



Profender® Topical Solution (emodepside/praziquantel)

Let's face it, pilling cats isn't for everyone.

Fortunately, there's Profender® – a broad-spectrum, topical dewormer for cats.



Profender® offers a purge deworming of tapeworms, roundworms and hookworms. All in **one single**, easy-to-apply topical application.[†]

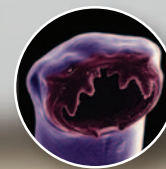
- No pilling necessary
- No water chasers
- No messy yellow paste
- No painful injections



Tapeworms



Roundworms



Hookworms

[†]A single treatment is effective and a second treatment should not be necessary. If reinfection with worms occurs, Profender® can be applied after 30 days.

Federal law (U.S.A.) restricts this drug to use by or on the order of a licensed veterinarian.
Children should not contact application site for twenty-four (24) hours.



Topical Solution

profender®

(emodepside/praziquantel)

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

Topical Solution for the treatment and control of hookworm, roundworm and tapeworm infections in cats and kittens that are at least 8 weeks of age and weigh at least 2.2 lbs (1 kg).

DESCRIPTION:
PROFENDER [1.98% emodepside/7.94% praziquantel] Topical Solution is a clear yellow ready-to-use solution packaged in single unit dosing applicator tubes for topical (dermal) treatment of cats 8 weeks of age and older and weighing at least 2.2 lbs (1 kg). The formulation and dosage schedule is designed to provide a minimum of 1.36 mg/lb (3 mg/kg) emodepside and 5.45 mg/lb (12 mg/kg) praziquantel based on body weight.

Emodepside, a semi-synthetic molecule, is a cyclic depsipeptide. The chemical name is Cyclo [D-2-hydroxypropanoyl-N-methyl-L-leucyl-3-[4-(4-morpholinyl)phenyl]-D-2-hydroxypropanoyl-N-methyl-L-leucyl-D-2-hydroxypropanoyl-N-methyl-L-leucyl-3-[4-(4-morpholinyl)phenyl]-D-2-hydroxypropanoyl-N-methyl-L-leucyl].

Praziquantel is an isoquinoline cestocide. The chemical name is 2-Cyclohexylcarbonyl-1,2,3,6,7,11b-hexahydro-4H-pyrazine-2,1-a-isoquinoline-4-one.

INDICATIONS:
PROFENDER Topical Solution is indicated for the treatment and control of hookworm infections caused by *Ancylostoma tubaeforme* (adults, immature adults, and fourth stage larvae), roundworm infections caused by *Toxocara cati* (adults and fourth stage larvae), and tapeworm infections caused by *Dipylidium caninum* (adults) and *Taenia taeniaeformis* (adults) in cats.

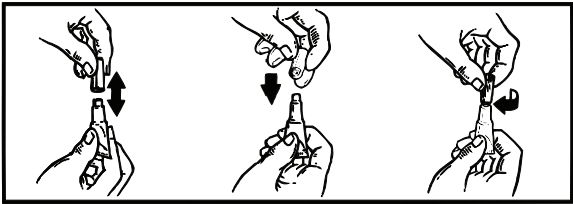
DOSAGE AND ADMINISTRATION:
The recommended minimum dose is 1.36 mg/lb (3 mg/kg) emodepside + 5.45 mg/lb (12 mg/kg) praziquantel as a single topical dose. A single treatment is effective and a second treatment should not be necessary. If re-infection occurs, the product can be re-applied after 30 days.

1. Select the package that correctly corresponds with the body weight of the cat. (See Table below.)

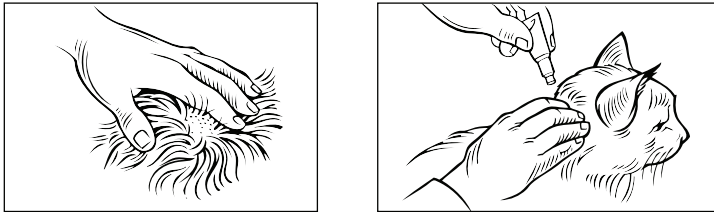
Cat Weight*	Profender Topical Solution	Volume (mL)	Emodepside (mg)	Praziquantel (mg)
2.2-5.5 lbs.	Small	0.35	7.5	30.0
>5.5-11 lbs.	Medium	0.70	15.0	60.1
>11-17.6 lbs.	Large	1.12	24.0	96.1

* Cats over 17.6 lbs should be treated with the appropriate combination of tubes.

- Remove one unit dose tube from the package.
- While holding the tube in an upright position, remove the cap from the tube.
- Turn the cap over and place the other end of cap onto the tip of the tube.
- Twist the cap to break the seal and then remove cap from the tube.



6. Part the hair on the back of the cat's neck at the base of the head, until the skin is visible.



7. To ensure the entire contents of the tube are administered, place the tip of the tube on the skin and squeeze the entire contents directly onto the skin. Lift tube away from the skin before releasing pressure on the tube.

Do not apply to broken skin or if hair coat is wet. Do not get this product in the cat's mouth or eyes or allow the cat to lick the application site for one hour. Oral exposure can cause salivation and vomiting. Treatment at the base of the head will minimize the opportunity for ingestion while grooming. In households with multiple pets, keep animals separated to prevent licking of the application site.

Stiff hair, a damp appearance of the hair, or a slight powdery residue may be observed at the treatment site. These effects are temporary and do not affect the safety or effectiveness of the product.

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

To prevent accidental ingestion of the product, children should not come in contact with the application site for twenty-four (24) hours while the product is being absorbed. Pregnant women, or women who may become pregnant, should avoid direct contact with, or wear disposable gloves when applying, this product. Studies performed in rats and rabbits suggest that emodepside may interfere with fetal development in those species.

PROFENDER Topical Solution may be irritating to skin and eyes. Reactions such as facial, tongue and hand swelling have been reported in humans in rare instances. Avoid contact with the application area while it is wet and wash hands thoroughly with soap and warm water after handling. People with known hypersensitivity to butylhydroxyanisole, emodepside or praziquantel should administer the product with caution. If the product accidentally gets into eyes, flush thoroughly with water. May be harmful if swallowed. In case of accidental ingestion or if skin or eye irritation occurs, call a poison control center or physician for treatment advice.

The Material Safety Data Sheet (MSDS) provides additional occupational safety information. For customer service or to obtain product information, including the MSDS, call 1-800-633-3796. For medical emergencies or to report an adverse reaction, call 1-800-422-9874.

PRECAUTIONS:
Safe use of this product has not been evaluated in cats less than 8 weeks of age or weighing less than 2.2 lbs (1 kg), in cats used for breeding, during pregnancy or in lactating queens. The effectiveness of this product when used before bathing has not been evaluated.

Use with caution in sick or debilitated cats. Oral ingestion or exposure should be avoided. Use with caution in heartworm positive cats. The cats enrolled in the field study were heartworm antigen and antibody negative prior to entering the study. In a laboratory study, cats artificially infected with adult heartworms and treated with PROFENDER Topical Solution had fewer worms recovered than the placebo control group. (**See ANIMAL SAFETY.**)

ADVERSE REACTIONS:
Field study: In a controlled, double-masked field safety study, owners administered PROFENDER Topical Solution to 606 cats. Adverse reactions reported by the cat owners included licking/excessive grooming in 18 cats (3.0%), scratching treatment site in 15 cats (2.5%), salivation in 10 cats (1.7%), lethargy in 10 cats (1.7%), alopecia in 8 cats (1.3%), agitation/nervousness in 7 cats (1.2%), vomiting in 6 cats (1.0%), diarrhea in 3 cats (0.5%), eye irritation in 3 cats (0.5%), respiratory irritation in 1 cat (0.2%) and shaking/tremors in 1 cat (0.2%). All adverse reactions were self-limiting.

Laboratory effectiveness studies: One cat died 10 days after receiving PROFENDER Topical Solution. The necropsy showed chronic active cholangiohepatitis. While the use of the drug did not appear to be the direct cause of death, treatment with the drug cannot be ruled out as a contributing factor (**See PRECAUTIONS**). One cat treated with a vehicle placebo (formulation minus the active ingredients) showed salivation, gagging, lethargy and a swollen tongue.

Foreign Market Experience: The following adverse events were reported voluntarily during post-approval use of the product in foreign markets: application site reaction (hair loss, dermatitis, pyoderma, edema, and erythema), salivation, pruritus, lethargy, vomiting, diarrhea, dehydration, ataxia, loss of appetite, facial swelling, rear leg paresis, seizures, hyperesthesia, twitching, and death.

Post-Approval Experience: The following adverse events are based-on post-approval adverse drug experience reporting. Not all adverse events are reported to FDA CVM. It is not always possible to reliably estimate the adverse event frequency or establish a casual relationship to product exposure using this data. The following adverse events are listed in decreasing order of reporting frequency in cats: Application site reaction (hair loss, dermatitis, pyoderma, edema, and erythema), hypersalivation, lethargy/depression, vomiting, ataxia, anorexia, trembling/twitching, diarrhea, mydriasis, fever, hyperactivity/nervousness. In some cases, death has been reported as an outcome of the adverse events listed. For a complete listing of adverse reactions for Profender Topical Solution reported to the CVM see: <http://www.fda.gov/ADEReports>.

The listing includes Adverse Events reported to CVM for products , such as Profender, that contain the combined active ingredients emodepside and praziquantel. Listings by active ingredient may represent more than one brand name.

To report suspected adverse events and/or to obtain a copy of the MSDS or for technical assistance, call Bayer Animal Health at 1-800-633-3796.

For additional information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDA-VETS or online at <http://www.fda.gov/AnimalVeterinary/Safety/Health>.

EFFECTIVENESS:
In a total of 13 controlled laboratory studies to establish effectiveness, 149 cats were treated with PROFENDER Topical Solution. In the field study conducted at 13 veterinary clinics/hospitals, 837 purebred or crossbred cats from single and multi-cat households were enrolled to evaluate safety and effectiveness under field conditions of use. Of those, 606 received a single treatment with PROFENDER Topical Solution. Cats ranged in age between 2 months and 17 years and weighed between 0.8 lbs (0.36 kg) and 21 lbs (9.62 kg). Data from these studies demonstrated PROFENDER Topical Solution is safe and effective for the treatment and control of hookworm infections caused by *Ancylostoma tubaeforme* (adults, immature adults, and fourth stage larvae), roundworm infections caused by *Toxocara cati* (adults and fourth stage larvae), and tapeworm infections caused by *Dipylidium caninum* (adults) and *Taenia taeniaeformis* (adults).

ANIMAL SAFETY:
In a field study, PROFENDER Topical Solution was used in cats receiving other frequently used products including: analgesics, anti-fungals, non-steroidal anti-inflammatories, anthelmintics, antimicrobials, flea and tick products, sedatives, anesthetics, cardiac medications, anxiolytics, hormonal treatments, steroids, otc and ophthalmic preparations, and vaccines.

Dose Tolerance Study in Cats: PROFENDER Topical Solution was applied topically one time to young cats at 10X the recommended label use rate. Two cats salivated. Another cat exhibited tremors and lethargy. These signs were self-limiting.

Oral Safety Studies in Cats: PROFENDER Topical Solution was administered orally at the recommended topical dose to young adult cats. The cats exhibited salivation, vomiting, tremors, abnormal gait, abnormal respiration and weight loss. These signs were self-limiting.

General Safety Study in Kittens: PROFENDER Topical Solution was topically applied at 0X (vehicle control), 1X, 3X and 5X the maximum dose to 48 healthy 8-week-old kittens every two weeks for six doses. One 5X kitten experienced salivation and tremors and another 5X kitten experienced salivation on the day of dosing. A third 5X kitten experienced tremors the day after dosing. Three cats vomited within 24 hours of dosing, one each in vehicle control, 3X and 5X groups.

Safety Study in Heartworm Positive Cats: Cats artificially infected with adult heartworms harvested from dogs were treated topically with PROFENDER Topical Solution at 0X, 1X or 5X the recommended dose once a month for three treatments. Clinical signs included salivation (one 1X and three 5X cats), labored breathing (all groups) and lethargy (one 5X cat). At the study conclusion, the 1X and 5X cats had fewer live heartworms recovered than the 0X group.

STORAGE INFORMATION:
Store at or below 77°F (25°C).
Protect from freezing.

HOW SUPPLIED:	
Code Number	Applications per Package
82482521	20 - 0.35 mL tubes (5 blisters of 4 tubes)
03615026	40 - 0.35 mL tubes (10 blisters of 4 tubes)
82482572	20 - 0.7 mL tubes (5 blisters of 4 tubes)
03615034	40 - 0.7 mL tubes (10 blisters of 4 tubes)
82482580	20 - 1.12 mL tubes (5 blisters of 4 tubes)
82482602	40 - 1.12 mL tubes (10 blisters of 4 tubes)
81175276	8 - 0.35 mL tubes (2 blisters of 4 tubes)
	20 - 0.7 mL tubes (5 blisters of 4 tubes)
	8 - 1.12 mL tubes (2 blisters of 4 tubes)

Profender is protected by the following U.S. Patents: 5 514 773 and other patents pending.

Made in Germany

NADA 141-275, Approved by FDA

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82482521/03615026/82482572/03615034/82482580/82482602, R.2

March, 2015
19675

Bayer

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GHG031315

The doctor behind the 'Dogfella'

Mobster-turned-rescuer relies on the help of a special NYC vet team

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It keeps you awake at night. It overshadows every life decision. It may even make you question your career choice. But you can be free of veterinary student debt—you just need the right information and the right plan.

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DJD calls for TLC: Helping relieve cats' pain and immobility
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PROVEN REDUCTION
IN KEY ORAL HEALTH INDICATORS^{1*}

HALITOSIS

53%

PLAQUE

42%

CALCULUS

54%

Defend against plaque, calculus, and halitosis



Fight the source of oral health problems
with the science of delmopinol.



The only chews with the power of delmopinol, **ORAVET**[®] Dental Hygiene Chews create a barrier against bacterial attachment—and when bacteria can't attach, they can't produce plaque biofilms or the volatile sulfur compounds of halitosis. **ORAVET** Dental Hygiene Chews have been proven effective in multiple canine trials, including "clean mouth" and "dirty mouth" studies.^{1,2} They are also highly palatable,¹ and the scrubbing action of the chew works in parallel with delmopinol to remove existing plaque and calculus. For full study results, contact your sales representative or visit oravet.com.

*Compared with dogs receiving dry diet alone

References: 1. Data on file. 2. Data on file.

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ORAVET[®]
DENTAL HYGIENE CHEWS
Serious Oral Care Made Simple[®]

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Another kind of debt relief

Getting a handle on your student loans is not an impossible feat.

Earlier this year, our Fetch dvm360 conference attendees in Virginia Beach were fortunate enough to get to hear Tony Bartels, DVM, MBA, of the VIN Foundation, speak on “Climbing Mt. Debt,” where he shared ways veterinarians could navigate their student loan and repayment options.

Knowing we were going to be presenting this dvm360 Leadership Challenge on student debt later in the year, I sat through Dr. Bartels’ session to soak up the information and also to gauge attendees’ reactions—to “read the room,” so to speak. (Fun fact: The dvm360 team actually does this a lot when we’re trying to figure out what Fetch content we might want to adapt for

a print or digital readership audience—maybe we’ve chatted with some of you in the process!)

Anyway, it was remarkable to me to observe how our attendees’ body language and voices changed in the hourlong span while Dr. Bartels spoke. As he methodically, rationally and authoritatively laid out the options for tackling veterinary student debt and explained resources attendees could consult to figure out their own scenarios, people’s shoulders dropped and relaxed. Questions changed in tone from shrill and panicky to calm and even excited as folks in the room realized *they could do this*. The mountain was not unscalable. The situation was not impossible. Hope was not lost.

I knew then and there that had to be part of our message in this Leadership Challenge. While student debt is a huge problem for the veterinary profession—one with no clear solutions at the moment—for most individuals at this moment in time, the situation is not hopeless. With the right knowledge and the right plan, they can manage their six-figure debt load and be rid of it in their lifetime.

We weren’t able to get Dr. Bartels to contribute to this particular issue of the magazine, but good information is good information, and Stephen Brinker’s article on page 14 solidly brings the same message—the knowledge that will help you is out there. Know your options, and make the right decision for your situation.

Introvert expert Susan Cain to deliver keynote address at Fetch dvm360 conference



Bestselling author will highlight the positive impact introverts have on the veterinary profession during San Diego event.

At the Fetch dvm360 conference Dec. 13-16 in San Diego, Susan Cain, author of *Quiet: The Power of Introverts in a World That Can't Stop Talking* and *Quiet Power: The Secret Strengths of Introverts*, will deliver a keynote address to a room full of—appropriately enough—introverted veterinarians.

In her talk, Cain will discuss how introverts think and work in ways that are crucial to the survival of today’s organizations, including veterinary practices. Drawing on her original research and the latest in neuroscience and psychology, she’ll offer ways you can harness your powers, better manage your team and play to your strengths.

As it happens, veterinary professionals frequently describe themselves as introverts. (After all, animals are easier to interact with than people most days.) While it’s generally thought that extroverts make better leaders, Cain points out that introverts display certain qualities that make them better suited to deal with clients—including pet owners. Analytical, knowledge hungry, excellent at listening and empathetic—introverts bring these strengths and more to the veterinary profession.

Of course, veterinary professionals aren’t alone in identifying as introverts, as the success of Cain’s work reveals. *Quiet* has been translated into 40 languages and is in its sixth year on the *New York Times* bestseller



Catch Susan Cain at Fetch dvm360 conference in San Diego.

list. She’s also shared her research in pieces for *The New York Times*, *The Atlantic*, *The Wall Street Journal* and many other publications.

Pumped for this powerful keynote? Check out Cain’s record-smashing TED talk, “The Power of Introverts,” which has been viewed over 19 million times and was named by Bill Gates as one of his all-time favorite talks.

Join us at Fetch dvm360 conference in San Diego to see Susan Cain for yourself (visit fetchdvm360.com/sd), and learn more about Susan Cain’s Quiet Revolution on her website at quietrev.com.

On any given day, you're dealing with ...

Money problems

Job performance woes

Relationship struggles

Medical emergencies




Frustrated coworkers

Fractious furballs ...

And you know what? We can't stand it any longer.

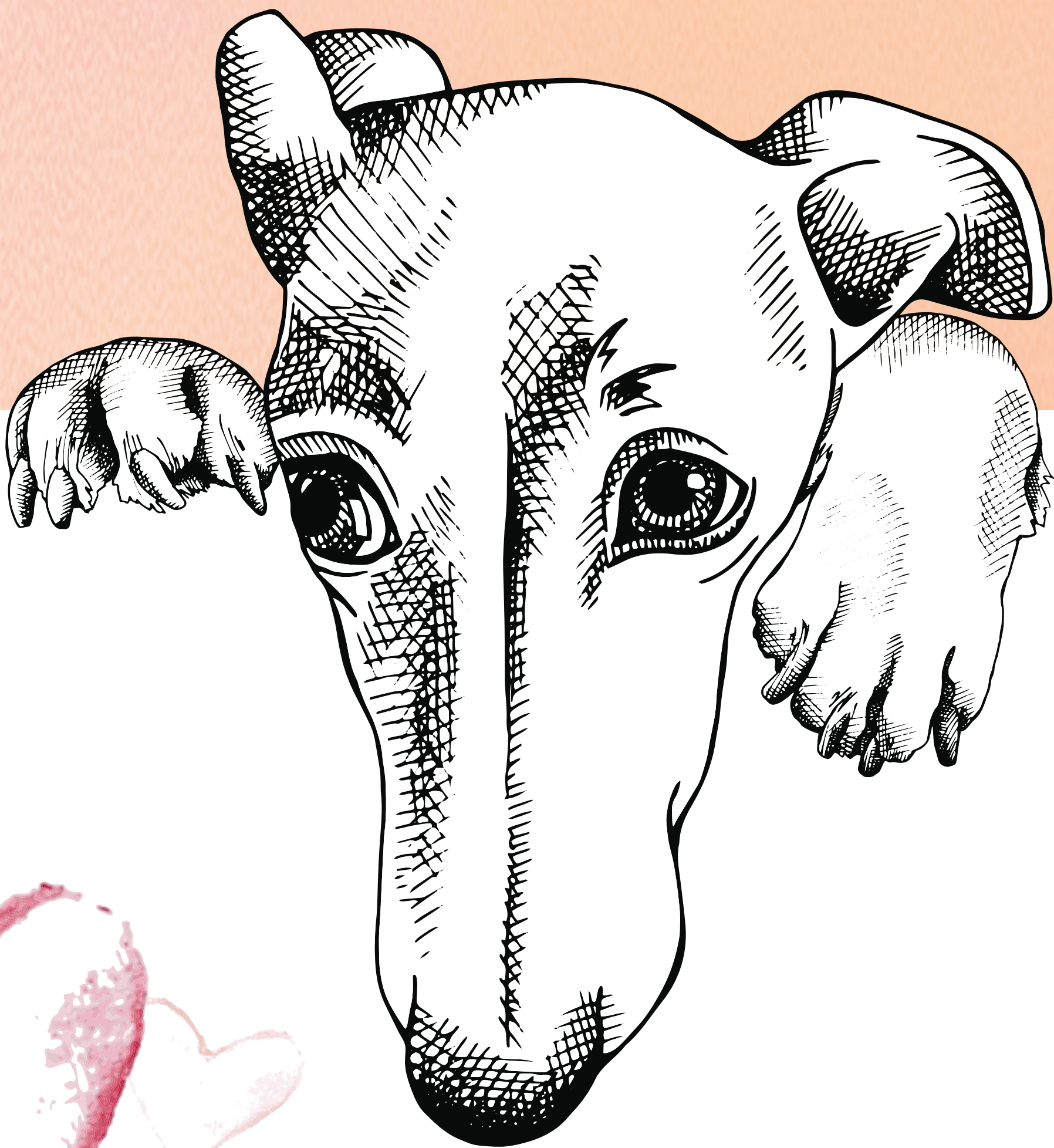
We think these issues are critical. So, you'll find the support you need at every Fetch dvm360 conference.

What does that look like?

-  Sessions where your peers talk openly about the solutions to keep from totally losing it on everyone in their lives
-  Opportunities to invest in your emotional health, because sanity is something worth fighting for
-  Healthy physical activities that change the way you learn and open your mind to new ideas.



All that, and the CE you need to nurture your mind and get back to enjoying your life and work. **Register today.**



Join us in
San Diego
Dec. 13-16, 2018!

fetch
dvm360
CONFERENCE

San Diego, December 13-16, 2018

Baltimore, May 2-5, 2019

Kansas City, August 23-26, 2019

Go to fetchdvm360.com to learn more and register.

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POST-SURGICAL NUTRITION PROTOCOL

Help your patients **get well soon**

Surgeries are stressful for your clients.
With active post-surgical nutrition protocol,
you can provide:

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- Peace of mind for pet parents
- Nutritional support to help your patients recover quickly

Hill's® Prescription Diet® i/d® is an optimal post-surgical choice.



Highly digestible to help pets absorb nutrients necessary for recovery



Gentle on the pet's GI tract — ideal to support nauseated patients



Promotes beneficial gut bacteria which may be compromised by medication

Order your free post-surgical nutritional support material
through your Hill's Representative today.



What's Amazon doing in the pet consumables market?

We got a peek inside the retail giant's thought process recently at the NAVC E-Commerce Summit. *By Katie James*

VETORYL® CAPSULES (trilostane)

5 mg, 10 mg, 30 mg, 60 mg and 120 mg strengths
Adrenocortical suppressant for oral use in dogs only.

BRIEF SUMMARY (For Full Prescribing Information, see package insert.)

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

DESCRIPTION: VETORYL Capsules are an orally active synthetic steroid analogue that blocks production of hormones produced in the adrenal cortex of dogs.

INDICATION: VETORYL Capsules are indicated for the treatment of pituitary- and adrenal-dependent hyperadrenocorticism in dogs.

CONTRAINDICATIONS: The use of VETORYL Capsules is contraindicated in dogs that have demonstrated hypersensitivity to trilostane. Do not use VETORYL Capsules in animals with primary hepatic disease or renal insufficiency. Do not use in pregnant dogs. Studies conducted with trilostane in laboratory animals have shown teratogenic effects and early pregnancy loss.

WARNINGS: In case of overdosage, symptomatic treatment of hypoadrenocorticism with corticosteroids, mineralocorticoids and intravenous fluids may be required. Angiotensin converting enzyme (ACE) inhibitors should be used with caution with VETORYL Capsules, as both drugs have aldosterone-lowering effects which may be additive, impairing the patient's ability to maintain normal electrolytes, blood volume and renal perfusion. Potassium sparing diuretics (e.g. spironolactone) should not be used with VETORYL Capsules as both drugs have the potential to inhibit aldosterone, increasing the likelihood of hyperkalemia.

HUMAN WARNINGS: Keep out of reach of children. Not for human use. Wash hands after use. Do not empty capsule contents and do not attempt to divide the capsules. Do not handle the capsules if pregnant or if trying to conceive. Trilostane is associated with teratogenic effects and early pregnancy loss in laboratory animals. In the event of accidental ingestion/overdose, seek medical advice immediately and take the labeled container with you.

PRECAUTIONS: Hypoadrenocorticism can develop at any dose of VETORYL Capsules. A small percentage of dogs may develop corticosteroid withdrawal syndrome within 10 days of starting treatment. Mitotane (o,p'-DDD) treatment will reduce adrenal function. Experience in foreign markets suggests that when mitotane therapy is stopped, an interval of at least one month should elapse before the introduction of VETORYL Capsules. The use of VETORYL Capsules will not affect the adrenal tumor itself. Adrenalectomy should be considered as an option for cases that are good surgical candidates. The safe use of this drug has not been evaluated in lactating dogs and males intended for breeding.

ADVERSE REACTIONS: The most common adverse reactions reported are poor/reduced appetite, vomiting, lethargy/dullness, diarrhea, elevated liver enzymes, elevated potassium with or without decreased sodium, elevated BUN, decreased Na/K ratio, weakness, elevated creatinine, shaking, and renal insufficiency. Occasionally, more serious reactions, including severe depression, hemorrhagic diarrhea, collapse, hypoadrenocortical crisis or adrenal necrosis/rupture may occur, and may result in death.

VETORYL® CAPSULES (trilostane)

Distributed by:
Dechra Veterinary Products
7015 College Boulevard, Suite 525
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Veterinary Products

Amazon surprised many animal health insiders recently by announcing its intention to expand into the pet retail market, causing whispers and worries about how retail may be affected at veterinary clinics. How can the hometown veterinarian's limited retail shelves compete against a giant that offers free two-day shipping directly to the client's home?

Since then, the company hasn't offered much insight into its pet business model—until now. Zak Watts, director of Amazon Pets, and Mike Bassani, consumables lead for Amazon Pets, presented details at the inaugural NAVC E-Commerce Summit held Sept. 19 in Kansas City.

The Amazon team defines “consumables” as food, healthcare products such as parasite prevention, and litter. Consumables is where Amazon is focusing on growing its portfolio of products in the pet space. Items like toys, leashes, harnesses and behavior aids are a large part of Amazon's sales, but the company isn't focusing its energy in those areas, Watts says.

So what's the vision for Amazon Pets? Citing industry reports, Watts says retail sales of pet supplies are forecasted to be \$8.2 billion in 2018. Amazon wants to leverage that spending and the strong emotional bond pet owners have with their pets to create deeper connections with its customers through the pet category. The company aims to drive loyalty and repeat purchases, Watts says.

Amazon wants to be seen as having the best selection of products, the best value available and the most convenient way to purchase all these products. One way it's trying to do this is by investing in customer acquisition—for example, by offering 40 percent off the customer's first “subscribe and save” order.

How else is Amazon creating innovation in the pet space? The company now lets customers set up a “pet pro-



Do you now have to worry about competing with Dr. Amazon in addition to Dr. Google?

file” on their Amazon accounts (see below). As these profiles are completed, Amazon will begin recommending products tailored to that pet's needs and preferences, Watts says. The company's goal is to take personalization to the next level, leveraging data to help pet owners make better decisions for their pets, he says.

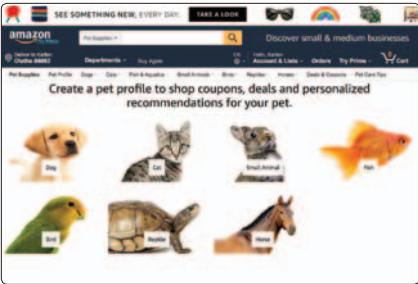
While Watts outlined the vision, Bassani offered a few brass-tacks strategy insights about Amazon's pet retail plans. Today the company offers mainly flea and tick products in its

healthcare category, but in the future it wants to offer expanded brand selection, evaluate new features, and expand into product education for pet owners. Amazon wants to advocate for pet owners and help them learn by offering articles, Bassani says.

Do you now have to worry about competing with Dr. Amazon in addition to Dr. Google? Bassani says the company wants the education it provides to be respected by the veterinary community. It also wants to integrate with the manufacturer through features like “Ask the manufacturer,” where a company can directly answer pet owner questions, aiming to build bridges in communication and education with shoppers.

Bassani says Amazon's goal is to build the pet category the “right way,” working directly with the best brands and eventually serving all species and breeds in collaboration with the veterinary community. Amazon doesn't want to be seen as predatory but collaborative, Bassani says.

In the long run, Bassani says Amazon builds only when it feels equipped to deliver. How these goals will play out in the market is yet to be seen, but it's clear that the company aims to enter the market in a big way.



