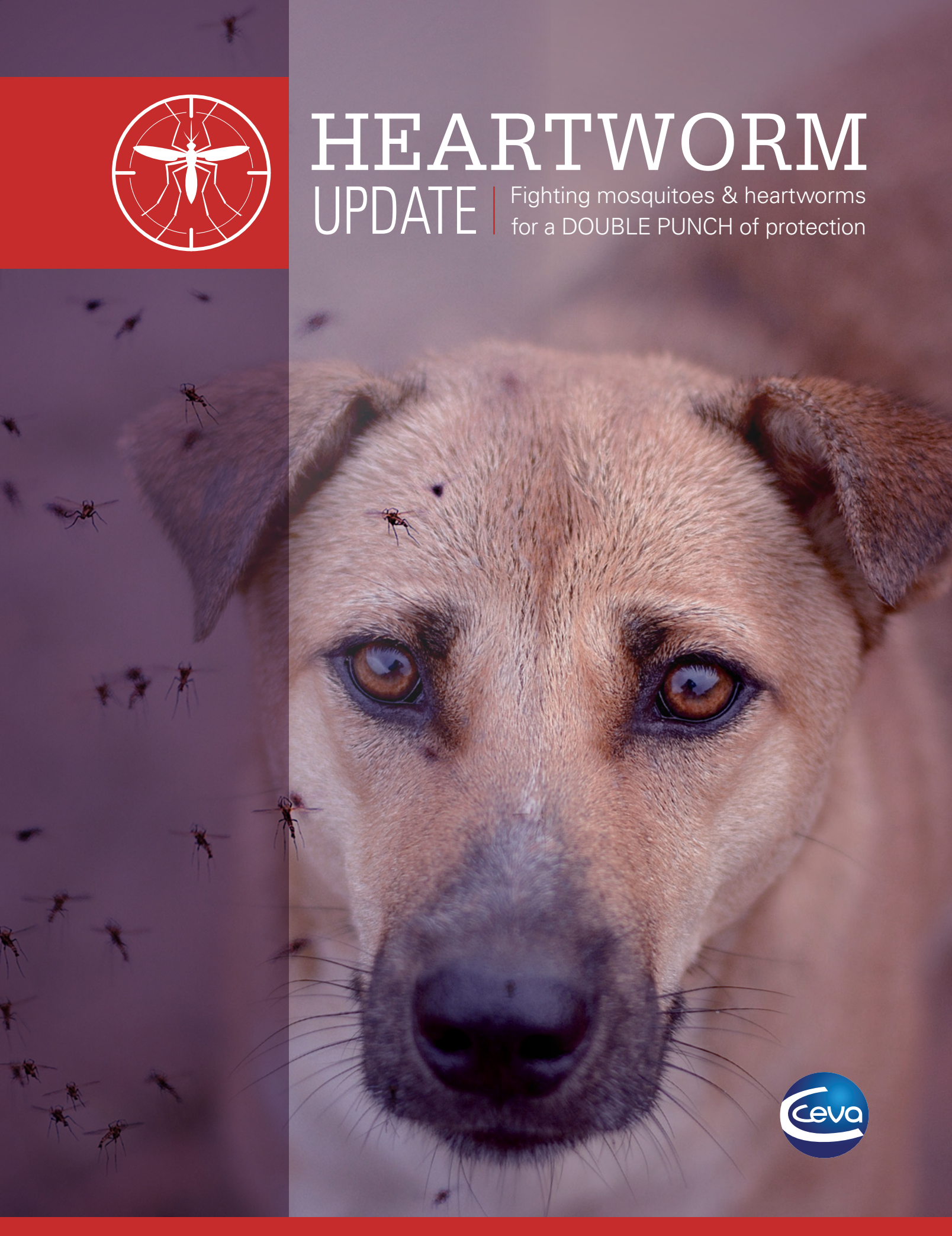




# HEARTWORM UPDATE

Fighting mosquitoes & heartworms  
for a DOUBLE PUNCH of protection





# HEARTWORM

UPDATE | Fighting mosquitoes & heartworms  
for a DOUBLE PUNCH of protection

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Dear Colleague:

Sometimes even the tiniest things can create huge problems.

Despite increased awareness, the number of dogs testing positive for heartworm infections in the US has been growing—and forecasts show those numbers will only continue to rise.

Fortunately, research has revealed exciting new recommendations that could change that prediction and help in our fight to decrease the incidence of this deadly disease.

At AAHA, we are passionate about promoting excellence in veterinary medicine, including providing up-to-date information and evidence-based recommendations to help veterinary teams practice great medicine and deliver the highest-quality patient care available. The information in this booklet will give you an overview of the latest research and offer practical strategies for updating heartworm disease prevention and management protocols in your practice.

Veterinary medicine is constantly evolving, and great things are on the horizon. Thank you for taking the time to read about this important and exciting advancement and for being on the forefront of change to help us stop heartworm disease in its tracks.



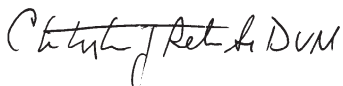
Michael T. Cavanaugh, DVM, DABVP (Emeritus), AAHA Chief Executive Officer

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I was happy to learn of a resource being developed for veterinary practice teams to help veterinarians and their staff members to better educate their clients and protect more pets from what Dr. Clarke Atkins calls “the most important infection in veterinary medicine: heartworm disease.” This comprehensive resource highlights the history of heartworm disease, increasing heartworm prevalence, new information presented at the American Heartworm Society’s 15th Triennial Symposium, vector information, and a multimodal approach to the prevention of this dreaded infection.

Your hospital team now has a very useful and informative resource to help you better serve your clients and patients. Utilizing this information will result in better client compliance, fewer pets suffering from the lifelong effects of heartworm infection, and growth in preventive care delivery for your practice. By adhering to the highest standards in all areas of our hospitals and utilizing best practices, we continue to provide the quality of care that our clients and patients deserve.

The mission of the American Heartworm Society is to lead the veterinary profession and the public in understanding heartworm disease. I believe utilizing this resource will enhance your own, your staff’s and the public’s understanding of heartworm disease. Understanding leads to action. Go be the person your dog thinks you are. Good luck.



Dr. Christopher J. Rehm Sr., President, Rehm Animal Clinics of Mobile and Baldwin Counties;  
President, Board of Directors, American Heartworm Society



## A Brief History of Canine Heartworms

In 1586, Chez Jean Wolfe sketched the grotesque creature found inside a horse's heart. That "monster," as he called it, turned out to be *Dirofilaria immitis*<sup>1</sup>—heartworms. Almost 300 years later, canine heartworms were discovered in dogs on the coast of the southeastern United States. The earliest cases of heartworms in dogs occurred in South America in 1847, but the official report wasn't published until 1875.<sup>2</sup> Nearly 100 years later, in 1974, the American Heartworm Society was established.

Macrocytic lactones first came to the veterinary market in the 1980s as an option for regularly clearing heartworm infections before dogs developed full-blown heartworm disease.

Those have been the main highlights in the history of canine heartworms—until now.

Research conducted in March 2015 and August 2016 looked at the efficacy of approaching canine heartworm with mitigation and mosquito-bite prevention strategies like those used around the world for preventing the spread of mosquito-borne diseases in people. The results look promising.

