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### **Lyme Disease Revisited** **Linda Aronson, DVM**

Lyme disease as well as *Anaplasma phagocytophilum* and *Ehrlichia canis* now occur in all of the contiguous 48 States and in many other places around the world. With widespread testing we are picking up many dogs that test positive but show no signs of disease. This leads to the question of whether these dogs should be treated.

In areas where Lyme infection is high the question is how best to avoid infection and whether or not it is helpful and/or safe to vaccinate dogs against the disease.

Only about 5 to 10% of owner presented dogs that test positive for Lyme disease show apparent signs of the disease, although more than 60% have been reported to in some studies where they have been more closely observed.

Signs tend to occur 2 to 5 months after infection and include lameness, arthritis in one or more joints, enlarged lymph nodes, lethargy and fever. The tell-tale target lesion often seen in people or any other skin lesion is uncommon in dogs, and even less likely to be seen through their hair. The signs will usually resolve within three days, often spontaneously or in some cases with antibiotic therapy. Other more serious conditions have also been noted in conjunction with Lyme infection including kidney disease (Lyme nephritis), heart disease (myocarditis) and neurologic disease, as well as hemolytic anemia and thrombocytopenia – low platelets.

Lyme disease is diagnosed serologically by looking for antibodies as very few bacteria are needed to produce infection. The ELISA test is non-specific although very sensitive. It does not distinguish between antibodies produced by infection and vaccination. There are two tests that detect antibodies against the Lyme C6 protein. Because this protein is expressed only when the animal is infected naturally through a tick, vaccinated dogs will not test positive unless they have also been infected.



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The in-house SNAP 4Dx (also tests for heartworm, *A. phagocytophilum* and *E. canis*) is used to screen dogs for exposure to Lyme infection. Dogs that test positive have a current active Lyme infection. The quantitative C6 Lyme test will give you a titer that correlates to circulating anti-Lyme immune complexes and this is used by some practitioners to decide whether or not to treat the individual dog.

We used to believe that it took 48 hours for attached ticks to transmit Lyme disease to their hosts. We now know that transfer can occur in as little as 18 hours, while the tick and especially the nymph may still be too small to see. Still, if you see a tick it should certainly be removed.

**Prevention.** Using K9 Advantix, Frontline or other proven products is very effective at preventing infection in dogs exposed to infected ticks. Frequently though they can be overwhelmed by the sheer numbers of ticks the dog encounters.

I really can't recommend vaccination against Lyme disease. There are two types of vaccine. Both work by binding the bacteria in the gut of the tick while it's dining on the host's blood. Once bacteria enter the dog the vaccine is no longer effective. Both types of vaccine will need to be boosted at least every 12 months and possibly more often. They do not protect against other tick borne disease, and even against Lyme disease a high infestation can easily overwhelm the protection they do offer. The big question though is their safety. I have seen bleeding problems in dogs post vaccination with these products.

Often dogs show signs of Lyme infection 4 to 8 weeks after vaccination, but test negative for the disease. I have also seen higher C6 titers in vaccinated dogs (remember this is due to infection not vaccination) than in unvaccinated dogs. Other complications include rheumatoid arthritis and acute kidney failure. Lyme nephritis is the result of immune complexes (antibody-antigen) accumulating in the kidneys, and vaccination may contribute to the condition, although this has not been proven as yet. The common signs of Lyme disease resolve quickly, often without antibiotic treatment and never even develop in most infected dogs, but it is likely that



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in many dogs even prolonged antibiotic treatment does not rid the body of bacteria and they can re-emerge later, probably when the body's immune system is stressed and weakened.

The more serious effects of Lyme disease are also the most difficult to treat. Certainly, any dog showing clinical signs of Lyme disease should be treated, preferably with doxycycline, and I prefer to treat for 8 weeks. Some vets treat all dogs that test positive for Lyme disease on the SNAP tests, while others require a certain titer to be reached on the quantitative C6 test. Given that synovitis (inflammation of the joint capsule) has been found in virtually all dogs that test positive for Lyme - regardless of whether or not they show clinical signs - at necropsy, while about 25% show more serious signs of inflammation of the blood vessels and nerve sheaths, I would err on the side of treating all positive dogs, and hopefully avoiding more serious complications.

Spring is coming, please take appropriate precautions to spare your Beardie from infection.