly pet insurance claims

22 | In the news
Bulldog statue snatched from clinic vehicle

24 | Research
T cells 'hunt' parasites like predators stalk prey, study finds

AAVMC, NIH confirm veterinarians' eligibility for loan repayment

26 | In the news
State Farm names top 10 states for dog bite claims in 2011

30 | Animal welfare
World Vets, Innovacyn team up to help donkeys in Tanzania

31 | In the news
Stuffed Animal Clinic at Sacramento Zoo raises $600 for police canine association

Child-sized veterinary clinic opens at Discovery Center Museum in Illinois



Westend61 k/Getty Images

ON THE COVER

No workforce shortage, study finds

But impending gaps are identified in research, public health, industry; panel calls veterinary profession's current direction 'unsustainable.'

Standardized CPR guidelines developed for dogs and cats

Specialists from ACVECC, VECCS collaborate on new evidence-based tool.

Small Animal

Small animal practitioners: This section just for you begins after page 54.

1S | Developmental enamel defects in dogs

6S | Abdominal exploratory: A therapeutic and diagnostic tool

Equine

Equine practitioners: Your special section begins after page 54.

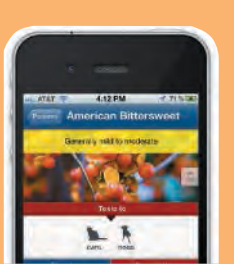
1E | A case of the heaves: Recurrent airway obstruction in horses

6E | Investigating equine stem cell therapy

products 360

Tools of the trade

Don't miss this listing of new veterinary products mailed quarterly with your issue.



32 | Regulatory
FDA releases plans for monitoring food safety, antimicrobial resistance

In the news
FDA appeals judge's order to take action on antimicrobial use

Two California dairies released from BSE quarantine

34 | In the news
Five animal survivors honored at ACVIM event

Study finds owners of certain breeds brush off breathing difficulties

35 | Education
Majority of veterinary colleges see rise in graduate numbers in 2012

USDA targets Internet breeders with proposed definition change

38 | Research
Chicken vocalization provides insight for poultry industry

55 | In the news
Panel questions drugs in horse racing

OPINION

39 | Letters

SPECIAL CONTRIBUTORS

Michael Obenski, VMD
7 | Where did I go wrong?
Loud and clear

Michael H. Riegger, DVM, Dipl. ABVP
40 | Good medicine, good business
12 secrets to Mayo Clinic's success

Marc Rosenberg, VMD
44 | The dilemma
What a client wants

Michael Paul, DVM
46 | Market watch
Be choosy about choosing

Christopher J. Allen, DVM, JD
49 | Letter of the law
A solid exit plan can soothe burnout

Gerald Snyder, VMD
51 | Practice for profit
3 ways veterinarians are their own worst enemies

Carl Osborne, DVM, PhD, DIPL. ACVIM
54 | Diagnotes
Feline urethral plug composition analysis, 2011

Bo Brock, DVM
70 | Stampede
Cowboy surprise

READER SERVICES

69 | Calendar

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LOW COST CLINICS: Compete *OR* cooperate

Pet owners have ever-increasing options for where to purchase pet medications and obtain services, and many veterinarians are wondering how exactly they can compete with Walmart and Target for pharmacy business. Log on to dvm360.com/lowcost to see veterinary market expert Mike Paul, DVM, weigh in on this issue.

Photo by Troy Van Horn

News online Every day.

More events making headlines on dvm360.com /dailyupdates.

Photo gallery: Nonprofit veterinarians in action

» Humane Society Veterinary Medical Association-Rural Area Veterinary Services program (HSVMA-RAVS) volunteers travel across the map to provide care to pet owners who don't have access, either due to their rural location or financial situation. Check out pictures of these veterinary heroes in action and read their tales of triumph.

The case of the shaky kitty

» Rintu is a 3-year-old castrated male domestic shorthaired cat experiencing body tremors and intermittent crying starting at about 2 a.m. He's a strictly indoor cat, that's been healthy up to this point. How would you diagnose Rintu? Find out what our expert said.

Dog's death inspires veterinary grant program

» A new nonprofit organization called the Buddy Care Foundation, founded by a Nashville-based entertainment publicist, has been created to financially assist families who can't afford veterinary expenses for their canine companions.

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The top 10 news stories on dvm360.com

Search the headline to read the article.

1. **The changing drug model**
   Increasing pet owner options about where to obtain medications means veterinarians must adjust, experts say.
2. **Dog's death leads to federal lawsuit over chicken jerky treats from China**
   Case highlights ongoing concerns over FDA warnings.



3. **Hoarding: Veterinarians investigate mock crime scene at conference**
   Program offers hands-on forensics training.
4. **Photos and stories from the next generation of equine practitioners**
   A series of profiles of this year's AAEP Markel scholarship recipients.
5. **Diamond Pet Foods adds another product to its pet food recall**
   Recall includes twelve brands of dry dog food; CDC investigates.
6. **New York veterinarian charged with unlawfully dumping dead animal bodies**
   Veterinarian accused of tossing pets into the woods.
7. **Food hypersensitivities: Performing an elimination diet trial**
   Take the time to find the right diet and counsel clients on what to feed.
8. **Report: Pet owners unaware of their pets' suffering during allergy season**
   Novartis Animal Health recently revealed results from its allergy survey.
9. **FidoPharm readies for heartworm preventive launch**
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Where did I go wrong?

by **Michael A. Obenski, VMD**

LOUD and clear

One DJ gets a taste of his own medicine—courtesy of an office manager.

I am listening patiently while a man speaks, but he is getting on my nerves. He thinks his inane banter is so amusing that he can't help but laugh at his own cleverness.

The young lady with him can't stop her incessant giggling. Apparently, she has never heard anything so funny.

These two are on a morning radio program. It's their job to make me believe that the two people who have to get up at 3 a.m. just so they can get to the radio station and act like imbeciles for the next four hours are actually the happiest people in the world.

It's all a lie. I know that because the guy, Mr. Dour, is a client of mine. That's good news for every other veterinarian in the world because he is the surliest, meanest, most evil-tempered client that ever lived. (He really should have a pilot's license, he flies off the handle so often.)



Illustration: Ryan Ostrander

"Don't even bother to tell me I'm late," he announces as he charges the front desk.

Just the presence of his name on the appointment schedule puts a dark cloud over the day. At the beginning, each office call goes very smoothly. All is peaceful for the first 20 minutes or so. That's because he's late. Once he arrives, the trouble starts. (The poop hits the propeller.)

Don't even bother to tell me I'm late," he announces as he charges the front desk. "I might be on time someday if you people had more reasonable office hours. Why don't you stay open later? I always ask for your last appointment and I still can't make it on time. You're lucky I get here at all." (Yippee!)

Over the next several minutes, he will typically say lovely things like, "A stool sample? I don't have time for crap like that. Let the doctor get one while he checks the anal glands." And, of course, "I hope he's ready to see me right away. My appointment was scheduled for 20 minutes ago."

My staff knows enough to let his comments fall on deaf ears. So they take him to an exam room and hand the problem over to me.

"I'd like to know why you people think my dog should be on a leash when he comes in here. He's never on a leash at home. You know, this isn't a museum. It's a vet's office."

I mumble something about leashes and patient safety, but I'm thinking that a choke collar would be a better idea. (Not for the dog, but for his owner.)

Diagnosis always presents a problem. Mr. Dour doesn't have time to get to his appointment when scheduled, but he has plenty of time to Google his dog's symptoms before he arrives. That gives him just enough information to disagree with everything I say. Even if I win the diagnosis argument, I am usually faced with a medication dispute.

His last visit was no exception to these usual occurrences. While he was checking out with the receptionist and simultaneously complaining about our perceived incompetence, my office manager came to me with a request.

"Why can't we just get rid of this guy?" she asked. I didn't have an answer. In fact, I knew that we needed to send him elsewhere. So I gave her the go-ahead to fire him. She accosted him at the front desk.

"Hey, aren't you the guy from the radio, Reilly Dour from 'Reilly and Rachel in the Morning'? I listen to your show every day on the way to work."

He seemed almost pleased to get the recognition, so she continued, pleasantly enough.

"I like your show. Do you take requests?"

He nodded reluctantly.

"Good," she said. "Our whole staff has a request for you. Take your dog and your attitude and go somewhere else!"

We haven't seen him since. **dvm**

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

For a complete list of articles by Dr. Obenski, visit dvm360.com/obenski

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Through its extensive network of news sources, *DVM Newsmagazine* provides unbiased multimedia reporting on all issues affecting the veterinary profession.

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IN THE NEWS

Pfizer Animal Health to change name to Zoetis, prepares for IPO

Spinoff company plans to offer minority share in stocks in 2013.

By Brendan Howard
Guest Editor

Pfizer hopes to spin off Pfizer Animal Health as an independent company in 2013, with the company offering a minority stake in stocks to the public and giving the venture a new name.

Executives have begun the registration process for a 2013 initial public offering for Pfizer Animal Health, which will be known as Zoetis (pronounced zō-EH-tis). Zoetis would continue to operate under Pfizer's financial reporting processes.

Pfizer's chairman and chief executive, Ian Read, told Reuters in March that Pfizer Animal Health was more likely to spin off than be sold. Reporters at the time said potential buyers had made offers to Pfizer for its animal-health division, which brought in $4.2 billion in revenue in 2011.

"We are on track to create a standalone animal health company by our previously stated target of July 2013," says Read in the announcement.

As for the spinoff company's new name, its roots lie in a prefix associated with animals as well as a reference to life, according to Pfizer.

"The name Zoetis has its root in *zo*, which is familiar in commonly known words such as *zoo* and *zoology*," says a spokesperson. "It derives from *zoetic*, meaning 'pertaining to life,' and signals the company's dedication to improving the health of animals across species and around the world."

More details on the IPO will come in this year's second-quarter earnings announcement July 31, 2012. **dvm**

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dvm In Brief

Franck's Pharmacy recalls sterile human and veterinary compounded prescriptions

Franck's Pharmacy has issued a recall of all sterile human and veterinary compounded prescriptions that were distributed dating back to November 21, 2011.

The U.S. Food and Drug Administration (FDA) recently notified the pharmacy, based in Ocala, Fla., that an environmental sampling of its clean room revealed the presence of microorganisms and fungal growth, which presents a possible risk of infection and subsequent patient illness.

Anyone in possession of these newly recalled products should discontinue their use and destroy any remaining quantities. Adverse events should be reported immediately to Franck's Pharmacy and FDA's MedWatch program.

This isn't the first time the pharmacy has had trouble with compounded prescriptions. In 2009, Franck's was the subject of an investigation involving the sudden deaths of 21 polo horses. The horses died of heart failure caused by an improperly compounded vitamin supplement. While the FDA sought a permanent injunction against Franck's to shut down its compounding operations, a court overturned the FDA's decision, ruling that the agency had overstepped its authority. The FDA has appealed the court's decision.

Questions regarding this recent recall should be directed to Franck's Pharmacy at (352) 690-6773, Monday through Friday from 9 a.m. to 5 p.m. EST. **dvm**

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IN THE NEWS

Infant illness leads to Diamond lawsuit

Contaminated dog food blamed for *Salmonella infantis* infection in N.J.; Costco also named as defendant.

By Heather Biele, DVM
Content Specialist

The latest hurdle facing Diamond Pet Foods in the aftermath of its large-scale pet food recall is a lawsuit filed after a New Jersey infant became severely ill due to *Salmonella* infection. The infection is believed to have resulted from contact with a bag of contaminated dog food in the household.

According to the lawsuit, filed which was May 25 in U.S. District Court for the District of New Jersey and names Diamond Pet Foods and Costco Wholesale Corp., the distributor of the pet food product, as defendants, the plaintiff purchased the Diamond Pet Foods product, Kirkland Signature Super Premium Healthy Weight Dog Formulated with Chicken and Vegetables, from a Morganville, N.J., Costco store. The product was later discovered to be one of many Diamond Pet Foods products contaminated with *Salmonella*. The lawsuit states that the infant experienced severe diarrhea, fever and loss of appetite and "was in obvious pain and was extremely uncomfortable." The infant was hospitalized for three days and during that time, a stool sample tested positive for *Salmonella infantis*, the outbreak strain linked to 16 other cases of human illness in the United States and Canada.

The lawsuit brings eight counts against the defendants, including negligence and fraudulent misrepresentation. The plaintiff is seeking an excess of $75,000 for compensatory and punitive damages and costs of the suit.

Diamond first made headlines back in April when the company recalled its Diamond Naturals Lamb Meal and Rice dry dog food after *Salmonella* was detected during routine sampling. The recall quickly expanded and eventually included multiple varieties of the manufacturer's products: Chicken Soup for the Pet Lover's Soul, Country Value, Diamond, Diamond Naturals, Premium Edge, Professional, 4Health, Apex, Kirkland Signature, Kirkland Signature Nature's Domain, Taste of the Wild and Canidae.

Shortly after, reports of human *Salmonella* infection surfaced and were linked to products manufactured at the company's Gaston, S.C., facility. An investigation conducted by the U.S. Centers for Disease Control and Prevention (CDC) and the U.S. Food and Drug Administration (FDA) ensued, which included a weeklong inspection of the Gaston production plant. It was noted that the facility failed on multiple counts to ensure product safety. According to the inspection report, the FDA found that the company failed to take precautions to protect product from contamination, did not provide hand-washing and -sanitizing facilities in areas where there was direct contact with exposed food, and did not maintain its equipment in a way that guarded against contamination and allowed it to be cleaned adequately (inspectors noted cardboard, duct tape and other non-cleanable surfaces on equipment).

According to the Diamond Pet Recall website, a thorough internal investigation was conducted of all systems and processes at the Gaston plant and corrective action was taken. Production and delivery have resumed at the facility.

Most recently, a surveillance sample of Diamond Naturals Small Breed Adult Lamb and Rice formula produced in the company's Meta, Mo., plant tested positive for *Salmonella liverpool*. At this time, no human illnesses have been linked to this strain of bacteria. **dvm**



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STATE NEWS

North Carolina names May 23 Veterinarians Day

The North Carolina Veterinary Medical Association heads to the Capitol in Raleigh for discussion with legislators.

Gov. Beverly Perdue recently signed a proclamation naming May 23 North Carolina Veterinarians Day and urges citizens to recognize the impact veterinarians have on the health and safety of animals and humans.

The state joins the North Carolina Veterinary Medical Association to recognize veterinarians' dedication to preserving the human-animal bond and promoting standards of science-based, ethical animal welfare.

"We are honored that Gov. Perdue has recognized May 23 as North Carolina Veterinarians Day," says Claire Holley, executive director of the NCVMA. "We hope this day will inspire citizens to observe and recognize the huge impact veterinarians have on animals and humans."

NCVMA hosted its annual Veterinarians Day at the Capitol May 23 where state legislators and veterinarians from around the state discussed animal welfare policy and veterinary medicine. **dvm**



State of North Carolina

BEVERLY EAVES PERDUE
GOVERNOR

NORTH CAROLINA VETERINARIANS DAY

2012

BY THE GOVERNOR OF THE STATE OF NORTH CAROLINA

A PROCLAMATION

WHEREAS, veterinarians provide a valuable public health service through preventive medicine, control of zoonotic diseases and scientific research; and

WHEREAS, veterinarians have advanced human and animal health by investigating and utilizing techniques and instrumentation such as artificial hips, bone plates, splints, anesthesia; and

WHEREAS, veterinarians play an integral role in protecting the quality and security of the food and feed supply in North Carolina and throughout the nation; and

WHEREAS, military veterinarians provide crucial assistance to the armed forces of developing nations around the world; and

WHEREAS, disaster relief veterinarians provide public health services and veterinary medical support to animals and humans displaced by disasters; and

WHEREAS, veterinarians are dedicated to preserving the human-animal bond and promoting the highest standards of science-based, ethical animal welfare; and

WHEREAS, the State of North Carolina joins the North Carolina Veterinary Medical Association and other interested agencies and organizations in recognizing the impact that veterinarians make on the health and safety of animals and humans;

NOW, THEREFORE, I, BEVERLY EAVES PERDUE, Governor of the State of North Carolina, do hereby proclaim May 23, 2012, as "NORTH CAROLINA VETERINARIANS DAY", and commend its observance to all citizens.

BEVERLY EAVES PERDUE

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the Great Seal of the State of North Carolina at the Capitol in Raleigh this fourteenth day of March in the year of our Lord two thousand and twelve, and of the Independence of the United States of America the two hundred and thirty-sixth.

dvm In Brief

Florida

Pet owners in the Marion County, Florida, area will soon have access to a brand-new, state-of-the-art pet emergency clinic, thanks to the University of Florida College of Veterinary Medicine and a team of local veterinarians. The new clinic will provide emergency care between 5 p.m. and 8 a.m. during the week and will be open 24 hours on weekends and holidays. The new clinic is scheduled to open July 2, 2012.

Indiana

The Indiana Veterinary Medical Association recently launched its Power of Ten Leadership Program, a new initiative designed to help cultivate leadership skills in recent veterinary graduates. The program will provide selected individuals with seven leadership development sessions over an eight-month period. The program is co-sponsored by Elanco Animal Health.

Maryland

The Maryland State Board of Veterinary Examiners (MSBVE) has announced that the state's veterinarians, veterinary technicians and veterinary hospital owners can now renew their licenses online. The MSBVE developed the new online registration system in order to streamline the process and make it more efficient for both veterinary professionals and MSBVE staff to keep veterinary licenses up to date.

Massachusetts

The Massachusetts Department of Public Health recently announced revisions to its guidelines for responding to eastern equine encephalitis (EEE). An expert panel convened earlier this year to address concerns that the risk of human illness from EEE may be on the rise in Massachusetts. The new guidelines provide information on environmental risk levels and mosquito control.

New Jersey

The sale of shark fins in New Jersey is a hot topic in the Legislature, thanks to a bill introduced by Sen. Raymond Lesniak. The bill would put an end to the practice of shark "finning," a practice in which sharks are caught, the fins cut off and their bodies returned to the water. Lesniak calls the practice "cruel and inhumane," as sharks are unable to survive without the use of fins. The bill would make it illegal to sell, trade or distribute any shark fin.

Wyoming

Wyoming State Rep. Sue Wallis has her sights on building another horse slaughter facility—this time in her home state. Wallis heads the group United Equine, which hopes to open a slaughterhouse in Riverton, Mont., within a year. The group also announced plans to open horse slaughter plants in Oklahoma and Missouri. The meat from the proposed facilities would be sold for human consumption overseas and in the United States. **dvm**

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IN THE NEWS

New York veterinarian charged with unlawfully dumping dead animal bodies

Andrew Manesis, DVM, accused of tossing 35 pets into the woods instead of cremating bodies.

BY ANDREA HEWITT
CONTENT SPECIALIST

Andrew Manesis, DVM, of the Bronx in New York City, was arrested May 25 for allegedly dumping 35 pet carcasses along the Hutchinson River Parkway in Westchester County.

The investigation began April 5 when New York Department of Transportation employees were mowing grass and cleaning brush. They found the remains of 26 cats, eight dogs and one South African lizard, says Kieran O'Leary, public information officer for the Westchester County Police.

Most of the bodies were in advanced states of decay, O'Leary says, but seven cats had died recently. Necropsies performed on those cats revealed that they had all been euthanized or died of natural causes—there were no signs of animal cruelty.

Most of the animals were wrapped in garbage bags, but one of the recently dumped cats was in a shoebox the cat's owner had used to transport the body to Manesis's clinic. The shoebox was traced to a Las Vegas seller and the buyer was identified, which led police to Throggs Neck Animal Hospital where Manesis practices, O'Leary says. Police later found a second owner whose pet had been dumped and are hoping more will come forward.


Andrew Manesis, DVM

O'Leary says the victims paid Manesis for a company to pick up their pets and perform group cremation. When detectives utilized a search warrant to obtain and analyze Manesis's records, they found no indication that he had interacted with any group cremation company for the past six to eight months. The detectives concluded that this was probably how long Manesis had been dumping the dead animal bodies.

"Dr. Manesis was entrusted by his clients to dispose of their pets' remains in a proper and dignified manner," says Public Safety Commissioner George N. Longworth in a public statement. "Instead, it appears he simply pulled off to the side of a local highway and tossed the animal carcasses into the woods."

Manesis is charged with four misdemeanors—scheme to defraud in the second degree, violation of environmental conservation law and two counts of petit larceny. The number of petit larceny charges could increase if more victims come forward.

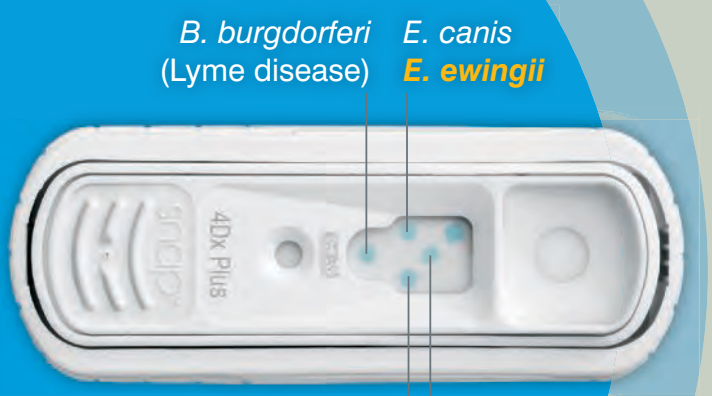
Manesis was released May 25 with orders to appear on June 5 in Harrison Town Court in Harrison, N.Y. **dvm**



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IN THE NEWS

Tennessee walking horse trainer pleads guilty to charges of soring

Undercover investigation reveals abusive practices; multiple violations of Horse Protection Act cited.

BY HEATHER BIELE, DVM
CONTENT SPECIALIST

The Tennessee Walking Horse National Celebration is heralded as a festive event, one that draws hundreds of people to Shelbyville, Tenn., each summer. Unfortunately, what happens behind the scenes for some of these horses is hardly worth celebrating.

For decades, the Tennessee walking horse industry has been plagued with reports of soring—a practice utilized by some trainers of purposefully inflicting pain to achieve an exaggerated, high-stepping gait in horses. And now, Jackie McConnell, one of the most well-known figures in walking horse training history, has pleaded guilty to charges related to conspiracy to violate the Horse Protection Act, according to a report from the U.S. Attorney's Office for the Eastern District of Tennessee. McConnell's plea came on the heels of an undercover video that was released by the Humane Society of the United States (HSUS), which aired on the May 16 episode of ABC News' *Nightline*.

> "The immense suffering horses often endure simply for the sake of a showy gait is unacceptable."
>
> —Keith Dane, HSUS

The video shows McConnell of Collierville, Tenn., and several of his employees applying chemicals to horses' front legs in an effort to produce an artificial gait for the show ring. Additionally, the video shows horses being whipped, kicked, shocked in the face and hit with heavy wooden sticks.

"The immense suffering horses often endure simply for the sake of a showy gait is unacceptable," says Keith Dane, director of equine protection for the HSUS.

This isn't the first time McConnell has been in violation of the Horse Protection Act, a federal law that prohibits individuals from transporting or showing sored horses. Dating back to 1979, McConnell has faced repeated charges of training or entering sored horses in Tennessee walking horse events, each time being hit with a monetary penalty and disqualification from training. In fact, McConnell was still serving a five-year disqualification term when the undercover video footage was taken in 2011.

Based on the findings from the HSUS undercover investigation, the Department of Agriculture Office of Inspector General and the Federal Bureau of Investigation conducted a follow-up investigation and built a case against McConnell, which led to a 52-count indictment against him and three of his employees at Whitter Stables—Jeff Dockery, John Mays and Joseph Abernathy—for conspiracy to violate and substantive violations of the Horse Protection Act.

The indictment on file with the U.S. District Court in Chattanooga, Tenn., alleges that all four individuals conspired to violate the Horse Protection Act by applying prohibited substances, such as mustard oil, to the horses as a means of soring them. The conspiracy is alleged to have begun in 2006 and continued through 2011.

McConnell's plea agreement states that he falsified paperwork to show someone else was training the horses and instructed his workers to camouflage evidence of soring damage on the horses' legs. Specifically, McConnell's employees used spray paint and magic markers to hide the horses' hair loss and used numbing agents to temporarily desensitize the horses to pain, according to the HSUS's investigative report.

The same day that McConnell plead guilty to violating the Horse Protection Act, the Tennessee Walking Horse National Celebration Board of Directors voted to suspend McConnell for life from entering the Celebration grounds for any event.

"This action is the strongest we can take and it clearly reflects our disgust with the actions of Mr. McConnell," says Dr. Doyle Meadows, CEO of the Tennessee Walking Horse National Celebration, in a statement on the organization's website. "His actions are not reflective of the Tennessee Walking Horse industry, and we in no way want him associated with our show."

In addition, Pepsi Co. dropped its sponsorship of the event shortly after the video aired. The video also generated a response from Congressman Jim Cooper in Tennessee, who signed onto legislation co-sponsored by fellow Tennessee Congressman Steve Cohen that would authorize the Agriculture Department to spend up to $5 million to enforce the Horse Protection Act. Although H.R. 2966 is primarily written as an anti-horse slaughter bill, there are specific provisions in the bill that address the detainment of horses thought to be sore, as well as the prosecution of individuals with equipment or substances in their possession that would contribute to the soring of a horse.

Sentencing has been set for McConnell and two of the other defendants for September 10. If convicted, McConnell could face a term of up to five years in prison, a $250,000 fine, supervised release for up to three years and a $100 special assessment. **dvm**

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WELLNESS

Rescue dogs and pampered pooches shed pounds at Doggie Fat Camp in Oregon

Program places obese pets on a strict exercise and diet regimen.

By Ashley Barforoush
Associate Editor

Butters the yellow Labrador retriever may have dodged death at the shelter, but he had another large obstacle to overcome: his weight. The 142-pound pup inspired animal activist Heather Hines to start Doggie Fat Camp in Vernonia, Ore. "He had no hope of being adopted when we found him," Hines says. "No question."

Hines saved Butters from being euthanized at a county shelter in April 2011 through her nonprofit organization Indigo Rescue, which she founded in 1998 in an effort to reduce euthanasia in shelters and give "unadoptable" dogs and cats another chance to find a home. She also owns and operates Indigo Ranch, a cage-free boarding business, to fund the rescue work. Now the ranch can add another line to its list of services: fat camp. "We kept seeing these chubby dogs coming in and thought, 'Man, we need a doggy fat camp,'" Hines says. "It was kind of a joke at first."

Then Hines met Butters. The 3-year-old dog's weight was no laughing matter. It took four people to load him into Hines' vehicle. He wasn't just obese; he was greasy too, Hines says. Butters smelled foul and had huge patches of hair missing. Hines knew the pudgy pooch would have to lose a considerable amount of weight if he ever wanted to be adopted.

First, Mark Norman, DVM, owner of Bethany Family Veterinary Clinic in Portland, Ore., examined Butters to make sure a weight-loss regimen was appropriate for him and checked that there weren't any other medical conditions that needed to be addressed.

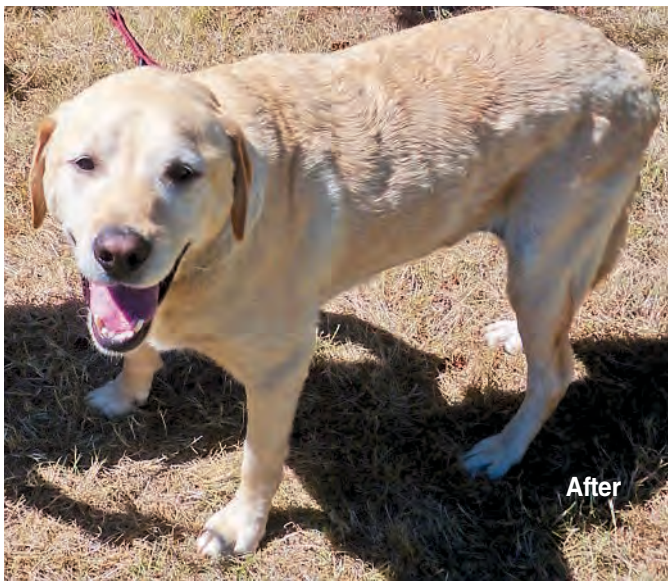
"If there's an animal with a specific medical issue—dermatologic, metabolic or orthopedic—then Indigo Rescue directs the pet to us," Norman says. "Our role is to assist, treat and advise. If we can facilitate correction of the problem we do."

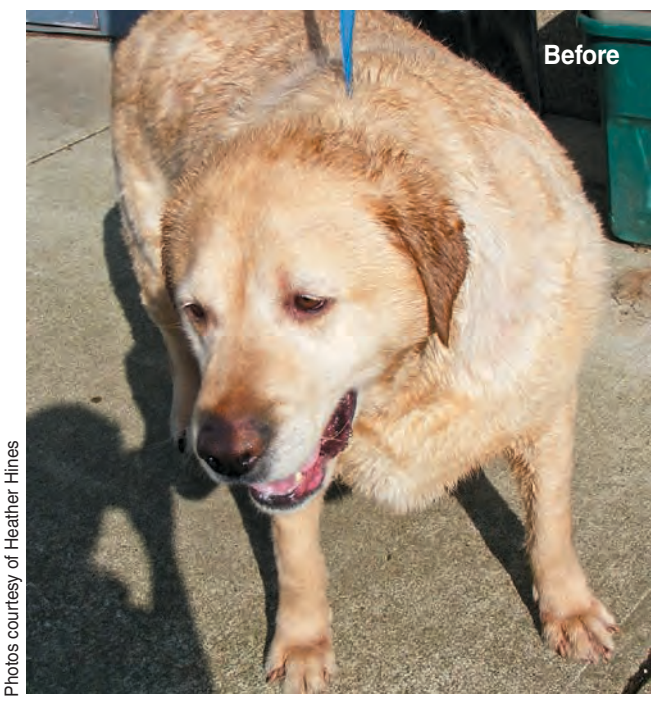
The doctors and staff members at Bethany Family Veterinary Clinic donate their time to the organization and Norman provides treatment at cost. The clinic also serves as a clearinghouse for these rescued pets. Staff members decide what dogs can be treated and sent to a foster family and determine which animals need to visit a specialty clinic—or fat camp.

