

## Are animals affected by Lyme disease?

Dogs were the first domestic animals known to be affected by Lyme disease. Where Lyme disease is common, a large percentage of dogs can be expected to show significant levels of antibodies to the Lyme disease spirochete. Symptoms of Lyme disease in dogs include loss of appetite, lack of activity, and lameness. Cats, horses, and cattle are among the domesticated animals also known to be affected by Lyme disease. Little is known about the effects of Lyme disease on wildlife.

## How can Lyme disease be prevented or controlled?

The best way to control Lyme disease is to avoid tick-infested areas. If this is not possible, you should consider dressing appropriately when going into potentially tick-infested areas. Wearing light-colored clothing, for example, will make it easier to observe ticks. By tucking pants legs into socks, ticks will be forced to crawl on the outside of clothing where they may be more easily observed.

Protection may be increased by the use of personal repellents, which may be used on skin or clothing, or clothing repellents that should only be applied to clothing. **Be certain to follow labeling directions carefully.** There have been several reports of generalized seizures among individuals who used personal repellents containing DEET (N,N-diethyl-m-toluamide) applied directly to skin. The possibility of adverse reactions may be minimized by applying the repellent sparingly and by avoiding the use of high-concentration products on exposed skin, particularly in children.

Risk of infection can be reduced further by examining yourself, family members, and pets when returning from tick-infested areas and removing ticks before they have a chance to feed. Ticks require many hours to insert their mouthparts and begin the feeding process. Ticks that are removed promptly are unlikely to transmit the infection.

Ticks that are embedded in skin should only be removed by grasping the tick with tweezers as close to the skin as possible and applying firm, steady backward pressure until the tick is

dislodged. Removal of embedded ticks by use of noxious chemicals or by burning will not work and may cause injury to the skin. After the tick is removed, infection may be avoided by washing the area thoroughly. Removed ticks may be saved for identification, but this procedure is not very useful in diagnosing Lyme disease. If you develop signs and symptoms consistent with Lyme disease, contact your physician.

## Are effective tick control methods currently available?

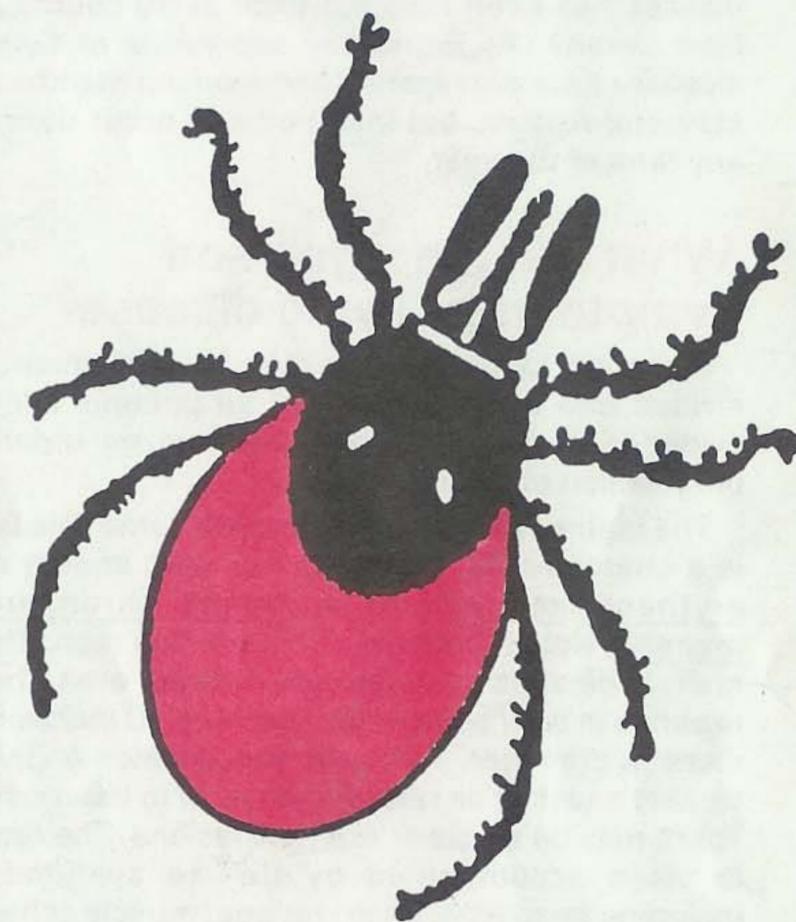
Effective methods to control deer ticks in every situation have not been developed. Research conducted by the New Jersey State Department of Health has shown that applications of liquid and granular formulations of several general-use insecticides can provide excellent control of all host-seeking stages of the deer tick. However, the type of insecticide formulation to use, timing, and placement of the application are critical to successful control and applications are only recommended for areas known to be infested with infected deer ticks. Because of the complex nature of tick ecology and insecticide application regulations, chemical control of the deer tick should be left to licensed professional pesticide applicators. For further information on tick control, contact the Rutgers Cooperative Extension Service or your County Agricultural Agent.