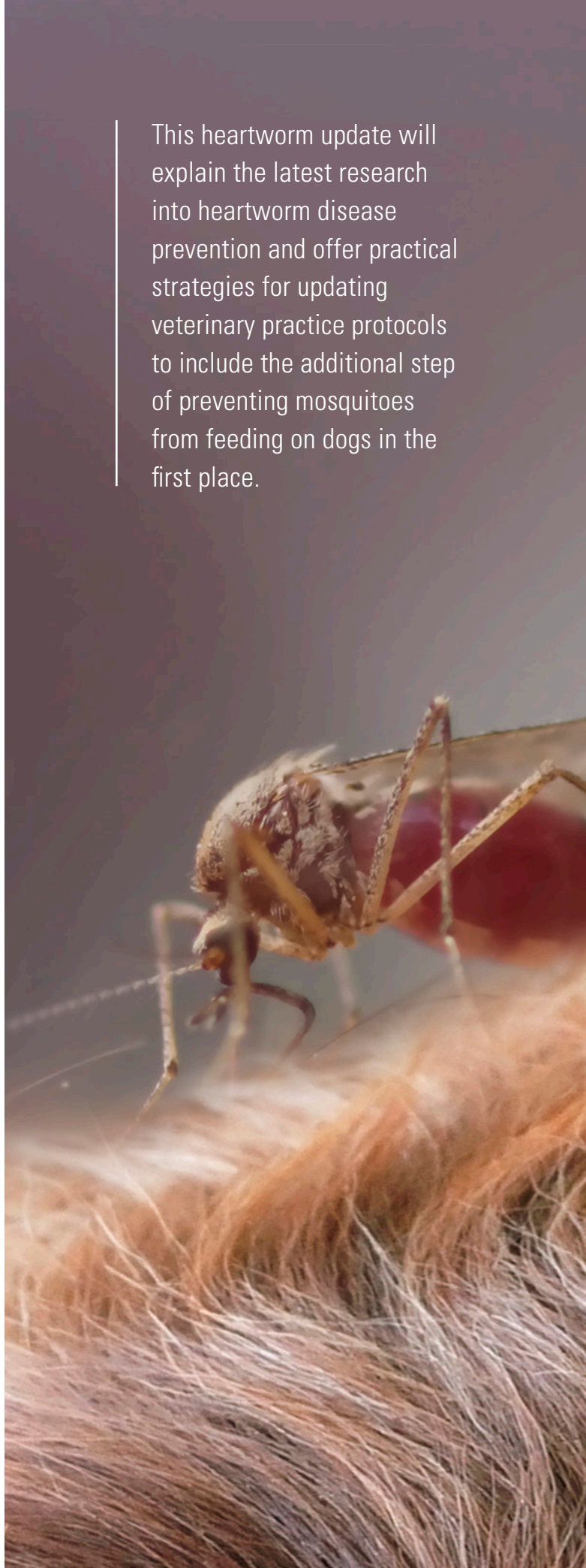
By adding a layer of mosquito repellent insecticide to macrocytic lactone use, the transmission of *D. immitis* microfilariae drops significantly—even with resistant strains of canine heartworm, such as JYD34 (short for "junk yard dog 34"), which is one of six known resistant strains.

This heartworm update will explain the latest research into heartworm disease prevention and offer practical strategies for updating veterinary practice protocols to include the additional step of preventing mosquitoes from feeding on dogs in the first place.

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1. Wolfe, C.I. 1586. Le vray purtraict d'un ver monstrueux qui a esté trouvé dans le cœur d'un cheval qui est mort en la ville de Londres le 17. de mars. 1586. Microfilm. Ann Arbor, Mich.: UMI, 1950. 1 microfilm reel; 35 mm. (Early English books, 1475-1640; 428:2).

2. Dirofilaria History, 2006, Stanford University website (<https://web.stanford.edu/group/parasites/ParaSites2006/Dirofilaria/History.htm>).



## Heartworm Disease Timeline



—1586

● Heartworm “monster” discovered inside a horse’s heart.



—1847

● Canine heartworms found in dogs in South America.



—1856

● Canine heartworms found in dogs on the southeast coast of the US.



—1974

● American Heartworm Society established.



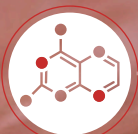
—1980s

● Macrocyclic lactones introduced to the veterinary market.



—2000s

● Resistant strains of canine heartworms emerge.



—2015/  
2016

● Research results show the efficacy of combining regular application of a topical mosquito repellent insecticide with regular use of macrocyclic lactones.



## Updated Protocols Address Increasing Heartworm Prevalence

Suggestions for heartworm prevention now include mosquito bite repellency and insecticide activity. This additional step is increasingly important as the number of dogs testing positive for heartworm infections each year keeps going up.

Despite more than 30 years of increased awareness and preventive efforts incorporating the use of macrocyclic lactones, more dogs continue to become infected by mosquitoes carrying *D. immitis* microfilariae.

This increased prevalence across the United States may be due to:

- Gaps in client compliance with giving macrocyclic lactones on schedule every time
- Weather conditions ripe for mosquito breeding
- Emergence of macrocyclic-lactone-resistant heartworm strains

The Companion Animal Parasite Council's (CAPC) annual heartworm prevalence forecast looks even worse for 2017, due in part to above average precipitation and above average temperatures in a



Mosquitoes remain the only known source of heartworm infection transmission.

Mosquitoes are the messengers. It's time to kill the messengers and break the cycle of infection.

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wide swath of the country. CAPC predicts several endemic areas will see even more cases than usual, including the Lower Mississippi River Valley, New England, and the Ohio River Valley.<sup>3</sup>

The forecast also predicts higher prevalence in areas that typically see low numbers of cases, such as the Rocky Mountains and westward.<sup>4</sup>

The reality is that veterinary testing finds canine heartworm infections in all 50 states. In a 2016 American Heartworm Society survey of veterinary practices, 21.7% reported seeing more heartworm cases in 2016 compared to 2013.



