Illnesses Caused by the Bite of a Tick

Ticks are small insects that feed on blood and can transmit a variety of illnesses when they attach themselves to humans and bite. Over several days the tick becomes engorged with blood and then detaches itself and falls off. The bite is painless and often goes unnoticed until a lump is felt.

The three most common tick-borne diseases are Lyme disease, Rocky Mountain spotted fever, and Ehrlichiosis.

Lyme disease
Lyme disease is caused by a bacterial infection transmitted by the deer tick (Ixodes scapularis). It may cause symptoms affecting the skin, nervous system, heart and/or joints of an individual. First diagnosed in the Lyme, Connecticut region in the 1970s, this bacterial infection has now been reported in 48 states, with most cases reported in the Northeastern U.S., forested Midwest and forested West Coast. The tick’s usual host is the white footed mouse. It spends its immature development (the nymphal stage, when it the size of a poppy seed)) on this rodent. This is the tick stage most likely to transmit Lyme disease. The adult tick, approximately the size of a sesame seed, prefers the white-tailed deer as a host although human transmission can occur in this stage as well.

People who spend time in grassy and weeded environments are at an increased risk of exposure. The chances of being bitten by a deer tick are greater during times of the year when ticks are most active. Deer ticks in the nymphal stage are active from mid-May to mid-August; adult ticks are most active in mid to late fall. Not all deer ticks are infected with the bacteria (called Borrelia burgdorferi). Person-to-person spread of Lyme disease does not occur.

The early stages of Lyme disease are usually marked by one or more of the following symptoms:

- Fatigue
- Chills and fever
- Headache
- Swollen lymph nodes
- A characteristic skin rash, called erythema migrans (EM), a red circular patch that appears in the majority of the cases, usually three days to one month after the bite of an infected tick at the site of the bite. The patch then expands, often to a large size. Sometimes many patches appear, varying in shape, depending on their location. Common sites are the thigh, groin, trunk, armpits and around the ear. The center of the rash may clear as it enlarges, resulting in a bull’s-eye appearance. The rash may be warm, but it usually is not painful. Not all rashes that occur at the site of a tick bite are due to Lyme disease. For example, sensitivity to tick saliva at the site of the bite can be confused with the rash of Lyme disease. Sensitivity to tick saliva usually occur within a few hours to a few days following the bite but usually do not expand and normally disappear within a few days.
- Nervous system abnormalities can include numbness, pain, Bell’s palsy (facial paralysis which usually occurs on one side) and meningitis (fever, stiff neck and severe headache).

Some symptoms and signs of Lyme disease may not appear until weeks, months or years after the tick bite.

- Arthritis is most likely to appear as brief bouts of mild pain and marked swelling, usually in one or more large joints, especially the knees, and without treatment may recur over many years.
- Irregularities of the heart rhythm.
- In some persons the rash never forms; in some the first and only sign of Lyme disease is arthritis, and in others nervous system problems are the only evidence of the disease.

Diagnosis of Lyme disease depends on:

- Exposure to ticks, especially in areas where Lyme disease is known to occur.
- Symptoms and signs as described above.
- The results of blood tests used to determine whether the patient has antibodies to Lyme disease bacteria. These tests are most useful in later stages of illness, but even then they may give inaccurate results.
Lyme disease is treated with antibiotics under the supervision of your child’s doctor. Several antibiotics are effective. Usually they are given by mouth but may be given intravenously in more severe cases. With prompt diagnosis and appropriate treatment, children usually recover rapidly and completely. Information available at present indicates that re-infection is possible.

For further information regarding Lyme disease or other insect-borne diseases call the Bureau of Communicable Disease Control at 518-474-4568

Rocky Mountain spotted fever (RMSF)

Although first described in the Rocky Mountains, this illness occurs in any wooded area, and, in fact, most cases occur in the Southeastern United States. The germ transmitted by the tick is a rickettsia, a special type of bacteria. This organism has a life cycle that involves an animal species as a host, and we are accidental victims. Symptoms usually begin about a week after a bite from a tick carrying this bacterium. The illness starts abruptly with fever, aches, chills, nausea and vomiting. Affected individuals look and feel seriously ill. Several days later the characteristic rash appears. Classically, the rash is first noticed around the wrists and hands and spreads to involve the whole body within hours. Although initially flat red bumps, the involved areas become bumpy as the disease progresses. More serious involvement includes the presence of tiny pinpoint hemorrhages called petechiae which characteristically involve the palms and soles.

