**Glen Mills Veterinary Hospital**

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**Lyme Disease (Borreliosis)**

**History**

Lyme disease (borreliosis) is an infectious, tick-borne disease first recognized in dogs in 1984, though has existed in wildlife for many years. It is caused by Borrelia burgdorferi, a type of bacteria called a “spirochete.” The common deer tick Ixodes scapularis (formerly called Ixodes dammini) is the primary carrier of B. burgdorferi in the Northeast and upper Midwest.

**Prevalence of Lyme Disease in the U.S.**

Despite the fact that people and dogs from all states have been infected with the disease, it is felt that they acquired the disease by traveling to endemic areas. Only a relatively small portion of the United States is endemic for the disease. However, all of the areas where Lyme disease is present are areas with high human and pet populations bringing the total number of people and animals that can be potentially exposed to a high number. In humans, 85% of cases have occurred in the eastern coastal states from Massachusetts to Virginia. 10% of the cases come from Wisconsin and Minnesota and 4% from California. All of the other states account for less than 1% of the disease.

**Life cycle of the deer tick**

The deer tick (I. scapularis) goes through several stages in its life cycle. In the spring, the eggs hatch into larvae. During the summer, the larvae then bite a previously infected white-footed mouse. This infected larva will then winter over until the following spring when it becomes a nymph. The infected nymph then bites another mouse, or it bites a deer, dog, human or other mammal infecting them. The nymph then molts into an adult and lays its eggs, which will hatch the following spring.

**Transmission**

For a nymph to transmit B. burgdorferi, it must be attached to the host. It is not clear exactly how long it takes for disease transmission to take place. It is of course best to remove ticks as soon as possible to minimize their disease potential.

Other types of ticks and insects have been shown to be infected with B. burgdorferi, but they are considered insignificant spreaders of the disease at this time.

**Symptoms**

Clinical illness usually occurs 2 to 5 months after initial exposure and the likelihood of disease and the severity of the disease seems to vary with the animal's age and immune status. Cats can develop Lyme disease, but it occurs rarely in them, even in endemic areas. Other domestic animals such as horses have contracted Lyme disease, but it does not appear to be a significant problem. Dogs show several different forms of the disease, but by far, the most common symptoms are a fever of between 103 and 105°, shifting leg lameness, swelling in the joints, lethargy, inappetence, and a response to appropriate antibiotics.

Arthritis may be a result of both short- and long-term infections. Most dogs that are promptly diagnosed and treated do not appear to develop arthritis, but a few dogs who do not respond completely to treatment or were not treated will develop progressive degeneration of the infected joints.

A few dogs have developed severe progressive renal disease as sequelae to Lyme disease. This severe kidney failure is often non-responsive to treatment and death is often the outcome. Fortunately, this form appears to be uncommon.

Usually dogs will not develop any rash or the circular area of redness around the bite (erythema migrans) which is seen in people.

**Diagnosis**

Animals that have a history of tick exposure, clinical signs suggestive of Lyme disease, and have a rapid response to antibiotic therapy appropriate to Lyme are highly suggestive of infection. Many clinically affected Lyme positive animals clinically improve within 48 hours of starting antibiotic therapy.

There are two tests currently being used to test for Lyme disease in dogs. The first is called a Lyme 4Dx ELIZA test. We screen for Lyme, heartworm and Ehrlichia (another tick borne disease) with this test and have results within 15 minutes. A positive Lyme result on this test means your dog has had exposure to Lyme at some point in its life.

**Treatment**

Treatment for Lyme disease is very straightforward and consists of using either a tetracycline or penicillin-based antibiotic. The two most commonly used are oral Doxycycline or Amoxicillin. A recent study showed that both antibiotics worked equally well. The antibiotics must be given a minimum of 14 days, but 30 days is recommended. However, some preliminary studies show that some animals may not even clear the organism after 30 days and will relapse once the antibiotic is discontinued. In these cases, the animal may have to be on the antibiotic for much longer. It appears that some animals may never completely rid themselves of B. burgdorferi despite aggressive treatment. These animals may suffer from increased degenerative changes in the joints leading to premature arthritis. Despite the fact that some animals may develop chronic infections, the vast majority of infected dogs respond rapidly and satisfactorily to doxycycline treatment. In some animals with severe arthritis, additional medications, like non-steroidal anti-inflammatories, may be prescribed. The use of steroids in this disease is contraindicated.

**Prevention**

We strongly recommend the use of topical preventatives against tick borne diseases, including Lyme disease. **Frontline** is a great product for cats and **Advantix II, Frontline Plus and Revolution with the added Tick Collar** are good options for dogs. Please ask our staff about these products.

Please also ask us about the Lyme vaccine. We'd be happy to review this with you. It is regarded as a highly valuable vaccine that is highly effective against Lyme transmission, though like other vaccines, can not be considered 100% effective.