

Lyme and other Tickborne Diseases

To: Vermont Healthcare Providers, Hospitals, and Ambulatory Care Centers
From: Harry Chen, MD, Commissioner of Health

– Please Distribute Widely –

Lyme Disease

Vermont has experienced a significant increase in Lyme disease cases in recent years. The number of confirmed and probable human cases reported to the Vermont Department of Health climbed from 105 cases in 2006 to 623 cases in 2011.

Overall, the 2011 incidence rate for confirmed cases was 76 per 100,000 people. In 2010, Vermont had the fifth highest incidence rate in the country.

Cases have been reported from all counties in Vermont, but Lyme disease is not distributed evenly in the state. Addison, Rutland, Windham and Windsor Counties had rates of more than 100 cases per 100,000 people. The incidence rate in Bennington County was over 200 cases per 100,000 people.

Risk of illness is highest in late spring and summer when the nymphs are most active. Nymphs are responsible for most of the transmission of Lyme disease because they are small and often go unnoticed. The tick must attach and feed for many hours before the bacteria reach the salivary glands and can be transmitted to a person. Ticks removed in less than 36 hours after they attach are unlikely to transmit Lyme disease.

Diagnosis –

- Diagnosis of Lyme disease is based on signs and symptoms. Lab testing can support the clinical diagnosis.
- A history of a tick bite is not necessary for diagnosis. Many people with Lyme disease do not recall being bitten by a tick.
- An EM rash in a person who has recently been exposed to tick habitat in an endemic area is pathognomonic for Lyme disease. Laboratory evidence of infection is not necessary to confirm the diagnosis.

Laboratory testing – CDC recommends two-tier testing:

1. Screening test: IFA or ELISA. Samples positive or equivocal on this test are then subject to more specific confirmatory testing.
2. Confirmatory tests: IgM and IgG Western blot

Skipping the screening test is not recommended and can lead to false positive results. Serology is often negative during the first two to three weeks after infection. Most people with Lyme disease will seroconvert within four weeks and have detectable IgG by Western blot. Most people with neurologic symptoms, arthritis, or cardiac involvement are IgG positive by Western blot.

Early treatment with appropriate antibiotics may prevent seroconversion. IgG, and even IgM, can persist for months or years after infection. There is no test that confirms a cure.

The Health Department Laboratory does not perform these tests.

Prophylaxis after a tick bite –

Other than removing the tick promptly, in most cases no treatment is needed after a tick bite unless symptoms develop. Routine use of antibiotics or serologic testing is not recommended for asymptomatic people. However, a single 200 mg dose of doxycycline may be offered to adults and to children 8 years or older (4 mg/kg, up to a maximum of 200 mg) if all of the following conditions have been met:

- The tick can be identified as a nymphal or adult deer tick (*Ixodes scapularis*), and it has likely been attached for more than 36 hours based on the degree of engorgement of the tick or the certainty of the time of exposure.
- Prophylaxis can be taken within 72 hours of the time the tick was removed.
- The local rate of infection of deer ticks with *B. burgdorferi* is greater or equal to 20 percent.

Note: Ecologic information on tick infection rates in Vermont is lacking. However, 13 of Vermont's 14 counties meet the CDC's 2008 definition for endemic Lyme disease. The Lyme disease status of Essex County is largely unknown. In the 13 counties where Lyme disease is endemic, healthcare providers could assume that at least 20 percent of deer ticks are infected.

Doxycycline is not contraindicated. There is no data to support using a short prophylactic course of any other antibiotics if doxycycline cannot be given.

Testing the tick is not recommended because of issues with sensitivity, specificity and timeliness of testing.

