

# Tick Disease Info Is Better, but Prevention Is Still Key

By Susan Chaney

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Tick disease isn't as simple as it appeared to be a decade ago. Researchers and clinicians have learned a lot more about the many bacteria, referred to as "pathogens," that cause the various diseases. And veterinarians now have access to much better diagnostic tools, such as DNA tests that can tell you not only that your dog has been exposed to babesia, for example, but that it's actually infected with *Babesia canis* or *Babesia gibsoni*, in particular. This distinction allows your veterinarian to treat your dog appropriately, giving it the best chance of recovering, although, in many cases, a dog's immune system will eliminate the pathogen, in what's called an "immunological cure," with no treatment required.



Prevention is the best way to protect your dogs from tick-borne diseases, however, annual screening for the pathogens that are transmitted by ticks is also an option. Photo © [Can Stock Photo](#).

## It's Still About Prevention

Nonetheless, Edward B. Breitschwerdt, D.V.M., Ph.D., a professor of internal medicine at North Carolina State University College of Veterinary Medicine, is quick to repeat the often heard adage, "An ounce of prevention is worth a pound of cure."

Even after doing years of research into tick-borne diseases, he knows that it's much better if ticks just never attach to your dog.

"I know some people are afraid of the acaricide products, but I use them on my dogs 365 days a year," he says. "I know they're the safest and most effective products we've had in the history of veterinary medicine." He's referring to the flea and tick preventives that include chemicals that keep ticks from biting, attaching, then sharing the pathogens that cause babesiosis, Rocky Mountain spotted fever, ehrlichiosis and other diseases. You may never have even heard of some of them, such as bartonellosis and hepatozoonosis. In the veterinary profession, all but Rocky Mountain spotted fever and Lyme disease are usually referred to with "canine" in front of the disease name.

The vast majority of dogs that have been exposed to ehrlichia, rickettsia and other tick-borne pathogens never have any symptoms of infection. However, the diseases that sometimes develop can have very different symptoms and outcome in dogs than they do in people. In addition, both diagnosis and treatment can be challenging, Breitschwerdt says.

It takes only seven kinds of ticks to spread these bacteria around the country. To find out where these ticks live and which pathogens they transmit, you may want to read “[Ticks in America](#).” It includes links to Centers for Disease Control and Prevention maps of where each tick makes its home. One of them, the brown dog tick (*Rhipicephalus sanguineus*), is known to transmit three of the pathogens, possibly five, and it lives in every region of the United States, except a very small part of Utah.

Thus, Breitschwerdt’s use of the prevention adage.



Loss of appetite and weight loss are potential signs of infection with several tick-borne diseases. Photo by © [Can Stock Photo](#).

### One Size Does Not Fit All

One reason research into tick-borne diseases is important is that not all tick-borne diseases can be treated effectively with the same antibiotics and the same course of treatment.

Breitschwerdt says one group, the infections from rickettsias, anaplasmas and ehrlichias, often responds well to doxycycline or another tetracycline. “For those diseases, if the diagnosis is wrong but the treatment is given, the animal is likely to respond,” he says. However, with rickettsia, the cause of Rocky Mountain spotted fever, a seven-day course is recommended, while four weeks of antibiotic treatment are needed for anaplasmas and ehrlichias. Even with four weeks of doxycycline, a subset of dogs may not be cured.

Babesia, on the other hand, “requires specific drugs directed at those protozoa,” Breitschwerdt says. *Babesia canis* and *Babesia gibsoni* are the most common cause of babesiosis in North America, and “the drugs used for *canis* don’t work for *gibsoni*.” He points out that one of his former doctoral students, Adam Birkenheuer, Ph.D., has done a lot of work on babesia at North Carolina State for that exact reason: the treatment is different.

In fact, babesias are divided into “large” and “small,” based on their physical size. *Babesia canis* is large, while *Babesia gibsoni* is small, Breitschwerdt explains. “The large babesias respond well to treatment,” with dogs recovering completely. “Small babesias are more difficult to treat. Ten to 20 percent [of dogs] don’t respond or clear the infection.”

It’s through the use of DNA analysis that treatment can now target particular types of large or small babesias. “Historically, the diagnosis of babesiosis was based upon looking for the organism in the red blood cells under the microscope,” Breitschwerdt says. “For many years, that’s the only technology veterinary medicine had. We thought all small babesias were one species and all large were one species. In the last 10 years, we’ve found a lot of babesias that we had not known to exist.”

This might seem too complicated for the average veterinarian to manage, but Breitschwerdt says the university gets consultation requests “every day” on how to treat babesia. The university’s website includes recommended protocols for treating the various types, including *Babesia conradae*, found in Southern California, and *Babesia* “coco,” which is so new that it doesn’t have an official name yet. “We try to share that information,” he says.