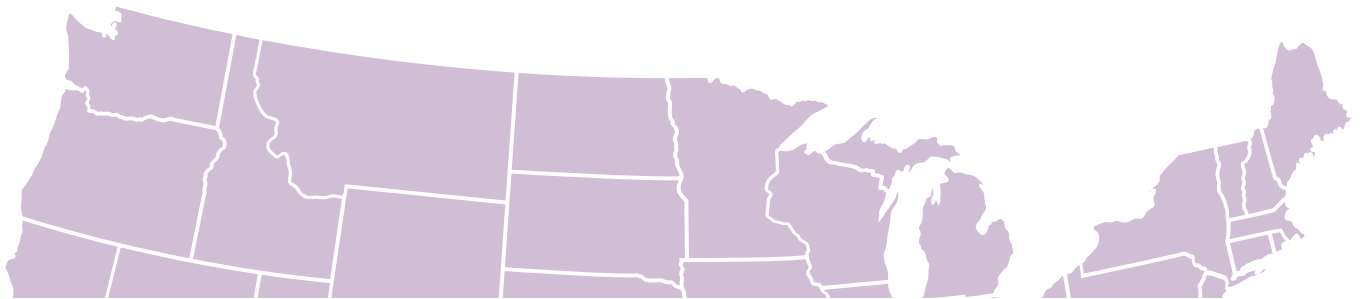
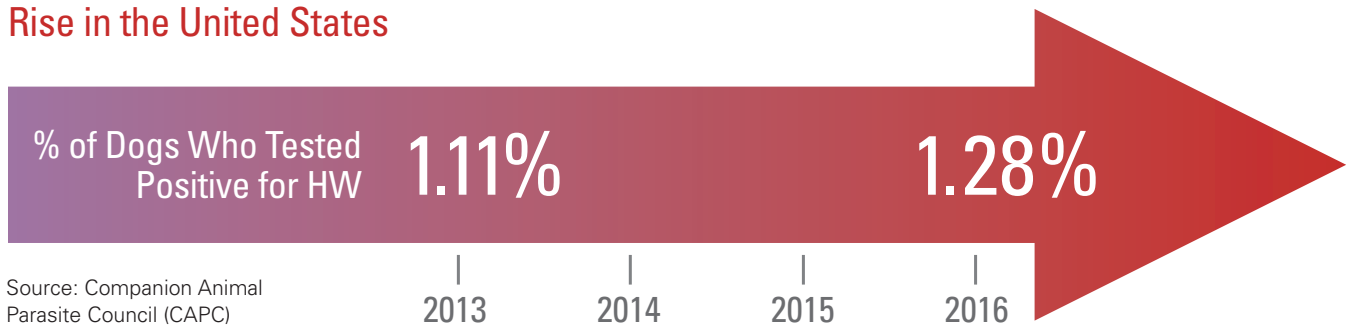
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3. CAPC Annual Heartworm Prevalence Forecast, 2017.

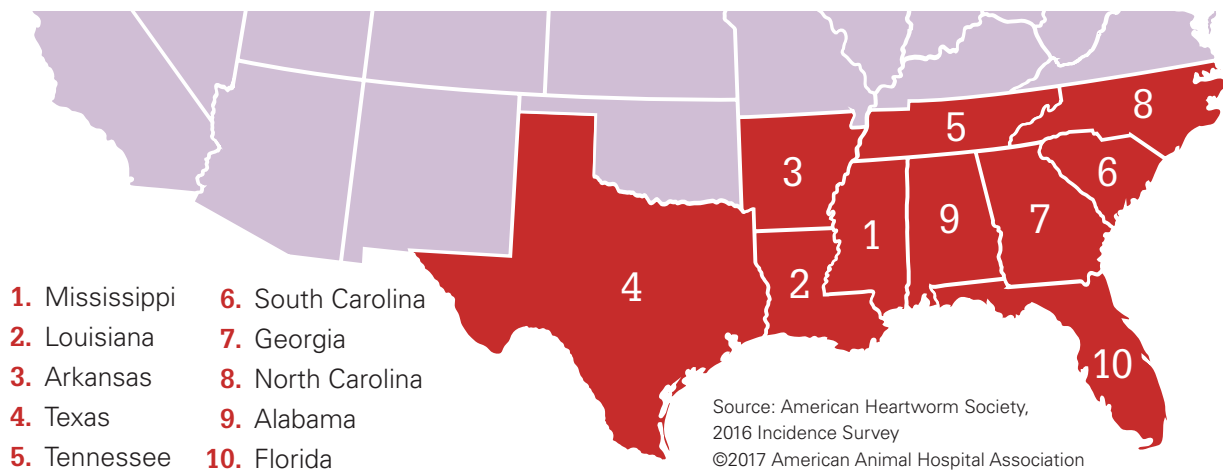
4. CAPC Annual Heartworm Prevalence Forecast, 2017.



## Heartworm-Positive Cases on the Rise in the United States



### Top 10 States for HW-Positive Dogs in 2016



## Reviewing the Latest Heartworm Prevention Research

In light of these increases in heartworm infections despite decades of macrocyclic lactones use, John W. McCall, MS, PhD, professor emeritus, Department of Infectious Diseases, College of Veterinary Medicine, University of Georgia, asked an important question: "What effect does repellency have on disease transmission?"

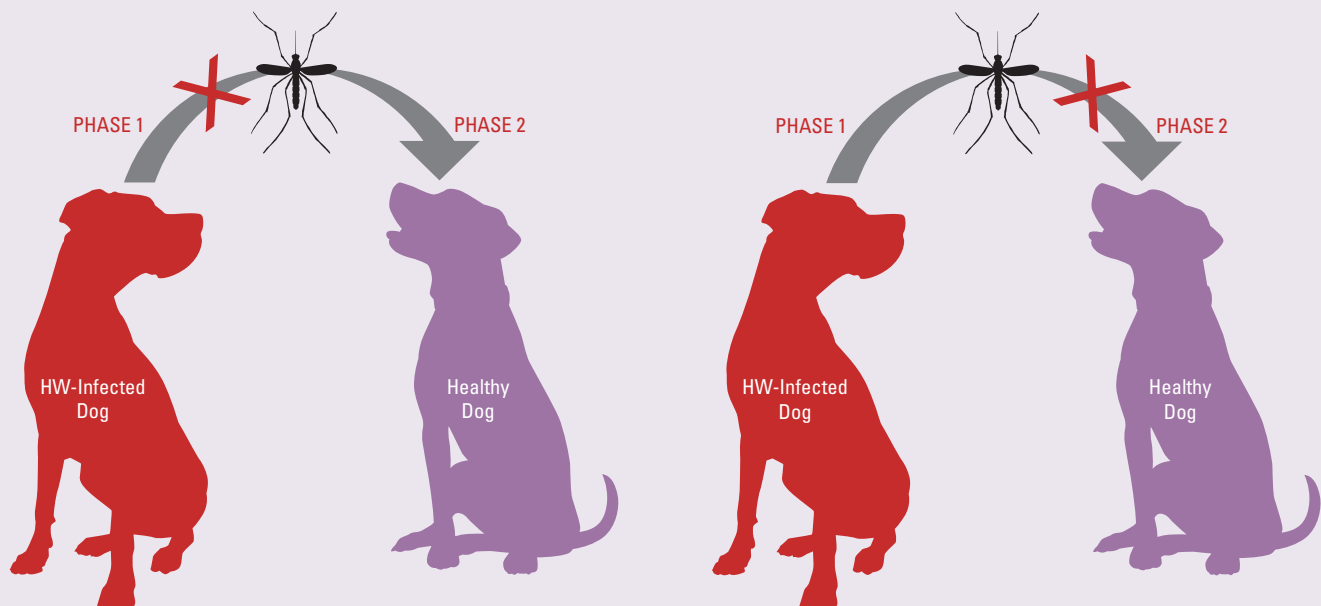
In other words, if we could prevent or reduce mosquitoes from feeding on dogs and if we could

kill the ones carrying heartworm microfilariae, would that break the cycle and potentially make what we're already doing work better? Could we double-up on prevention strategies?

Imagine what success in this area of prevention would do for the infection load and vector burden in a given environment. The goal? Fewer mosquito bites, fewer infections.

### HYPOTHESIS:

Repellent insecticides would provide an additional layer of protection against heartworm disease.