Amazon's website pet profile starts here.



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FDA: Neurologic risks associated with isoxazolines

Newest class of flea and tick preventive generates reports of muscle tremors, ataxia, seizures; agency says products still safe for majority of animals.

The FDA is warning veterinarians and pet owners to be aware of the potential for neurologic adverse events in dogs and cats treated with drugs in the isoxazoline class, according to an agency release.

Since these products have obtained their FDA approvals, data received by the agency indicates that some animals receiving fluralaner (Bravecto—Merck), afoxolaner (Nexgard—Merial/Boehringer Ingelheim) or sarolaner (Simparica—Zoetis) have experienced adverse events such as muscle tremors, ataxia and

seizures, the release states. Another product in the isoxazoline class, lotilaner (Credelio—Elanco), recently received FDA approval. These products are approved for the treatment and prevention of flea infestations and the treatment and control of tick infestations.

The FDA says it is working with manufacturers of isoxazoline products to include new label information to highlight neurologic events because these events were seen consistently across the isoxazoline class of products.

The agency says it carefully reviewed studies

on Bravecto, Credelio, Nexgard and Simparica before approval, and these products continue to be safe and effective for the majority of animals. The agency is asking the manufacturers to change product labeling to help veterinarians and pet owners make treatment decisions for each pet on an individual basis. Veterinarians should use their specialized training to review their patients' medical histories and determine, in consultation with pet owners, whether a product in the isoxazoline class is appropriate for the pet, the release states.

New canine heartworm guidelines arrive

Priorities include clarifying test recommendations, avoiding treatment shortcuts.

The American Heartworm Society (AHS) has updated its canine heartworm guidelines to focus on reducing heartworm transmission, clarifying testing recommendations and avoiding shortcuts in treatment, according to an association release. The guidelines, which are updated by the society as needed based on assessment of heartworm research, also address heartworm biology and epidemiology, the association says.

Prevention guidelines have been updated because the latest research has found incidence trending upward, says Chris Rehm, DVM, president of AHS. The data show that the number of dogs diagnosed per clinic has risen by 21 percent in the United States and its territories between 2013 and 2016, he says in the release.

Climate and environmental changes as well as relocation of heartworm-infected dogs and expansion of the territory of heartworm-infected wild canines are considered contributing factors to both incidence numbers and the spread of heartworm in areas that were considered non-endemic previously, the release states. Pet owner compliance also plays a role in effective prevention strategies.

“For these reasons, we continue to stress the importance of year-round administration of macrocyclic lactone preventives, along with practical steps to reduce mosquito exposure, such as eliminating standing water on the



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property and keeping pets indoors during peak mosquito times,” says Dr. Rehm in the release. “Year-round prevention is the single most important step owners can take to reduce the risk of heartworms to their pets.”

The 2018 guidelines also recommend that veterinarians use EPA-approved mosquito repellents or ectoparasiticides to control mosquitoes if the risk is high in the area.

“In regions with relatively low heartworm incidence and few mosquitoes, use of preventives alone can be sufficient to safeguard patients. Where mosquito proliferation and heartworm incidence numbers are high, however, additional measures may be warranted,” says Dr. Rehm. “Individual veterinarians are in the best position to assess the risk for their practices and their patients.”

According to the release, studies have been done over the last decade to better understand the potential for heat treatment of serum samples to unmask blocked antigen, which raises questions about optimal testing methods. Further testing is needed to better understand the mechanisms at work, but the AHS guidelines note that the high sensitivity

of microfilaria tests makes heat treatment unnecessary for routine screening.

The AHS guidelines recommend veterinarians consider heat treating serum when either the presence of circulating microfilariae is detected or the veterinarian suspects active clinical disease in the absence of a positive antigen test, Dr. Rehm notes.

The guidelines also reemphasize the AHS protocol for treatment. Dr. Rehm notes that the AHS protocol was designed to kill adult worm infections with minimal complications while stopping the progression of disease. Dr. Rehm adds that non-arsenical treatment protocols have been studied to understand how to manage heartworm-positive dogs that aren't candidates for melarsomine treatment. “Because some dogs are simply not candidates for adulticide treatment, there is a place for alternatives such as these,” he explains in the release. “However, it's also important for veterinarians to understand that these non-arsenical protocols have serious disadvantages, the most important of which is the length of time required to kill adult worms, during which time heartworm pathology and damage can progress. This also greatly increases the length of time the pet needs strict exercise restriction, which is problematic.”

To see the complete updated AHS canine and feline heartworm guidelines, visit heartwormsociety.org.

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Salvatore Pernice, DVM, (left) and James "Dogfella" Guiliani

The doctor behind the 'Dogfella'

This ex-Gambino-crime-family mobster can't rescue the creatures of New York without the help of a veterinarian and team. *By Hannah Wagle*

An ex-mob enforcer walks into a veterinary clinic with a litter of baby opossums. While that may seem like the start of a joke, for Salvatore Pernice, DVM, at Brooklyn Veterinary Group (BVG) in Brooklyn, New York, it's a regular occurrence.

It's a story that has taken the internet by storm: an ex-enforcer for the Gambino crime family is now an animal rescuer. James "Dogfella" Guiliani got into the rescue business 12 years ago and never looked back. For five years now, he's owned and operated a rescue for animals in need, including dogs, cats, pigeons, raccoons, squirrels, rabbits, turtles and baby opossums.

"Right now, I have 16 permanent residents here," he says in an exclusive interview with *dvm360*.

Guiliani says he does this completely

on his own, living off of cigarettes, espresso and limited hours of sleep a night. Because his dogs are aggressive and free-roaming, he prefers to handle the workload alone, which means he's working 18 hours a day, every day.

But, of course, working with animals day and night requires a regular dose of veterinary assistance.

'I know when I speak to him ... I'm hearing the truth'

Dr. Pernice says he first met Guiliani when he asked for advice on a pet store he'd opened.

"Someone had given him my name and he asked to meet up," Dr. Pernice says in an interview with *dvm360*. "When we met, he was considering selling puppies and we discouraged him. After that, we became good friends."

"I am not a vet," Guiliani says. "I don't play a vet. I'm not one of those rescue groups that administers their own shots. That is for a qualified person to do. My qualifications lie in caring for these animals that need help."

Talking to both of them, it's clear that working with the Dogfella can be summed up in just one word: blunt. The need for brutal honesty means life or death for the vulnerable animals these two are caring for.

"Dr. Pernice does not lie," Guiliani says. "He's too brutally freakin' honest, but that's what I love about him. I know when I speak to him, I'm not hearing exactly what I want to hear; I'm hearing the truth."

Dr. Pernice seems to be the yin to the Dogfella's yang. Where the veterinarian is reserved, Guiliani steps



Better rescue relations

Read how Dr. Jeff Werber works with rescues and maintains good boundaries for better relations with rescues at dvm360.com/7ways.

in to fill the quiet with stories of their friendship and the hard work that Dr. Pernice and his veterinary team do to help with rescuing.

“We’re opposites,” Guiliani says, “but that’s what makes us work. We make a great team, and more rescuers should appreciate their vets and the work that they put in.

“Without good vets, there’d be no such thing as rescuing—but nobody appreciates them because they charge for their services. God forbid.

“My only friend in the world other than my wife is Dr. Pernice,” Guiliani continues. “He’s my mentor, and he has been for many, many years. He’s not just my vet—he’s my friend. When I’m ready to break, he knows it.”

In fact, through their friendship, Guiliani found what has become a guiding motto: All God’s creatures.

“It’s a motto that Pernice gave me. My place is open for all animals,” he says, “and if it’s an animal that I don’t know about, I will educate myself on it. Rescuing isn’t something we should pick and choose on.”

‘Who do you know is doin’ that?’

Dr. Pernice says that Guiliani may come in with any number of animals to get looked at in his veterinary hospital, but if it’s something that needs to be looked at by a specialist, he’ll have Guiliani do so.

“I have peace in my life, and it’s because of Dr. Pernice and his vet group,” says Guiliani. “I can go over there any time I need to and they’ll help me out—I was just there before this interview, actually.”



“More rescuers should appreciate their vets ... Without good vets, there’d be no such thing as rescuing—but nobody appreciates them because they charge for their services. God forbid.”

— James “Dogfella” Guiliani

While Dr. Pernice doesn’t seem the type to brag, his friend is more than happy to brag on his behalf.

“I’ll give you a killer story to show you just how great this guy is,” says Guiliani. “Superstorm Sandy hit, and it pretty much took out Staten Island. I went down there, and [Dr. Pernice] and his son came with me.

“We found a house that had 17 cats still alive. We went in that water, grabbed every cat, put them in cages and Dr. Pernice made a [nearby] colleague open his clinic to us to treat them. We did that every day for five days. Who do you know is doin’ that?”

‘We should be able to overlook the nonsense’

Both Dr. Pernice and Guiliani are aware of the stigma that comes with rescue groups. Their response? Keep fighting the good fight.

“As veterinarians, sometimes we tend to judge,” Dr. Pernice says, “but a pet owner or rescuer is likely doing the best they can. Not everyone is going to be a well-spoken professional. Some are going to be a little rough around the edges, just like with any animals we might see. We should be able to overlook the nonsense of it all and help them and the animal with them.”

For Guiliani, the animal’s life matters first and foremost.

“If I kill an animal that lives here, I’d have to close,” he says, “because I wouldn’t have the right to run this rescue anyhow. I’d be a killer. If that happens, I might as well become a gangster and start shooting people again.”

At the end of the day, the two have gathered an assortment of rescued animals and built a friendship that has withstood many trials and tribulations.

“If you ever met me, you’d think I’m a joke,” Guiliani says. “I’m in a sweat suit, I sound like Rodney Dangerfield, I’m smoking and cursing—I don’t fit the picture. But Pernice—call him Superman. Call him St. Francis of Brooklyn. He saves all God’s creatures.”



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Adverse Reactions: Field safety was evaluated in 244 dogs. The most common adverse reactions were diarrhea and vomiting. Of the dogs that received ENTYCE (n = 171), 12 experienced diarrhea and 11 experienced vomiting. Of the dogs treated with placebo (n = 73), 5 experienced diarrhea and 4 experienced vomiting.

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NADA 141-457, Approved by FDA

US Patent: 6,107,306

US Patent: 6,673,929

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AT2-021-16

August 2016

It keeps you awake at night. It overshadows every life decision. It may even make you question your career choice. In this dvm360 Leadership Challenge, sponsored by Banfield Pet Hospital, you'll learn that you *can* be free of the soul-sucking burden of veterinary student debt—you just need the right plan. *By Stephen Brinker, MBA*

With the current United States student loan debt reaching \$1.5 trillion and affecting more than 44 million Americans, it's not surprising that this debt has become a hot topic. Many veterinarians face student loans well into the six figures, and with starting salaries averaging \$75,000 to \$100,000, veterinarians have been some of the hardest hit by this issue.

As I speak with recent vet grads, I've found it's not uncommon for them to say they're not sure they would have become veterinarians if they'd known how stressful the student debt would be. This pains me to hear, although I can't say I'm shocked. As a financial professional, my goal is to provide the necessary education and assistance to reduce the anxiety associated with these student loans.

Compared with other financial professionals, I have a bit of a unique perspective on this subject. I'm experiencing it all firsthand because my wife is a veterinarian. Upon graduation, my wife was fortunate enough to already have a job lined up. She began working and, when the time came, started paying on her loans. At that time the focus was on her career and there was plenty of stress involved with being a new doctor in the veterinary profession.

The loans were being paid, but I can't say we necessarily had a plan. There just wasn't enough emotional bandwidth for her to deal with the new career and this seemingly impossible



amount of debt. Once we were married, I decided it was time to dig into this situation and figure out what plan was best for our financial future.

As I began to research, I found that a ton of information was available, but much of it was contradictory. I understand how all this information

can quickly become confusing. And unfortunately, the easiest thing to do as a result is ignore the problem. The goal of this article is to provide you with the necessary education so that you'll feel confident enough to take the first step in tackling your student debt.

During a student loan consulta-



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tion, I always start the meeting with two points. First, congratulations on becoming a veterinarian! Thousands of people dream of doing what you've done and never reach that goal, so you should be extremely proud. Although these loans seem terrible, they did help make it possible for you to achieve your dream.

Second, you're not alone. As I men-

One of the most common mistakes I see being made is refinancing federal loans into a private loan without fully understanding all of the options being given up with this choice.

tioned previously, there are more than 44 million Americans with student loans and many of them are in a similar situation as you. Your well-being is important, and if you feel overwhelmed, you shouldn't hesitate to ask for help.

Keeping that in mind, let's dive in. My goals here are to help you:

- > Educate yourself.
- > Define the methods.
- > Narrow your options.
- > Tackle your debt.

Understanding your loans: the basics

Before you create a plan, it's important to understand the details of your loans. The first distinction is to determine if you have federal loans or private loans. This information can be located on your statement from the loan servicer—keep in mind it's not uncommon to have a mix of federal and private loans. The next step is to ascertain which loans are subsidized and which are unsubsidized. A subsidized loan does not begin collecting interest until the end of your six-month grace period. Unsubsidized loans begin accruing interest the day they're taken out, even if you're still in school.

It's also important to identify the interest rate on each loan. This rate will determine how much of each payment goes to paying down the loan. Finally, it's critical for you to understand the total unpaid balance on all of your loans. Becoming familiar with these items will make it easier to understand the options available and decide what

Don't let your psyche trick you

Being the upstanding, hardworking people most veterinarians are—and given that student debt is such a drain on the profession right now—many folks assume that the best way to deal with their veterinary debt is to get rid of it ASAP. Plus, popular personal finance personalities are out there evangelizing for a debt-free lifestyle, so it seems obvious that you'd want to jettison that toxic load in as few years as possible, even if it means living at poverty level or delaying important life events like buying a house and having kids.

Not so fast. You need to fight your psychological abhorrence for your debt load with a calm, rational approach. In other words, stop screaming, "Get it off! Get it off!" like a victim in a horror movie and run the numbers. It may very well be that under an income-driven plan paying just a little bit per month, you'll come out ahead—i.e. pay less overall—when the balance is forgiven, even after you've paid the tax bill at that time. The smarter thing to do may be to make loan payments you can manage, live your life and start saving for the taxes on the forgiveness.

Consult a knowledgeable advisor or use the VIN Foundation's Student Loan Repayment Simulator (available at vinfoundation.org) to see what's best for your financial future.

—dvm360 staff

strategy best fits your scenario.

Before going into all of the repayment and forgiveness options, I want to share one of the most common mistakes I see being made. This mistake is refinancing federal loans into a private loan without fully understanding all of the options that are being given up with this choice. I'm not saying private loan refinance is always a bad option, but it's crucial to realize that once a federal loan is refinanced into a private loan, it cannot go back.

Federal loan repayment options

Now, let's dive into the different repayment options available for loans from the federal government.

Standard repayment. This is the default plan for federal loans. It has a 10-year amortization, meaning you'll make equal payments for 10 years and your loan will be paid off at the end of that 10-year period.

Graduated repayment. This plan

also has a 10-year payoff, but the payments are smaller at the beginning and increase every two years.

Extended repayment. As the name implies, this plan extends the repayment period out to 25 years. This means the monthly payments will be smaller, but you'll be paying for a longer time, which means paying more in interest.

It's important to note that the three plans above do not factor in your income; the monthly payment amounts are based purely on math and will not fluctuate with changes in your earnings. And while it's helpful to be aware of these plans, for many veterinarians with six-figure debt, none of them is going to be the most effective strategy.

Next are the plans that do take income into account. Naturally, these plans fit into the category known as income-driven repayment (IDR) plans. These plans ensure that monthly student loan payments do not exceed a certain percentage of your income. This can be quite beneficial for individuals with higher student loan debt than their annual salary, which is the case for many new veterinarians.

Income-Based Repayment. The oldest and most well-known plan in the IDR category is Income-Based Repayment (IBR). Under this plan, payments are equal to 15 percent of discretionary income and any remaining loan balance is forgiven after 25 years on loans taken out before July



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Generation Debt (or not)

Before you judge your colleagues, take a long, hard look at the educational debt they carry and why it might be limiting their choices—and, overall, bumming them out.

KEY

How long ago did you graduate veterinary school?

5 years

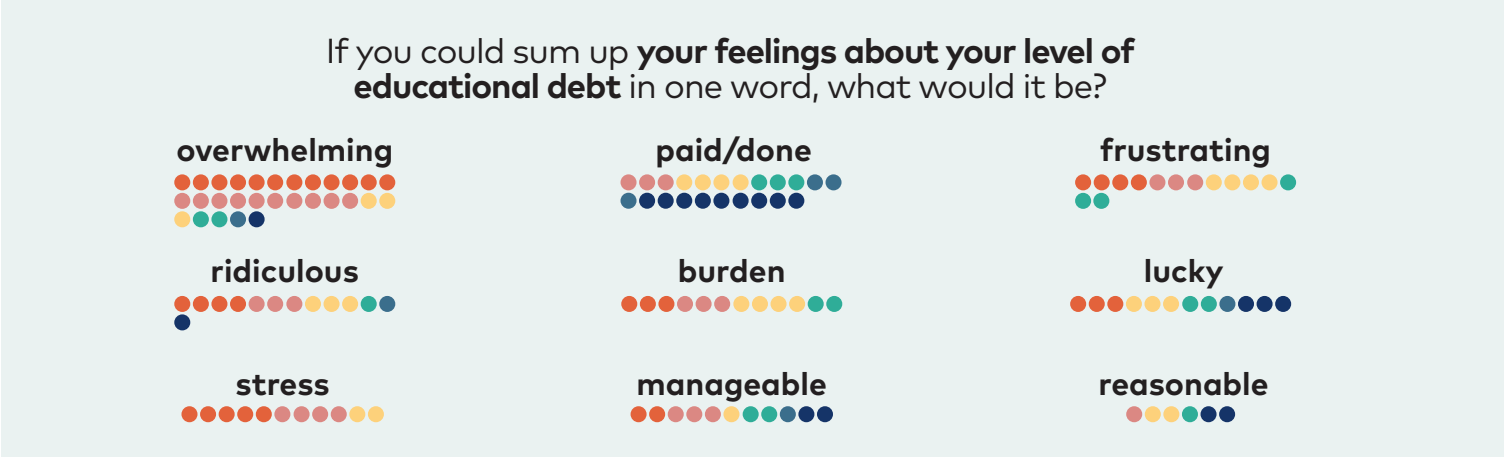
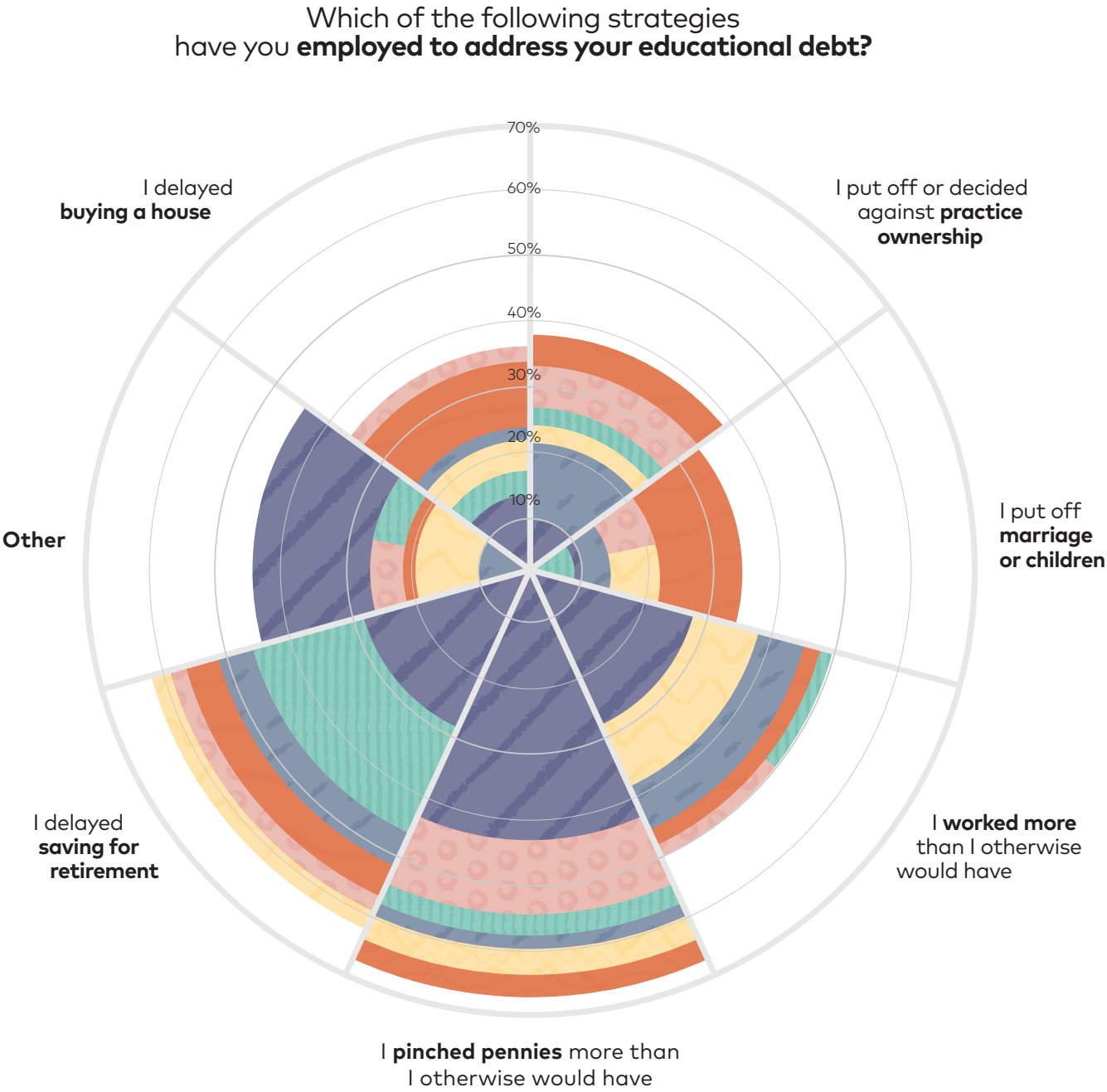
10 years

15 years

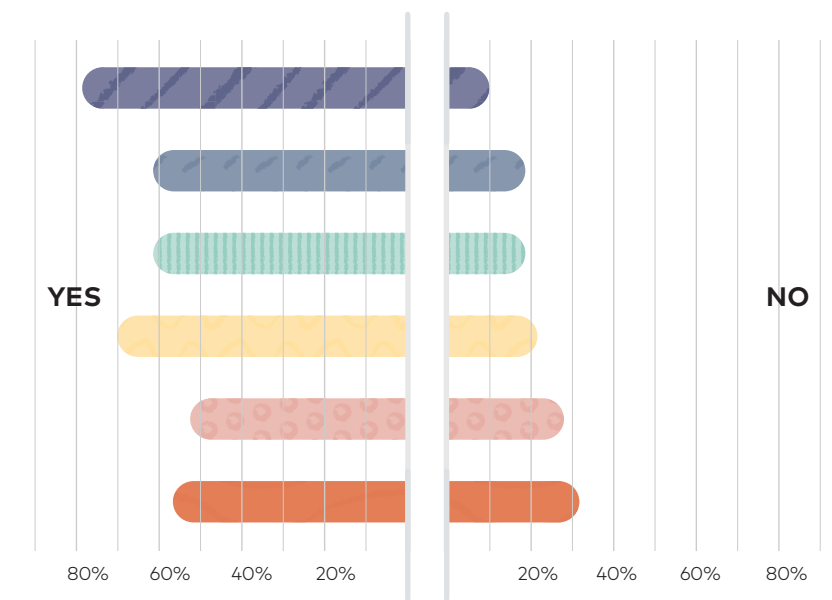
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25 years

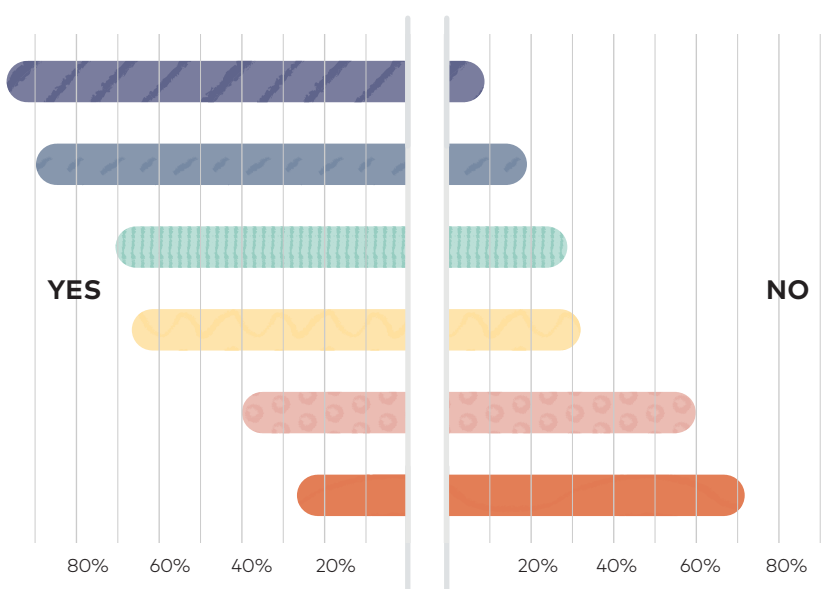
30+ years



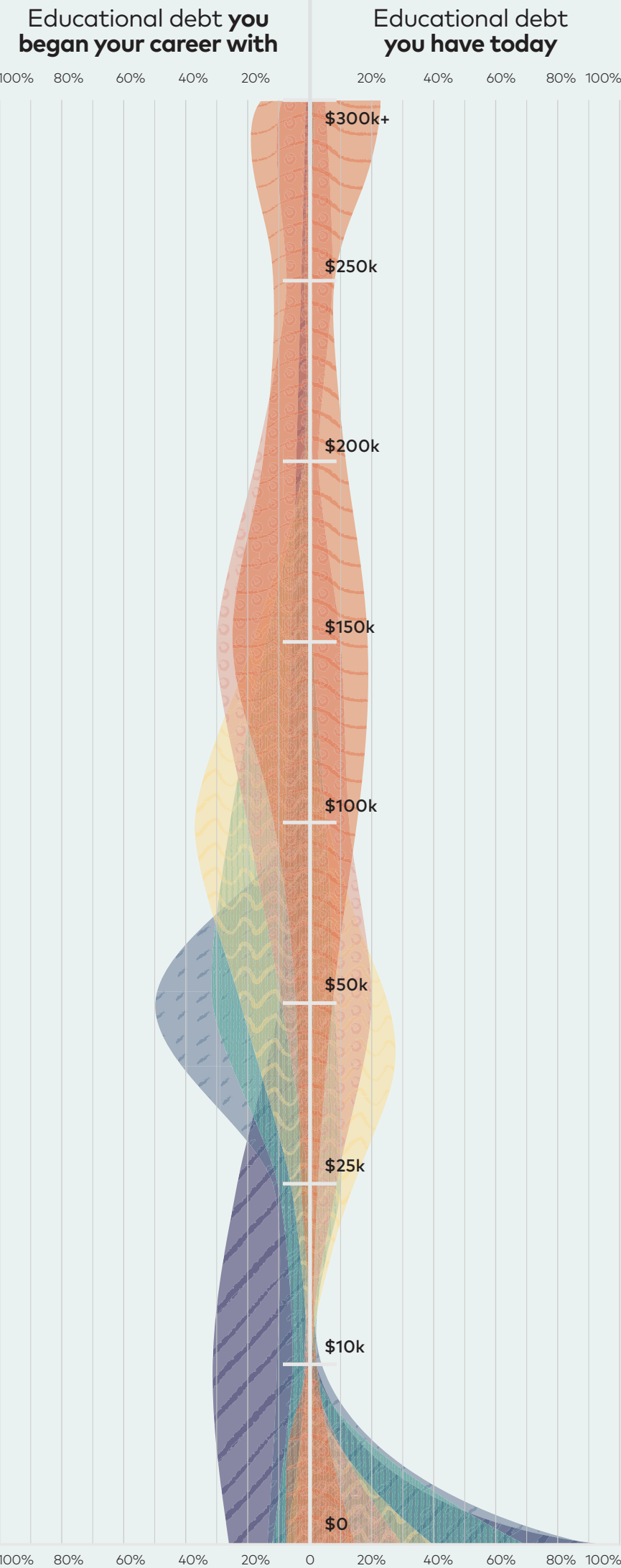
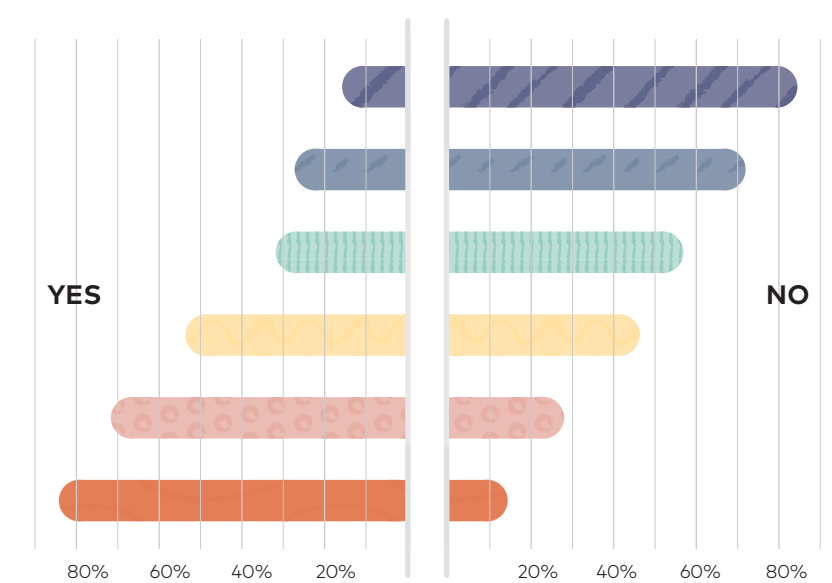
Considering your level of educational debt, **would you still have pursued a career in veterinary medicine?**



Do you think the value of your schooling is **worth the level of debt you have?**



Does your level of educational debt **affect your opinion on the profession of veterinary medicine?**





> Continued from page 16

2014. For loans that originated after July 2014, the payments are equal to 10 percent of discretionary income and balances are forgiven after 20 years.