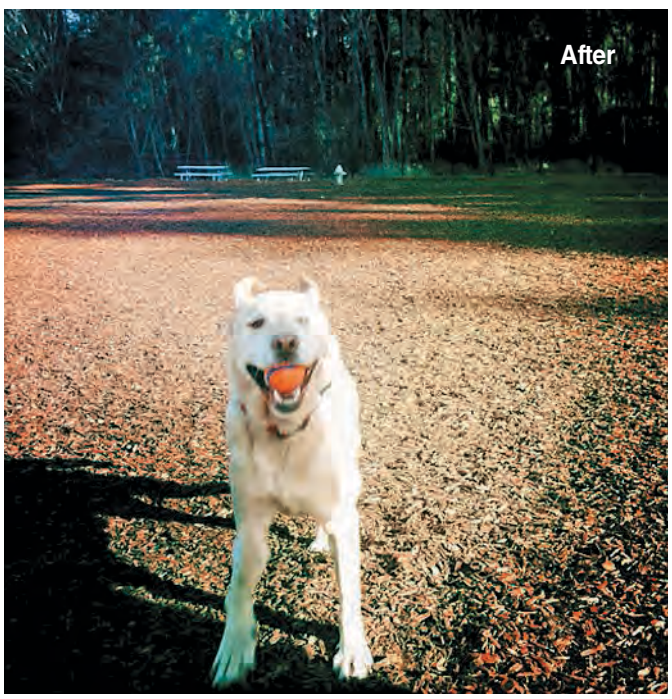
"Whether it's an owned pet or one coming out of a shelter, those pets are all checked by a veterinarian before they go into the fat camp," Norman says. "Then a strict diet and exercise program is established."

Aside from the fact that Butters was extraordinarily obese, he was otherwise healthy with normal blood work results. Once Norman gave the all-clear, Doggie Fat Camp at Indigo Ranch had its first attendee.









Photos courtesy of Heather Hines

Goodbye fat, hello home: Butters the yellow Labrador retriever (featured in the before-and-after photos at left) weighed 142 pounds when animal rescue worker Heather Hines kept him from being euthanized at a county shelter. After four and half months at Doggie Fat Camp, he lost 58 pounds and found a home.

In the beginning, Butters couldn't stay on his feet long enough to exercise—he was carrying so much weight he had to lie down to eat and straddle the dish between his legs, Hines says. She controlled his portions and fed him grain-free, lean protein kibble twice a day—with a little bit of steamed veggies, like green beans, thrown in as well. Over time, through gradual weight loss, he become more active and Hines pushed him to walk around the 16-acre ranch.

"Halfway through his journey he suddenly realized, 'I can run!'" Hines says. "It was very gratifying to see this dog, who could barely walk a few weeks ago, be able to run."

Four and a half months later, Butters slimmed down to a trim 84 pounds—the equivalent of another large dog in weight lost, Hines says. "We placed him with a family and, of course, our contingency was, 'You need to keep him on this diet.'"

Now the camp is in full swing and Ozzy the rat terrier is Hines' first client dog on the road to better health. Pet owner Linda Phillips of Hillsboro, Ore., dropped Ozzy off at Indigo Ranch weighing 46 pounds. Her veterinarian says he should weigh 29 pounds at the most. Phillips and her husband had coddled Ozzy throughout his life because when he was a puppy he'd experienced necrosis in his right hip. Their veterinarian had to remove the joint and stretch the muscle over the area to act as a ball and joint.

"We felt so bad for the little guy," Phillips says. "We just couldn't stop giving him treats. The longer we had him, the larger his waist became." She says their veterinarian would "groan" at Ozzy's weight, so they bought therapeutic dog food and walked him, but they didn't have much success in helping Ozzy shed the extra weight.

"We were embarrassed for Ozzy. Kids, being blunt, would point and say, 'That's a fat dog!'" Phillips says. "I realized, 'Oh my gosh, we're killing him with kindness.' We needed some help."

Until he reaches his goal weight, Ozzy stays at Doggie Fat Camp Monday through Friday and goes home every weekend with measured portions of Indigo Ranch's diet food. It's been only a few weeks but Phillips says Ozzy is already jumping and running—acting like a new-and-improved dog.

When people think of a doggie fat camp they might picture a dog strapped to a treadmill—that's not what this is about, Hines says. Staff members take Ozzy on a half-mile walk alongside the Nehalem River twice a day. Initially he couldn't make the entire walk without lying down periodically to rest. Now Ozzy isn't panting or gasping for air, Hines says. She says the dogs feed off the fresh air and their energy levels improve just from being in the country.

Doggie Fat Camp costs $800 a month, plus the cost of food, which Hines says is basically the price of boarding. The pups weigh in once a month and stay until they get fit. However, it's useless to train the dog if you don't train the people, Hines says.

"I tell Ozzy's mom and dad it's going to be a waste of money if they go back to their old ways with him," Hines says.

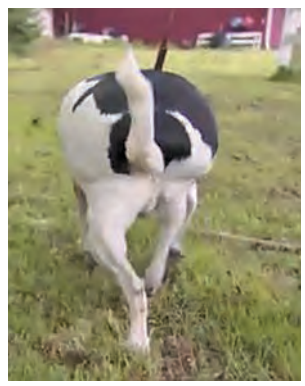
Phillips says that won't be an issue. She and her husband are so relieved that Ozzy is forming healthier habits, they vow never to return to the way they were. The rat terrier used to sit tableside at every meal—now he's confined to the bedroom during lunch and dinner. Ozzy needs to continue exercising and dieting at the fat camp for at least one more month, but Phillips says his saddlebags are getting smaller every week.

"Ozzy's head used to be out of proportion with his body but now the collar around his neck is loose," Phillips says. "He's a happier dog and we're happier people." **dvm**

"We were embarrassed for Ozzy. Kids would point and say, 'That's a fat dog!' I realized, 'Oh my gosh, we're killing him with kindness.' We needed some help."











Photos courtesy of Heather Hines and Linda Phillips

The skinny on Ozzy: This current fat camp attendee made the local news—Ozzy the rat terrier poses with KATU News reporter Melanie Wingo and Heather Hines, owner of Doggie Fat Camp (middle left). Ozzy wasn't always chunky; he sits pretty at his goal weight several years ago (bottom right).

OFFICE CALL

This month's topics from the experts



CHRISTOPHER J. ALLEN, DVM, JD

A SOLID EXIT PLAN CAN SOOTHE BURNOUT A change in careers might be a refreshing solution—but be prepared. pg. 49



MICHAEL PAUL, DVM

BE CHOOSY ABOUT CHOOSING Too many options can be confusing—streamline your clients' choices and eliminate their frustration. pg. 46



MICHAEL H. RIEGGER, DVM

12 KEYS TO MAYO CLINIC'S SUCCESS Just like this institution, your practice can be a well-oiled machine. pg. 40

IN THE NEWS

Ohio woman faces charges after acting as veterinarian without license

Brandi Tomko indicted on 39 felony and misdemeanor counts; trial set for September.

By Andrea Hewitt
Content Specialist

Brandi Tomko, 35, of Akron, Ohio, has been indicted on 39 charges, including 19 felony and 20 misdemeanor counts, resulting from accusations that she acted as a veterinarian at C & D Animal Hospital without a license or any formal training.

The charges include practicing veterinary medicine without a license, five counts of cruelty to animals, two counts of deception to obtain a dangerous drug, identity fraud, three counts of selling a dangerous drug, 10 counts of possession of a dangerous drug, two counts of theft, five counts of injuring animals, assaulting or harassing an assistance dog and nine counts of prohibitions concerning companion animals, "in that she did knowingly torture, torment, needlessly mutilate or maim, cruelly beat, poison, needlessly kill or commit an act of cruelty against a companion animal," according to the indictment report.

Lt. Rick Edwards of the Akron Police department says Tomko also has several prior arrests for possesssion of cocaine and drug paraphernalia dating back to March 2011.

Teresa Stir, executive director of the Ohio Veterinary Medical Licensing Board, confirmed that Tomko is not a licensed veterinarian and says the board received complaints regarding Tomko from several people, which led to an investigation and Tomko's arrest.

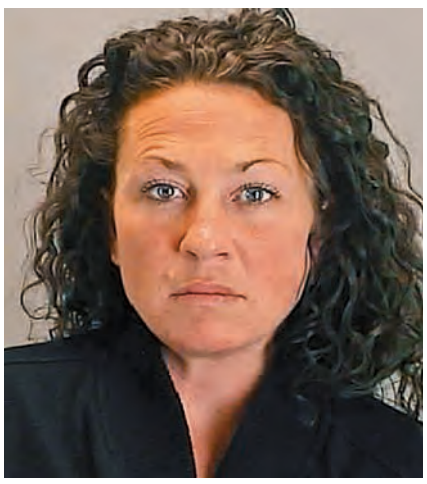
The first complaint came from pet owner Holly Devanich. According to her testimony in the complaint she filed with the Ohio veterinary board, Devanich took her dog, Teddy, to C & D Animal Hospital May 28, 2011, because he "had been having diarrhea all day and was not acting himself." Tomko was the only person working at the hospital. Tomko treated the dog and prescribed medication. After the visit Devanich researched Tomko to find out if she was indeed a licensed veterinarian or technician, and when she found out Tomko was not licensed to practice, she asked for a refund.

Another pet owner, Kenny Reymann, took his dog, Charlie, to C & D April 7, 2011, according to his complaint to the Ohio board. Tomko led him to believe she was a veterinarian and asked Reymann to pay for a blood test, exam and urine specimen. Two days later, Tomko called Reymann and said the results of the blood test were in. She told him Charlie was in renal failure and that he needed to be brought in for hospitalization or he would die.

"My dog was there for four days and was put on medicine and IV fluids," Reymann wrote in his complaint. "Each day I went in to see my dog, he looked worse and worse. Brandi assured me that he was getting better each day, but he quit eating and ended up not eating for five days straight."

Tomko released the dog on April 12. Reymann missed a call from Tomko that night saying she'd received the blood test results and was treating Charlie with the wrong medication. When Reymann woke up the next morning, he found Charlie dead on his living room floor.

The final complaint to the Ohio veterinary board came from Tim Harland, a senior humane officer at the Humane Society of Greater Akron. Harland says he received complaints at the humane society about Tomko performing surgery without a license (with at least one animal dying), taking blood without sending the sample to a lab but telling owners the results were negative, keeping expired medication in the office and not being present at the hospital when owners arrived to pick up their pets after a surgical procedure.


Brandi Tomko

"Each day I went in to see my dog, he looked worse and worse."

One of the complaints Harland sent to the veterinary board stated, "A report was received from a local animal rescue who took in two cats that had been spayed at C & D Animal Hospital. The incision sites were twice as long as needed and infected. The operations did not appear to be performed by a veterinarian."

Stir says all of the complaints were forwarded to the county prosecutor, which resulted in Tomko's indictment. Tomko's trial is scheduled to begin Sept. 11, 2012. **dvm**

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IN THE NEWS

Fire hits Washington State veterinary school

Police believe fire was intentional and related to two others on main campus.

By Andrea Hewitt
Content Specialist

In the early-morning hours of May 29, the Washington State University (WSU) police department and the Pullman, Wash., fire department responded to a fire in a WSU College of Veterinary Medicine building on the Pullman campus.

No animals or people were harmed during the fire, Assistant Police Chief Steve Hansen says. This is the third fire on the Washington State campus during the span of a week. Hansen says police believe the fires were set deliberately, but they are waiting on lab results, including fingerprints and chemical analysis, to make a final determination. It could take two to three weeks for lab results to come in.

Hansen says the veterinary school building showed signs of forced entry through a window, and investigators found multiple ignition points where a fire wouldn't normally start on its own.

The damage during the fire in the veterinary school was limited because a sprinkler system quickly extinguished the blaze, according to a statement released by the university, but the previous two fires destroyed two community centers, which were deemed a "complete loss." The damage estimate for the three fires exceeds $800,000. **dvm**

IN THE NEWS

Early a.m. fire at New Mexico veterinary hospital kills 66 pets

Practice owner receives outpouring of support, offers to help rebuild from members of community.

BY ANDREA HEWITT
CONTENT SPECIALIST

A May 21 fire at Tucumcari Animal Hospital in Tucumcari, N.M., led to the death of 66 pets. Lt. Lance Bateman with the New Mexico State Police says firefighters entered the building to save some of the animals but were only able to rescue five or six.

"Losing the building was one thing, but losing the animals was another," says veterinary practice owner Jean Corey, DVM. "Hopefully they can catch the person or people involved so nothing like this happens again."

Corey says an engineer from the insurance company is coming to see if the walls are salvageable, but she says that the roof and the inside are lost. However, she has received numerous displays of support from the community, including offers to help rebuild. A relief fund was also set up at a local bank.

"I had a seventh grader give me a dollar toward rebuilding the hospital," Corey says. "I've received lots and lots and lots of help from the community."

According to the fire report, firefighters arrived on the scene at approximately 4 a.m. and had extinguised the fire shortly after 7 a.m. Bateman says he's "99 percent sure" the fire was set intentionally, but the police are waiting for lab results that could take up to five weeks to receive.

Scot Jaynes, one of the respondents to the fire and emergency manager for Tucumcari and Quay County, says the blaze could be linked to two other recent fires in the area, including one at an adult probation and parole office on April 16. All of the fires occurred during the early hours of the morning and the causes are suspicious.

Bateman says the police are waiting for the lab results to confirm the source of ignition before they determine whether the fires are related. **dvm**

dvm IN BRIEF

Pets Best names top 5 most costly pet insurance claims

As the cost and quality of veterinary care increase, so do claims submitted to pet insurance companies. Pets Best Insurance recently revealed some of the highest claims it has received over the past year. Here are the top five most expensive.

1. Car accident. One dog was hit by a car and kept on life support for approximately two weeks. The owner filed a claim for more than $55,000.

2. Cervical spondylomyelopathy. This condition, also known as "wobbler's syndrome," caused one pet owner to file a claim for $21,580, which reflects the condition's progressive nature and the necessity of diagnostic tests.

3. Meningioma. The claim for this form of central nervous system cancer came to a total of $15,533.

4. Intervertebral disc disease. A "slipped disk" in the spinal cord often renders the pet unable to move or feel sensation in its limbs. This claim came into Pets Best Insurance at nearly $14,400.

5. Endocarditis. One pet owner submitted a claim for more than $11,000 to treat this inflammatory condition of the heart chambers and valves. **dvm**

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Photos courtesy of Gloria Najecki

Missing dog: "Marilyn," pictured above, went missing from her post atop Advanced Veterinary Clinic's vehicle. The staff at the Manchester, N.H., practice hope she'll be returned safely.

IN THE NEWS

Bulldog statue snatched from clinic vehicle

New Hampshire veterinary practice searches for its missing 'Marilyn.'

BY ANDREA HEWITT
CONTENT SPECIALIST

Marilyn, a statue of a bulldog belonging to Advanced Veterinary Clinic of Manchester, N.H., has been abducted from her post atop a clinic vehicle—a Mini Cooper painted to look like an ambulance.

Jamie Dekraai, clinic operations manager, says the statue, dubbed "Marilyn," was unbolted from the car between the evening of May 26 and the morning of May 28. Marilyn has been with Advanced Veterinary Clinic for a year and was painted last fall by a local artist to make her look like a real bulldog.

The clinic wants the statue returned no questions asked, Dekraai says. She's even stated publicly that Marilyn can be dropped off anonymously at a local animal shelter and the clinic staff will come pick her up.

Dekraai says that if Marilyn isn't found, the practice might purchase a replacement, but for the time being the staff is hopeful she'll be returned. The practice has yet to receive any tips, but on May 29, a man came into the clinic and pointed out a surveillance camera on a building across the street. The business is going through footage from the camera to see if it turns up anything useful related to the theft. **dvm**

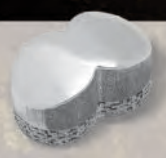
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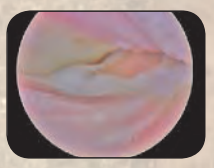
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Arthroscopic image of severe MCD



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Serious adverse reactions have been reported following concomitant extra-label use of ivermectin with spinosad alone, one of the components of Trifexis chewable tablets. Treatment with fewer than three monthly doses after the last exposure to mosquitoes may not provide complete heartworm prevention. Prior to administration of Trifexis, dogs should be tested for existing heartworm infection. The most common adverse reactions recorded in clinical trials were vomiting, pruritus, lethargy and diarrhea. If vomiting occurs within an hour after administration, redose with another full dose. Puppies less than 14 weeks of age may experience a higher rate of vomiting. For product label, including complete safety information, see page 24

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RESEARCH

T cells 'hunt' parasites like predators stalk prey, study finds

Penn veterinary school, physics department researchers analyze immune system response to *Toxoplasma gondii*.

A cross-disciplinary team of veterinary researchers and physics analysts at the University of Pennsylvania have arrived at a somewhat surprising finding: T cells, a key immune system component, track parasites using a movement strategy similar to that of sharks, monkeys and other predators when hunting prey.

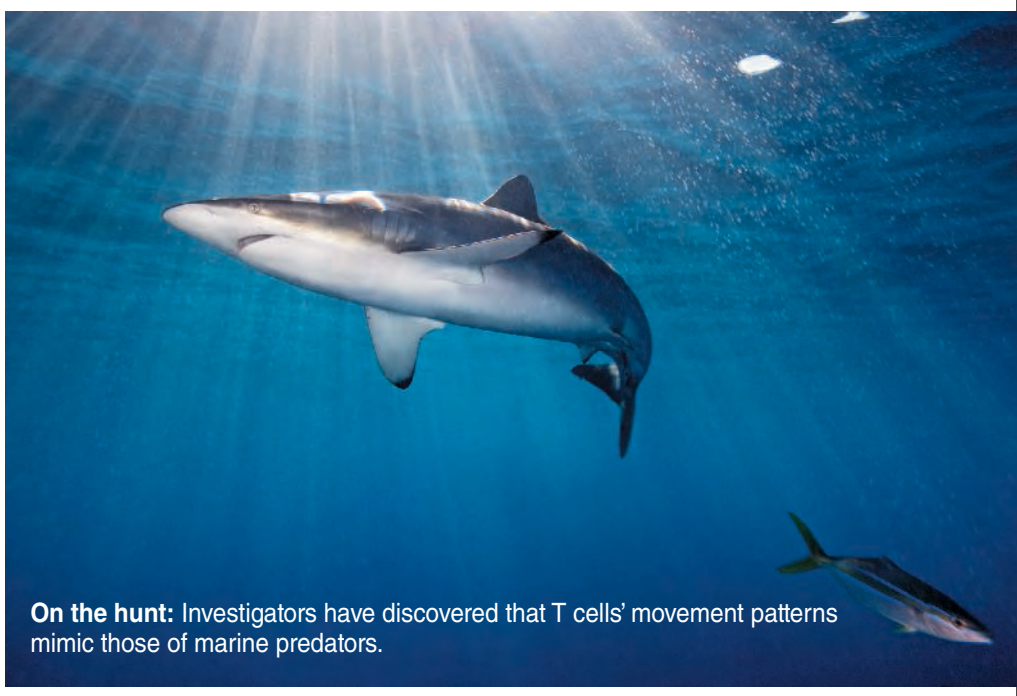
The research was led by Christopher Hunter, professor and chair of the pathobiology department in Penn's School of Veterinary Medicine, and Andrea Liu, professor of physics in the school's department of physics and astronomy. Penn Vet postdoctoral researcher Tajie Harris and physics graduate student Edward Banigan also played leading roles.

The study was conducted in mice infected with *Toxoplasma gondii*, which were used as a model to learn how T cell movement in the brain affects the body's ability to control *T. gondii* infection.

According to information released by the University of Pennsylvania, the researchers sought to pinpoint the exact movement patterns of individual T cells in living tissue from *T. gondii*-infected mice using multi-photon imaging, a technique that uses a powerful microscope to display living tissues in three dimensions in real time.

Using this technique the Penn researchers found that, contrary to what immunologists have assumed, the T cells showed no directed motion. That's where the statistical physics expertise of Liu and Banigan came in. "After some work we managed to find a model that fit the tracks beautifully," Liu says.

That model is known as a Lévy walk. This "walk," or a mathematical path, tends to have many short "steps" and occasional long "runs." The model was not fully consistent with the data, however. "Rather, I had to look at variations on the Lévy walk model," Banigan says, because the researchers also observed that the T cells paused between steps and runs. Like the movements of the cells, the pauses were usually short but occasionally long.



On the hunt: Investigators have discovered that T cells' movement patterns mimic those of marine predators.

James R.D. Scott /Getty Images

Hunter likens the model to a strategy a person might employ to find misplaced keys in the house. "When you lose your keys, how do you go about looking for them?" he says. "You look in one place for a while, then move to another place and look there."

"What that leads to is a much more efficient way of finding things," Liu says. That makes sense for T cells, which have to locate sparsely distributed parasites in a sea of mostly normal tissue.

T cells are not alone in employing a Lévy-type strategy to find their targets. Several animal predators move in a similar way—with many short-distance movements interspersed with occasional longer-distance moves—to find their prey. The strategy seems particularly common among marine predators, including sharks, tuna, zooplankton, sea turtles and penguins, though terrestrial species like spider monkeys and honeybees may use the same approach to locate rare resources.

This parallel with animal predators also makes sense because parasites, like prey species, have evolved to evade detection. "Many pathogens know how to hide, so T cells are not able to move directly to their target," Hunter says. "The T cell actually needs to go into an area and then see if there's anything there."

The model is also relevant to cancer and other immune-mediated diseases, Hunter notes. "Instead of looking for a parasite, these T cells could be looking for a cancer cell," he says. By knowing what controls T cell movement, "you might be able to devise strategies to make the T cells more efficient."

With this new insight into immune-cell movement, researchers may be able to create more accurate models of immune-system function, which may in turn inform novel approaches to combat diseases from cancer and arthritis to HIV/AIDS. **dvm**

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Before using TRIFEXIS chewable tablets, please consult the product insert, a summary of which follows:

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

Indications:
TRIFEXIS is indicated for the prevention of heartworm disease (*Dirofilaria immitis*). TRIFEXIS kills fleas and is indicated for the prevention and treatment of flea infestations (*Ctenocephalides felis*), and the treatment and control of adult hookworm (*Ancylostoma caninum*), adult roundworm (*Toxocara canis* and *Toxascaris leonina*) and adult whipworm (*Trichuris vulpis*) infections in dogs and puppies 8 weeks of age or older and 5 pounds of body weight or greater.

Contraindications:
There are no known contraindications to the use of TRIFEXIS Chewable Tablets.

Warnings:
Not for human use. Keep this and all drugs out of the reach of children.

Serious adverse reactions have been reported following concomitant extra-label use of ivermectin with spinosad alone, one of the components of TRIFEXIS Chewable Tablets (see **ADVERSE REACTIONS**).

Precautions:
Treatment with fewer than 3 monthly doses after the last exposure to mosquitoes may not provide complete heartworm prevention (see **EFFECTIVENESS**).

Prior to administration of TRIFEXIS, dogs should be tested for existing heartworm infection. At the discretion of the veterinarian, infected dogs should be treated with an adulticide to remove adult heartworms. TRIFEXIS is not effective against adult *D. immitis*. While the number of circulating microfilariae may decrease following treatment, TRIFEXIS is not indicated for microfilariae clearance. Mild, transient hypersensitivity reactions manifested as labored respiration, vomiting, salivation and lethargy, have been noted in some dogs treated with milbemycin oxime carrying a high number of circulating microfilariae. These reactions are presumably caused by release of protein from dead or dying microfilariae.

Use with caution in breeding females. The safe use of TRIFEXIS in breeding males has not been evaluated. Use with caution in dogs with pre-existing epilepsy. Puppies less than 14 weeks of age may experience a higher rate of vomiting.

Adverse Reactions:
In a well-controlled US field study, which included a total of 352 dogs (176 treated with TRIFEXIS chewable tablets and 176 treated with an active control), no serious adverse reactions were attributed to administration of TRIFEXIS chewable tablets. All reactions were regarded as mild.

Reactions that occurred at an incidence >2% (average monthly rate) within any of the 6 months of observation are presented in the following table:

Average Monthly Rate (%) of Dogs With Adverse Reactions

Adverse Reaction	TRIFEXIS Chewable Tablets[a]	Active Control Tablets[a]
Vomiting	6.13	3.08
Pruritus	4.00	4.91
Lethargy	2.63	1.54
Diarrhea	2.25	1.54

[a]n=176 dogs

In the US field study, one dog administered TRIFEXIS experienced a single mild seizure 2½ hours after receiving the second monthly dose. The dog remained enrolled and received four additional monthly doses after the event and completed the study without further incident.

Following concomitant extra-label use of ivermectin with spinosad alone, a component of TRIFEXIS, some dogs have experienced the following clinical signs: *trembling/twitching, salivation/drooling, seizures, ataxia, mydriasis, blindness and disorientation.* Spinosad alone has been shown to be safe when administered concurrently with heartworm preventatives at label directions.

In US and European field studies, no dogs experienced seizures when dosed with spinosad alone at the therapeutic dose range of 13.5-27.3 mg/lb (30-60 mg/kg), including 4 dogs with pre-existing epilepsy. Four epileptic dogs that received higher than the maximum recommended dose of 27.3 mg/lb (60 mg/kg) experienced at least one seizure within the week following the second dose of spinosad, but no seizures following the first and third doses. The cause of the seizures observed in the field studies could not be determined.

For technical assistance or to report an adverse drug reaction, call 1-888-545-5973. Additional information can be found at www.TRIFEXIS.com.

Effectiveness:

Heartworm Prevention:
In a well-controlled laboratory study, TRIFEXIS was 100% effective against induced heartworm infections when administered for 3 consecutive monthly doses. Two consecutive monthly doses did not provide 100% effectiveness against heartworm infection. In another well-controlled laboratory study, a single dose of TRIFEXIS was 100% effective against induced heartworm infections. In a well-controlled six-month US field study conducted with TRIFEXIS, no dogs were positive for heartworm infection as determined by heartworm antigen testing performed at the end of the study and again three months later.

Flea Treatment and Prevention:
In a well-controlled laboratory study, TRIFEXIS demonstrated 100% effectiveness on the first day following treatment and 100% effectiveness on Day 30. In a well-controlled laboratory study, spinosad, a component of TRIFEXIS, began to kill fleas 30 minutes after administration and demonstrated 100% effectiveness within 4 hours. In field studies conducted in households with existing flea infestations of varying severity, flea reductions of 98.0% to 99.8% were observed over the course of 3 monthly treatments with spinosad alone. Dogs with signs of flea allergy dermatitis showed improvement in erythema, papules, scaling, alopecia, dermatitis/pyodermatitis and pruritus as a direct result of eliminating the fleas.

Treatment and Control of Intestinal Nematode Infections:
In well-controlled laboratory studies, TRIFEXIS was ≥ 90% effective in removing naturally and experimentally induced adult roundworm, whipworm and hookworm infections.

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dvm IN BRIEF

AAVMC, NIH confirm veterinarians' eligibility for loan repayment

The National Institute of Health (NIH) has clarified on its website that research veterinarians are eligible for competitive grants and student-loan repayment plans.

Representatives from the Association of American Veterinary Medical Colleges (AAVMC) originally noticed that a prominent NIH web page didn't list "DVM" as an eligible degree for student loan repayment. However, in talks with AAVMC legal counsel, NIH officials acknowledged that veterinarians were eligible—in fact, the fine print deeper in the website makes that clear.

"All veterinarians interested in biomedical research will benefit from knowing [they] can compete for support from agencies such as NIH," says Brian Smith, AAVMC's director of governmental affairs.

The DVM degree is now listed prominently, clarifying for website visitors that veterinarians in research and science fields can apply for NIH grants and loan repayment. The page appears at lrp.nih.gov/eligibility/eligibility_of_individuals.aspx.

The website says the NIH may repay up to $35,000 of a qualified veterinarian's student loan debt per year, including most undergraduate, graduate and veterinary school loans.

At press time, representatives from both the NIH and the AAVMC were scheduled to meet again in mid-June to discuss other ways in which veterinarians can be included in grants.

"Veterinarians are important components of interdisciplinary biomedical research teams," Smith says. "The rules governing the clinical loan repayment program do require direct human patient contact, something that is generally not part of a veterinarian's duties. AAVMC is working with NIH to determine how best to expand these opportunities as veterinarians continue to contribute to biomedical research teams." **dvm**

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IN THE NEWS

State Farm names top 10 states for dog bite claims in 2011



Insurers across the country paid nearly $479 million in dog bite claims last year. Is your state on the list? Find out where the dogs' bite was worse than their bark.

State Farm insurance paid more than $109 million as a result of the nearly 3,800 dog bite claims filed in 2011. The Insurance Information Institute estimates that insurers across the country paid nearly $479 million total in dog bite claims last year. In honor of National Dog Bite Prevention Week in May, State Farm released these statistics, along with safety tips.

But dog bites don't just happen in May. Almost 5 million people are bitten or attacked by dogs every year, according to the State Farm report, making this an important safety issue for veterinarians to address with clients every month. Dog bites are a serious problem that can cause both physical and emotional damage to victims and considerable cost to communities.

In 2011, California had the highest number of reported dog bites (527), and State Farm paid approximately $20.3 million in claims. Illinois came in second with 309 cases and $10 million in paid claims. Texas was third with 219 claims totaling $5.1 million. See the map at right for the top 10 states for dog bite claims.

State Farm also reports that a dog's tendency to bite depends on many factors, such as heredity, obedience training, socialization, health and the victim's behavior. It says there are aggressive and nonaggressive dogs within every breed and it doesn't refuse insurance based on breed.

The company also reveals that children and seniors are the most frequent victims of dog bites. In fact, more than half of all dog bite victims are children. "Among children, the rate of dog bite-related injuries is highest for those ages 5 to 9 years," says Patricia Olson, DVM, chief research officer for the American Humane Association. "It's important to note that children are often bitten by a dog in their own household. Thus, supervision by parents and teaching children how to avoid being bitten is crucial for protecting both the child and the dog."

Olsen says that before obtaining a dog, veterinarians should educate their clients about which dog might be the best match for their family. It's also important for veterinarians to warn clients how to properly introduce the pet to an infant when they bring a newborn baby home. Olson recommends the American Humane Association's free downloadable book *When Pet Meets Baby*.

In addition to stressing responsible pet ownership, State Farm and the American Humane Association encourage veterinarians to share these safety tips with clients to keep children—and pets—safe.