**Phase I** of McCall's research looked at the ability to block an uninfected mosquito from picking up microfilariae from a heartworm-positive dog.<sup>5</sup>

**Phase II** of the research looked at the ability to block a heartworm-infected mosquito from infecting a heartworm-negative dog.<sup>6</sup>

5. McCall, J.W., et al. Inhibition of the transmission of *Dirofilaria immitis* to mosquitoes by weekly exposure of microfilaremic dogs treated topically with dinotefuran-permethrin-pyriproxyfen to uninfected *Aedes aegypti*. 60th AAVP, 2015; 59.

6. McCall, J.W., et al. Inhibition of the transmission to *Dirofilaria immitis* to mosquitoes by weekly exposure to microfilaremic dogs treated topically with dinotefuran-permethrin-pyriproxyfen. Abstract presented at the meeting of the American Association of Veterinary Parasitologists, Boston, MA, July 2015.



## Research Results

**Phase I results (mosquito study).** After one month of weekly exposure of mosquitoes to heartworm-positive dogs, one group treated with a repellent insecticide and one group not treated, McCall found a repellency rate of 95%. Mosquito repellency is defined as antifeeding activity. The insecticidal efficacy of treatment was also greater than 95%.

In addition, none of the mosquitoes exposed to the treated dogs, if they survived, lived long enough to develop infective larvae (L<sub>3</sub>).<sup>7</sup>

**Phase II results (dog study).** McCall divided the dogs into four groups:

1. Control group of untreated dogs
2. Dogs treated with repellent insecticide product only
3. Dogs treated with macrocyclic lactone product only
4. Dogs treated with both repellent insecticide product and macrocyclic lactone product

After multiple exposure over one month to mosquitoes carrying heartworm microfilariae, no adult heartworms were detected in any of the dogs treated with both a mosquito repellent insecticide product and a macrocyclic lactone product.

Among the other dog groups in the study:

- 8 out of 8 control-group dogs were infected and developed 22–66 heartworms per dog.

- 8 dogs out of 8 in the macrocyclic-lactone-only group were infected, with a 58% reduction of worm counts versus the control group.
- 3 dogs out of 8 in the repellent insecticide-product-only group were infected, with a 96% reduction in worm counts versus the control group.<sup>8</sup>

Overall the antifeeding effect of the repellent insecticide product was 98.5%.<sup>9</sup>

Keep in mind that McCall used the macrocyclic-lactone-resistant heartworm strain called JYD34 in the two phases of the study. That's the heartworm strain that scares everyone, and even it was defeated by a multimodal prevention strategy.

**Research conclusions.** The combination of both a mosquito repellent insecticide product and a macrocyclic lactone product had greater efficacy for protecting dogs against heartworm transmission and infection than macrocyclic lactone products alone, according to the results of McCall's phase II study.<sup>10</sup>

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These results show that it's possible to block an uninfected mosquito from transmitting heartworm infection (or microfilariae) from a heartworm-positive dog.


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7. McCall, J.W., et al. Inhibition of the transmission of *Dirofilaria immitis* to mosquitoes by weekly exposure of microfilaremic dogs treated topically with dinotefuran-permethrin-pyriproxyfen to uninfected *Aedes aegypti*, in Proceedings 60th Annual Meeting of the American Association of Veterinary Parasitologists, 2015; Abstract No. 7; 60.

8. McCall, J.W., et al. Inhibition of the transmission to *Dirofilaria immitis* to mosquitoes by weekly exposure to microfilaremic dogs treated topically with dinotefuran-permethrin-pyriproxyfen. Abstract presented at the meeting of the American Association of Veterinary Parasitologists, Boston, MA, July 2015.

9. McCall, J.W., et al. Inhibition of the transmission to *Dirofilaria immitis* to mosquitoes by weekly exposure to microfilaremic dogs treated topically with dinotefuran-permethrin-pyriproxyfen. Abstract presented at the meeting of the American Association of Veterinary Parasitologists, Boston, MA, July 2015.

10. McCall, J.W., et al. Inhibition of the transmission to *Dirofilaria immitis* to mosquitoes by weekly exposure to microfilaremic dogs treated topically with dinotefuran-permethrin-pyriproxyfen. Abstract presented at the meeting of the American Association of Veterinary Parasitologists, Boston, MA, July 2015.



Research supports an update to current canine heartworm prevention strategies to include a double layer of protection via use of a mosquito repellent insecticide product along with routine administration of an approved macrocyclic lactone.

## Understanding Heartworm Transmission Risk Factors and Assessment

A number of factors affect the heartworm transmission risk in the community you serve. These factors include:

- Local bodies of water and other breeding grounds for mosquitoes
- Weather conditions (both seasonal and year to year)
- Mosquito species in your area (currently, 25 species of the approximately 180 species recognized in the US are known to carry heartworm microfilaria)<sup>11</sup>
- The number of dogs in your community receiving regular veterinary care, including heartworm testing and preventives

**Geography plays a significant role.** Some areas hold the dubious distinction of being heartworm infection hot zones. It's obvious that places near river and stream valleys and near wetlands see higher mosquito populations, but you might be surprised to learn that areas in Northern California and Southern Iowa are now considered more endemic areas than in the past.<sup>12</sup> Predictions for 2017 even show areas of the West, including the Rocky Mountains, as growing areas of concern.<sup>13</sup> Greater mobility in the human population, including people traveling with their dogs, can introduce heartworm into a community with a previously low infectious burden.