Pay As You Earn. The second IDR plan that was created is known as Pay As You Earn (PAYE). This plan is available to new borrowers after October 2007 and offers payments at

10 percent of discretionary spending and balance forgiveness after 20 years. A frequent question I hear is, if I have some loans from before and some loans after October 2007, can I use this plan for the loans after that date? The answer is that, unfortunately, if you have any student loans taken in your name before October 2007, you

do not qualify for this plan.

Revised Pay As You Earn. In 2015, the Department of Education released a new plan that offers favorable treatment to a larger group of borrowers. The new plan they created is called Revised Pay As You Earn (REPAYE). Under this plan, monthly payments are equal to 10 percent of discretionary income, undergraduate loan balances are forgiven after 20 years, and graduate balances are forgiven after 25 years.

So, I’ve discussed multiple payment options for government loans, but what if you’re unable to make any payment at this time? Fortunately, federal loans have some included options for delaying payments due to financial hardship. The first option, known as deferment, is intended for short-term issues. The typical deferment period is 60 days. This allows the borrower to avoid the monthly payment without any late fees or negative credit impacts. The other delay option is called forbearance, and it’s intended for longer-term situations. The forbearance period can be up to 12 months and the borrower will not incur any late fees during this time. The loans will, however, continue to accrue interest.

Private loans

Private student loans are much more straightforward than federal loans. These loans operate very much like a typical home or auto loan. Payments on a private loan will stay the same throughout the term of the loan unless the interest rate is variable. The vast majority of private student loans do not offer income-driven repayment plans, deferment or forbearance.

Strategies for repayment

Hopefully, now you have a little bit better understanding of the student loans you have and some of the available options. With that knowledge, let’s move forward by discussing the strategies for tackling these loans. For student loan debt, there are essentially two opposing strategies. One is to pay the loan off as quickly as possible. The other is to pay as little as possible. The most challenging detail is evaluating which strategy best suites your position and then implementing that strategy at the highest efficiency. Let’s discuss the pros and cons of each strategy.

1. Get rid of it fast. The first strategy is to pay off the loans as quickly as

NADA 141-297, Approved by FDA

ProZinc® (protamine zinc recombinant human insulin)

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

Description: ProZinc® insulin is a sterile aqueous protamine zinc suspension of recombinant human insulin.

Each mL contains:

recombinant human insulin	40 International Units (IU)
protamine sulfate	0.466 mg
zinc oxide	0.088 mg
glycerin	16.00 mg
dibasic sodium phosphate, heptahydrate	3.78 mg
phenol (added as preservative)	2.50 mg
hydrochloric acid	1.63 mg
water for injection (maximum)	1005 mg

pH is adjusted with hydrochloric acid and/or sodium hydroxide.

Indication: ProZinc (protamine zinc recombinant human insulin) is indicated for the reduction of hyperglycemia and hyperglycemia-associated clinical signs in cats with diabetes mellitus.

Dosage and Administration: USE OF A SYRINGE OTHER THAN A U-40 SYRINGE WILL RESULT IN INCORRECT DOSING.

FOR SUBCUTANEOUS INJECTION IN CATS ONLY.

DO NOT SHAKE OR AGITATE THE VIAL.

ProZinc insulin should be mixed by gently rolling the vial prior to withdrawing each dose from the vial. Once mixed, ProZinc suspension has a white, cloudy appearance. Clumps or visible white particles can form in insulin suspensions; do not use the product if clumps or visible white particles persist after gently rolling the vial. Using a U-40 insulin syringe, the injection should be administered subcutaneously on the back of the neck or on the side of the cat.

Always provide the Cat Owner Information Sheet with each prescription.

The initial recommended ProZinc dose is 0.1 – 0.3 IU insulin/pound of body weight (0.2 – 0.7 IU/kg) every 12 hours. The dose should be given concurrently with or right after a meal. The veterinarian should re-evaluate the cat at appropriate intervals and adjust the dose based on both clinical signs and glucose nadirs until adequate glycemic control has been attained. In the effectiveness field study, glycemic control was considered adequate if the glucose nadir from a 9-hour blood glucose curve was between 80 and 150 mg/dL and clinical signs of hyperglycemia such as polyuria, polydipsia, and weight loss were improved. Further adjustments in the dosage may be necessary with changes in the cat’s diet, body weight, or concomitant medication, or if the cat develops concurrent infection, inflammation, neoplasia, or an additional endocrine or other medical disorder.

Contraindications: ProZinc insulin is contraindicated in cats sensitive to protamine zinc recombinant human insulin or any other ingredients in the ProZinc product. ProZinc insulin is contraindicated during episodes of hypoglycemia.

Warnings: User Safety: For use in cats only. Keep out of the reach of children. Avoid contact with eyes. In case of contact, immediately flush eyes with running water for at least 15 minutes. Accidental injection may cause hypoglycemia. In case of accidental injection, seek medical attention immediately. Exposure to product may induce a local or systemic allergic reaction in sensitized individuals.

Animal Safety: Owners should be advised to observe for signs of hypoglycemia (see Cat Owner Information Sheet). Use of this product, even at established doses, has been associated with hypoglycemia. An animal with signs of hypoglycemia should be treated immediately. Glucose should be given orally or intravenously as dictated by clinical signs. Insulin should be temporarily withheld and, if indicated, the dosage adjusted.

Any change in insulin should be made cautiously and only under a veterinarian’s supervision. Changes in insulin strength, manufacturer, type, species (human, animal) or method of manufacture (rDNA versus animal-source insulin) may result in the need for a change in dosage.

Appropriate diagnostic tests should be performed to rule out other endocrinopathies in diabetic cats that are difficult to regulate.

Precautions: Animals presenting with severe ketoacidosis, anorexia, lethargy, and/or vomiting should be stabilized with short-acting insulin and appropriate supportive therapy until their condition is stabilized. As with all insulin products, careful patient monitoring for hypoglycemia and hyperglycemia is essential to attain and maintain adequate glycemic control and to prevent associated complications. Overdosage can result in profound hypoglycemia and death. Progestogens, certain endocrinopathies and glucocorticoids can have an antagonistic effect on insulin activity. Progestogen and glucocorticoid use should be avoided.

Reproductive Safety: The safety and effectiveness of ProZinc insulin in breeding, pregnant, and lactating cats has not been evaluated.

Use in Kittens: The safety and effectiveness of ProZinc insulin in kittens has not been evaluated.

Adverse Reactions:

Effectiveness Field Study

In a 45-day effectiveness field study, 176 cats received ProZinc insulin. Hypoglycemia (defined as a blood glucose value of <50 mg/dL) occurred in 71 of the cats at various times throughout the study. Clinical signs of hypoglycemia were generally mild in nature (described as lethargic, sluggish, weak, trembling, uncoordinated, groggy, glassy-eyed or dazed). In 17 cases, the veterinarian provided oral glucose supplementation or food as treatment. Most cases were not associated with clinical signs and received no treatment. One cat had a serious hypoglycemic event associated with stupor, lateral recumbency, hypothermia and seizures. All cases of hypoglycemia resolved with appropriate therapy and, if needed, a dose reduction.

Three cats had injection site reactions, which were described as either small, punctate, red lesions; lesions on neck; or palpable subcutaneous thickening. All injection site reactions resolved without cessation of therapy.

Four cats developed diabetic neuropathy during the study as evidenced by plantigrade stance. Three cats entered the study with plantigrade stance, one of which resolved by Day 45. Four cats were diagnosed with diabetic ketoacidosis during the study. Two were euthanized due to poor response to treatment. Five other cats were euthanized during the study, one of which had hypoglycemia. Four cats had received ProZinc insulin for less than a week and were euthanized due to worsening concurrent medical conditions.

The following additional clinical observations or diagnoses were reported in cats during the effectiveness field study: vomiting, lethargy, diarrhea, cystitis/hematuria, upper respiratory infection, dry coat, hair loss, ocular discharge, abnormal vocalization, black stool, and rapid breathing.

Extended Use Field Study

Cats that completed the effectiveness study were enrolled into an extended use field study. In this study, 145 cats received ProZinc insulin for up to an additional 136 days. Adverse reactions were similar to those reported during the 45-day effectiveness study and are listed in order of decreasing frequency: vomiting, hypoglycemia, anorexia/ poor appetite, diarrhea, lethargy, cystitis/hematuria, and weakness. Twenty cats had signs consistent with hypoglycemia described as: sluggish, lethargic, unsteady, wobbly, seizures, trembling, or dazed. Most of these were treated by the owner or veterinarian with oral glucose supplementation or food; others received intravenous glucose. One cat had a serious hypoglycemic event associated with seizures and blindness. The cat fully recovered after supportive therapy and finished the study. All cases of hypoglycemia resolved with appropriate therapy and if needed, a dose reduction.

Fourteen cats died or were euthanized during the extended use study. In two cases, continued use of insulin despite anorexia and signs of hypoglycemia contributed to the deaths. In one case, the owner decided not to continue therapy after a presumed episode of hypoglycemia. The rest were due to concurrent medical conditions or worsening of the diabetes mellitus.

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

Information for Cat Owners: Please refer to the Cat Owner Information Sheet for more information about ProZinc insulin. ProZinc insulin, like other insulin products, is not free from adverse reactions. Owners should be advised of the potential for adverse reactions and be informed of the associated clinical signs. Potential adverse reactions include: hypoglycemia, insulin antagonism/resistance, rapid insulin metabolism, insulin-induced hyperglycemia (Somogyi Effect), and local or systemic reactions. The most common adverse reaction observed is hypoglycemia. Signs may include: weakness, depression, behavioral changes, muscle twitching, and anxiety. In severe cases of hypoglycemia, seizures and coma can occur. Hypoglycemia can be fatal if an affected cat does not receive prompt treatment. Appropriate veterinary monitoring of blood glucose, adjustment of insulin dose and regimen as needed, and stabilization of diet and activity help minimize the risk of hypoglycemic episodes. The attending veterinarian should evaluate other adverse reactions on a case-by-case basis to determine if an adjustment in therapy is appropriate, or if alternative therapy should be considered.

Effectiveness: A total of 187 client-owned cats were enrolled in a 45-day field study, with 176 receiving ProZinc insulin. One hundred and fifty-one cats were included in the effectiveness analysis. The patients included various purebred and mixed breed cats ranging in age from 3 to 19 years and in weight from 4.6 to 20.8 pounds. Of the cats included in the effectiveness analysis, 101 were castrated males, 49 were spayed females, and 1 was an intact female.

Cats were started on ProZinc insulin at a dose of 0.1–0.3 IU/lb (0.2–0.7 IU/kg) twice daily. Cats were evaluated at 7, 14, 30, and 45 days after initiation of therapy, and the dose was adjusted based on clinical signs and results of 9-hour blood glucose curves on Days 7, 14, and 30.

Effectiveness was based on successful control of diabetes, which was defined as improvement in at least one blood glucose variable (glucose curve mean, nadir, or fructosamine) and at least one clinical sign (polyuria, polydipsia, or body weight). Based on this definition, 115 of 151 cases (76.2%) were considered successful. Blood glucose curve means decreased from 415.3 mg/dL on Day 0 to 203.2 mg/dL by Day 45, and the mean blood glucose nadir decreased from 407.9 mg/dL on Day 0 to 142.4 mg/dL on Day 45. Mean fructosamine values decreased from 505.9 µmol/L on Day 0 to 380.7 µmol/L on Day 45.

Cats that completed the effectiveness study were enrolled in an extended use field study. The mean fructosamine value was 342.0 µmol/L after a total of 181 days of ProZinc therapy.

How Supplied: ProZinc insulin is supplied as a sterile injectable suspension in 10-mL multidose vials. Each mL of ProZinc product contains 40 IU recombinant human insulin.

Storage Conditions: Store in an upright position under refrigeration at 36–46°F (2–8°C). Do not freeze. Protect from light.

Manufactured for:
Boehringer Ingelheim Vetmedica, Inc.
St. Joseph, MO 64506 U.S.A.

Manufactured by:
Alcami Carolinas Corporation,
Charleston, SC 29405

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human insulin)



Important Safety Information: For use in cats only. Animals presenting with severe ketoacidosis, anorexia, lethargy, and/or vomiting should be stabilized with short-acting insulin and appropriate supportive therapy until their condition is stabilized. As with all insulin products, careful patient monitoring for hypoglycemia and hyperglycemia is essential to attain and maintain adequate glycemic control and to prevent associated complications. Overdosage can result in profound hypoglycemia and death. Progestogen and glucocorticoid use should be avoided. PROZINC insulin is contraindicated in cats during episodes of hypoglycemia and in cats sensitive to protamine zinc recombinant human insulin or any other ingredients in the PROZINC product.

References: **1.** Nelson RW, Henley K, Cole C; PZIR Clinical Study Group. Field safety and efficacy of protamine zinc recombinant human insulin for treatment of diabetes mellitus in cats. *J Vet Intern Med.* 2009;23(4):787–793. **2.** Nelson RW. Disorders of the endocrine pancreas. In: Nelson RW, Cuoto CG, eds. *Small Animal Internal Medicine*. 4th ed. St. Louis, MO: Mosby Elsevier; 2008:764–802. **3.** Rucinsky R, Cook A, Haley S, Nelson R, Zoran DL, Poundstone M; American Animal Hospital Association (AAHA). AAHA diabetes management guidelines for dogs and cats. *J Am Anim Hosp Assoc.* 2010;46(3):215–224.



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Please see Brief Summary on page 20

Plan	Payment	Forgiveness
Standard repayment	Fixed payment for 10-year payoff	N/A
Graduated repayment	Payments are lower at first and then increase, usually every two years, and are for an amount that will ensure your loans are paid off within 10 years.	N/A
Extended repayment	Payments may be fixed or graduated and will ensure that your loans are paid off within 25 years.	N/A
Income-Based Repayment (IBR)	Payments equal to 15% of discretionary income (loans before July 2014). Payments equal to 10% of discretionary income (loans after July 2014).	25 years (loans before July 2014); 20 years (loans after July 2014)
Pay As You Earn (PAYE)	Payments equal to 10% of discretionary income (new borrowers after October 2007).	20 years
Revised Pay As You Earn (REPAYE)	Payments equal to 10% of discretionary income.	20 years (undergraduate loans); 25 years (graduate loans)

possible, which seems fairly easy to understand. The goal here is to pour every dollar you can afford into your loans and free yourself of that debt as soon as you humanly can. But before choosing this strategy, ask yourself if you can commit to the sacrifice. For many veterinarians, the monthly payments can be thousands of dollars. The result is that many large expenses need to be delayed. You may need to wait longer before buying a house, reduce vacations and travel, and likely drive an older car. It's important to consider how this strategy will affect your well-being.

If you use an IDR plan and work toward loan forgiveness, the total amount you pay can actually be significantly less than if you'd used a standard repayment plan or paid the balance off as soon as possible.

If you're comfortable committing to this lifestyle for the next 10 years, this strategy might be best for you.

2. Let it linger—and get forgiven.

The second strategy is to pay as little as possible and work toward loan forgiveness. You utilize the best income-driven repayment plan for you to get the monthly payment as low as possible and continue to make these payments until your loans are forgiven.

The most well-known forgiveness plan is the Public Service Loan Forgiveness (PSLF) plan. This is a great option if you qualify; unfortunately, not very many veterinary jobs

do. The criteria include working for a government or nonprofit organization, working a minimum of 30 hours a week, and working in that position for 10 years while making timely student loan payments. If you meet all of these requirements, your remaining loan balance will be forgiven and there is no tax liability.

I find it interesting that most people are familiar with the PSLF program but do not realize that everyone using an income-driven repayment plan is eligible for forgiveness. Depending on your specific situation, your remaining

ever, keep in mind that loan balances forgiven under an IDR plan are treated as income and taxed accordingly. I always encourage individuals to work with a financial advisor to help them plan for this potential tax burden.

Note: If your student loan debt is not more than your annual salary, I would not likely recommend strategy No. 2 for you. When your debt is less than your salary, the plan is not as effective mathematically—you won't be able to substantially lower your payment and will likely pay off the loan before reaching the forgiveness period. If you fall into this bucket, I would encourage you to consider the first strategy and avoid the additional interest of a longer payoff period.

Parting thoughts

In conclusion, I'd like to share a few additional pieces of advice. I highly recommend that you include your significant other in this process and the decision making. Second, don't be afraid to enlist the help of an expert. This can be a very confusing situation and you don't need to feel ashamed asking for help. Finally, always remember that there are many others in your position and you are not alone. As bad as it may seem, there are always options.

Stephen Brinker, MBA, is a financial professional with Kalibr, a financial planning firm based in St. Louis. The spouse of a veterinarian, he understands the financial challenges many veterinary professionals face. Contact dvmnews@ubm.com with questions or comments.

Learn more live

At Fetch dvm360 conference in San Diego, Gary Glassman, CPA, will present "Student debt and other disasters: 5 financial mistakes veterinarians make." Register at fetchdvm360.com/sd.





Personal accounts:
An associate veterinarian paying down \$110k in debt

This veterinarian muses about the steep cost of therapeutic diets for her four cats—and that's with the professional discount. *Anonymous*

Occupation and income

Job: Full-time associate veterinarian
Location: Eastern Shore, Maryland
Monthly income: \$4,000

Monthly expenses
Housing: \$1,446
Student loan: \$1,150
Car loan: N/A
Electricity: \$132
Gas: \$21.30
Water and trash: \$55
TV and internet: \$131
Long-term disability insurance: \$90
Life insurance: \$33
Car insurance: \$60
Health, vision, dental: \$118
Cell phone: \$45
Total: \$3,281.30

Editor's note: This piece is part of the dvm360 Personal Accounts series, where veterinary professionals in different areas of the country track their spending for one week, revealing the impact of daily money choices on veterinary living. Read them all at dvm360.com/personalaccounts.

I am a small animal associate veterinarian in Eastern Shore, Maryland. I'm paid on production with a \$50,000 per year base salary. My monthly take-home income averages \$4,000. If I make no production, which is very rare, my take-home salary is \$2,900 a month. This has happened three times in two years. Those were rough months!

I've been in my current job two years and at three different clinics in the past eight years. It was hard to find a place that was the right fit.

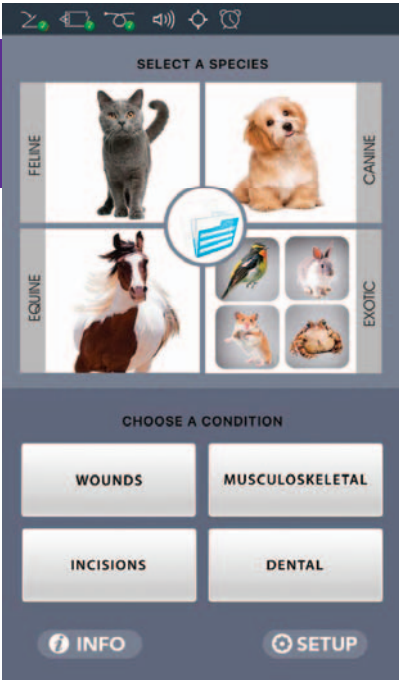
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That meant a couple moves for me to different cities and states in the past several years, which was tough on my savings account. I feel like I can't get ahead and really start to build my savings, especially with my student loan. I still owe about \$110,000.

I ended up buying my first home last year. I'd rented a house the prior year,

but the owners decided to move back in. I had about two months to find a place to live. Rental homes are few and far between in this area, and the rentals that are available cost more than what I'd spend on a mortgage, so I ended up buying a home. I got lucky and found a house that was perfect for my boyfriend and me. I had three cats and he had one, all males. The introductions went pretty well. The house did require new flooring and paint before moving in, so that was a big expense I had to put on a credit card.

My boyfriend is a registered veterinary technician at another hospital. He gives me \$200 every two weeks to help with household expenses. The rest of his income goes towards his car payment, retirement and savings for our future. He also usually pays if we end up eating out. Here's a look at my spending in a week.

Monday

- 7 a.m.** Wake up, feed the cats, scoop litterboxes and catch up on the *Today Show* for a few minutes. I pack lunch (leftovers) and grab a protein shake for breakfast on the way to work.
- 8 a.m.** Stop at the gas station to return a Redbox movie. I grab a fountain Cherry Coke for the morning. Total: \$1.06
- 8:10 a.m.** Stop at Walmart to grab a box of breakfast sandwiches for my boyfriend—they're his typical work-day breakfast. Total: \$8.88
- 9 a.m.** Start with a full schedule, but a two-patient appointment cancels at the last minute. I take the time to catch up on lab calls, emails and Facebook posts for the clinic page.
- 12:10 p.m.** Lunch is leftover Olive Garden from the weekend.
- 3:15 p.m.** Leave work and stop by my boyfriend's dad's house to check on his 13-year-old Labrador retriever.
- 6 p.m.** Try a new recipe for dinner for one-pot chicken and rice. Not bad. There are only leftovers for one person tomorrow, so my boyfriend will take that.
- 9 p.m.** Relax a little before bed. We're fostering a kitten, so I let her out with some of our other cats. They all do well.

Daily total: \$10

Tuesday

- 9:30 a.m.** This is my regular day off, so I take advantage and sleep in. My

boyfriend worked today, so he's up early and feeds the cats. I cleaned over the weekend, so I don't have to worry about that, but I definitely need a grocery store run. I grab a banana and head off.

10:15 a.m. Pick up the usual stuff as well as ingredients for dinner tonight, tomorrow and Thursday. I spend a little more than usual as they have Coke on sale, so I get four 12-packs for \$12. They also have T-bone steaks on sale, so I pick up two to grill this weekend. There are a couple things the store doesn't have, so I need to run home to unload, then head out to a second store. I hate that! Total: \$92.35

12:30 p.m. Stop at McDonald's for a quick lunch, including a free medium Diet Coke thanks to a deal on their smartphone app. Total: \$2.96

1 p.m. Second grocery store has a really good deal on ribeye steaks, so I buy two more. I'll freeze this pair for another weekend. Total: \$52.45

2 p.m. I'm finally home to relax for the day to catch up on laundry and maybe start the new season of *Orange Is the New Black*.

6:30 p.m. Dinner is homemade Old Bay chicken wings and fries.

7 p.m. Chatted with DirecTV to cancel the monthly protection plan. I meant to do this months ago but kept forgetting. I don't think it's worth the extra \$8.99 a month.

8:45 p.m. We're running low on Purina DM canned food for two of the cats, so I buy that along with a box of FortiFlora from the Purina for Professionals website. The cats love the taste of FortiFlora, so we give that once a day—with added Zylkene for anxiety for our high-strung boy. Two of our cats eat Purina DM canned food and Hill's Metabolic + Urinary Stress dry food because of weight issues. The other two eat Hill's w/d canned food and Royal Canin Urinary + Satiety dry food, because one of them has issues with severe pancreatitis and high cholesterol. We're trying him on a low-fat diet trial and so far it's helping a lot. It's so nice to be able to take advantage of the staff feeding programs each of those companies offer. It makes a big difference. Sometimes I do wonder how we expect owners to afford therapeutic diets. I barely can. Total: \$46.06

Daily total: \$194

(mirtazapine transdermal ointment)

For topical application in cats only. Not for oral or ophthalmic use.

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

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

INDICATION: Mirataz™ is indicated for the management of weight loss in cats.

DOSAGE AND ADMINISTRATION: Administer topically by applying a 1.5-inch ribbon of ointment (approximately 2 mg/cat) on the inner pinna of the cat's ear once daily for 14 days. Wear disposable gloves when applying Mirataz™. Alternate the daily application of Mirataz™ between the left and right inner pinna of the ears. **See Product Insert for complete dosing and administration information.**

CONTRAINDICATIONS: Mirataz™ is contraindicated in cats with a known hypersensitivity to mirtazapine or to any of the excipients. Mirataz™ should not be given in combination, or within 14 days before or after treatment with a monoamine oxidase inhibitor (MAOI) [e.g. selegiline hydrochloride (L-deprenyl), amitraz], as there may be an increased risk of serotonin syndrome.

HUMAN WARNINGS: Not for human use. Keep out of reach of children. **Wear disposable gloves when handling or applying Mirataz™ to prevent accidental topical exposure.** After application, dispose of used gloves and wash hands with soap and water. After application, care should be taken that people or other animals in the household do not come in contact with the treated cat for 2 hours because mirtazapine can be absorbed transdermally and orally. However, negligible residues are present at the application site and the body of the cat at 2 hours after dosing. In case of accidental skin exposure, wash thoroughly with soap and warm water. In case of accidental eye exposure, flush eyes with water. If skin or eye irritation occurs seek medical attention. In case of accidental ingestion, or if skin or eye irritation occurs, seek medical attention.

PRECAUTIONS: Do not administer orally or to the eye. Use with caution in cats with hepatic disease. Mirtazapine may cause elevated serum liver enzymes (See **Animal Safety** in the product insert). Use with caution in cats with kidney disease. Kidney disease may cause reduced clearance of mirtazapine which may result in higher drug exposure. Upon discontinuation of Mirataz™, it is important to monitor the cat's food intake. Food intake may lessen after discontinuation of mirtazapine transdermal ointment. If food intake diminishes dramatically (>75%) for several days, or if the cat stops eating for more than 48 hours, reevaluate the cat. Mirataz™ has not been evaluated in cats < 2 kg or less than 6 months of age. The safe use of Mirataz™ has not been evaluated in cats that are intended for breeding, pregnant or lactating cats.

ADVERSE REACTIONS: In a randomized, double-masked, vehicle-controlled field study to assess the effectiveness and safety of mirtazapine for the management of weight loss in cats, 115 cats treated with Mirataz™ and 115 cats treated with vehicle control were evaluated for safety. The vehicle control was an ointment containing the same inert ingredients as Mirataz™ without mirtazapine. The most common adverse reactions included application site reactions, behavioral abnormalities (vocalization and hyperactivity), and vomiting. **See Product Insert for complete Adverse Reaction information.** To report suspected adverse events, for technical assistance or to obtain a copy of the SDS, contact Kindred Biosciences, Inc. at 888-608-2542. For additional information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDA-VETS or online at <http://www.fda.gov/AnimalVeterinary/SafetyHealth>.

EFFECTIVENESS: The effectiveness of Mirataz™ (mirtazapine transdermal ointment) was demonstrated in a randomized, double-masked, vehicle-controlled, multi-site field study involving client-owned cats of various breeds. Enrolled cats were ≥ 1 year of age and had existing documented medical history of ≥ 5% weight loss deemed clinically significant. The most common pre-existing conditions included renal insufficiency, vomiting, and hyperthyroidism. Some cats had more than one pre-existing condition. Cats were randomized to treatment groups in a 1:1 ratio of Mirataz™ to vehicle control. A total of 230 cats were enrolled and received either Mirataz™ (115 cats) or a vehicle control (115 cats) containing the same inert ingredients without mirtazapine. The cats were 2.8-24.6 years of age and weighed 2.1-9.2 kg. The dosage was a 1.5-inch ribbon (approximately 2 mg/cat) mirtazapine or vehicle ointment administered topically to the inner pinna of the cat's ear. A total of 177 cats were determined to be eligible for the effectiveness analysis; 83 cats were in the Mirataz™ group and 94 cats were in the vehicle control group. The primary effectiveness endpoint was the mean percent change in body weight from Day 1 to the Week 2 Visit. At Week 2, the mean percent increase in body weight from Day 1 was 3.94% in the mirtazapine group and 0.41% in the vehicle control group. The difference between the two groups was significant (p<0.0001) based on a two-sample t-test assuming equal variances. A 95% confidence interval on the mean percent change in body weight for the Mirataz™ group is (2.77, 5.11), demonstrating that the mean percent change is statistically different from and greater than 0.

STORAGE: Store below 25°C (77°F). Multi-use tube. Discard within 30 days of first use.

HOW SUPPLIED: Mirataz™ is supplied in a 5 gram aluminum tube.

MANUFACTURED FOR:
Kindred Biosciences, Inc.
1555 Bayshore Highway, suite 200
Burlingame, CA 94010

NADA 141-481, Approved by FDA
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The FIRST AND ONLY FDA-approved transdermal medication for the management of weight loss in cats

"ANOTHER PILL? GIVE IT TO THE DOG."