1. Never leave a baby or small child alone with a dog.

2. Always be on the lookout for unleashed animals and potentially dangerous situations.

3. Tell children they should never approach strange dogs.

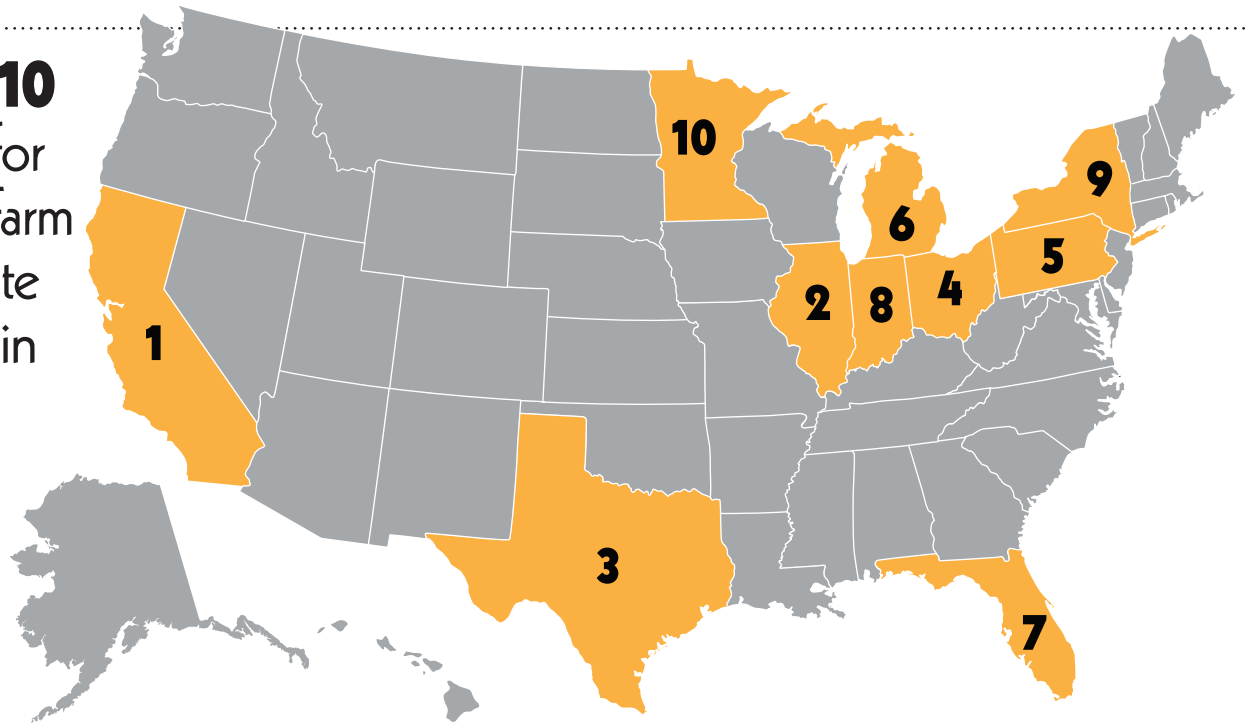
4. Educate all children—including toddlers—to be calm and careful around all pets.

5. Make sure children ask an owner's permission before petting any dog.

For more information and tips about dog bite prevention, visit the State Farm Learning Center, www.statefarm.com/dogbites, or the American Humane Association website, www.americanhumane.org. **dvm**

Getty Images

TOP 10 states for State Farm dog bite claims in 2011



State	Number of claims	Claims paid (estimated)
1 California	527	$20.3 million
2 Illinois	309	$10.0 million
3 Texas	219	$5.1 million
4 Ohio	215	$5.4 million
5 Pennsylvania	197	$4.9 million
6 Michigan	181	$7.0 million
7 Florida	157	$5.1 million
8 Indiana	139	$3.5 million
9 New York	133	$6.1 million
10 Minnesota	117	$3.5 million

Source: State Farm





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ANIMAL WELFARE

World Vets, Innovacyn team up to help donkeys in Tanzania

Eight volunteers hope to provide veterinary care to 1,000 animals on weeklong trip.

World Vets, a nongovernment organization that provides veterinary aid around the world, and Innovacyn, makers of Vetericyn animal healthcare products, have announced that they will collaborate on a mission to help donkeys in Arusha, Tanzania, June 21-29.

Eight World Vet volunteer veterinarians and technicians, along with local partners in Tanzania, will deliver assistance to donkeys owned by the Maasai, Meru and Arusha people. The team's rural mobile donkey clinics will provide veterinary care, hoof trimming, wound treatment and deworming, as well as instruction on proper handling techniques and ongoing care.

There are estimated to be 600,000 donkeys in the area that are vital to the livelihood of their owners, carrying supplies and providing transportation and farming support.

"Our initial assessment of the donkey population revealed a complete lack of preventive healthcare such as vaccinations and deworming," says Dr. Cathy King, founder and CEO of World Vets. "The most common health problems were infected wounds from carrying heavy loads on their backs. An estimated 50 percent of the donkeys suffered from painful lesions that require treatment. … In addition to treating individual animals, education on prevention will be a critically important part of the project."

World Vets' goal for the mission is to treat more than 1,000 donkeys and to give owners and local veterinarians the tools needed for ongoing support.

"World Vets provides essential care to treat and improve the lives of both animals and people around the world," says Dave Mills, general manager of Innovacyn. "When we heard about the high numbers of donkeys with infections and wounds in Arusha, we knew Vetericyn could help and wanted to do everything we could to move the mission forward." **dvm**



Donkey aid: Dana Bridges, DVM, helps a donkey on World Vets' trip to Kahama, Tanzania, in October 2011.



Key to livelihood: Three Maasai women bring their donkeys to the World Vets' field clinic in Arusha, Tanzania.

Photos courtesy of Debbie Pfeifer

dvm360

To see more photos from the articles on pages 30 and 31, visit veterinarynews.dvm360.com.

IN THE NEWS

Stuffed Animal Clinic at Sacramento Zoo raises $600 for police canine association

Mock veterinary exams educate children and cure stuffed animal ailments.

By Ashley Barforoush
Associate Editor

Zoo veterinarians examined plush dogs, cats, dinosaurs and more at the second annual Stuffed Animal Clinic on May 26 at the Sacramento Zoo in Sacramento, Calif.

The Greater Sacramento Chapter of the American Association of Zoo Keepers (AAZK) hosted the fundraiser to benefit the Sacramento Police Canine Association. The mock clinic included multiple stations with bandages, candy medication and a health certificate redemption center.

For the stuffed animals unfortunate enough to have lost eyes, ears or stuffing, there was a surgery table with two docent volunteers dressed up in caps and gowns. Each exam cost $3 and stuffed animals were available for adoption for $1. The zoo raised $600 to assist with the veterinary care of Bodie, a canine officer shot in the line of duty.

When Rachael Wallace told her 5-year-old daughter, Maia, they'd be attending the event, she had one question: "Pinky's not going to get any shots, right?" To Maia's relief her appropriately named pink teddy bear received a healthy diagnosis. "The veterinarian looked her over, checked her ears and said she was well-loved," Wallace says.

Some of the other cases weren't so simple, says Sathya Chinnadurai, DVM, associate veterinarian at the Sacramento Zoo. While he was taking the history of one patient, the pint-sized owner said the stuffed lion had jumped off the bed earlier that morning and broken all four legs. "We were lucky we caught it early," Chinnadurai says. "We applied splints using tongue depressors and gave the girl instructions on when to take off the bandages."



Stuffed with love: 5-year-old Maia Wallace poses with her "pets" post checkup.

Photo courtesy of Rachael Wallace

Other reported stuffed animal ailments included stomachaches and headaches. Chinnadurai says the process was not unlike what he would go through during an actual veterinary exam. He asked each child questions like, "How long have you had the pet?" and "Are there any other animals around the house?"

One child said his stuffed animal had been sneezing for the past couple of days, which made more sense when Chinnadurai found out there was a stuffed bunny at home with similar symptoms. The zoo veterinarian performed a "physical exam" on each patient and administered vaccinations—with empty syringes and colored water to resemble the vaccine fluid—when necessary. Chinnadurai says the best part was interacting with the children, especially those interested in veterinary medicine.

Six-year-old Alexandra Salazar wants to be veterinarian when she grows up and had trouble choosing just one stuffed animal to bring to the clinic. She decided on a pink leopard, Jingga, whom she named after an endangered Sumatran tiger cub born at the Sacramento Zoo in March 2010. Alexandra's mom, Linda Williams of Stockton, Calif., says they visit the zoo every year and the mock clinic was the perfect opportunity for her daughter to interact with zoo veterinarians.

"Alexandra's all about animals so we thought the whole experience was great," Williams says. "My daughter said she learned that it's important to take care of your animals."

Chinnadurai made certain all attendees left with a better understanding of what goes on in a real veterinary clinic. He talked them through each exam and explained how to evaluate a patient's eyes, ears and joint movement. "It was nice to talk to the kids in a non-stressful situation and let them know what we look for in animals—stuffed and non-stuffed," he says. **dvm**

IN THE NEWS

Child-sized veterinary clinic opens at Discovery Center Museum in Illinois

A new exhibit allows children to play doctor and learn important lessons about veterinary medicine.

By Ashley Barforoush
Associate Editor

Aspiring veterinarians can put on pint-sized lab coats, grab a chart and take on the role of doctor, groomer, trainer or pet owner at the Tot Spot Vet Clinic at the Discovery Center Museum in Rockford, Ill.

Now through Aug. 5, children can examine and treat stuffed patients using such tools as stethoscopes, otoscopes, radiography machines, bandages, syringes, scales and more. The mini kennel gives overnight "patients" a place to rest and future equine veterinarians can practice their skills in the corral, complete with horses, sheep and pigs.

Pretend pet owners can pass the time in the clinic waiting room with animal books and puzzles. They can also test out pet carriers and learn how to transport pets safely. Faux groomers can bathe animals in the pretend sink and dry patients' fur with the flexible hose.

The Tot Spot Vet Clinic is designed to teach children these five lessons about veterinary medicine, the Discovery Center Museum reports.

1. Pet owners need to partner with a veterinarian in order keep their animals healthy.

2. Veterinarians treat a variety of pets including dogs, cats, rabbits, turtles and so on.

3. Sick or injured pets are surveyed on an exam table and veterinary staff members use a variety of tools to examine patients.

4. Equine veterinarians travel to farms to care for large animals.

5. Pets need to be bathed and brushed on a regular basis in order to stay happy and healthy.

The child-sized veterinary clinic is sponsored by the Greater Rockford Veterinary Medical Association and the Northern Illinois Veterinary Medical Association Auxiliary in memory of Alicia McEniry. McEniry served on the Northern Illinois Veterinary Medical Association board and helped create lab coats and gather stuffed animals to make the original Tot Spot Vet clinic possible in 1994. She believed children are never too young to learn about responsible pet ownership and proper preventive care for pets. **dvm**



Heart sounds: Three-year-old Irelyn Nye examines her patient before she makes a diagnosis. Thousands of children are expected to visit the Tot Spot Vet Clinic at the Discovery Center in Rockford, Ill.

Photo courtesy of Ann Marie Walker

REGULATORY

FDA releases plans for monitoring food safety, antimicrobial resistance

Initiatives focus on public health in addition to safety and effectiveness of animal feed and drugs.

The U.S. Food and Drug Administration (FDA) recently announced its final strategic plan for the Foods and Veterinary Medicine Program (FVM) and an updated plan for the National Antimicrobial Resistance Monitoring System (NARMS).

The FVM plan combines the efforts of the Center for Food Safety and Applied Nutrition, the Center for Veterinary Medicine and the Office of Regulatory Affairs and was developed to identify key goals and objectives to advance food safety, nutrition and animal health. The NARMS plan details the organization's commitment to food safety through monitoring and research, with a focus on antimicrobial resistance.

The FVM plan comes in response to the FDA Food Safety Modernization Act of 2011, which was signed into law last year and, according to the FDA, is the first major overhaul of food safety regulation in more than 70 years. The act tasks the FDA with developing a new and modernized food safety system that focuses on protecting public health and safeguarding the U.S. food supply.

One of the guiding principles of the FVM strategic plan is regulating the safety and effectiveness of animal drugs and feed, a critical piece that affects both the health of animals and the safety of the nation's food supply. With this in mind, the program intends to focus on providing timely pre-market review of new animal drugs, ensuring that approved drugs are being used appropriately and putting measures in place to minimize the illegal sale of unapproved drugs.

NARMS is a collaboration among the FDA, the U.S. Centers for Disease Control and Prevention (CDC), the U.S. Department of Agriculture (USDA) and state and local health departments. Its goal is to monitor antimicrobial susceptibility in enteric bacteria from humans, food-producing animals and retail meats. The FDA uses data collected from the NARMS program—in addition to input from veterinarians, the animal drug industry and animal producers—to develop strategies to protect public health and promote judicious use of medically important antibiotics.

One of the major priorities for NARMS is developing an improved sampling strategy that better represents food animal production, distribution and consumption. In order to accomplish this goal, NARMS intends to improve retail meat testing, modify animal slaughter sampling and conduct pilot studies to collect animal drug use and resistance data prior to slaughter.

More information on these plans can be found at www.fda.gov. **dvm**

IN THE NEWS

FDA appeals judge's order to take action on antimicrobial use

Federal agency seeks to overturn court's ruling to start proceedings addressing concerns.

The U.S. Food and Drug Administration (FDA) has appealed a mandate ordering the agency to move forward with its 1977 proposal to address concerns related to subtherapeutic use of antimicrobials in food animals. A federal district court judge in New York issued the orders on March 22 in response to a lawsuit filed by the Center for Science in Public Interest, National Resources Defense Council, the Union of Concerned Scientists and Food Animal Concerns Trust. The four organizations claim that the FDA failed to deliver on its promise to conduct proceedings to withdraw approvals for subtherapeutic uses of penicillin and tetracycline.

The appeal, dated May 21, is filed by Margaret Hamburg, commissioner of the FDA; Bernadette Dunham, director of the FDA's Center for Veterinary Medicine; and Kathleen Sebelius, secretary of the U.S. Department of Health and Human Services.

If the FDA fails to overturn the court's ruling, the agency will be required to initiate withdrawal proceedings for relevant NADAs (new animal drug applications) and ANADAs (abbreviated new animal drug applications). Additionally, it will need to reissue a notice of the proposed withdrawals, which may be updated, and provide opportunities for hearings to drug sponsors. **dvm**



dvm IN BRIEF

Two California dairies released from BSE quarantine

Two California dairy facilities associated with the nation's fourth case of bovine spongiform encephalopathy (BSE) have been released from quarantine, says the U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (AHPIS).

The case was confirmed on April 24, 2012, after the animal was humanely euthanized and sampled for disease at one of the state's rendering facilities. The USDA's National Veterinary Services Laboratories also tested the samples and sent them to the World Organization for Animal Health reference laboratories in Canada and England. Both laboratories confirmed that the diseased cow was positive for atypical (L-type) BSE, a variation of the disease that is seen less often than typical BSE.

The dairies were released from quarantine after their feed records and feed suppliers were cleared in an investigational audit. All were found to be in compliance with regulations. As part of the investigation, APHIS also identified two progeny of the diseased cow. The first was stillborn in the last few years and the second was evaluated, humanely euthanized and sampled for BSE at the National Veterinary Services Laboratories in Ames, Iowa. Test results for that animal were negative for BSE.

According to a report from the California Department of Food and Agriculture (CDFA), typical BSE, and possibly the atypical variation of BSE, spread among cattle primarily through feed containing meat and bone meal made of rendered ruminant products from infected animals. Since 1997, the U.S. Food and Drug Administration has enforced a ban on the use of protein derived from mammalian tissues (with the exception of milk, blood, porcine and equine products) in ruminant feed. Approximately 40,000 animals are examined each year for BSE, the CDFA reports.

The CDFA and APHIS are rounding out the investigation by attempting to track down other living cattle that were raised with the diseased cow. **dvm**

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dvm In Brief

Study finds owners of certain dog breeds brush off breathing difficulties

The Royal Veterinary College at the University of London published a study in May concluding that owners of brachycephalic breeds may be putting their pets' welfare at stake because they consider these dogs' breathing difficulties to be normal.

"As a result of intense selection for short muzzles, 'brachycephalic' dogs, such as pugs, have a compressed upper jaw, which results in the soft tissue being crammed within the skull," the researchers reported. "These dogs are at high risk of developing brachycephalic obstructive airway syndrome (BOAS), with clinical signs including noisy and labored breathing, breathing difficulties even on short walks, overheating, gagging and choking."

The researchers surveyed the owners of 285 dogs, referred to the Queen Mother Hospital for Animals for all clinical services during a five-month period. Thirty-one dogs—including pugs, bulldogs, Pekingese, French bulldogs, Boston terriers and Cavalier King Charles spaniels—were affected by brachycephalic airway syndrome, and the researchers found that despite owners' reports of severe clinical signs in their pets, they did not perceive a "breathing problem."

All affected dogs' owners reported that their dogs snored (sometimes even when awake), compared with less than 2 percent of unaffected dogs, and two-thirds of affected dogs showed difficulty breathing during exercise. However, 58 percent of these dogs' owners said their pet did not have or have a history of breathing problems. This suggests that the majority of owners of dogs with brachycephalic airway syndrome don't recognize a problem and, therefore, don't seek veterinary assistance.

"Our study clearly shows that owners of brachycephalic dogs often dismiss the signs of this potentially severe breathing disorder as normal and are prepared to tolerate a high degree of respiratory compromise in their pets before seeking help," says the Royal Veterinary College's Rowena Packer, who carried out the research. "It may require a particularly acute attack, such as the dog losing consciousness, for owners to perceive a problem."

With brachycephalic breeds increasing in popularity—U.K. Kennel Club registrations of the pug alone increased from 3,500 to nearly 6,000 per year between 2007 and 2010—the authors urged owners of these dogs to seek care from a veterinarian if they notice any abnormal breathing sounds. **dvm**

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In the news

Five animal survivors honored at ACVIM event

Dogs, cats and horses receive recognition for overcoming life-threatening illnesses.

The American College of Veterinary Internal Medicine (ACVIM) honored five animals at its twelfth annual Animal Survivor Media Event at the 2012 ACVIM Forum on May 31 in New Orleans. These animals overcame life-threatening illnesses and beat the odds because of advances in veterinary internal medicine, the ACVIM reports. The five survivors, all from the New Orleans area, are pictured below. To learn more about these warrior animals, visit weareanimalsurvivors.org. **dvm**



1. Angel
This Carolina yellow dog survived lymphoma through chemotherapy. She's now in complete remission leading a happy, healthy life.



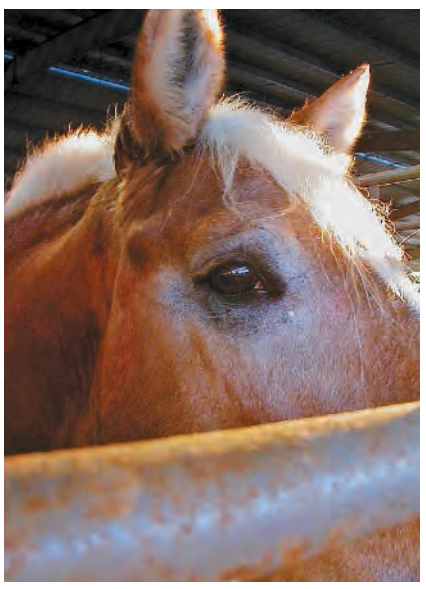
3. Camille
This female shorthaired cat was trapped during Hurricane Katrina and suffered hepatic lipidosis from starvation. She found a home and is now well-fed.



2. Bailey
She lost her front left leg to bone cancer, but the mastiff therapy dog is now in remission and back in action working with those in need.



4. Penny
After suffering from a gastric ulcer and septic peritonitis, this Labrador retriever recovered and is back to her the active lifestyle.



5. Rocky and the New Orleans Police Department horses
These horses suffered from chronic obstructive pulmonary disease (COPD). They survived and can once again watch over the streets of New Orleans.

Photos courtesy of the American College of Veterinary Internal Medicine.

EDUCATION

Majority of veterinary colleges see rise in graduate numbers in 2012

Iowa State, Ohio State continue to top list by class size.

By Heather Biele, DVM
Content Specialist

Of the 26 veterinary colleges responding to *DVM Newsmagazine*'s survey this year, 13 schools saw an increase in the size of their graduating class, similar to trends observed in 2011.

Once again, Iowa State University churned out the most new veterinarians, with a graduating class size of 145 students. Last year, Iowa State saw a marked spike in its graduating class, largely due to the inclusion of students from the University of Nebraska-Lincoln, and the school continued that trend in 2012. The Ohio State University was a close second this year with 139 graduates. Rounding out the top five colleges in terms of class size were Texas A&M and Colorado State University, both with 129 graduates, and the University of California, Davis with 128 graduates.

10 schools saw a drop in the number of graduating students, with Western University seeing the largest decline of 10 students. Additionally, three schools retained the same number of students as last year.

Another recurring and notable trend this year was the percentage of female students making up the overwhelming majority of the graduating classes. More than 75 percent of the graduates this year were women, with Tufts University leading the pack with almost 88 percent of its graduating class represented by female students. The veterinary school with the closest ratio of male to female students was Auburn University, with men making up almost 40 percent of the graduating class. **dvm**

dvm TABLE 1

College	Number of graduates	Change from 2011	Percent male	Percent female
Iowa State University	145	+2%	28%	72%
The Ohio State University	139	0	21%	79%
Colorado State University	129	–6%	24%	76%
Texas A&M University	129	+5%	27%	73%
University of California, Davis	128	+3%	18%	82%
University of Pennsylvania	125	+11%	26%	74%
University of Illinois	122	+6%	19%	81%
Kansas State University	106	–1%	23%	77%
Michigan State University	104	–4%	13%	87%
University of Georgia	97	0	23%	77%
University of Tennessee	96	+35%	14%	86%
Western University	95	–10%	19%	81%
Virginia-Maryland	92	+8%	25%	75%
Auburn University	90	–1%	38%	62%
University of Minnesota	89	0	21%	79%
Oklahoma State University	86	+5%	24%	76%
University of Florida	83	–6%	29%	71%
Cornell University	82	–6%	16%	84%
Louisiana State University	82	+9%	22%	78%
Tufts University	82	+6%	12%	88%
Mississippi State University	78	+7%	29%	71%
University of Wisconsin-Madison	78	–6%	19%	81%
North Carolina State University	76	–1%	22%	78%
University of Missouri	70	+1%	21%	79%
Purdue University	67	–6%	25%	75%
Oregon State University	54	+10%	17%	83%
Total	**2524**	**+2%**	**22%**	**78%**

Note: Tuskegee and Washington State Universities did not respond to survey inquiries.

IN THE NEWS

USDA targets Internet breeders with proposed definition change

New definition of 'retail pet store' designed to ensure health and welfare of pets sold unseen to buyers.

The U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) is proposing a revision to its definition of "retail pet store" to close a loophole watchdogs say has endangered the health and welfare of pets sold over the Internet for too long.

The current law, which was developed more than 40 years ago—well before the Internet became mainstream—exempts retail pet stores from the requirements of the Animal Welfare Act, which APHIS enforces. The idea behind the exemption was that people who walk into a pet store can see for themselves whether an animal is healthy and being cared for properly before deciding to make a purchase. Breeders who do not operate as retail pet stores are subject to licensing and inspection by APHIS officials.

However, many breeders who do business over the Internet, by phone or via mail call themselves retail pet stores. And because they sell animals sight-unseen to buyers, they're not subject to inspection by the federal government or potential pet owners. The result, USDA officials say, is that buyers have received animals with contagious disease, genetic deformities and other medical and social issues. Some of these buyers also received animals that were too young to be weaned.

The new proposal restores the designation of "retail pet store" to businesses or residences that buyers physically enter to observe the animal before purchasing and where certain animals, such dogs and cats, are sold solely for use as pets. This means that Internet-, phone- and mail-based retailers would be required either to allow interested buyers to enter their premises and observe the animals before purchase or obtain a license and allow APHIS to conduct inspections on each animal.

Another stipulation in the proposed rule is that small, hobby breeders would continue to be exempt from licensing requirements as long as they keep three or fewer breeding females on their premises. Dog owners who breed four or more females would be subject to licensing and inspection, a change that affords APHIS the opportunity to focus their efforts on large-scale commercial dog breeders, often known as puppy mills, which present the greatest risk for noncompliance.

"By revising the definition of retail pet store to be better-suited to today's marketplace, we will improve the welfare of pets sold to consumers via online, phone- and mail-based businesses," says Rebecca Blue, USDA deputy under secretary for marketing and regulatory programs.

Some animal welfare groups, such as the Humane Society of the United States (HSUS), also view the proposal as a chance to reform the law. "While the USDA oversight is not without its deficiencies, this is an important step in dragging thousands of unlicensed, uninspected puppy mills out of hiding once and for all," says Wayne Pacelle, president and CEO of HSUS, on the organization's website.

APHIS is accepting comments on the proposed rule to determine how best to target enforcement and whether exemptions should be maintained. More information can be found at www.aphis.usda.gov. **dvm**

dvm

No veterinary workforce shortage, study finds

» CONTINUED FROM PAGE 1

veterinary medicine being practiced. What's more, if these imbalances aren't corrected, the profession is headed for economic disaster.

"The committee is concerned that an unsustainable economic future is confronting the profession and calls for veterinary organizations, academe, industry, government and nongovernment organizations to proceed strategically and with urgency," the study committee says in the report.

The study was instigated after legislation introduced in Congress in 2005, the Veterinary Workforce Expansion Act, called for an increase in the number of veterinarians. The bill was predicated on the assumption that there would be a shortfall of 15,000 to 20,000 veterinarians by 2024 and that, as a result, the nation was ill-equipped to address concerns related to bioterrorism, zoonotic disease and other public health and safety issues.

The bill did not pass, but in 2007, the American Veterinary Medical Association (AVMA), the American Association of Veterinary Medical Colleges (AAVMC) and other organizations commissioned the National Research Council, part of the National Academies of Science, to investigate these assumptions in more detail.

Originally the investigation was supposed to take 18 months. But, says Alan Kelly, BSc, BVSc, PhD, chairman of the committee and dean emeritus at the University of Pennsylvania School of Veterinary Medicine, complications arising from the economic recession, along with a lack of reliable data on segments of the veterinary profession—compounded by a rigorous review process involving all 13 committee members—stretched out the process into a more-than-five-year undertaking.

> "The committee is concerned that an unsustainable economic future is confronting the profession and calls for veterinary organizations ... to proceed strategically and with urgency."
>
> —"Workforce Needs in Veterinary Medicine," National Research Council

In the meantime, the question has continued to plague the profession: Is there truly a shortage of veterinarians in the United States? Some groups say yes, including U.S. veterinary schools, which have increased their enrollment steadily over the past several years. In addition, new veterinary schools have been created in the United States and foreign veterinary schools have been accredited by the AVMA.

Other groups say no, there is no shortage, including the American Association of Bovine Practitioners (AABP). The AABP issued a report in 2011 stating that parts of rural America are underserved by veterinarians not because of a shortage of willing practitioners but because it simply isn't possible for large animal veterinarians to make a viable living in these areas.

And the report from the group tasked with providing a definitive answer and laying the debate to rest kept getting delayed, and delayed—and delayed again.

Finally, on May 30, the committee released its report, titled "Workforce Needs in Veterinary Medicine." In answer to the question "Is there a shortage of veterinarians?" the report gives a clear answer: no.

"True personnel shortages are indicated when salaries rise sharply in an attempt to attract qualified candidates," the report says. "That is not occurring in any sector of veterinary medicine, except industry," which requires a PhD or other highly specialized training.

However, that's a highly qualified "no," as the rest of the report goes on to explain in 298 pages' worth of analysis and detail. Here are the report's key findings and recommendations:

• **Although there is no overall shortage of veterinarians, there are unfilled positions in some sectors of veterinary medicine.** These sectors inclue industry and scientific research, which require advanced training, and the public sector (epidemiology, food safety, wildlife and ecosystem health and public health), where salaries are lower than average and recruitment efforts fail to reach veterinarians who might be looking for jobs. The report recommends more extensive partnerships between veterinary schools and animal health corporations and also encourages state and local governments to reexamine how they recruit and pay veterinarians.

The report also implies that veterinary schools—which are increasing their class sizes as well as growing in number—focus too heavily on companion animal medicine. "The demand for a veterinary education among U.S. citizens remains high, yet the economic reality regarding student educational costs in relation to modest practice incomes is worrisome," the report states. "Companion animal medicine has come to dominate the curriculum and resources of veterinary schools, sometimes to the detriment of other fields of veterinary medicine." The report urges organizations such as the AVMA, AAHA and AAVMC to address this imbalance accordingly.

• **The decline in veterinary school funding has jeopardized the profession's ability to meet society's needs.** Specifically, the report indicates, state budget cuts have hurt scientific research efforts. "Veterinary medicine has made immense contributions to human well-being but is losing the breadth of its intellectual base," the report reads. "The trend jeopardizes the vigor of veterinary medicine, threatens the profession's future and urgently requires a change in direction."

In addition to recommitting to scientific investigation and recruiting students and faculty to research careers, veterinary schools need to seek alternative sources of funding, the report states—for example, from the National Institutes of Health (NIH). "The total NIH funding of the nation's 28 veterinary schools and colleges in 2010 was about $280 million—less than the NIH funding for any one of the nation's top medical schools." This despite ample opportunity for cross-disciplinary biomedical investigation that has direct implications for human health, such as cancer research.

• **The cost of veterinary education is at a "crisis point."** With the ratio of student debt to starting salaries at greater than 2 to 1, people will eventually wake up to the grim reality of this paltry return on investment, and the quality of veterinary school applicants will decline, the report predicts. Veterinary schools will need to seek other sources of funding besides tuition increases, make a better case for the value of veterinary services to state and federal governments (which, again, requires a recommitment to scientific research that's in the public interest) and examine alternative teaching methods that reduce costs (such as webinars and partnering with private specialty practices instead of maintaining teaching hospitals).

One potential piece of the solution suggested by the report is to encourage more students to apply for admission to veterinary school after two years of undergraduate training, similar to how many pharmacy schools and overseas veterinary schools operate. Earlier admission would decrease the student debt load and help graduates begin earning income earlier. "In Britain we go straight from high school to vet school," says committee chairman Kelly. "I've never understood why in North America students need an additional four years."

• **The veterinary profession is losing its presence in food animal production and care.** Food animal medicine has failed to adapt to the changes in the livestock and poultry industries, the report asserts. Rather than providing traditional veterinary care focused on individual animals, food animal veterinarians need to be

dvm TABLE 1

Type of employment	Number of veterinarians	Median earnings, 2009
Food-animal-exclusive practice	1,109	$103,000
Food-animal-predominant practice	3,890	$91,000
Mixed-animal practice	4,326	$85,000
Companion-animal-predominant practice	5,966	$91,000
Companion-animal-exclusive practice	41,381	$97,000
Equine practice	3,743	$85,000
Other private practice	1,087	$79,000
College or university	6,425	$103,000
Federal government	1,780	$103,000
State or local government	1,099	$106,000
Uniformed services	713	$85,000
Industry	3,218	$148,000
Other public and corporate	2,066	$103,000
Other, unknown	16,766	N/A

Source: AVMA

trained to manage herd health and increase producers' productivity.

"Large producers who dominate the livestock industries seek veterinarians who are … committed to food animal practice, who can understand production systems, can read farm records and can use them to make decisions aimed at increasing herd health, productivity and the overall profitability of the farming operation," the report says. "It is these services producers seek and for which they are willing to pay."