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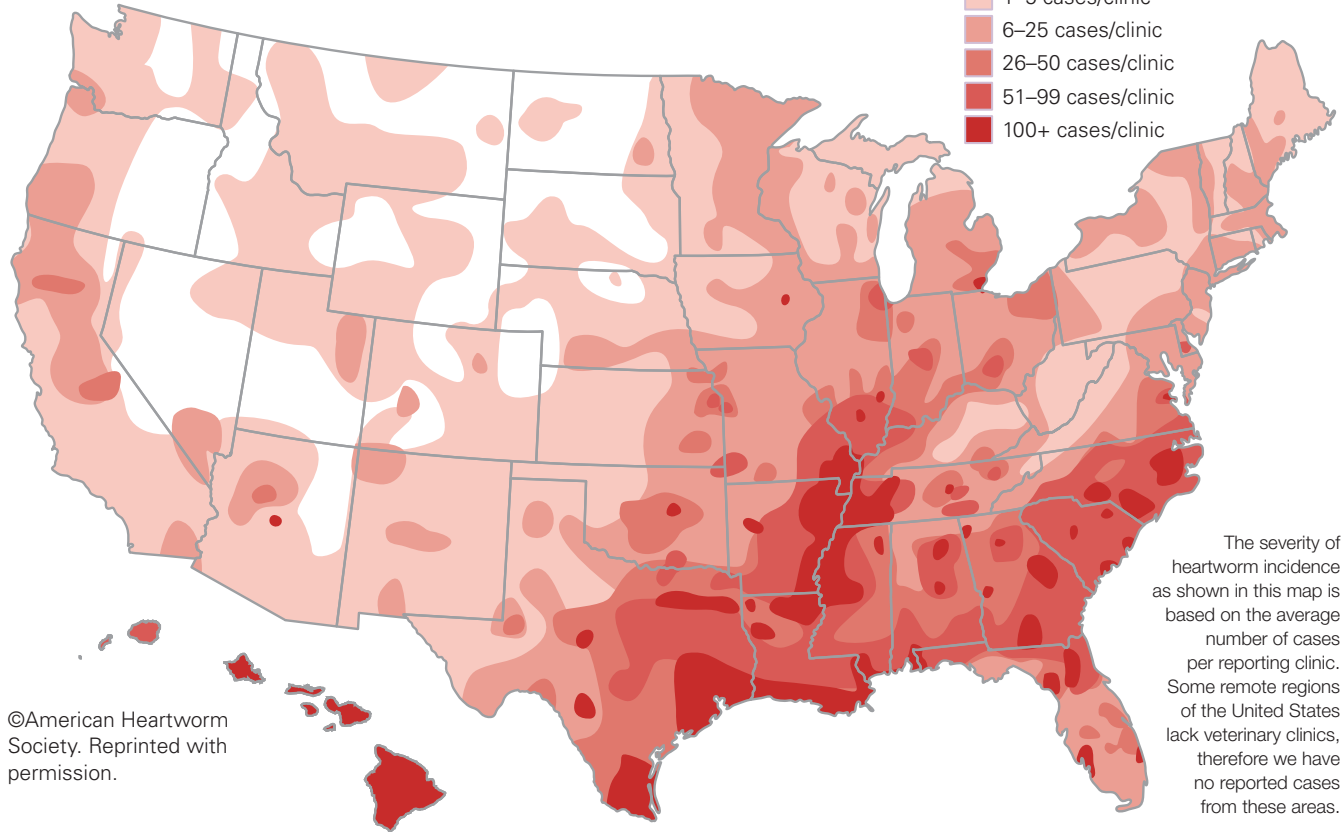
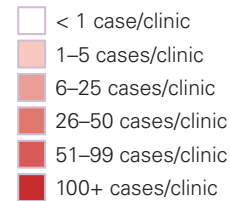
11. Ledesma, N. and Harrington, L. Mosquito vectors of dog heartworm in the United States: vector status and factors influencing transmission efficiency. *Topics in Companion Animal Medicine*. 2011; 26(4):178-185. doi: 10.1053/j.tcam.2011.09.005.

12. CAPC Annual Heartworm Incidence Data.

13. CAPC Annual Heartworm Prevalence Forecast, 2017.

## 2016 Heartworm Incidence Map

Average number of cases per reporting clinic



©American Heartworm Society. Reprinted with permission.

The severity of heartworm incidence as shown in this map is based on the average number of cases per reporting clinic. Some remote regions of the United States lack veterinary clinics, therefore we have no reported cases from these areas.

While wildlife, such as coyotes, also can carry heartworm infections, don't convince yourself or let clients believe that heartworm infection is primarily a rural problem. Even with mosquito species that travel only one to three miles from breeding grounds,<sup>14</sup> imagine how many dogs could live in that small radius in a densely populated urban or nonrural area.

**Infection prevalence maps.** It's easy for veterinary clients, especially in previously nonendemic areas, to discount or dismiss data about increases in heartworm cases. To make those big numbers much more personal, CAPC provides an online parasite prevalence map that drills down to the county level. To share this super-local data with clients, follow these steps:

- Go to [CAPCVet.org](http://CAPCVet.org).
- Choose "Parasite Prevalence Maps" from the top menu.
- Choose "Heartworm" from the first pull-down menu.
- Click on your state.
- Click on your county.

Some less populated counties may not have any data to report, but many other counties will show how many dogs have tested positive for heartworm infection. For example, in Jefferson County, Colorado, where the American Animal Hospital Association (AAHA) is located, so far in 2017 a total of 71 dogs have tested positive out of 9,031 dogs tested. That's an incidence rate of 0.79% for that county.<sup>15</sup>

14. American Mosquito Control Association FAQ, [mosquito.org/faq](http://mosquito.org/faq).

15. CAPC incidence data pulled June 2017.



In comparison, Nashville, Tennessee, where AAHA held its annual conference in 2017, is located in Davidson County. That location has seen 112 dogs test positive so far in 2017 out of 6,673 dogs tested. That's an incidence rate of 1.68%.<sup>16</sup>

In addition to these professional resources, consider keeping or pulling your own data about dogs testing

positive in your immediate community. If you can speak with authority about the number of cases you've seen in the past year, month, or week, that brings the risk of this potentially deadly disease home in ways that grander, wider, more comprehensive data often cannot.

**Compliance.** Big picture data combined with super-local data can bring the urgency of heartworm prevention home. Being honest and getting clients to be honest about missed doses and other compliance challenges helps too.

If you or anyone on your team has ever forgotten entirely or been late with your dog's macrocyclic lactone dose, share that detail with clients so that they might feel less guilty or less inclined to hide this fact from you.

A 2009 AAHA study looked at client compliance on a variety of core wellness topics, including use of heartworm preventives. Researchers found overall compliance at 51% regardless of the community's endemic status. That was up from 45% in a similar study from 2003.<sup>17</sup>

While you cannot be there to know for sure whether every canine patient receives heartworm preventives on time each month, you can track your practice's own compliance data, including:

- Heartworm prevention recommendations you make
- Number of dogs receiving routine heartworm testing
- Client purchase of heartworm preventives at checkout or known outside purchase
- Consistent client use of heartworm preventives (as tracked through reorders)

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16. CAPC incidence data pulled June 2017.

17. *Compliance: Taking Quality Care to the Next Level*, AAHA Press, 2009, page 11.

Once you've done as much as possible to get heartworm prevention products into the hands of clients, brainstorm ways to make it easier to remember to dose dogs with macrocyclic lactone, and now with a mosquito repellent insecticide too:

- Ask clients to sign up for email or text reminders.
- Suggest they add an alarm or text alert on their smart phones.
- Recommend people find a buddy to help them remember.

**Passion protects pets.** Clients are more likely to respond to your heartworm prevention recommendations if they feel your passion and excitement. It's pretty exciting that there is a new evidence-based strategy for heartworm infection prevention that you can introduce to clients. It's always fun to talk about something new, to explain how veterinary medicine is advancing, and to give clients opportunities to add something easy and affordable to their pet-care routine.

When appropriate, you can share insights into the difficulties of treating and the heartbreak associated with full-blown heartworm disease.

It also helps that there is increased awareness and interest in mosquito-borne infections due to topics such as the Zika virus in the news. In fact, clients might even ask if dogs are at risk for Zika. (At this point, it looks like the answer is no.) Such questions open the door for conversations about the biggest mosquito-borne risk to dogs as well as infections transmitted by other parasitic vectors.

Even the Centers for Disease Control and Prevention's advice to pet owners and veterinarians includes a recommendation of repellent insecticide use for dogs to prevent transmission of vector-borne diseases.<sup>18</sup>

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18. Centers for Disease Control and Prevention, "Preventing Ticks on Your Pets," [cdc.gov/ticks/avoid/on\\_pets.html](http://cdc.gov/ticks/avoid/on_pets.html).

## It Only Takes One

### **One heartworm-positive dog or mosquito could put a whole neighborhood at risk.**

Even one heartworm-positive dog in the neighborhood substantially increases the risk of infection to nearby healthy dogs. Most mosquito species can fly one to three miles from a breeding ground, and bigger species common in the Midwest can fly as far as seven miles.