- ✓ In clinical studies, Mirataz™ (mirtazapine transdermal ointment) resulted in significant weight gain in cats in as little as 14 days following topical application of 2 mg per day¹
- ✓ Mirataz gives your clients a practical way to manage their cat's weight loss without administration of oral medication and does not rely on the cat to eat to be medicated
- ✓ Due to proprietary Accusorb™ technology, Mirataz achieves measurable plasma concentrations of mirtazapine in cats²
- ✓ Mirataz was well tolerated both locally and systemically in clinical studies¹

For more information, contact your KindredBio Sales Specialist at 1-888-608-2542, your preferred Distributor Sales Representative, or go to [kindredbio.com/Mirataz](https://www.kindredbio.com/Mirataz).

Important Safety Information

Mirataz™ (mirtazapine transdermal ointment) is for topical use in cats only under veterinary supervision. Do not use in cats with a known hypersensitivity to mirtazapine or any of the excipients. Do not use in cats treated with monoamine oxidase inhibitors (MAOIs). Not for human use. Keep out of reach of children. Wear gloves when handling/applying, wash hands after and avoid contact between the treated cat and people or other animals for 2 hours following application. Use with caution in cats with hepatic and kidney disease. Cat's food intake should be monitored upon discontinuation. Safety has not been evaluated in cats less than 2 kg, less than six months of age or in breeding, pregnant or lactating cats. The most common adverse reactions observed during clinical trials were application site reactions, behavioral abnormalities (vocalization and hyperactivity) and vomiting. **For additional safety information, see brief summary of prescribing information on following page. 24**

Reference: 1. Mirataz™ (mirtazapine transdermal ointment) [package insert], Kindred Biosciences, Inc. (Burlingame, CA). Rev. 5/2018. 2. Buhles W, Quimby JM, Labelle D, et al. Single and multiple dose pharmacokinetics of a novel transdermal ointment in cats. J Vet Pharmacol Ther. In press 2018.



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US-MAZ-1800044 May-11-2018

Mirataz™
(mirtazapine transdermal ointment)



See more of our coverage in our sister publications:

vetted

Think a veterinary internship is a good step forward to help earn more down the line and pay down those student loan bills? In *Vetted*, we'll walk you through some thoughts to consider first, plus a few honest views from your colleagues on how they're handling their debt from the Vet Confessionals project.

firstline

DVMs aren't the only veterinary professionals struggling with salaries that fall short of their student debt loads. In *Firstline*, we'll look at the financial reality that many technicians are facing once they enter the workforce, as well as what can be done to ease the burden—including why a spending analysis could be your new best friend (or could at least replace your budget).

For this coverage and more, visit dvm360.com/curbyourdebt.

Supported by an educational grant from:



Wednesday

Today's the largest payday of the month, because it includes the bonus from last month. One credit card payment goes out today. Total: \$150

7:30 a.m. Wake up, feed the cats, scoop the litterboxes and grab a bowl of cereal for breakfast. Today is my long day at work, from 9 a.m. to 7 p.m.

10 a.m. I get an email that my monthly Chewy autoship order of six 15-lb jugs of cat litter shipped out today. With four cats, we go through a lot. Plus, I'm pretty OCD about keeping the boxes clean. I dump and clean entirely every two to three weeks. Total: \$52.22

12:45 p.m. Lunch is leftover chicken wings from last night. Very good!

3:15 p.m. Another two-patient appointment cancels at the last minute. What is it with this week? Ugh ...

8 p.m. I transfer money to my parents for my student loan as well as my cell phone. My parents offered to refinance their house to pay off my student loan a couple of years ago. I now pay them back for that loan, but I will save a lot in the long-term due to the much lower interest rate. I'm on a family plan with them for the cell phone, which also helps me save a little. Total: \$1,150 for loan, \$45 for cell phone

Daily total: \$1,397

Thursday

8 a.m. Usual morning routine. Bowl of cereal for breakfast. Took the foster kitten in with me to work for the day to visit everyone at the clinic.

10 a.m. I had two sick patient appointments this morning that were fairly complex. Ran late with both. It stresses me out to run behind.

12 p.m. Lunch was leftover chicken wings again. Still tasted good!

3:30 p.m. We had three back-to-back euthanasias, which were tough on all of us. One was an FIP kitten. I hate FIP. I treated myself to a 7-Eleven Slurpee afterwards to try to brighten my afternoon and filled my car with gas. Total: \$1.06 Slurpee, \$22 gas

7:30 p.m. I made tacos for dinner then relaxed catching up on a couple TV shows.

Daily total: \$23

Friday

8 a.m. The usual morning routine: bowl of cereal and off to work.

12 p.m. Salad and some watermelon from home for lunch.

4 p.m. Off work. Beach traffic is bad heading home.

7 p.m. We have birthday dinner out for my boyfriend's grandmother at a nice restaurant in a nearby town. She turned 83. We both have the seafood buffet—delicious—but we probably didn't get our money's worth. We enjoyed a couple cocktails with everyone as well. Boyfriend took care of the bill, which was close to \$100.

Daily total: \$0

Saturday

8 a.m. I took my car into the shop for an oil change and tire rotation. The tire rotation was free, because I'd bought my tires from the shop earlier this year. I did notice this week my car's A/C didn't seem to be cooling like it should. They weren't able to look at that today, so I have to bring it back during the week. Ugh ... I hope it's not too expensive. Total: \$65

8:20 a.m. Stop by Chick-fil-A to pick up a couple chicken biscuits for our breakfast on the way home. Boyfriend pays.

3 p.m. Visit with my boyfriend's family for the afternoon. Nice day for the pool!

7 p.m. Delivery from a local restaurant for dinner—pizza, wings and some subs. Boyfriend's dad treats.

9 p.m. Drive home in an awful storm. It was very scary, but thankfully we made it home safely.

Daily total: \$65

Sunday

10 a.m. We both sleep in, then head out for Sunday breakfast at a local diner. Total: \$22

11 a.m. Swing by the pet store for some kitten food for the foster. We pick out a collar with a bell so we and our boys know where she is. My boyfriend takes care of this.

11:30 a.m. Quick stop at the local wholesale club for cranberry juice and flavored water. I see a coupon for the shampoo I use, so I grab a double pack of that. Total: \$18.82 for the drinks, \$8.93 for the shampoo.

12:30 p.m. Cleaning house this afternoon, then some TV.

6:30 p.m. Steaks on the grill for dinner. Tasty! Relaxed rest of the evening with some TV. Tomorrow starts another week!

Daily total: \$50

Weekly total: \$1,739

The breakdown

Weekly total spent: \$1,739

Weekly expenses

- Food and drink: \$200
- Entertainment: \$0
- Home and health: \$0
- Clothes and beauty: \$9
- Transportation: \$87
- Pet expenses: \$99
- Student loan: \$1,150
- Utilities/credit cards: \$195

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Where DVMs fit in the U.S. student debt crisis

Take a look at the numbers, and you see the student debt crisis is bigger than veterinary medicine. But the debt-to-income ratio makes our profession's student loans particularly tough.

A large part of our focus at the AVMA is on addressing the issue of increasing educational debt for new veterinarians. While the veterinary community works together toward creative solutions to tackle the student debt burden, it's also helpful to consider the bigger picture: Veterinary student debt is part of a larger debt trend in the United States.

What veterinary graduates face

In 2017, the average student debt for U.S. veterinary school graduates was \$138,067. However, because some students are able to graduate without borrowing any funds, these numbers don't fully reflect the reality that faces students who do owe. If we look only at graduates who had to borrow funds to pay for their education, the average debt number is higher: \$166,714 in 2017.

Through our research into factors associated with student debt, we've identified the most influential ones. On average, students who pay nonresident tuition rates for veterinary school graduate with \$45,000 more debt than students who pay resident rates. This factor has the biggest impact on the amount of debt a student incurs. Another factor is the cost-of-living variation based on location.

The foundational problem is not just debt, however; it's the relationship between debt and income. Across the veterinary profession, student debt continues to grow faster than income. As a result, the debt-to-income ratio (DIR) for veterinarians—a key indicator of economic well-being—continues to rise. Bringing the DIR down by lowering student debt or increasing income is something we would all like to see.

What college graduates face

While the veterinary debt picture can look daunting, veterinarians aren't alone in facing student debt challenges. In



fact, the nation's total of \$1.5 trillion in student loan debt is shared by 44.2 million Americans. Consider these facts:

- > Across all professions, the average monthly student loan payment for a borrower between the ages of 20 and 30 is \$351.
- > The student loan delinquency rate is more than 11 percent nationwide.
- > Across all medicine and health science fields, the average combined undergraduate and graduate debt for those who borrowed is \$161,772. For someone with a law degree, it's \$140,616.
- > At \$1.48 trillion, outstanding student debt exceeds auto loan debt

How the AVMA is helping

We're working on various strategies to crack the veterinary student debt problem. We produce economic research and data to help guide good policy decisions and monitor progress, and provide financial tools that empower veterinarians to better manage personal finances. And we are forging relationships and partnerships across the profession to work with diverse coalitions toward this common goal. Specifically, we've partnered with the Association of American Veterinary Medical Colleges and the Veterinary Medical Association Executives on the Veterinary Debt Initiative. This initia-

Students who pay nonresident tuition rates for veterinary school graduate with \$45,000 more debt than students who pay resident rates.

(\$1.1 trillion) and credit card debt (\$977 billion).

Student debt is a societal issue. The good news is that there are many people outside of our profession who are paying attention to student debt and searching for solutions. There's a rising chorus of voices eager to see progress made toward lowering the cost of education across the board.

tive focuses on creative solutions to help veterinarians develop financially sustainable and rewarding careers.

We also work with organizations like the Veterinary Information Network to provide tools that support decision-making on managing veterinary education debt. Many resources can be found at MyVeterinaryLife.com, our new site for early-career veterinarians.

Student debt: By the numbers

- > Americans owe **\$1.48 trillion** for student loans.
- > 2017 U.S. veterinary graduates owed **\$403 million** in student loans.
- > U.S. average monthly student loan payment (borrowers age 20-30): **\$351**

Average student debt by group:

- > Graduating veterinarians (2017): **\$166,714**
- > All health science graduates (2014): **\$161,772**
- > Law school graduates (2014): **\$140,616**

—Source: AVMA

On the legislative front, much of the AVMA's advocacy work focuses on student debt as we work in Washington, D.C., to protect and expand loan forgiveness and repayment programs, representing the veterinary perspective in discussions about higher education funding at the federal level.

What do you do?

There are never easy solutions when your debt and your income don't match up. If you're facing student debt or considering taking on more, the first step is to set up a personal budget and stick to it. Look for ways to reduce educational costs if you're in school or considering more education. Learn about strategies for loan repayment. (Dive into more at dvm360.com/studentdebt.) Take advantage of financial learning opportunities like webinars and financial CE sessions at conferences you attend.

And remember that the AVMA has many resources that can help you with financial planning and management. They're available to all AVMA and Student AVMA members as a benefit of your association membership. These resources include:

- > AVMA Personal Financial Planning Tool: avma.org/MyBudget
- > My Veterinary Life, the AVMA's new website for early-career veterinarians and veterinary students: MyVeterinaryLife.com
- > Student Financial Resources: avma.org/SAVMA
- > Financial webinars: avma.org/CE
- > AVMF veterinary student scholarships: avmf.org.

Bridgette Bain, PhD, is associate director of analytics with the AVMA Veterinary Economics Division.

Loan repayment program to benefit recent grads in Colorado

State program will help repay veterinary debt for students going into large-animal medicine.

Colorado, like many livestock-producing states across the country, is experiencing a lack of rural veterinarians, officials say. One-third of Colorado's 64 counties lack the veterinarians needed to care for the sheep, hogs, dairy cattle and beef cattle essential to food production and the well-being of rural communities, according to a release from Colorado State University.

In order to combat the veterinary shortage, a new state program, with staff support from Colorado State University's College of Veterinary Medicine and Biomedical Sciences, is helping to repay college debt for veterinarians who pledge to practice livestock medicine in underserved agricultural communities.

According to the AVMA, educational debt for veterinary school graduates is nearly \$144,000 with more than 20 percent of recent veterinary graduates surpassing \$200,000 in debt. With this sky-high debt hanging over their heads, recent graduates who want to practice large-animal medicine in rural communities can't afford to do so, the release states.

"Much of rural Colorado is a long way from a practicing veterinarian. It's a real problem," says Scott Johnson, chair of the recently established council that runs the Colorado Veterinary Education Loan Repayment Program, in the release. "This program is a real win for new veterinary graduates who want to practice in rural Colorado, and it's a real win for production agriculture."

The program aims to tackle the lack of large-animal veterinarians in rural areas by eliminating financial concerns. The CSU release states that over a four-year period, the program will provide \$70,000 for each awardee. The program is accepting its first round of applications through Oct. 31 and the first two recipients will be named in December.

Kayla Henderson, DVM, a 32-year-old veterinarian in southern Colorado's San Luis Valley, views the loan-repayment program from the perspective of a young practitioner.

"It's huge," she says of the repayment program's importance.

Dr. Henderson is vice chair of the program council. She's also a 2012 CSU veterinary graduate and a third-generation cattle rancher who returned to her hometown, Monte Vista, Colorado, to provide medical care for cattle, horses and other animals, according to the release. Without support from the USDA's federal loan repayment program—the model for the new state program—she wouldn't have been able to fulfill her childhood dream, she says.

Officials anticipate that many awardees will be young veterinarians, like Dr. Henderson, who grew up in rural Colorado and want to return home to practice.

According to the release, the program council will select two awardees in its first cycle; that number may rise if the state allocates additional funds to the program, officials say.

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High-flying planes in your vet hospital



The overhead horizontal plane is showing up in dvm360 Hospital Design Competition entries. Will it land in your own practice design? *By Tim Parsons, AIA*

One architectural element seemed to make a recurring appearance in many of this year's dvm360 Hospital Design Competition entries: overhead horizontal planes. So, what are they, what are they for, and do you want them in your practice? Let's show off some examples in these two award-winning veterinary hospitals' reception areas.

A more human scale

In a tall, voluminous space, placing a horizontal element at a lower elevation can serve to bring the height down to a more human scale. If desired, this element may also be an opportunity to splash color in an otherwise-white sea of ceiling tile. Some horizontal planes provide a surface for mounting light fixtures, whether recessed cans or decorative pendants. In the photos at left, you can see recessed cans in the ceiling tiles and pendant lights hanging from the overhead horizontal planes. Pendants may be suspended at various lengths.

A fascinating thing about this feature in the hands of a skilled architect is, veterinary clients can take physical cues from horizontal planes. They can suggest a transition to a different type of space, be it a different function (front to back) or an area that shouldn't be entered without staff guidance.

Linear or free-form

Horizontal planes can be more lean and linear in form—like an overhead soffit above a reception desk (in the photos at left) or more free-form in nature, extending beyond the desk



The planes function as visual elements above the reception desk and on the way down both hallways from reception at Noah's Westside Animal Hospital, Merit Award winner in the 2018 dvm360 Hospital Design Competition. Photo by Jonathan Bednarski, Fotovan; primary architect Wayne Usiak, BDA Architecture



The profession needs you

Quick! If you've got pictures of your new hospital or remodel, we want them. You have until Nov. 30 to enter the 2019 dvm360 Hospital Design Competition. The two Hospitals of the Year (one category for more than 8,000 square feet, the other for under 8,000) as well as a handful of Merit Award winners will be chosen to grace the pages of this magazine and sister magazine *Vetted* next year. You and your team deserve kudos for all your hard work, and the profession can learn from—and be inspired by—your new hospital. Visit dvm360.com/enterhd for details and the entry form. Good luck!

confines to provide an opportunity for an architectural element, a light fixture or an accent color (in the photo bottom left on the way to a door that leads from the emergency lobby to the general practice lobby).

As shown in the photos at right, a horizontal plane is a nice place for a centrally located overhead soffit that acts as a base for light fixtures—like the drop-style pendants above—which were seen in abundance in this year's dvm360 Hospital Design Competition entries.

Here's to hoping your veterinary architect puts up some overhead horizontal planes that make you heady with happiness!

Visit dvm360.com/HDgalleries to see more award-winning designs.

Tim Parsons, AIA, is lead creative designer for veterinary building company TerWisscha Construction.



A plane shows up as a strip over the reception desk at Wheat Ridge Animal Hospital, Specialty Hospital of the Year in 2018 dvm360 Hospital Design Competition. Photo by Tim Murphy, Murphy Foto Imagery; primary architect Brad Haswell, Studio DH Architecture; second architect Tony Cochrane, Animal Arts

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Readers say ethics column on natural vs. prescription parasite prevention misses key points

Not surprisingly, a Dr. Marc Rosenberg column in last month’s *dvm360* magazine about two veterinarians who disagree over the best way to prevent fleas and ticks in veterinary patients has inspired more debate.

Editor’s note: Both of these letters are in response to “Prescription vs. natural: A clash over parasite products” (October 2018; read at dvm360.com/clash).

I believe that “natural” products are usually a sales pitch. Clients don’t realize that these often have no research to prove the products work. They also need to know that even natural ingredients can be toxic to their pets. I have concern about the veterinarian claiming that FDA-approved products killed some of her pets. Did she have necropsies performed to prove their cause of death? That is the biggest question I need answered before I start looking further into her stories.

—Jody Jones, DVM
Lincoln, Nebraska

In reading this article, I have found an interesting double standard: Dr. Palm is facing criticism and censure for recommending all-natural flea and tick prevention without adequately educating the client about all the available options. And yet, didn’t Dr. Kline do exactly the same thing by recommending prescription products without educating his client about natural alternatives—particularly considering that only after receiving pushback does Dr. Kline later say he would provide a recommendation for a natural product?

The hypocrisy is a bit difficult for me to stomach. If practitioners advocating for natural treatments are expected to provide client education on traditional therapies and approaches, it seems to me that it is only fair to expect supporters of traditional practices to provide the same level of client education regarding natural therapies. We either want our clients fully educated to make their own decisions, or we want them just educated on our one point of view so they make the decision we support.

I’m sorry, but the latter does not sound like “informed consent” to me.

—Anne Taylor, DVM, CCRT
Davenport, Iowa

Semintra® (telmisartan oral solution) 10 mg/mL

For oral use in cats only
Angiotensin II Receptor Blocker

Brief Summary: Before using SEMINTRA, please consult the product insert, a summary of which follows:

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

Description: SEMINTRA (telmisartan oral solution) is a clear, colorless to yellowish viscous solution containing 10 mg/mL telmisartan.

Indication and Usage: SEMINTRA is indicated for the control of systemic hypertension in cats. The initial dose of SEMINTRA is 1.5 mg/kg (0.68 mg/lb) orally twice daily for 14 days, followed by 2 mg/kg (0.91 mg/lb) orally once daily. The dose may be reduced by 0.5 mg/kg (0.23 mg/lb) increments to a minimum of 0.5 mg/kg (0.23 mg/lb) orally once daily to manage SEMINTRA-induced hypotension. SEMINTRA can be administered directly into the mouth, or next to or on top of a small amount of food. Do not mix into food.

SEMINTRA should be administered using the dosing syringe provided in the package. The dosing syringe fits onto the bottle and has 0.1 mL incremental marks. The dose should be rounded to the nearest 0.1 mL. After administration close the bottle tightly with the cap. Rinse the dosing syringe with water and let air dry.

If the cat vomits within 30 minutes of dosing, the cat may be re-dosed.

Information for Cat Owners: Adverse reactions can occur with use of SEMINTRA. The most common adverse reactions reported during the field studies included vomiting, diarrhea, lethargy, weight loss, anemia and dehydration.

Contraindications: Do not use in cats with a hypersensitivity to telmisartan.

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

SEMINTRA is an angiotensin II antagonist/angiotensin receptor blocker (ARB). Pregnant women should avoid contact with SEMINTRA because substances that act on the renin-angiotensin-aldosterone system (RAAS) such as angiotensin receptor blockers (ARBs) can cause fetal and neonatal morbidity and death during pregnancy in humans.

Precautions: SEMINTRA can cause mild anemia or non-regenerative anemia. Cats should be monitored for anemia when initiating treatment with SEMINTRA.

SEMINTRA may cause inappetence and weight loss in some cats. Cats should be monitored for weight loss when initiating treatment with SEMINTRA. Use with caution in cats with a history of vomiting, inappetence or weight loss.

SEMINTRA has not been evaluated in cats with systolic blood pressure >200 mm Hg.

The safe use of SEMINTRA in cats with hepatic disease has not been evaluated. SEMINTRA is metabolized by the liver.

The safe use of SEMINTRA has not been evaluated in cats less than 9 months of age, or in cats that are pregnant, lactating, or intended for breeding.

See Human Warnings.

The safe use with other anti-hypertensive medications has not been evaluated.

Adverse Reactions: The safety of SEMINTRA was evaluated in a 28-day field study in 192 cats. Adverse reactions that occurred include vomiting 46 (24.0%), diarrhea 18 (9.4%), lethargy 13 (6.8%), weight loss 13 (6.8%), decreased appetite/inappetence 13 (6.8%) 7 (7.3%) non-regenerative anemia 11 (5.7%), dehydration 10 (5.2%), retinal lesions (target organ damage) 4 (2.1%).

The long-term safety of SEMINTRA was evaluated in an open label, 5 month field effectiveness and safety study in 107 cats that received at least one dose of SEMINTRA. Adverse reactions that occurred in this study are weight loss 37 (34.6%), vomiting 32 (29.9%), dehydration 18 (16.8%), non-regenerative anemia 17 (15.8%), anorexia 14 (13.1%), diarrhea 12 (11.2%),

lethargy 12 (11.2%), decreased appetite/inappetence 11 (10.3%), heart murmur 10 (9.3%), death, euthanasia, found dead 9 (8.4%), cough 8 (7.5%) and retinal lesions (target organ damage) 6 (5.6%).

Nine cats died or were euthanized during the study. Three cats had progressive chronic kidney disease that may have been affected by telmisartan treatment, concurrent disease, or inadequate control of hypertension. The other six cats died of causes unrelated to treatment (e.g. neoplasia).

To report suspected adverse drug events, for technical assistance, or to obtain a copy of the Safety Data Sheet (SDS), contact Boehringer Ingelheim Vetmedica, Inc. at 1-866-638-2226. For additional information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDA-VETS or at <http://www.fda.gov/AnimalVeterinary/SafetyHealth>.

Effectiveness: Effectiveness was demonstrated in a 28-day multi-center, controlled, randomized and masked field study in client-owned cats with hypertension, and in an open-label 5-month field study.

28-Day Field Study

In a 28-day study, 288 cats with hypertension (systolic blood pressure [SBP] 160-200 mmHg) were enrolled in the study and randomized to treatment with SEMINTRA (telmisartan oral solution) (n=192) or vehicle control (n=96). The study population included cats with hypertension associated with chronic kidney disease or controlled hyperthyroidism, or idiopathic hypertension. The per protocol population for effectiveness was 141 SEMINTRA treated cats and 79 control cats. SEMINTRA was administered orally at 1.5 mg/kg twice daily for 14 days, then 2 mg/kg once daily until study end; the vehicle control was administered at a mL/kg volume equivalent to SEMINTRA. The two primary variables for effectiveness were comparison of the SEMINTRA and control group mean SBP (mSBP) from baseline to Day 14, and a decrease in mSBP >20 mmHg in the SEMINTRA group from baseline to Day 28. Cats with SBP >180 mmHg at Days 14 or 28 were rescued and removed from the study. There was a statistically significant difference between the mSBP for the SEMINTRA group compared to the control group at Day 14 (p=0.0005). At Day 14 the SEMINTRA group mSBP decreased by 23.2 mmHg, and the control group mSBP decreased by 7.3 mmHg. At Day 28, the SEMINTRA group mSBP decreased 23.9 mmHg compared to baseline.

5-Month Field Study

One hundred-seven cats from the SEMINTRA group that had successfully completed the 28-day study were enrolled in a 5-month open-label study. At the beginning of the 5-month study most cats were administered SEMINTRA at 2 mg/kg once daily. Cats that experienced hypotension (defined as SBP <120 mmHg) at 2 mg/kg once daily could have the SEMINTRA dose reduced to 1 mg/kg once daily. Cats that experienced hypotension at 1 mg/kg once daily could have the SEMINTRA dose reduced again to 0.5 mg/kg once daily. Cats were evaluated for SBP, target organ damage (TOD; primarily assessed by retinal photographs), clinical pathology and adverse reactions. SBP was measured on Days 28, 56, 98, 140 and 182 and retinal photographs and clinical pathology were collected on Days 28, 98 and 182. Seventy-three (68.2%) cats completed the study (Day 182), 8 cats were removed for hypertension (SBP >180 mmHg), 2 cats were removed for hypotension, 10 cats were removed by the owner or for owner non-compliance, 8 cats were removed for new or worsening TOD, and 6 cats were removed for adverse reactions unrelated to TOD. Twenty-six cats had dose reductions to 1 mg/kg once daily to manage hypotension. Of these 26 cats, 10 had an additional dose reduction to 0.5 mg/kg once daily.

NADA 141-501, Approved by FDA

Manufactured for:

Boehringer Ingelheim Vetmedica, Inc.
St. Joseph, MO 64506, U.S.A.

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Reference: Package Insert 449201-00 Revised 03/2018 09/2018

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IMPORTANT SAFETY INFORMATION

SEMINTRA is an angiotensin II antagonist/angiotensin receptor blocker (ARB). Pregnant women should avoid contact with SEMINTRA because it can cause fetal and neonatal morbidity and death during pregnancy in humans. Pregnant women should avoid contact with SEMINTRA because other similar drugs have been found to harm the unborn baby during pregnancy. **Precautions:** SEMINTRA can cause mild anemia or non-regenerative anemia. Cats should be monitored for anemia when initiating treatment. Cats should be monitored for weight loss when initiating treatment with SEMINTRA. Use with caution in cats with a history of vomiting, inappetence, or weight loss. The safe use of SEMINTRA in cats with hepatic disease has not been evaluated. SEMINTRA is metabolized by the liver. SEMINTRA has not been evaluated in cats with systolic blood pressure > 200 mmHg. The safe use of SEMINTRA has not been evaluated in cats less than 9 months of age, or in cats that are pregnant, lactating, or intended for breeding. The safe use with other anti-hypertensive medications has not been evaluated. For additional information, see the full prescribing information on page 32.

References: 1. Semintra® (telmisartan oral solution) Prescribing Information. Boehringer Ingelheim Vetmedica, Inc. 2018.
2. Zimmering T. Ease of use of Semintra® and its effects on quality of life—update on cat owner feedback ("EASY Programme") [abstract]. In: Proceedings from the 21st Federation of European Companion Animal Veterinary Associations (FECAVA); October 15–17, 2015; Barcelona, Spain. Poster.

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Semintra®

(telmisartan oral solution)



Dr. Greenskin makes an offer

Our favorite associate decides she wants to buy her boss out, so she makes Dr. Codger an offer he can't refuse ... or can he?

It's one of those rare quiet afternoons in the hospital. Thanks to a couple of no-show new clients and a few "I think my pet is dying!" appointments with simple solutions, Dr. Greenskin is having one of those days that makes her worry about her job security. Perhaps she should learn to refocus and recharge during these highly infrequent unfrenzied moments instead of picturing herself penniless on the street as soon as cases stop flowing through the door nonstop.

On a positive note, the timing of this slowdown gives Dr. Greenskin the window she needs to attend to some important business. After months of analyzing the benefits and sacrifices, poring over numbers and finalizing her business plan, she's finally built up the nerve to plunk down her firm offer to buy the clinic from Dr. Codger.

Full of confidence, the young doctor grabs a tidy manilla envelope detailing her offer and plans for the hospital, as

well as some contingencies depending on how receptive the old man seems to be, and takes off in search of Dr. Codger himself.

When she finds him, he is in an unusually chipper mood. It might be the result of his new daily flaxseed regimen, but whatever the cause, Dr. Greenskin sees her opportunity to pounce. Feeling calm and collected, she enters the lion's den—that musty, wood-paneled office littered with decades of weathered vet magazines where Dr. Codger has spent the vast majority of his life.

Dr. Codger's chair creaks as he leans back to greet his protégé.

"Pretty quiet out there today," the old man states with knitted brows. "These slow days happen, you know. It's best to use them to catch up on your records and maybe read a couple of journals."

Dr. Greenskin smiles and nods as she seats herself across from the old DVM. Placing her folder on the desk,

she begins her well-rehearsed pitch.

"I've really enjoyed my time here," she begins, "and I can't overstate how much I appreciate your guidance and all the hard work you dedicate to this hospital every single day."

Dr. Codger detects the weight of what's coming. His chair groans again as he leans forward for the revelation.

Dr. Greenskin can't help but grin ear to ear as she continues: "So that's why I want to make an offer to buy this hospital and work with you toward your eventual retirement!"

With the cat out of the bag, the confident associate eyes her boss closely, hoping to get a jump on negotiations. A smile is barely visible on Dr. Codger's otherwise solemn face. After a pause long enough to make Dr. Greenskin's soaring heart sink, he finally responds.

"Well, Dr. Greenskin, I'm so proud of you," he begins with a voice as creaky as the chair holding him up. "You're just getting started in this gig. You're going



They've got issues

You think this is all the drama these two veterinarians have gotten into over the years? Nope. Catch up with it all at dvm360.com/campfield.

OLD SCHOOL, NEW SCHOOL

to do great things in your career—I have no doubt about that! I’m honored that you’d be willing to step up and take the reins! But as far as this hospital is concerned, well ... “

He pauses. The silence is suffocating, and Dr. Greenskin struggles to breathe in the Old-Spice-cologne-scented office.

