

# firstline®

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# firstline

Healthy team members = healthy pets



## Huddle up for success

Improve communication among your veterinary team by creating a living document of office questions and wins.

Communication among team members is always a challenge, so we try to make it as simple as possible. Everyone is encouraged to write in our "Huddle Book" if they have something to say, a suggestion or a question to ask. After we discuss it, we date and cross it off. I put the initials of team members who were present for the huddle. In addition, at the beginning of every month, we also give prizes out for the team member who has the most successful statistic. Some statistics we monitor are new clients, six-pack preventive sales, dental, laser, spay/neuter and grooming.

We also randomly pick a "Catch Me at My Best" for

the month, and the winner gets a prize as well. If someone has the day off, they are asked to read and initial what was discussed while they were gone. We find handling questions on a day-to-day basis is much better than letting time lapse (and problems continue) until our next staff meeting. It also makes the subject matter for our meetings more interesting. We can focus on matters like safety in the workplace, new products on the market, team-building skills and setting goals.

Happy huddling!

Kim Murray  
Practice manager  
Seville Animal Hospital  
Seville, Ohio

DENISIMAGILOV/STOCK.ADOBE.COM



# PEARLS

(Lustrously good advice and tips)



## ASK KATIE

**Q:** We have implemented some new things for 2019, but I'm having trouble getting my veterinary team to do them. I feel like I have told them 1,000 times already! Help!

### My team is killing my resolutions!

**A:** If you've already said it 1,000 times, then you've only got another 1,000 or so to go. Humans are naturally resistant to change, even when we think we're open to new things. It takes about six weeks for us to move through the process of resistance—deciding if we're going to comply or not, and then getting on board. During that time, you'll need to repeat the process and support and encourage more times than you think you have the patience for, believe me.

Try illustrating the new method or process with a "job aid." A job aid is like a standard operating procedure, but stated in no more than 10 steps. If you've got team members who clearly aren't getting it after six weeks (read: they're overtly or

covertly resistant or they don't have the capacity to do what you've asked), then you'll need to have a different conversation with those folks. Otherwise, mark your calendar for six weeks from the inception of the new process so you have a light at the end of the tunnel, practice deep breathing and get an essential oil diffuser with some lavender in it for your office.

Hang in there. You've got this!

*Katie Adams, CVPM, is owner and management consultant at Agrygation Consulting.*

Got a question for Katie? Email us at [firstline@ubm.com](mailto:firstline@ubm.com).



# Dig into these **instant otitis tips** from Instagram

Catch a few ideas floating between your veterinary colleagues' ears on managing otitis in dogs and cats.

**W**e did a quick dive into all of our Instagram (@dvm360mag) followers and asked for some tips on managing otitis. Lend your ears—or your patients' ears—to these nuggets of advice from your veterinary colleagues.

**Tip 1:** "I place a small amount of cotton in both ears before bathing to help prevent water from accumulating in the horizontal ear canal. After the bath, I remove the cotton and follow up with an ear cleanser that contains a drying agent."

**Tip 2:** "I use cytologic examination to determine whether the infection is primarily yeast or bacteria, and treat accordingly. For example, I prescribe either an antifungal or antibacterial otic flush once a day for seven days, instruct owners to let the ears dry thoroughly for 30 minutes, then apply a combination antifungal/antibacterial/corticosteroid otic suspension twice a day for 10 days."

**Tip 3:** "We prescribe a ceruminolytic flush every other day, and we also combine 15 ml of the flush with 15 ml of a combination antibiotic/antifungal/anti-inflammatory ointment and tell owners to place a small amount in both ears once a day for 10 days."



Itching for more? Check out our Veterinary Medicine Essential on otitis at [dvm360.com/otitisessential](https://dvm360.com/otitisessential).



Help your veterinary clients teach their fanged friends to tolerate—and maybe even like—having their teeth brushed.

No one looks at the razor-sharp teeth in a kitten's mouth and thinks, "Boy, would I like to get my fingers in there!" And yet, that's exactly what this handout from Kathryn Primm, DVM, encourages clients to do—all for the sake of starting good teeth-cleaning habits early so that when those permanent teeth come in, the growing cat has been primed to tolerate (and maybe even like) regular dental care.



Download the  
handout at  
[dvm360.com/  
FLkittenteeth](http://dvm360.com/FLkittenteeth).



# Best attempts at pitching veterinary products (and some fails)

**Bash Halow has seen the good  
and the bad in the exam room.**

**S**imple question: Do you like being told “no” repeatedly as you make a product suggestion? Right—most people don’t. Well, Fetch dvm360 conference speaker Bash Halow, LVT, CVPM, is somewhat to blame for putting you in a bad position—literally—when making the offer.

As someone responsible for the series of questions, including the product pitch, asked in the exam room, he says a bad offering comes down to body language. If your back is to the client while you ask whether they want flea medication, for example, you may be indicating that they don't even need the stuff.

"They're signaling without even knowing it that client is going to shut them down," he says. "It ends up being a self-fulfilling prophecy."

As for the best type of product pitch, Halow says be the honest, caring person you are. He shares a comment from one of his sessions where an attendee told the class

how she does it.

"The first thing she said is 'I listen and I tell the that I care about what's going on. And then I make a recommendation,'" he says.

Halow emphasizes that the recommendation shouldn't be the first thing. Only after hearing the client and understanding their needs can you truly give guidance.

Want more info from Halow on this? Watch an extended video



clip at [dvm360.com/  
bashpitches](http://dvm360.com/bashpitches).



**NEED  
PREVENTION  
INSPIRATION?**

For a round up of tips, tricks and reader-submitted parasite prevention strategies, head to [dvm360.com/parasiterefresh](https://dvm360.com/parasiterefresh).





# Finding the *purrfect* feline diet

Veterinarians should take inspiration from mice to identify the ideal meal for cats. *By Erin E. Rand*

**W**hen Donna Raditic, DVM, DACVN, CVA, brought three feral kittens into her life, deciding how to feed them was something of a quandary. At her session The Purrfect Diet at the Fetch dvm360 conference in Virginia Beach, she addressed how she decided to meet her new kittens' nutritional needs, and how veterinarians can work with their clients to make sure cats are getting the most out of their food.

## Understanding cat behavior

According to Dr. Raditic, the right diet for cats and kittens will help them achieve optimal health, a long life and a good quality of life. "I believe without a doubt that you

can use nutrition to help improve the health of every patient you see," she says.

The first key to mastering the feline diet lies in understanding cat behavior. Though cats are social creatures, they prefer to hunt and eat alone. "[Cats] really are control freaks," Dr. Raditic says. They want to be the master of their own domain, with access to food, water, the litter box, their resting space. With her three kittens, Dr. Raditic separated their food bowls, giving them each independent space to eat the way they want to.

Cats are also quite picky eaters. The odor, the taste, the temperature and the texture of the food are all critical things to think about

when trying to get a cat on a new diet. Because cats get habituated on certain foods and develop "neophobia," or fear of the new, when it comes to alternatives, it might be tempting for owners to settle with one brand once they figure out

## IF PETS COULD CHOOSE

In a recent study, dogs and cats that participated were free to eat from four different diets with varying macronutrients. When given their druthers, what did they devour, as assessed by their circulating metabolites?



Find out at [dvm360.com/selfselectionJS](https://dvm360.com/selfselectionJS).





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peace of mind.

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- ✓ Over 140 million doses of afoxolaner have been prescribed<sup>1</sup>
- ✓ And it's the only flea and tick control product indicated for the prevention of *Borrelia burgdorferi* infections as a direct result of killing *Ixodes scapularis* vector ticks

**NexGard**<sup>®</sup>  
(afoxolaner) Chewables

What one little chew can do

<sup>1</sup>Data on file.



**IMPORTANT SAFETY INFORMATION:** NexGard is for use in dogs only. The most frequently reported adverse reactions include vomiting, pruritus, lethargy, diarrhea and lack of appetite. The safe use of NexGard in pregnant, breeding, or lactating dogs has not been evaluated. Use with caution in dogs with a history of seizures or neurologic disorders. For more information, see the full prescribing information or visit [www.NexGardClinic.com](http://www.NexGardClinic.com).

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Please see Brief Summary on page 8.

# NexGard®

## (afoxolaner) Chewables

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

### Description:

NexGard® (afoxolaner) is available in four sizes of beef-flavored, soft chewables for oral administration to dogs and puppies according to their weight. Each chewable is formulated to provide a minimum afoxolaner dosage of 1.14 mg/lb (2.5 mg/kg). Afoxolaner has the chemical composition 1-Naphthalenecarboxamide, 4-[5-[3-chloro-5-(trifluoromethyl)-phenyl]-4, 5-dihydro-5-(trifluoromethyl)-3-isoxazoly]-N-[2-oxo-2-[(2,2,2-trifluoroethyl)amino]ethyl].

### Indications:

NexGard kills adult fleas and is indicated for the treatment and prevention of flea infestations (*Ctenocephalides felis*), and the treatment and control of Black-legged tick (*Ixodes scapularis*), American Dog tick (*Dermacentor variabilis*), Lone Star tick (*Amblyomma americanum*), and Brown dog tick (*Rhipicephalus sanguineus*) infestations in dogs and puppies 8 weeks of age and older, weighing 4 pounds of body weight or greater, for one month. NexGard is indicated for the prevention of *Borrelia burgdorferi* infections as a direct result of killing *Ixodes scapularis* vector ticks.

### Dosage and Administration:

NexGard is given orally once a month, at the minimum dosage of 1.14 mg/lb (2.5 mg/kg).

### Dosing Schedule:

Body Weight	Afoxolaner Per Chewable (mg)	Chewables Administered
4.0 to 10.0 lbs.	11.3	One
10.1 to 24.0 lbs.	28.3	One
24.1 to 60.0 lbs.	68	One
60.1 to 121.0 lbs.	136	One
Over 121.0 lbs.	Administer the appropriate combination of chewables	

NexGard can be administered with or without food. Care should be taken that the dog consumes the complete dose, and treated animals should be observed for a few minutes to ensure that part of the dose is not lost or refused. If it is suspected that any of the dose has been lost or if vomiting occurs within two hours of administration, redose with another full dose. If a dose is missed, administer NexGard and resume a monthly dosing schedule.

### Flea Treatment and Prevention:

Treatment with NexGard may begin at any time of the year. In areas where fleas are common year-round, monthly treatment with NexGard should continue the entire year without interruption.

To minimize the likelihood of flea reinfestation, it is important to treat all animals within a household with an approved flea control product.

### Tick Treatment and Control:

Treatment with NexGard may begin at any time of the year (see **Effectiveness**).

### Contraindications:

There are no known contraindications for the use of NexGard.

### Warnings:

Not for use in humans. Keep this and all drugs out of the reach of children. In case of accidental ingestion, contact a physician immediately.

### Precautions:

Afoxolaner is a member of the isoxazoline class. This class has been associated with neurologic adverse reactions including tremors, ataxia, and seizures. Seizures have been reported in dogs receiving isoxazoline class drugs, even in dogs without a history of seizures. Use with caution in dogs with a history of seizures or neurologic disorders (see **Adverse Reactions** and **Post-Approval Experience**).

The safe use of NexGard in breeding, pregnant or lactating dogs has not been evaluated.

### Adverse Reactions:

In a well-controlled US field study, which included a total of 333 households and 615 treated dogs (415 administered afoxolaner; 200 administered active control), no serious adverse reactions were observed with NexGard.

Over the 90-day study period, all observations of potential adverse reactions were recorded. The most frequent reactions reported at an incidence of > 1% within any of the three months of observations are presented in the following table. The most frequently reported adverse reaction was vomiting. The occurrence of vomiting was generally self-limiting and of short duration and tended to decrease with subsequent doses in both groups. Five treated dogs experienced anorexia during the study, and two of those dogs experienced anorexia with the first dose but not subsequent doses.

**Table 1: Dogs With Adverse Reactions.**

	Treatment Group			
	Afoxolaner		Oral active control	
	N <sup>1</sup>	% (n=415)	N <sup>2</sup>	% (n=200)
Vomiting (with and without blood)	17	4.1	25	12.5
Dry/Flaky Skin	13	3.1	2	1.0
Diarrhea (with and without blood)	13	3.1	7	3.5
Lethargy	7	1.7	4	2.0
Anorexia	5	1.2	9	4.5

<sup>1</sup>Number of dogs in the afoxolaner treatment group with the identified abnormality.

<sup>2</sup>Number of dogs in the control group with the identified abnormality.

In the US field study, one dog with a history of seizures experienced a seizure on the same day after receiving the first dose and on the same day after receiving the second dose of NexGard. This dog experienced a third seizure one week after receiving the third dose. The dog remained

enrolled and completed the study. Another dog with a history of seizures had a seizure 19 days after the third dose of NexGard. The dog remained enrolled and completed the study. A third dog with a history of seizures received NexGard and experienced no seizures throughout the study.