Treatment

Route	Drug	Dosage – adults	Dosage - children
Oral	Doxycycline (preferred)	100 mg BID	4 mg/kg/day in 2 divide doses (maximum, 100 mg/dose). Only for children >= 8 yrs
	Amoxicillin	500 mg TID	50 mg/kg/day in 3 divided doses (maximum, 500 mg/dose)
	Cefuroxime axetil	500 mg BID	30 mg/kg/day in 2 divided doses (maximum, 500 mg/dose)
Parenteral	Ceftriaxone (preferred)	2 g IV qd	Ceftriaxone 50 – 75 mg/kg IV qd (maximum, 2 g)
	Cefotaxime	2 g IV q8h	150-200 mg/kg/day IV in 3-4 divided doses (maximum, 6 g/day)
	Penicillin G	18-24 million U/day IV divided q4h	200,000-400,000 U/kg/day divided q4h (maximum, 18-24 million U/day)

Choice of drug, route of administration and duration of treatment depend on the symptoms and stage of Lyme disease. Early Lyme can be treated for 10 to 21 days (doxycycline for 10 to 21 days, amoxicillin or cefuroxime axetil for 14 to 21 days), while late disease may require up to four weeks of treatment.

Patients treated early and appropriately usually recover completely. A few patients may have recurrent or persistent symptoms and may benefit from an additional four-week course of antibiotics.

Longer courses of antibiotics have not been proven to be effective and are not recommended.

For **detailed information about treatment** see the Infectious Disease Society of America (IDSA) Guidelines at <http://www.journals.uchicago.edu/doi/full/10.1086/508667>.

Other Diseases Transmitted by Deer Ticks

Co-infections are possible. Consider them in patients with severe symptoms or in those who don't respond to treatment.

Babesiosis: Indigenous cases have not yet been reported in Vermont.

Organism:

Babesia microti (protozoan parasite that infects erythrocytes)

Transmission:

Tick bite usually. Blood transfusion is an emerging concern.

Incubation:

Usually one to four weeks, but can be longer; can be many months after a blood transfusion.

Symptoms:

Asymptomatic; non-specific flu-like symptoms; or hemolytic anemia.

More severe in elderly, immunocompromised, asplenic people, or those with underlying health conditions.

Diagnostic tests:

- Thin and thick blood smear
- PCR
- four-fold rise in antibody detection between acute and convalescent serums samples (single IgM not reliable)

Treatment¹:

- Adults: Atovaquone 750 mg PO bid + Azithromycin 500-1000 mg on day 1 then 250 mg PO qd
- Children: Atovaquone 20 mg/kg PO bid (max 750 mg/ dose) + azithromycin 10 mg/kg PO on day 1 (max 500 mg/d) then 5 mg/kg PO qd (max 250 mg/dose)

¹ For more information on treatment, see the IDSA guidelines at <http://www.journals.uchicago.edu/doi/full/10.1086/508667>.

Human granulocytic anaplasmosis (HGA)

(previously referred to as human granulocytic ehrlichiosis or HGE)

Indigenous cases have been reported in Vermont.

Organism:

Anaplasma phagocytophilum (previously referred to as *Ehrlichia phagocytophilum*)

Transmission:

Tick bite

Symptoms:

Acute, febrile illness with headache, chills, malaise, myalgia, arthralgia, nausea, and vomiting; rash uncommon. Recovery is common but illness can occasionally be severe.

Diagnostic tests:

- PCR
- Four-fold rise in antibody titer in acute and convalescent serum samples - may cross-react with ehrlichia species
- Microscopy: morulae in granulocytes (poor sensitivity)

Treatment¹:

Adults:

Doxycycline 100 mg PO bid for 10 days

Children 8 years and older:

Doxycycline 2 mg/kg PO bid for 10 days (max dose 100mg)

Children younger than 8 years

Severe disease: Doxycycline (dose as above) for four to five days, monitor for resolution of symptoms; if co-infected with Lyme disease, complete a 14 day course with Amoxicillin OR Cefuroxime axetil (doses as above)

Mild disease: Rifampin 10 mg/kg PO bid (max 300 mg/dose) for seven to 10 days

For more information –

- about Lyme disease: <http://www.cdc.gov/lyme/healthcare/clinicians.html>
- about ticks and tickborne diseases, see <http://www.cdc.gov/ticks/index.html>
- about preventing tick bites: <http://healthvermont.gov/prevent/lyme/personal.aspx>

For questions related to this advisory – call 802-863-7240 (800-640-4374 in Vermont).