

Human granulocytic anaplasmosis (HGA)

Symptoms

Chills, high fever, headache (often severe), muscle aches and fatigue. Nausea, vomiting, diarrhea, cough and joint pain have also been reported. In fewer than 20% of cases, a rash may appear about one week after the onset of illness. Symptoms typically appear 7 - 11 days after being bitten by an infected tick, though they may emerge up to 21 days later. Anaplasmosis can be fatal.

Treatment

Doxycycline and other tetracycline antibiotics are used to treat HGA when it is diagnosed early. HGA does not respond to amoxicillin.

Babesiosis

Elderly individuals or those with weakened immune systems are most susceptible.

Symptoms

Most cases are asymptomatic; however, symptoms can include malaise, anorexia, fatigue, fever, drenching sweats, muscle pain, and headache. Hemolytic anemia, kidney failure, and dangerously low blood pressure are also possible. Babesiosis can be fatal.

Treatment

Standardized treatments have not been developed. Drugs used to treat malaria have been effective in some cases.

Some Basic Tick Facts

- The blacklegged tick is not a newly discovered species, it is a new name for what was previously called the deer tick.
- Tick-borne diseases are increasing across the United States. Diseases carried by the blacklegged ticks in Dutchess County are transmitted by similar tick species in different parts of the country.



Institute of Ecosystem Studies research and education staff are not trained in public health matters. We cannot assist with tick identification, diagnosis or questions concerning individual risk. Please direct questions regarding ticks and tick-borne diseases to your physician or to your local Cooperative Extension Office, County Health Department or State Health Department.



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For more information about the ecology of Lyme disease please visit our website at http://www.ecostudies.org/IES_lyme_disease.html



TICK-BORNE DISEASES: What Every IES Visitor Needs to Know

If you spend time outdoors you need to be aware of the dangers posed by Lyme disease and other tick-borne diseases. Multiple tick-borne diseases are transmitted to humans by infected blacklegged ticks. Because blacklegged ticks are tiny, much smaller than an American dog tick or lone star tick, special precautions must be taken to avoid bites.

Everyone using the trails, grounds, and gardens at the Institute of Ecosystem Studies (IES) should be aware that blacklegged ticks, formerly called deer ticks, are abundant on the site. They live in forests, brush, meadows, lawns, and gardens. Any time the temperature is above 0° C (32° F), ticks can be active.



During the larval stage, blacklegged ticks are about the size of the period at the end of this sentence—barely visible. Larvae molt into nymphs, which are about this size •. Most active from May to August, nymphs molt into adults in late summer. Adults are approximately 2 millimeters (0.08 inches).

By taking precautions you can avoid tick bites!

Blacklegged ticks can carry organisms that cause the following diseases:

Lyme disease, caused by the spirochete bacterium, *Borrelia burgdorferi*, was identified in Lyme, Connecticut in 1975. The disease has quickly spread, with cases now reported in all U.S. states except Alaska. It is one of the fastest growing infectious diseases in New York State. Since the mid-1980's, scientists at IES have been researching the ecology of Lyme disease in Dutchess County. Research has revealed intriguing links between the blacklegged tick, its principal hosts (white-tailed deer and white-footed mouse) and acorn production in oak forests.

Human granulocytic anaplasmosis (HGA), formerly called human granulocytic ehrlichiosis (HGE), is a tick-borne disease caused by the bacterium *Anaplasma phagocytophilum*. Discovered in 1994, this disease seems to be rapidly emerging and expanding in Dutchess County and throughout the northeastern U.S. The blacklegged tick is responsible for transmitting HGA. IES research indicates that in Dutchess County up to 42% of ticks (from a sample of 200) carry this disease-causing bacterium, and up to 28% of ticks carry both Lyme disease and HGA bacteria. Therefore, a single tick bite can cause a patient to be exposed to both diseases.

Human babesiosis, caused by a protozoan, is also transmitted by the blacklegged tick. Babesiosis appears to be widespread in New York, New England, New Jersey, and the upper midwest. Babesiosis might also be emerging in Dutchess County.

Tick paralysis is transmitted by dog ticks in the eastern U.S.; in other parts of the country it is spread by different tick species. This rare illness is caused by a neurotoxin present in the tick's salivary glands. While adults can be affected, victims are more frequently children under age seven. Domestic animals are also susceptible. Symptoms subside almost immediately after the tick is removed.

Rocky Mountain spotted fever is transmitted by American dog ticks and other tick species. Fewer than 50 cases are reported in New York State each year.

Human monocytic ehrlichiosis is transmitted by the bite of the lone star tick, which appears to be expanding its range into the mid-Atlantic states and the northeast.

Please be aware - you can have more than one disease at the same time!

There have been instances of individuals coming down with multiple tick-borne diseases. This can occur when an individual is bitten by a single tick that is carrying multiple pathogens, or by an individual being bitten by several different ticks. While the diseases can have similar symptoms, effective treatment can require separate medication.

Basic precautions can reduce your chances of contracting a tick-borne disease.

- **When outdoors, wear pale colored fabrics.** Ticks are easier to see on light colored clothing. Wear long pants and sleeves to minimize exposed skin; tuck pants into socks to prevent ticks from crawling up your shoes and onto your bare legs. Wear closed shoes.
- **Wear insect repellent.** Repellent with no more than 33% DEET (N N-diethyl meta toluamide) may provide some protection. Spray repellent on your clothing, especially on your pant legs from knees to cuffs, some people report irritation from DEET applied directly to skin.
- **Going for a hike? Stay on the trails.** Ticks are more abundant in brush and leaf litter.
- **Ticks usually crawl upward** and are commonly found on the scalp, behind knees, on the neck, in armpits, and in the groin area. They also seek areas, such as a waistband, where clothing is tight.
- **Remove attached ticks carefully using fine tweezers.** Grasp ticks by the head (not the body) and gently pull them straight out. Avoid crushing the body or causing the tiny mouthparts to break off. Wash the wound site, apply antiseptic and monitor the site for up to two weeks to detect signs of a rash. You may want to save the tick for later identification by your physician, should disease symptoms appear.
- **Do not wait to remove ticks.** Disease transmission can begin after the tick has begun to draw blood, so the earlier an attached tick is removed the better your chances are of avoiding disease.

Symptoms & Treatment of Diseases Transmitted by the Blacklegged Tick



Lyme disease

Symptoms

A bull's eye rash. Many, but not all, people who contract Lyme disease exhibit a circular red rash at the site of the bite. The rash can appear roughly 3-30 days after the bite. Typically starting as a small red spot, the rash can expand to a diameter of 2.5 - 46 centimeters (1 - 18 inches). The rash may have a bright red border and a hard, often pale central area that is warm to the touch. Similar rashes may appear elsewhere on the body.

Early symptoms may resemble the flu: fatigue, headache, fever, chills, nausea, vomiting, diarrhea, sore throat, dry cough, stiff neck, chest, ear, back pains, pain in muscles and joints, recurrent joint swelling, swollen lymph glands or spleen, dizziness, and sun sensitivity.

Later symptoms may include neurological problems such as Bell's palsy, heart problems, and joint problems that can be confused with arthritis. BUT ... in some patients, the first and only indication of Lyme disease is arthritis, while in others it is neurological problems.

Treatment

Antibiotics. Treatment with an antibiotic — usually (but not limited to) amoxicillin, a penicillin derivative; doxycycline, a tetracycline; or Cefitin® — is most effective in the early stages, but later symptoms are also treatable.