### Post-Approval Experience (July 2018):

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

The following adverse events reported for dogs are listed in decreasing order of reporting frequency for NexGard:

Vomiting, pruritus, lethargy, diarrhea (with and without blood), anorexia, seizure, hyperactivity/restlessness, panting, erythema, ataxia, dermatitis (including rash, papules), allergic reactions (including hives, swelling), and tremors.

### Contact Information:

For a copy of the Safety Data Sheet (SDS) or to report suspected adverse drug events, contact Merial at 1-888-637-4251 or [www.nexgardfordogs.com](http://www.nexgardfordogs.com).

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

### Mode of Action:

Afoxolaner is a member of the isoxazoline family, shown to bind at a binding site to inhibit insect and acarine ligand-gated chloride channels, in particular those gated by the neurotransmitter gamma-aminobutyric acid (GABA), thereby blocking pre- and post-synaptic transfer of chloride ions across cell membranes. Prolonged afoxolaner-induced hyperexcitation results in uncontrolled activity of the central nervous system and death of insects and acarines. The selective toxicity of afoxolaner between insects and acarines and mammals may be inferred by the differential sensitivity of the insects and acarines' GABA receptors versus mammalian GABA receptors.

### Effectiveness:

In a well-controlled laboratory study, NexGard began to kill fleas four hours after initial administration and demonstrated >99% effectiveness at eight hours. In a separate well-controlled laboratory study, NexGard demonstrated 100% effectiveness against adult fleas 24 hours post-infestation for 35 days, and was >93% effective at 12 hours post-infestation through Day 21, and on Day 35. On Day 28, NexGard was 81.1% effective 12 hours post-infestation. Dogs in both the treated and control groups that were infested with fleas on Day -1 generated flea eggs at 12- and 24-hours post-treatment (0-11 eggs and 1-17 eggs in the NexGard treated dogs, and 4-90 eggs and 0-118 eggs in the control dogs, at 12- and 24-hours, respectively). At subsequent evaluations post-infestation, fleas from dogs in the treated group were essentially unable to produce any eggs (0-1 eggs) while fleas from dogs in the control group continued to produce eggs (1-141 eggs).

In a 90-day US field study conducted in households with existing flea infestations of varying severity, the effectiveness of NexGard against fleas on the Day 30, 60 and 90 visits compared with baseline was 98.0%, 99.7%, and 99.9%, respectively.

Collectively, the data from the three studies (two laboratory and one field) demonstrate that NexGard kills fleas before they can lay eggs, thus preventing subsequent flea infestations after the start of treatment of existing flea infestations.

In well-controlled laboratory studies, NexGard demonstrated >97% effectiveness against *Dermacentor variabilis*, >94% effectiveness against *Ixodes scapularis*, and >93% effectiveness against *Rhipicephalus sanguineus*, 48 hours post-infestation for 30 days. At 72 hours post-infestation, NexGard demonstrated >97% effectiveness against *Amblyomma americanum* for 30 days. In two separate, well-controlled laboratory studies, NexGard was effective at preventing *Borrelia burgdorferi* infections after dogs were infested with *Ixodes scapularis* vector ticks 28 days post-treatment.

### Animal Safety:

In a margin of safety study, NexGard was administered orally to 8 to 9-week-old Beagle puppies at 1, 3, and 5 times the maximum exposure dose (6.3 mg/kg) for three treatments every 28 days, followed by three treatments every 14 days, for a total of six treatments. Dogs in the control group were sham-dosed. There were no clinically-relevant effects related to treatment on physical examination, body weight, food consumption, clinical pathology (hematology, clinical chemistries, or coagulation tests), gross pathology, histopathology or organ weights. Vomiting occurred throughout the study, with a similar incidence in the treated and control groups, including one dog in the 5x group that vomited four hours after treatment.

In a well-controlled field study, NexGard was used concomitantly with other medications, such as vaccines, anthelmintics, antibiotics (including topicals), steroids, NSAIDs, anesthetics, and antihistamines. No adverse reactions were observed from the concomitant use of NexGard with other medications.

### Storage Information:

Store at or below 30°C (86°F) with excursions permitted up to 40°C (104°F).

### How Supplied:

NexGard is available in four sizes of beef-flavored soft chewables: 11.3, 28.3, 68 or 136 mg afoxolaner. Each chewable size is available in color-coded packages of 1, 3 or 6 beef-flavored chewables.

NADA 141-406, Approved by FDA

Marketed by: Frontline Vet Labs™, a Division of Merial, Inc.

Duluth, GA 30096-4640 USA

Made in Brazil.

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Rev. 05/2018





which one their cat likes best. But that doesn't necessarily mean the cat is having all of its nutritional needs met.

### Variety is the spice of life

Some cats like chicken-flavored cat food over fish. Some are dry food fans while others put their nose up at anything but wet food. Despite these preferences, Dr. Raditic advocates that owners fight this habituation by taking a "smorgasbord" approach.

"I offer them lots of different options in small amounts on paper plates ... Why paper plates? Because no matter how much you clean, animals smell in molecules," she describes. With her smorgasbord, Dr. Raditic wants each food to be completely isolated, and no amount of scrubbing will eradicate the smells from the previous occupant of the dish. This exercise will help open up the cat's appetite and make them more flexible to dietary changes.

Owners can also increase variety in how their cat's food is being delivered. While most owners might only feed their cats once or twice a day, Dr. Raditic says that cats should have up to 10 eating experiences every day. This can be accomplished with two or three meals of wet food, doling out small quantities of dry food between those meals. This doesn't have to be an ordeal—automatic feeders can do this job for pet parents who work during the day.

"My last cat I fed twice a day, and I should have known better," Dr. Raditic says, adding that he often kept her awake at night because he was restless and wanted to hunt. "I'm surprised he didn't say, 'Seriously, Donna, what the heck is that? I'm a cat!'"

### Nutritious as a mouse

If Tom had ever caught Jerry and made the mouse his lunch, he would have consumed around 30 calories.

In the wild, cats eat mice, and because of this, the nutritional makeup of a mouse proves to be a good model for what should be in a domestic cat's diet. A mouse is between 50 and 64 percent protein, 12 and 46 percent fat, 2 and 10 percent carbs and has a moisture content of about 50 percent. Most pet owners are probably feeding their cat a diet with too many carbs and not nearly enough protein. Though canned diets fare a little better on the protein front than dry foods, most over-the-counter cat diets fall far short of the nutrition a mouse would provide.

To sidestep this, Dr. Raditic recommends placing cats on therapeutic diets. "Canned diabetic diets aren't perfect, but they are close to mouselike diets," she says. Therapeutic diets also have an advantage because the nutrition information is presented more clearly, and owners can be assured that the quality of ingredients in the food is high.

"Even if an over-the-counter diet has higher protein than a therapeutic, I would still choose the therapeutic, because you don't know the quality and digestibility of that protein. The cat will probably still get more out of the protein in the therapeutic," Dr. Raditic says.

Finding the right diet for a cat is an ongoing process for both the veterinarian and the owner. Veterinarians shouldn't be afraid to run new nutrition ideas by their clients to reach the goal of a healthier, happier and longer-lived cat.

## Feline-focused food puzzles don't have to be complicated

This easy-to-assemble food puzzle comes to you courtesy of a *Firstline* reader.



This is my DIY feeding puzzle, preferred by two of my four cats. I modified it with the wooden base after my 11-pound cat would just tip over the original cardboard box that I'd cut holes out of to hold the cups. Make sure the cups are narrow enough so that the cat can't just face plant and eat out of the cup.

*Ann Wortinger BIS, LVT, VTS (ECC, SAIM, Nutrition), FFCP*



Want to submit your own? We pay \$50 for each tip we publish. Send one in at [dvm360.com/pearls](https://dvm360.com/pearls).

# A team approach to behavior medicine:

## Taking away the veterinarian's anxiety over behavior cases

Or, how my staff keeps me cool when Boris is on the books. *By Adriana Fisher, DVM, CVA*

Checking my schedule for the busy workday I see the usual suspects: standard wellness appointments, ear infections, a couple chronic weight loss cases. And then my stomach knots up. Today at 4:30 it's Boris.

This appointment is over eight hours away and already I'm fraught with anxiety.

What is it about Boris? He's a neutered male Rhodesian Ridgeback who shows severe aggression issues with strangers. And those issues are even worse with me, his veterinarian of many years.

I dread seeing Boris (or any one of my patients like him) on the schedule for multiple reasons. First is the wrench these appointments can throw into my day. Complicated behavior cases like this often require more than the allotted 30-minute appointment time and can put the rest of the day into a tailspin.

But more disappointingly, I feel like by prescribing one of the four go-to behavioral medications, crossing my fingers and hoping for

the best, I am likely failing these patients and clients. But I've been unsure of how to improve this aspect of my general practice.

However, after listening to Fetch dvm360 conference speaker Lisa Radosta, DVM, DACVB, I realize how my staff and I could work together to be a better first line response to behavioral problems.

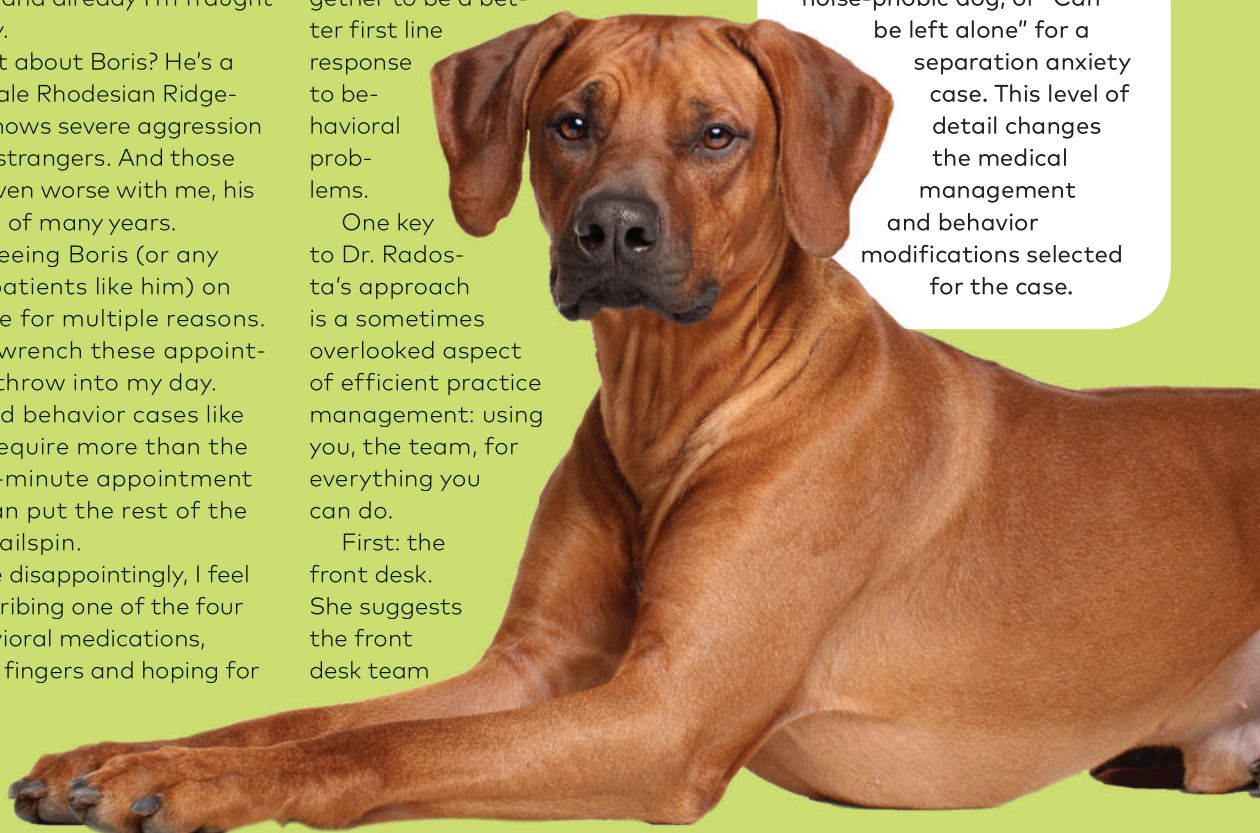
One key to Dr. Radosta's approach is a sometimes overlooked aspect of efficient practice management: using you, the team, for everything you can do.

First: the front desk. She suggests the front desk team

### About that training

In order to see success (and, as a result, happy patients and clients), the approach needs not only consistency in application, but specific, realistic goals from the outset. For example, a client saying "I want a calm dog" is not enough. Instead, get specific: "Does not panic during fireworks" for a noise-phobic dog, or "Can be left alone" for a

separation anxiety case. This level of detail changes the medical management and behavior modifications selected for the case.