In rural areas where there are too few farms that are too widely dispersed to make veterinary practice finacially feasible, the profession should look to the human health model of utilizing nurse practitioners and other paraprofessionals in underserved areas, the report recommends.

"The AVMA and other professional associations will need to enter a dialogue with officials to modify state practice acts to permit credentialed veterinary technicians to administer livestock-health services, provided that they are subject to collaborative oversight (and constant communication) with licensed practitioners who may be in distant locations," the report says. "Veterinary technicians and other paraprofessionals working with food animal veterinarians in this way have the potential to provide affordable, high-quality care to rural America, and their role should be expanded."

• **Global food issues will dominate the 21st century, and the veterinary profession must be equipped to manage these challenges.** With the world's population currently at 7 billion and well on its way to 9 billion by 2050, the report says, "it is increasingly clear that agricultural science, veterinary medicine and other disciplines must work together to deliver sufficient, safe food to sustain the world's growing population."

Currently the rising demand for animal protein in developing, rapidly urbanizing areas of the world is being met by increasing numbers of low-producing animals, a trend that is "environmentally destructive and unsustainable," the report states. One example is ranchers in Argentina clear-cutting the rain forest to create grazing pasture for their cattle.

As an alternative, the veterinary profession should partner with other disciplines and organizations to increase the efficiency of livestock and poultry production so that yields are higher and numbers are lower. Plus, veterinarians need to understand animal health hazards and control infectious disease outbreaks that endanger public health. All of this, the report says, calls for an expansion of the One Health initiative beyond infectious diseases into management of food safety and sustainability.

"Society tends to view veterinary medicine through the narrow lens of companion animal medicine," the report reads. "The profession has not done enough to expand recognition of its immense responsibilities in addressing global food security and resilience. Tackling the multiple dimensions of One Health and sustainable food security will require a new, broader definition of veterinary medicine, of its foundational competencies and the focus that veterinary research must take."

Andrew McCabe, DVM, MPH, JD, executive director of the AAVMC, says he is pleased with how closely the report aligns with the North American Veterinary Medical Education Consortium (NAVMEC) "Roadmap for Veterinary Medical Education in the 21st Century" in calling for changes to veterinary education.

"This report confirms our initial thoughts that there are sectors of unmet need and shortages in certain key disciplines: biomedical research, public health and global medicine," McCabe says. "There are certainly areas of unmet need. If we fail to meet those, we risk losing relevance in society." **dvm**

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dvm

Standardized CPR guidelines releases for dogs and cats

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University's College of Veterinary Medicine, and Manuel Boller, DVM, MTR (master of science in translational research), Dipl. ACVECC, senior research investigator at University of Pennsylvania's School of Veterinary Medicine and the Center for Resuscitation Science at Perelman School of Medicine, created the Reassessment Campaign on Veterinary Resuscitation (RECOVER), a collaborative project supported by VECCS and ACVECC.

The motivation for the initiative came about as the two colleagues were developing material for a CPR course. They soon discovered that there was considerable variation in CPR technique in the veterinary community and decided that needed to change.

"We wanted to formalize the process, do a more thorough review of existing evidence and develop true, evidence-based guidelines for CPR," Fletcher says. "We also wanted to establish consensus for the guidelines by involving more people in the veterinary community for the review process."

And that's just what they did. Veterinary specialists affiliated with the RECOVER initiative spent 18 months surveying more than 1,000 pieces of experimental and clinical CPR literature, critically appraising it and devising a series of evidence-based CPR guidelines for dogs and cats.

The process for developing the guidelines was similar to that used to develop the American Heart Association guidelines for CPR in human medicine. RECOVER identified five critical "domains," or subject areas, the guidelines needed to address: preparedness and prevention, basic life support, advanced life support, monitoring, and post-cardiac arrest care. In the end, 74 topics related to small animal CPR were evaluated, and from that analysis, 101 clinical guidelines were generated. The draft guidelines were made available to veterinary professionals for comment during an open feedback period and finalized by members of the RECOVER committee before publication.

The finished product includes detailed information about performing chest compressions, intubating and providing ventilation, monitoring the patient, gaining vascular access for drug administration and reversing the effects of sedatives and anesthetics, if those agents were used. Diagrams, step-by-step algorithms and drug dosing charts are also provided as quick-reference tools for practitioners.

Those closely involved with the project believe that the guidelines will have a substantial impact on the veterinary profession. "We finally have true, evidence-based guidelines that we can teach people and that will improve outcomes in patients," Fletcher says. "And on a greater scale, this is the first time in veterinary medicine that we've had a large initiative like this. This process is new for veterinary medicine and we hope that it will serve as a model to be applied to a lot of different questions in our profession."

The researchers state that while challenging, the methods used in this initiative—identifying and systematically evaluating specific key issues and questions using a collaborative approach and involving a variety of experts—are certainly feasible and could pave the way for further evidence-based efforts in veterinary medicine.

A free, downloadable version of the new CPR guidelines is currently available in a special issue of the *Journal of Veterinary Emergency and Critical Care* and online at www.veccs.org. In addition, RECOVER is working on developing a user-friendly, standardized training course to supplement the guidelines. Veterinary professionals who elect to take the course will become certified in CPR through ACVECC and VECCS. **dvm**



RESEARCH

Bird vocalization provides insight for poultry industry

Researchers think chicken chatter could reveal how healthy and comfortable birds are in their environment.

Researchers from the University of Georgia and the Georgia Institute of Technology believe they may have cracked the code—the clucking code, that is. A project initiated by a team of professionals at these educational institutions could reveal valuable information about how content and healthy chickens are, based on their vocalization, according to information recently released by both schools.

In the state of Georgia, poultry production is the most profitable agricultural industry, pulling in a whopping $20 billion statewide each year. And industry insiders like Casey Ritz, a University of Georgia associate professor of poultry science, know that improving the health and well-being of chickens could improve the bottom line for individual poultry producers—and possibly translate into a boost for the state's economy. Stressful conditions can stunt a chicken's growth and reduce its value when it goes to market, so it makes sense that producers would want to keep their flocks happy if they want to keep their profits up. And in today's market, there's extra incentive for egg producers to address the welfare of their chickens. The popularity of "cage-free" and "free-range" egg products is proof that modern consumers are demanding a more environmentally responsible and humane approach to the production of foods they put on their table. To remain profitable, producers must answer those demands.

While this particular research project is certainly innovative, the concept of fowl feedback isn't new to seasoned poultry producers. "Many poultry professionals swear they can walk into a grow-out house and tell whether a flock is happy or stressed just by listening to the birds vocalize," says Wayne Daley, a Georgia Tech Research Institute (GTRI) principal scientist who is leading the research. "The trouble is, it has proved hard for these pros to pinpoint for us exactly what it is that they're hearing."

And that's where scientists at the University of Georgia and Georgia Tech come in. The researchers are hoping to back up producers' anecdotal claims with scientific evidence by conducting stress-related experiments on small flocks, recording the birds' reactions on audio and video and analyzing the results. "If what experienced farmers hear and sense can be defined and quantified, sensors to detect cues from the birds themselves could really make a difference in providing real-time information on house environment, bird health and comfort," says Michael Lacy, head of the Department of Poultry Science at the University of Georgia.

Although the poultry industry already has measures in place to gauge housing factors, equipment failure and other factors can affect presumably ideal conditions and prove costly to correct. "That's where being able to judge the flock's behavior can be so important," says Daley. "Your temperature sensors might say that things are fine, but the birds could be telling you that they think it's a bit too warm."

The researchers hope that results from this project will ultimately save the poultry industry in production supply costs by allowing them to forgo expensive equipment in exchange for a simple system of microphones and computer algorithms to monitor the condition of their flocks. **dvm**

"Many poultry professionals swear they can walk into a grow-out house and tell whether a flock is happy or stressed just by listening to the birds vocalize."

—Wayne Daley, Georgia Tech Research Institute

Effective, Safe Nutritious Dental Treats: Fundamentals of Optimal Product Design



Bradley Quest, DVM, Senior Product Development Veterinarian for the GREENIES® Brand, shares insights into the science behind GREENIES® Canine Dental Chews.

Pet oral care is important to overall pet health. Periodontal disease is one of the most common—if not the most common—disease seen in small animal practices. In addition to malodor, eating difficulties and patient discomfort, periodontal disease may also lead to systemic health concerns.[1] Optimum oral health can be achieved through a combination of Oral Assessment, Treatment and Prevention (ORAL ATP® protocol), which includes preventive in-home care. And while daily tooth brushing is the best option for at-home care, it can be difficult for the pet owner to do on a regular basis. Using dental chew products can be a good alternative if the product is effective, safe and healthy for the pet.

GREENIES® Canine Dental Chews, including the Veterinary Formula, provide a safe, effective and nutritious alternative for pets when daily brushing is not an option.

Balancing Efficacy, Safety and Nutrition

A dental chew should successfully clear away disease-causing plaque and tartar. However, it should also be safe and healthy beyond its teeth-cleaning capabilities. Solubility, digestibility and nutritional value are as important to the development of healthy treats as their functionality for oral care.

Solubility, or the measure of how well the product breaks down when exposed to liquid, is critical for optimal safety within a dog's digestive system. High solubility found in all GREENIES® Canine Dental Chews formulations work to prevent obstructions in the digestive tract.

[1]Association of periodontal disease with systemic health indices in dogs and the systemic response to treatment of periodontal disease. Rawlinson, Jennifer E., DVM, DAVDC; Goldstein, Richard E., DVM, DACVIM; Reiter, Alexander M. Dipl Tzt, Dr. med vet, DAVDC; Attwater, Daniel Z., BS; Harvey, Colin E., BVSc, DAVDC, DACVS. *Journal of the American Veterinary Medical Association.* March 1, 2011, Vol. 238, No. 5, Pages 601-609.

GREENIES® Veterinary Formula Canine Dental Chews, the latest dental chew from the GREENIES® brand team, was recently tested to reveal its safety credentials. The product demonstrated 93.99 percent solubility when exposed to enzyme solutions at a fixed pH level and temperature during a fixed period of time. Both gastric and small intestinal digestion were simulated in the 2011 study.[1]

Dental Chew Solubility[1]	
GREENIES® Veterinary Formula	**93.99%**
C.E.T. HEXTRA Premium Chews	22.55%

Digestibility, or the percentage of nutrients that are absorbed by the dog's body, is also important in the development of dental chew products. Premium dry dog foods are about 82–89 percent digestible.[2] In comparison, GREENIES® Veterinary Formula Canine Dental Chews are 92.6 percent digestible[3] when consumed by dogs. High digestibility works to further optimize the safety of the treat and, when combined with a nutritionally complete formula, offers the dog added nutrition for better health.

Solubility and digestibility combined with complete and balanced nutrition supports overall good health beyond oral care functionality. GREENIES® Veterinary Formula Canine Dental Chews incorporate antioxidant levels, omega profiles and chelated minerals recommended by WALTHAM® researchers.

Healthy works best when the treat is readily accepted by the dog, therefore palatability is also a consideration. A 2011 study[4] illustrated the high palatability of GREENIES® Veterinary Formula Canine Dental Chews over C.E.T. HEXTRA Premium Oral Hygiene Chews. In the study, 85 percent of dogs preferred the taste of the GREENIES® product.

Combining a taste dogs prefer with balanced nutrition, high solubility and digestibility ensures maximum efficacy and safety. For pet owners who are unable to regularly brush their pet's teeth, GREENIES® Canine Dental Chews formulations provide a beneficial alternative veterinarians can feel good about recommending and selling.

	VOHC Seal of Acceptance	Reported Dental Test Results	Natural[5]	Nutritionally Complete and Balanced[6]	Antioxidant levels, omega profiles and chelated minerals recommended by WALTHAM® researchers
GREENIES® Veterinary Formula	✓	✓	✓	✓	✓
C.E.T. HEXTRA Premium Chews	✗	✓	✗	✗	✗

[1]Based on *in vitro* simulated digestion model. Data on file, The Nutro Company, 2011.

[2]Data on file, The Nutro Company, 2012.

[3]BEG Digestibility Study, 2009. Data on file, The Nutro Company.

[4]Canine Palatability Study, November 2011. ($p<0.001$). Data on file, The Nutro Company.

[5]Fortified with added vitamins, minerals and other nutrients.

[6]For adult dogs.

Understanding Oral Biometrics

The science of biometrics, or the accurate measurement of the characteristics of living things, is crucial to the development of functional dental chews for dogs. Studying canine chewing capabilities helps us more fully understand feeding behaviors and provides data that can be used to optimize product development.

Utilizing biometric data, such as bite force capacities of canines with various skull shapes and sizes, in product design results in differentiation of product within size ranges. That's why GREENIES® Canine Dental Chews formulations differ not only in size, but also texture, shape and formulation to better accommodate individual behaviors and needs. Canine biometric data allows for "smart" product design (Fig. 1). Smart product development means safer, more efficacious oral health and nutritional products.

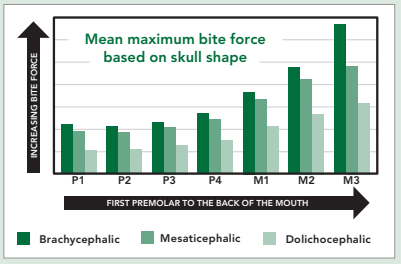


Figure 1



GREENIES® Canine Dental Chews formulations bend to maximize plaque and tartar control.

Dental Chew Efficacy

Dental chews boost oral health by reducing plaque and tartar, the main culprits of periodontal disease. An effective dental chew removes plaque and tartar during the chewing process. Biometrically inspired GREENIES® Canine Dental Chews formulations, which carry the Veterinary Oral Health Council (VOHC) Seal of Acceptance[1], are designed to control plaque and tartar accumulation while the dog is manipulating and consuming the treat.

While the toothbrush design works to keep dental health top-of-mind, more importantly it incorporates chewing behaviors of dogs to optimize efficacy. The bristles and grooves provide greater surface contact and natural breakpoints for manageable bite sizes. The brush head encourages dogs to manipulate the product, resulting in more teeth being cleaned. The handle valley, which varies in depth depending on the size and chewing capacity of the dog, guides the dog's mouth naturally to the brush head and provides an additional groove for tooth surface exposure. The knuckle ends provide additional breakpoints to maximize both grip and digestibility. The chewy texture enables the dog's teeth to sink into the treat down to the gum line, maximizing the mechanical action to control plaque and tartar.

[1]The VOHC Seal of Acceptance is awarded only to products proven safe and effective by stringent third-party clinical testing. GREENIES® Veterinary Formula Canine Dental Chews and GREENIES® Canine Dental Chews carry the VOHC Seal of Acceptance for plaque and tartar control.

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Opinion/Analysis

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Colleagues, not competitors



I would like to stand and applaud Dr. Andrew Roark and his excellent article ("I'm a hypocrite; are you one too?" May 2012). I could sign my name at the end of the column and everything he wrote would apply to me. If we could all treat each other as colleagues, not competitors, and walk in each others' shoes, we would see everything differently. Thank you, Dr. Roark, for writing so precisely what I feel and being so transparent. Excellent! Bravo!

—Michael D. McGuire, DVM
Charlotte, N.C.

Pol delivers warm personality but subpar patient care



In response to William K. Wellman's "In defense of Dr. Pol" (Letters, May 2012)—I recently watched in horror as Dr. Pol examined a dog that had been severely bitten and attacked by another dog. Dr. Pol told the injured dog's owner that the dog was in shock and that if he administered anesthesia at that point to repair the multiple lacerations the dog had incurred, it would likely die. As such, it was imperative to treat the dog for shock until he stabilized and then consider the laceration repair.

All of which sounds good until we witness him give a subcutaneous injection (which we presume is a steroid) and place the dog in a cage, saying, "Well, its up to him now," and watch him go out on a farm call. No intravenous catheter with IV fluids, no pain medicine, no antibiotics or blood test, etc. Dr. Pol later returns from the call and his receptionist/wife tells him the dog did not make it. We see Dr. Pol call up the owner and explain that the dog's condition was too far gone!

I am aware that there are areas in the world where the level of care received by this canine patient would surpass that given to many people under similar circumstances. However, this is the U.S., and this veterinarian is in the public spotlight, representing the standard of care given by our beloved profession. His surgical technique—he operates on dogs on a cold metal table without administering IV fluids and without intubating them—only further substantiates my claims. Dr. Pol is a warm, heartfelt individual and his personality as a caring veterinarian certainly comes across well to a TV audience. The standard of care of his patients, however, and as far as I am concerned, is subpar.

—Dr. Robert Glasser, DVM
New York, N.Y.

The hen or the egg?

My comment is in regard to the article in the May 2012 edition of *DVM Newsmagazine* titled "AVMA lends support to hen-housing legislation." Has the AVMA researched the implication this legislation will have on egg prices? European countries enacted similar legislation years ago, and their egg prices quadrupled overnight. This would put U.S. egg prices at over $8 per dozen. I, for one, enjoy eggs as an inexpensive and healthy source of protein for my family. $8 a dozen would put eggs out of my budget. Perhaps the issue should have been investigated deeper before *DVM* published this article so that everyone is completely informed on the impact this legislation would have on all Americans.

—Cheri Herschell, CVT
Zelienople, Pa.

Moving on from student loans



Regarding "David vs. Goliath: One veterinarian's epic battle against student debt" (May 2012), I can sympathize with Dr. Campfield's desire to completely pay off his student loans, as I am also the type of person that hates owing money to anyone, especially the government. But I have to disagree with his financial plan.

I graduated from veterinary school in 2009 with a student loan debt of approximately $160,000 and also completed a year-long internship where I earned barely enough to pay my rent. I did, however, buy into the proven idea that it is more financially beneficial to save for your future instead of putting your entire paycheck towards student loans. I am currently enrolled in the income-based repayment plan for all of my student loans, and I have to say that if the government wants to "forgive" what's left of my loans after so many years, more power to them. Even with my huge student loan debt, which I have made barely a dent in so far, I currently own my own home and car and am saving every day for my future. I just wanted all our fellow colleagues swimming in student debt to know that it is possible to move on with your life without paying off all your student loans first.

— Jenni Smagala, DVM
Bear, Del.

Wringing hands over debt

I realize the debate over student debt has raged for a number of years and is heating up as amounts of debt increase. I also think Dr. Jeremy Campfield is now doing exactly the right thing: living on as little as possible and working off that debt as quickly as possible.

One key thing to remember is that veterinary students are out of the job market for eight years while their peers in other fields are making money. It seemed from the article that Dr. Campfield chose to extend that to 11 years by traveling, which is a choice he was free to make. However, if he would have made $50,000 per year for three years, he would have made great inroads into his debt. I am sure he had expenses during those three years.

Student loans are also very high in graduate and undergraduate school because of the great increases in tuition. Universities seem to be unaccountable to anyone to lower costs. Since student loans are readily available, it increases the demand on a limited number of spots. Simple economics would translate that to higher fees. Let's address the causes and possibly do something about this problem instead of wringing our hands.

I guess I am left wondering: What is Dr. Campfield's point? That student debt is a big burden?

— Paula Kuhfus, DVM
Radcliffe, Iowa



Good Medicine | Good Business

by **Michael H. Riegger, DVM, Dipl. ABVP**



Tips from the top: insights from the Mayo Clinic can help improve your practice and increase your business.

12 secrets to Mayo Clinic's success

Just like this instituition, your veterinary practice can be a well-oiled machine.

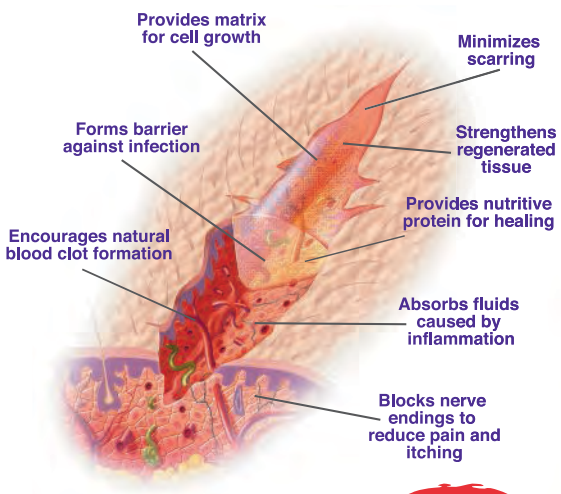
If you're looking to help your veterinary practice grow, expand and thrive, take a few cues from the Mayo Clinic in Rochester, Minn. The Mayo Clinic is doing all three—it has upwards of 60,000 employees (including doctors), grosses more than $8 billion and sees about 1 million patients per year. Despite its size, the Mayo Clinic enjoys the best reputation in the world for human medical care and is categorized as one of the best places to work in the United States.

Compare that to an average veterinary practice that has fewer than 10 employees and fewer than three veterinarians, each of whom sees about 15 patients per day. Most veterinary clinics have cash-flow problems, staff turnover at a two-year rate, and employees who receive few (if any) benefits such as healthcare, dental, vision and retirement. Although most veterinary clinics can't compare to the size and scale of the Mayo Clinic, there are plenty of nuggets to glean from the way it operates.

CONTINUED ON PAGE 42 »

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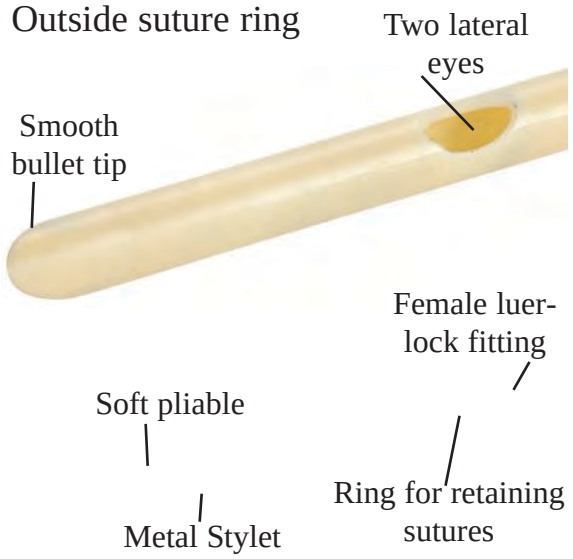
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12 secrets to Mayo Clinic's success

» CONTINUED FROM PAGE 40

1. Vision

The Mayo Clinic trustees have a clear idea of what they're doing and where they're headed, and they constantly seek data and input from others about the best ways to get there. Everything that everyone at the Mayo Clinic does revolves around the current and morphing state of healthcare. This vision incorporates bedside medicine, government activities, insurance dynamics, current and emerging patient needs and the state of evolving technology.

2. Mission

More than 100 years ago, the Mayo brothers created a simple mantra that became a mission statement: "The best interest of the patient is the only interest to be considered." Outcome tracking, a Mayo Clinic principle I was introduced to more than 40 years ago, still guides me today in my practice.

3. Employees

Take a minute to chat with Mayo Clinic employees and you'll notice that everyone, from janitors and volunteers to doctors and nurses, understands his or her contribution to the vision and mission. Veterinary practice owners most frequently ask me how to keep their staff members motivated. With the Mayo Clinic model, it's simple. Give your team a mission and vision to believe in, and then make it happen, every day.

4. Compensation

A central feature of the Mayo Clinic system is the compensation dynamic. Doctors are paid well, but on salary. Production is not an issue. Locker-room shop talk is about cases, not money. When my wife was being considered for a liver transplant, we met the head of the transplant team, Dr. David C. Mulligan. He walked in and said, "Mrs. Riegger, you do not need a liver transplant—your condition is benign." Our one-and-a-half hour appointment turned into a three-hour education session, courtesy of Dr. Mulligan. We left smiling. It's expected that new hires for the Mayo Clinic doctor team need five years to get up to speed. To help them succeed, the clinic sets up an educational training track.

5. Team

Cooperation is central to the Mayo Clinic's activities. Employees work in teams within their departments, and they work with other institutions and small practices throughout the world with one goal—help each patient, one at a time. Everything is centered on a team: medical teams, surgical teams and training teams.

6. Training

Everything at Mayo revolves around training. And on the fourth floor of the Mayo Clinic Phoenix Campus is a $20 million simulation center. When an issue or problem is identified, it's off to the simulation center to address it.

7. Environment

The facility plays a huge role in the healing of its patients. From the parking lot to the foyers, to the rooms and the healing garden—every space is carefully created, cultivated and fine-tuned to assure that patients and their families are comfortable and inspired to heal. Even the nurses' stations are carefully planned. Each room is no more than 20 steps away from a station.

8. Bill of rights and responsibilities

You can access this three-page document at the Mayo Clinic website, mayoclinic.org. There are two specific items in it that caught my attention. The patient has the right to choose the level of care he or she desires—including declining recommendations and the responsibility to understand the consequences of these decisions. When I had two trauma injuries in 2011, a ski accident and a horse accident, I was fully apprised of my options and the potential outcomes of each one. Then I made my decisions. Nobody pushed, pressed or guilted me into anything; they just gave me the facts.

9. Adherence to schedule

Dang, it's impressive. A patient has an appointment at 10 a.m., and it is actually at 10 a.m. I asked how they do it and the Reader's Digest answer is, "It's hard work."

10. Client education

The clinic's newsletters, website and other materials all have a clear purpose: education. And you don't get a sense they're trying to sell you something. It's clear they believe an educated medical consumer makes for good relationships.

11. Follow-up excellence

Excellent follow-up care and tracking helps determine outcomes. The flow at the Mayo Clinic is: admission, appointment and then arrival at the scheduling desk. This desk is separate from admission and the cashiers—it's the scheduling desk only. So as a patient leaves each appointment, new appointments are made and if adjustments are needed to a string of appointments, the new appointment is entered and the string is adjusted.

12. Leadership

This is a physician-run organization. And an excellent clinician may ascend to a leadership role, but only for a time. Then he or she goes back to his or her clinical specialty. And while there are non-physicians within the flow chart of leadership, they're in support roles. An MBA or a CPA is not making decisions that affect patients.

While this is a lot to take in, your first step in emulating the success of the Mayo Clinic is to develop a mission statement that everyone in your practice will believe in. Once that's in place, you can set up policies and programs that empower employees to follow and live by the mission. **dvm**

Dr. Riegger is the chief medical officer at Northwest Animal Clinic Hospital and Specialty Practice. Contact him at (505) 898-0407, riegger@aol.com or www.northwestanimalclinic.com. Find him on AVMA's NOAH as the practice management moderator.

For a complete list of articles by Dr. Riegger, visit dvm360.com/riegger

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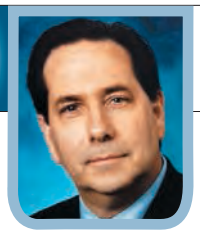
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See brief summary on page 44

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The Dilemma

by **Marc Rosenberg, VMD**

ETHICAL DILEMMA: What a client wants

It can be hard to say no to an emotional client. But if you don't stick to your guns, you might be stuck with big problems.

Dr. Lee Saltz is not that different from you. He's a beloved small animal practitioner. He has built his practice on quality medicine and committed relationships to his clients and their pets. It's not unusual for clients to have his private phone number. A phone call from a client after hours is the norm, not an exception. So consider his sticky situation and see if you'd handle it the same way.

Setting the stage for conflict

Ms. Weiss has been a client of Dr. Saltz's since her 9-year-old Labrador, Jack, was a puppy. Dr. Saltz and his staff treat Jack like he's one of Ms. Weiss's children. Over time, this kind of treatment has made her a frequent and diligent client, but on the other hand, she often becomes emotionally volatile when faced with even the most minor of her dog's medical issues.

Recently, Jack was presented with a swelling on his lower left rear leg. Ms. Weiss had noticed the swelling for the past two weeks. Jack had started limping and seemed to be experiencing discomfort, so she brought him to see Dr. Saltz. The exam revealed a hard swelling on the proximal tibia about the size of a small lime, and radiographs showed it to be a bony mass. It was clearly painful and the limping was pronounced. Dr. Saltz told Ms. Weiss that he was concerned and added that a growth like this in an older, large-breed dog was often bone cancer. There were other possibilities, he said, but osteosarcoma was at the top of his list. He advised her of the guarded prognosis—amputation was the treatment of choice *after* a biopsy confirmed the nature of the growth.

The result

Ms. Weiss was crushed. She did not want her dog in pain any longer, and she did not want the tumor to spread. Dr. Saltz told her that it would only take seven days to get the biopsy result, but Ms. Weiss did not want to wait that long to help her dog. The doctor was confident of his diagnosis but not absolutely sure, and he advised Ms. Weiss to wait for the biopsy results. The client listened, but through her tears she decided she wanted him to do the amputation immediately because she felt time was an issue. Dr. Saltz, knowing how volatile his client was (and after informing her of the risks) proceeded with the surgery.

"Even when a client is aware of all potential consequences, the veterinarian must abide by medical judgments that he or she believes are ethical and sound."



Gary S. Chapman /Getty Images

Jack did well during the surgery, but it was for naught. Unfortunately, eight days after the amputation, the biopsy result indicated that this was not an osteosarcoma but rather a severe inflammatory bone lesion.

Ms. Weiss was furious. She blamed Dr. Saltz for not standing his ground and allowing her to make a poor decision at a vulnerable time. She said removing the limb unnecessarily created permanent disfigurement and discomfort for her dog. She filed a complaint with the state regulatory agency and claimed Dr. Saltz was guilty of malpractice. Dr. Saltz insisted that Ms. Weiss made an informed decision after hearing all the options and that he was simply honoring the decision she had chosen to make.

Dr. Rosenberg's response: Dr. Saltz was wrong

The veterinarian and the pet owner should work as a team. Dr. Saltz valued his client's wishes as well as her allegiance to his practice. The question here is: where does professional judgment stop and client intimidation begin? His initial recommendation was to biopsy the mass and proceed based on the lab results. This is the standard approach to such a case.

Technically, Dr. Saltz acted with informed consent. But ethically, he was bound to act in the best interests of the pet and the owner. Rolling the dice on a potential diagnosis when the result was the loss of a limb was not an acceptable course of action. His efforts should have been directed toward educating the pet owner that a seven-day delay to obtain the biopsy results would not drastically influence the potential cancer to spread.

Even when a client is aware of all potential consequences, the veterinarian must abide by medical judgments that he or she believes are ethical and sound. This may require that a veterinarian not give in to the wishes of an emotional pet owner. In this case, Dr. Saltz made the wrong decision.

Weigh in

Do you agree with Dr. Saltz's decision or Dr. Rosenberg's conclusion? What would you have done? Tell us how you would handle such a dilemma. **dvm**

Dr. Rosenberg is director of the Voorhees Veterinary Center in Voorhees, N.J. He is a member of the New Jersey Board of Veterinary Medical Examiners.

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CONTRAINDICATIONS
Do not use in dogs with known tympanic membrane perforation.

EASOTIC® suspension is contraindicated in dogs with known or suspected hypersensitivity to corticosteroids, imidazole antifungals, or aminoglycoside antibiotics.