Twenty-five different species of mosquitoes in the United States carry heartworm. Each species is active at different times of the day and the year.



#### **Sources:**

- American Heartworm Society, [heartwormsociety.org](http://heartwormsociety.org).
- American Mosquito Control Association FAQ, [mosquito.org/faq](http://mosquito.org/faq).
- Ledesma, N. and Harrington, L. Mosquito vectors of dog heartworm in the United States: vector status and factors influencing transmission efficiency. *Topics in Companion Animal Medicine*. 2011; 26(4):178-185. doi: 10.1053/j.tcam.2011.09.005.

# Introducing the New Multimodal Approach to Heartworm Prevention

Reducing the number of mosquitoes in the environment and thus their ability to feed on dogs fits naturally into the One Health perspective of medicine, which encourages the collaborative efforts of multiple disciplines—working locally, nationally, and globally—to achieve the best health for people, animals, and the environment. If you look at vector-borne disease prevention around the world, parasite control has always been part of limiting vector-borne diseases.

For example, we don't allow malaria-carrying mosquitoes easy access to people and then ask people to take a monthly pill to manage any possible malaria. We don't accept that those pills might work most of the time.

That's why malaria prevention programs include spraying mosquito breeding grounds, use of repellents on the body, netting over beds, and so on. About 50% of all resources spent in the world to control malaria aims at preventing contact between mosquitoes and humans. Health organizations around the world attribute 70% of their success in combatting malaria to that 50% spent on vector control.<sup>19</sup>

Antimalaria drugs work well, but they are not 100% effective in preventing malaria infections in people. That's why organizations like the Centers for Disease Control and Prevention and the World Health Organization make such strong insect repellent recommendations, including other available protections from mosquito bites.

With the increasing rates of heartworm infection and the emergence of macrocyclic-lactone-resistant strains (six so far), the veterinary profession needs to consider moving beyond just administering

macrocyclic lactones and expand its efforts by implementing the latest in evidence-based prevention methods.

Double-up prevention efforts:

**Step 1: Control the mosquito vector through repellent and insecticidal products.**

**Step 2: With macrocyclic lactones, clear the body of any larvae that sneak through.**



Limiting exposure to mosquitoes through multimodal efforts, including repellent insecticidal strategies, has been successful in human medicine. It has not been strongly recommended in veterinary medicine with mosquitoes, until now. To reduce resistance and limit exposure to infective parasites, we must control the vector. That's exactly what this new multimodal approach to heartworm prevention does.

19. World Health Organization, Malaria Fact Sheet, [who.int/mediacentre/factsheets/fs094/en/](http://who.int/mediacentre/factsheets/fs094/en/).

## Not Just Itchy . . . Possibly Deadly



A single dog can be bitten more than 80 times by mosquitoes in a single evening. It takes only one



mosquito to transmit a heartworm infection from one heartworm-infected dog to another dog in the community.



Mosquitoes can reproduce wherever there is as little as one inch of standing water, including poorly maintained water bowls and baby pools for dogs.



Female mosquitoes must feed on blood several times in order to lay eggs. Each one can lay several hundred eggs.

## Backyard Mosquito Mitigation

Encourage clients to eliminate breeding grounds and use repellents themselves to keep mosquitoes away from the whole family.

People want to be outside with their dogs. They want to enjoy nice weather, and preventing mosquito bites makes everyone happier, more comfortable, and in the case of heartworm prevention in dogs, healthier too.

Environmental management to eliminate mosquito breeding grounds in typical backyards include these strategies:

- Empty, wash, and refill outdoor water bowls daily to remove any mosquito eggs before they hatch (typically in 24–48 hours after being laid).
- Empty and turn over baby pools, bird baths, and yard items, such as buckets, when not in use.
- Resolve any landscaping areas where water from sprinklers or rain can pool.
- Keep screens on any open windows and doors.

### Sources:

- Capelli, G., et al. Risk of canine and human exposure to *Dirofilaria immitis* infected mosquitoes in endemic areas of Italy. *Parasites & Vectors* 2013, 6:60.
- American Heartworm Society, (n.d.). Heartworm Basics. Retrieved July 20, 2016, from [www.heartwormsociety.org/pet-owner-resources/heartworm-basics](http://www.heartwormsociety.org/pet-owner-resources/heartworm-basics).



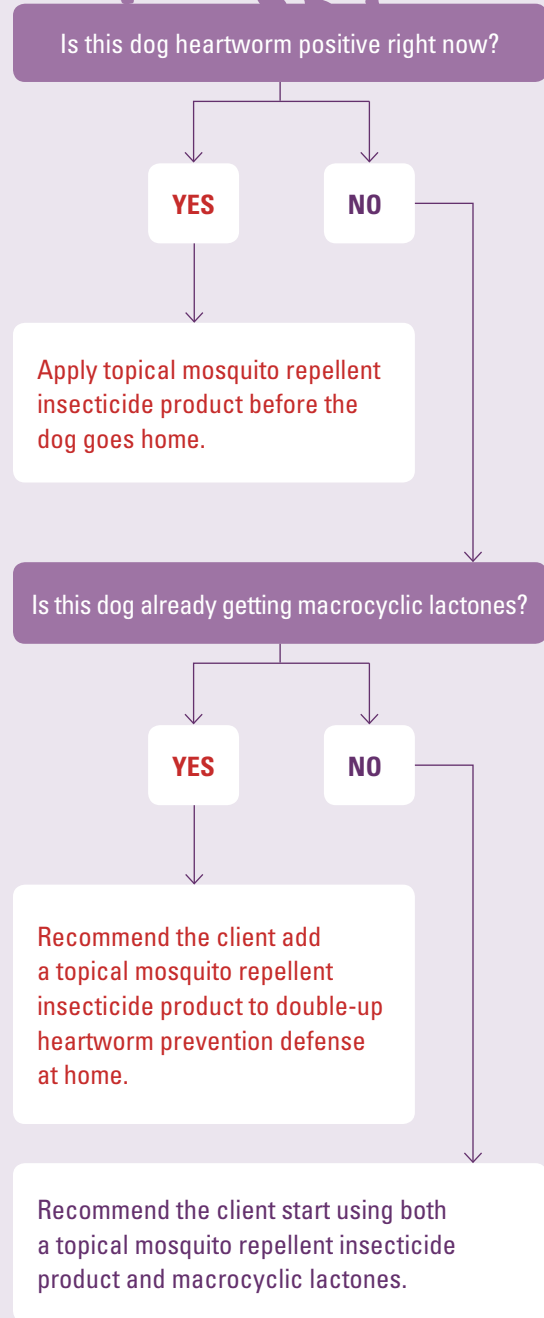
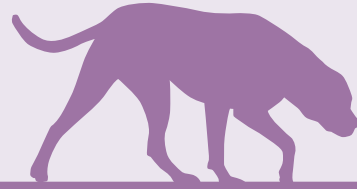
## Putting New Heartworm Protocols into Patient Care Plans

Now that there is conclusive evidence that a double line of heartworm defense works, let's look at veterinary practice scenarios (pages 16–17) where you can put this new protocol to work in the lives of the dogs in your care.