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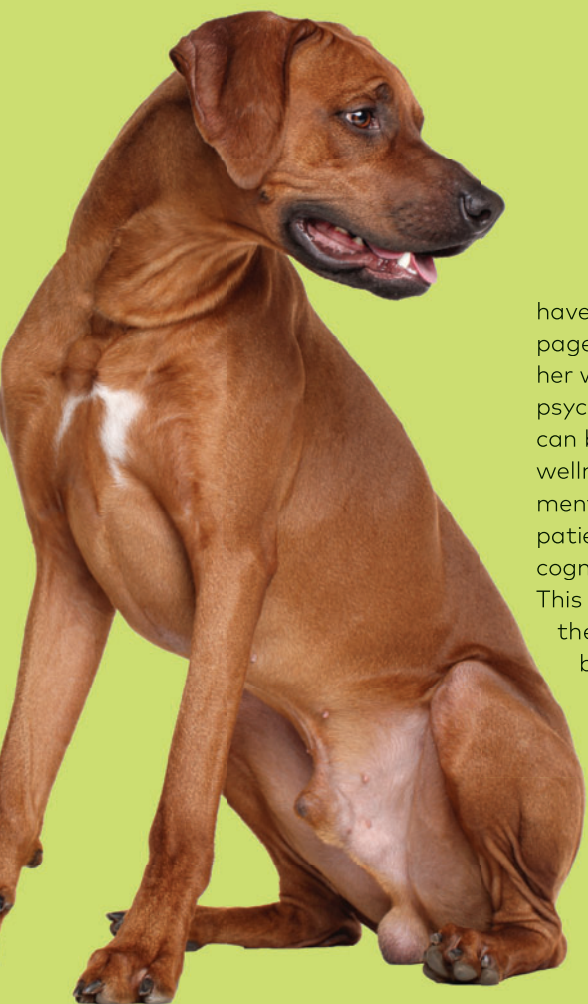
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have clients fill out simple one-page screening forms (available on her website) regarding the pet's psychological health. The form also can be passed to clients scheduling wellness appointments that may mention behavioral issues and for patients over 10 years old where cognitive dysfunction is noted. This will save time and prevent the doctor from being blindsided by behavioral problems in the exam room.

Regarding treatment, here's where the rest of the team comes in. Dr. Radosta says that there are more layers to handling this type of patient than just prescribing trazodone, fluoxetine, clomipramine or alprazolam. "Behavioral plans have three

parts: management, medical treatment and behavioral treatment," she says, "And veterinarians are often falling short on the behavioral component."

Here's how Dr. Radosta says that last element can be tightened up: Following the exam and client consultation, the veterinarian should identify the behavior diagnosis and determine a plan. Then—another chance to utilize your in-house veterinary professionals—rely on technicians to institute that plan. Have a technician show clients how to implement the desired training/behavior modification techniques and carry out weekly follow-up sessions.

Having an educated, enthusiastic behavior-focused technician team is key to this approach.

## Client-facing video content: How do I find a veterinary behaviorist and why do I need one?

**Share this easily understandable advice from Dr. Julia Albright about choosing a veterinary behavior professional with your clients.**

Veterinary clinics: Julia Albright, MA, DVM, DACVB, breaks down how and why a veterinary client would need to seek out a board-certified behaviorist. You can embed her opinion directly on your website to help educate your clients. They'll benefit from her position as an expert; you'll benefit

from her stance that the veterinary clinic is the first stop. She also delves into why the trainer the veterinary client found on the Internet may be able to make the pet perform a behavior every time, but that they may not be addressing underlying issues like an emotional, anxiety-driven behavior problem.



See it, and instructions about how to share the video for your own clients at [dvm360.com/behaviorhowto](https://dvm360.com/behaviorhowto).

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A small, light-colored dog is lying down, appearing to be under anesthesia. A person's hand is gently resting on the dog's back. The background is a soft, out-of-focus image of the dog. The overall tone is calm and professional.

# Sweet dreams: Anesthesia for the diabetic patient

**Kristen Cooley, BA, CVT, VTS (anesthesia & analgesia), highlights the considerations to make when putting a diabetic patient under anesthesia.** *By Kristen Cooley, BA, CVT, VTS (anesthesia & analgesia)*

**D**iabetes mellitus is an endocrine disease that is the result of inadequate serum insulin levels or insulin resistance (decreased sensitivity of peripheral tissues to the effects of insulin).<sup>1</sup> It is characterized as being either type 1 or type 2. Type 1 diabetes mellitus occurs when immune-mediated destruction of the pancreatic beta cells ensues, leading to hypoinsulinemia, hyperglycemia and the need

for exogenous insulin supplementation.<sup>1</sup> This type of diabetes is more common in female dogs.<sup>1</sup> Type 2 diabetes is likely a combination of the impaired secretion of insulin as well as a reduction in tissue insulin sensitivity leading to hyperglycemia. Type 2 is more common in male cats and is usually managed through diet, although approximately 70% will require exogenous insulin supplementation.<sup>1,2</sup>

Insulin is essential for normal cellular function and works to inhibit glycogenolysis (the breakdown of glycogen into glucose), gluconeogenesis (the generation of glucose from noncarbohydrate substances mainly in the liver and kidney), and lipolysis (fat hydrolysis).<sup>1</sup> Insulin also stimulates glucose uptake into cells and potassium transport, and suppresses ketogenesis. An animal with sustained hyperglycemia and





# Do your heartworm protocols need an update?

Here's your reminder postcard.  
p.3



## HEARTWORM

March 2019

[dvm360.com/heartwormtoolkit](http://dvm360.com/heartwormtoolkit)

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## CORAXIS<sup>®</sup> (moxidectin) Topical Solution for Dogs

**BRIEF SUMMARY:**  
Before using Coraxis<sup>™</sup>, please consult the product insert, a summary of which follows:

### WARNING

- **DO NOT ADMINISTER THIS PRODUCT ORALLY**
  - For the first 30 minutes after application ensure that dogs cannot lick the product from application sites on themselves or other treated animals.
  - Children should not come in contact with application sites for two (2) hours after application.
- (See Contraindications, Warnings, Human Warnings, and Adverse Reactions, for more information)

### CAUTION:

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

### INDICATIONS:

CORAXIS is indicated for the prevention of heartworm disease caused by *Dirofilaria immitis*. CORAXIS is also indicated for the treatment and control of the following intestinal parasites:

	Intestinal Parasite	Intestinal Stage		
		Adult	Immature Adult	Fourth Stage Larvae
Hookworm	<i>Ancylostoma caninum</i>	X	X	X
	<i>Uncinaria stenocephala</i>	X	X	X
Roundworm	<i>Toxocara canis</i>	X		X
	<i>Toxascaris leonina</i>	X		
Whipworm	<i>Trichuris vulpis</i>	X		

### CONTRAINDICATIONS:

Do not administer this product orally. (See WARNINGS.)

Do not use this product (containing 2.5% moxidectin) on cats.

### WARNINGS:

For the first 30 minutes after application: Ensure that dogs cannot lick the product from application sites on themselves or other treated dogs, and separate treated dogs from one another and from other pets to reduce the risk of accidental ingestion. Ingestion of this product by dogs may cause serious adverse reactions including depression, salivation, dilated pupils, incoordination, panting, and generalized muscle tremors. In avermectin sensitive dogs, the signs may be more severe and may include coma and death.<sup>a</sup>

<sup>a</sup> Some dogs are more sensitive to avermectins due to a mutation in the ABCB1 gene (formerly MDR1 gene). Dogs with this mutation may develop signs of severe avermectin toxicity if they ingest this product. The most common breeds associated with this mutation include Collies and Collie crosses.

<sup>b</sup> Although there is no specific antagonist for avermectin toxicity, even severely affected dogs have completely recovered from avermectin toxicity with intensive veterinary supportive care.

### HUMAN WARNINGS:

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

Children should not come in contact with application sites for two (2) hours after application. Causes eye irritation. Harmful if swallowed. Do not get in eyes or on clothing. Avoid contact with skin. Exposure to the product has been reported to cause headache, dizziness, and redness, burning, tingling, or numbness of the skin. Wash hands thoroughly with soap and warm water after handling.

If contact with eyes occurs, hold eyelids open and flush with copious amounts of water for 15 minutes. If eye irritation develops or persists, contact a physician. If swallowed, call poison control center or physician immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or physician. People with known hypersensitivity to benzyl alcohol or moxidectin should administer the product with caution. In case of allergic reaction, contact a physician. If contact with skin or clothing occurs, take off contaminated clothing. Wash skin immediately with plenty of soap and water. Call a poison control center or physician for treatment advice.

The Safety Data Sheet (SDS) provides additional occupational safety information. For a copy of the Safety Data Sheet (SDS) or to report adverse reactions call Bayer Veterinary Services at 1-800-422-9874. For consumer questions call 1-800-255-8826.

### PRECAUTIONS:

Do not dispense dose applicator tubes without complete safety and administration information.

Use with caution in sick, debilitated, or underweight animals. The safety of CORAXIS has not been established in breeding, pregnant, or lactating dogs. The safe use of CORAXIS has not been established in puppies and dogs less than 7 weeks of age or less than 3 lbs body weight.

Prior to administration of CORAXIS, dogs should be tested for existing heartworm infection. At the discretion of the veterinarian, infected dogs should be treated with an anthelmintic to remove adult heartworms.

CORAXIS is not effective against adult *D. immitis*. (See ANIMAL SAFETY - Safety Study in Heartworm-Positive Dogs.)

### ADVERSE REACTIONS:

Since CORAXIS contains 2.5% moxidectin, studies that demonstrated the safe use of a topical solution containing 2.5% moxidectin + 10% imidacloprid were acceptable to demonstrate the safety of CORAXIS.

**Field Studies:** Following treatment with a topical solution containing 2.5% moxidectin + 10% imidacloprid or an active control, dog owners reported the following post-treatment reactions:

OBSERVATION	Moxidectin + Imidacloprid n = 128	Active Control n = 68
Pruritus	19 dogs (14.8%)	7 dogs (10.3%)
Residue	9 dogs (7.0%)	5 dogs (7.4%)
Medicinal Odor	5 dogs (3.9%)	None observed
Lethargy	1 dog (0.8%)	1 dog (1.5%)
Inappetence	1 dog (0.8%)	1 dog (1.5%)
Hyperactivity	1 dog (0.8%)	None observed

During a field study of a topical solution containing 2.5% moxidectin + 10% imidacloprid using 61 dogs with pre-existing flea allergy dermatitis, one (1.6%) dog experienced localized pruritus immediately after product application, and one investigator noted hyperkeratosis at the application site of one dog (1.6%).

**Laboratory Effectiveness Studies:** One dog in a laboratory effectiveness study experienced weakness, depression and unsteadiness between 6 and 9 days after application of a topical solution containing 2.5% moxidectin + 10% imidacloprid. The signs resolved without intervention by day 10 post-application. The signs in this dog may have been related to peak serum levels of moxidectin, which vary between dogs, and occur between 1 and 21 days after product application.

The following clinical observations also occurred in laboratory effectiveness studies following application of a topical solution containing 2.5% moxidectin + 10% imidacloprid and may be directly attributed to the drug or may be secondary to the parasite burden or other underlying conditions in the dogs: diarrhea, bloody stools, vomiting, anorexia, lethargy, coughing, ocular discharge and nasal discharge. Observations at the application sites included damp, stiff or greasy hair, the appearance of a white deposit on the hair, and mild erythema, which resolved without treatment within 2 to 48 hours.

### ANIMAL SAFETY:

In a controlled, double-masked, field safety study, a topical solution containing 2.5% moxidectin + 10% imidacloprid was administered to 128 dogs of various breeds, 3 months to 15 years of age, weighing 4 to 157 pounds. The moxidectin + imidacloprid topical solution was used safely in dogs concomitantly receiving ACE inhibitors, anticonvulsants, antihistamines, antimicrobials, chondroprotectants, corticosteroids, immunotherapeutics, MAO inhibitors, NSAIDs, ophthalmic medications, sympathomimetics, synthetic estrogens, thyroid hormones, and urinary acidifiers. Owners reported the following signs in their dogs after application of moxidectin + imidacloprid topical solution: pruritus, flaky/greasy residue at the treatment site, medicinal odor, lethargy, inappetence and hyperactivity. (See ADVERSE REACTIONS.)

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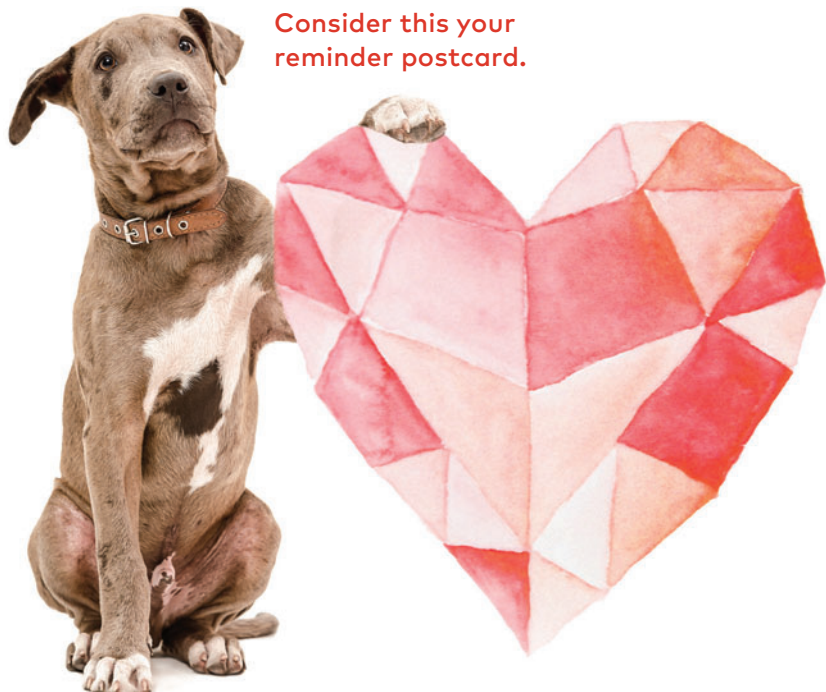
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Consider this your  
reminder postcard.