WARNINGS
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Humans with known or suspected hypersensitivity to hydrocortisone, aminoglycoside antibiotics, or azole antifungals should not handle this product.

Animal Warnings: As a class, aminoglycoside antibiotics are associated with ototoxicity, vestibular dysfunction and renal toxicity. The use of EASOTIC® suspension in a dog with a damaged tympanic membrane can result in damage to the structures of the ear associated with hearing and balance or in transmission of the infection to the middle or inner ear. Immediately discontinue use of EASOTIC® suspension if hearing loss or signs of vestibular dysfunction are observed during treatment (see **ADVERSE REACTIONS**).

PRECAUTIONS
Do not administer orally.

Concurrent administration of potentially ototoxic drugs should be avoided.

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Long-term use of topical otic corticosteroids has been associated with adrenocortical suppression and iatrogenic hyperadrenocorticism in dogs (see **ANIMAL SAFETY**).

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ADVERSE REACTIONS
In a field study conducted in the United States, there were no adverse reactions reported in 145 dogs administered EASOTIC® suspension.

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WIT0412085



Market Watch

by **Michael Paul, DVM**

Be choosy about choosing

Too many options can be confusing—streamline your clients' choices and eliminate their frustration.



Sensory overload: Dr. Mike Paul's experiences in the bazaars of India gave him unique insight to the power of choice—and how you can harness that power to reduce clients' confusion and improve your credibilty.

On a recent overseas flight, I was reading one of those airline publications when I came across an interview that caught my eye. It was about choices, decision-making and their outcomes in business management.

Reading the article reminded me of the experiences I had just had in the marketplaces and bazaars of India. These venues were crammed full of crafts, rugs, pashminas and more smells, sights and sounds than you can possibly imagine. It was literally sensory overload. Even more overwhelming was the fact that virtually every shop, booth and stand carried essentially the same items. Nothing differentiated one stall from another. Hundreds, perhaps thousands, of offerings were available and there were no clear signposts to identify brand name or provide product information. How could I decide whose item I would purchase? There were too many choices, there was too little differentiation, and there was no way to make an informed decision. Sound familiar?

I have been in a number of veterinary practices that seem to think they must inventory every option for pet owners. Every flea and tick control product, every heartworm preventive and every non-steroidal anti-inflammatory drug. After a certain point the choices become not only confusing but pointless. How many kinds of chewing gum do you need?

It is time for us to stop overwhelming our clients with choices and decisions that, frankly, they're not in-



Americans place great importance on choice and the "have it all" mentality. But where does all this free choice get us?

formed (nor qualified) to make. "You can do A, B or C" provides no guidance to a pet owner trying to decide on a vaccine protocol, pet food or a parasite control product. Studies have repeatedly shown that when people are faced with too many choices for them to process, they are unlikely to make a decision. In the end, they may walk away with nothing. If they do make a purchase, they're even less likely to be satisfied with their decision.

The perception of choice

Life would be a lot simpler if one size fit all. However, while a universal pet healthcare protocol might cover critical areas, it may not be appropriate for many patients. Fortunately, clinicians have tools at their disposal to help them make implementable and actionable recommendations to their clients that will reduce confusion, enhance credibility and improve adherence.

The most important tools are medical guidelines. Medical guidelines are science-based recommendations for treatment and preventive healthcare that, when coupled with a personalized risk assessment, will lead to a recommendation that can be clearly explained. For example: "Based on what we know about your pet's health and risk factors, we recommend the following." This approach can shape the way you and your clients discuss non-core vaccines, specific dietary recommendations, parasite prevention and control products and more.

Another tool involves understanding the psychology of choice. How people choose has become the subject of much research and analysis in the last few years. Professor Sheena Iyengar of Columbia University, Barry Schwartz, author of *The Paradox of Choice,* and Malcolm Gladwell, author of *Blink*, have all studied choice and the process of taking action. Their consensus? People believe that every little difference matters; therefore, every choice matters. While most of us equate choice with freedom, not everyone thrives under the pressure of making decisions. To force clients to make a choice, particularly from a range of similar options—nutritional products, parasite control products, medical treatment possibilities—frequently leads to paralysis. They simply can't choose and frequently end up frustrated and confused.

Look at your own hospital pharmacy. How much overlap exists among products? Unless there is a demonstrable difference that you can easily explain to your clients, you are not doing anyone any favors by presenting unguided options rather than advocating for a single recommendation. Again, how many types of chewing gum do we need? The value of choice relies on the ability to appreciate differences between options.

Of course, Americans place great importance on choice. It's the "you can have it all" mentality. Look at where we shop—big-box megastores where the purchasing of a single item can be an overwhelming experience. But where does this cultural value of free choice get us? Studies have shown that too many options interfere with consumers' ability to make choices and, perhaps just as importantly, they can prevent consumers from being satisfied with the choices they do make.



The psychology of choice: Forcing clients to make a choice from a range of similar options can lead them to feel paralyzed.

Make choices meaningful

When considering products or services to provide in your veterinary hospital, don't ask, "How many choices can I give my clients?" Rather, ask, "How can I make the client experience more meaningful?" This means offering just a small selection of choices with easy-to-understand benefits and advantages. Most people can identify the differentiating factor between choice A and choice B, but trying to differentiate among choices A through Z is simply too much.

So how do you present choices for the greatest acceptance of and adherence to your recommendation? First, reduce the number of choices offered. Studies show this step alone will increase acceptance of recommendations. Additionally it will lower inventory costs and ultimately result in an improved experience for the client.

Second, make it real. Make sure you point out implications and advantages of each choice.

Third, break things into categories and give options in each category. For instance: dental care, vaccinations and parasite control. Walk the client through one choice per category before going to the next.

Fourth, take it easy. Some choices are more complex than others. Approach the simplest choices first.

The goal is to advocate for the highest-quality choice and avoid causing confusion with needless options. Remember, you'll clarify by simplifying the client's choices. **dvm**

Dr. Paul is a veterinary consultant and a founding member and former executive director/CEO of the Companion Animal Parasite Council. He has served as president of the American Animal Hospital Association. He lives in Anguilla in the British West Indies.

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LOW-COST CHOICES

With so many options available to pet owners, veterinarians are wondering how to compete with low-cost clinics. Dr. Mike Paul responds at **dvm360.com/lowcost**.

Photos courtesy of Dr. Mike Paul



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Letter of the Law

by Christopher J. Allen, DVM, JD



A solid exit plan can soothe BURNOUT

When you feel like you're trudging through your days, a change in careers might seem like a refreshing solution. But if you decide to get out of practice ownership and sell, be prepared.

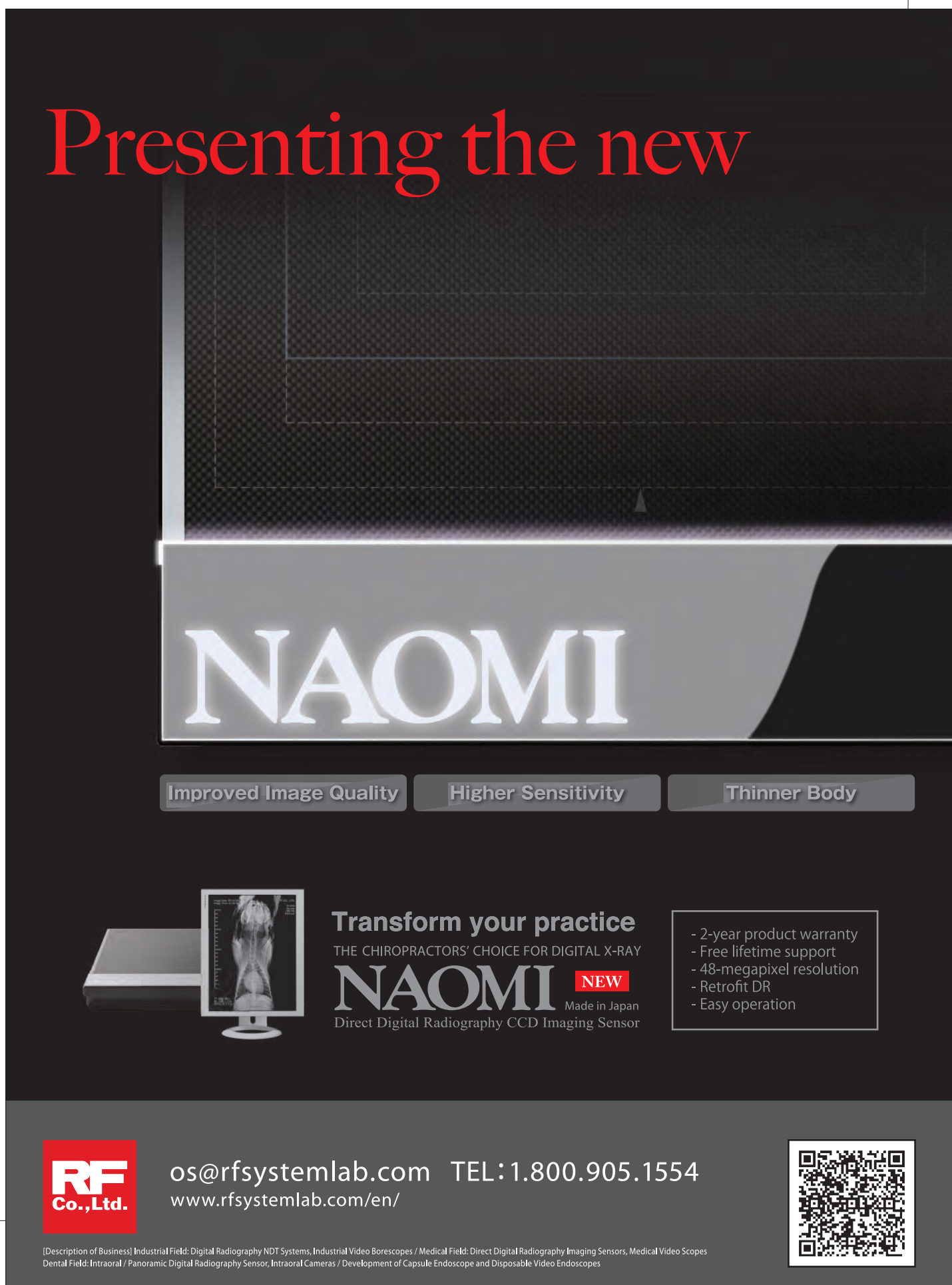
Most of us know that it isn't payroll, taxes or inventory control that eventually drives a veterinary practice owner to the brink. It's the people: the clients, the staff members and the colleagues. If you're a practice owner, you deal with your fair share of employees who gossip and compare paychecks, no-show clients or clients who get a second opinions via the Internet, associates who quit without notice and throw tantrums in the doctors' lounge—sometimes it just feels like too much.

With all the stress you deal with on a daily basis, it's important to distinguish between the occasional bout of frustration and a larger sense of looming, nagging frustration. The latter is pernicious and calls for more than leaving an hour early on Fridays to attend Zumba classes and blow off steam.

When that feeling of "enough is enough" becomes habitual, it may be time to plan for the possibility that things aren't going to get better this time. An exit plan may be the key to accommodating those feelings, even if it seems like it's too soon to be thinking in those terms. Having a well-considered plan for leaving the ownership role can be soothing. It can also keep you from losing control of the reins when burnout becomes so intense that you're ready to close the doors and walk away at any cost. Moving into a non-ownership role may be a more realistic route to sanity.

Most practice owners don't prepare for the eventuality that genuine burnout might strike suddenly. Consequently, they have not developed a departure scenario. For these practice owners, when a discouraging day turns into a discouraging month (or six), they find themselves in a tough spot. These practitioners may find themselves stuck simultaneously in a bleak financial situation and poor psychological position. The dilemma: They can't stand the idea of continuing to operate their own hospital for

CONTINUED ON PAGE 50 »



dvm

A solid exit plan can soothe burnout

» CONTINUED FROM PAGE 49

much longer, yet they haven't prepared for the practice to go on the market. The consequences of this situation can be dire: clinical depression, substance abuse, or a decision to escape in a hurry and sacrifice financially.

What burnout looks like

Here's an example of what can happen when a practice owner ignores the onset of career dissatisfaction and continues to deny those feelings as they reappear, often more dramatically with the passage of time.

Dr. Smith bought a small practice 15 years ago, and through long hours of work and more tolerance on the part of his wife and kids than he cares to admit, he has grown it into a fairly large operation. He has a few associates, a burgeoning payroll obligation and monthly bills that would seem unbearable if clients weren't clamoring for his services. But over the last few years, Dr. Smith has grown tired. He's losing patience with the daily dramas of the staff, he feels like clients and employees underappreciate him and he's experiencing increasing guilt over the many band concerts, track meets and dance recitals he's missed.

When he realizes he only sees his children in the mornings because they're in bed by the time he gets home, he feels emotional, anxious and trapped. And these emotions aren't necessarily new. In fact, one of the reasons he's accumulated so many doctors and staff members over the years is so that he could take some time off to reacquaint himself with his family—and to try to stave off the burnout that's been creeping in. Plus, Dr. Smith has purchased some expensive new equipment with the hope that it would generate more income to support the ever-growing payroll and throw a little novelty into mundane daily practice life. But it's not working.

Finally, Dr. Smith realizes that the only thing that will genuinely salvage his psyche is simply to get into another role in the field of veterinary medicine: one where he's not putting out fires 24/7 and a day off is not a monumental logistical undertaking. He wants to sell his practice—the sooner the better.

Dr. Smith makes a phone call to get a practice appraisal. The Smith family is excited about the possibility of dad being home more. Everybody understands that his new career might not be as lucrative, but it will be worth it—as long as he can get at a reasonable price for the business he worked so hard to build. He submits several years' worth of business financials to the practice appraiser, and shortly thereafter he gets a phone call. The appraiser is concerned about whether the practice will sell. Its financials reflect that after Dr. Smith takes his reasonable salary every year, the business shows a negative cash flow and declining gross revenue.

Dr. Smith has explanations, naturally. The economy has been bad for a while, so gross is down a little—for four straight years. But over that slow period, payroll has still increased substantially. And nobody seems cognizant of the fact that drug, supply and equipment costs have been rising by double-digit annual percentages, even as revenue is dropping. To the appraiser, the picture is becoming clear. Dr. Smith has been so busy trying to institute short-term fixes for his burnout—more helpers means less work for him, and abdicating drug ordering authority to others means getting home earlier sometimes—that he has left his practice in a virtually unmarketable condition.

How can a practice that's grossing seven or eight figures and has multiple associates be impossible to sell? Here's a hint: ask any stockbroker about the price of public companies that have years of falling top-line revenue but are burning through cash. The result is inevitable: the stock price tanks. Veterinary hospitals are capitalist enterprises too, and value lives and dies by growth and profitability. Nobody wants a business, no matter how big or how pretty, if in the final analysis it amounts to nothing more than a not-for-profit.



When Dr. Smith puts down the phone, he is paralyzed by the sudden reality: on an emotional level he needs to leave, but financially he isn't even close to being able to do so. What should he have done differently? Here are some things to keep in mind.

It's OK if the economy is bad

You can successfully sell a practice in a bad economy and after several years of declining gross. The question is, what measures did you take to accommodate for the faltering economy? Did you adopt more aggressive marketing tactics? Did you consider a move to a new location? Sometimes opening a satellite location can boost revenue and referrals without you having to leave the neighborhood where your practice traditionally draws its clientele.

Someone must steer the ship

If Dr. Smith wanted more time off, he needed to delegate, not abdicate. There's no reason why he couldn't give another staff member the responsibility of ordering—or even hiring and firing, for that matter. But you can't delegate to someone else without proper training and setting clear parameters for the team member to use in carrying out the tasks. That sort of transfer of responsibility must also be made clear to the entire staff. Everyone needs to know who's responsible for selecting and buying supplies or reprimanding staff members. The team must know that the designee has the support and authority necessary to function.

Numbers must control the practice

A depressed or overworked practice owner needs to become more focused on the bottom line, not less. As mentioned above, buyers can understand and live with a temporary or even protracted drop in gross revenue, but not a drop in profitability.

Business is about the returns

Veterinary practices will not sell for a palatable price if profitability is not demonstrable. Folks just don't want to buy a private business for the purpose of providing paychecks to employees and healing ill animals. There must be a pecuniary return, it must be predictable and it must be worth the effort and headaches involved or there won't be a sale.

If a disenchanted practice owner has neglected business management, profitability will begin to suffer immediately. If employees need to be furloughed and are not, costs begin to run ahead of inflation. If drug inventory is left to run itself, the shelves will spill over with every pill from every obscure manufacturer any of the associates has ever heard about in a CE meeting.

While there may be enough left to pay the practice owner a salary, there will not be enough left to satisfy a buyer. Especially not when there are so many other practices and alternative investments out there for a seller to compete against. And, it bears mentioning—being desperate while also being detached is a sure recipe for a practice owner to receive disappointing offers for his business. **dvm**

Dr. Allen is president of the Associates in Veterinary Law P.C., which provides legal and consulting services to veterinarians. Call (607) 754-1510 or visit info@veterinarylaw.com.

For a complete list of articles by Dr. Allen, visit dvm360.com/allen

Jordan Adams /Getty Images



Practice For Profit

by Gerald Snyder, VMD



3 WAYS { veterinarians are their own worst enemies

Introverted? Hate selling? Business-phobic? You're not alone, but these traits could be killing your practice.

As a practice management consultant, I have met and advised thousands of my colleagues on every permutation of companion animal practice. On the whole, I observe that we veterinarians are basically introverted, we hate selling and we just don't want to "manage" our practices. This professionally disastrous triple threat is entirely self-determined and blocks the path of our optimum success and personal fulfillment. Of course, no one has ever accused our profession of acting in its own best interests.

1 No people skills

Many of our veterinary colleagues are introverted and just do not have well-developed people skills. (Raise your hand if you recognize this in yourself.) Yet people skills are the most important determinant of practice success. In fact, in too many practices success and competence are not found together. We all know stories of ol' Doc Smith, who had two radiographs in his practice: one positive for hip dysplasia, one normal—and no x-ray machine. He made a fortune diagnosing hip dysplasia despite clients' concerns having nothing to do with lameness. If you can get away with that, you have some excellent people skills (albeit no clinical skills).

The question here is: how can honest, competent, but naturally introverted veterinarians develop great bonding relationships with their clients?

First, we have to realize that we are not in the dog and cat maintenance and repair business. We are in the

CONTINUED ON PAGE 52 »

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Correction

The chart accompanying Dr. Gerald Snyder's "Practice for Profit" column on page 62 of the June 2012 issue contained an error. For a corrected version of this chart, see **dvm360.com/junesnyder**.



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3 ways vets are their own worst enemies

» CONTINUED FROM PAGE 51

people business. Our state legislatures have given us licenses to serve the people of our states. We can connect with our clients and have a powerful impact on their lives by nurturing their pets' lives. The secret is that there is no secret—simply take a sincere interest in everyone you meet, client or not.

Most women are better communicators than men. Women know (and most men need to learn) that the secret to high-quality conversations is to ask meaningful questions with a sincere interest in the answers. Finding out more about the life and lifestyle of the pet's human companions is very important to tailoring prescriptions for that pet's health. It is extremely fortuitous that veterinarians do not have to be the life of the party (because, short of a fifth of something, we are not always capable). Rather, we just need to be caring souls. Connecting and building relationships with your clients is a much more powerful and rewarding experience than "just" serving their pets' immediate needs.

2 A distaste for selling

Too many veterinarians feel that "selling" is not professional. That's another destructive mindset that needs to be addressed.

The only way that I know to convince a professional of the importance of sales is to show them the consequences of not selling. If I did not convince my clients that dental treatment was important, how much more oral pain (not to mention tooth and periodontal bone loss) would that pet have to endure? We are not selling here, but instead "influencing for a higher purpose," to use the phrase coined by author and lecturer Tony Robbins.

We veterinarians want to be givers, not takers, in our doctor-client-pet relationships. While we do need to take care of our practices as businesses, our profession wants to serve first and foremost. That's what it's all about. Therefore our focus needs to be not on sales but on the repercussions of failing to influence our clients to act on their pets' behalf. Think of clients' happiness in enjoying the "longevity enhancement properties" of your advice instead the pain they will experience from the pet's suffering as a result of not influencing them enough. The mindset of selling often involves manipulation. The mindset of service brings happiness all around.

3 Avoidance of leadership

Now, finally, we know that effective management and leadership skills are required for success. However, too many veterinarians see themselves as skilled craftspersons. They only want to work with their furry, feathery patients. Pet owners are a necessary evil.

Often it's impossible to make a leader out of one that does not exist. My cure for this conundrum is to get the practice owner to admit that he or she is a poor leader and let another staff member take over. That is no dishonor to the owner. Think about the artists who appear in our film industry—very few are able to direct and produce as well as star in their own productions.

The key, here, is to appoint a practice manager or administrator and delegate both responsibility and authority to that person. There is no worse fate than responsibility without authority. The first time you let a staff member talk you into an exception to the rules set in cooperation with your manager/administrator, you destroy the system—so be very careful.

I guess we can all admit to a few faults, can't we? Perhaps the greatest example of how damaging these three semi-deadly sins really are lies within a simple statistic: 30 percent of all veterinary practice owners in the U.S. are making less than they would as an associate in another practice in their own town. If you fall in that 30 percent, the time is now to make the necessary changes that will change your practice for the better. **dvm**

Dr. Snyder, a well-known consultant, publishes Veterinary Productivity, a newsletter for practice productivity. He can be reached at 112 Harmon Cove Towers Secaucus, NJ 07094; (800) 292-7995; Vethelp@comcast.net; fax: (866) 908-6986.

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Diagnotes

by Carl A. Osborne, DVM, PhD, Dipl. ACVIM; Jody P. Lulich, DVM, PhD, Dipl. ACVIM; and Eugene Nwaokorie, DVM, MS

Feline urethral plug composition analysis: 2011

Past trends continue, but with therapeutic preventive options available, many plugs can be avoided.

Since we've been analyzing uroliths in dogs and cats over the past three decades, the composition has varied. In this article, the third of three installments, we evaluate current trends of urethral plugs in cats and examine the implications for our feline patients.

A look at the numbers

It is important to determine the mineral composition of urethral plugs since most therapeutic regimens are based on this composition. Of 283 urethral plugs submitted to the Minnesota Urolith Center by veterinarians in 2011, the mineral composition of just over 90 percent was primarily sterile struvite (magnesium ammonium phosphate) (Table 1; Figures 1-3). Just under 2 percent were composed of calcium oxalate.

These data are not surprising. Since the founding of the Minnesota Urolith Center in 1981, struvite has consistently been the most common mineral in feline urethral plugs, while the prevalence of calcium oxalate in urethral plugs has always been infrequent (Table 1; Figures 1 and 2).

There have been significant shifts in the prevalence of calcium oxalate and struvite in uroliths during the past 30 years, but the prevalence of struvite and calcium oxalate in feline urethral plugs has not significantly changed. Why this is occurring is not obvious to us. In recent years, there has also been a dramatic decline in the frequency of urethral plugs submitted for quantitative mineral analysis and a parallel decline in the frequency of perineal urethrostomies associated with urethral obstruction.

dvm TABLE 1

Mineral composition of 283 feline urethral plugs, 2011

Predominant mineral type	Number of urethral plugs	Percentage
Magnesium ammonium phosphate (6 H_2O)	256	90.5
Magnesium hydrogen phosphate (3 H_2O)	1	< 1
Calcium oxalate	5	1.8
Mixed	2	< 1
Compound	1	< 1
Matrix	18	6.4

What the findings mean for our patients

Since struvite continues to be the most common mineral type in urethral plugs, practitioners should consider struvitolytic and prevention foods to manage cats at risk for urethral obstruction caused by such plugs. Therapeutic diets are available that can minimize formation of struvite plugs by reducing the supersaturation of urine with magnesium ammonium phosphate. It is likely that most of the 283 struvite plugs submitted to the Minnesota Urolith Center in 2011 could have been prevented by feeding the cats these diets designed to promote formation of urine that is undersaturated with struvite (e.g., Prescription Diet c/d Multicare Feline—Hill's Pet Nutrition).

Not all struvite urethral plugs can be prevented by dietary manipulation alone. In some cases dietary manipulation may be ineffective because of poor owner or patient compliance.

These data also tell us that we must remain vigilant. To help monitor future trends, be sure to send urethral plugs to a reputable laboratory that uses contemporary techniques for evaluating the mineral composition of uroliths and urethral plugs. Keep in mind that air-dried plugs are preferred for evaluating the crystalline component in urethral plugs.

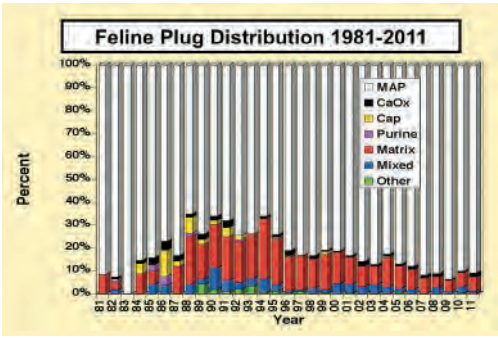


Figure 1: Note: MAP = struvite; CaOx = calcium oxalate; Cap = calcium phosphate.

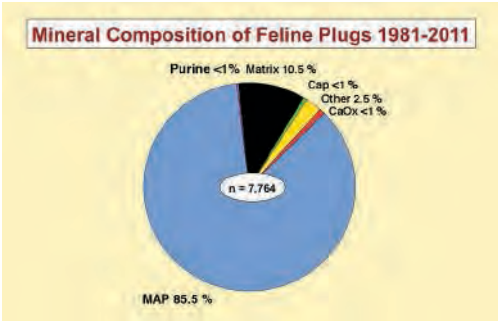


Figure 2: Note: MAP = struvite; Cap = calcium phosphate; CaOx = calcium oxalate.

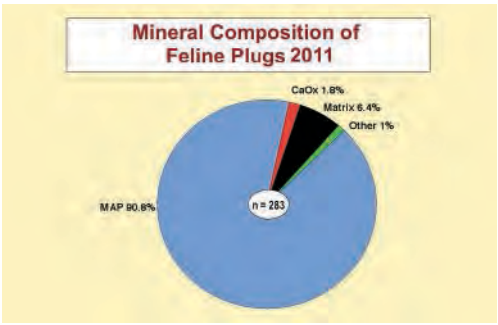
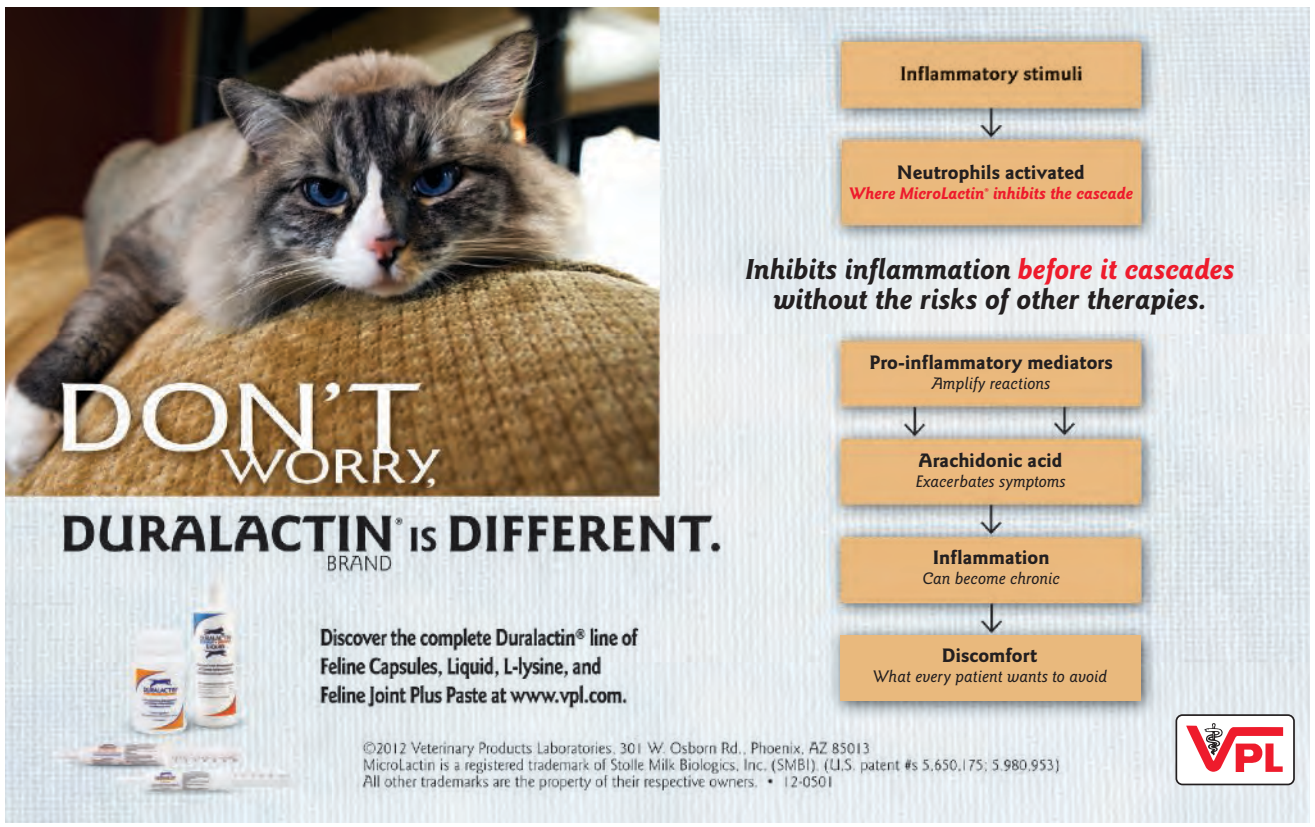


Figure 3: Note: MAP = struvite; CaOx = calcium oxalate.

Editor's note: The Minnesota Urolith Center—with the support of an educational gift from Hill's Pet Nutrition as well as contributions from veterinarians and pet owners—provides quantitative urolith analysis at no charge. Online submission, email notification and electronic retrieval of results are available. With access to our database of 730,000 samples, the veterinary community is offered the latest information on urolith trends, treatment and prevention suggestions. For details, visit www.cvm.umn.edu/depts/MinnesotaUrolithCenter. **dvm**

Dr. Osborne is the director of The Minnesota Urolith Center and a professor at the College of Veterinary Medicine at the University of Minnesota. Dr. Lulich is the co-director of The Minnesota Urolith Center and professor of veterinary internal medicine at the University of Minnesota. Dr. Nwaokorie recently completed his MS and is pursuing a PhD at the University of Minnesota.



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Section from pgs.1S-8S





DENTISTRY

Developmental enamel defects in dogs

{ Make sure you know the best way to treat these discolorations that can signify severe disease.

