



# New Hampshire Health Alert Network

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**Status:** Actual  
**Message Type:** Alert  
**Severity:** Moderate  
**Sensitive:** Not Sensitive  
**Message Identifier:** NH-HAN #20130605 Lyme Disease and Other Tick-Borne Diseases  
**Delivery Time:** 12 hours  
**Acknowledgement:** No  
**Originating Agency:** NH Department of Health and Human Services, Division of Public Health Services

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**DATE:** June 5, 2013

**TIME:** 1500 EDT

**TO:** Physicians, Physician Assistants, Nurses, Infection Control Practitioners, Infectious Disease Specialists, Hospital Emergency Departments, Hospital CEOs, Laboratory Response Network, Manchester Health Department, Nashua Health Department, NHHA, NH School Nurses and Administrators, Community Health Centers, EWIDS, DHHS Outbreak Team, DPHS Investigation Team, Public Health Network Coordinators, and DPHS Management Team, Zoonotic Alert Team, Health Officers, Deputy Health Officers, MRC, NH Schools, EWIDS

**FROM:** Jodie Dionne-Odom, MD, Deputy State Epidemiologist

**SUBJECT:** Lyme Disease and Other Tick-Borne Diseases

**NH Department of Health and Human Services (NH DHHS) recommends:**

- Awareness that the incidence rate of Lyme disease in NH in 2011 was the third highest in the nation. In fact, since 2006, NH's has been in the nation's top five states for Lyme disease incidence rate. In most NH counties, over 50% of deer ticks sampled from 2007-2010 were infected with *Borrelia burgdorferi*, the bacteria that causes Lyme disease.
- Prevention of disease with frequent tick checks after possible outdoors exposure since removal of a deer tick within 24-36 hours of attachment can prevent disease transmission.
- Recognition that diagnosis of early Lyme disease (erythema migrans) should be based solely on clinical suspicion since diagnostic serologies (including IgM) may not yet be positive.
- Report all tick-borne diseases, confirmed or suspected, to the Division of Public Health Services (DPHS) within 72 hours at 603-271-4496 (after hours 1-800-852-3345, x5300).

**Background**

Lyme disease (*Borrelia burgdorferi*), babesiosis (*Babesia microti*), and anaplasmosis (*Anaplasma phagocytophilum*) are transmitted by the bite of the deer tick (*Ixodes scapularis*), also known as the black-legged tick. Although ticks have a 2 year life cycle, the greatest risk for human acquisition of tick borne diseases is between May and August when the aggressive nymph stage of the deer tick is active. Nymphs are very small (< 2mm) and easy to miss unless they become attached and engorged with blood.

**Epidemiology**

Since the peak of 1,598 cases of Lyme disease reported in NH in 2008, we have seen a plateau in the number of reported cases. In 2012, 1,456 cases (confirmed and probable) were reported, with the highest disease rates occurring in Rockingham, Strafford and Hillsborough counties, respectively. Although NH ticks can be coinfecting with organisms that also cause babesiosis or

anaplasmosis, these reportable diseases are infrequently diagnosed. In 2012, 52 cases of anaplasmosis and 19 cases of babesiosis were reported. Compared to national data from 2011 (the latest year for which it is available), CDC reports that NH has the third highest incidence rate of Lyme disease in the US (case rate of 67.3 per 100,000 population). Only Delaware and Vermont have higher rates of reported disease.

Lyme disease data and maps by county and town from 2006-2012 are available at <http://www.dhhs.nh.gov/dphs/cdcs/lyme/publications.htm>

The risk of infection for any individual depends on their outdoor activities and the abundance of infected ticks in the area of exposure. Based on tick surveillance performed during 2007-2010, over 50% of ticks tested in NH counties were infected with the bacteria causing Lyme disease with the exception of slightly lower rates (40%) in Belknap and Carroll, and very low numbers of ticks collected in Coos County, precluding data analysis. Rates of tick infection or coinfection with *B. microti* and *A. phagocytophilum* are not yet available for these tick batches but will be tested by the NH Public Health Laboratories once methods have been validated.