# Do your heartworm protocols need an update?

By Christopher Rehm, DVM

With new canine treatment guidelines out now, it's a perfect time to revisit your protocols to make sure your veterinary practice is current on heartworm prevention and treatment for cats and dogs.

Whether you practice in Alabama, Arizona, California or Connecticut, chances are you have a protocol in place for routine heartworm screening and prevention as well as a

plan to treat heartworm-positive dogs. But the American Heartworm Society—which continually monitors the latest studies—has recently updated guidelines. Check to see if you're up-to-date on ...





## TOOLS YOU NEED

For the latest AHS guidelines for heartworm disease in dogs, go to [dvm360.com/heartwormtoolkit](https://dvm360.com/heartwormtoolkit).

### Preventives: Assessing risk

The AHS heartworm guidelines on prevention call for year-round administration of heartworm preventives and practical steps to reduce mosquito exposure (for example, eliminating standing water and keeping dogs indoors during peak mosquito times) as the backbone of any prevention protocol. However, added risk may mean additional preventive steps are needed.

### Factors that constitute high risk include:

#### Heartworm prevalence.

The relative risk of heartworm infection where you practice may vary both from year to year and from season to season. Take a year-over-year look at the number of heartworm cases you've been diagnosing. Has the

number been rising? The presence of heartworm-positive dogs along with environmental and climate conditions that favor the proliferation of mosquitoes—either seasonally or year-round—can increase the risk of heartworm transmission.

**Client compliance.** The efficacy of a prevention program is impaired by poor or inconsistent compliance. This also increases risk.

If and when the relative risk of heartworm transmission is considered high or individual client compliance is less than desirable, consider the added use of an EPA-approved repellent/ectoparasiticide. This will provide additional control of the mosquito vector and interrupt the chain of transmission by reducing the transmission from infected mosquitoes to dogs and from infected dogs to mosquitoes.

### Testing: The 'how' and 'when' of heat treatment

Heat treatment of serum samples prior to antigen tests can improve testing accuracy when antigen blocking produces false-negative results on in-clinic

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**The step-by-step AHS heartworm treatment protocol is designed to help reduce the severity of complications from adulticide therapy.**

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heartworm tests. While acknowledging that this added step has value when active clinical disease is suspected in the absence of a positive antigen test, however, the AHS does not recommend this step for routine in-clinic screening.

Why not? The available heartworm tests are highly sensitive and accurate.

Heat treatment of samples is contrary to label instructions for in-house tests and may interfere with the accuracy of both heartworm tests and combination tests designed to detect antibodies of other infectious agents.

Suspected serum samples should be sent to a veterinary reference lab or a college of veterinary medicine's parasitology department.

### **Treatment: Make the AHS protocol your go-to**

The step-by-step AHS heartworm treatment protocol—which includes administering a macrocyclic lactone (ML) preventive to kill juvenile worms and doxycycline to eliminate *Wolbachia* species bacteria prior to melarsomine administration—is designed to help reduce the severity of complications from adulticide therapy. The

protocol includes a one-month waiting period between antibiotic and adulticide administration to allow more time for effects of the doxycycline to reduce worm biomass, reduce *Wolbachia* species metabolites and render microfilariae unable to mature to adults.

The AHS argues that this should be the default heartworm treatment. It's true that alternative non-arsenical protocols have been studied in the U.S. and Europe because of the need in cases where melarsomine treatment can't be used. However, the length of time required to kill adult worms, the uncertainty of "slow kill" treatment in resistance, the increased pathology, and the unknown restriction requirements with these protocols make them less than ideal for most patients and less predictable in outcomes. More studies are definitely needed.



**Dr. Christopher Rehm,**  
president, American  
Heartworm Society

The American Heartworm Society was founded in early 1974 by a group of veterinary practitioners and scientists concerned about heartworm disease. Active membership is open to all veterinarians and scientists with interests in any aspect of heartworm disease. The AHS is governed by an executive board made up of veterinary practitioners, academicians and researchers. Christopher Rehm, DVM, is the owner of Rehm Animal Clinics of Mobile and Baldwin counties, four small animal clinics in south Alabama and has served as the AHS president since 2016.

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# Don't take 'no' for an answer

Despite your parasite preventive conversations in the exam room, a client may ask anybody in the hospital, including receptionists, 'Do I really need to shell out money for this?' Here's how to make sure everyone on the team is armed for the conversation.

**T**he American Heartworm Society (AHS) canine guidelines for heartworm prevention, diagnosis and treatment were recently revised, with a strong

emphasis placed on the importance of year-round heartworm prevention.

Why? A 2016 AHS survey of almost 5,000 veterinary practices revealed that the number of heartworm-positive pets per clinic rose by 21 percent since the previous survey of three years earlier.

Among veterinarians who reported that

heartworm disease was "on the rise" since the previous survey, the leading reason was that "owners skip doses or don't give preventives year-round." This compliance conundrum highlights the importance of client conversations about heartworm prevention—a priority that puts staff members front and center. Following are suggestions for handling heartworm prevention pushback from owners.

**Client:** "Heartworm medicine's so expensive. Why should I spend my money on it?"

**Veterinary team member:** "While it seems expensive, you get a lot more value for your prevention dollar than





you realize. Consider this: You can protect your dog from a fatal heartworm infection for an entire month for what you'd spend on a pastry and coffee at your local coffee shop. Many monthly medications also offer more than just heartworm protection—some protect against fleas and common intestinal worms, too. That's important to your pet's health as well as that of your family, when you consider that parasites like roundworms and hookworms can be spread to your kids and other household members."

**Client: "I still don't think I can justify spending money on it."**

**Veterinary team**

**member:** "Here are two important facts you need to know. First, preventing heartworms is a lot cheaper than treating them; heartworm treatment can cost up to \$1,000 in medication and veterinary bills. Secondly,

while heartworm disease in dogs can be treated and the worms eliminated, the damage left by heartworms is forever, and many dogs are left with residual health problems."

(Bonus round for staff members in "nonendemic" areas)

**Client: "I don't think I need it. Heartworms aren't that common around here."**

**Veterinary team**

**member:** "While heartworm disease isn't as common here as in other parts of the U.S., heartworms have been diagnosed in every state in this country. In parts of the country that stay cold for six months or more, there are lots of warm, protected spots where mosquitoes that transmit heartworms can live. In urban areas, radiated heat is stored in concrete and asphalt and is released at night when mosquitoes are active. In rural areas, mosquitoes

may find a warm spot in a hollow log or animal burrow to ride out the winter. In dry locales, thanks to sprinkler systems, birdbaths and watering cans, there are pockets of standing water everywhere where mosquitoes can breed.

"I know parasite preventives may be an added expense you weren't expecting, and you may be weighing the costs and benefits. Makes perfect sense. It boils down to this: No matter where you live, is it worth putting your pet at risk? Isn't it easier to give a single medication once a month—or an injection every six months—to keep him or her safe? Think about it this way: You may never have been in a car wreck, but you still put on your seat belt. Would you risk your life by not wearing one? Why would you risk your pet's life by not giving him or her heartworm prevention?"



# Here comes the sun:

## Are you ready for parasite season?

Longer days. More vegetation. Spring brings forth a sense of hope and, at the same time, more stuff to encourage parasite numbers.

**T**he time for the rise of the parasites begins—acknowledging, of course, that some warmer climates never quite lose them. So we asked a local veterinary clinic for what parasitology-related questions they have and snagged answers from Richard Gerhold, DVM, MS, PhD—always ready to deliver crucial parasite prevention tips.

**Do heartworm preventives with efficacy against intestinal parasites work for**

### **routine puppy deworming?**

**Dr. Gerhold:** Depending on the active drug in the preventive, the treatment should be effective at removing *Toxocara canis* (roundworms), *Ancylostoma caninum* (hookworms) and potentially *Trichuris vulpis* (whipworms). Ivermectin is not effective against *T. vulpis*, so animals receiving a preventive with only ivermectin would need a secondary product for treatment of infection with *T. vulpis*. Furthermore,

tapeworm infections would need to be treated with either praziquantel or fenbendazole, depending on the tapeworm species. Finally, if dogs are being treated with ProHeart 6, they will also need to be given a monthly medication to control intestinal parasites.

### **What are the latest updates on microfilarial resistance to heartworm?**

**Dr. Gerhold:** While there does appear to be some legitimate resistance



While there does appear to be some legitimate resistance of *Dirofilaria immitis microfilariae* to at least some of the preventives, it's a minor issue compared to lack of owner compliance in administering monthly heartworm preventives to dogs and cats.

of *Dirofilaria immitis microfilariae* to at least some of the preventives, it's a minor issue compared to lack of owner compliance in administering monthly heartworm preventives to dogs and cats. Efforts should be focused on educating owners about the necessity of compliance with monthly administration of heartworm preventive. Furthermore, veterinarians should avoid the use of the slow-kill method for adult heartworms if at

all possible. The use of slow kill greatly increases the chances of selecting for resistant strains of *D. immitis microfilariae* that may be transmitted to other canids.

**What do you think of genetically modifying mosquitoes to make them less capable of transmitting diseases?**

**Dr. Gerhold:** I am in favor of research to investigate options for genetically controlling vector-borne disease. I see this research

as being similar to the release of sterile male screw worm flies that led to eradication of screw worms from the United States. Hopefully there is funding for such research projects in the future to test the efficacy of such genetically modified vectors.

*Dr. Richard Gerhold works in the Department of Biomedical and Diagnostic Sciences in the College of Veterinary Medicine at the University of Tennessee.*







# Counter **cost concerns** with heartworm treatment

Show clients the value of heartworm treatment as well as payment help.

**T**he recently updated American Heartworm Society (AHS) canine heartworm guidelines emphasize the advantages of the protocol over the non-arsenical treatment protocols that have been studied in the U.S. and Europe. While these protocols are needed for dogs that aren't candidates for melarsomine treatment, the hope is that most heartworm-positive dogs can undergo the AHS treatment regimen, which is designed to eliminate the highest percentage of adult worms while minimizing treatment complications.

So, you have the better protocol and access to medications. What can you do to make sure the pet owner isn't put off by cost or a weak recommendation?

## **Countering cost concerns with adulticide treatment**

**Create a step-by-step estimate that breaks down the treatment steps.**

Treatment estimates that break out the different costs can help veterinary clients understand the complexity of heartworm treatment as well as the total cost. Pet owners understand that fees are associated with lab tests and imaging as well as with medications, monitoring and—in some instances—hospitalization. (*Editor's note:* Worried that if you list all the specific costs that clients will argue to knock some of them off? It's all good. Itemize the parts of the treatment but don't include individual prices.)

**Create a payment plan that mirrors**



*By Chris Duke, DVM, founder of Bienville Animal Medical Center in Ocean Springs, Mississippi.*

**the treatment plan.** One benefit to the AHS treatment protocol is that the medications are administered in a step-by-step fashion. Because there are 60 days between the initial diagnosis and the first melarsomine injection—as well as another 30 days between the first and second injections—payments can be billed in tandem with the medication. This also gives the client the opportunity to save for the costliest component of treatment: the melarsomine injections.

**Use third-party payment plans.** For clients who aren't enrolled in a pet health insurance plan or who can't afford to pay as they go, programs like CareCredit and Scratchpay can help owners stretch out the treatment costs in a manageable payment schedule.

## Putting the brakes on slow kill

While it may be tempting to offer alternative protocols to clients on tight budgets, forgoing adulticide treatment is not always in the long-term best interest of the pet. Here's how to handle it:

**Explain the risks.** Because it can take years for alternative protocols to achieve results, the progression of pulmonary pathology and damage from adult heartworms continues over an extended period of time. Most clients want what's best for their pet; we do our clients a disservice if we don't provide our best recommendation first.

**Compare the costs.** While non-arsenical protocols eliminate the cost of melarsomine, they aren't necessarily cheap. Doxycycline—which should be used in non-arsenical as well as adulticide regimes to kill *Wolbachia* species bacteria and reduce the reproductive potential of adult heartworms—is a fairly expensive antibiotic. Meanwhile, dogs on non-arsenical therapy require repeated antigen tests to ascertain their status.