Babesiosis, Lyme, bartonellosis and hepatozoonosis are the more chronic and debilitating diseases. For hepatozoonosis, a combination of anti-protozoal drugs are prescribed off-label, meaning they weren’t specifically developed to treat this tick-borne disease. “But that’s all we have,” he says. Despite long-term – up to six months of – treatment with multiple drugs, dogs infected with *Hepatozoon americanum* often relapse.

### The Secret’s In the DNA

One thing that’s in dogs’ favor, however, is the development of tests that can more accurately identify the various pathogens. With dogs that regularly are exposed to ticks, annual screening can help their veterinarians recognize tick-transmitted infections when symptoms first develop. For example, Idexx had a heartworm test, which now also identifies antibodies to *Borrelia burgdorferi*, the cause of Lyme disease; three *Ehrlichia* species and two *Anaplasma* species, in eight minutes right at the veterinary clinic. Although antibodies only document exposure to one or more of these six tick-borne pathogens, the information allows the veterinarian to determine if additional testing is needed and if preventive products are being used routinely.

When it was first introduced about a decade ago, Breitschwerdt says there was a lot of debate as to whether it was a good thing. “In other words, ‘Was it creating more confusion than it was worth?’” After all, just because your dog’s been exposed to *Ehrlichia ewingii*, for example, it doesn’t mean he’s sick.

“My conclusion now is that it’s a good thing and like all diagnostic testing modalities, the veterinarians who are using the test have to understand the limitations of that test to use it correctly. Positive results indicate that a dog has been exposed. It doesn’t mean it’s still infected.”

Despite the fact that all preliminary chain reaction (PCR) testing has limitations, as do all testing modalities, Breitschwerdt says such DNA testing has “revolutionized infectious disease diagnosis.” If a veterinarian knows a dog has been exposed to *Ehrlichia ewingii*, for example, then the dog shows up months later with a fever and loss of appetite, “It gives you a whole lot of justification for treating the animal with antibiotics.” With earlier diagnosis, the chances of full recovery are better.



All kinds of atypical dog behaviors can be signs of tick-borne disease. Lethargy, limping, fever and weakness are just a few, and they vary significantly from infection to infection. Photo by © [Can Stock Photo](#).

### Know the Signs

It helps to know the possible clinical signs associated with tick disease, so you can get your dog treated promptly.

If Lyme disease is common where you live, watch for swollen joints, loss of appetite, fever and fatigue. Although Lyme is common around the U.S., “the less common ones are more important,” according to Susan E. Little, D.V.M., a parasitology professor at Oklahoma State University Center for Veterinary Health Sciences. Dogs with ehrlichiosis also lose their appetites, but often have a fever, and runny eyes and nose. The symptoms move on to “nose bleeds, swollen limbs and muscle pain,” she says. Three to 5 percent of dogs who become sick with ehrlichiosis die from “severe internal bleeding.”

“With anaplasmosis, dogs have fever, lose their appetites, have stiff joints and are lethargic,” she says. “They may also vomit and have diarrhea. In extreme cases, they will have seizures as well.” Rocky Mountain spotted fever may start with fever, of course, and stiffness, but then it progresses to neurological problems, as well as skin lesions.

Babesiosis is evident by anemia, pale gums, general weakness and vomiting. Little points out that *Babesia gibsoni* can be spread from dog to dog via dog bites. “There’s a high rate in pit bulls and fighting breeds,” she says. Breitschweidt says he and his team have tested American Pit Bull Terrier kennels in the Southwest where every single dog tested PCR positive (actively infected) for babesia. However, he says, dogs of this breed “generally do not have” any symptoms of infection.

Bartonellosis is “less well-recognized and understood,” Little says. “There are more tick-borne diseases out there that we don’t know about than we do.” It causes fever and intermittent lameness, but can lead to heart or liver disease.

A unique method of transmission sets hepatozoonosis apart from other tick diseases. A dog must eat a tick that carries the pathogen in order to contract it. “Most infected dogs are not clinically ill,” Little says, “however, those that do get sick are very sick with fever, runny eyes and nose, and muscle wasting.”

No good statistics exist on what percentage of dogs is treated for the various tick diseases or how many dogs die from them.

So, regardless of the progress made in identifying and treating tick-borne infections, prevention is the best weapon against illness and potential death.

Tags: [anaplasmosis](#), [babesiosis](#), [bartonellosis](#), [Best in Show Daily](#), [BISD](#), [Edward B. Breitschwerdt DVM PhD](#), [ehrlichiosis](#), [hepatozoonosis](#), [Lyme disease](#), [North Carolina State University College of Veterinary Medicine](#), [Oklahoma State University Center for Veterinary Health Sciences](#), [Rocky Mountain Spotted Fever](#), [Susan Chaney](#), [Susan E. Little DVM](#), [tick-borne diseases](#)