“I’m sorry to tell you that the practice has already been sold,” he continues at last. “I signed all of the papers last week. It’s a smaller corporate outfit, and they’re going to take great care of you and the entire team. They plan to add facilities as well as staffing, including two more doctors. They’re very likely to offer you a medical director position, in which case you’d be a big player in the leadership here at the clinic. You’re the only one who knows about any of this. I was planning on gathering everyone up in a couple days for the big announcement.”

Stunned, Dr. Greenskin sits back, her thoughts racing. A few hot tears stream down her face. Dr. Codger tactfully gives her a box of tissues and some time to regain her composure.

“Oh, wow,” she stammers. “I just thought—we’d talked many times about me possibly taking over—and I thought you wanted the practice to stay independent. I thought we had an understanding.”

Dr. Codger looks his young protégé in the eye.

“This was simply a business decision,” he says, “and I don’t want you to take it personally. Both parties were ready to move, and timing is very important. The corporation has the resources to do all the things I should’ve done a long time ago but never made time for. They’re going to take this hospital to the next level. It’s going to be the best decision for all of us.”

He shrugs, then gets a little more personal: “Plus, to be honest, I really didn’t think you were interested in buying. You weren’t clear enough with me on that. If you want to own a practice, then you absolutely will. I’m afraid it just won’t be this one—at least not at this point in time. You’re a great doctor, and I want you to learn from this experience. I’m sure the next time an opportunity to own arises, you’re going to be all over it.”

Dr. Greenskin does her best to

absorb this final lesson from her longtime mentor, but with her wounds so fresh, she can’t help but feel her relationship with Dr. Codger is crumbling before her eyes. Marking a profound moment in her professional development, the young associate realizes that even her most trusted and revered mentor is capable of letting her down. Dr. Greenskin makes a quick promise to herself that she’ll never again put a boss or mentor on the type of pedestal Dr. Codger has occupied, then stands up to leave—but not before delivering a few parting words.

“I understand, doc,” she says with a sigh that helps ease the tension in her chest. “You had to make the right decision for all involved. I wish I would’ve been more persistent and forward. I’m sure this will be a good change. I won’t say anything to anyone so you can make the announcement on your own terms.”

Dr. Greenskin exits the office to find a safe, quiet place to be alone, while Dr. Codger remains seated, gazing pensively at the collection of bobblehead animals adorning his old wooden desk. He does care about Dr. Greenskin and knows she’ll be just fine.

“It’s an important life lesson for her,” he mumbles to himself while picking up the phone, a smile appearing at the corners of his mouth. “Now, I need to get my travel agent back on the phone. Time to go wild!”

Is this the outcome you envisioned for our two favorite vets? Is it what you would’ve chosen for them? Or is it the inevitable conclusion in today’s business environment? What will the fallout be when Dr. Codger makes the big announcement? Find out next time in Old School, New School.

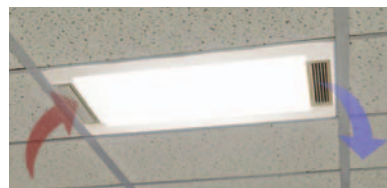
Dr. Jeremy Campfield lives near Sacramento with his family, including an aging mini Aussie and an obstreperous pitbull mix that some mistake for a chocolate Lab (to the delight of her owners). When the family is not getting their hands dirty in the garden, Dr. Campfield indulges in his love for the outdoors with hiking, kitesurfing and climbing aboard any two-wheeled contraption. Please remember: Watch for cyclists, share the road, and pass them like you love them!

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Playing monopoly in the vet market

As more practices are bought by larger companies, are consolidators undertaking legal restraint of trade? Let's roll the dice and find out.

Several years ago, when the flood of corporate veterinary acquisitions was more of a trickle, I was asked to opine on the possibility that corporate veterinary ownership could run afoul of state and federal laws designed to prohibit restraint of competition in the veterinary health provider space.

The quandary is this: If a certain region were fully or nearly fully served only by veterinary hospitals owned by one or more large corporations, would this trigger regulations designed to protect the public from anticompetitive forces like price fixing, restraint of competition and price-gouging?

Learning the rules of play
After reviewing what I know about federal and state antitrust regulation

and doing some research, I formulated a response that I think remains quite valid today, even in light of the virtual bidding war going on among veterinary practice consolidators for new target hospitals.

My conclusion? I just don't see the government being particularly concerned or prepared to launch any robust new regulatory activity.

My expectation remains that, in an environment where far larger industries are being allowed relatively unfettered merger opportunities (consider Disney's acquisition of 21st Century Fox), it's difficult to imagine that regulators will become particularly alarmed by the consolidation of veterinary medical service providers. After all, the veterinary medical space is far smaller than the human

health field, in which behemoths such as Kaiser Permanente and Northwell continue to expand and consolidate virtually unchallenged.

And though pet spending has reached about \$70 billion this year, veterinary care is only one element of that space. Regulators seem more likely to target higher-profile segments such as OTC products, pet insurance and pet food than the relatively esoteric veterinary field—which many authorities likely think is already adequately policed through practice acts and state veterinary boards.

In fact, my opinion that veterinary practice consolidation is unlikely to pique regulators' interest has recently been bolstered by personal experience.

First, remember that antitrust laws prohibiting anticompetitive



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consolidation are designed primarily to protect consumers—the general public—from unreasonable increases in pricing attributable to an artificial reduction in the number of vendors offering a specific product or service.

So far, corporations can pass Go

My veterinary-law office just isn't seeing much in the way of practice roll-ups forcing veterinary prices upward. So far, at least, I haven't become alarmed that the consolidators purchasing my clients' clinics are smacking the public with outlandish price increases. I'm getting similar reports from practice sellers (who usually remain employed, at least for a few years, at the clinics they have sold).

Here's what we are currently observing with respect to the consolidation of veterinary hospitals:

In small markets (metropolitan areas with populations under 100,000), practices that might be interesting to consolidators (those with annual gross revenue of more than \$1.5 million) are relatively few in number. When roll-up companies buy clinics in these areas, they often have difficulty staffing their acquisitions, mostly because younger doctors tend to want to migrate to more exciting cities. Because professional employees are a scarce local resource in small cities and towns, I just don't see the corporations pushing out mom-and-pop clinics.

In medium-sized markets (populations of 100,000 to 1 million), the consolidator hunt for practices to buy is full-on. Sellers are getting multiple offers and it's getting increasingly difficult for independent veterinarians to purchase existing practices—many are just becoming too expensive. Nonetheless, with corporations large and small competing for a foothold in these markets, the public is often the beneficiary. The acquired practices fall all over each other in an effort to retain and cultivate clients. Small- and medium-sized consolidators want to attract a plethora of new clients so they'll have a bursting portfolio of customers when they make the move to either sell to a competitor or go public in an initial public offering. As such, I believe it could take a while before veterinary corporations start having a substantial impact on prod-

uct or service pricing in many of our nation's mid-sized metropolitan areas.

Large markets (Houston, Philadelphia, Chicago) are places where I could imagine anticompetitive behavior unfolding as big-money consolidation players squeeze out, merge with or buy out smaller consolidators. But, remember, in big cities the public often expects higher than average prices. Folks probably don't price shop as aggressively on the North Shore of Long Island as they do in Omaha. So if there is an anticompetitive impact

The constant drop in the number of veterinary clinic "entities" providing general and specialty veterinary services to the public is unquestionably placing artificial and substantial downward pressure on the compensation of associate veterinarians.

from a mass acquisition of veterinary hospitals, it may not be noticed right away. And when it is noticed, perhaps nobody will be that edgy about it in a world where draft beer goes for \$10 a pint. I see the government only marginally concerned with pet care cost increases in big cities. And I see it disinclined to do much about it.

So, by all appearances, the blinding pace of veterinary practice purchases has not created changes in pricing or service options that would motivate regulators to protect the public. And, to reiterate, the government in its trade-regulatory capacity is not focused on the impact of consolidation on the competitors. In other words, the Federal Trade Commission isn't designed to protect Circuit City from getting hurt when Best Buy edges it out. Not as long as other players keep prices down and options available.

So who's pulling the Go to Jail card?

But just because consolidation in our industry doesn't yet appear to be seriously harming the consumer—and even though the law isn't designed to protect small businesses from larger competitors—nobody said veterinary practice roll-ups weren't hurting one very important subset of the public. In fact, one group is getting hurt a lot.

The constant drop in the number of veterinary clinic "entities" provid-

ing general and specialty veterinary services to the public is unquestionably placing artificial and substantial downward pressure on the compensation of associate veterinarians.

I have become convinced that this group is taking a major hit economically from the consolidation trend. I'm convinced because of what I read in the associate contracts I see on a daily basis. Stay tuned ... I will describe in detail what this financial impact looks to be next month in part two of this two-part series. I'll lay out in detail

the phenomenon I see emerging as clinic consolidation rapidly moves forward—I call it "the commoditization of the DVM."

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

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'Can you believe that homeless guy owns a pet?!'

It's easy to get judgy about a pet living in poverty. Before you do, take a moment to imagine where its owner came from.

As you may know, my wife and I travel outside the U.S. a great deal. We've visited a number of developing countries where poverty is a way of life. Yet many people who can hardly feed themselves have pets. When basic needs are barely met, what makes pet ownership appear so natural? Recently, in Indonesia, we saw people caring for dogs and cats when they were struggling to provide for themselves. Why? What needs are these pets filling?

I recently read an online story on Medium.com about why homeless people own pets (see the link in this article at dvm360.com/homeless). I'm not talking about strays or feral animals but real pets that, like their owners, have found themselves without a fixed home. It's been estimated that as many as 10 percent of homeless people have pets.

Why it happens

Turns out there are a number of reasons why people who are struggling to survive take on the responsibility for another life.

Companionship. Being homeless is an isolating experience, and in some cases, a pet is the only source of nonjudgmental love for someone who's sleeping on the street.

Comfort for the mentally ill. Experts say about a third of homeless Americans are affected by some form of mental illness. We know that pets have well-documented therapeutic benefits. A pet is sometimes the only mental health-related assistance available to a homeless person.

Personal safety. People living on the streets, particularly women, are vulnerable. These pets can help homeless people protect themselves and their possessions. They can also be a



Being homeless is an isolating experience, and in some cases, a pet is the only source of nonjudgmental love for someone who's sleeping on the street.

stabilizing influence for a person with no help from family or social support.

Why it can be a good thing

There are some other less obvious considerations to keep in mind the next time you see a pooch or feline with a homeless person.

Not a forever situation. Not all homeless situations are permanent or even long-term. Less than 20 percent of homeless people are long-term or chronically homeless. More than 80 percent are "between homes." Pet owners may have had the pet while living in a previous home, and they continue to take care of it while on the street.

Purpose and accountability. This is one of the great lessons children learn from pet ownership, and adults grow up and can benefit from the same purpose. Pets impart responsibility, and this is no different for homeless people. In fact, the emotional impact of a pet can be even more powerful for owners without a home. The Homeless Hub reviewed a study that shows just how

transformative pet ownership can be for homeless individuals (find a link to this at dvm360.com/homeless).

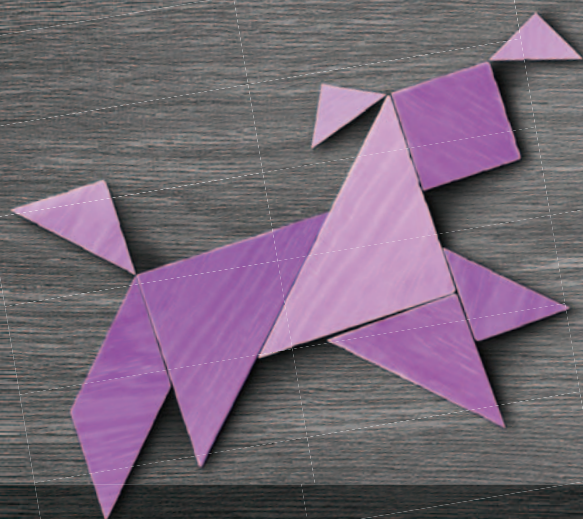
It's easy to look at a homeless person with a pet and wonder whether the pet is a tool of manipulation, a prop to gain sympathy. But the next time you encounter this scenario, consider that there's likely more to the story than you know. A lot of animal care shelters and individual veterinary professionals lend a hand by providing medical care to these pets. A little compassion can go a long way, so don't judge those less fortunate. The next time you see a sign that asks for help, say "hi," smile and lend a hand when you can to pet owners without a home.

Dr. Mike Paul is the former executive director of the Companion Animal Parasite Council and a former president of the American Animal Hospital Association. He is currently the principal of MAGPIE Veterinary Consulting. He is retired from practice and lives in Anguilla, British West Indies.

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IMPORTANT SAFETY INFORMATION: METACAM (meloxicam oral suspension) and PREVICOX (firocoxib) are for use in dogs only. METACAM (meloxicam) Solution for Injection is approved for use in dogs or cats. Repeated use of meloxicam in cats has been associated with acute renal failure and death. Do not administer additional injectable or oral meloxicam to cats. As a class, cyclooxygenase inhibitory NSAIDs like METACAM and PREVICOX may be associated with gastrointestinal, kidney, or liver side effects. Dogs should be evaluated for pre-existing conditions and currently prescribed medications prior to treatment with METACAM or PREVICOX, then monitored regularly while on therapy. Concurrent use with another NSAID, corticosteroid, or nephrotoxic medication should be avoided or monitored closely.

Please see brief summaries of full prescribing information for products mentioned in this ad on pages 40-41.



CHEWABLE TABLETS

Brief Summary: Before using PREVICOX, please consult the product insert, a summary of which follows:

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

Indications: PREVICOX (firocoxib) Chewable Tablets are indicated for the control of pain and inflammation associated with osteoarthritis and for the control of postoperative pain and inflammation associated with soft-tissue and orthopedic surgery in dogs.

Contraindications: Dogs with known hypersensitivity to firocoxib should not receive PREVICOX.

Warnings: Not for use in humans. Keep this and all medications out of the reach of children. Consult a physician in case of accidental ingestion by humans.

For oral use in dogs only. Use of this product at doses above the recommended 2.27 mg/lb (5.0 mg/kg) in puppies less than seven months of age has been associated with serious adverse reactions, including death (see Animal Safety). Due to tablet sizes and scoring, dogs weighing less than 12.5 lb (5.7 kg) cannot be accurately dosed.

All dogs should undergo a thorough history and physical examination before the initiation of NSAID therapy. Appropriate laboratory testing to establish hematological and serum baseline data is recommended prior to and periodically during administration of any NSAID. **Owners should be advised to observe for signs of potential drug toxicity (see Adverse Reactions and Animal Safety) and be given a Client Information Sheet about PREVICOX Chewable Tablets.**

For technical assistance or to report suspected adverse events, call 1-877-217-3543. For additional information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDAVETS or <http://www.fda.gov/AnimalVeterinary/SafetyHealth>

Precautions: This product cannot be accurately dosed in dogs less than 12.5 pounds in body weight. Consider appropriate washout times when switching from one NSAID to another or when switching from corticosteroid use to NSAID use.

As a class, cyclooxygenase inhibitory NSAIDs may be associated with renal, gastrointestinal and hepatic toxicity. Sensitivity to drug-associated adverse events varies with the individual patient. Dogs that have experienced adverse reactions from one NSAID may experience adverse reactions from another NSAID. Patients at greatest risk for adverse events are those that are dehydrated, on concomitant diuretic therapy, or those with existing renal, cardiovascular, and/or hepatic dysfunction. Concurrent administration of potentially nephrotoxic drugs should be carefully approached and monitored. NSAIDs may inhibit the prostaglandins that maintain normal homeostatic function. Such anti-prostaglandin effects may result in clinically significant disease in patients with underlying or pre-existing disease that has not been previously diagnosed. Since NSAIDs possess the potential to produce gastrointestinal ulceration and/or gastrointestinal perforation, concomitant use of PREVICOX Chewable Tablets with other anti-inflammatory drugs, such as NSAIDs or corticosteroids, should be avoided. The concomitant use of protein-bound drugs with PREVICOX Chewable Tablets has not been studied in dogs. Commonly used protein-bound drugs include cardiac, anticonvulsant, and behavioral medications. The influence of concomitant drugs that may inhibit the metabolism of PREVICOX Chewable Tablets has not been evaluated. Drug compatibility should be monitored in patients requiring adjunctive therapy. If additional pain medication is needed after the daily dose of PREVICOX, a non-NSAID class of analgesic may be necessary. Appropriate monitoring procedures should be employed during all surgical procedures. Anesthetic drugs may affect renal perfusion, approach concomitant use of anesthetics and NSAIDs cautiously. The use of parenteral fluids during surgery should be considered to decrease potential renal complications when using NSAIDs perioperatively. The safe use of PREVICOX Chewable Tablets in pregnant, lactating or breeding dogs has not been evaluated.

Adverse Reactions:

Osteoarthritis: In controlled field studies, 128 dogs (ages 11 months to 15 years) were evaluated for safety when given PREVICOX Chewable Tablets at a dose of 2.27mg/lb (5.0 mg/kg) orally once daily for 30 days. The following adverse reactions were observed. Dogs may have experienced more than one of the observed adverse reactions during the study.

Adverse Reactions Seen in U. S. Field Studies		
Adverse Reactions	PREVICOX (n=128)	Active Control (n=121)
Vomiting	5	8
Diarrhea	1	10
Decreased Appetite or Anorexia	3	3
Lethargy	1	3
Pain	2	1
Somnolence	1	1
Hyperactivity	1	0

PREVICOX (firocoxib) Chewable Tablets were safely used during field studies concomitantly with other therapies, including vaccines, anthelmintics, and antibiotics.

Soft-tissue Surgery: In controlled field studies evaluating soft-tissue postoperative pain and inflammation, 258 dogs (ages 10.5 weeks to 16 years) were evaluated for safety when given PREVICOX Chewable Tablets at a dose of 2.27 mg/lb (5.0 mg/kg) orally approximately 2 hours prior to surgery and once daily thereafter for up to two days. The following adverse reactions were observed. Dogs may have experienced more than one of the observed reactions during the study.

Adverse Reactions Seen in the Soft-tissue Surgery Postoperative Pain Field Studies		
Adverse Reactions	Firocoxib Group (n=127)	Control Group* (n=131)
Vomiting	5	6
Diarrhea	1	1
Bruising at Surgery Site	1	1
Respiratory Arrest	1	0
SQ Crepitus in Rear Leg and Flank	1	0
Swollen Paw	1	0

*Sham-dosed (pilled)

Orthopedic Surgery: In a controlled field study evaluating orthopedic postoperative pain and inflammation, 226 dogs of various breeds, ranging in age from 1 to 11.9 years in the PREVICOX-treated groups and 0.7 to 17 years in the control group were evaluated for safety. Of the 226 dogs, 118 were given PREVICOX Chewable Tablets at a dose of 2.27 mg/lb (5.0 mg/kg) orally approximately 2 hours prior to surgery and once daily thereafter for a total of three days. The following adverse reactions were observed. Dogs may have experienced more than one of the observed reactions during the study.

Adverse Reactions Seen in the Orthopedic Surgery Postoperative Pain Field Study		
Adverse Reactions	Firocoxib Group (n=118)	Control Group* (n=108)
Vomiting	1	0
Diarrhea	2**	1
Bruising at Surgery Site	2	3
Inappetence/ Decreased Appetite	1	2
Pyrexia	0	1
Incision Swelling, Redness	9	5
Oozing Incision	2	0

A case may be represented in more than one category.

*Sham-dosed (pilled).

**One dog had hemorrhagic gastroenteritis.

Post-Approval Experience (Rev. 2009): The following adverse reactions are based on post-approval adverse drug event reporting. The categories are listed in decreasing order of frequency by body system:

Gastrointestinal: Vomiting, anorexia, diarrhea, melena, gastrointestinal perforation, hematemesis, hematachezia, weight loss, gastrointestinal ulceration, peritonitis, abdominal pain, hypersalivation, nausea

Urinary: Elevated BUN, elevated creatinine, polydypsia, polyuria, hematuria, urinary incontinence, proteinuria, kidney failure, azotemia, urinary tract infection

Neurological/Behavioral/Special Sense: Depression/lethargy, ataxia, seizures, nervousness, confusion, weakness, hyperactivity, tremor, paresis, head tilt, nystagmus, mydriasis, aggression, uveitis

Hepatic: Elevated ALP, elevated ALT, elevated bilirubin, decreased albumin, elevated AST, icterus, decreased or increased total protein and globulin, pancreatitis, ascites, liver failure, decreased BUN

Hematological: Anemia, neutrophilia, thrombocytopenia, neutropenia

Cardiovascular/Respiratory: Tachypnea, dyspnea, tachycardia

Dermatologic/Immunologic: Pruritis, fever, alopecia, moist dermatitis, autoimmune hemolytic anemia, facial/muzzle edema, urticaria

In some situations, death has been reported as an outcome of the adverse events listed above.

For a complete listing of adverse reactions for firocoxib reported to the CVM see: <http://www.fda.gov/downloads/AnimalVeterinary/SafetyHealth/ProductSafetyInformation/UCM055407.pdf>

Information For Dog Owners: PREVICOX, like other drugs of its class, is not free from adverse reactions. Owners should be advised of the potential for adverse reactions and be informed of the clinical signs associated with drug intolerance. Adverse reactions may include vomiting, diarrhea, decreased appetite, dark or tarry stools, increased water consumption, increased urination, pale gums due to anemia, yellowing of gums, skin or white of the eye due to jaundice, lethargy, incoordination, seizure, or behavioral changes. **Serious adverse reactions associated with this drug class can occur without warning and in rare situations result in death (see Adverse Reactions). Owners should be advised to discontinue PREVICOX therapy and contact their veterinarian immediately if signs of intolerance are observed.** The vast majority of patients with drug-related adverse reactions have recovered when the signs are recognized, the drug is withdrawn, and veterinary care, if appropriate, is initiated. Owners should be advised of the importance of periodic follow up for all dogs during administration of any NSAID.

Effectiveness: Two hundred and forty-nine dogs of various breeds, ranging in age from 11 months to 20 years, and weighing 13 to 175 lbs, were randomly administered PREVICOX or an active control drug in two field studies. Dogs were assessed for lameness, pain on manipulation, range of motion, joint swelling, and overall improvement in a non-inferiority evaluation of PREVICOX compared with the active control. At the study's end, 87% of the owners rated PREVICOX-treated dogs as improved. Eighty-eight percent of dogs treated with PREVICOX were also judged improved by the veterinarians. Dogs treated with PREVICOX showed a level of improvement in veterinarian-assessed lameness, pain on palpation, range of motion, and owner-assessed improvement that was comparable to the active control. The level of improvement in PREVICOX-treated dogs in limb weight bearing on the force plate gait analysis assessment was comparable to the active control. In a separate field study, two hundred fifty-eight client-owned dogs of various breeds, ranging in age from 10.5 weeks to 16 years and weighing from 7 to 168 lbs, were randomly administered PREVICOX or a control (sham-dosed-pilled) for the control of postoperative pain and inflammation associated with soft-tissue surgical procedures such as abdominal surgery (e.g., ovari hysterectomy, abdominal cryptorchidectomy, splenectomy, cystotomy) or major external surgeries (e.g., mastectomy, skin tumor removal \leq 8 cm). The study demonstrated that PREVICOX-treated dogs had significantly lower need for rescue medication than the control (sham-dosed-pilled) in controlling postoperative pain and inflammation associated with soft-surgery. A multi-center field study with 226 client-owned dogs of various breeds, and ranging in age from 1 to 11.9 years in the PREVICOX-treated groups and 0.7 to 17 years in the control group was conducted. Dogs were randomly assigned to either the PREVICOX or the control (sham-dosed-pilled) group for the control of postoperative pain and inflammation associated with orthopedic surgery. Surgery to repair a ruptured cruciate ligament included the following stabilization procedures: fabellar suture and/or imbrication, fibular head transposition, tibial plateau leveling osteotomy (TPLO), and 'over the top' technique. The study (n = 220 for effectiveness) demonstrated that PREVICOX-treated dogs had significantly lower need for rescue medication than the control (sham-dosed-pilled) in controlling postoperative pain and inflammation associated with orthopedic surgery.

Animal Safety: In a targeted animal safety study, firocoxib was administered orally to healthy adult Beagle dogs (eight dogs per group) at 5, 15, and 25 mg/kg (1, 3, and 5 times the recommended total daily dose) for 180 days. At the indicated dose of 5 mg/kg, there were no treatment-related adverse events. Decreased appetite, vomiting, and diarrhea were seen in dogs in all dose groups, including unmedicated controls, although vomiting and diarrhea were seen more often in dogs in the 5X dose group. One dog in the 3X dose group was diagnosed with juvenile polyarteritis of unknown etiology after exhibiting recurrent episodes of vomiting and diarrhea, lethargy, pain, anorexia, ataxia, proprioceptive deficits, decreased albumin levels, decreased and then elevated platelet counts, increased bleeding times, and elevated liver enzymes. On histopathologic examination, a mild ileal ulcer was found in one 5X dog. This dog also had a decreased serum albumin which returned to normal by study completion. One control and three 5X dogs had focal areas of inflammation in the pylorus or small intestine. Vacuolization without inflammatory cell infiltrates was noted in the thalamic region of the brain in three control, one 3X, and three 5X dogs. Mean ALP was within the normal range for all groups but was greater in the 3X and 5X dose groups than in the control group. Transient decreases in serum albumin were seen in multiple animals in the 3X and 5X dose groups, and in one control animal. In a separate safety study, firocoxib was administered orally to healthy juvenile (10-13 weeks of age) Beagle dogs at 5, 15, and 25 mg/kg (1, 3, and 5 times the recommended total daily dose) for 180 days. At the indicated (1X) dose of 5 mg/kg, on histopathologic examination, three out of six dogs had minimal periportal hepatic fatty change. On histopathologic examination, one control, one 1X, and two 5X dogs had diffuse slight hepatic fatty change. These animals showed no clinical signs and had no liver enzyme elevations. In the 3X dose group, one dog was euthanized because of poor clinical condition (Day 63). This dog also had a mildly decreased serum albumin. At study completion, out of five surviving and clinically normal 3X dogs, three had minimal periportal hepatic fatty change. Of twelve dogs in the 5X dose group, one died (Day 82) and three moribund dogs were euthanized (Days 38, 78, and 79) because of anorexia, poor weight gain, depression, and in one dog, vomiting. One of the euthanized dogs had ingested a rope toy. Two of these 5X dogs had mildly elevated liver enzymes. At necropsy all five of the dogs that died or were euthanized had moderate periportal or severe panzonal hepatic fatty change; two had duodenal ulceration; and two had pancreatic edema. Of two other clinically normal 5X dogs (out of four euthanized as comparators to the clinically affected dogs), one had slight and one had moderate periportal hepatic fatty change. Drug treatment was discontinued for four dogs in the 5X group. These dogs survived the remaining 14 weeks of the study. On average, the dogs in the 3X and 5X dose groups did not gain as much weight as control dogs. Rate of weight gain was measured (instead of weight loss) because these were young growing dogs. Thalamic vacuolation was seen in three of six dogs in the 3X dose group, five of twelve dogs in the 5X dose group, and to a lesser degree in two unmedicated controls. Diarrhea was seen in all dose groups, including unmedicated controls. In a separate dose tolerance safety study involving a total of six dogs (two control dogs and four treated dogs), firocoxib was administered to four healthy adult Beagle dogs at 50 mg/kg (ten times the recommended daily dose) for twenty-two days. All dogs survived to the end of the study. Three of the four treated dogs developed small intestinal erosion or ulceration. Treated dogs that developed small intestinal erosion or ulceration had a higher incidence of vomiting, diarrhea, and decreased food consumption than control dogs. One of these dogs had severe duodenal ulceration, with hepatic fatty change and associated vomiting, diarrhea, anorexia, weight loss, ketonuria, and mild elevations in AST and ALT. All four treated dogs exhibited progressively decreasing serum albumin that, with the exception of one dog that developed hypoalbuminemia, remained within normal range. Mild weight loss also occurred in the treated group. One of the two control dogs and three of the four treated dogs exhibited transient increases in ALP that remained within normal range.

Made in France
Marketed by: Merial, Inc., Duluth, GA 30096-4640, U.S.A.
1-877-217-3543
NADA 141-230, Approved by FDA
Rev. 09-2015

Brief Summary
NADA 141-213, Approved by FDA

Metacam®

(meloxicam oral suspension)
1.5 mg/mL (equivalent to 0.05 mg per drop) /0.5 mg/mL (equivalent to 0.02 mg per drop)
Non-steroidal anti-inflammatory drug for oral use in dogs only

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

Warning: Repeated use of meloxicam in cats has been associated with acute renal failure and death. Do not administer additional injectable or oral meloxicam to cats. See Contraindications, Warnings, and Precautions for detailed information.

Description: Meloxicam is a non-steroidal anti-inflammatory drug (NSAID) of the oxicam class. Each milliliter of METACAM Oral Suspension contains meloxicam equivalent to 0.5 or 1.5 milligrams and sodium benzoate (1.5 milligrams) as a preservative. The chemical name for Meloxicam is 4-Hydroxy-2-methyl-N-(5-methyl-2-thiazolyl)-2H-1,2-benzothiazine-3-carboxamide-1, 1-dioxide. The formulation is wwa yellowish viscous suspension with the odor of honey.