Developmental enamel defects represent not only a cosmetic alteration of the crown of teeth in dogs, but, more important, the brown-to-tan discoloration indicates that the underlying dentin may be exposed to the oral environment (Photo 1, p 2S). This exposure can lead to pulpitits and death of the affected tooth or teeth. Dentin sensitivity is a concern, especially if multiple teeth are affected.

Root aberrations may also occur that may require treatment (Photo 2, p 2S). Dental radiography, therefore, is paramount in assessing all teeth with enamel defects, regardless of cause.

Classification

Developmental enamel defects can be categorized based on compromise of quality or quantity. Defects in quality (hypocalcification) cause a less inorganic matrix, and the resulting enamel is softer than normal enamel. It's often possible to remove hypocalcified enamel with ultrasonic scaling.[1] Defects in quantity (hypoplasia) result in a much thinner than normal enamel.[1] Pitting may be present in the surface. Both types of defects can be found concurrently, and differentiation is not necessary because, therapeutically, the approach is the same.

Many teeth with developmental enamel defects also will have variations in developmental root abnormalities. Roots may appear long and thin toward the apex (Photo 3, p 2S) or have blunt attenuated roots (Photo 4, p 2S).

In addition, amelogenesis imperfecta is an inherited maturation disorder of the enamel. This condition appears to be uncommon in dogs, although standard poodles may have a genetic predisposition.[2]

Causes

Enamel formation occurs in dogs between 2 weeks and 3 months of age.[3] Trauma during enamel development is a common cause of enamel defects in dogs. However, in general, a history of oral trauma is nonexistent but, occasionally, can be traced to altercations with other pets or accidental drops, falls, etc. The result is generally seen in one or several teeth in a regional distribution. A febrile event that occurred during enamel development may be responsible for cases in which most or all of the dentition is affected.

Systemic insults that may result in enamel defects include nutritional deficiencies, infection, fever, metabolic abnormalities, toxins and parasites.

CONTINUED ON PAGE 2S »



A summery smile: By identifying and correcting tooth enamel abnormalities early, you can help your canine patients grow up with healthy grins.

BY BRETT BECKMAN
DVM, DIPL. ACVD, DIPL. AAPM



Dr. Beckman lectures internationally on veterinary dentistry and sees patients at Affiliated Veterinary Specialists, Orlando, Fla.; Florida Veterinary Dentistry and Oral Surgery, Punta Gorda, Fla.; Animal Emergency Center of Sandy Springs, Atlanta, and Dallas Veterinary Dentistry and Oral Surgery, Dallas. Find out more at veterinarydentistry.net.



p. 6S Surgery STAT
5 steps for conducting a successful abdominal exploratory

dvm360.com Managing storm phobias
What's the best way to manage a greyhound with a storm phobia? Valarie V. Tynes, DVM, DACVB, weighs in. See **dvm360.com/stormphobias**.

Dawn Kish/Getty Images

dvm

Developmental enamel defects in dogs

» CONTINUED FROM PAGE 1S

Distemper viral infections and other *Morbillivirus* species infections are classically recognized as causes of enamel hypoplasia or hypocalcification.[4]

Treatment

Eliminating unsound enamel while conserving tooth structure forms the groundwork for bonding dentin to eliminate oral microbe exposure and sensitivity. Ultrasonic scaling and polishing removes loosely adhered and diseased enamel.

After cleaning, odontoplasty and cavity preparation, the remaining diseased enamel should be removed, and the tooth should be prepared for bonding and restoration. Case selection should be based on the extent of the lesion or lesions. Minor, localized defects may be bonded or restored by practitioners equipped and skilled in performing minor restorations. Deep defects and widespread involvement should be referred to a veterinary dental specialist.

Generalized cases are time-consuming and should be reserved for specialists skilled and efficient in performing these procedures. Although aesthetics is not the ultimate goal of this therapy, removal of diseased enamel and restoration result in a more pleasing appearance (Photos 5 and 6, p 4S).

Every tooth involved must be radiographed before restoration to determine viability, and sound root structure

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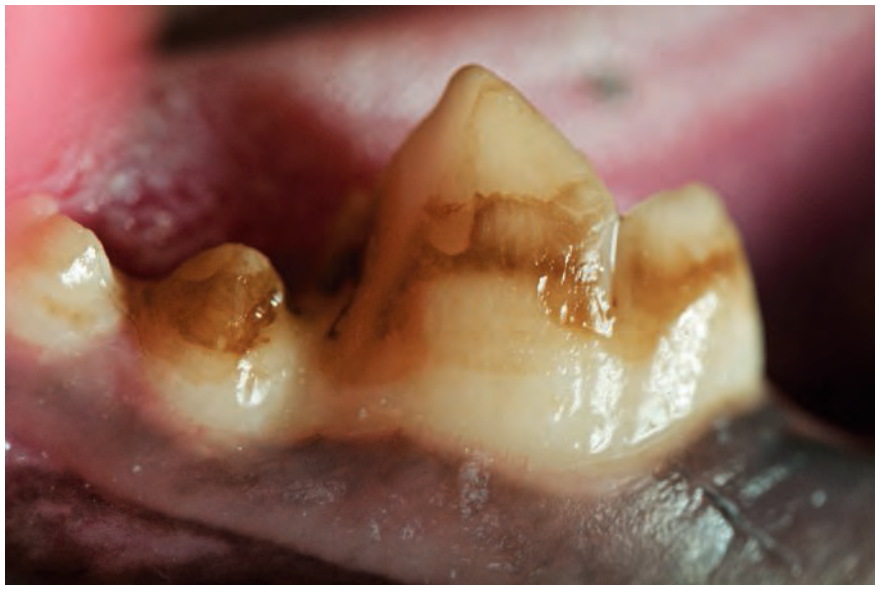


Photo 1: A developmental enamel defect in the right mandibular first molar in a dog. Note the tan-to-brown discoloration.

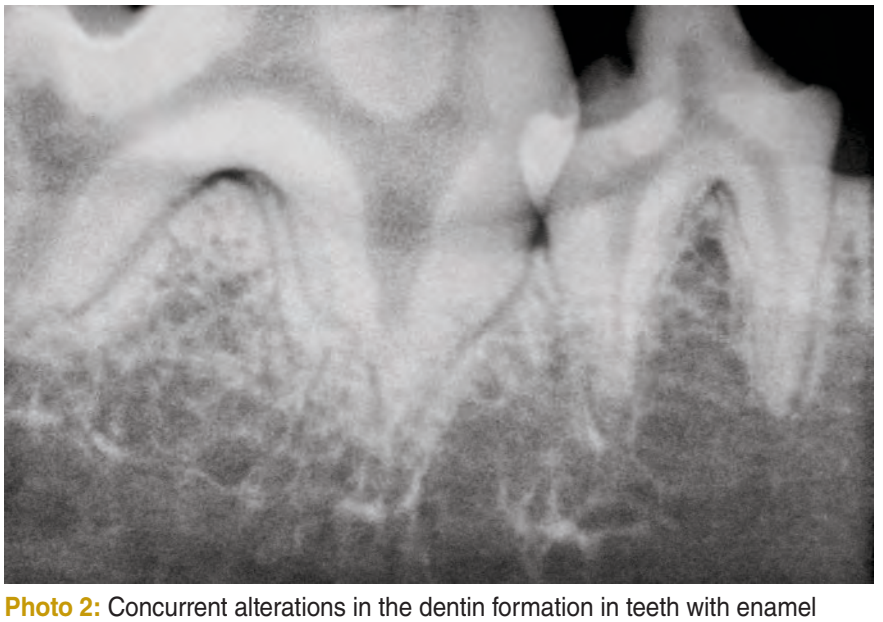


Photo 2: Concurrent alterations in the dentin formation in teeth with enamel defects may result in root abnormalities. Note the shortened and apically thin mesial root of the right mandibular first molar in this dog.

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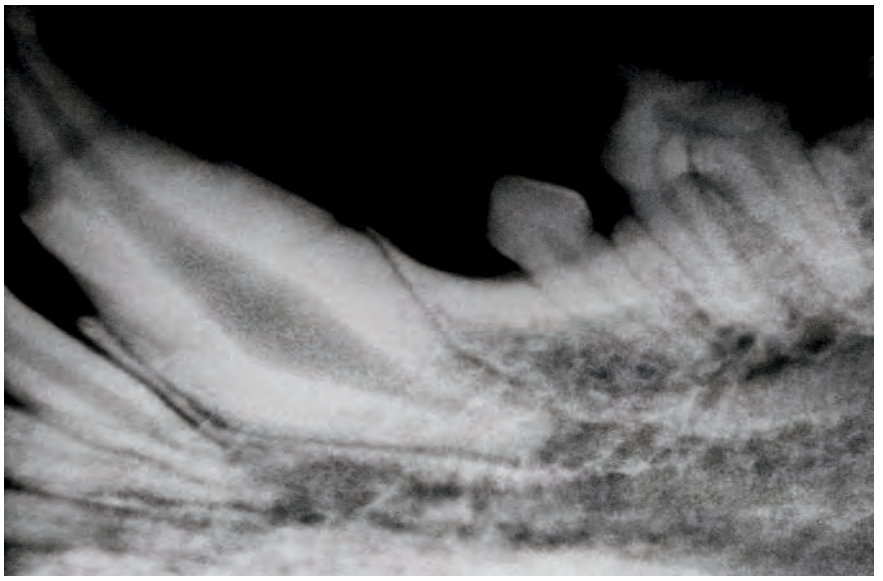


Photo 3: Thinning at the apex is present in this dog's left mandibular canine tooth.

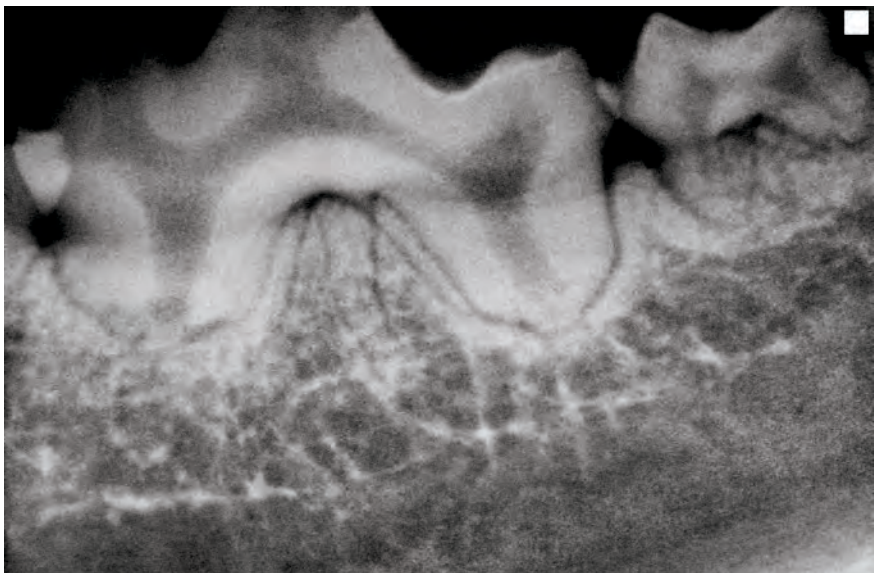


Photo 4: Attenuation and blunting are present in this dog's left first and second molar teeth.

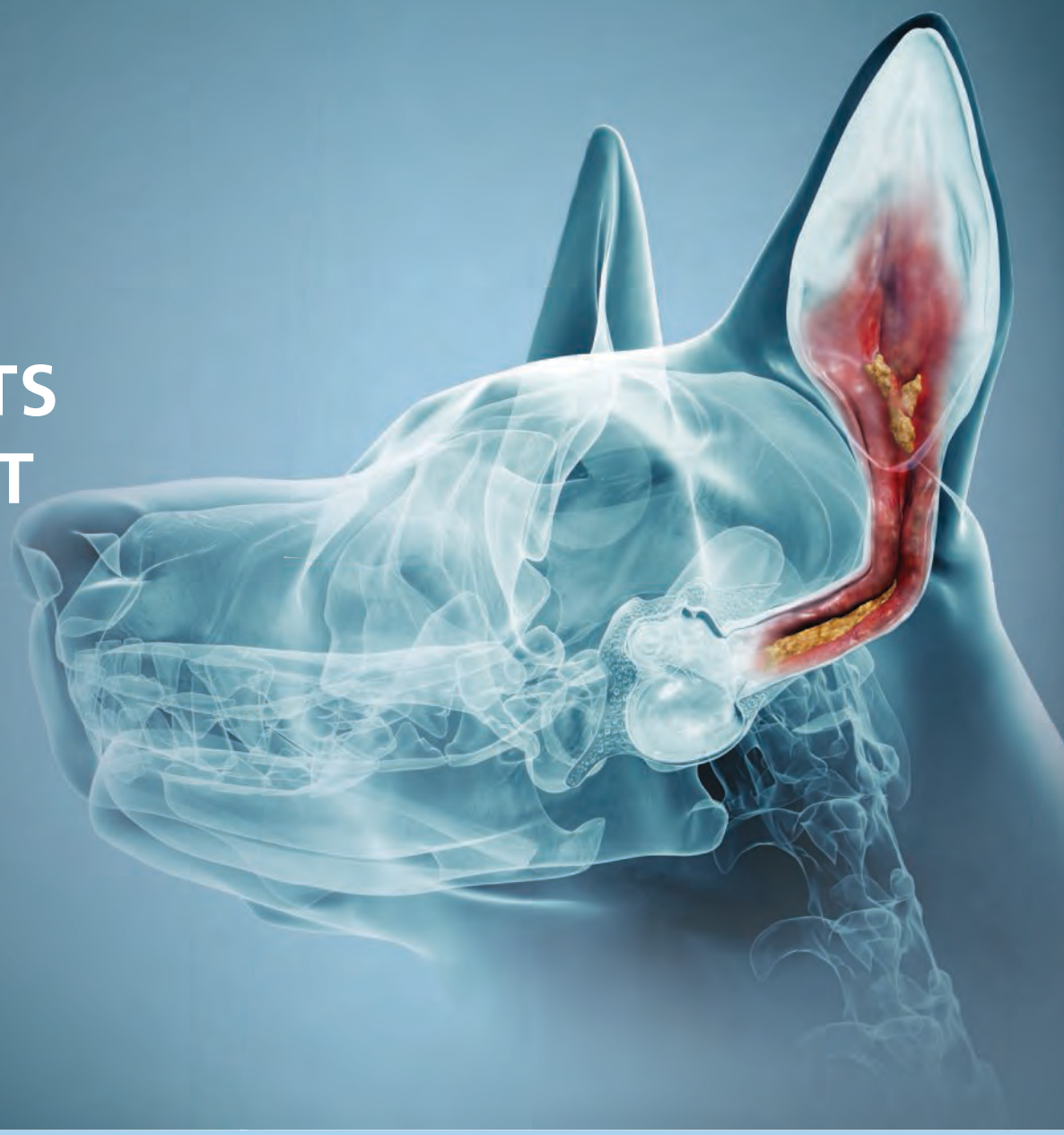
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POSATEX® Otic Suspension is contraindicated in dogs with known or suspected hypersensitivity to quinolones, mometasone furoate monohydrate, or posaconazole. Do not use in dogs with known tympanic perforation. The safe use in dogs used for breeding purposes, during pregnancy or in lactating bitches, has not been evaluated.

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Developmental enamel defects in dogs

» CONTINUED FROM PAGE 2S

should be documented before proceeding. Consider endodontic repair for mild to moderately affected teeth that are nonviable but have structurally sound roots. Extraction is an alternative. Teeth with severely attenuated roots should be considered candidates for extraction to prevent endodontic and periodontal involvement.

Finally, consider prosthetic crown placement in large teeth with marked defects. Under these circumstances, I recommend crown placement on the carnassial and canine teeth (Photo 7). Not only does this protect the crown from tooth or composite breakdown, it lessens the plaque and tartar-retention capacity of the affected crown.

Follow-up

Teeth with developmental enamel defects that have been restored still have plaque and tartar-retentive properties that predispose the surrounding tissue to periodontal disease. Home care and periodic cleaning in the hospital are part of the commitment to manage these patients.

Keep in mind that changes noted on radiography may be present at the time of the initial therapy, although endodontic disease may already be present. And with time, the composite breakdown may re-expose the dentin and provide a source for endodontic compromise. Therefore, radiographic evaluation every six to 18 months is indicated. **dvm**

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Photo 5: Generalized enamel hypoplasia and hypocalcification in a dog before therapy.



Photo 6: Generalized enamel hypoplasia and hypocalcification in a dog after therapy.



Photos courtesy of Dr. Brett Beckman

Photo 7: A cast metal alloy crown protects the crown of a dog's left mandibular first molar that is affected by a developmental enamel defect.

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VETERINARY
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BRIEF SUMMARY (For full Prescribing Information, see package insert.)
CAUTION Federal law restricts this drug to use by or on the order of a licensed veterinarian.
Keep this and all drugs out of the reach of children.
INDICATIONS MOMETAMAX Otic Suspension is indicated for the treatment of otitis externa in dogs caused by susceptible strains of yeast (*Malassezia pachydermatis*) and bacteria (*Pseudomonas* spp. [including *P. aeruginosa*], coagulase-positive staphylococci, *Enterococcus faecalis, Proteus mirabilis,* and beta-hemolytic streptococci).
CONTRAINDICATIONS If hypersensitivity to any of the components occurs, treatment should be discontinued and appropriate therapy instituted. Concomitant use of drugs known to induce ototoxicity should be avoided. Do not use in dogs with known perforation of eardrums.
WARNINGS The use of these components has been associated with deafness or partial hearing loss in a small number of sensitive dogs (eg, geriatric). The hearing deficit is usually temporary. If hearing or vestibular dysfunction is noted during the course of treatment, discontinue use of MOMETAMAX Otic Suspension immediately and flush the ear canal thoroughly with a nonototoxic solution.

Corticosteroids administered to dogs, rabbits, and rodents during pregnancy have resulted in cleft palate in offspring. Other congenital anomalies including deformed forelegs, phocomelia, and anasarca have been reported in offspring of dogs that received corticosteroids during pregnancy.

Field and experimental data have demonstrated that corticosteroids administered orally or parenterally to animals may induce the first stage of parturition if used during the last trimester of pregnancy and may precipitate premature parturition followed by dystocia, fetal death, retained placenta, and metritis.

PRECAUTIONS Before instilling any medication into the ear, examine the external ear canal thoroughly to be certain the tympanic membrane is not ruptured in order to avoid the possibility of transmitting infection to the middle ear as well as damaging the cochlea or vestibular apparatus from prolonged contact.

Administration of recommended doses of MOMETAMAX Otic Suspension beyond 7 days may result in delayed wound healing.

If overgrowth of nonsusceptible bacteria or fungi occurs, treatment should be discontinued and appropriate therapy instituted.

Avoid ingestion. Adverse systemic reactions have been observed following the oral ingestion of some topical corticosteroid preparations. Patients should be closely observed for the usual signs of adrenocorticoid overdosage which include sodium retention, potassium loss, fluid retention, weight gain, polydipsia, and/or polyuria. Prolonged use or overdosage may produce adverse immunosuppressive effects.

Use of corticosteroids, depending on dose, duration, and specific steroid, may result in endogenous steroid production inhibition following drug withdrawal. In patients presently receiving or recently withdrawn from corticosteroid treatments, therapy with a rapidly acting corticosteroid should be considered in especially stressful situations.

ADVERSE REACTIONS

Gentamicin: While aminoglycosides are absorbed poorly from skin, intoxication may occur when aminoglycosides are applied topically for prolonged periods of time to large wounds, burns, or any denuded skin, particularly if there is renal insufficiency. All aminoglycosides have the potential to produce reversible and irreversible vestibular, cochlear, and renal toxicity.

Mometasone: ALP (SAP) and ALT (SGPT) enzyme elevations, weight loss, anorexia, polydipsia, polyuria, neutrophilia, and lymphopenia have occurred following the use of parenteral, high-dose, and/or prolonged or systemic synthetic corticosteroids in dogs. Cushing's syndrome in dogs has been reported in association with prolonged or repeated steroid therapy.

Clotrimazole: The following have been reported occasionally in humans in connection with the use of clotrimazole: erythema, stinging, blistering, peeling, edema, pruritus, urticaria, and general irritation of the skin not present before therapy.

MOMETAMAX Otic Suspension: In field studies following once-daily treatment with MOMETAMAX Otic Suspension, ataxia, proprioceptive deficits, and increased water consumption were observed in less than 1% of 164 dogs. In a field study following twice-daily treatment with MOMETAMAX Otic Suspension, inflammation of the pinna and diarrhea were observed in less than 1% of 141 dogs.

U.S. Patent No. 6,127,353.

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BRIEF SUMMARY
(For full Prescribing Information, see package insert)

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

Federal law prohibits the extralabel use of this drug in food-producing animals.

INDICATIONS
POSATEX® OTIC SUSPENSION is indicated for the treatment of otitis externa in dogs associated with susceptible strains of yeast (*Malassezia pachydermatis*) and bacteria (coagulase positive staphylococci, *Pseudomonas aeruginosa*, and *Enterococcus faecalis*).

CONTRAINDICATIONS
POSATEX® Otic Suspension is contraindicated in dogs with known or suspected hypersensitivity to quinolones, mometasone furoate monohydrate, or posaconazole. Do not use in dogs with known tympanic perforation (see PRECAUTIONS).

PRECAUTIONS
The use of POSATEX® Otic Suspension in dogs with perforated tympanic membranes has not been evaluated. The integrity of the tympanic membranes should be confirmed before administering this product.

Avoid prolonged or repeated use of POSATEX® Otic Suspension. Long-term use of topical otic corticosteroids has been associated with adrenocortical suppression and iatrogenic hyperadrenocorticism in dogs (see ANIMAL WARNINGS).

The safe use of POSATEX® Otic Suspension in dogs used for breeding purposes, during pregnancy or in lactating bitches, has not been evaluated. The systemic administration of quinolones has been shown to produce cartilage erosions of weight bearing joints and other signs of arthropathy in immature animals of various species.

WARNINGS:
Human Warnings: Not for use in humans. Keep out of reach of children.

Animal Warnings: Do not administer orally. Immediately discontinue use of POSATEX® Otic Suspension if hearing loss is observed during treatment (see ADVERSE REACTIONS).

ADVERSE REACTIONS
In the field study, 143 dogs were treated with POSATEX® Otic Suspension. Of those, 1 dog with bilateral otitis externa developed transient hearing loss.

POSATEX® Otic Suspension treatment was discontinued and the condition resolved after one week.

HOW SUPPLIED
POSATEX® Otic Suspension is available in 7.5 g, 15 g, and 30 g plastic bottles.

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dvm Surgery STAT

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ABDOMINAL EXPLORATORY: A therapeutic and diagnostic tool

Use these five steps to conduct a successful procedure and identify and investigate areas of concern.

BY JANICE BUBACK, DVM, MS, DIPL. ACVS
CONTRIBUTING AUTHOR

Abdominal exploratory surgery—a systematic evaluation of the abdominal cavity and its contents—is often done in veterinary practice for therapeutic reasons, including elective sterilization, retrieval of urinary calculi, gastrointestinal foreign body removal and treatment of neoplastic conditions and other abdominal maladies. Looking beyond the therapeutic benefits, abdominal exploratory is an invaluable *diagnostic* tool as well, particularly in patients with nonspecific chronic gastrointestinal signs, hepatopathy or abnormal findings on radiographic or ultrasonographic examination. Acquiring good biopsy samples is key to maximizing the information gained during an exploratory.

An exploratory can be done via open laparotomy or laparoscopy. Open laparotomy has the advantage of allowing visual and tactile inspection as well as the ability to address any problems identified. Laparoscopy is a minimally invasive alternative that allows good visual inspection of the abdomen, acquisition of excellent biopsy samples and completion of many procedures.

> Traditionally, the abdomen is explored cranially to caudally, but the order of exploration doesn't really matter as long as you use a systematic approach and do it the same way every time.

Steps for successful abdominal exploratory

1. Prepare the patient and operating room. A complete sponge count (4-x-4 gauze sponges and laparotomy sponges) and instrument count (hemostats) should be done before entering any body cavity.

2. Approach the abdomen via the ventral midline through the linea alba. A full exploratory is best done with an incision from the xyphoid to pubis. Excision of the falciform ligament and associated fat allows better access to the cranial abdomen.

3. Begin exploration as soon as the linea is incised. Note the appearance of the abdomen, the presence and character of fluid, organ positions, gut motility and the integrity of the peritoneal wall and diaphragm. Traditionally, the abdomen is explored cranially to caudally, but the order of exploration doesn't really matter as long as you use a systematic approach and do it the same way every time. Look at and feel everything (Figures 1-3). And be sure to evaluate the entire abdomen before addressing any problems you identify. Good technique and tissue handling throughout the procedure are a must.

4. Complete your plan once the entire abdomen has been evaluated. Isolate the area of interest with moist-

CONTINUED ON PAGE 8S »

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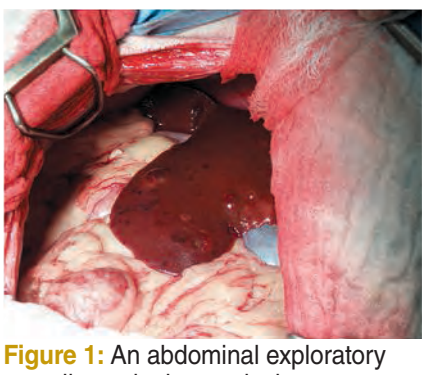


Figure 1: An abdominal exploratory revealing splenic neoplasia.

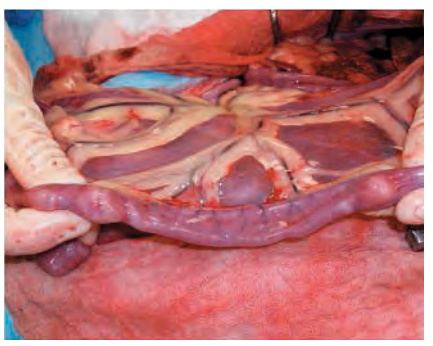


Figure 2: Evaluation of the small intestine during an exploratory.

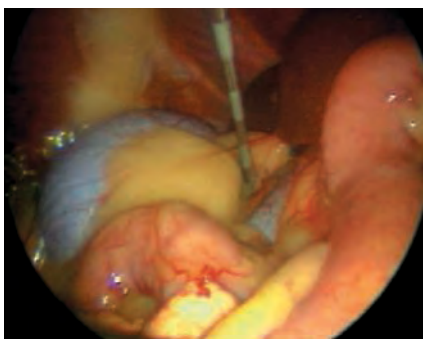


Figure 3: A laparoscopic exploratory evaluating the kidney, intestine, liver and adrenal gland.



Figure 4: A liver biopsy sample being obtained via laparoscopy.

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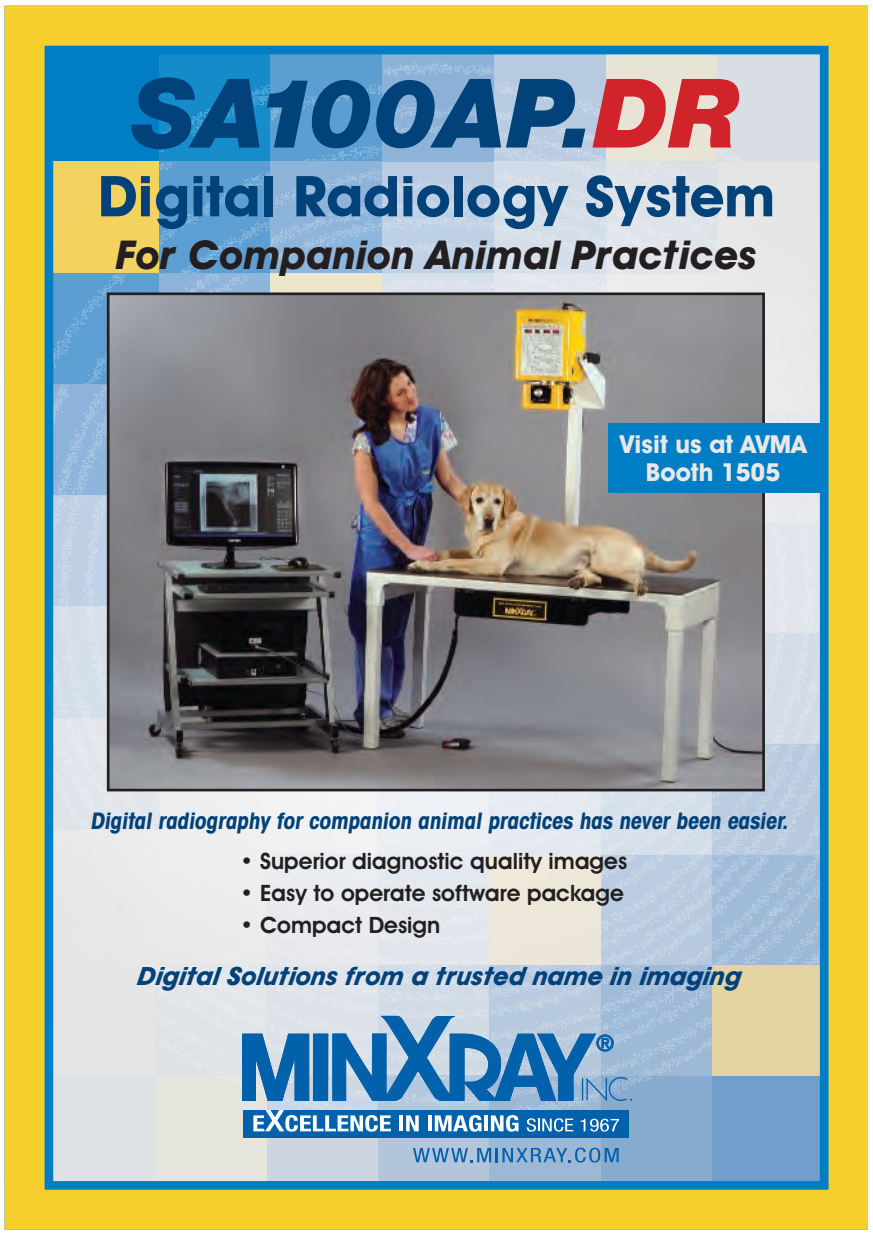
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Guidelines for biopsy of organs during abdominal exploratory

Organ or organ system	Indications	General rules	Basic techniques
Gastrointestinal* (LA)**	Vomiting, diarrhea, weight loss, neoplasia	• Full-thickness samples are most helpful. • Liver biopsy samples are usually obtained at the same time. • It's best to obtain a small sample from each portion of the small intestine. • Colonic biopsy is not recommended (samples are better obtained via colonoscopy).	• Small incisional biopsy of the stomach—full-thickness samples, routine closure • Small incisional or punch biopsy of the intestine from the antimesenteric margin—routine appositional closure
Liver* (L)**	Hepatopathy, GI disease, hepatic lipidosis, nodular or neoplastic changes, suspected portosystemic shunt	• It's best to obtain samples from different lobes. • Reserve some tissue (1 g) for metal analysis and culture.	• Guillotine technique or punch biopsy using skin punch and gel foam
Gallbladder (L)	Hepatopathy, biliary disease	• Often only fine-needle aspirates of bile are needed. • It's uncommon to obtain a biopsy sample of the gallbladder unless a cholecystectomy is done.	• Not applicable—biopsy is usually done after a cholecystectomy
Pancreas (L)	Pancreatitis, neoplasia	• Biopsy is not routinely done since the pancreas is so fragile. • When biopsy is necessary, use very gentle tissue handling.	• May use guillotine technique for biopsy on the margin • May use a Tru-Cut biopsy needle or small punch biopsy or shave off tissue with scalpel for other lesions less accessible
Lymph node* (L)	Lymphadenopathy, neoplasia (checking for metastatic disease)	• Biopsy is recommended any time enlargement is noted or a node is adjacent to concurrent disease.	• Excisional biopsy or incisional biopsy via resecting wedge or slice from the node • Close site with single horizontal mattress suture
Kidney (L)	Acute renal failure	• Consider the benefits of biopsy and the information gained vs. the risk of obtaining a sample. • A good cortical sample must be obtained for the best information. • Biopsy is contraindicated with coagulopathy.	• Tru-Cut biopsy needle (percutaneous, laparoscopic or open procedure) • Wedge biopsy (2- to 5-mm thickness) • Close site with mattress suture
Spleen (L)	Neoplasia, diffuse disease, splenomegaly	• Biopsy is contraindicated with coagulopathy.	• Percutaneous needle or Tru-Cut biopsy needle, punch biopsy, incisional biopsy • Pre-place mattress sutures around biopsy site • LigaSure-assisted incisional biopsy
Urinary bladder (LA)	Chronic cystitis, neoplasia	• Biopsy is often combined with cystotomy.	• Cystoscopic mucosal biopsy, open or laparoscopy-assisted small full-thickness biopsy sample • Routine closure

*The organs in which biopsies are most routinely performed.
**L = amenable to laparoscopic procedure; LA = amenable to laparoscopy-assisted procedure



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Abdominal exploratory: A therapeutic and diagnostic tool

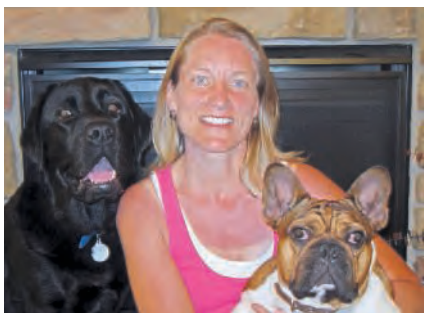
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ened laparotomy sponges, particularly if entering a lumen. Use stay sutures, atraumatic retractors, clamps and forceps to minimize tissue damage. Use appropriate suture materials—ideally, in most cases, this involves monofilament, absorbable sutures on small taper needles. Biopsies are indicated for any abnormalities noted (e.g., thickened bowel, lymphadenopathy, lesions or nodules on the liver or spleen) (Figure 4, p 6S). Organs commonly biopsied, indications for biopsy, general rules of thumb and basic techniques regarding biopsies are listed in Table 1. Local lavage of the surgical site or, if warranted, lavage of the entire abdomen with warm, sterile saline solution can be done at the end of the procedure. Evacuate as much fluid as possible from the abdomen, and perform sponge and instrument counts before closure.