Just make sure with any change in protocols that you and your team are on the same page on the importance of the change if it affects what pet owners are paying. This is about strong recommendations and strong communication. In my view, good medicine is always good business, and maintaining standards of integrity keeps our patients healthier—and our clients happier—in the long run.



# 3 simple strategies to talk heartworms

Add some oomph to your heartworm prevention conversations with these tips.

*By Ronald Hamilton, BSc, DVM*

If your heartworm prevention conversations feel a bit stale, use these quick tips to protect pets against this dangerous killer.

## 1. Use cooked spaghetti as an example.

Pet owners are often surprised to learn that heartworms can range in size from 4 to 12 inches and look like cooked spaghetti wrapping through the heart. Dogs are a natural host for heartworms, which means that the worms that live inside the dog mature into adults, mate and produce

offspring.

If untreated, their numbers can increase, and dogs have been known to harbor several hundred worms in their bodies. You can drive this point home by showing pet owners an entire box of cooked spaghetti in a clear glass jar, representing the magnitude of heartworm infestation.

## 2. Explain the mosquito bite phenomenon.

Sometimes pet owners need a better understanding of how heartworm disease is transmitted, and

explaining the worm's life cycle can help. I recommend adapting information from the American Heartworm Society.

## 3. Teach cat owners about the gravity of infection.

Remind pet owners that heartworm can be sneaky in cats. Tell them to watch for signs, including coughing, asthma-like attacks, periodic vomiting, lack of appetite or weight loss. Remind them that there's no treatment for cats, so they should contact your practice



as soon as they notice any signs or suspect a problem. Cat owners are always under the impression that because cats are indoors, they are not susceptible to heartworms. But—spoiler alert—mosquitos fly into homes! Visual aids like an emailed video link showing what cats look like with heartworm-caused respiratory distress, or having a video explaining the transmission process on in the lobby or exam rooms is a big help in demonstrating the effect heartworms can have, particularly for the cats.



# Minimizing heartworm transmission in relocated dogs: An algorithm

**T**he American Heartworm Society (AHS) has announced a new set of best practices for minimizing heartworm transmission in relocated dogs, including recommendations for testing, treatment and prevention, that were developed in collaboration with the Association of Shelter Veterinarians (ASV), according to a society release.

These guidelines are intended to help in situations such as newly adopted pets left homeless by a recent hurricane, the dog that moved cross-country with its family or the canine companion that's returning from a beach vacation—situations the society says are familiar to veterinarians in today's mobile society.

"Preventing transmission of *D[irofilaria] immitis* has always been a focus of the AHS heartworm

guidelines. However, we believe we need to do more given the potential for heartworm-positive dogs to serve as reservoirs for infection," says AHS President Chris Rehm, DVM, in the release. "For example, if a microfilaria-positive dog is rescued in one state and subsequently moved to a new home in another state where nearby pets are unprotected, mosquitoes feeding on the new dog can quickly become heartworm vectors. The results can be disastrous for unprotected pets in the vicinity."

While the ideal scenario is to treat infected dogs before transporting or traveling with them, situations often dictate that infected animals can't undergo a full course of heartworm treatment, including adulticide administration, before hitting the road,

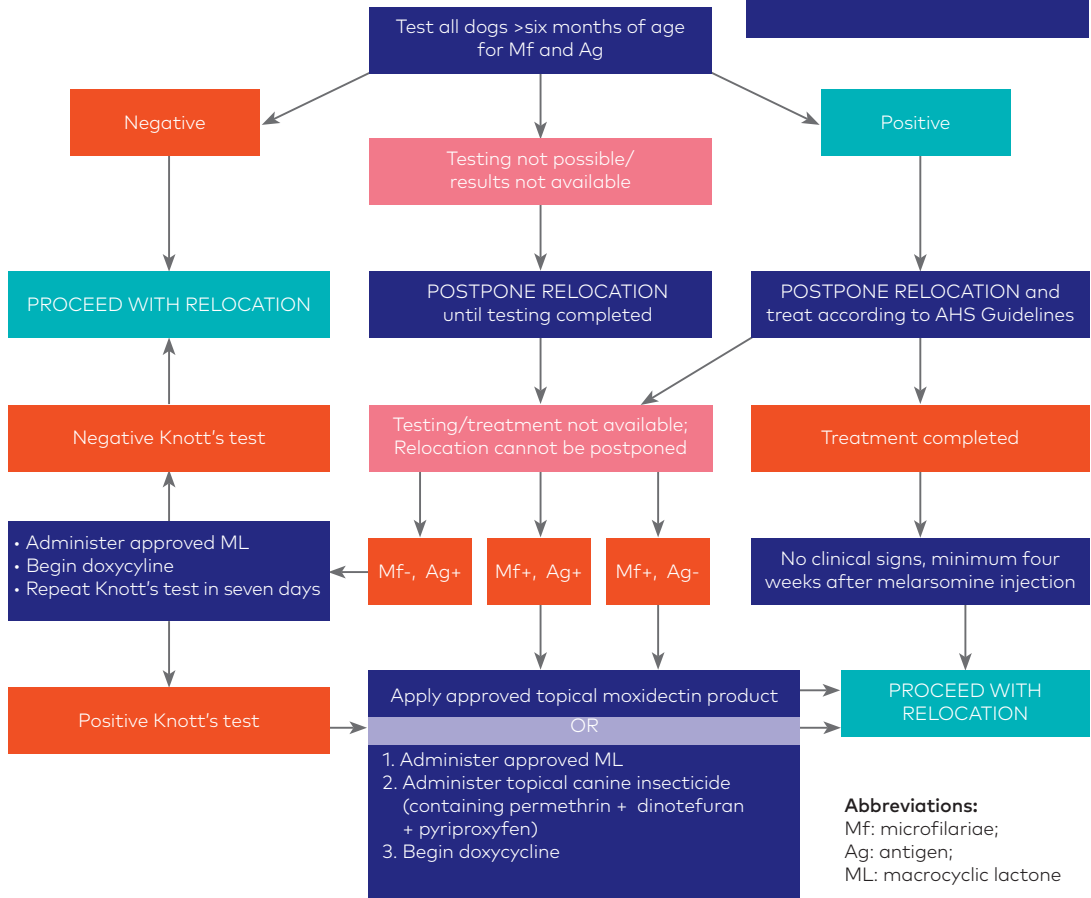
the release states. The goals of the AHS transportation guidelines are to prevent infected dogs from becoming heartworm reservoirs, ensure that untimely travel doesn't trigger heartworm disease complications, and ensure that, once treated, dogs are on lifelong heartworm prevention. These guidelines are also an algorithm to decide best course of treatment for a pet.

Best practices include the following steps:

- > Testing all dogs 6 months of age or older before relocation
- > Delaying relocation of heartworm-positive dogs
- > Pretreating heartworm-positive dogs (e.g. administering macrocyclic lactone drugs, applying an EPA-approved product that kills and repels mosquitoes,

## TOOLS YOU NEED

For a free download of this algorithm, go to [dvm360.com/heartwormtoolkit](https://dvm360.com/heartwormtoolkit).



and administering antibiotics) when relocation can't be delayed

- > Following guidelines for microfilaria testing and retesting to avoid transportation of microfilaremic dogs
- > Following guidelines

for transport after administration of melarsomine to infected dogs.

"It is clear that care, cooperation and communication are needed on both ends of any journey that involves a heartworm-

positive dog," Dr. Rehm states. "Our goal is to help veterinarians who oversee the health of both traveling and adopted dogs—as well as their clients—understand the threat and make the prevention of heartworm transmission a priority.





# When the pet owner thinks heartworms are **#FakeNews**

**Your veterinary client thinks that heartworms are nothing more than a made up scam for money. Here's how I like to steer them straight.** *Erika Ervin, MBA, CVPM, CVT*

**W**hen I'm faced with a client who doesn't believe heartworms exist, first I try to determine their source of information. This helps me tailor my approach and understand how their sources convinced them so well. This is important, because you wouldn't want to offend someone if they're receiving information from a friend or family member.

One of the best ways I educate clients on the topic of heartworms and the threat they pose to dogs and cats is to share my personal experiences. This approach is more genuine than just giving clients facts about heartworms—something

they can just claim you've made up. With personal stories, I'm able to connect with clients and gain their trust. Once we've established trust, I can start to ask about their views on heartworm and dispel any myths they may have heard or false information they've received.

Maybe money is important to them. In that case, I'd explain how prevention is always more affordable than treatment. And in cats especially, where there is no treatment, it becomes a matter of life and death.

Or maybe they place high value on science and facts. For those clients, I'd explain to them how

heartworm is found in all 50 states today. I'd explain how Hurricane Katrina impacted heartworm prevalence in different areas around the country and why, now more than ever, it's important to protect our pets against heartworm. There's a chance many other pet owners aren't protecting their pets, and that poses a risk for transmission to our pets.

At the end of the day, the only way to gain credibility with pet owners is to discover what they value most and use that to formulate the best response. This way you'll resonate with what they find important and they'll be more likely to trust and buy into your message.

FROM YOUR VETERINARIAN 

## Is heartworm prevention worth it?



Heartworm medication is an expense you might not have expected, but it's an important one. Here are answers to common questions to help you think about a single medication once a month—or an injection every six months—to keep your pet safe and sound.

**Heartworm medicine can be expensive. Why should I spend my money on it?**  
While it seems expensive, you get a lot more value for your prevention dollar than you realize. Consider this: You can protect your dog from a fatal heartworm infection for as little as \$10 a month. That's just a penny a day, and it's a small price to pay to keep your dog healthy and happy. Many monthly medications also offer more than just heartworm protection—some protect against fleas and prevent intestinal worms, too. That's important to your pet's health as well as that of your family, where you consider that parasites like roundworms and hookworms can be spread to your kids and other household members.

**I still don't think I can justify spending money on it.**  
Here are two important facts you need to know. First, preventing heartworms is a lot cheaper than treating them. Heartworm treatment can cost up to \$1,000 for medication and necessary tests. Second, while heartworm disease in dogs can be treated and the worms eliminated, the damage left by heartworms is forever, and some dogs are left with lifelong health problems.

**I don't think I need it. Heartworms aren't that common around here.**  
While heartworm disease may not be common in some parts of the U.S., heartworms have been diagnosed in every state in the country. In parts of the country that may still be too remote or rural, there are lots of warm, protected spaces where mosquitoes that transmit heartworms can live. In urban areas, dogs and cats are more in contact with people and animals of all ages. Mosquitoes are active in most areas, mosquitoes may find a way to get to a remote region, and humans to take care of the worms. In all climates, thanks to climate control, backyards and watering cans, there are pockets of standing water everywhere where mosquitoes can breed.

**That's about it for me. My dog never has been in a car wreck, but you still put on your seat belt. Would you risk your life to not wearing one? Why would you risk your pet's life by not giving him or her heartworm prevention?**  
Think about it this way: Your dog never has been in a car wreck, but you still put on your seat belt. Would you risk your life to not wearing one? Why would you risk your pet's life by not giving him or her heartworm prevention?

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[dvm360.com/heartwormtoolkit](http://dvm360.com/heartwormtoolkit)





# An update on heartworm disease and HARD in cats

Dr. Ray Dillon shares why this 'juvenile delinquent' form of heartworm disease causes so much trouble in feline veterinary patients.

**W**hat do veterinarians need to know about feline heartworm disease and heartworm-associated respiratory disease (HARD) in cats? Ray Dillon, DVM, MS, MBA, DACVIM, professor of small animal internal medicine at Auburn University, took a few minutes to answer these

questions at the 15th Triennial Heartworm Symposium in New Orleans.

**Feline heartworm disease: Think quality of life, not life or death**

"When we first started thinking of this disease 40 years ago, we made the mistake of always assuming it is a fatal

disease," says Dr. Dillon. "And now we recognize that it is rarely a fatal disease."

Feline heartworm disease does, however, affect the cat's quality of life—often for the duration of the cat's life, Dr. Dillon says.

Even an "unsuccessful" infection—one where the parasite doesn't make it





Watch the video by  
scanning the code or  
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to the adult stage—can have dire consequences on the cat's respiratory tract, Dr. Dillon says. The cat is still likely to suffer from disease even though it's not the adult parasite causing it.

So what's the takeaway? According to Dr. Dillon, both veterinary professionals and clients need to be reminded that this is a quality-of-life disease instead of a life-or-death disease.

### **HARD: Hard diagnostics**

"The incidence of HARD (and even the incidence of heartworms) in cats is an ongoing question people always want to know," says Dr. Dillon. But instead of wading through percentages with clients,

Dr. Dillon simply reminds them that if it occurs in their cat, it affects 100 percent of the cat.

"We know that the infection rate throughout most of the Southeast in cats is about a third of all cats come up heartworm-antibody-positive at some point in their lives, which means they were successfully infected," says Dr. Dillon. But the real question is how far the worms traveled and developed in the cat before dying.

"Did they die precardiac?" he says. "Did they make it to the HARD stage and die? Did they make it to the adult heartworm [stage] and then the adult heartworm died?"