Here is an overview of the main messages to convey:

- **Big news!** Recent research has uncovered a new way to protect dogs from heartworm infections.
- **Added protection!** Our new line of defense against heartworm infections in dogs takes two steps:
  1. Use a topical mosquito repellent insecticide product.
  2. Use heartworm preventives medication.
- **Works better!** The doubling of efforts by using two products, one to protect dogs from mosquitoes and another to prevent heartworms, works better than either product alone, even against resistant strains of heartworms.
- **Affordable!** Adding a topical repellent insecticide product is an affordable and easy addition to the heartworm prevention you're already doing.
- **Mosquito protection matters!** Although heartworm preventives we've been using for decades are very effective, they are not 100% effective in preventing heartworm disease, especially as resistant strains emerge. That's why you need to use a mosquito repellent insecticide and take other steps to keep mosquitoes from biting your dog.

## New Heartworm Prevention Protocol Flow Chart







## Veterinary Practice Scenarios

### SCENARIO 1 Based on your conversations with clients, they don't seem to know about the newest way to help protect dogs from heartworm.

Make an announcement about an exciting update to your heartworm prevention recommendations. Using the marketing avenues that work best for your practice, announce the breaking news that you have a new way to help protect dogs from heartworm infections. Then, support your marketing efforts with exam room discussions with clients.

### SCENARIO 2 New client or client with new puppy or dog makes an appointment for a heartworm test and preventives.

When you're starting fresh with a new client or even an existing client with a new dog or puppy, it's a great time to introduce this new multimodal strategy for heartworm prevention.

#### **Sample script for talking to a new client:**

"It's so nice to meet you and [name of dog]. I'm happy to share with you that we've recently updated our heartworm preventive recommendations here at [name of veterinary practice]. Now, in addition to the monthly heartworm preventive pills you may already know about, we recommend the monthly use of a topical mosquito repellent insecticide. There is new research that shows that the two products used together work better than either one individually, including with resistant heartworm strains that have emerged in recent years. When you leave today, I recommend you take both the heartworm pills and the topical product home with you. If you've never applied a topical before, I'm happy to do that for you here in the exam room before you leave."

#### **Sample script for talking to an existing client with a new dog or puppy:**

"It's so great to meet [name of dog]. How lucky both of you are to have each other. I want to let you know that we've recently updated our heartworm preventive recommendations for all the dogs we see. Now, in addition to the monthly heartworm preventive pills you already know and use, we recommend the monthly use of a topical mosquito repellent insecticide. There is new research that shows that the two products used together work better than either one individually, including with resistant heartworm strains that have emerged in recent years. When you leave today, I recommend you take both the heartworm pills and the topical product home with you. I'm happy to apply the topical here in the exam room before you leave, if you'd like."

The heartworm-positive dog scenario is called "treatment without transmission." In other words, as long as heartworm-positive dogs are microfilaremic, they should be treated with a mosquito repellent insecticide to prevent mosquitoes from picking up the infection and passing it along to other dogs.

### SCENARIO 3 Client calls or comes in to refill heartworm pills.

This situation is the perfect opportunity to educate individual clients on the new doubled-up heartworm prevention protocol.

**Sample script:** “I know you’re here/calling to refill the heartworm preventive. I want to let you know that based on new research, we’ve updated our recommendations for all dogs on heartworm prevention, including heartworm-resistant strains, by adding a monthly topical mosquito repellent insecticide product. We now know that the two products used together work better than either one individually, including with resistant heartworm strains. May I add the topical product to your order?”

### SCENARIO 4 Client’s dog has just been diagnosed with a heartworm infection.

This situation is tougher emotionally for everyone. It might be much harder for the client to hear any additional information. However, it’s important for the safety of other dogs in the neighborhood that a heartworm-positive dog receives a mosquito repellent insecticide treatment immediately upon diagnosis. Thanks to this new research, we know that adding this product to stop mosquitoes to the heartworm infection treatment will reduce the spread of infection to other mosquitoes and dogs via those mosquitoes.

**Sample script:** “I know this news is unwelcome and upsetting. I’m so sorry. The treatment plan we’re recommending for [name of dog] includes treating [him/her] right away with a topical mosquito repellent insecticide. There is new research that shows that this extra step controls mosquitoes and reduces the risk of mosquitoes picking up the heartworm infection from [name of dog] and transferring it to other dogs in your neighborhood. I know you have a lot on your mind right now, but I truly believe that if all of us start using this mosquito repellent insecticide product in a proactive manner that we can—over time—cut down on the number of dogs and families facing this situation. May I start [name of dog’s] treatment right now by applying the topical product?”



## Establishing Veterinary Team Roles and Responsibilities

When making a major change to your existing heartworm prevention recommendations for dogs, it takes every member of the veterinary practice team's cooperation. Take time to plan ahead to ensure that everything goes as smoothly as possible with day-to-day efforts as well as with client education and ultimately client compliance with the new protocols. Don't forget to set goals!

Different practices will handle the details of the switch in heartworm prevention protocols in different ways, but most practices will have certain foundational strategies in common:

- **Veterinary team education**, including reading details from the new McCall research or lunch-and-learn sessions with appropriate product representatives
- **Selection of a topical repellent insecticide product** or heartworm products the practice will carry and recommend to clients
- **Adjustments to inventory planning** and ordering as needed before any announcements are made to clients
- **Team-wide creation of client education** and communication strategies to announce the change and start rolling out its implementation for all dogs seen at the practice
- **Creation of any client education materials** you plan to use
- **Day-to-day implementation** of the new recommendations

**V VETERINARIANS.** The veterinarians on the practice team can develop the details of the practice's protocol, including what, when, and how the recommendations will be made, as well as scenarios that would exempt specific dogs, if any, from the protocol. Veterinarians also likely oversee implementation of the new plan practice-wide.

**PM PRACTICE MANAGERS.** As with all staff development opportunities, practice managers will take responsibility for staff education and training and monitor implementation performance against established goals.

**VT VETERINARY TECHNICIANS.** In the client education and support role, veterinary technicians can take the lead on explaining how the new protocol works, asking and answering questions to confirm understanding of why and how to put the new prevention plan in place at home, and supporting the veterinarian's recommendations. Technicians also may provide the bulk of the client follow-up aimed at improving client compliance with regular dosing of the two products, including instruction in using topical products for clients unfamiliar with their use.

**FD FRONT-DESK STAFF.** Because the first and last people clients see at each visit or talk to on the phone often are veterinary team members working at the front desk, they can engage with clients about the importance of heartworm infection prevention, help raise awareness that a new protocol is now recommended by the veterinary practice, and handle any details pertaining to consumer promotions, rebates, or discounts offered by makers of the heartworm preventive and mosquito repellent products.





## Changing the Dialogue About Heartworm Prevention

For all the efforts over the years to educate clients about canine heartworm disease, most of the focus was on how doggone scary the heartworms are. Seriously, seriously creepy. The photos and models of infected hearts likely ruined many pasta dinners.

Sure, clients understood that the infection came from mosquitoes, but we mostly told them to worry about the downstream result—adult heartworms.

While avoiding that terrible and sometimes deadly outcome is still the goal, it's time to turn our attention to the other bad critter in the heartworm saga—the mosquito.