5. Close the abdomen by using the external fascia of the rectus abdominis, not the muscle or subcutaneous fat. A local block using bupivacaine can be performed along the linea for additional analgesia. Then perform standard subcutaneous and skin closures. To ensure a good recovery, administer appropriate analgesia, heat support and supportive care.

Conclusion

Abdominal exploratory is a useful therapeutic *and* diagnostic tool when done appropriately. Even if you have a plan going into surgery, be prepared for surprises and be ready able to adapt your plan to address the findings. Never leave the abdomen without doing something—there should never truly be a negative exploratory. **dvm**



Dr. Janice Buback is a surgeon with Lakeshore Veterinary Specialists in Port Washington, Glendale and Oak Creek, Wis. She and her family, including Angus and Pinot (a.k.a. "Steak and Wine"), enjoy working and playing in southeast Wisconsin.

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A case of the heaves

Recurrent airway obstruction in horses

Stabling and eating hay are two of many factors that can contribute to this life-threatening disease.

BY ED KANE, PHD
CONTRIBUTING AUTHOR

Confined, stabled horses have to contend with a lack of fresh air and the inability to continually nibble on fresh grass. In addition, they're exposed to potential contamination in their environment from dust; more than 50 types of molds; toxins associated with dried forage, bedding and stale air; and a mixture of noxious gas (ammonia, hydrogen sulfide, methane, carbon dioxide) and airborne dust—both organic and inorganic.

All these pollutants can negatively impact horses' respiratory systems. Indeed, such horses have an increased risk of developing a chronic, recurrent and debilitating respiratory syndrome, says Jean-Pierre Lavoie, DMV, Dipl. ACVIM, professor of equine internal medicine at Université de Montréal, Canada.

This respiratory syndrome, called recurrent airway obstruction (RAO), or heaves, occurs in up to 20 percent of adult horses in the cold northern hemisphere and in temperate climes. Current thought, according to Lavoie, is that RAO "likely results from complex interactions between innate and acquired immune responses, environment and genetic susceptibility." Horses with heaves exhibit a chronic disorder of the airway and present with variable and recurring airflow obstruction, bronchial hyperresponsiveness and airway inflammation. They also show increased respiratory effort at rest, cough and decreased exercise performance.

"What we know for certain about

CONTINUED ON PAGE 2E »

Michele Constantini/Getty Images



p. 6E Regenerative therapy
Doctoral student receives grant for studying the role of stem cell disease in degenerative joint disease



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A case of the heaves: Recurrent airway obstruction in horses

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heaves is that in many horses it's precipitated by stabling," says Ed Robinson, BVetMed, PhD, Matilda R. Wilson Chair in Large Animal Clinical Sciences at Michigan State University's College of Veterinary Medicine. "Our current understanding is that it's exacerbated from inhaling the particles from hay, such as stable dust. Heaves is defined as a recurrent airway obstruction caused by inhalation of inorganic dust."

A horse with labored breathing at rest, without infection as a cause of these signs, is suffering from heaves, says Renaud Léguillette, DMV, MSc, PhD, Dipl. ACVIM, associate professor of equine internal medicine, Veterinary Clinical and Diagnostic Sciences, University of Calgary Veterinary Medicine Department. Horses have such a large lung capacity that when their lungs aren't functioning well enough to properly respire at rest, the problem of inflammation can become extensive.

"Once you see a horse with heaves, it's really too late, as the damage is severe enough to disrupt normal breathing," says Léguillette. All of the lung tissue is severely damaged, affected by a lot of inflammation and lung tissue remodeling. The damage is a triad of

- Bronchoconstriction
- Inflammation—inflammatory cell accumulation in the airway affects the small bronchi and alveoli
- Mucous plugs, or overproduction of mucous in the small airways.

"The three insults combined are really terrible for proper lung function," Léguillette says. "The bronchoconstriction narrows the airways, plus increased mucous accumulation causes the airway to be constricted and partially blocked, which severely limits normal breathing."

True allergy?

Researchers have asked, is RAO initiated via the same mechanism that true allergies are—as allergen binds to IgE, promoting mast cell release of various mediators of inflammation, such as cytokines and histamine? Or does it result from a nonspecific inflammatory response to inhaled pro-inflammatory agents such as molds, endotoxins, particulates and noxious gases present in the breathing zone of stabled horses.

In the case of the allergic response, once the pro-inflammatory mediators are released, a cascade of mucous secretion, vasodilation, microvascular leakage and airway smooth muscle contraction may ensue. The result is narrowing of the airway lumen and obstruction. Theoretically, a second phase response is T-cell mediation of an asthmatic response.

For horses with RAO, what's the immune mechanism? "We don't know that in horses," says Robinson. "We're pretty certain heaves is not a typical IgE-mediated allergic immune response." It has all the characteristics of an allergic disease, he notes. Horses exposed to certain environments get airway obstruction and airway inflammation. For example, if an RAO horse is purchased in New York and is then moved to a stable in Kansas, it might not show heaves in that environment, Robinson says. "Heaves seems to be related to something in the local environment that causes the problem."

In people, hayfever is mediated via mast cells. But that doesn't appear to be the case in equine heaves. "It does seem to have the characteristics of an allergic disease, but the exact immune response is not understood," says Robinson. "Skin tests don't predict the allergens that will cause heaves. The measurement of IgE doesn't predict the things that are going to initiate the disease. So it's not a classical IgE immune-response hypersensitivity."

Another aspect that isn't typical of allergy—neutrophils are found in the airway of horses with heaves. Says Lavoie, "Usually with allergy, it's more mast cells or eosinophils—granulocytes nonetheless—similar but different.

"When we started to work on the immunological component of the disease, we found the bronchial lavage from horses with heaves express cytokines, which are similar to those we see with allergy, a Th2 profile," Lavoie continues. "We know that heaves is not a true allergic response, in which within 30 or 45 minutes of exposure to the allergen, you'll start to see clinical signs. When we take horses with heaves and bring them into the stables, some horses will become symptomatic within a day, but others will take several days to show signs. With heaves, we don't see the initial stage of the disease—the immediate allergic response. However, the rest of the response looks like an allergy because it's pretty much related to exposure to antigen, primarily to hay. If we expose a horse with heaves to feeding on hay, it becomes symptomatic. If we remove the hay, the clinical signs essentially disappear."

Initially, it was uncommon to see Th2-type, response-associated neutrophils, Lavoie says. At that time neutrophils were not considered an important part of the asthmatic response in people. "But during the past 10 years that has changed, where today there's a lot of interest regarding the role of neutrophils in asthma. Our grant work was to try to understand how Th2-type cytokines could activate neutrophils."

His studies have shown that, using recombinant proteins, "if we make equine IL-4 and expose them to neutrophils, it activates the neutrophils," says Lavoie. "Also, if you expose endothelial cells from the pulmonary artery of horses to IL-4, they'll produce cytokines, mediators that are chemotactic factors to neutrophils. We and others have done a large body of studies showing that Th2-type cytokines contribute to not only attracting neutrophils within the airways, but also activating them."

Robinson says RAO is different from human asthma, which tends to diminish as people age. "There is no 'childhood' heaves, i.e., young foals getting heaves. It's a disease of older horses; 8 to 10 years old is the common age of onset."

Lavoie agrees, adding, "We do see young horses, even weanlings, coughing, but it's rare to see foals with RAO. The process of airway remodeling, the changes in the lung architecture, including increases in smooth muscle surrounding the airways, probably takes years to occur."

Airway remodeling

A critical portion of Lavoie's research involves the physical changes that take place within the lungs of horses with heaves—a buildup (which gets more severe over time) of smooth muscle surrounding the airway tissue. Eventually, a lot of these horses are euthanized

CONTINUED ON PAGE 4E »



Richard Nowitz /Getty Images

What lurks in the haystack: Researchers say that recurrent airway obstruction, or heaves, is exacerbated by inhaling the particles from hay, such as stable dust.

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A case of the heaves: Recurrent airway obstruction in horses

» CONTINUED FROM PAGE 2E

because they're difficult to manage.

"We think the reason they become increasingly severe is because of the changes occurring within the lungs surrounding the airways, as is true in human asthma," Lavoie says. "We reported that horses with heaves have two to three times more smooth muscle surrounding the airways than age-matched control healthy horses. The more muscle present, the more likely the contraction is going to be. The lumen of the airways is reduced in diameter, therefore air is not moving freely through the airway. And with the increased smooth muscle, there's increased contraction of the airway, making breathing even more difficult."

In further research, Lavoie studied airway remodeling, taking lung biopsy samples from deceased horses and from horses with heaves over time (a few months or years). In the live horses with severe cases of heaves, they documented the same thing they saw in the necropsied samples.

Lavoie tried to reverse this increase in smooth muscle remodeling. His team studied a group of horses with heaves—half were pastured on pelleted feed for a year and the other half were treated with inhaled corticosteroids for a year. Initially, the horses treated with corticosteroids were stabled. After six months they continued the treatment and put them on pasture. They measured smooth muscle surrounding the airways before the treatment, at six months and again at a year. Mathilde Leclere, DMV, a graduate student in Lavoie's lab, showed there's a decrease in the amount of smooth muscle surrounding the airway after treatment with inhaled corticosteroids, but they were very far from reversing it even after a year. The researchers also showed if they kept horses with heaves stabled for a few weeks, smooth muscle mass didn't change, since remodeling is inherently a very gradual process.

Leclere also looked at what was responsible for the decrease in airway smooth muscle, as they hope to eventually develop targeted therapy that may allow for restoration of lung tissue to normal status, if possible.

Another Université de Montréal graduate student, Emilie Lanctot-Setlakwe, DMV, is looking at the collagen content present between the epithelium and the smooth muscle. "She found there's an increase in collagen, so there is also some fibrosis taking place in the lung tissue of horses with heaves. We're trying to determine if this is reversible or not," Lavoie says.

These studies show airway remodeling, or the change in airway architecture, takes place during a period of several years. "That's probably why we rarely see the severity of clinical signs of airway disease in young horses," Lavoie says. "Coughing may be present, though the horse lung has an incredible reserve compared with the human lung. The severe disease process takes years to develop, and we rarely see the lung damage of heaves in young horses at rest."

Attempts at control—a confluence of factors

Heaves is a chronic condition. The propensity to develop airway obstruction doesn't go away, so such horses have to be continually managed. Add to this the fact that the stable is a complex environment, and you see that there are many factors to consider.

"We know endotoxin present in hay dust plays a role in the inflammation response," says Robinson. "When trying to figure out what to do to help the affected animal, there's no point where a horse owner can decide to try to take 'this' or 'that' out of the horse's bedding or hay, because they'll never know exactly what to take out."

The horse owner, instead, needs to focus on reducing the particulate exposure. The best solution is pasturing these horses. For many horses with heaves, keeping them on pasture grass in spring and summer and in run-in sheds with pelleted food during winter can help keep them free of signs of disease—though this may not be practical for many clients.

"One concern about horses eating





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Keeping horses on pasture grass in spring and summer and in run-in sheds with pelleted food during winter can help keep them free of signs of disease.

hay is that they sink their noses directly into the hay net or manger. As they tug at the hay, they create dust," says Robinson. "Also, if it's a show horse, people need to think about this when they travel with the animal."

Owners and equine specialists should also think about reducing particles in the stable. "Keep the doors and windows open. For a particularly 'heavey' horse, take it off hay and give it something that has less dust, such as a complete pelleted feed," Robinson says.

Soaking hay may be an easy solution because it significantly reduces the particles. But note it also may wash out the nutrients. "Unless the horse eats it all at once, it dries out again. As it dries, it may grow more mold," Robinson cautions.

Stall cleaning is another factor. Consider a horse that has been away from its stall for 24 hours, and the stall hasn't been cleaned out during that time, Robinson says. Mold grows in the bedding, the horse walks on it and the spores are kicked up into the stall environment as a cloud of dust. Clients with RAO-afflicted horses should be educated about keeping the stall cleaned and the horse out of the stall while it's being mucked out.

"I'm not as concerned about the bedding, per se, but about getting the chaff hay out of the bedding," says Robinson. "The particles from hay are a lot more of a concern that the particles from straw, which are larger and don't get very far into the lungs."

A final factor, says Robinson, is noxious gases, such as ammonia, which are respiratory irritants and enhance the production of mucous, so they may contribute to airway obstruction.

"With heaves, often a little bit of this by itself may not cause a problem," says Robinson, "but when it's mixed with a little bit of that, the two together may have a synergistic effect. There are all kinds of interactions between particles, endotoxins, molds, ozone, ammonia—all are in some way interacting with each other. But predicting what exactly may be affecting a particular horse—that's not easy. One almost needs a diary to keep track of what may be the problem."

And stabling is not a problem for all horses, just for certain RAO-afflicted horses, he continues. "I have a former graduate student who has a 'heavey' horse that she can manage quite well housed in a stable. She has a low-dust stall for it, but its big trigger is a dusty arena. If it goes outside and runs around a dusty arena, it will be affected. Similarly, some horses are affected by certain pollens outdoors. Some horses have seasonal problems, and you can manage those with the proper medications at those times of the year."

Overall solution—limit exposure

As noted, the main concern for horses with heaves is to limit their exposure to organic dust. "If horses are confined to stables, turn them outside as much as possible. Put the horses completely off hay, and feed them pellets or cubes," says Léguillette. Léguillette also recommends the use of hay steamers. The steam kills molds and bacteria and washes the hay to decrease dust and organic particles. "They seem to work very well. I strongly recommend preventing exposure to organic dust as much as possible. I also recommend that people turn their horses out when they sweep the barn area or when bedding the stall to reduce exposure to dust, and to wet the barn area when they sweep to keep the dust down. If people are turning their horses out, even for only a few hours per day, it should be at the time they're cleaning the stall and barn areas. Wait a couple of hours before bringing the horse back into the barn."

In Calgary, researchers even found that horses that had been turned outside during cold weather did better than those left in confinement with dust. "The barn is a bad place for accumulation of dust, especially for horses with lung disease," Léguillette says.

The main implication of this research interest—changes occurring in the lungs of horses with heaves are quite severe, says Lavoie. "It's probable that once these horses are heave-affected, once the disease has progressed, it might be too late to reverse the condition. One probably needs to intervene much earlier.

"What we don't know at this point for those horses with mild asthma or inflammatory airway disease: Do those animals go on to develop more severe disease? We need to recognize early on horses that will eventually develop heaves and apply appropriate therapy or change their environment to change this progression, which eventually causes this severe decline in airway function." **dvm**

Suggested reading

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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.

IN THE NEWS

Diseased horses smuggled across Texas border

U.S. Border Patrol agents recently seized 10 adult horses and four yearlings as their handlers attempted to cross the Texas border near El Paso, says the Texas Animal Health Commission (TAHC). The adult horses were later found to be infected with equine piroplasmosis.

Smugglers from Mexico were attempting to illegally cross the Rio Grande with the animals when federal officials intercepted them. The animals were turned over to veterinarians with the U.S. Department of Agriculture (USDA), who tested them for disease. All 10 of the of the adult animals tested positive for equine piroplasmosis, a blood-borne disease commonly seen in South and Central America but not considered endemic in the United States. If left undetected, the disease could have a serious effect on interstate and international equine transportation, says the TAHC.

Dr. Grant Wease, field veterinarian for the USDA's Animal and Plant Health Inspection Service in El Paso, says the illegal movement of animals is an ongoing concern in Texas. "In some places, the Rio Grande poses no barrier at all to foot traffic for man or animal," he says. Approximately 280 head of cattle and 160 head of equine (primarily horses) were intercepted by the USDA along the Rio Grande in 2011, Wease says.

The TAHC also points out that many of the normal import processes for livestock coming into Texas have been adversely impacted by border violence. Because of unsafe conditions in Mexico, U.S. government employees are forbidden from conducting livestock and horse inspections south of the Texas border. As a result, the state retains horses in holding facilities and tests them for infectious diseases before allowing them to enter the U.S. However, at this time there are no open holding facilities in Texas, which has increased the incidence of smuggling. State officials are hoping to rectify this and resume the normal import process this summer by reopening a port in Nuevo Laredo, says Dee Ellis, DVM, state veterinarian and TAHC executive director.

"Racing quarter horses with some connection to Mexico appear to be at highest risk of testing positive to the emerging disease," Ellis says. "This situation highlights the ongoing border security problems Texas is facing, which leads to an increased risk of disease introduction for the Texas livestock population when animals enter our state illegally."

The USDA and TAHC are currently investigating the smuggling incident, focusing their efforts on both the source of the animals and their destination. **dvm**



Lindsey Helms Boone, DVM, makes media to provide adequate nutrients for cellular growth of the mesenchymal stem cells.

INVESTIGATING equine stem cell therapy

University of Georgia veterinary doctoral student receives AAEP grant for work on regenerative medicine.

BY ED KANE, PHD
CONTRIBUTING AUTHOR

Lindsey Helms Boone, DVM, a University of Georgia veterinary PhD candidate and surgery resident, received a $5,000 fellowship during the 57th annual American Association of Equine Practitioners (AAEP) convention this past November. The grant will support Boone's endeavors in equine research.

According to the AAEP, Boone's doctoral research involves using equine allogenic bone marrow-derived mesenchymal stem cells (BMSCs) given intra-articularly to treat acute and chronic degenerative joint disease in horses. Regenerative therapy is increasingly used for many equine musculoskeletal diseases, but its precise mechanisms of action, the full potential of its application and the potential for deleterious side effects have not been fully investigated. Boone's research aims to answer many of these questions.

Supported in partnership with the AAEP Foundation and the EQUUS Foundation, the $5,000 grant emphasizes the importance of assisting equine researchers in their exploration of horse healthcare topics.

Boone received her bachelor's degree in animal and veterinary sciences in 2004 from Clemson University and her veterinary degree in 2008 from the University of Georgia. She did a one-year large-animal rotating internship at Texas A&M University in 2009 and is completing a combined large-animal surgical residency and doctoral program in physiology and pharmacology at the University of Georgia.

Regenerative therapies

Regenerative therapies are gaining prominence at veterinary schools across the country, including the University of California-Davis School of Veterinary Medicine (see "Calif. researchers collaborate on animal, human health" in the August 2011 *DVM Newsmagazine*); the Equine Orthopedic Research Center, Colorado State University; and Cornell University College of Veterinary Medicine.

And the establishment of the North American Veterinary Regenerative Medicine Association has thrust this therapy into the forefront of veterinary medicine. Previous researchers have advocated that "the application of stem cell-based therapies in the horse should be done cautiously, and treatment outcomes (good and bad) should be recorded and reported."[1]

Equine regenerative medicine has the potential to treat damaging musculoskeletal injuries that lead to limited equine athletic performance, such as tendonitis or desmitis, joint-related pathologies, equine fracture repair and laminitis. The use of stem cell therapy has also shown promise for treating wounds, muscle-related injuries (skeletal and cardiac muscle) and neurologic disease.

Currently, both bone marrow-derived and adipose-derived mesenchymal stem cells are favored in equine regenerative medicine because of the ease of tissue acquisition for cell extraction. Despite the therapeutic potential of these stem cells, there's little objective evidence supporting their benefit to tissue repair, necessitating the need for further research into the optimal cell source and proper treatment regimen (i.e., timing, dose, dosing frequency and route of administration), as well as efficacy and safety of the procedures.

Mesenchymal stem cells for orthopedic injury

Although there's much work being done regarding the use of mesenchymal stem cells for orthopedic injury, most studies are in vitro with relatively few in vivo studies evaluating the use of mesenchymal stem cells in surgically created or naturally occurring musculoskeletal disease. Some concerns that clinicians may have regarding the use of stem cells include their viability, proliferation and ability to renew and regenerate into viable tissue after injection, allowing horses to heal with little scar formation and enabling their return to previous levels of performance.

Photos courtesy of Dr. Lindsey Helms Boone

Successful use of intra-articularly administered mesenchymal stem cells has shown promising results in tissue healing of experimentally produced lesions in dogs and sheep. According to one study of experimentally induced equine femoropatellar joint lesions, in vivo implantation of mesenchymal stem cells within autogenous fibrin plugs yielded increased fibrous tissue deposition that contained predominantly collagen type II.[2] However, this lasted only 30 days. But seven months later, the control and treated lesions were indistinguishable.

Researchers at Louisiana State University's School of Veterinary Medicine found that equine BMSCs had superior chondrogenic potential compared with adipose-derived cells in the presence of stimulatory growth factors.[3]

Besides the viability of stem cells and their ability to convert to various tissue cells for repair (i.e., their pluripotent, self-renewing capability toward tissue regeneration), there's data as to their ability to directly affect the inflammatory process since it appears that stem cell therapy in horses may also provide impact as an immunomodulator.[4] Tissue repair and disease improvement as assisted by mesenchymal stem cells has been shown to be related to an individual's immune system. It's been found that mesenchymal stem cells have effects on various immunomodulators (e.g., B cells, T cells, natural killer cells, dendritic cells, macrophages, neutrophils) that can affect the humoral immune response. As they regenerate tissue, stem cells could also help by reducing the immune response, making it easier for them to be effective as opposed to classical tissue grafting or tissue transplantation regarding a concern for tissue rejection.

Boone's AAEP fellow research

Boone explored various aspects of regenerative medicine as a portion of her work, including the research for which she received the AAEP fellowship. As a clinician using various regenerative medicine therapies, Boone had a lot of questions as she injected horses intra-articularly with mesenchymal stem cells.

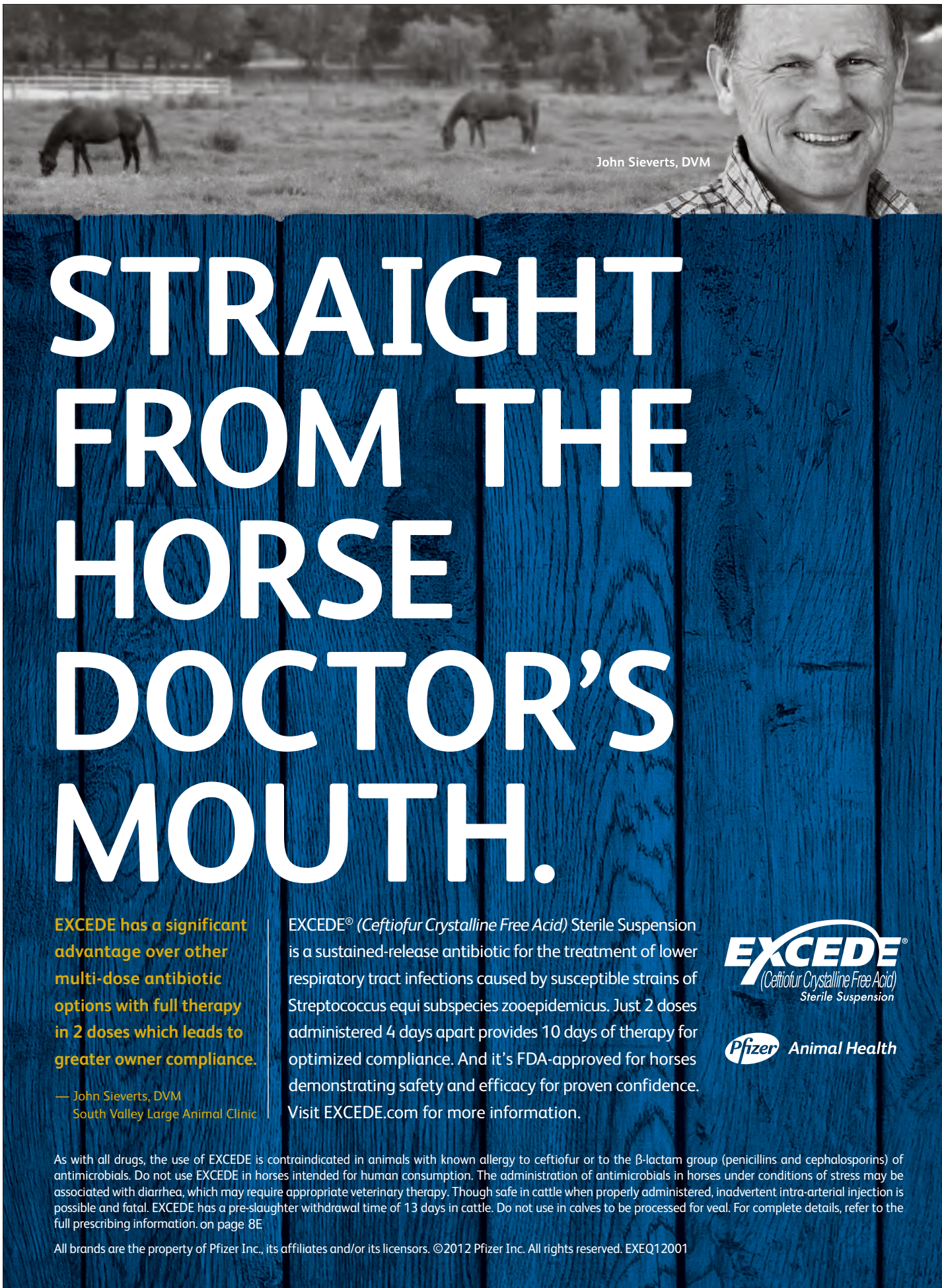
The basis for her PhD work was her curiosity about what happened to the cells after they were injected into a joint: Where do they go? Do they live in the synovial fluid? Do they develop toward an articular cartilage phenotype? Can they start to produce cartilage if they're exposed to synovial fluid? What's the proper vehicle of delivery?

Boone also became interested in how to manipulate the cells and how to use them in an allogenic manner. She concentrated on two major types of articular disease that the veterinarians at the University of Georgia were treating—osteoarthritis (OA), an on-going inflammatory process that leads to articular cartilage degeneration, and osteochondritis dissecans (OCD) lesions, or subchondral bone cysts that have abnormalities to their articular cartilage but don't necessarily have the degree of on-going inflammation within the joint.

Originally, Boone wanted to try to meld the two, but she says she is now "very much more interested in the fact that the cells we inject also have immunomodulatory anti-inflammatory properties. Can we use those properties to help modulate the inflammatory environment within the joint and then use them to repair articular cartilage? Is there a way to make them useful in an ongoing OA

CONTINUED ON PAGE 8E »

> As they regenerate tissue, stem cells could also help by reducing the immune response.



dvm

Investigating equine stem cell therapy

» CONTINUED FROM PAGE 7E

horse, which I think is much more enticing to people, but also fixing articular defects that are an interest, looking at the inflammatory environment?"

The first project of Boone's PhD work looked at harvesting synovial fluid from horses and examining the survivability, proliferation and chondrogenesis of stem cells in allogenic synovial fluid in vitro.

"If I take cell lines from a group of several horses and add synovial fluid that's not their own, will they survive, will they increase in their numbers and can they promote cartilage?" Boone asked. "We use various levels of synovial fluid, because in vitro in the synovial fluid environment you don't have that ongoing process of replenishment. In vitro, obviously you have a limited amount of growth factors—nutrients that will be depleted over time."

During this first study, she looked at the response during a 72-hour period—in some cases out to five days—to various percentages of media supplementation with synovial fluid up to 100 percent; she introduced only synovial fluid. In this study, she says, "We were using normal synovial fluid, though we're planning on trying to use OA synovial fluid as well."



Boone oversees Merrilee Thoresen, PhD, as she evaluates the morphology of the mesenchymal cells while in culture to ensure the cells are growing appropriately.