Dr. Dillon explains that

HARD is seasonal instead of lifelong, which can complicate diagnostics.

"HARD represents a juvenile delinquent form of the adult heartworm, so it's very much like a car wreck caused by a juvenile delinquent driver: They come in, they have a wreck, they cause all kinds of damage and then they're gone," he says. "There's no way to go back and prove who caused that accident."

Because HARD is so transient, clinicians can't easily perform diagnostics that confirm the disease 100 percent. "Necropsy studies only study cats that develop fully mature adult heartworms, and that's simply the tip of the iceberg," Dr. Dillon says.

# Handle concerns about the price of heartworm prevention

Money makes the world go 'round. *By Sue O'Brien*

**E**xpense is one of the leading objections clients give for forgoing heartworm prevention. Things like:

## **"Heartworm prevention is too expensive."**

Pet owners who assert that heartworm prevention is a luxury they can't afford may not be aware that there are low-cost options available—or understand how much

treatment may set them back if they try to skimp on prevention. Is the pet a dog, cat or ferret? If it's a dog, is it a petite terrier or a massive mastiff? Does he only need heartworm prevention or should the product protect him from fleas, ticks, heartworms and hookworms? Annual costs for clients can range from \$60 to \$250 for dogs and from \$140 to \$200 for cats and

ferrets, depending on the product's spectrum and whatever promotions are available from manufacturers. Within that range, most clients can find a cost they can live with while still meeting the needs of their pet.

Meanwhile, not every owner who finds cost to be a significant hurdle is vocal about it. "When I talk about year-round prevention in the exam room, I see a lot of head nodding from my clients," says Chris Duke, DVM, of Bienville Animal Medical Center in Ocean Springs, Mississippi. "However, my staff members tell me it's not uncommon for owners to back out of the purchase once I've exited the scene."

While it can be discouraging when pet owners insist on going home with prescriptions to fill through online services, Dr. Duke is an



advocate of picking his battles. "We always stress that purchasing from our hospital provides our clients with important support," he says, "but refusing to provide written prescriptions can result in client alienation. We provide a prescription as long as we have a valid doctor-client relationship

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**"It's up to us to provide concise, consistent and compassionate information and to create confidence in our recommendations. I tell my clients, who should they trust—a pet store worker, a TV commercial or a trained medical professional? We need to provide a winning experience at every visit—without exception—if we're going to maintain that trust."**

**— Dr. Christopher Rehm**

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and the dog has had a heartworm test in the past year. However, we specify in writing that our prescriptions are only good for U.S. products and we limit refills to the point of a new blood check."

**"If my dog gets heartworm disease, I can always just have him treated."**

The cost of treating heartworms in a dog is roughly 10 times the annual cost of preventives in most practices, but the cost of heartworms goes well beyond the dollars and cents of medications and veterinary fees. "I emphasize that the cost of prevention is a small price to pay to save pets from suffering the pain and permanent damage caused by heartworms," says Jennifer Rizzo, DVM, of Friendship Pet Hospital in San Schertz, Texas. "Having dealt with emergencies such as heart failure, pulmonary thromboembolisms and caval syndrome in the ER, I can paint a vivid picture of just how scary heartworms are. I also emphasize that prevention is a small price to pay if owners want to protect their pets from suffering and help them live a longer, happier life."

**"I don't think heartworm prevention is worth it."**

Clients set their own priorities, but it can be helpful to remind them that—important as it is—there's more at stake than just their pets' health. AHS President Christopher Rehm, DVM, owner of Rehm Animal Clinics of Mobile and Baldwin Counties in Mobile, Alabama, says, "I explain to pet owners that there are four pillars in pet healthcare: protection from parasites; protection from infectious diseases; nutrition; and keeping the pet safe via proper housing, spaying or neutering and grooming. Failure to invest adequately in any one of these four areas can have disastrous results for the pet, the family and the wallet. Pillars one and two actually reach beyond the pet because some parasites and infectious diseases can be shared between pets and family members and can even represent public health concerns because of the risk of zoonotic infections."



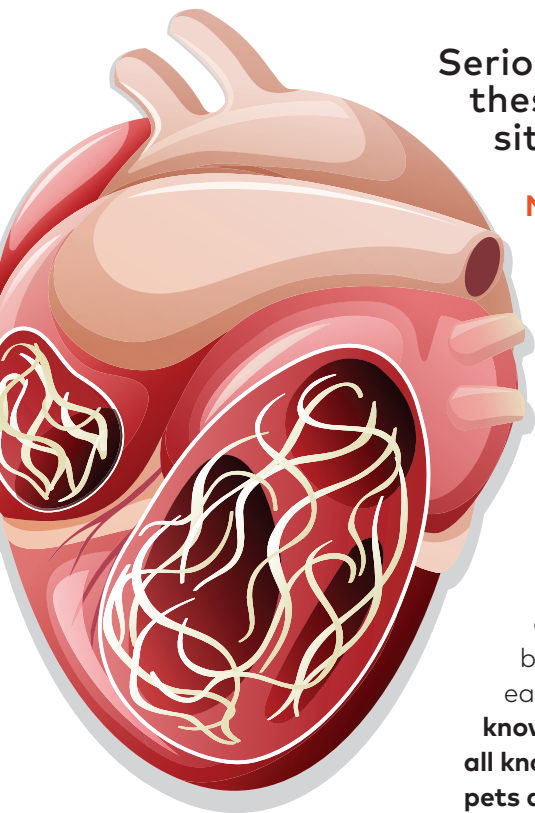


## TOOLS YOU NEED

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# Stop slacking on these 5 recommendations

Seriously. It's time to take a stand on these veterinary client noncompliance situations. *By Sarah J. Wooten, DVM*



### **No. 1: Stop telling people who say their pet doesn't go outside that they can skip heartworm preventives**

Just the other day I was in a room in my house that was the farthest from any exterior doors, and guess what was buzzing around my ear? A mosquito. **You**

**know it, I know it, we all know it: Indoor-only pets are still at risk** for heartworm disease.

### **No. 2: Stop arguing your client's limits**

Ever said to yourself, "The client only has so much money, and the fill-in-the-blank chronic medicine is more important." Or: "OMG, this dog has so many problems I have to

talk to the client about. There's no way they're going to hear me out on parasite control too!"

Do yourself a favor and suspend your own disbelief about what the client will pay for, and **just go into that exam room and give your clients the information they need** to hear—even if you don't think they want to hear it or you don't want to say it.

### **No. 3: Stop saying clients can give preventive only during mosquito season**

I have clients push me on this all the time and, I agree—it gets old. You want to say, "Fine! Just give it during the summer!"

However ... if I do that, then **I'm not doing my job or doing the client any favors**. Clients who feel "safe" from parasites

**Y**ou work with clients all day long who won't take your recommendations to heart. It can be tempting to just give in and smile and nod while they give you excuses about parasite prevention. Here are five ways to stop doing that.

## Advantage Multi® for Dogs and for Cats (imidacloprid + moxidectin)

**BRIEF SUMMARY:** Before using Advantage Multi® for Dogs (imidacloprid+moxidectin) or Advantage Multi® for Cats (imidacloprid+moxidectin), please consult the product insert, a summary of which follows:

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

### Advantage Multi for Dogs:

#### WARNING

- **DO NOT ADMINISTER THIS PRODUCT ORALLY.**
  - For the first 30 minutes after application ensure that dogs cannot lick the product from application sites on themselves or other treated animals.
  - Children should not come in contact with the application sites for two (2) hours after application.
- (See Contraindications, Warnings, Human Warnings, and Adverse Reactions for more information.)

#### INDICATIONS:

**Advantage Multi for Dogs** is indicated for the prevention of heartworm disease caused by *Dirofilaria immitis* and the treatment of *Dirofilaria immitis* circulating microfilariae in heartworm-positive dogs. **Advantage Multi for Dogs** kills adult fleas and is indicated for the treatment of flea infestations (*Ctenocephalides felis*). **Advantage Multi for Dogs** is indicated for the treatment and control of sarcoptic mange caused by *Sarcoptes scabiei* var. *canis*. **Advantage Multi for Dogs** is also indicated for the treatment and control of the following intestinal parasites species: Hookworms (*Uncinostoma caninum*) (*Uncinaria stenocephala*), Roundworms (*Toxocara canis*) (*Toxascaris leonina*) and Whipworms (*Trichuris vulpis*).

**Advantage Multi for Cats** is indicated for the prevention of heartworm disease caused by *Dirofilaria immitis*. **Advantage Multi for Cats** kills adult fleas (*Ctenocephalides felis*) and is indicated for the treatment and control of ear mite (*Otodectes cynotis*) infestations and the intestinal parasites species Hookworm (*Uncinostoma tubaeforme*) and Roundworm (*Toxocara cati*). **Ferrets:** **Advantage Multi for Cats** is indicated for the prevention of heartworm disease in ferrets caused by *Dirofilaria immitis*. **Advantage Multi for Cats** kills adult fleas (*Ctenocephalides felis*) and is indicated for the treatment of flea infestations in ferrets.

**CONTRAINDICATIONS:** Do not administer this product orally. (See **WARNINGS**). Do not use the Dog product (containing 2.5% moxidectin) on Cats.

#### WARNINGS:

**Advantage Multi for Dogs:** For the first 30 minutes after application: Ensure that dogs cannot lick the product from application sites on themselves or other treated dogs, and separate treated dogs from one another and from other pets to reduce the risk of accidental ingestion. Ingestion of this product by dogs may cause serious adverse reactions including depression, salivation, dilated pupils, incoordination, panting, and generalized muscle tremors. In avermectin sensitive dogs\*, the signs may be more severe and may include coma and death.

\* Some dogs are more sensitive to avermectins due to a mutation in the MDRI gene. Dogs with this mutation may develop signs of severe avermectin toxicity if they ingest this product. The most common breeds associated with this mutation include Collies and Collie crosses.

\* Although there is no specific antagonist for avermectin toxicity, even severely affected dogs have completely recovered from avermectin toxicity with intensive veterinary supportive care.

**Advantage Multi for Cats:** Do not use on sick, debilitated, or underweight cats. Do not use on cats less than 9 weeks of age or less than 2 lbs. body weight. Do not use on sick or debilitated ferrets.

**HUMAN WARNINGS:** Not for human use. Keep out of the reach of children. Dogs: Children should not come in contact with the application sites for two (2) hours after application. Cats: Children should not come in contact with the application site for 30 minutes after application.

Causes eye irritation. Irritant if swallowed. Do not get in eyes or on clothing. Avoid contact with skin. Wash hands thoroughly with soap and warm water after handling. If contact with eyes occurs, hold eyelids open and flush with copious amounts of water for 15 minutes. If eye irritation develops or persists, contact a physician. If swallowed, call poison control center or physician immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or physician. People with known hypersensitivity to benzyl alcohol, imidacloprid, or moxidectin should administer the product with caution. In case of allergic reaction, contact a physician. If contact with skin or clothing occurs, take off contaminated clothing. Wash skin immediately with plenty of soap and water. Call a poison control center or physician for treatment advice. The Safety Data Sheet (SDS) provides additional occupational safety information. For a copy of the Safety Data Sheet (SDS) or to report adverse reactions call Bayer Veterinary Services at 1-800-422-9874. For consumer questions call 1-800-255-6826.

**PRECAUTIONS:** Do not dispense dose applicator tubes without complete safety and administration information. Use with caution in sick, debilitated or underweight animals. The safety of **Advantage Multi for Dogs** has not been established in breeding, pregnant, or lactating dogs. The safe use of **Advantage Multi for Dogs** has not been established in puppies and dogs less than 7 weeks of age or less than 3 lbs. body weight. **Advantage Multi for Dogs** has not been evaluated in heartworm-positive dogs with Class 4 heartworm disease.

Cats may experience hypersalivation, tremors, vomiting and decreased appetite if **Advantage Multi for Cats** is inadvertently administered orally or through grooming/licking of the application site. The safety of **Advantage Multi for Cats** has not been established in breeding, pregnant, or lactating cats. The effectiveness of **Advantage Multi for Cats** against heartworm infections (*D. immitis*) after bathing has not been evaluated in cats. Use of this product in geriatric cats with subclinical conditions has not been adequately studied. Ferrets: The safety of **Advantage Multi for Cats** has not been established in breeding, pregnant, and lactating ferrets. Treatment of ferrets weighing less than 2.0 lbs. (0.9 kg) should be based on a risk-benefit assessment. The effectiveness of **Advantage Multi for Cats** in ferrets weighing over 4.4 lbs. (2.0 kg) has not been established.

**ADVERSE REACTIONS: Heartworm Negative Dogs:** The most common adverse reactions observed during field studies were pruritus, residue, medicinal odor, lethargy, inappetence and hyperactivity. **Heartworm Positive Dogs:** The most common adverse reactions observed during field studies were cough, lethargy, vomiting, diarrhea (including hematochezia), and inappetence. **Cats:** The most common adverse reactions observed during field studies were lethargy, behavioral changes, discomfort, hypersalivation, polydipsia and coughing and gagging. **Ferrets:** The most common adverse reactions observed during field studies were pruritus/scratching, scabbing, redness, wounds and inflammation at the treatment site; lethargy; and chemical odor.

