

## Tick Borne Diseases in Wisconsin

Disease transmitted by ticks is very common in our area. Ticks can carry a variety of bacteria that cause illness in both pets and people. The most common tick-borne diseases we see in Wisconsin occur in dogs, and are caused by one of the following organisms: *Borrelia burgdorferi* (causes Lyme's disease), *Anaplasma platys* (causes Cyclic Thrombocytopenia), *Anaplasma phagocytophilum* (causes the same symptoms as Lyme's disease), *Ehrlichia* (several species; cause symptoms similar to Lyme's disease).

The *symptoms* caused by these organisms tend to be very similar. You may see: pain, which can be in the legs, back, neck, or difficult to pinpoint; fever; loss of energy (lethargy), and a loss of appetite. Some organisms can also cause spontaneous bleeding of the nose or eyes. There may also be blood in the stool and bruises on the skin. This disease can be life-threatening, and symptoms can recur throughout the dog's life.

*Diagnosing* this disease is not as straight-forward as we would like. We do have a test available that can be performed in the clinic using a small amount of your pet's blood. The test is designed to identify antibodies that a dog's body has made to fight off the bacteria. However, if the pet has been exposed to the bacteria but fought it off, we can get a false positive test, and the symptoms will be from something else. If the pet has been exposed but developed symptoms right away, there may not be any antibodies in the bloodstream yet, so we can get a false negative ("no infection") test. If the pet has been exposed to a new variety of one of these bacteria, we can get a false negative test. If the test shows that the dog has been exposed to *Anaplasma*, we do not know which kind of *Anaplasma* we need to worry about.

False negative tests are rare with Lyme's disease, because it can take MONTHS for a dog to show symptoms after it has been infected. That is why we see patients with this disease even in the middle of winter: they were most likely bitten by an infected tick in the summer or fall, but the signs of disease didn't develop until much later. However, false positive tests are common, because the antibody level can stay high even after the bacteria is no longer causing any problems. False negative test results are common with *Anaplasma* and *Ehrlichia*. These organisms often causes symptoms of disease within days of infecting a dog, but it can take three weeks for the pet's body to make enough antibodies for the test to show up positive.

There is a new variant of Ehrlichia that is infecting dogs and people in Wisconsin, Minnesota, and Michigan. This type of Ehrlichia used to only be found in mice, but it changed (mutated) enough to allow it to grow in other mammals as well. Outside of research laboratories, there is no test available for this bacteria yet. It will not show up as positive on the "Lyme test" that looks for other types of Ehrlichia. Scientists recently discovered that birds can be a source for some of these infections, which means that migratory birds may bring ticks to Wisconsin that are infected with different types of bacteria--ones that we aren't testing for yet.

SO WHY TEST? Very many of our diagnostic tests leave us with unanswered questions. Medicine is like a murder mystery: you have to collect information, compare it, and come up with an answer that way. Although the "Lyme's test" is not 100% reliable, it gives us clues as to what is going on, and helps us decide how to treat your pet.

In most cases, *treatment* involves antibiotics and a short course of pain medication with an anti-nausea medication. In cases where there are complications, such as kidney failure, vomiting, or a bleeding disorder, other medications may need to be added. In general, pain medications are only given for a very short time, because we need to stop them to make sure that the antibiotic is working--that the pain symptoms stay gone even when the pain medication is taken away. Antibiotic therapy is continued for a minimum of 4 weeks, sometimes longer. The antibiotic of choice for these infections is doxycycline or minocycline. Either can cause tooth discoloration in animals whose teeth are still forming (though it is less likely with minocycline), so may not be prescribed for young pups. They can also cause stomach upset, which may be avoided by giving with meals rather than on an empty stomach. Calcium interferes with the body's ability to absorb the medication, so it should not be given with high-calcium foods. Finally, these two medications will very rarely cause liver problems. If your pet begins vomiting while receiving this medication, it will need to be evaluated by a veterinarian. For patients who only have Borrelia infections and are difficult to medicate or don't tolerate doxy- or mino-cycline, an injection of a cephalosporin can be given every two weeks for two to three doses.

There is no way to completely *prevent* your pet from contracting a tick-borne disease. The best thing that you can do is to prevent ticks from biting your dog. There are many products available that claim to do that. Some are applied to the skin every 4 weeks, but there are also monthly and every three month oral medications as well as special collars available. The type of

product and frequency of application recommended depends on several factors. It is best to discuss this with your pet's primary care veterinarian. Examining your pet after trips outside is an important addition to using tick preventatives. Remember to look between the toes, in the lip folds, under the chin, and inside the folds of the outer ear, as well as underneath the collar. Lyme's vaccinations do not necessarily prevent infection with the Borrelia that cause Lyme's disease, but are reported to decrease or eliminate the symptoms of disease, and we have seen very few deaths from Lyme's nephritis (kidney failure) since we began using the vaccine. As of this writing (12/31/15), there are no vaccines available for Anaplasma.