Originally Boone and her colleagues wanted to look at normal synovial fluid to see if BMSCs injected into that environment would be viable or if some would die or be lost. "Preliminary data seems to show the viability is not altered," Boone says. "The BMSCs survive fine and do seem to slightly proliferate in the synovial fluid. You don't have a sharp die-off of cells."

Boone is now trying to repeat those studies, but it's difficult because you have to harvest quite a bit of synovial fluid, and it takes a lot of time.

"If you inject 20 million cells within a joint, they should have time to find where they need to go and have the nutrients they need until they find another source of nutrients," says Boone. "We think they find those needed nutrients in the synovial membrane due to its vascularity."

The first thing is determining whether they live and whether the synovial fluid pushes them toward a chondrogenic phenotype. "Our data is preliminary," Boone cautions.

In the clinic, Boone and her colleagues tend to inject BMSCs in platelet-rich plasma (PRP) into joints. "I was interested in using allogenic stem cells and using autologous PRP. What I wanted to know: Was there any difference between use of allogenic PRP and autologous PRP and its introduction to stem cells on the viability, chondrogenesis and proliferation?"

The variance of PRP work is the basis for the grant she was awarded—the difference between using allogenic vs. autologous PRP with BMSCs.

Boone's hope is to advance her studies, to take her allogenic work into a model system—either a joint-defect or OA model—and look at allogenic bone marrow-derived stem cells. She's unsure if she'll be able to look at the model studies, though, because of financing issues. Maybe another grant or fellowship is in the future?

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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.

EXCEDE® (Ceftiofur Crystalline Free Acid) Sterile Suspension

For intramuscular injection in the horse.

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

INDICATION
EXCEDE Sterile Suspension is indicated for the treatment of lower respiratory tract infections in horses caused by susceptible strains of *Streptococcus equi* ssp. *zooepidemicus*.

CONTRAINDICATIONS
EXCEDE Sterile Suspension is contraindicated in horses with known allergy to ceftiofur or to ß-lactam (penicillins and cephalosporins) group antimicrobials. Due to the extended exposure in horses, based on the drug's pharmacokinetic properties, adverse reactions may require prolonged care.

WARNINGS
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Do not use in horses intended for human consumption.
Penicillins and cephalosporins can cause allergic reactions in sensitized individuals. Topical exposure to such antimicrobials, including ceftiofur, may elicit mild to severe allergic reactions in some individuals. Repeated or prolonged exposure may lead to sensitization. Avoid direct contact of the product with the skin, eyes, mouth and clothing. Sensitization of the skin may be avoided by wearing protective gloves. Persons with a known sensitivity to penicillin or cephalosporins should avoid exposure to this product. In the case of accidental eye exposure, flush with water for 15 minutes. In case of accidental skin exposure, wash with soap and water. Remove contaminated clothing. If allergic reaction occurs (e.g. skin rash, hives, difficult breathing) seek medical attention.

PRECAUTIONS
Prescribing antibacterial drugs in the absence of a proven or strongly suspected bacterial infection is unlikely to provide benefit to the treated animal and may increase the risk of development of drug-resistant animal pathogens.
The administration of antimicrobials to horses under conditions of stress may be associated with acute diarrhea that can be fatal. If acute diarrhea is observed, additional doses of EXCEDE should not be administered and appropriate therapy should be initiated.
Due to the extended exposure in horses, based on the drug's pharmacokinetic properties, adverse reactions may require prolonged care. EXCEDE is slowly eliminated from the body, with approximately 17 days needed to eliminate 97% of the dose from the body. Animals experiencing adverse reactions may need to be monitored for this duration of time.
The use of ceftiofur has not been evaluated in horses less than 4 months of age and in breeding, pregnant, or lactating horses. The long term effects on injection sites have not been evaluated.

ADVERSE REACTIONS
The injection of EXCEDE Sterile Suspension in the horse may cause firmness, swelling, sensitivity, and/or edema at the injection site.
A total of 373 horses of various breeds, ranging in age from 4 months to 20 years, were included in the field study safety analysis. Adverse reactions reported in horses treated with EXCEDE and the placebo control are summarized in Table 1.
Injection site swelling (edema) was reported in 10 of 278 (3.6%) EXCEDE-treated horses and 1 of 95 (1%) of the placebo-treated horses. Of the 10 EXCEDE-treated horses with injection site swelling, 8 horses had swellings of 4 cm or less in diameter, one horse had a 10 cm diameter swelling and one horse had injection site reactions to both injections measuring 25 x 12 cm each. The injection site reactions in EXCEDE-treated horses resolved over 1 to 20 days.
At least one episode of diarrhea, loose, soft, or cowpie stools were observed in 25 of 278 (9%) of the EXCEDE-treated horses and 7 of 95 (7%) of the placebo-treated horses. The duration of episodes in EXCEDE-treated horses ranged from a single observation of loose stool to observations lasting 6 days. All cases were self-limiting and resolved with minimal (a single dose of loperamide) or no treatment.

Table 1. Number of Horses with Adverse Reactions During the Field Study with EXCEDE

Adverse Reaction	EXCEDE (n=278)	Placebo (n=95)
Diarrhea/Soft Stool	25 (9%)	7 (7%)
Injection Site Swelling	10 (4%)	1 (1%)

The material safety data sheet (MSDS) contains more detailed occupational safety information. To obtain a material safety data sheet, please call 1-800-733-5500. To report any adverse event please call 1-800-366-5288.

STORAGE CONDITIONS
Store at controlled room temperature 20° to 25°C (68° to 77°F). Shake well before using. Contents should be used within 12 weeks after the first dose is removed.

HOW SUPPLIED
EXCEDE Sterile Suspension is available in the following package size: 100 mL vial

U.S. Patent No. 5,721,359 and other patents pending.

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

INDICATIONS
EXCEDE Sterile Suspension is indicated for treatment of bovine respiratory disease (BRD, shipping fever, pneumonia) associated with *Mannheimia haemolytica, Pasteurella multocida,* and *Histophilus somni* in beef, non-lactating dairy, and lactating dairy cattle.

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EXCEDE Sterile Suspension is also indicated for the treatment of bovine foot rot (interdigital necrobacillosis) associated with *Fusobacterium necrophorum and Porphyromonas levii* in beef, non-lactating dairy, and lactating dairy cattle.

CONTRAINDICATIONS
As with all drugs, the use of EXCEDE Sterile Suspension is contraindicated in animals previously found to be hypersensitive to the drug.

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Persons with a known hypersensitivity to penicillin or cephalosporins should avoid exposure to this product.

In case of accidental eye exposure, flush with water for 15 minutes. In case of accidental skin exposure, wash with soap and water. Remove contaminated clothing. If allergic reaction occurs (e.g., skin rash, hives, difficult breathing), seek medical attention.

The material safety data sheet contains more detailed occupational safety information. To obtain a material safety data sheet please call 1-800-733-5500. To report any adverse event please call 1-800-366-5288.

Injection of EXCEDE Sterile Suspension into the arteries of the ear is likely to result in sudden death to the animal.

RESIDUE WARNINGS
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- **Following label use as a single treatment, no milk discard period is required for this product.**
- **Use of dosages in excess of 3.0 mg CE/lb (6.6 mg CE/kg) BW or administration by unapproved routes (subcutaneous injection in the neck or intramuscular injection) may cause violative residues.**
- **A withdrawal period has not been established for this product in pre-ruminating calves.**
- **Do not use in calves to be processed for veal.**

PRECAUTIONS
Following subcutaneous injection in the middle third of the posterior aspect of the ear, thickening and swelling (characterized by aseptic cellular infiltrate) of the ear may occur. As with other parenteral injections, localized post-injection bacterial infections may result in abscess formation. Attention to hygienic procedures can minimize their occurrence.

Following injection at the posterior aspect of the ear where it attaches to the head (base of the ear), areas of discoloration and signs of inflammation may persist at least 13 days post administration resulting in trim loss of edible tissue at slaughter. Injection of volumes greater than 20 mL, in the middle third of the ear, may result in open draining lesions in a small percentage of cattle.

The effects of ceftiofur on bovine reproductive performance, pregnancy, and lactation have not been determined.

ADVERSE EFFECTS
Administration of EXCEDE Sterile Suspension into the ear arteries is likely to result in sudden death in cattle. During the conduct of clinical studies, there was a low incidence of acute death (nine out of approximately 6000 animals). Three of these deaths were confirmed to be the result of inadvertent intra-arterial injection. No other adverse systemic effects were noted for either the antibiotic or formulation during any of the clinical and target animal safety studies.

STORAGE CONDITIONS
Store at controlled room temperature 20° to 25°C (68° to 77°F). Shake well before using. Contents should be used within 12 weeks after the first dose is removed.

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IN THE NEWS

Panel questions drugs in horse racing

Performance enhancers tarnish the sport, say congressional panel of veterinarians, jockeys and trainers.

BY ED KANE, PHD
CONTRIBUTING AUTHOR

Equine practitioners and other professionals told members of the U.S. House of Representatives in April that it's time for the federal government to regulate the use of drugs in horse racing.

"With the myriad of state and local controls over racing and the various interests, from owners to trainers to racing jurisdictions, there is virtually no way that you're going to be able to get any kind of consistent rule to control these drugs without some kind of federal legislation," said Gregory Ferraro, DVM, director of UC Davis's Center for Equine Health and a member of the panel offering testimony. "While many of us feel that federal rules and regulations are something we want to keep out of our sport, I think in this instance, there is just no way to manage this without it."

Ferraro and others spoke April 30 before the members of the U.S. House of Representatives subcommittee in Kennett Square, Pa. Representatives are considering the creation of a national body to enforce the rules of racing and to standardize regulations.

In his opening statement, Rep. Joseph Pitts (R-Pa.), the subcommittee chairman, noted that according to *The New York Times*, trainers have been caught illegally drugging horses 3,800 times since 2009, a figure that understates the problem because only a small percentage of horses are actually tested.

"Illegal doping often occurs on private farms before horses are shipped to the track. Few states can legally test horses there," Pitts said. "We're considering the need for a national set of uniform rules to prohibit the use of performance-enhancing drugs."

Panelist Kathryn Papp, DVM, of Hillcrest Meadow Equine Services in Harrisburg, Pa., stated that overuse and abuse of medication is rampant at racetracks and training centers.

"The abuse is not limited to just performance-enhancing drugs. It encompasses all substances that our trainers think may improve their horses' performance," Papp said.

Overused medications include antibiotics, corticosteroids, NSAIDs, hormones, calmative agents, hypersensitizing agents and respiratory aids, Papp said. "These substances are not just being used inappropriately around race time," she said. "They are employed during training and the time leading up to races. I cannot tell you how many barns I know that train every one of their horses on phenylbutazone daily whether they need it or not."

And it's not just trainers to blame, Papp says. "It is not uncommon for me to see, on race day, a practitioner enter a stall in one of the private barns or the detention barn with three to ten syringes full of medication."

Singling out the problem drugs

Most of the panel members made little distinction between therapeutic medications and what they called "drugging, doping or performance-enhancing drugs." Only furosemide can legally be administered on race day. With phenylbutazone, there are limitations to the amount that can be given prior to race day, and a limited tested amount that can be in the horse's bloodstream (2 to 5 µg, depending on the racing jurisdiction).

Many of those at the hearing expressed concern that the public view of horse racing has been tarnished by the overuse and abuse of drugs like phenylbutazone and furosemide.

"Does the public know that horses are drugged and therefore conclude no level playing field exists in the horse racing industry?" asked Pitts.

"That is my belief," replied Gary Stevens, a Racing Hall of Fame jockey who was a member of the panel.

• **Furosemide.** Papp singled out furosemide as a "Band-aid" that masks symptoms and the true fitness of undrugged thoroughbred horses. And the side effects are pernicious, she said.

"Furosemide dehydrates the horse. It decreases the circulating blood volume … (and) decreases the blood pressure in the lungs," she said. "We need a phase-out of furosemide, because there are much more useful medications, like interferon-alpha. There are other options that are healthier."

Panel members offered medical evidence of furosemide's performance enhancement. Thoroughbred owner George Strawbridge Jr. of Cochranville, Pa., pointed to two studies in 1998 and 1999 concluding that furosemide delayed the onset of fatigue and increased the oxygen going to muscles.

Papp noted that a recent study found that furosemide increased horses' hematocrit from 10 percent to 18 percent, which would be considered "blood doping." She acknowledged that furosemide can help reduce the risk of exercise-induced pulmonary hemorrhage (EIPH). However, because of the extreme increase in hematocrit, the drug is "performance-enhancing, not solely a preventive for EIPH."

Both panel veterinarians, Papp and Ferraro, believe that the use of performance-enhancing drugs has weakened the fitness of U.S. thoroughbreds.

"Look at the horses in Europe," Ferraro said. "They are much better than ours now. The offspring of these stallions are much better racehorses, and I believe that we've done a detriment to the breed (by overusing these drugs)."

Not noted by any members of the panel nor by Congress members was that though racehorses around the world are not administered furosemide on race day, with the exception of Hong Kong, they train on furosemide.

• **"Bute."** Papp also turned her sights on phenylbutazone. "Bute" is hardly a performance enhancer, she argued, but it's overused because it's legal.

"There is no horse that is going to go from lame to sound on the amount of 'bute' that is allowed to be left in their system at the time of racing," Papp noted. "It's just because it is allowed to be used that everybody uses it. It has GI and kidney side effects. I don't think the level of bute is harming horses or covering up anything, but because it's legal, it is being abused."

Hiding injuries

In addition to side effects and unfair advantages, overuse and abuse of drugs may be masking the presence of more dangerous drugs or hiding existing injury or lameness, panelists said, though for the most part no scientific evidence was discussed at the hearing to support these claims.

"There are numerous drugs that are non-detectable," said Strawbridge. "They are definitely 'performance-enhancing.' They cover up pain. There are muscle relaxers. There is evidence of blood-doping to increase the oxygen supply to the muscle."

Papp agreed that eliminating pain in thoroughbreds puts horses and jockeys at risk. "Pain is a protective mechanism that allows these athletes to protect and save themselves in certain circumstances. Horses, especially thoroughbreds, will under every circumstance do anything necessary to remain upright and not fall and injure their rides," she said. "However, this protective mechanism is nullified when doping occurs, and thus our riders and jockeys incur a significantly greater risk of injury or even death (when such drugs are used)."

Papp argued as well that corticosteroids are given too freely and too often with unfortunate side effects. "For horses that have inflammation in joints and in other parts of their bodies, we would administer corticosteroids at a reasonable dose, at a reasonable time, with an appropriate diagnosis," Papp explained. "Usually we're talking about injection into joints of corticosteroids. The down side of these is immune suppression and decreased bone density. We're seeing a lot of breakdowns directly related to a lot of corticosteroid use."

Federal oversight requested

Trainer Ken McPeek, a member of the panel, denied that performance-enhancing drugs and illegal doping was as common as some other panelists suggested, but he still stood by the idea of federal oversight.

"My reason for supporting a Horse Racing Improvement Act is standardized rules, licensing and medication," McPeek said. "It would be wonderful to have uniform rules nationally, though I have concerns that the focus (of the legislation) is too narrow in its agenda. Doping seems to be the focus here and it is important to address, but the occurrences are very rare. ... I believe in many cases (violations) are due to poor management, metabolism variation in individual horses and possibly environmental factors, not necessarily cheating and doping.

"Medication overuse is not the sole cause of breakdowns," McPeek continued. "There are many factors, including track surface. I'm not sure you're going to completely eliminate the problem because injuries are unavoidable in all sports."

Watching the public

All medicine and complicated treatment and testing issues aside, the public image of horse racing has to be considered, according to Ferraro.

"I can tell you without a doubt, whether we believe medication is good or bad for the horse, whether we can make the distinction between therapeutic medications and doping, the general public cannot," he said. "They are overwhelmingly against any kind of use of drugs in horseracing.

"My general feeling about this is that if we continue to allow the use of drugs in horseracing, ... we will eventually lose our fan base and destroy the sport. Based on my previous experience on the racetrack, I understand the opposition to banning drugs such as furosemide and phenylbutazone. I was one of the original proponents when those drugs were originally allowed. It has not served the industry well. It has not served the horses well." **dvm**

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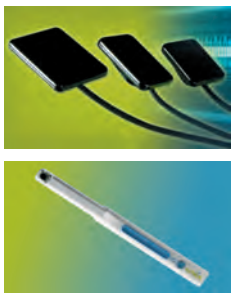
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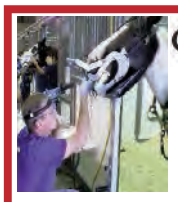


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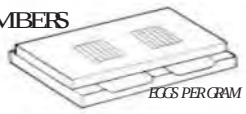


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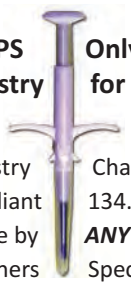
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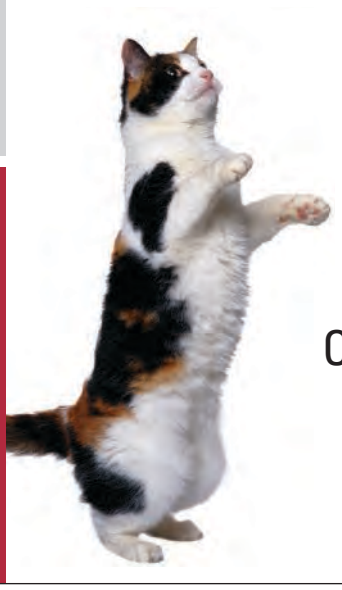
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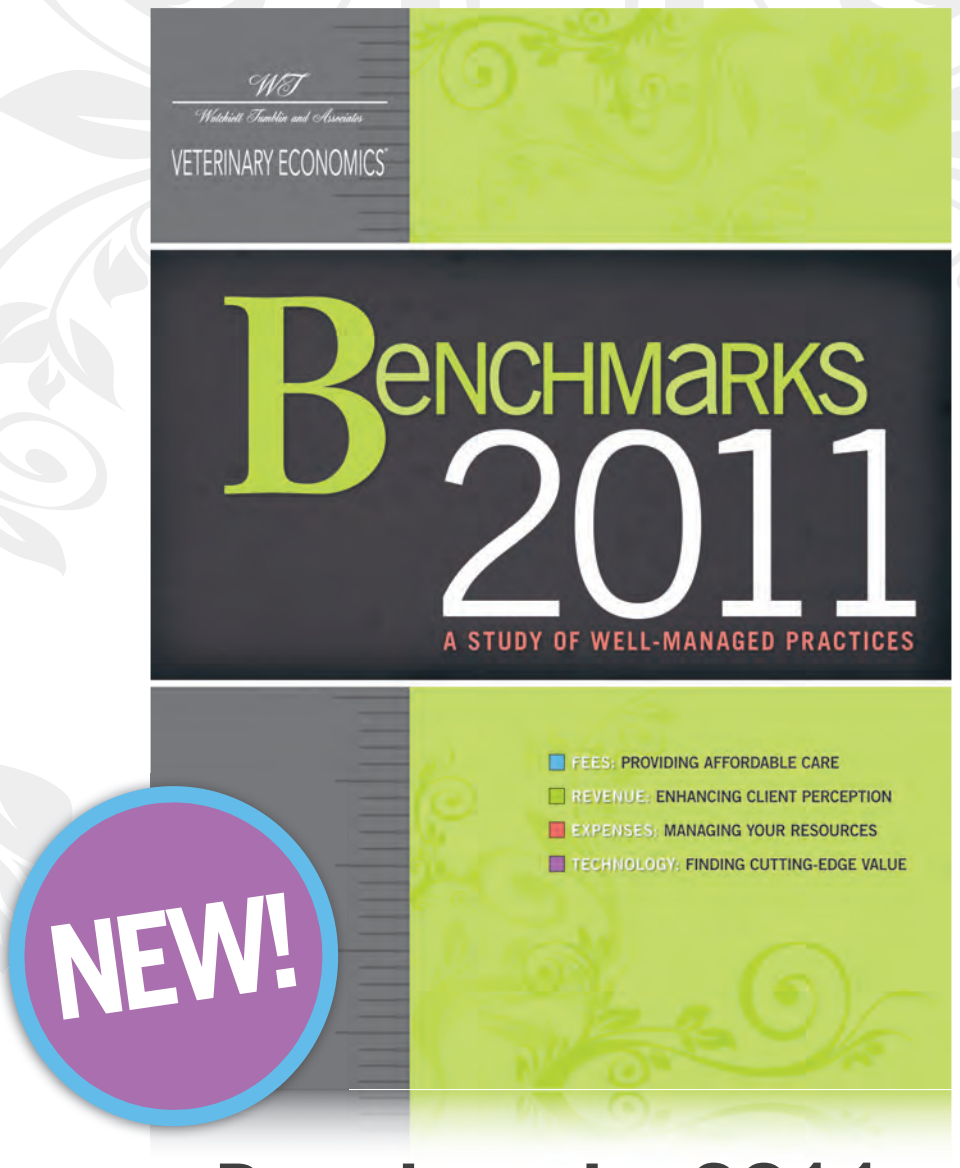


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People with a Scarcity Mentality have a very difficult time sharing recognition and credit, power or profit—even with those who help in the production. They also have a very hard time being genuinely happy for the success of other people.

—Stephen Covey

Our attitudes are substantially shaped by external influences: what we read, what we watch, whom we listen to, and what we think about.

—Robert Jeffress

Let us not become egotistical stirring up competition with each other.

—Galatians 5: 26

Just as different parts of our body must work together to allow us to function efficiently, so cooperation of different members of an organization prompt unity of purpose.

—1 Corinthians 12: 12-30

The academic world reinforces win/lose relationships. The normal distribution curve basically conveys the idea that if you get an "A," someone else must get a "C."

—Stephen Covey

Look to each other's interest and not merely your own.

—Philippians 2: 4

He that is reproving a man will afterward find more favor than he will that is flattering with his tongue.

—Proverbs 28: 23

Please send contributions
to Dr. Carl A. Osborne
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Calendar of Events

For a full listing of events in 2012, visit **dvm360.com/calendar**

National Meetings

July 11-14
64th Canadian Veterinary Medical Convention
Montreal, QB Canada
www.canadianveterinarians.net
(613) 236-1162

July 24-28
7th World Congress of Veterinary Dermatology
Vancouver, BC Canada
www.vetdermvancouver.com
(866) 481-5226

August 2
Academy of Veterinary Consultants 2012 Summer Conference
Kansas City, MO
www.avc-beef.org
(913) 766-4373

August 3
Hambletonian CE Seminar for Equine Veterinarians
East Rutherford, NJ
www.firstchoicemarketing.us
(973) 240-7471

Aug. 16-19
6th Keystone Veterinary Conference
Hershey, PA
www.keystonevetconference.org
(888) 550-7862

Aug. 18
International Homeless Animals Day
www.isaronline.org
(570) 586-2200

Aug. 21-25
Annual Theriogenology Convention and Symposiam
Baltimore, MD
www.therio.org
(334) 395-4666

Aug. 31-Sept. 1
38th Annual Congress on Veterinary Acupuncture
Galway, Ireland
www.ivas.org
(970) 266-0666

Sept. 8-12
18th International Veterinary Emergency and Critical Care Symposium
San Antonio, TX
www.2012.iveccs.org
(210) 589-9399

CVC unconventional

July 11
CVC Kansas City Early-bird registration savings ends
Kansas City, MO
www.dvm360.com/cvc

Aug. 22-27
CVC Kansas City
Kansas City, MO
www.dvm360.com/cvc

Aug. 1
CVC San Diego Advantage Pricing ends
San Diego, CA
www.dvm360.com/cvc

Local Meetings

July 5-8
Animal Chiropractic Module #5: Extremity
Dallas, TX
www.parker.edu/animal-chiropractic-program/
(800) 266-4723

July 7-20
Neuroscience ACVIM Training Course
Athens, GA
www.vet.uga.edu/CE
(706) 542-1451

July 11
Manager meetings with sponsored CE
Atlanta, GA
www.gavma.com
(678) 467-2750

July 11
VSTONE/TCSVM Scholarship Golf Tournament
Grafton, MA
www.tufts.edu/vet/ce
(508) 887-4723

July 13-14
Overview of Canine Arthroscopy
Las Vegas, NV
www.oquendocenter.org/veterinary-profession
(702) 443-9246

July 19-22
Mississippi VMA 2012 Summer Meeting
Orange Beach, AL
www.msvet.org
(662) 323-5057

July 20
Introduction to Minimally Invasive Surgery
Denver, Co
www.rigidendoscopycenter.com
(877) 227-3884

July 20-21
Flexible GI Endoscopy Course
Athens, GA
www.vet.uga.edu/CE
(706) 542-1451

July 22-23
Basic Rigid Endoscopy Course
Athens, GA
www.vet.uga.edu/CE
(706) 542-1451

July 22
Practical Veterinary Dentistry Course
Athens, GA
www.vet.uga.edu/CE
(706) 542-1451

July 25
CE Series: The Anesthesia Machine and Anesthetic
Las Vegas, NV
www.oquendocenter.org/veterinary-profession
(702) 443-9246

July 27-28
Oral and Maxillofacial Trauma in Dogs and Cats Course
Las Vegas, NV
(940) 368-1798

July 27-30
Certified Veterinary Acupuncture Program
Reddick, FL
www.tcvm.com
(800) 891-1986

July 27-30
Taking Action for Animals
Washington, DC
www.takingactionforanimals.org
(888) 259-5088

Aug. 2
Hambletonian CE Wet Labs for Equine Veterinarians
East Rutherford, NJ
www.firstchoicemarketing.us
(973) 240-7471

Aug. 2-5
Animal Chiropractic Module #6: Putting it all together
Dallas, TX
www.parker.edu/ce-calendar
(800) 266-4723

Aug. 3-4
Clinical Techniques for Emergency Medicine
Las Vegas, NV
www.oquendocenter.org

Aug. 3-5
Oral Surgery 1, Oral Radiology Wet Labs
Baltimore, MD
www.AnimalDentalCenter.com
(410) 828-1001

Aug. 3
Annual Behavior Symposium
San Diego, CA
www.avsabonline.org
(310) 478-5035

Aug. 8-10
North Dakota VMA Meeting
Minot, ND
www.ndvma.com
(701) 221-7740

Aug. 9
Fracture Management in Dogs and Cats: Pins, Wires
Las Vegas, NV
www.oquendocenter.org/veterinary-profession
(702) 443-9246

Aug. 10-13
Veterinary Acupuncture Training Course
Reddick, FL
www.tcvm.com
(800) 891-1986

Aug. 15-18
South Dakota VMA Annual Meeting
Rapid City, SD
www.sdvetmed.org
(605) 688-6649

Aug. 16-Oct. 14
Advanced Hematology Training Course
Davis, CA
www.vin.com/ce/DIAG209-0812.htm
(800) 700-4636

Aug. 17-18
Surgery Made Simple: Practical Skin Reconstructive and Soft Tissue Techniques
Las Vegas, NV
www.oquendocenter.org

Sept. 5-Oct. 13
Small Rodent Review
Davis, CA
www.vin.com/ce/EXOT404-0912.htm
(800) 700-4636

Sept. 5
Chicago VMA 2012 CE Series: Nephrology
Oak Brook, IL
www.chicagovma.org
(630) 325-1231

Sept. 6-7
Montana VMA Fall Symposium
Bozeman, MT
www.mtvma.org
(406) 447-4259

Sept. 7-8
Practical Approaches to Surgical Oncology: From Mast Cell to Mammary Tumors
Las Vegas, NV
www.oquendocenter.org/veterinary-profession
(702) 739-6698

Sept. 8-11
American Holistic VMA Annual Conference
Birmingham, AL
meetings.ahvma.org
(410) 569-0795

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Stampede | A look at the lighter side of practice

by **Bo Brock, DVM**

Cowboy surprise

One cowboy gets quite the calf-working experience, thanks to an excited mutt.

It was all I could do to stand there and laugh as I heard the story unfold. When one old cowboy tells a story about another old cowboy, it is positively delightful.

If you have never been to a West Texas calf working, you might need a little introduction. Allow me: The calves are gathered into a pen, usually about a quarter of the size of a football field. There are a few cowboys who rope the calf, another cowboy who catches the roped calf and takes him down, and yet another cowboy or two who give the calf its shots, brand it and castrate it.

I have been around this activity all of my life, and it's usually accompanied by a chuck wagon-type breakfast and lunch. All of the neighbors show up to help. My grandfather, and even his grandfather before him, did roughly the same thing with the process unchanged throughout the years.

But at the particular calf working the one old cowboy was describing, a bit of a different twist occurred. The calves belonged to cowboy Rick. Rick's neighbor Perry was the one doing the castrating. As is usually the case, there were a large number of dogs present for the calf working. But one dog, a skinny, adolescent 60-pound mutt, played a critical role in this story.



When one castrates a calf, it requires getting down on your knees. This leaves no way to fend off a very enthusiastic 60-pound mutt.

This dog belonged to Rick, and ol' Rick knew a secret about this rascally mutt that made it essential that the dog come to the calf working. Apparently, this dog humped everything in sight. Rick and Perry are good friends, always playing jokes on each other. So it wasn't surprising that Rick knew this dog would hump anything that stood still and he made sure that dog was in the pen whenever Perry was castrating calves. When one castrates a calf in the dragging pen, it requires use of both hands and getting down on your knees. This clearly leaves no way to fend off a very—*ahem*—enthusiastic 60-pound dog.

Sure enough, the first calf was roped and down and ol' Perry dove in to do his mission. The dog saw Perry assume the position and went right to work. Can you just picture an old cowboy dude bent over at the waist while on his knees, working frantically with both hands to castrate a calf? Now, add to that a skinny mutt mounting him every time he goes down, while 25 other cowboys are laughing so hard they're falling off of their horses.

Perry couldn't do a thing to stop it. He had to use both hands and all his concentration in order to get the required job done. And none of those other cowboys were going to jump in to help. This, of course, made Perry furious. And this, of course, made the ring of cowboys laugh even harder.

A few days later, Rick and Perry showed up at my veterinary clinic with their story and the skinny mutt in tow. Perry had to work calves again the next week and was getting tired of the fact that the local cowboy clan found such delight in his misery. That's when Perry informed me that he was paying to have the dog castrated, even though it wasn't his. I don't think I'll forget the look on Perry's face as Rick described the events of that calf working. What a funny, funny surprise.

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



Illustration: Matt Collins

dvm360

CATCH 'EM EARLY?

Perry's pants might have been spared some rough handling if the dog in this article had been castrated earlier. See the latest on pediatric spays and neuters at **dvm360.com/earlyneuter**.

Ty Foster/Getty Images



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[1]Garcia-Mazcorro JF, Lanerie DJ, Dowd SE, et. al. *FEMS Microbiol Ecol* 2011;78:542-544.
[2]Shown to meet label claim in independent testing by ConsumerLab.com 2009.



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