For a copy of the Safety Data Sheet (SDS) or to report adverse reactions call Bayer Veterinary Services at 1-800-422-9874. For consumer questions call 1-800-255-6826.

**Advantage Multi** is protected by one or more of the following U.S. patents: 6,232,328 and 6,001,858.

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V-03/2016

during the winter are getting a false sense of security from us when we tell them it's OK to stop parasite protection during the winter.

### No. 4: Stop saying clients don't have to give prevention because you don't have heartworm in your area

Remember the micro-outbreaks of heartworm disease after dogs were

Patient, err, Dog Zero into an area with previously low reports of heartworm disease, and suddenly all dogs are at risk. Your clients deserve to know that their dog is at risk anywhere, at any time.

### No. 5: Stop saying "I recommend"

One of the most profound and effective changes I've made in the way I talk to clients is to **stop**

**Time management tip: Make a plan with your client to address only one or two of the most important health problems, prioritize those issues along with the parasite control talk, and schedule a follow-up appointment to discuss less-pressing issues.**

rescued from areas affected by Hurricane Katrina? Hundreds of dogs were also lost or displaced after the hurricanes this season—where are those dogs and their undiagnosed heartworm disease going to end up? Have you already seen these dogs in your practice? **(Check out the algorithm on page 14.)** One need only introduce

saying, "I recommend ...," and instead substituted, "Your pet needs ..." or "We need to ..." or "You need to ..." While clients value our opinion, they're less interested in what we recommend and more interested in what their pet needs. Switch your language and take the emphasis off you and put it back it onto the pet, where it belongs.



# Experience the many layers of Advantage Multi<sup>®</sup> (imidacloprid+moxidectin)

Every dog and cat deserves comprehensive, broad-spectrum protection. That's why Advantage Multi<sup>®</sup> delivers layers of protection from heartworms, fleas and intestinal parasites.



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\*Treats and controls roundworms, hookworms and whipworms in dogs and roundworms and hookworms in cats.

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subsequent ketonemia may also suffer from metabolic acidosis, dehydration, endothelial dysfunction, cerebral ischemia and impaired wound healing.<sup>3</sup>

On physical exam, the diabetic patient may present dehydrated with serum chemistry abnormalities. The abnormalities of interest to the anesthetist may include elevated liver and kidney enzymes, reductions in sodium and potassium, and hyperglycemia.<sup>3</sup> Urine should be evaluated for the presence of glucose and/or ketones. These quick and inexpensive tests give insight into the presence and severity of diabetes, as stress itself may also cause elevations in blood glucose. When glucose levels surpass the renal tubular threshold, all the filtered glucose does not get resorbed as some remains in the urine; the presence of ketonuria suggests a greater degree of insulin deficiency compared to hyperglycemia alone. A fundic exam should be performed to rule out hypertension-induced changes such as retinopathy and concurrent cerebral vessel abnormalities.<sup>4</sup> Other clinical signs like polyphagia, polydipsia and polyuria are common.<sup>1,2</sup>

Autonomic neuropathy can lead to gastroparesis predisposing the diabetic patient to regurgitation, poor vasomotor tone leading to hypotension, respiratory depression and impaired thermoregulation.<sup>5,6</sup> These concerns are common to all anesthetic cases, diabetic or nondiabetic; the difference is that the former is less resilient and prone to hemodynamic instability under anesthesia.<sup>6</sup> Impaired autoregulation of organ perfusion may necessitate an overall higher mean arterial

blood pressure in order to maintain oxygen delivery to tissues.<sup>2,7</sup>

Anesthetic plans for diabetic and nondiabetic patients are similar in the sense that a balanced approach should be used for both. Injectable induction agents have a negligible effect on blood glucose levels with the exception of ketamine. Ketamine is an indirect sympathetic stimulant that has the potential to worsen hyperglycemia.<sup>5,8</sup> Opioids and benzodiazepines moderate sympathetic stimulation, thereby potentially reducing the hyperglycemic response to surgery.<sup>9,10</sup> Epidural anesthesia using local anesthetics may also inhibit catecholamine release; however, the anesthetist must be cognizant of potential complications related to epidural use, which can be exacerbated in the diabetic patient with preexisting neurologic deficits.<sup>12</sup> Inhalants reduce insulin production and use of inhalants should be minimized during anesthesia with the concurrent use of minimal alveolar concentration (MAC) reducing adjunctive medications.<sup>6,11</sup>


Stress reduction through the use of anxiolytic agents is recommended along with adequate analgesic techniques to minimize the effects that pain and stress can have on blood glucose. The use of alpha-2 adrenergic agonists such as dexmedetomidine is controversial. This class of drug can worsen hyperglycemia through its interaction with alpha-2a receptors that inhibit insulin secretion.<sup>13</sup> However, the use of alpha-2 agonists in healthy dogs does not cause hyperglycemia and actually reduces the stress response through a reduction in sympathetic nervous system activity.<sup>13</sup> The

diabetic patient may benefit from the pre-operative use of an alpha-2 agonist from this perspective.

Anesthesia in the unregulated diabetic patient should be avoided unless it is emergent. The risks associated with this patient population can manifest as hemodynamic instability and hypotension from changes to vascular endothelium and impaired response to anesthetic drugs secondary to metabolic acidosis.<sup>6</sup> The anesthetist should be prepared to monitor and support blood pressure, blood pH and blood glucose levels. The uncontrolled diabetic is minimally classified as an ASA III.

The controlled diabetic that presents for an elective procedure should be scheduled first thing in the morning. This reduces fasting time, which can alter insulin requirements, and provides time for the patient to recover and resume their normal feeding/insulin schedule. Patients should not be given their morning insulin until their blood glucose levels have been evaluated and insulin needs determined.<sup>1</sup> Patients presenting with blood glucose levels less than 100 g/dl should have their insulin withheld and a 2.5-5% dextrose infusion initiated. Pre-operative glucose levels measuring at 300 g/dl and beyond can be given a half dose of insulin. Patients with a blood glucose between 100 and 300 g/dl don't require special pre-operative treatment; however, all diabetic patients should have their glucose monitored every 30-60 minutes to avoid broad swings in glucose levels and to help direct necessary therapy.<sup>1,7</sup>

Diabetic patients should be sufficiently pre-medicated using



an opioid and a sedative, then rapidly induced with an injectable induction agent. Patients should be intubated with an appropriately sized endotracheal tube and the pilot balloon adequately inflated as needed to create a sealed system prior to positioning. This protects the airway from regurgitation and aspiration, which can be seen in the diabetic patient with autonomic neuropathy and gastroparesis.<sup>5</sup> Patients should be supported with an intravenous balanced electrolyte solution, inhalant levels kept low with the use of analgesics and adjunctive medications, and glucose levels maintained between 150–250 g/dl as hyperglycemia is

associated with increased morbidity and mortality, prolonged hospital stays and decreased wound healing.<sup>7</sup> Glucose should be monitored through recovery until the patient is up and eating. Hypoglycemia in the recovery phase may be seen as the muscle activity from shivering consumes glucose. It should also be noted that stress and inflammation common in the postoperative period can increase insulin requirements.<sup>7</sup>

As a threat to homeostasis, diabetes can negatively affect surgical and anesthetic outcomes. Elective procedures should only be performed on patients that are well-regulated and steps should

be taken to ensure that pain and stress are adequately controlled. Patients with an immediate surgical need must be approached with a full understanding of the potential negative sequela of the disease and preparations made to deal with complications should they arise.

*Kristen Cooley, BA, CVT, VTS (anesthesia) is an instructional specialist at The University of Wisconsin School of Veterinary Medicine and a consultant in Veterinary Anesthesia Support and Training.*



Find the references online.  
Visit [dvm360.com/SweetRefs](https://dvm360.com/SweetRefs).





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REC16NALYMEAD2 (03/18).

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<sup>3</sup> Probert WS, Crawford M, Cadiz RB, LeFebvre RB. Immunization with outer surface protein (Osp) A, but not OspC, provides cross-protection of mice challenged with North American isolates of *Borrelia burgdorferi*. *J Infect Dis.* 1997;175(2):400-405.





# 3 products to organize your veterinary practice

It's the prime time of year for spring cleaning, so we're sharing a few of our favorite practice organization hacks to help get you started.

## Keep trash contained

Dr. Robert Dumont sent us this excellent hack. To hide trash cans inside cabinets, he installed cat doors with magnetic closures in the doors. Trash stays out of sight and rooms are kept odor-free. He liked the idea so much he installed a second labeled door on the cabinets, so one can be used for trash and one for used syringes.

## Organize odd objects

Are your practice's exam room drawers looking more like junk drawers? The Firstline team loved this tip from Dreaming Summit



Move over, cats. Your doors have a new use in practice. (Monika Wisniewska/stock.adobe.com)

Animal Hospital in Litchfield Park, Arizona. Keep essential items (of

all shapes and sizes) organized with plastic drawer trays in each exam room. Adjust the trays to an object's size for a perfect fit and place them in the same spot room to room for time saving.

## Store surgical scrub brushes

Dr. Tracy Beeler shared this smart idea with us. Place a plastic container designed to hold plastic shopping bags above your sink and use it to store surgical scrub brushes. Not only are the brushes off the counter yet easy to grab, but the see-through container helps alert the team when to reorder.



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Ask your Merck Animal Health Rep about BRAVECTO or Visit [Bravectovets.com](http://Bravectovets.com)

\*BRAVECTO kills fleas and prevents flea infestations for 12 weeks. BRAVECTO Chew kills ticks (black-legged tick, American dog tick, and brown dog tick) for 12 weeks and also kills lone star ticks for 8 weeks.

#### Important Safety Information

**BRAVECTO Chews for Dogs:** The most common adverse reactions recorded in clinical trials were vomiting, decreased appetite, diarrhea, lethargy, polydipsia, and flatulence. Bravecto has not been shown to be effective for 12-weeks' duration in puppies less than 6 months of age. Bravecto is not effective against lone star ticks beyond 8 weeks after dosing. Please see Prescribing Information on following page.

**BRAVECTO®**  
(FLURALANER)

*Also available as a topical application.*

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US/BRV/1017/0090a





Flavored chews for dogs.

#### Caution:

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

#### Description:

Each chew is formulated to provide a minimum dose of 11.4 mg/lb (25 mg/kg) body weight.

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

#### Indications:

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

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

#### Dosage and Administration:

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

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

Bravecto should be administered with food.

#### Dosage Schedule

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

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

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

#### Contraindications:

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

#### Warnings:

Not for human use. Keep this and all drugs out of the reach of children. Keep the product in the original packaging until use, in order to prevent children from getting direct access to the product.

Do not eat, drink or smoke while handling the product. Wash hands thoroughly with soap and water immediately after use of the product.

#### Precautions:

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

#### Adverse Reactions:

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

#### Percentage of Dogs with Adverse Reactions in the Field Study

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

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

For technical assistance or to report a suspected adverse drug reaction, contact Merck Animal Health at 1-800-224-5318. Additional information can be found at [www.bravecto.com](http://www.bravecto.com). For additional information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDA-VETS or online at <http://www.fda.gov/AnimalVeterinary/SafetyHealth>.

#### Clinical Pharmacology:

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

#### Mode of Action:

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

#### Effectiveness:

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

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

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

#### Animal Safety:

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

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

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

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

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

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

#### Storage Information:

Do not store above 86°F (30°C).

#### How Supplied:

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

NADA 141-426, Approved by FDA

Distributed by:

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## Fear Free and older pets

Make the veterinary visit so great for these patients that 'the dog will drag the pet owner through the front door' the next time.

**W**hen it comes to treating older pets in the veterinary clinic, Fetch dvm360 conference speaker and Fear Free champion Marty Becker, DVM, says there is a problem: You just don't see these patients in great numbers. For a variety of reasons, pet owners think it's simply "old age" keeping pets from behaving the way they used to.

But Dr. Becker says these pets need to visit the vet—and that Fear Free is the way to go.

"We need to make it to where people know that they need to come in and that it's going to be something that is not stressful for this pet," he says.

All right, how then? Dr. Becker says, for one thing, it comes down to currency. And to a dog, that can only mean food.

"You have to have exceptional

food treats," he says, "especially for a dog whose senses may be dulled, like an older dog."

He suggests having high-value treats at the ready: Deli turkey, Braunschweiger and liver treats are examples that will win you a friend for life.

Dr. Becker says another option is a "chill pill." A nutraceutical may be just the right thing for stressed-out patients.

Last, he says not to forget about sedation.

"A little trazodone for an anxious pet goes a long way into making it a friendly, Fear Free visit for both the pet and the pet owner," Dr. Becker says.



Watch the video at [dvm360.com/happyseniors](https://dvm360.com/happyseniors) for more.