This very serious disease can last weeks. Involvement of the nervous system, heart, lungs and other vital organs is frequent. Shock and death can result. Laboratory confirmation is difficult early in the illness, so a history of tick bite in an area that reports RMSF followed by an illness resembling this disease is crucial for early diagnosis. Fortunately, treatment is available and, if given early enough in the illness, is quite effective.

Ehrlichiosis

Ehrlichiosis exists in two forms in humans.

- Human Monocytic Ehrlichiosis (HME) was discovered in the late 1980s. The germs causing this illness are related to rickettsia. They only live in animal cells.
  
  Symptoms: HME infection is usually symptomatic. The most common symptoms, which occur one to three weeks after the tick bite, are fever, headache, body aches, vomiting and lethargy, similar to a viral flu-like, but without any runny nose or cough, infection. A variable appearing rash occurs in 30-50% of infections about one week after symptoms begin. HME is usually much milder than RMSF and lasts one to two weeks before disappearing. Occasionally much more serious illness, including life-threatening problems, occurs. Laboratory diagnosis and specific antibiotic therapy are available.

- Human Granulocytic Ehrlichiosis (HGE) is a less common but more severe form, first described in 1994.
  
  Symptoms: The illness is similar to HME with general symptoms of fever, headache and body ache a week or so following a tick bite. However, rash occurs less commonly (about 10%), and the likelihood of severe and life threatening illness is greater if treatment is delayed or not given. Laboratory confirmation is available, and a history of a tick bite followed by illness is crucial to suspecting this Ehrlichiosis.

Babesiosis

- Babesiosis is not usually seen in healthy children over three months of age. Sometimes, however, children without spleens will contract this disease.

- The symptoms include unexplained fevers with anemia and possibly jaundice.

- There is treatment available.

Prevention of tick-borne illnesses

- Removing leaves and clearing brush and tall grass around houses and at the edges of gardens may reduce the numbers of immature ticks. This is particularly important in the eastern United States where most transmission of Lyme disease is thought to occur near the home.
A relationship has been observed between the abundance of deer and the abundance of deer ticks in the eastern United States. Consequently, removing vegetation that attracts deer and constructing physical barriers may help discourage deer and attached ticks from coming near the house.

Applying acaricides (chemicals that are toxic to ticks) to gardens, lawns and the edge of woodlands near homes is being done in some areas, but questions remain regarding its effectiveness and environmental safety. Application to residential properties should be supervised by a licensed professional pest control expert. Control of rodents around the home may be helpful.

Avoid tick-infested areas, especially in May, June and July. (Many local health departments and park or extension services have information on the local distribution of ticks.)

Wear light-colored clothing so that ticks can be spotted more easily.

Wear long pants and tuck the pant legs into your socks or boots. Wear a long-sleeved shirt and tuck it into your pants. Use a hat for added protection.

Tape the area where pants and socks meet so that ticks cannot crawl under clothing.

Spray insect repellent containing DEET (products should not contain more than 30% DEET) on clothes or the skin, or treat clothes (especially pants, socks and shoes) with permethrin which kills ticks on contact. Use repellents sparingly and with care as they may cause adverse reactions in some individuals. It is best to apply them to clothing and not on the skin. See “About Repellents” below for further information.

Walk in the center of trails to avoid overhanging grass and brush.

After being outdoors, remove your clothing and wash and dry it at a high temperature.

Inspect your child carefully and remove any attached ticks. For tick removal, grasp the tick with fine tweezers as close to the skin surface as possible, pull straight up with a slow, steady force and avoid crushing the tick or slipping off the body. Ultimately you do not want to force any material from the tick into your skin. Clean the area of tick attachment with disinfectant, and wash your hands. If removal occurs within 24 hours of attachment, the risk of tick-borne infection is substantially reduced. Do not attempt to remove ticks using petroleum jelly, lit cigarettes or other home remedies because these methods may actually increase the chance of contracting a tick-borne disease. Make note of the date and location of the bite for future reference.

Treat pet dogs and cats with an insecticide, such as Frontline or Advantix, that kills ticks when they bite the pet. Do not allow pets in bed or on the furniture.