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

Contraindications: Dogs with known hypersensitivity to meloxicam should not receive METACAM Oral Suspension. **Do not use METACAM Oral Suspension in cats. Acute renal failure and death have been associated with the use of meloxicam in cats.**

Warnings: Not for use in humans. Keep this and all medications out of reach of children. Consult a physician in case of accidental ingestion by humans. **For oral use in dogs only.**

As with any NSAID all dogs should undergo a thorough history and physical examination before the initiation of NSAID therapy. Appropriate laboratory testing to establish hematological and serum biochemical baseline data is recommended prior to and periodically during administration. Owner should be advised to observe their dog for signs of potential drug toxicity and be given a client information sheet about METACAM.

Precautions: The safe use of METACAM Oral Suspension in dogs younger than 6 months of age, dogs used for breeding, or in pregnant or lactating dogs has not been evaluated. Meloxicam is not recommended for use in dogs with bleeding disorders, as safety has not been established in dogs with these disorders. As a class, cyclo-oxygenase inhibitory NSAIDs may be associated with gastrointestinal, renal and hepatic toxicity. Sensitivity to drug-associated adverse events varies with the individual patient. Dogs that have experienced adverse reactions from one NSAID may experience adverse reactions from another NSAID. Patients at greatest risk for renal toxicity are those that are dehydrated, on concomitant diuretic therapy, or those with existing renal, cardiovascular, and/or hepatic dysfunction. Concurrent administration of potentially nephrotoxic drugs should be carefully approached. NSAIDs may inhibit the prostaglandins that maintain normal homeostatic function. Such anti-prostaglandin effects may result in clinically significant disease in patients with underlying or pre-existing disease that has not been previously diagnosed. Since NSAIDs possess the potential to induce gastrointestinal ulcerations and/or perforations, concomitant use with other anti-inflammatory drugs, such as NSAIDs or corticosteroids, should be avoided. If additional pain medication is needed after administration of the total daily dose of METACAM Oral Suspension, a non-NSAID or non-corticosteroid class of analgesia should be considered. The use of another NSAID is not recommended. Consider appropriate washout times when switching from corticosteroid use or from one NSAID to another in dogs. The use of concomitantly protein-bound drugs with METACAM Oral Suspension has not been studied in dogs. Commonly used protein-bound drugs include cardiac, anticonvulsant and behavioral medications. The influence of concomitant drugs that may inhibit metabolism of METACAM Oral Suspension has not been evaluated. Drug compatibility should be monitored in patients requiring adjunctive therapy.

Adverse Reactions: Field safety was evaluated in 306 dogs.¹ Based on the results of two studies, GI abnormalities (vomiting, soft stools, diarrhea, and inappetence) were the most common adverse reactions associated with the administration of meloxicam.

The following adverse events are based on post-approval adverse drug experience reporting. Not all adverse reactions are reported to FDA/CVM. It is not always possible to reliably estimate the adverse event frequency or establish a causal relationship to product exposure using these data. The following adverse events are listed in decreasing order of frequency by body system.

Gastrointestinal: *vomiting, diarrhea, melena, gastrointestinal ulceration*
Urinary: *azotemia, elevated creatinine, renal failure*
Neurological/Behavioral: *lethargy, depression*
Hepatic: *elevated liver enzymes*
Dermatologic: *pruritus*

Death has been reported as an outcome of the adverse events listed above. **Acute renal failure and death have been associated with use of meloxicam in cats.**

Information for Dog Owners: METACAM, like other drugs of its class, is not free from adverse reactions. Owners should be advised of the potential for adverse reactions and be informed of the clinical signs associated with drug intolerance. Adverse reactions may include vomiting, diarrhea, decreased appetite, dark or tarry stools, increased water consumption, increased urination, pale gums due to anemia, yellowing of gums, skin or white of the eye due to jaundice, lethargy, incoordination, seizure, or behavioral changes. **Serious adverse reactions associated with this drug class can occur without warning and in rare situations result in death (see Adverse Reactions). Owners should be advised to discontinue METACAM and contact their veterinarian immediately if signs of intolerance are observed.** The vast majority of patients with drug related adverse reactions have recovered when the signs are recognized, the drug is withdrawn, and veterinary care, if appropriate, is initiated. Owners should be advised of the importance of periodic follow up for all dogs during administration of any NSAID.

Effectiveness: The effectiveness of meloxicam was demonstrated in two field studies involving a total of 277 dogs representing various breeds, between six months and sixteen years of age, all diagnosed with osteoarthritis. Both of the placebo-controlled, masked studies were conducted for 14 days. All dogs received 0.2 mg/kg meloxicam on day 1. All dogs were maintained on 0.1 mg/kg oral meloxicam from days 2 through 14 of both studies. Parameters evaluated by veterinarians included lameness, weight-bearing, pain on palpation, and overall improvement. Parameters assessed by owners included mobility, ability to rise, limping, and overall improvement. In the first field study (n=109), dogs showed clinical improvement with statistical significance after 14 days of meloxicam treatment for all parameters. In the second field study (n=48), dogs receiving meloxicam showed a clinical improvement after 14 days of therapy for all parameters; however, statistical significance was demonstrated only for the overall investigator evaluation on day 7, and for the owner evaluation on day 14.¹

Reference: 1. FOI for NADA 141-213 METACAM (meloxicam oral suspension).

Manufactured for:
Boehringer Ingelheim Vetmedica, Inc.
St. Joseph, MO 64506 U.S.A.

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601401-08/601413-04/6015161-10/6015268-04
Revised 07/2016

Brief Summary
NADA 141-219, Approved by FDA

Metacam®

(meloxicam)
5 mg/mL Solution for Injection
Non-steroidal anti-inflammatory drug for use in dogs and cats only

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

Warning: Repeated use of meloxicam in cats has been associated with acute renal failure and death. Do not administer additional injectable or oral meloxicam to cats. See Contraindications, Warnings, and Precautions for detailed information.

Description: Meloxicam is a non-steroidal anti-inflammatory drug (NSAID) of the oxicam class. Each mL of this sterile product for injection contains meloxicam 5.0 mg, alcohol 15%, glycofuro 10%, poloxamer 188 5%, sodium chloride 0.6%, glycine 0.5% and meglumine 0.3%, in water for injection, pH adjusted with sodium hydroxide and hydrochloric acid.

Indications:
Dogs: METACAM (meloxicam) 5 mg/mL Solution for Injection is indicated in dogs for the control of pain and inflammation associated with osteoarthritis.

Contraindications: Dogs with known hypersensitivity to meloxicam should not receive METACAM 5 mg/mL Solution for Injection.

Warnings: Not for use in humans. Keep this and all medications out of reach of children. Consult a physician in case of accidental ingestion by humans. For IV or SQ injectable use in dogs. All dogs should undergo a thorough history and physical examination before administering any NSAID. Appropriate laboratory testing to establish hematological and serum biochemical baseline data is recommended prior to, and periodically during use of any NSAID in dogs.

Owner should be advised to observe their dogs for signs of potential drug toxicity.

Precautions: The safe use of METACAM 5 mg/mL Solution for Injection in dogs younger than 6 months of age, dogs used for breeding, or in pregnant or lactating bitches has not been evaluated. Meloxicam is not recommended for use in dogs with bleeding disorders, as safety has not been established in dogs with these disorders. Safety has not been established for intramuscular (IM) administration in dogs. When administering METACAM 5 mg/mL Solution for Injection, use a syringe of appropriate size to ensure precise dosing. As a class, cyclo-oxygenase inhibitory NSAIDs may be associated with gastrointestinal, renal and hepatic toxicity. Sensitivity to drug-associated adverse events varies with the individual patient. Dogs that have experienced adverse reactions from one NSAID may experience adverse reactions from another NSAID. Patients at greatest risk for renal toxicity are those that are dehydrated, on concomitant diuretic therapy, or those with existing renal, cardiovascular, and/or hepatic dysfunction. Concurrent administration of potentially nephrotoxic drugs should be carefully approached. NSAIDs may inhibit the prostaglandins that maintain normal homeostatic function. Such anti-prostaglandin effects may result in clinically significant disease in patients with underlying or preexisting disease that has not been previously diagnosed. Since NSAIDs possess the potential to induce gastrointestinal ulcerations and/or perforations, concomitant use with other anti-inflammatory drugs, such as NSAIDs or corticosteroids, should be avoided. If additional pain medication is needed after the administration of the total daily dose of METACAM Oral Suspension, a non-NSAID or noncorticosteroid class of analgesia should be considered. The use of another NSAID is not recommended. Consider appropriate washout times when switching from corticosteroid use or from one NSAID to another in dogs. The use of concomitantly protein-bound drugs with METACAM 5 mg/mL Solution for Injection has not been studied in dogs. Commonly used protein-bound drugs include cardiac, anticonvulsant and behavioral medications. The influence of concomitant drugs that may inhibit metabolism of METACAM 5 mg/mL Solution for Injection has not been evaluated. Drug compatibility should be monitored in patients requiring adjunctive therapy. The effect of cyclo-oxygenase inhibition and the potential for thromboembolic occurrence or a hypercoagulable state has not been studied.

Adverse Reactions:
Dogs: A field study involving 224 dogs was conducted.¹ Based on the results of this study, GI abnormalities (vomiting, soft stools, diarrhea, and inappetence) were the most common adverse reactions associated with the administration of meloxicam.

The following adverse reactions are based on post-approval adverse drug event reporting. The categories are listed in decreasing order of frequency by body system:

Gastrointestinal: *vomiting, diarrhea, melena, gastrointestinal ulceration*
Urinary: *azotemia, elevated creatinine, renal failure*
Neurological/Behavioral: *lethargy, depression*
Hepatic: *elevated liver enzymes*
Dermatologic: *pruritus*

Death has been reported as an outcome of the adverse events listed above. **Acute renal failure and death have been associated with the use of meloxicam in cats.**

Information For Dog Owners: Meloxicam, like other NSAIDs, is not free from adverse reactions. Owners should be advised of the potential for adverse reactions and be informed of the clinical signs associated with NSAID intolerance. Adverse reactions may include vomiting, diarrhea, lethargy, decreased appetite and behavioral changes. Dog owners should be advised when their pet has received a meloxicam injection. Dog owners should contact their veterinarian immediately if possible adverse reactions are observed, and dog owners should be advised to discontinue METACAM therapy.

Effectiveness:

Dogs: The effectiveness of METACAM 5 mg/mL Solution for Injection was demonstrated in a field study involving a total of 224 dogs representing various breeds, all diagnosed with osteoarthritis.¹ This placebo-controlled, masked study was conducted for 14 days. Dogs received a subcutaneous injection of 0.2 mg/kg METACAM 5 mg/mL Solution for Injection on day 1. The dogs were maintained on 0.1 mg/kg oral meloxicam from days 2 through 14. Variables evaluated by veterinarians included lameness, weight-bearing, pain on palpation, and overall improvement. Variables assessed by owners included mobility, ability to rise, limping, and overall improvement.

In this field study, dogs showed clinical improvement with statistical significance after 14 days of meloxicam treatment for all variables.

Reference: 1. FOI for NADA 141-219 METACAM (meloxicam) 5 mg/mL Solution for Injection.

Manufactured for:
Boehringer Ingelheim Vetmedica, Inc.
St. Joseph, MO 64506 U.S.A.

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The name game

Ms. Murphy, age 82, becomes 'Helen' in this clinic. When it comes to professional courtesy with veterinary clients, how comfortable is too comfortable when doctors and team members talk?

Dr. Jim Kidd ran a tight ship. He owned a clinic with four doctors, 10 technicians, five receptionists and an office manager. Excellent veterinary care and professionalism was the mission he lived by. He took pride in himself and his staff for acting in a professional manner at all times. This is why he was taken aback when a longtime client, 82-year-old Helen Murphy, asked to speak privately to him before her next visit.

She stepped into Dr. Kidd's office and asked if he would indulge her while she described a recent scenario to him. Ms. Murphy had arrived at the clinic some weeks earlier for an appointment with Fluffy. She confessed that she loved her Fluffy more than

several of her grandchildren and great-grandchildren. As usual, the waiting room had been full when the pair arrived at the clinic, but things were running smoothly. About 10 minutes after Ms. Murphy arrived and checked in, a young technician called to her and said, "Helen, would you and Fluffy like to step into exam room four?"

Ms. Murphy then told Dr. Kidd about another recent experience with family. Not too long ago, her granddaughter had brought her friend Jane to their family home. Jane was introduced to Ms. Murphy and said, "It's very nice to meet you, Ms. Murphy." A week or so later Ms. Murphy was shopping at the mall when a young woman approached her and said, "Hi, Ms. Murphy, do you remember me? I'm Jane, a friend of your granddaughter's." The two women exchanged pleasantries and moved on.

Dr. Kidd was being patient, but he wondered what the point was of this story. Ms. Murphy said the technician who assisted her during her recent clinic visit was, in fact, her granddaughter's friend Jane. Yet when greeting her, Jane had felt comfortable calling her "Helen" when she escorted her to the exam room.

"It was 'Ms. Murphy' when visiting my home. It was 'Ms. Murphy' when greeting me in the mall. Why was it 'Helen' at your clinic?" she asked. "Let me ask you, Dr. Kidd, what would you think of a 22-year-old acquaintance going up to your grandmother and simply addressing her by her first name?"

Dr. Kidd explained that he wanted his clients to feel welcome and comfortable. He certainly never intended this encounter to be a sign of disrespect. Ms. Murphy said she had great respect for Dr. Kidd and his staff. She did recommend, however, that the safest way to address clients would be in what she called a "business formal fashion." If at some point the client mentioned that he or she wanted to be addressed more casually, that could be taken into consideration.

They parted ways on good terms. Dr. Kidd had never encountered a request of this nature from any of his clients before. He definitely would note on Ms. Murphy's record how she would like to be addressed. That said, he decided he would have his team maintain the practice of addressing clients casually, because in the long run, he thought his patrons would experience a warmer and more personal attachment to the practice.

Do you agree with Dr. Kidd? Let us know at dvmnews@ubm.com.

Rosenberg's response

Sometimes we have to accept the fact that we don't always think things through. I know personally that when I see an 80-plus-year-old client I always use the salutation of "Mr.," "Mrs." or "Ms." This is how I was raised. Colleagues might cite a desire for a warmer, more personal approach like Dr. Kidd, but I could not disagree more.

We are professionals, and addressing both colleagues and clients in a professional manner will serve us in the long run. Veterinarians need this arm's-length client relationship in order to communicate efficiently. When we interact with clients on an informal basis and find ourselves having to deliver tragic information, make awkward financial requests or simply say no, the task becomes much more difficult.

Of course, all rules have exceptions according to our discretion. Nevertheless, defaulting to professional client interactions as opposed to "socially casual" communication will allow patient care to encounter fewer bumps down the road.

Marc Rosenberg, VMD, is director of the Voorhees Veterinary Center in Voorhees, New Jersey. In his private time, he enjoys playing basketball and swing dancing with his wife. Although many of the scenarios Dr. Rosenberg describes are based on real-life events, the veterinary practices, doctors and employees described are fictional.



Formal vs. informal

This client wanted to be called "Ms." Read a hilarious story of a client who dropped formalities (and other things) at dvm360.com/trousers.



MEDICINE | Pain management

DJD calls for TLC

When your feline patients show up with degenerative joint disease (and the majority do), are you recognizing the related pain and debilitation? Here's how to bring comfort to these cats. *By Jennifer Gaumnitz*

Let's start with two astounding statistics that relate to feline degenerative joint disease (DJD): First, nine out of 10 cats show evidence of DJD on radiographs—even 6-month-old kittens!¹ Second, one in five cats in the United States is over the age of 11 years.²

DJD is a common but often unrecognized condition in cats, causing chronic pain and preventing cats from performing normal feline behaviors. Since the disease is progressive, it worsens with age and clinical signs increase. Ilona Rodan, DVM, DABVP (feline practice), discussed the condition at a recent Fetch dvm360 conference. If DJD is untreated, she explained to her audience, the cat's social relationships within a household can change and patient welfare can suffer.

By being aware of DJD, its incidence, the joints it affects, the pharmacologic options available, other multimodal therapies, and simple environmental

modifications, your veterinary team can help improve the quality of life of affected cats and help them live comfortably with their owners.

What causes DJD?

The cause in the majority of feline DJD cases remains unknown, Dr. Rodan says, but we do know that obesity is a predisposing factor for the disease. Large studies in human medicine have shown that obesity is a cause of DJD and arthritis in people, and the same seems to be true in pets.

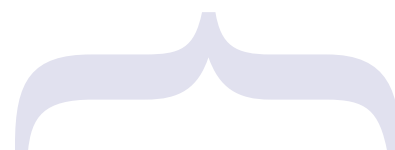
"We know that weight loss helps with osteoarthritis in dogs, and we have reduction in lameness in cats with weight loss," says Dr. Rodan.

Another interesting finding, Dr. Rodan says, is the association between chronic kidney disease and DJD. In fact, 69% of cats (between 6 months and 20 years) that have DJD also have chronic kidney disease. "It's not just coincidence because they're older cats,"

Dr. Rodan says. "There is definitely some correlation." When veterinarians treat cats with DJD, they need to consider chronic kidney disease when choosing medications, she says.

Injury and genetic conditions—including hip dysplasia, patellar luxation and osteochondrodysplasia—can also predispose cats to developing DJD. Hip dysplasia is prevalent in Maine coon cats, and patellar luxation is common in Abyssinian and Devon rex breeds—although Dr. Rodan says her most recent cases have been in domestic shorthairs. Osteochondrodysplasia in the Scottish fold breed is a dominantly inherited condition that results in malformed limbs and progressive joint destruction. "Deformities can be seen by 7 weeks of age and the condition accelerates degenerative joint disease. There are organizations, especially in other countries, that are recommending that Scottish folds not be bred," says Dr. Rodan.

Degenerative joint disease causes pain and limited mobility in cats of all ages, but clinical signs worsen with age.



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Which joints are affected by DJD?

Feline DJD often affects multiple joints in the limbs, spine or both. Spinal or axial DJD is most frequently found between thoracic vertebrae T7 and T10, but more severe disease is seen in the lumbar vertebrae, Dr. Rodan says. Axial DJD increases as the cat ages. (See “DJD” or “osteoarthritis?” at right.)

“In the limbs, elbows and knees are affected about 20% each. The incidence in the hips and shoulders is about 18%. And we see it in the hocks as well,” says Dr. Rodan. As opposed to axial DJD, appendicular DJD occurs equally through the various ages. “So, all ages for the limbs; older cats for the back,” concludes Dr. Rodan. Knowing this can help you during your physical examination of a cat you suspect has DJD.

Why is diagnosis a challenge?

Feline DJD is difficult to detect because cats hide their pain as a protective mechanism. Also, just as in people, there’s individual variance in pain threshold among cats, Dr. Rodan says.

“DJD has a slow, insidious onset,” Dr. Rodan says. “Most owners just think their cat is getting old. Plus, pain is not always static. The clinical signs of DJD can wax and wane. Sometimes the cat

“DJD has a slow, insidious onset. Most owners just think their cat is getting old.”

will have good days; sometimes they’ll have bad days.”

As opposed to dogs, most cats with DJD do not show lameness because the disease tends to impact the same joints bilaterally. “Unless secondary to an injury, owners often don’t recognize signs as cats are not limping because DJD is impacting both legs,” she says.

Dr. Rodan says that in practice, the best way to diagnose DJD is a combination of patient history, physical examination and radiographs.

Patient history and owner observations

Changes in behavior are the most common signs of DJD, but these can also occur with other types of pain, nonpainful illnesses and distress. Clients often recognize the pain of DJD in their own pets more accurately than veterinarians do because they know their cats’ normal behaviors and

‘DJD’ or ‘osteoarthritis’?

Although the terms “osteoarthritis” and “degenerative joint disease” are used interchangeably in journal articles, Dr. Rodan chooses to use “DJD” because it is the overarching term—it includes osteoarthritis as well as trauma, inflammation and other types of joint degeneration, including spondylosis of the intervertebral joints. “Osteoarthritis is only in the limbs or appendicular joints,” she says. DJD includes both appendicular and axial disease—and axial disease is common in cats.

routines and notice changes. However, clients frequently attribute the changes to old age rather than to pain.

According to Dr. Rodan, signs of pain with DJD can include decreased grooming, reduced movement or withdrawal, changes in vocalization, house soiling, changes in relationships with people or other animals in the household, and human-directed aggression. A cat may exhibit multiple changes in behaviors.

Analysis of a cat’s gait is admittedly challenging to conduct in a practice. So the patient history should include questions about changes in the cat’s mobility, including how high the cat can (and will) jump, whether the cat hesitates before jumping up or down, and whether the client has noticed changes in how the cat climbs up or down stairs.

Dr. Rodan says a good client questionnaire to use is the Feline Musculoskeletal Pain Index (created by Dr.

Duncan Lascelles and copyrighted by the Comparative Pain Research Laboratory at North Carolina State University College of Veterinary Medicine).

Your examination

The main goal of the examination is to evaluate the cat’s gait and posture, Dr. Rodan says. The first step? Watch from a distance. “Observe them in the exam room,” she says. “They may want to jump up on the bench or the owner’s lap, but they may hesitate quite a while before they jump. They appear to be thinking, ‘Is it worth the pain to get where I want to go?’”

Your hands-on examination should include palpation of the cat’s back and limbs to check for stiffness and muscle atrophy. Dr. Rodan says, “On palpation, we can note a decreased range of motion and joint thickening, but only in the elbows and hocks. In hips, shoulders and knees, DJD has to be really

bad before there’s a change in range of motion.” Spinal pain is most common over the lumbar and lumbosacral regions. “Less common findings are pain on range of motion, fluid in the joint capsule, limping and crepitus,” she says.

Finally, observe the cat as it returns to its carrier at the end of the examination, noting any hesitation that might reflect joint pain. As cats should never be forced to get them to move, Dr. Rodan also advises asking clients to take 30- to 45-second videos of their cat jumping up and down from the bed and climbing up and down stairs. If the owner shares the videos electronically, you can link them to the pet’s electronic medical records. Comparing these videos over time to assess response to treatment can be very helpful.

Confirmatory radiographs

Although many cats have radiographic evidence of DJD, radiographic signs do not necessarily equate with pain. And conversely, DJD pain can be felt before there are obvious changes on radiographs, with a range of 33 to 85% of painful joints having radiographic evidence of disease.³ “Radiographs don’t always correlate with exam findings,” she warns. Therefore, radiographs are taken to rule out other possible causes of pain, such as neoplasia or fracture.

When you’re taking radiographs of these cats, analgesia is essential, Dr. Rodan says. She prefers to do them when the cat is under general anesthesia, such as for a dental prophylaxis or periodontal procedure. Careful radiographic positioning is also important. “Stretching these cats out is going to make them really uncomfortable, but that’s necessary to obtain good views, making analgesia plus sedation or anesthesia critical,” Dr. Rodan says.

If your physical exam and radiographs don’t reveal evidence of DJD but you’re still suspicious that the feline patient is in pain, you can do an analgesic trial. Ideally you would conduct a nonsteroidal anti-inflammatory

drug (NSAID) trial after your review of the relevant laboratory values.

Treating cats with DJD

Unfortunately, cats with DJD get treated less than dogs. “There are a lot of reasons for that,” says Dr. Rodan. “One is it’s harder to diagnose DJD in cats in the first place. They’re not limping. And then we’re concerned about adverse effects of medications, which is a very important reason.” On top of those factors, owners can have trouble administering the prescribed drugs.

Combination drug therapies and changes to the home environment that allow the cat to perform its normal behaviors are essential to pain management and the patient’s comfort and welfare, according to Dr. Rodan.

Multimodal pharmacologic management

Different pharmaceuticals target different sites along the pain pathways, so Dr. Rodan advocates for a fully multimodal therapy. “Use different therapies together because they work synergistically,” she says. “Using them together allows you to use lower doses so you have fewer side effects.”

NSAIDs. Dr. Rodan says the NSAIDs approved for cats—meloxicam and robenacoxib—are the treatment of choice right now for feline DJD, even though they’re not approved in the United States for long-term use in cats. “Meloxicam, which has been around for longer, is approved for long-term use in cats in Canada, Europe, the Middle East, Australia, New Zealand and several other countries,” she says.

When using NSAID therapy in cats, Dr. Rodan advises following the guidelines developed by the International Society of Feline Medicine and the American Association of Feline Practitioners. If you’re going to prescribe meloxicam or robenacoxib for long-term use in the U.S., she recommends asking cat owners to sign a waiver acknowledging the off-label usage.

Use only the 0.5 mg/ml injectable meloxicam and discard the enclosed syringe, replacing it with a 1-ml syringe for accurate dosing to reduce the potential for kidney and liver problems, Dr. Rodan instructs. She advises giving 0.1 mg/kg the first day, then reducing the dose to 0.05 mg/kg every day or less frequently.

“We give the first dose in the prac-



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tice, then we teach the owner how to give the lower dose at home,” she says. “We mark a tuberculin or insulin syringe with a permanent marker so the owner can see where they’re supposed to draw the drug up to.” Dr. Rodan has her technicians teach clients how to prepare and administer the drug and to explain the importance of accurately administering the drug to the cat.

Dr. Rodan says she often tapers the dose and frequency of meloxicam, and she’s found that many cats are comfortable with low-dose NSAIDs given every other or every third day. “That works because I’m using it in conjunction with something else,” she says.

There are certain precautions to take when combining NSAIDs with other drugs in cats with DJD. Dr. Rodan avoids using NSAIDs with glucocorticoids, warfarin, phenobarbital and digoxin, and she says NSAIDs should also be used carefully with ACE inhibitors and diuretics. “I will not use NSAIDs with diuretics because it’s so easy for cats to become dehydrated,” she says.

If a cat is on short-term steroids, Dr. Rodan advises a five-day washout period before starting an NSAID. If a cat has been on long-term steroids and you want to attempt to transition it to an NSAID, she says you need to taper the steroid for a minimum of three weeks and then allow for at least a three-week washout period. “I find that most of these cats have been put on long-term steroids because they need them, and I can’t get them off. So I just won’t use NSAIDs in those cases,” she says.

Dr. Rodan says to warn owners about the side effects to look for and advise them to stop the NSAID and call you if the cat begins vomiting, won’t eat or exhibits other changes.

Veterinarians are often concerned about NSAID use in cats with concurrent chronic kidney disease, but Dr. Rodan says studies have shown that meloxicam and robenacoxib can be used in cats with concurrent DJD and chronic kidney disease as long as patients are eating well and normovolemic, and the kidney disease is stable and in stages 1, 2 or early stage 3.^{4,5} Patient monitoring, as noted in the AAFP/ISFM’s “Long Term Use of NSAIDs in Cats,” is necessary.

Central-acting drugs. About one-quarter of cats with DJD have maladaptive pain, Dr. Rodan notes. “NSAIDs do not work on maladaptive pain,” she

“Exercise is really important. In human medicine, they’re now talking about exercise even more than the calories that are eaten.”

says. “So in addition to NSAIDs, or when we cannot use NSAIDs, we have to use something else.”

Although tramadol can decrease central sensitization, Dr. Rodan does not use it. “It’s bitter, and with the [human] opioid addiction problem, I won’t let it be in the clinic,” she says.

Gabapentin is Dr. Rodan’s choice for a centrally acting drug. It can be used for chronic and neuropathic pain without serious side effects. “Gabapentin is fantastic,” she says. “It functions at the site of the spinal cord. It’s short-acting, and it’s ideal when you can use it in conjunction with other treatments.” She notes that gabapentin is very safe, though it can be sedating. She starts at lower doses and gradually increases to effect to prevent sedation.

NV-02. NV-02 (also known as frunevetmab) is a feline anti-nerve growth factor monoclonal antibody being developed by Nexvet. There have been two studies published on this emerging therapy,^{6,7} with a pivotal study in progress. Dr. Rodan says NV-02 appears to be a safe long-term analgesic for cats with DJD-related pain. “Hopefully it’s going to get FDA approval soon,” she says.

Nonpharma treatments and environmental modifications

When treating cats with DJD, Dr. Rodan says veterinarians need to consider more than just drugs: Weight reduction in overweight cats, nonpharmacological therapies and environmental changes can all help in DJD cases.

Obesity exacerbates DJD pain because it puts an increased load on the joints, and it causes low-grade inflammation that may be associated with DJD. “Weight loss improves function and mobility; it reduces pain and disability,” Dr. Rodan explains. “Exercise is really important. In fact, in human medicine, they’re now talking about exercise even more than the calories that are eaten.” Dr. Rodan says getting a cat to exercise is as easy as taking it outside on a harness, letting it out-side in a safe enclosure, engaging it in

interactive and self play, using puzzle feeders, and letting it try hydrotherapy if the cat doesn’t mind water.

The diet the cat eats can help too, Dr. Rodan says: “The only nutraceutical that works is omega-3 fatty acids, and that is when fed in the diet.” Check prescription joint, kidney and senior diets for omega-3 fatty acid supplementation.

Dr. Rodan has found acupuncture to be a safe, effective therapy for feline DJD when used within a multimodal approach. She has a certified acupuncturist in her practice, and she says cats tolerate the treatments very well.

Other therapies to try in a multimodal management program include the Assisi Loop (or other targeted pulsed electromagnetic field devices) and cold-laser therapy. Dr. Rodan points out that studies in cats are lacking. “These are anecdotal,” she says, “but I use these treatments in conjunction with other things. I like to use multiple things, and owners don’t mind it. Always reassess the patient to ensure its comfort.”

The home environment should also be modified to allow the cat with DJD to have easy access to its favorite places. Dr. Rodan advises clients to provide food, water and litter in easily accessible areas where the cat doesn’t have to compete with housemates. “Owners like to put litterboxes in the basement, but each cat should have access to a litterbox on the floor where it spends most of its time,” she says. “Use whatever box you want as long as the cat can easily get in and out of it and have space to turn around.”