For further information regarding the signs and symptoms of Lyme disease, contact your physician.

All other questions regarding Lyme disease should be directed to your local health department or call 800-792-8831.



# LYME DISEASE



# IN NEW JERSEY

## What is Lyme Disease?

Lyme disease is caused by a bacterium known as a spirochete that is transmitted primarily through the bite of certain infected ticks. Although Lyme disease has been reported from 43 states, New Jersey is one of the eight states reporting over 90% of all cases nationwide. About one-half of all reported New Jersey cases occur in Monmouth and Ocean Counties. However, Lyme disease has been reported from every county in New Jersey. Approximately two-thirds of Lyme disease cases are reported between the months of May and August, but infection can occur during any time of the year.

## What are the signs and symptoms of Lyme disease?

Although Lyme disease may be conveniently divided into three stages, not all patients show evidence of all stages and there is no orderly progression of the illness.

The hallmark of the initial stage of Lyme disease is a characteristic skin lesion or rash known as erythema migrans or erythema chronicum migrans. Not all patients will have this rash. The rash begins as a small red, raised area that expands in size, sometimes reaching 20 inches or more in diameter. The rash may develop a clear center, and may be raised and warm to the touch. There may be single or multiple lesions. The rash is often accompanied by flu-like symptoms including headache, fever, fatigue, muscle aches, and nausea. The signs and symptoms of the first stage of Lyme disease normally appear within several days to several weeks following a bite from an infected tick.

The second stage of Lyme disease, which normally occurs within several weeks to several months following a bite from an infected tick, is marked by various neurologic and/or heart problems.

The signs and symptoms of the third stage of Lyme disease include recurrent attacks of joint swelling and pain (sometimes followed by chronic arthritis) and/or more severe neurological problems. The third stage of Lyme disease may occur several months to a year or more following a bite from an infected tick.

## How is Lyme disease diagnosed and treated?

Although blood tests for Lyme disease may aid in diagnosis, **the diagnosis of Lyme disease should be based primarily on the symptoms experienced by the patient and on the doctor's examination of the patient.** The diagnosis of Lyme disease is most easily made in the early stage of the illness. Diagnosis of Lyme disease in the later stages is more difficult because of the time delays between tick bite and onset of symptoms and because the signs and symptoms may be confused with other diseases. Only about one-half of patients recall a tick bite. Therefore, information about routine exposure to tick infested areas, travel history, and results of blood testing may be useful in making the diagnosis of later stage Lyme disease.

Lyme disease is treatable with antibiotics. The best results are achieved when treatment is given during the early stage of the disease.

## Does Lyme disease pose an additional risk during pregnancy?

While there have been several reports of adverse outcomes due to Lyme disease during pregnancy, there have been no scientific studies conducted to date that document an increased risk. Pregnant women diagnosed with Lyme disease should be treated promptly with antibiotics. Women bitten by ticks during pregnancy should consult their doctor.

## How valuable are blood tests in the diagnosis of Lyme disease?

The blood tests that are routinely available through your physician measure the levels of antibodies produced by your immune system in response to the presence of Lyme disease spirochetes. The results of blood tests taken during the first stage of Lyme disease are often negative since it may take up to eight weeks following infection for there to be sufficient antibodies to turn the test positive. When signs and symptoms consistent with early Lyme disease are present, treatment should not be withheld while waiting for the results of a blood test.

A second problem with the blood test is that the antibody production may be reduced or eliminated if the patient is given correct antibiotic therapy. Finally, blood tests for Lyme disease are not standardized and there appears to be a significant amount of variability among laboratories. Therefore, the usefulness of blood testing for Lyme disease is currently limited in many instances.

## What are ticks and what is their role in Lyme disease transmission?

In New Jersey, Lyme disease spirochetes are transmitted principally through the bite of infected deer ticks (Ixodes dammini). Deer ticks feed on a wide variety of animals and normally acquire the infection during the immature stages of their life cycle (larva and nymph) after feeding on white-footed mice. In New Jersey, the lone star tick is known to occasionally transmit the infection, but is considered of secondary importance. The more familiar American dog tick, sometimes called the wood tick, is not known to be involved in Lyme disease transmission.

Of the three tick species mentioned, the deer tick is the smallest. The body of an adult deer tick is about the size of a sesame seed. The female deer tick is dark brown to black in color with a distinctive brick red abdomen. The male deer tick is smaller than the female and uniformly dark brown to black in color. Adult deer ticks are most active from mid-October to early December, but are also present from late March to early May and in the winter during periods of warming. Deer tick nymphs, which are active between May and August, are responsible for most of the cases in New Jersey.

Deer ticks are generally most abundant in wooded areas with a dense layer of shrub vegetation and some older fields with woody vegetation. Both larvae and nymphs are normally found in the leaf litter, while adults climb on shrub layer vegetation when seeking hosts. Lyme disease is seen most often in suburban environments and it is estimated that about 75% of all infections are acquired near one's residence.