Everywhere, constantly feeding, forever multiplying, biting every other lifeform they can on any given day, any time of year, mosquitoes are the only known source of heartworm infections in dogs. It's time they got a lot more attention than they have in the past.

This new research is your hook. That's your news angle. That's science coming to your aid and to the aid of tens of thousands of dogs suffering needlessly from the hassle of mosquito bites and the deadly threat of heartworms.

Finally, after more than 30 years, you have something new to talk about and something new to protect your canine patients.

Use science (and your personal passion for pet health) to drive this shift in the conversation about heartworm infections to include the all-important vector.

Clients are looking for specific recommendations. Practices that use a direct and detailed approach see greater success. Now that we have evidence this new heartworm preventive protocol works, even with the scariest resistant strains, it's time to update your talking points and recommendations.



### 3 Questions Clients Frequently Ask

After so many years of doing the same thing, veterinary clients will probably have questions about changes in your heartworm prevention recommendations. Start a team-wide conversation with these common questions and consider brainstorming questions and answers of your own based on the unique needs and characteristics of the community you serve.

#### 1 What does this new research say?

**Phase I** of the study found that using a repellent insecticide against mosquitoes was 95% effective on heartworm-positive dogs, and no transmission of heartworm infection occurred.

**Phase II** of the study found that no transmission of heartworm infection from infected mosquitoes to heartworm negative dogs occurred with use of mosquito repellent in addition to heartworm preventive pills.

According to the study's author, "A multi-modal approach to the prevention of heartworm by reducing populations of vector mosquitoes, preventing mosquitoes from biting and killing mosquitoes, as well as monthly or bi-annual administration of a [heartworm preventive] should be strongly encouraged."

#### 2 What does repellency mean?

Repellency means different things for different parasites. In the case of mosquitoes, it means they fly up near the dog, sense the product and are repelled, sometimes without landing.

In the case of topical products that also work as insecticides, any mosquitoes that do land on the dog are killed or greatly weakened before being able to bite the dogs in most cases.

#### 3 Can I bathe my dog before or after I apply the topical preventive?

Yes, just be sure your dog is completely dry before applying the topical product. In addition, the topical product needs to be completely distributed before your dog gets wet during play or in the bathtub. Moreover, the dog shampoo you choose is very important. Do not use a detergent dish soap or detergent shampoo because these products will remove the topical product from your dog's skin and coat, which results in loss of protection.

If your dog needs therapeutic shampoos and rinses for other skin conditions, your veterinarian can explain how to use the shampoos and a topical mosquito repellent insecticide in these situations.

## Renewed Commitment and Passion

A lot has changed in veterinary practice over the years. Medical and diagnostic technological advancements and certainly the explosion of information on the internet make the practice of veterinary medicine more exciting, more complicated, and more expensive in many cases.

The downside of so much access to pet-care information and pet-care products, including some previously available only through veterinary practices, is that some veterinary products lead to a slugfest over price per dose.

Unit costs sometimes overshadow the science of veterinary medicine.

If that's where you feel you are in the world of heartworms, take a breath. Take a step back. And, take a look at how this advancement in heartworm prevention research can change the conversation:

- **Share with clients** the thrill of this improved strategy for heartworm prevention that's squarely rooted in the scientific method.
- **Share with your practice team and your clients** how seriously you take heartworm prevention based on national data, local data, practice data, and personal experience.

**Enthusiasm multiplies.** It goes "viral," to use an internet term. It's exciting to have something new to say about heartworm prevention after so many years of doing and saying the same thing.

When having conversations with clients around heartworm prevention, it's okay to be emotionally charged because full-blown heartworm disease is serious—in some cases deadly serious.

Especially with a new strategy to prevent even resistant heartworm strains from taking hold, you

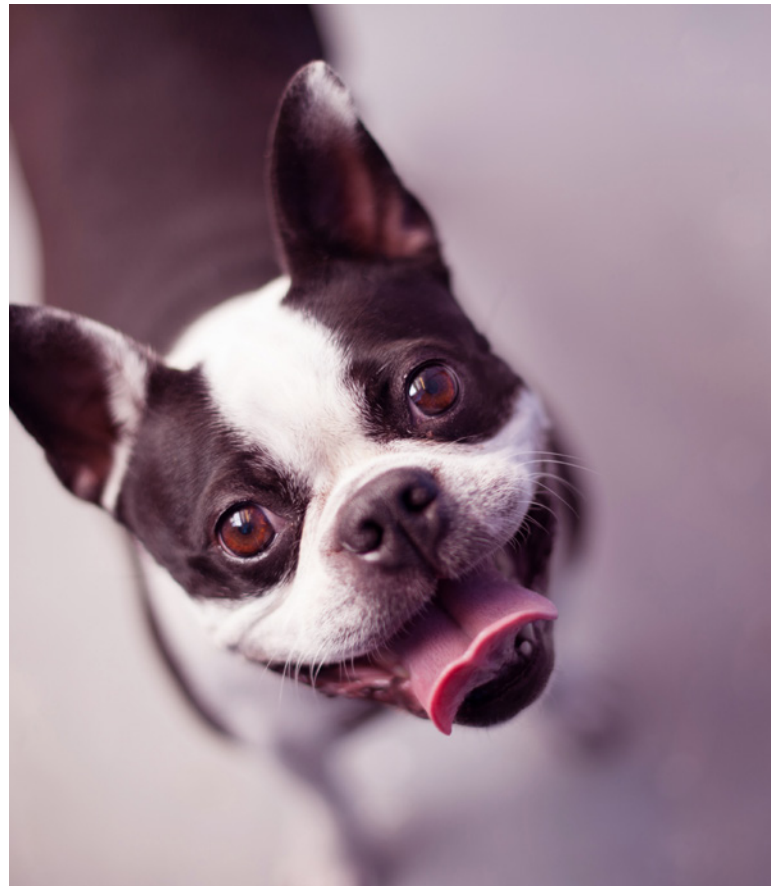
now have something newsworthy, effective, and affordable to discuss.

Take this opportunity to be passionate about science, passionate about practice teamwork, passionate about client education, and passionate about fighting the particularly pesky vector that happens to be the only known source of heartworm infection transmission.

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After 30-plus years of only fighting worms, it's time to take on mosquitoes by doubling dogs' heartworm defenses.

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As the sixth largest animal health company in the world, Ceva Animal Health offers more than 75 products designed to help keep pets healthy inside and out. Key offerings include a line of parasiticides as well as dermatology and pheromone products. Ceva has operations in 42 countries and employs more than 4,000 people worldwide. All are working to support its vision of a holistic approach to health centered on the idea that by protecting the health of animals and our environment, we protect our own health and future.



Established in 1933 by leaders in the veterinary profession, AAHA is best known for its accreditation of companion animal veterinary practices. To become accredited, companion animal hospitals undergo regular comprehensive evaluations by AAHA veterinary experts who evaluate the practice on approximately 900 standards of veterinary care. AAHA also develops publications and educational programs and resources designed to help companion animal hospitals thrive. Today, more than 3,700 practice teams (15% of all veterinary practices in the United States and Canada) are AAHA accredited. For more information about AAHA, visit [aaha.org](http://aaha.org).