A cat with DJD may not be able to crouch down normally to eat or drink from a food or water bowl resting on the floor. “Raising the food and water bowls to about the cat’s shoulder height lets them sit in a more normal feeding posture,” Dr. Rodan says.

Something as simple as a scratching post can be modified for a cat with DJD. Whereas a younger cat might have preferred a vertical sisal rope post, an older cat with DJD may prefer a soft carpet on a horizontal surface.⁸ Pet steps or ramps can provide easy access to preferred resting areas for cats with DJD.

Follow-up care

As with any chronic condition, cats with degenerative joint disease need recheck appointments to assess how the treatment is working. “Be sure to follow up to see how the cats are doing,” Dr. Rodan says. “Additionally, I like to have videos from before and after treatment. I can see if this cat is really moving around better than in the appointment alone.”

In summary, when looking at the cats in your practice and keeping an eye out for DJD, Dr. Rodan says to be aware that the disease happens in both the limbs and the spine. “Examinations are important; X-rays are important; and history is even more important,” she says. “These cats have a poor quality of life if not treated.”

Once a diagnosis of DJD is reached, NSAIDs should be the main treatment when indicated, and a multimodal strategy is best. Your veterinary team’s TLC can provide comfort for cats, despite the presence of DJD, and support for clients who want to be sure their cats are not in pain.

“Cats need to be cats. And we want them to have a great quality of life,” Dr. Rodan concludes.

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Dr. Ilona Rodan is founder of the Cat Care Clinic in Madison, Wisconsin, and Feline-Friendly Consultations.

The ABCs of veterinary dentistry: 'P' is for those pesky periodontal pockets

Do you know how to help patients with pockets? Get the lowdown on subgingival cleaning, laser gingivectomy and locally applied antimicrobials and sealants. *By Jan Bellows, DVM, DAVDC, DABVP, FAVD*

The gingival sulcus is a normal shallow space between the marginal gingiva and the tooth. Its depth is generally 0.5 to 1 mm in cats and 1 to 5 mm in dogs, depending on the specific tooth and the size of the patient.

A pocket is a pathologically deepened gingival sulcus that occurs secondary to coronal movement of the gingival margin (pseudopocket), apical movement of the gingival attachment (periodontal pocket) or a combination of both. The clinical or absolute pocket depth is the distance from the gingival margin to the base of a pocket (measured in millimeters).

Gingival recession refers to the displacement of the gingival margin apical to the cemento-enamel junction. Periodontal pockets and pseudopockets can occur together with gingival recession.

In this article, I will help you diagnose pockets and determine the optimal treatment.

Suprabony and infrabony pockets

Suprabony pockets, also referred to as supra-alveolar and supracrestal pockets, occur above the crest of alveolar bone (Figure 1). The lateral wall of the suprabony pocket consists of epithelial tissue. When the suprabony pocket is less than 5 mm in a medium or large dog, representing stage 2 periodontal disease, treatment includes the removal of supra- and subgingival plaque and calculus and closed root planing. If the 5-mm pocket represents stage 3 or 4 periodontal disease, consider extraction. Treatment may also include locally applied antibiotics. For suprabony pockets greater than 5 mm without gingival recession, coronal repositioned flap surgery can be performed

by a practitioner with advanced training in periodontal surgery.

Infrabony pockets, also referred to as intra-alveolar pockets, occur when the pocket floor (epithelial attachment) is apical to the alveolar bone (Figure 1). The lateral wall will consist of epithelial tissue and bone. Radiographically, infrabony pockets appear as vertical bone loss along the root surface. However, radiographs generally cannot be used to diagnose pockets since they are soft tissue defects. Infrabony defects can be further classified by the number of walls remaining around the tooth—information that can help inform treatment decisions. An infrabony defect is shaped like a box without a top. The bottom of the box is the base of the pocket. One of the box's sides is the tooth root. The three remaining sides of the box are the potential walls of the defect.

There is a direct relationship between the prognosis of the therapy and the number of intact walls. Three-wall defects that have progressed to stage 3 periodontal disease (25% to 50% support loss) have the best prognosis for new attachment after advanced periodontal surgery, bone grafts and stringent home care. Two-wall defects lag behind in terms of treatment prognosis, and one- and no-wall defects carry the worst prognosis. For patients with stage 2 periodontal disease (less than 25% support loss) easier treatment options can be effective (see below).

Gingival enlargement and resultant pseudopockets

Gingival enlargement is an increase in the size or thickness of the gingiva (Figure 1). Gingival hyperplasia, a histopathologic term, is an increased number of normal cells in normal arrangement. Gingival hypertrophy is an

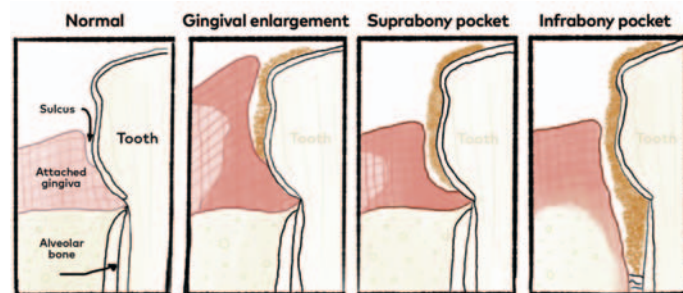


Figure 1. Illustrations of normal and abnormal gingival conditions.

increase in the size of individual cells. Gingival hyperplasia and hypertrophy can be accurately diagnosed only microscopically. When viewed clinically without histologic confirmation, this condition is correctly referred to as gingival enlargement.

The specific cause of gingival enlargement is unknown, but there may be a genetic predisposition in boxers,

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Figure 2A. Gingival enlargement resulting in pseudopockets.



Figure 2B. A gingivectomy surrounding the left maxillary third and fourth premolars and first molar is performed, eliminating the pseudopockets.



Figure 3A. Gingival enlargement secondary to amlodipine.



Figure 3B. Gingival enlargement resolved after discontinuation of medication and laser-assisted gingivectomy.



Figure 4. An air/water syringe is used to show plaque and calculus not removed during scaling and polishing.



Figure 5. Subgingival root planing.

rottweilers, Great Danes, collies, Doberman pinschers, Dalmatians and golden retrievers. Cyclosporine, phenytoin and calcium channel blocker medications, including amlodipine, have also been implicated (Figure 2A). Elimination of these medications, coupled with dental scaling, polishing and removal of the enlarged gingiva (preserving at least 2 mm of attached gingiva), usually results in a cure in cases caused by medication (Figure 2B). Gingival enlargement can lead to increased pocket depths secondary to augmented gingival height versus attachment loss (Figure 3A and 3B). The resultant pseudopocket accumulates plaque and calculus, which, if left untreated, may progress to attachment loss. Surgical treatment, including gingivectomy and gingivoplasty, is performed using a scalpel blade, laser or radiosurgery to sculpt the gingiva and decrease or eliminate the pseudopockets.

What to do when you find a pocket
The goal of periodontal therapy is to decrease the size of or eliminate

pockets in cases of early and moderate periodontal disease by removing subgingival plaque and calculus, using locally applied antimicrobials, performing gingivectomy, or extracting the affected teeth. Extraction is indicated when more than half of the root is not supported by the periodontium.

Subgingival cleaning: ultrasonic scaling. Bacteria-coated calculus left on the root surface contributes to the progression of periodontal disease. In order for the ultrasonic scaler to therapeutically débride a periodontal pocket, it needs to contact every part of the accessible root surface. Using ultrasonic thin periodontal tips specifically manufactured for root surface use, place the scaler tip's side parallel to the long axis of the tooth, similar to positioning a diagnostic periodontal probe. To avoid iatrogenic damage, decrease the power and increase the amount of water irrigation to remove subgingival plaque and calculus. After you've completed ultrasonic tooth scaling, use an air/water syringe to gently blow the gingival margin away from

Periodontal nomenclature

- An **alveolectomy** is the removal of some or all of the alveolar bone.
- An **alveoplasty** is a form of alveolectomy performed to restore physiological contours or achieve smooth contours of the alveolar bone.
- An **apically positioned flap** is moved apical to its original location.
- An **envelope flap** is retracted away from a horizontal incision; there is no vertical incision.
- Closed periodontal debridement** involves the removal of damaged, infected, inflamed or necrotic tissue from periodontal pockets and dental deposits from the tooth surface without the creation of a flap; this includes gingival curettage (or excisional new attachment procedure) and root planing.
- A **coronally positioned flap** is moved coronal to its original location.
- Gingival curettage** refers to the removal of damaged, infected, inflamed or necrotic tissue from the soft tissue lining of a periodontal pocket.
- Gingival enlargement** is a clinical term referring to the overgrowth or thickening of gingiva in the absence of a histological diagnosis.
- A **gingival flap** contains gingiva.
- Gingival hyperplasia** is a histological term referring to an abnormal increase in the number of normal cells in a normal arrangement resulting in clinical gingival enlargement.
- Gingival recession** refers to root surface exposure caused by apical migration of the gingival margin or loss of gingiva.
- Gingivectomy** refers to removal of some or all gingiva surrounding a tooth.
- Gingivoplasty** is a form of gingivectomy performed to restore physiological contours of the gingiva.
- A **mesiodistally** or **distomesially positioned flap** is moved distal or mesial to its original location along the dental arch; this flap has also been called a laterally positioned flap.
- Open periodontal debridement** is the removal of damaged, infected, inflamed or necrotic tissue from periodontal pockets and dental deposits from the tooth surface after flap creation; this includes the removal of affected gingiva and granulation tissue upon flap creation and management, root planing, and osseous resective procedures such as an alveolectomy and alveoplasty.
- A **periodontal flap** contains gingiva and alveolar mucosa.
- Root planing** refers to the removal of dental deposits from and smoothing of the root surface of a tooth; it is described as closed when performed without a flap and open when performed after flap creation.

the tooth and examine the tooth surface for remaining plaque and calculus to remove (Figure 4). You can then use water from the air/water syringe to lavage unattached debris from the sulcus or pocket.

Subgingival cleaning: curette-assisted root planing. The goal of root planing is to make the root less supportive of bacterial colony formation, plaque and calculus (Figure 5). Insert the curette with the face of the blade flush against the tooth. When the instrument reaches the bottom of

the pocket, the working angulation of the instrument (between 45 and 90 degrees) is established. Place the instrument against the tooth, pulling coronally and repeating the process until all subgingival calculus is removed.

Locally applied antibiotics. Applying local antibiotics is thought to reduce pocket depth by aiding in tissue shrinkage, connective tissue remodeling and soft tissue attachment. Diligent home care is essential for maintenance.

There are two locally applied antibiotic products approved for dental

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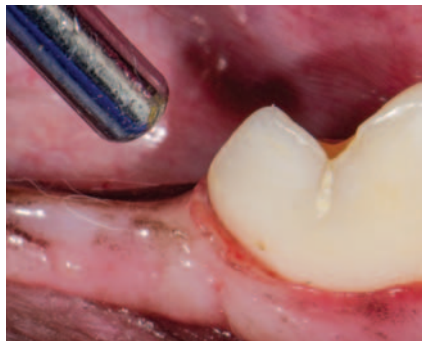


Figure 6A. An air/water syringe is used to dry a 4-mm periodontal pocket on the distal root of a dog's right mandibular first molar.



Figure 6B. Clindoral application.



Figure 6C. The appearance of extruded medication from the pocket confirms a complete fill.



Figure 7A. A 6-mm periodontal pocket affecting a dog's left mandibular canine.



Figure 7B. Laser gingivectomy of the dog's left mandibular canine.

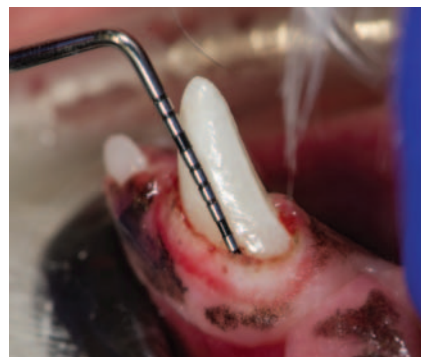


Figure 7C. The dog's decreased pocket depth following the laser gingivectomy.

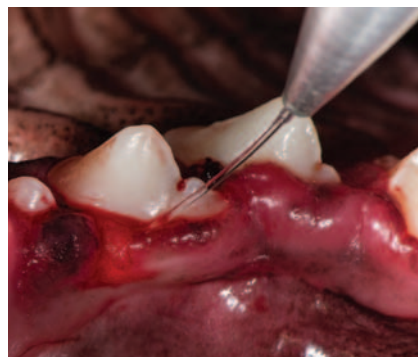


Figure 8. Locally applied diode laser energy into a dog's 4-mm pocket.



Figure 9. Dental sealant application.

conditions in small animals: Clindoral (TriLogic Pharma) and Doxirobe Gel (Zoetis). In cases of early periodontal disease, the biodegradable insertion of either of these products allows for the sustained release of therapeutic levels of the antimicrobial for several weeks at the injection site. However, neither product is a substitute for scrupulous pocket débridement and subsequent home care, and neither one should be applied to unclean root surfaces.

Clindoral is a periodontal pocket filler containing 2% clindamycin hydrochloride in a biodegrading, mucoadhesive gel matrix that releases clindamycin to the dried periodontal pocket or sulcus over a period of seven to 10 days after a single application (Figures 6A-6C). As the product warms to body temperature, it increases in viscosity two- to threefold to form a soft, pliable matrix the consistency of thick jam. Any liquid product that is part of the cleaning (e.g. fluoride, chlorhexidine) should be applied before applying Clindoral, and tooth sealants should be applied after. The pet owner should abstain from wiping or brushing the pet's teeth or giving dental treats for seven days after application.

Doxirobe Gel is provided in a two-syringe system. Syringe A contains the polymer delivery system: N-methyl-2-pyrrolidone and poly (D,L-lactide). Syringe B contains the active ingredi-

ent: doxycycline hyclate. Once combined, the product is a flowable mix equivalent to 8.5% doxycycline. When applied subgingivally, doxycycline is slowly released from the polymer, providing a local antimicrobial effect similar to Clindoral, particularly toward gram-negative anaerobic bacteria involved in periodontal disease. As with Clindoral, clients should avoid wiping and tooth brushing for one week.

Diode laser. Lasers may have a place in periodontal therapy. Diode laser energy transmitted through a thin fiber placed into a periodontal pocket is absorbed by the melanin and hemoglobin that are present in periodontal disease. For humans, dental protocols include the débridement of the hard side of the pocket (tooth and root surface) with ultrasonic scalers and hand instrumentation.

Measure the laser fiber to a length of 1 mm short of the pocket depth and use the energized fiber tip in light contact with a sweeping action that covers the entire epithelial lining, from near the base of the pocket upward (Figures 7A-7C and 8). Clean the fiber tip often with damp gauze to prevent the buildup of debris.

More randomized controlled clinical trials are needed to measure the benefit of using lasers as an adjunct to nonsurgical periodontal therapy.

Locally applied sealants. In human dentistry, a dental sealant is a thin,

plastic coating painted on the chewing surfaces of teeth to prevent caries. In veterinary dentistry, caries are rare, so sealants are applied to help prevent periodontal disease (Figure 9). Currently, there are two commercially available veterinary dental sealants that have been clinically proven to prevent the reattachment of plaque and calculus: SANOS Dental Sealant (All-Accem) and OraVet Plaque Prevention Gel (Boehringer Ingelheim).¹⁻³

SANOS Dental Sealant has been accepted by the Veterinary Oral Health Council and is applied by a veterinary professional during the oral hygiene procedure. SANOS is a hydrophilic polymer that seals the subgingival sulcus or small pocket from the accumulation of plaque and tartar. The hydrophilic design of the sealant is uniquely engineered to attract water and allow oxygen to pass through to create an unfavorable environment for anaerobes. Reapplication is recommended at six-month intervals. Home care products are OK to use with SANOS, though withholding dental diets, dental chews, water additives and gels for seven days after a professional cleaning is recommended.

OraVet Plaque Prevention Gel is a hydrophobic wax that binds electrostatically to tooth enamel, creating a barrier that helps prevent plaque-forming bacteria from attaching. OraVet is applied professionally during

the oral hygiene procedure and then weekly by the client thereafter. If clients also use OraVet Dental Hygiene Chews with their dogs, they should wait two weeks after OraVet Sealant is applied, as the mechanical abrasion of the chews will remove the sealant.

In conclusion

Periodontal disease is the most common malady affecting dogs and cats. With 42 teeth in dogs and 30 in cats, you have a great opportunity to make a difference in the lives of your patients and their caregivers.

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Compelling updates in veterinary surgery

Specialist says localized pain control and minimally invasive surgical techniques are where it's at.

When it comes to updates in the veterinary world, the realm of surgery mimics the profession at large in terms of constant change. Orthopedic specialist and Fetch dvm360 conference speaker David Dycus, DVM, MS, CCRP, DACVS-SA, shared with us a pair of improvements in veterinary surgery that have him excited.

First is the establishment of a liposome-encapsulated, long-lasting form of bupivacaine (Nocita—Aratana) for use in conjunction with certain canine procedures. Dr. Dycus points to current difficulties in obtaining opioids—not to mention other widespread problems associated with these drugs—as necessitating this change.

“The introduction of a long-lasting, local anesthetic for veterinary use has really helped make patients become much more comfortable following cruciate ligament surgery,” he says.

The other development that has Dr. Dycus energized is just how minimally invasive ortho-

Orthopedic wisdom: Keep 'em moving

Just because veterinary orthopedics is constantly evolving doesn't mean it can't be influenced by the past. In fact, Dr. Dycus came across a quote from 1895 that hit the nail on the proverbial head. Visit dvm360.com/moving to hear to what French surgeon Just Lucas-Championnière had to say about rehabilitation and how Dr. Dycus applies it to his everyday practice.

pedic procedures in general are becoming. He cites these examples:

- > The ability to put an arthroscope into almost any joint.
- > The consequent ability to treat most joint conditions arthroscopically.
- > The effectiveness of minimally invasive fracture repair—“This leads to less tissue morbidity, quicker recovery and, of course, a happier owner,” he says.
- > The appearance of more minimally invasive techniques for pain management and osteoarthritic management.

“When it comes to rehabilitation and reparative or regenerative medicine, we're using things like platelet-rich plasma, cortisone, stem cells or other injectables,” he says.

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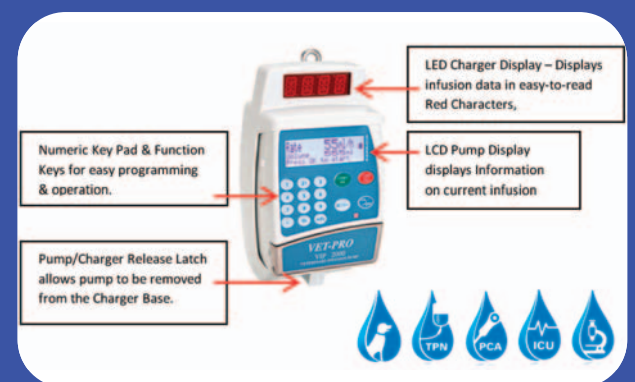
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Researchers focus on canine diabetes in hopes of helping dogs, people

University of Florida veterinary scientist receives NIH grant; Purdue-Indiana team explores role for collagen in treating type 1 diabetes.

Canine diabetes research has been in the news lately, with veterinary medical investigators at multiple institutions looking for answers to questions about the disease in both dogs and humans.

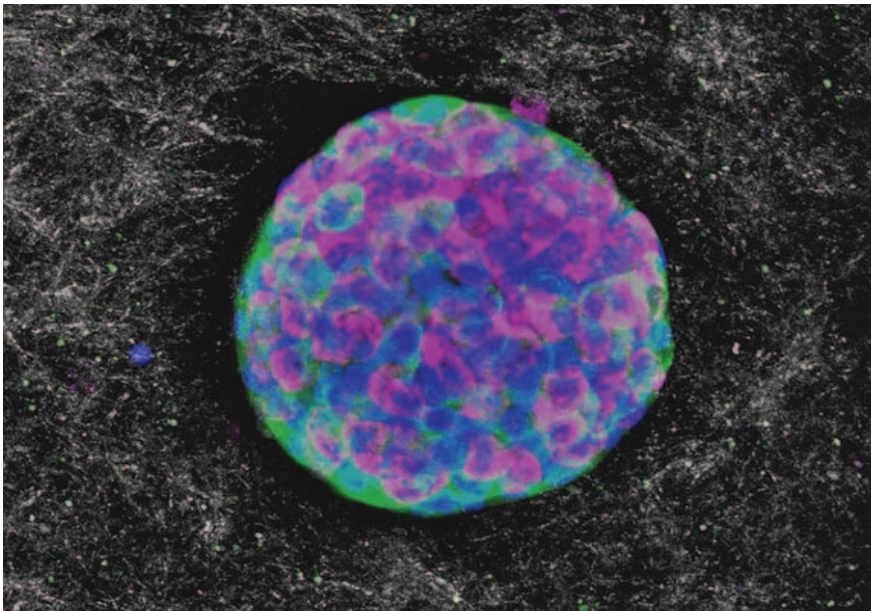
At the University of Florida, Allison O’Kell, DVM, MS, DACVIM, an assistant professor in the College of Veterinary Medicine, has received an award from the National Institutes of Health in support of her studies relating to canine diabetes, according to the school’s release.

“The overall goal of my research is to study the causes of diabetes in the dog,” Dr. O’Kell says in the release. “We hope that the work will benefit dogs with this disease, but also help us better understand whether studying the disease in dogs may be a novel way to understand the disease in humans.”

All of Dr. O’Kell’s research involves naturally occurring diabetes in pet dogs that live in the community. She’ll be studying these dogs to better define the function of the pancreas over time, investigating metabolic blood markers, and examining the role of immune system dysfunction in the disease. To accomplish these goals, Dr. O’Kell is recruiting diabetic dogs as well as healthy control dogs for several different study components. For more information, visit the website research.vetmed.ufl.edu.

Meanwhile, veterinary researchers at Purdue and Indiana universities are asking if it’s possible to manage type 1 diabetes not with daily insulin injections or pumps but with a single shot every few months.

The idea, according to a release from Purdue, is to usher in healthy pancreatic cells using a Trojan horse modality—the horse being, in this case, collagen. Researchers at Purdue, in collaboration with a team from Indiana



Purdue researchers, in collaboration with Indiana University, successfully injected a collagen solution mixed with pancreatic cells into diabetes-induced mice, achieving normal glucose levels for at least 90 days. (Image courtesy of Clarissa Hernandez Stephens/Purdue University)

University, have developed a collagen formulation mixed with pancreatic cells that’s been shown in a preclinical rodent study to reverse type 1 diabetes within 24 hours and maintain insulin independence for at least 90 days.

For diabetic pets, the next step is a pilot clinical study in dogs with naturally occurring type 1 diabetes, which will be conducted in collaboration with Purdue’s College of Veterinary Medicine.

“We plan to account for differences from mouse to human by helping dogs first. This way, the dogs can inform us on how well the treatment might work in humans,” says Clarissa Hernandez Stephens, first author on the work and a graduate researcher in Purdue’s school of engineering. Findings appear in early view for an upcoming issue of the *American Journal of Physiology: Endocrinology and Metabolism*.

Type 1 diabetes affects about one in every 100 companion animals in the U.S. and approximately 1.25 million American children and adults, the Purdue release states. Because diabetes

happens similarly in dogs and humans, both species could potentially benefit from the same cure: a new set of pancreatic cells to replace those that aren’t releasing insulin.

Twenty years of research hasn’t produced an effective transplantation therapy because multiple donors are needed, the current method of delivering cells through the portal vein of the liver is too invasive, and the human immune system tends to destroy a large percentage of transplanted cells, the Purdue release states.

Purdue researchers simply changed how the cells were packaged—first, within a solution containing collagen, and second, as an injection through the skin instead of all the way at the liver, saving patients from a nasty procedure.

In the research team’s approach, healthy pancreas cells are mixed with a collagen solution. Upon injection just under the skin, the solution solidifies, and the body recognizes the collagen and supplies it with blood flow to exchange insulin and glucose.



Dr. Allison O’Kell with her two dogs. (Photo courtesy of the University of Florida)



“With giving my dog shots twice a day, I have to constantly be thinking about where I am and when I need to be home. It greatly affects my work and my personal life,” says Jan Goetz, owner of a diabetic dog named Lexi. “Not having to give these shots would mean freedom.” (Photo courtesy of Purdue University)

NAVTA recognizes new veterinary technician specialty

Diagnostic imaging becomes the 16th academy acknowledged by the professional association, with details coming next year.

NAVTA recently announced that it has added the Academy of Veterinary Technician Specialists in Diagnostic Imaging (AVTDI) to its list of recognized academies. With this addition, the association now acknowledges a total of 16 technician specialties.

According to NAVTA's website, an academy consists of credentialed veterinary technicians who are recognized as specialists in a particular area after completing a specific regimen of training and testing (i.e. the veterinary technician specialist [VTS] credential). Technicians who meet all of the

requirements of this new academy will be able to add "VTS-DI" to their professional titles.

The AVDTI describes itself on its website as comprising "technicians dedicated to performing a higher level of veterinary diagnostic imaging modalities." These include:

- > digital radiography
- > computed tomography
- > magnetic resonance imaging
- > ultrasound and more.

"The Organizing Committee of the Academy of Veterinary Technicians in Diagnostic Imaging worked diligently to meet the NAVTA Committee

on Veterinary Technician Specialties (CVTS) standards required for NAVTA specialty recognition," says Ed Carlson, CVT, VTS (nutrition), interim chair of the CVTS, in an announcement on the AVDTI's website. "NAVTA is thrilled that veterinary technicians with a strong passion for diagnostic imaging now have a veterinary technician specialty to pursue."

The academy's website also notes that it's still going through the specialty recognition process and that all information for potential members will be available January 1, 2019.

The website is avdti.org.



A credentialed veterinary technician by any other name would smell just as sweet ...

Veterinary technicians can specialize and be called a "VTS," but what about "veterinary nurse"? Dig into more on NAVTA's push to make registered veterinary technicians nurses at dvm360.com/vetnurseinitiative.

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*Refers to needle echogenicity in ultrasound-guided lumbar spine injections; a cadaveric study Gofeld, M, Krashin, DL, Ahn, S.

A champion of chimps and dreams

Dr. Raven Jackson-Jewett landed the job of her dreams when she became the attending veterinarian at a chimpanzee sanctuary. Now she wants to inspire and invite others to follow in her footsteps—especially fellow minorities. *By Sarah Mouton Dowdy*

Think of the moment you decided to become a veterinarian. Where were you? How old were you? How many puppies or kittens had you snuggled that day?

For many, the veterinarian dream is sown in young soil. It typically starts with a love of animals, followed by the incredible discovery that it's someone's job to take care them.

The story of Raven Jackson-Jewett, DVM, is no different (at least in this respect). Despite being born to parents who were officially not animal lovers and who held hopes of their daughter someday treating two-legged patients, Dr. Jackson-Jewett says she's been drawn to animals and the idea of caring for them since she was a toddler. "My parents wondered where I came from," she laughs.

It wasn't until many years later, when Dr. Jackson-Jewett began interviewing at veterinary schools, that she was made aware of how her story diverges from the norm: She is black and was pursuing a profession that, according to the U.S. Census Bureau, is more than 93 percent white.

"It was very important for me to visit every university I was considering in person," recalls Dr. Jackson-Jewett. "On the walls, they have pictures of every class, and I would only see one or two faces that looked like mine."

Dr. Jackson-Jewett eventually chose to attend the Tuskegee University College of Veterinary Medicine, which proudly touts being recognized as the most diverse school of veterinary medicine in the nation.

"I was fortunate to see all types of nationalities within my class," she says.

When asked to comment on the reason why diversity remains so low in the veterinary profession, Dr. Jackson-Jewett chalks it up to a lack of exposure. "Children are heavily influenced by



Dr. Raven Jackson-Jewett serves as the attending veterinarian at Chimp Haven in Keithville, Louisiana, where she cares for more than 250 chimpanzees.

their environments," she says, "which is why it's really important for me to go to Title 1 schools and disadvantaged schools to let students know that they too can become anything that they want—even a veterinarian. I'm shocked at the number of times I've talked to children and they say, 'I can be a veterinarian? There are black veterinarians?' If they don't have an opportunity to see it, they often don't know it's a possibility for them."

Though Jackson-Jewett's desire to become a veterinarian managed to flourish in the absence of role models who looked like her, exposure played a crucial role in what she would eventually choose to specialize in.

"As a young girl, I'd only had exposure to small animals," she says. "I knew I loved animals, but to me that meant dogs and cats. It wasn't until I was a little older and was exposed to zoos and other facilities that I realized that there were so many other species I could potentially target."

With a wider view of her possibilities, Dr. Jackson-Jewett became captivated by a particular species during her undergraduate studies.

"While doing some behavioral observations in a wildlife and ecology course, one of the species I worked with was the chimpanzee," she says. "After seeing their social dynamics and how similar they are to us and how their family structures mirrored what I saw in my own family, I thought, 'Wow. It would be really cool if I could specialize in chimpanzee medicine.'"

