VERMONT
DEPARTMENT OF HEALTH

Health Advisory
June 20, 2014

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 890 cases in 2014. Overall, the 2014 incidence rate for confirmed cases was 108 per 100,000 people.

Cases have been reported from all counties in Vermont, but Lyme disease is not distributed evenly in the state. Most of the cases are reported in residents from the four most southern counties. However, reports of illness have been increasing in residents on the western side of the state from Addison through Franklin Counties.

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 in patients with an EM rash, and it will often be negative at this stage of infection.

Laboratory testing – The Centers for Disease Control & Prevention (CDC) and the Infectious Disease Society of America (IDSA) recommend 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 four weeks after infection when the sensitivity of the screening test is < 60 percent. Most people with Lyme disease will seroconvert within four weeks, and the sensitivity of the screening test approaches 100 percent. In addition, after four weeks most have detectable IgG by Western blot. Most people with late neurologic symptoms, arthritis or cardiac involvement are IgG positive by Western blot.

Treatment of early disease 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.

Prophylaxis After a Tick Bite
People should be instructed to remove embedded ticks as soon as they are found. For information on how to safely remove ticks see http://healthvermont.gov/prevent/lyme/personal.aspx.

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 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, health care 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 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. Reinfection is also possible and may be the cause of recurrent symptoms. Longer courses of antibiotics have not been proven to be effective and are not recommended.

New Law

Health care providers who consider using courses of treatment lasting more than 28 days should be aware of Act 134 of the 2014 **l**egislative session. The law mandates that the Board of Medical Practice and other licensing authorities issue a policy on Lyme disease treatment. The law also has certain requirements:

- **documentation** in the record of the basis for a diagnosis of Lyme disease or other tick-borne illness and the treatment ordered
- **providing information** to patients about Lyme disease tests, the meaning of diagnostic Lyme disease test results, and limitations of those results
- **written informed consen**t from the patient before administration of long-term treatment (considered to be over 28 days)

The law also directs the licensing authorities to advise health care providers that they will not be disciplined solely for using care recognized under guidelines of the Centers for Disease Control & Prevention, the Infectious Diseases Society of America, or the International Lyme and Associated Diseases Society when a patient is diagnosed with Lyme disease or other tick-borne illness. The Board of Medical Practice policy will be available on the Board's website when the law goes into effect: http://healthvermont.gov/hc/med_board/bmp.aspx. Advanced Practice Registered Nurses and Doctors of Osteopathy can find their licensing authority's policy on the website of the Office of Professional Regulation at: https://www.sec.state.vt.us/professional-regulation.aspx.

Report Lyme disease: Lyme disease is a reportable disease in Vermont. Clinically diagnosed cases should be reported by calling 802-863-7240 or by downloading and faxing the case report form available at http://healthvermont.gov/prevent/lyme/provider.aspx

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Other diseases transmitted by deer ticks (co-infections are possible)

Babesiosis: A few cases are reported each year in Vermont. All but one reported case has had travel history to a known endemic area outside of 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)

Treatment – for at least seven to 10 days:

- 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)

Human granulocytic anaplasmosis (HGA):
(previously referred to as human granulocytic ehrlichiosis or HGE)

Indigenous cases have been reported in Vermont. Most cases have been reported in Bennington and Rutland Counties.

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

Transmission**:**
Tick bite, rare reports of blood transfusion

Symptoms:
Asymptomatic infection is common. Symptoms include 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 serums samples - may cross-react with ehrlichia species
- Microscopy: morulae in granulocytes (poor sensitivity)

Treatment:
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 **detailed information about treatment** of these three diseases see the Infectious Diseases Society of America guidelines at http://www.journals.uchicago.edu/doi/full/10.1086/508667.

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).