## Yoga in the vet clinic: A lower back stretch

Whether it's wrangling a 150 lb Saint Bernard, hunching over a computer monitor or crouching to examine the kitten in the corner of the exam room, there are plenty of activities in the veterinary clinic that twist your body in taxing ways.

As Fetch dvm360 conference wellness ambassador and certified yoga instructor Torry Chamberlayne, RVT, puts it: "We bend a lot when we're in veterinary medicine—we're bending down, we're bending forward, we're at the computer."

Here's a move to help you untwist:

- > Keep your hips facing forward
  - > Twist from the mid-waist
  - > Make that twist gentle—don't "pull" yourself into it
  - > Keep your gaze the same direction your chest is pointing
- Chamberlayne suggests doing this move three to four times a day.

Follow Chamberlayne's Instagram account, [@the\\_yin\\_yogi](https://www.instagram.com/the_yin_yogi), for more information on yoga and meditation.



# Team meeting: Let's talk money

If you're experiencing exhaustion from difficult conversations with pet owners about paying for veterinary care, why not open this discussion up to your team? You may identify small tweaks to communication that might ease everyone's stress about managing the tough question of paying for top-notch pet care. *By Brendan Howard, Business Channel Director, Naomi Strollo, RVT*

**R**egardless of whether you believe wholeheartedly in "learning styles" or you're skeptical (skeptics, current research might be in your favor), we do know that hearing a message different times in different ways can help us learn.

As a practice owner, practice manager or team lead, if you're thinking of tackling the issue of how to help veterinary clients pay for your services, here are two ways to digest that information and share it with your team.

## 1. Let me just read it!

First, emergency-room staffer Naomi Strollo, RVT, wrote the article "Talk money without ticking off pet owners." Want to put this article to use for your team? Read the article on **dvm360.com**, then consider points you agree with and points you don't, as well as her recommendations that do or do not fit your practice's philosophy and financial protocols. What might you change? What do you feel you won't change?

Before the meeting, consider all those questions and give staffers a week to read and think about this article. Then make the problem ("Our clients sometimes can't or won't pay for our services") a brainstorming exercise ("What do we have it in our power to change in our practice to adjust our communication, our protocols and our policies?").

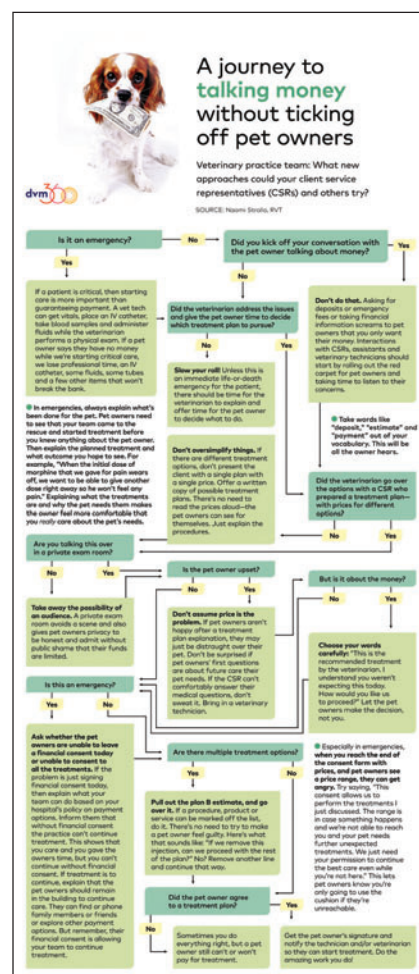
## 2. Show it to me!

Second, we took Strollo's article and turned it into this algorithm to really focus on the decision-making process that comes into play over the phone, in the exam room and before and after visits at the reception desk.

To pick up another practice's protocols on client payment—say, adopting the whole algorithm and making that your goal for staff training and client education—might be tough. Before a meeting, consider which of these steps you and your team take—which ones might be helpful to add or change and which ones feel impossible, impractical or poorly aligned with your practice's philosophy. Then share the algorithm with your team to look at before the meeting and sketch out, with your team, what your shared algorithm is for managing tough money talks with clients.

It's not even crucial that you change everything! Just reflect, discuss and get greater clarity and open communication about what your shared goals are for patient care and client payment, and what you all do, and will do, to bridge the gap between those things.

Let us know if you use these resources for a team meeting and how it went at **fl@ubm.com**. Happy learning!



Follow the algorithm at **dvm360.com/paychart** and get that money.

# The chew dogs love.

## THE SCIENCE YOU CAN TRUST.



Fight plaque, calculus and halitosis with  
Oravet® Dental Hygiene Chews - *the only*  
chew with the power of delmopinol!

- Unique dual-action mechanism
- Highly palatable<sup>1</sup>
- Designed to provide an extended chew duration<sup>1</sup>
- Proven technology<sup>1, 2, 3</sup>

### UNIQUE DUAL-ACTION MECHANISM

1. Delmopinol creates a protective barrier against the bacteria that cause bad breath and are the basis for plaque
2. The scrubbing action of the chew works in parallel with the delmopinol to effectively remove plaque and calculus

<sup>1</sup> Data on file.

<sup>2</sup> Data on file.

<sup>3</sup> Data on file.



# Heartgard® Plus

(ivermectin/pyrantel)

## CHEWABLES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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## Practice tip: Up your *Bordetella* compliance

Get your veterinary clients on board with a necessary *Bordetella* vaccination with a simple explanation.

By James Randolph, DVM

How many times have you heard, "Oh! Rover doesn't need the Bordello. He doesn't board."

After years of explaining to pet owners that *Bordetella* "isn't that kind of 'board,'" and still having people reject a very important aspect of disease protection, I had an epiphany.

About three years ago, I began calling it "*Bordetella bronchiseptica*, a bacterial infection," and immediately launching into a brief explanation of its part in infectious tracheobronchitis and possible complications.

Acceptance of the *Bordetella* vaccination at our practice is now well over 95 percent.

James Randolph, DVM  
Animal General Hospital  
Long Beach, MS

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\*Subject to credit approval.

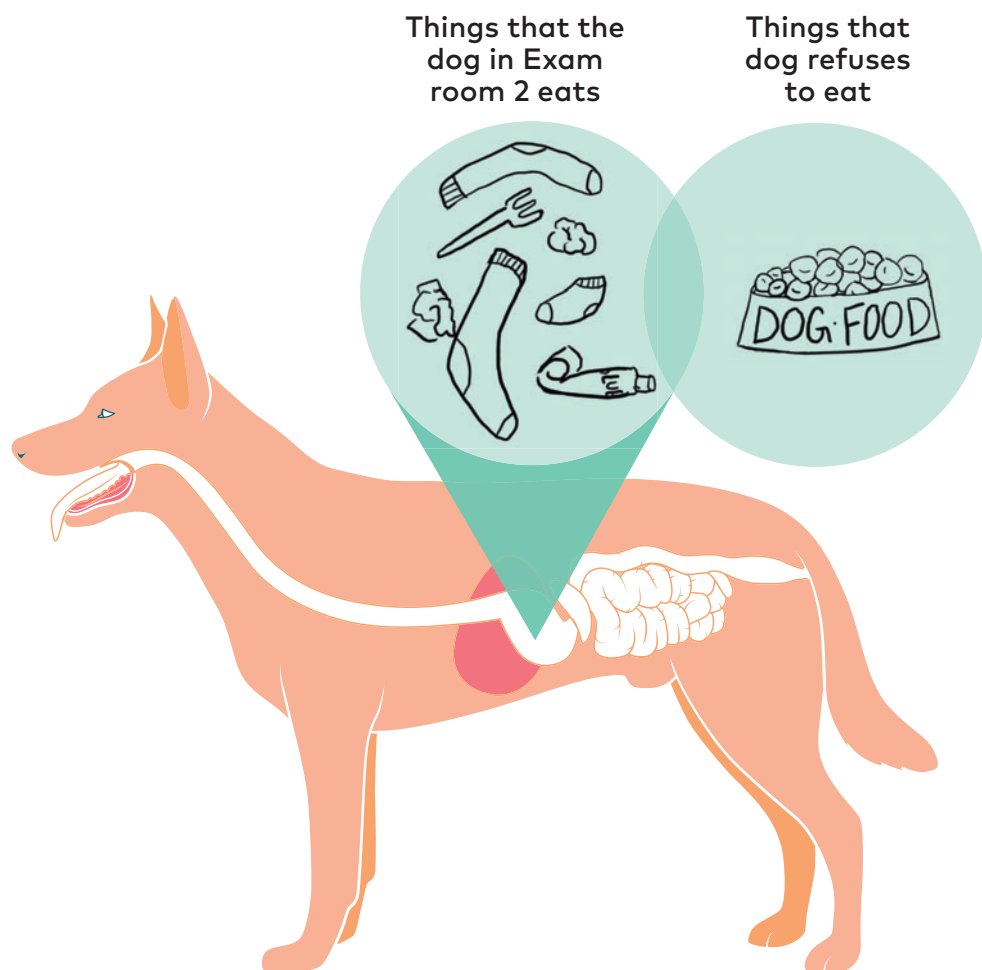
1. Cardholder Engagement Study, Q2 2018.

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FIRST2019VA

# He ate **what?** Managing the garbage gut in Exam 2

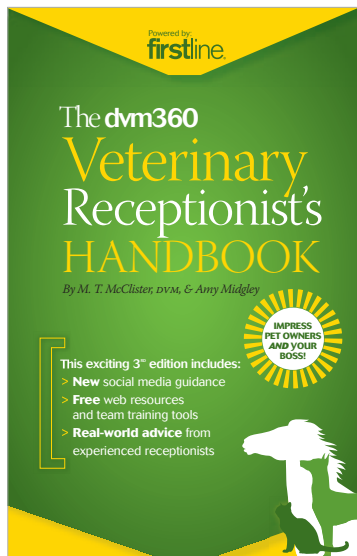
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Which best describes your role? (Please use a separate registration form for each attendee.)

- ☐ Associate veterinarian    ☐ Practice owner    ☐ Technician    ☐ Practice manager  
☐ 2019 student    ☐ 2019 veterinary grad    ☐ Hospital staff    ☐ Spouse

First name (exactly as you want it to appear on your    Last name    Degree

Street address: PLEASE SELECT ONE ► ☐ Work address ☐ Home address

Country    Email address (for confirmation, proceedings links, etc.)

Daytime telephone number with area code

### Veterinarians: Associates & practice owners

					By 2/4/19	After 2/14/19
<input type="checkbox"/> Veterinarian (four-days)					\$549	\$679
<input type="checkbox"/> Veterinarian (two-days, please note days)	Thursday	Friday	Saturday	Sunday	\$469	\$589
<input type="checkbox"/> Veterinarian (one-day, please note day)	Thursday	Friday	Saturday	Sunday	\$349	\$479
<input type="checkbox"/> 2019 veterinary graduate —(Please provide a diploma.)					\$259	\$389
<input type="checkbox"/> 2019 veterinary student —(No CE granted.)					\$55	\$70

### Practice Managers/Technicians / Assistants

<input type="checkbox"/> Practice manager (non-veterinarian)					\$329	\$459
<input type="checkbox"/> Veterinary technician (four-days)					\$329	\$459
<input type="checkbox"/> Veterinary technician (three-days)	Thursday	Friday	Saturday	Sunday	\$299	\$429
<input type="checkbox"/> Veterinary technician (two-days)	Thursday	Friday	Saturday	Sunday	\$269	\$399
<input type="checkbox"/> Veterinary technician (one-day)	Thursday	Friday	Saturday	Sunday	\$219	\$349
<input type="checkbox"/> 2019 veterinary technician student (Please provide a copy of your current class schedule.)					\$55	\$70

### Spouses

<input type="checkbox"/> Spouse attending seminars (non-veterinarian)					\$329	\$459
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### Guests

We welcome your guests who don't work in the veterinary industry. Guest badges will give your friends and family access to the exhibit hall for the welcome party. Veterinarians, technicians, practice managers, and team members must register and pay registration fees. (A \$5 processing fee will be charged for guest badges added on site.)

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First name    Last name

### Payment information    Credit Card: Please fill in credit information.

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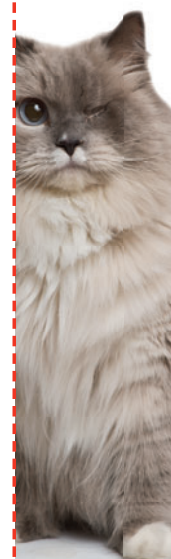
Core program	\$
Clinical techniques	\$
Addl. proceedings	\$
Total	\$

Credit card expiration must be valid through May 2019. Cancellation must be requested in writing by mail, fax, or email and received by March 27, 2019. A \$50 processing fee applies.

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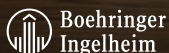
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<sup>1</sup> Freedom of Information: NADA140-971 (January 15, 1993).

<sup>2</sup> Data on file at Boehringer Ingelheim.

<sup>3</sup> Data on file at Boehringer Ingelheim.



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Please see Brief Summary on page 24.