For Dr. Jackson-Jewett, this was no fleeting thought. While working at a research facility during her postdoctoral internship in nonhuman primate behavior and medicine, she told her boss that her ideal job would be to work solely with chimpanzees one day. Dr. Jackson-Jewett's superior later shared this revelation with Linda Brent, PhD—a primate behaviorist and the founder and then-president of Chimp Haven, a nonprofit chimpanzee sanctuary located in Keithville, Louisiana—when she met her at a conference.

Brent told Dr. Jackson-Jewett's then-boss that Chimp Haven would soon be in need of an attending veterinarian and that she should encourage her intern to consider the position. When Brent didn't hear from the aspiring chimpanzee specialist, she took matters into her own hands and emailed Dr. Jackson-Jewett, urging her to apply.

"If I'm honest, I reached out to all of my mentors and they told me not to do it," she laughs. "That's just because it was a pretty hefty job for a new graduate who'd been out a little less than a year. They thought that starting a program and running a facility would be too much responsibility. But, I love a challenge, and my dream was sitting in front of me. My dream was attainable."

Living the dream

Chimp Haven was founded in 1995 with a mission to provide a sanctuary for chimpanzees formerly used in bio-



Could I do that ... ?

Has Dr. Jackson-Jewett's career got you thinking about yours? Explore a list of other ways to use a DVM degree at dvm360.com/37ways.



Dr. Jackson-Jewett checks on Keeli, a Chimp Haven resident.

medical research, in the entertainment industry and as family pets. In 2000, the nonprofit was provided with 200 acres to make its mission a reality, and the first chimpanzee residents arrived five years later. Now, Chimp Haven is home to more than 250 chimps.

“As the attending veterinarian, I’m responsible for veterinary care and oversight of the animal care program,” says Dr. Jackson-Jewett. “While getting my training and experience, I was in the laboratory setting and saw what some of these animals had to endure. And now I’m fortunate enough to get to see them on this side of the fence, thriving in the sanctuary.”

When Dr. Jackson-Jewett first came to Chimp Haven in August 2010, she realized that her schooling and training were far from over.

“A little over half of our colony has been exposed to HIV, hepatitis or other infectious diseases that we were not trained on in veterinary school,” she says. “That meant I had to pop open some books, do some training and take some continuing education courses to figure out how to treat these cases. It makes me think that maybe my mom was right—I think a medical doctor would thrive here because they’re so similar to humans.”

Dr. Jackson-Jewett refers to the chimps as her “extended family” and

says she’s been able to build relationships with each and every one.

“I’m here all the time, so they see me outside of just being a vet,” she says, which comes in handy on those days when the chimps need veterinary care, such as anesthesia.

“I’ll come in, show them the syringe, ask them to hold alert for an injection and most of them will do that willingly because we have a relationship,” says Dr. Jackson-Jewett.

Sharing the dream

Despite landing her dream job, Dr. Jackson-Jewett remains focused on the future and bringing others into it.

Chimp Haven is working on a \$20 million expansion in order to accommodate the more than 120 chimpanzees that will eventually join the sanctuary (the retirement process for a research lab animal is lengthy and complicated, so the facility doesn’t always know exactly when the new residents will arrive).

“Chimpanzees have a long lifespan—we’re talking 60-plus years—so there’s going to be a need for someone to take my job someday,” she says.

Again, Dr. Jackson-Jewett goes back to the importance of exposure.

“At Chimp Haven, I’ve spearheaded the veterinary department’s internship/externship program. When I started

here, that was one of the things that I was charged with by the National Institutes of Health—to do what I could to increase diversity within the field of laboratory animal medicine—including encouraging more men to enter the field as well. Prior to the 1980s, this was a male-dominated field. Now, it’s flipped the other direction. So, we’d like to see more men and more diversity.”

To this end, Dr. Jackson-Jewett

“I was in the laboratory setting and saw what some of these animals had to endure. And now I’m fortunate enough to get to see them on this side of the fence, thriving in the sanctuary.”

regularly travels to her alma mater and various other universities to tell veterinary students about the work she’s able to do at Chimp Haven, and students are also able to visit the sanctuary for a more in-depth exposure to laboratory animal medicine.

“I used to say I wanted to be the ‘black Jane Goodall,’” she laughs. “I wouldn’t say that’s exactly what I am now, but I’m living out my version of the dream and others can too.”

Client handout: Keep cats indoors

Print this PDF to educate your veterinary clients on the dangers of outdoor living for domestic housecats.

There are lots of reasons for pet cats to stay indoors: Unkind neighbors. Diseases. Wild animals. Cars. Jenifer Chatfield, DVM, DACZM, gathered those reasons and more for a client handout your veterinary hospital can share to explain the dangers of letting cats roam free. See it at right and download it at dvm360.com/catsindoors. (If somebody really wants a cat to get some outside time, there are always catios; see “Outside time, no loose cat” below.)



Outdoor time, no loose cat

They don't necessarily protect cats from all the dangers of the great outdoors, but “catios” give cats fresh air, a really great view and a little wandering time while keeping them away from cars and hostile neighbors (the two-legged and four-legged varieties included). If you or your clients want to delve into enclosed patios for cats, check out dvm360.com/catios.

FROM YOUR VETERINARIAN



Keep cats indoors

Cats don't have nine lives—just the one. Here are nine reasons they're healthier in your home.

1. Not everyone likes cats

We know you love your special kitty, but not everyone likes cats. Irritated neighbors or community interlopers could pose a threat to your special fluff if you allow him or her to roam the neighborhood.

2. Some people like cats too much

When people come into your neighborhood to visit friends, they might just see your beautiful cat as a great souvenir and take him or her home with them. While microchips can prove ownership, you first have to know who took your cat—and that can be tough to find out. Better to keep your valued family member inside and safe.

3. Rabies is still a problem

Rabies occurs in all areas of the United States, and cats are the most common domestic animal testing positive for rabies—yikes! We know you vaccinate your cat, but why

tempt fate? Cats roaming outdoors are frequently found hanging out with stray or feral cats, raccoons and other creatures that are capable of transmitting rabies to your cat.

4. Parasites are the pits

Roundworms, hookworms, fleas, ticks and other parasites are unwelcome houseguests. But if you let your cat roam free outdoors, these parasites could be moving in when your cat returns.

Heads-up: It's true that your cat may still be exposed to parasites even if you keep him or her exclusively indoors, so routine parasite treatments from your veterinarian can cut down the numbers and keep you, your family and your cat safe and healthy.

5. Felines fight

Free-roaming cats show up at veterinary hospitals with various wounds from fighting with other cats that are “on the street.” Cat-

bite abscesses are no fun for cats or their owners. So, while we know that your kitty is adored by all, other cats certainly might jump them in the alley. Best to keep your special snowflake safe and sound at home.

6. Car accidents happen

Cats are difficult to see, so unless your cat knows to cross inside the crosswalk and with the light, traffic is not your friend. I hope your kitty never has to learn how to cross the street the hard way. Keep them safe from vehicular damage and keep them inside.

7. Birds are not fans

That bird feeder in your backyard is like putting fish in a barrel for a free-roaming cat. Cats are great hunters and will hunt even if well-fed. Free-roaming cats devastate bird, lizard and other reptile and amphibian populations. Give your local ecosystem a break and keep your great huntress inside.

8. FIV and FeLV are serious

Feline immunodeficiency virus (FIV) and feline leukemia virus (FeLV) have lifelong implications for your cat and are spread through contact with unknown cats that transmit the disease. Unfortunately, cats that are vaccinated for FeLV can still contract the disease. Do your cat a favor and keep them safe from these chronic illnesses by keeping them inside.

9. Wild animals threaten

Foxes, coyotes, alligators, mountain lions, dogs and other wild animals can make a quick meal of your Muffin. Even if your cat makes it home from such an encounter, the recovery from the trauma and injuries can be significant and certainly no fun for you or your cat. Spare your special kitty the pain and suffering from such an assault and keep him or her indoors.

HOLLY / STOCK.ADOBE.COM

Source: Jenifer Chatfield, DVM



New regenerative therapies for horses

Studies at the University of Georgia and Kansas State University are advancing new ways to use stem-cell therapies and more.

Researchers at the University of Georgia have found that a novel stem cell culture medium works as well as the traditional culture medium and may improve outcomes in equine patients, according to a release from Morris Animal Foundation, the organization that funded the study. Platelet lysate was used as a culture medium with a goal of generating more immunologically compatible stem cells. The researchers' findings were published in *Stem Cell Research & Therapy*.

"Many laboratories use fetal bovine serum (FBS) for the culture of mesenchymal stem cells (MSCs) since it is a great source of growth factors and nutrients," says John Peroni, DVM, MS, DACVS, lead researcher on the project, in the release. "However, MSCs expanded in FBS can sometimes trigger unwanted immune responses in patients, essentially killing off the product intended to promote healing."

Using growth factors derived from the species being treated, in this case horses, would allow veterinarians to better evaluate the clinical outcomes of MSCs by avoiding adverse reactions related to using FBS, Peroni says.

"While veterinarians have been using stem cell therapies to treat

equine and small animal patients for more than a decade, many questions remain," says Kelly Diehl, DVM, DACVIM (SAIM), senior scientific and communications advisor at Morris Animal Foundation. "One concern is how to best improve treatment success by making sure the immune system doesn't destroy the introduced cells nullifying the treatment.

"Dr. Peroni and his team may have found a viable solution using platelet lysate derived from horses as the culture medium to avoid this potential problem and improve stem-cell based treatments for horses," Dr. Diehl continues.

The University of Georgia team successfully produced platelet lysate from donor horses and used it as the sole media supplement for the culture expansion of equine bone marrow-derived MSCs, according to the release. The platelet lysate was not found to alter the appearance or function of equine stem cells or their ability to interact with other cell types, especially those found at injury sites, which are commonly the target for regenerative therapy.

The next step is to make sure MSCs developed in lysate function appropriately in a preclinical setting, the foundation's release states.

At Kansas State University, regenerative therapy—including platelet-rich plasma and animal stem cell therapies for equine patients—is a new offering, a university release states. K-State's Veterinary Health Center has partnered with Enso Discoveries, a regenerative medicine company that is also based in Manhattan, Kansas. Stem cells collected from patients at the Veterinary Health Center can be processed at Enso and used with the patient in the same day. The company's protocols were developed in collaboration with Chanran Ganta, BVSc, PhD, DACVP, a stem cell researcher and veterinary pathologist at the Kansas State Veterinary Diagnostic Laboratory.

Dylan Lutter, DVM, MS, DACVSLA, a clinical assistant professor and equine surgeon at the Veterinary Health Center, and Dr. Ganta will soon be starting a project to study the effects of a novel platelet product and animal stem cells on wound healing in horses, according to the release. The project will use a bedside kit developed by Enso to produce platelet-rich product from the patient's blood. Another kit developed by Enso is already in use by Dr. Lutter and other surgeons to generate platelet-rich plasma.



Everything equine
New medicine and practice management content for equine practices shows up regularly at dvm360.com/equine. Bookmark it!

Product focus: Genes and cancer

KC Animal Health Corridor event showcases innovative technology that may soon help veterinarians diagnose and treat malignancies of all types. *By Kristi Reimer Fender*

While the 2018 Investment Forum hosted recently by the Kansas City Animal Health Corridor was not specifically designed to focus on cancer in animals, many of the products presented did just that, and most of them had a genetic component to their technology. The forum, which allows animal health manufacturers to pitch their emerging products in a *Shark Tank*-like format, helps startup companies attain investment funding, licensing partnerships and more to help bring their products to market. Here are some of the coolest products we at dvm360 think veterinarians will be interested in.

Canine melanoma vaccine

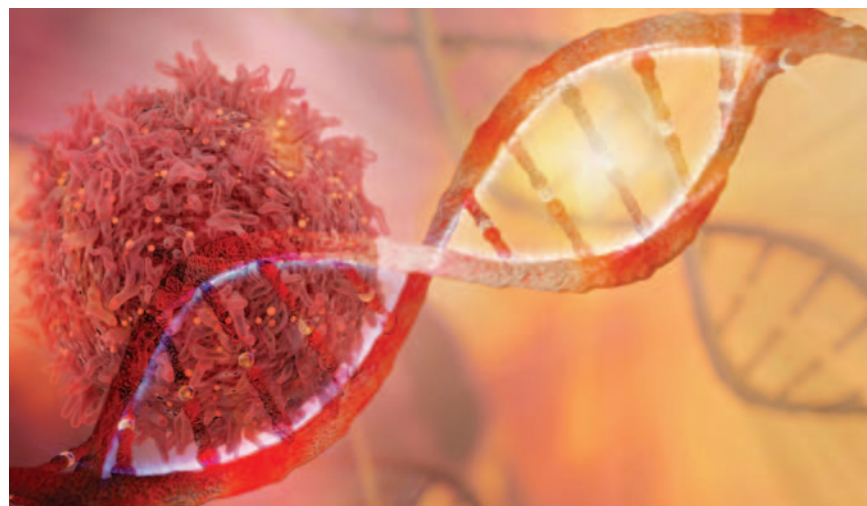
Checkpoint inhibitor immunotherapy is “the hottest field in human health today,” says MBF Therapeutics CEO Tom Tillett. This form of immunotherapy, which can target both cancer and infectious diseases, alters an invading cell’s genetics via a vaccine delivery system. MBFT is working to bring a canine melanoma vaccine to market

that would attack the tumor and its microenvironment, using checkpoint inhibitors to prevent the tumor from suppressing the host’s immune system.

Feline GI lymphoma test

In cats, the signs of inflammatory bowel disease (IBD) and gastrointestinal (GI) lymphoma are almost identical, says Andrew Barnell, CEO of Geneoscopy. But for lymphoma to be diagnosed, a cat has to undergo biopsy and sedation at a cost that many veterinary clients are unable or unwilling to pay. Many cat owners play the odds that their pet has IBD, Barnell says, but the odds are not great—45 percent of cats with this set of clinical signs (more than half a million present per year) actually have GI lymphoma. And while the condition is treatable if diagnosed early, the mortality rate for more advanced disease is high.

To address this dilemma, Geneoscopy has developed a test to diagnose GI lymphoma in cats that isolates a T-cell RNA biomarker in a stool sample. The test is noninvasive and much more



affordable than the current protocol, meaning many more cats are likely to receive appropriate veterinary care.

Tumor-derived cancer vaccine

Torigen Pharmaceuticals, another company exploring immunotherapeutics for cancer, has developed Vetivax, a treatment that uses a portion of a veterinary patient’s own tumor to create series of vaccines. After a portion of the tumor is surgically excised

at the veterinary clinic, the tissue is processed at Vetivax laboratories to create a multidose treatment administered subcutaneously once per week for three weeks. The deactivated tumor cells activate TH1 immunity in the patient, allowing the release of “killer cells” that attack the tumor, says Torigen CEO Ashley Kalinauskas. In its testing, Vetivax has treated more than 300 animals with different types of cancer in veterinary clinics across the U.S., with 70 percent of those patients exceeding their prognosis by an average of 2.14 times, Kalinauskas says.

Other emerging veterinary products

Of course, many of the developing technologies pitched at the Investment Forum were targeting diseases other than cancer. Here are the highlights.

An antimicrobial assist. “The Achilles’ heel of pathogenic microbes is their need for iron,” says Bill Cheliak, business development chief of Chelation Partners. His company’s product is designed to enhance or restore antibiotic efficacy in an era of drug resistance by exploiting pathogens’ essential need for iron. The drug is a polymer that targets iron like a supermagnet, Cheliak says, and it works on both fungi and bacteria. The initial application for dogs will be a topical product for pyoderma, wounds and ocular problems. The product has not been shown to interfere with iron in the body, Cheliak says.

New heartworm preventive. Chalante is a biotech company developing new parasiticides for pets and livestock, says Simon Asplund, general manager. It has developed a chewable monthly heartworm product for dogs with the goal of overcoming resistance to established products. The active ingredient is a “nature-

inspired molecule” that relies on a new mode of action—something the heartworm-prevention world has not seen in 30 years, Asplund says.

Topical drug delivery. “Who wants to pill a cat?” asks Illustris Pharmaceuticals CEO Mark Prygocki. The answer? No one ever. So Illustris has harnessed a novel drug delivery system that allows oral or injectable drugs to be delivered topically. How does this work? The product—which can be applied via a gel, ointment, spray, powder or patch—temporarily relaxes or “distracts” anchors binding dermal cells together without damaging the cells or cell junctions, allowing large drug molecules to pass in between. In other words, it instructs cells to temporarily move away from each other and become “leaky,” Prygocki says. Because this delivery leads to higher drug tissue concentrations than are seen with other modalities, clinicians can reduce the amount of drug needed to get the same clinical effect—making it cost-effective and safer, Prygocki says. What’s more, it works better on hair follicles, so no shaving is required for application.

Tumor gene profiling

Innogenics has developed a genomic test for cancer in dogs designed to optimize treatment, says Barbara Davis, president and CEO of the company. How it works: The veterinarian sends a biopsied tumor to Innogenics; Innogenics performs a two-day assay of genes that are turned on and off in that tumor; Innogenics provides a detailed personalized genomic report to the veterinarian with recommended therapies. In human oncology, gene expression profiling of tumors is becoming the standard of care, Davis says.

While these companies are in various stages of commercialization—meaning it may be a while before the products are available to practitioners—veterinarians can get excited that smart people are out there in laboratories dreaming up new ways to help pets overcome this deadly disease.

Vets Against Insanity



The *slightly* scandalous card game for veterinary professionals.

Practicing veterinary medicine is rewarding, important and often all-consuming. It can also be awkward, annoying and (on most days) downright disgusting. Sometimes, all you can do is laugh about it. Enter Vets Against Insanity: a fun, slightly scandalous take on the work and life of a veterinary professional.

Who should play:

- Veterinary professionals (can be various states of frustrated/happy/slightly drunk/completely sober/tired/overworked)
- Anyone who recently had to squeeze a dog's anal glands
- Everyone who has recently thought, "I'll have to laugh about this so I don't cry"

At its best, Vets Against Insanity is a hilarious tool designed to inspire veterinary professionals to take risks, laugh more, pursue personal development and enjoy more professional satisfaction and success.

BUY THE GAME AT

dvm360.com/vai

Warning: You can play with the regular folks in your life, but do you really want to deal with the blank stares you'll get after playing "radiolucent bladder stones"? To get your game now, go to dvm360.com/vai.





Boehringer Ingelheim FDA label claim for parasiticide to prevent Lyme disease

Merial, now part of Boehringer Ingelheim, has received approval from the FDA to expand label claims for NexGard (afoxolaner). The flea and tick control product is now approved to prevent *Borrelia burgdorferi* infections as a direct result of NexGard killing *Ixodes scapularis* vector ticks, commonly called black-legged ticks (or deer ticks). It is approved for use in dogs and puppies 8 weeks of age or older and weighing more than 4 pounds.

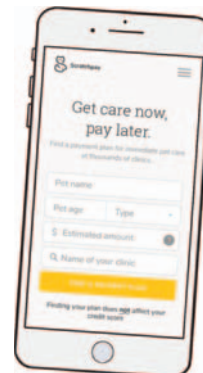
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Zoetis VetVance mobile app

This mobile version of the VetVance website is a free educational resource that provides on-the-go access to the online content offered through the VetVance platform. Available for use on iOS smartphones and tablets and Android smartphones, the app features courses, course progress tracking and registrant profiles. It also provides students and recent graduates with content relating to professional development, business skills, financial literacy and personal wellness. Eligible students can also use the app to apply for Zoetis scholarships.

For fastest response, visit zoetisus.com



Scratch Financial Longer-term, no-interest payment option

Scratchpay, a provider of pet care payment plans, has announced a new zero percent APR financing option. The new payment plan provides qualified pet owners with a three-month, interest-free option for financing veterinary care, from routine pet checkups to emergency visits. Scratchpay's payment product does not result in a hard credit inquiry for veterinary clients. The cost to veterinarians is a 5 percent fee per Scratchpay transaction.

For fastest response, visit scratchpay.com



Wedgewood, Vetsource Home delivery, compounding partnership

Wedgewood Pharmacy, a U.S. compounding pharmacy specializing in animal health, and Vetsource, a veterinary-industry home-delivery pharmacy provider, have partnered to add thousands of commonly prescribed compounded medications to Vetsource's home-delivery catalog. Vetsource provides innovative pharmacy, technology and business services to more than 8,000 veterinary practices across the country.

For fastest response, visit vetsource.com



Vetology AI radiograph analysis

Vetology AI, which utilizes AI ("artificial intelligence" or "augmented interpretation") technology, provides a resource for evaluating patient radiographs and determining necessary medical treatments. With the system, veterinarians can upload an image and receive a written analysis in less than 90 seconds, allowing for more immediate decision-making and consultation with pet owners. Through a specialized machine learning process, the software is able to alert a veterinarian to the presence or lack of medical abnormalities without human oversight.

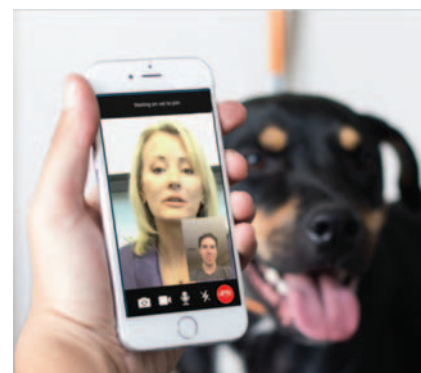
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IDEXX Faster reference lab results

IDEXX Laboratories has announced that its U.S. reference laboratory division will significantly expand its rapid overnight service, known as IDEXX-Direct, for thousands of rural U.S. veterinary practices. Through a new state-of-the-art reference laboratory in Louisville, Kentucky, IDEXX will provide thousands of veterinary hospitals across the country with additional flexibility by offering the latest possible patient sample pickup time with next-morning results.

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TeleVet, Vetsource Home delivery, telemedicine partnership

Vetsource has announced a strategic partnership with TeleVet, a remote healthcare application and online platform that allows veterinary clinics to diagnose and treat their own patients remotely where a veterinarian-client-patient relationship has already been established. Telemedicine will help Vetsource customers extend their services to where their clients want to consume them, complementing the existing home delivery services, company representatives say.

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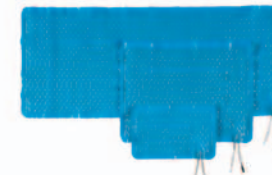
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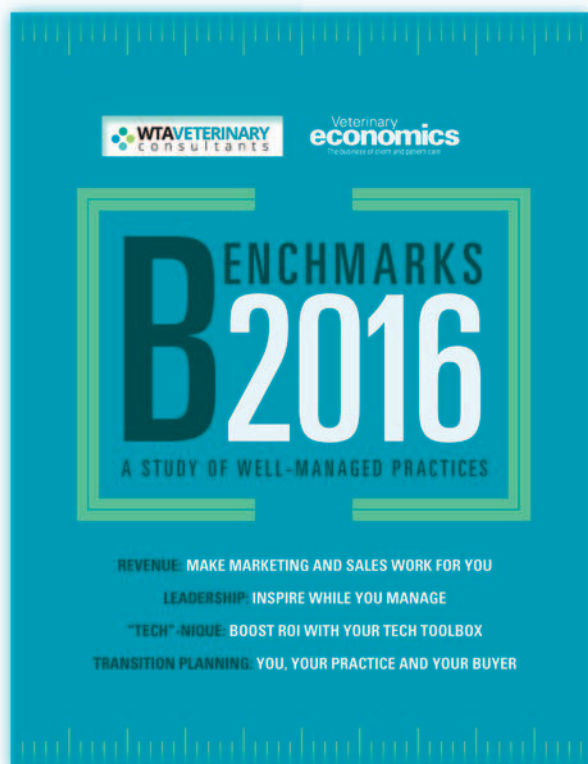


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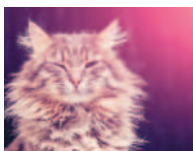
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Here are the CE opportunities coming in the next few months

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onlinepethealthwebinar.com

Nov. 26-Dec. 17

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oncoreepd.co.uk

Nov. 29-Dec. 1

Oral and maxillofacial
trauma in dogs and
cats: Imaging surgical
planning and repair
Las Vegas, NV
(866) 800-7326
wvc.org

Nov. 30-Dec. 2

Avian, reptile and small
mammal endoscopy
Athens, GA
(706) 540-4073
vet.uga.edu/ce/calendar

December 1-5

Canine rehabilitation
therapist module
Coral Springs, FL
caninerehabinstitute.com/Canine_Rehab_Therapist.lasso

December 2

Fear Free in practice:
A one-day workshop
Denver, CO

(303) 952-0585

fearfree.com/event

December 3

Veterinary dental radio-
graphic interpretation
online course
(941) 276-9141
veterinarydentistry.net

December 6-8

Dentistry and oncology
St. Croix
(888) 488-3882
vetvacationonce.com

December 6-9

6th Annual Gulf-
Atlantic Veterinary
Conference
Boca Raton, FL
(407) 851-3862
fvma.org

December 7-9

Veterinary medical
acupuncture for sports
medicine/rehabilitation
patients
Wheat Ridge, CO
caninerehabinstitute.com/Certification_Programs_Acupuncture.lasso

December 8-9

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pedic surgery
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January 10-13

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Leadership Conference
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avma.org/events

January 19-23

VMX 2019
Orlando, FL
(352) 375-5672
navc.com

February 17-20

WVC 2019
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February 22-24

Music City Veterinary
Conference

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March 15-17

28th Annual Food
Animal Conference
Columbiana, AL
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alvma.com

March 29-31

The American Laser
Study Club 2nd Annual
Symposium
Phoenix, AZ
(866) 589-2722
americanlaserstudy-club.org

April 5-7

2019 American
Academy of
Veterinary Acupuncture
Portland, OR
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aava.org

April 25-28

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Conference
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May 2-5

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June 6-8

2019 ACVIM Forum

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acvim.org

July 16-19

44th World Small
Animal Veterinary
Association Congress
and 71st Canadian
Veterinary Medicine
Association Convention
Toronto, ON
CANADA
canadianveterinarians.org

August 2-6

AVMA Convention
Washington, DC
avma.org/events

August 23-26

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September 23-24

World Congress on
Antibiotics and
Antibiotic Resistance
Rome, Italy
antibiotics.pulsusconference.com

September 27-29

Pacific Northwest
Veterinary
Conference
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The telltale blue star

My daughter took a creative approach to combat her 4-year-old's fibs. If only the method worked on veterinary clients.

Just today a fella came into the clinic with a horse that was 250 lbs underweight, and he wanted me to believe that the horse had been normal two days ago. With eyebrows raised, I looked to see if there was a bright blue star forming on his forehead.

In seemingly unrelated news ...

A few Fridays ago, Emili, my oldest daughter, brought her three children over to the house to hang out. I love this. Any opportunity I get to spoil the grandbabies makes me smile.

Early into the visit, 4-year-old Lilli came trotting across the living room and up to me with her left hand plastered across her forehead, palm down. The look on her face clearly said that she was about to ask me something important—something she knew her “Poppi” would do for her. I’d seen the look a hundred times before, but the hand on the head was new.

“Hey, Poppi! Will you make me some chocolate milk?” she asked softly with a heart-melting smile and her hand still pressed to her forehead. “Momma said it would be OK,” she reassured me.

Emili won’t let the kids drink chocolate milk at home. They just get regular milk. I like this rule because she’ll let the grandparents fix it for them a few times when they come to visit, which makes trips to our house that much more special. However, it seemed a bit odd to me that Emili would’ve approved such a request since I’d just fixed Lilli a heaping glass of chocolate milk an hour or so earlier.

“Sure! I would love to!” I replied. “But why do you have your hand smashed against your forehead?”

Before Lilli could say a word, Emili’s



voice came floating in from the kitchen with that unmistakable motherly tone.

“I don’t know what she just told you, but whatever it was, she’s lying!”

Emili’s judgment rang in my ears as I looked down at Lilli, who dropped her arms to her sides and let out an exaggerated sigh as she left the room.

What the heck had just happened? How could Emili have known Lilli was lying? I was sure she couldn’t have heard Lilli from the kitchen—Lilli had been speaking softly, while I had been using my normal voice. Why did Lilli walk away so gutted?

Mind reading or mom tricks?

I ambled into the kitchen and found Emili giggling to herself. She was cooking something and had flour all over her hands and cheeks, and her smile brought back memories of when she was Lilli’s age.

“What did she ask you?” Emili queried, still grinning.

“Wait,” I said, shaking my head.

“There’s no way you heard what Lilli asked me from all the way in here. She said it so softly I had to bend over to hear it!”

I went on to explain that Lilli had asked for chocolate milk—and that her

mother had approved it.

My daughter burst out with gut-busting laughter. She laughed long enough I finally had to interrupt, because my curiosity was outweighing my patience.

“Well, you see,” Emili explained, “Lilli has been fibbing quite a bit, and it’s gotten to the point that I can tell she’s lying when it happens. I told her that each time she’s dishonest, a blue star appears on her forehead. She doesn’t know for sure if you can see it too, so when she asked you, she covered up her forehead just in case.”

Oh, man. We both started laughing so hard that no noise came out as we considered this 4-year-old’s desperate plotting in search of another dose of chocolate milk, knowing full well her mother wouldn’t approve, and worrying that her Poppi would see the telltale blue star.

So as I stood there looking at the fella who assured me that his horse had lost 250 lbs in two days, I’m pretty sure I saw a blue star appear on his forehead.

Bo Brock, DVM, owns Brock Veterinary Clinic in Lamesa, Texas. His latest book is Crowded in the Middle of Nowhere: Tales of Humor and Healing From Rural America.



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