### Reporting

When filling out the case report form, remember to document the profession of the individual, in order to help us track possible occupational exposures to tick borne diseases. It is also important to record the date of symptom onset since we use this information for disease classification. A link to the report form is below:

<http://www.dhhs.nh.gov/dphs/cdcs/documents/lymediseasereport.pdf>

### Clinical Presentation and Treatment

Following any tick bite, there may be local redness or a small papule at the site due to an inflammatory response to the tick saliva. This reaction is small, lasting only 1-2 days and it does not denote erythema migrans nor warrant treatment. Based on the high prevalence of Lyme disease in NH, providers can consider prescribing single dose doxycycline prophylaxis (200 mg po once) for patients who meet all of the following four criteria (see attached sheet for additional information about prophylaxis):

1. **The attached tick is a black-legged tick (deer tick, *Ixodes scapularis*).** Tick identification is most accurately performed by an individual trained in this discipline. However, black-legged ticks are very common in southeastern and central New Hampshire and there are many images available online to help in general identification.
2. **The tick has been attached for at least 24-36 hours.** This determination is most reliably made by an entomologist, but simply asking the patient about outdoor activity in the time before the tick bite was noticed can often lead to an accurate estimate of attachment time. Unengorged (unfed) black-legged ticks are typically flat. Any deviation from this “flatness,” which is often accompanied by a change in color from brick red to a gray or brown, is an indication that the tick has been feeding.
3. **Prophylaxis can be started within 72 hours of the time that the tick was removed.** This time limit is suggested because of an absence of data on the efficacy of prophylaxis for tick bites following longer time intervals after tick removal.
4. **Doxycycline prophylaxis.** Doxycycline is contraindicated in pregnant women and children less than 8 years old. The other common antibiotic treatment for Lyme disease, amoxicillin, should NOT be used for prophylaxis because of an absence of data on an

effective short-course regimen for prophylaxis and the likely need for a multiday regimen and its associated adverse effects.

A single dose of doxycycline (200 mg) may be offered to adult patients and to children  $\geq 8$  years of age (4 mg/kg up to a maximum dose of 200 mg) if all the above criteria are met. . Note that single-dose doxycycline is not 100% effective for prevention of Lyme disease; consequently, patients who receive this therapy should monitor themselves for the development of Lyme disease as well as other tick-borne diseases including anaplasmosis and babesiosis. It is also a reasonable course of action to ask the patient to monitor the bite site and call back for further medical evaluation if a rash develops or any systemic symptoms (see attached form with treatment guidelines). Tick testing for tick borne infectious agents is available in certain labs but is not recommended for guiding individual prophylaxis or treatment decisions.

**A) Lyme Disease** is caused by the bacteria *Borrelia burgdorferi* and the incubation period is 3-30 days after tick exposure. In approximately 60-80% of patients, illness first manifests with a red rash that expands slowly, often with central clearing (erythema migrans (EM) or bulls eye rash). Early systemic manifestations may include malaise, fever, headache, stiff neck, muscle and joint pains, and lymphadenopathy. At this stage serologic testing is often negative and treatment should be based on clinical diagnosis and would generally lead to full and rapid recovery. Individuals who are not treated at this stage of infection may develop a variety of symptoms over days to weeks including aseptic meningitis, cranial neuritis, and cardiac abnormalities such as heart block or myopericarditis. Weeks to years after onset, a patient may develop chronic or intermittent episodes of arthritis or neurological symptoms.

Within 4 weeks of disease transmission the production of specific antibodies is high enough to be detected and the clinical diagnosis should be supported by two-stage serologic testing using FDA approved methods. ELISA is the screening test, confirmed by Western Blot if positive or equivocal. A patient is considered to have positive Lyme serology if 2 of 3 IgM bands are reactive (24, 39, 41 kDa) OR if 5 of 10 IgG bands are reactive (18, 21, 28, 30, 39, 41, 45, 58, 66, 93 kDa). An isolated positive IgM (without positive IgG) in a patient with a known tick exposure more than 8 weeks prior is suspicious for a false positive test. The diagnosis of Lyme disease is based on appropriate clinical presentation and possibility of exposure to the tick vector. Laboratory testing should be used to support clinical suspicion of disease and case definitions used for public health surveillance are not intended to replace the need for clinical decision making on an individual basis. Only laboratories with validated and approved testing methods for Lyme ELISA and confirmatory Western blot should be used for diagnosis of disease.

The Infectious Disease Society of America (IDSA) updated guidelines for tick-borne diseases in 2006. These were confirmed by an independent panel, with recommendations published in 2010. A summary of treatment recommendations based on these guidelines is attached and the link is below:

<http://cid.oxfordjournals.org/content/43/9/1089.full.pdf+html>

**B) Anaplasmosis** [Human granulocytic anaplasmosis (HGA), previously human granulocytic ehrlichiosis] is an infection of neutrophils caused by the rickettsial bacteria *Anaplasma phagocytophilum*. Clinical manifestations are nonspecific and may include fever, chills, headache, and myalgia. Some people, particularly elderly persons or those with weakened immune systems, may have a more severe illness. Symptoms typically occur 5-21 days following the bite of an infected tick. People can be successfully treated

with a course of doxycycline which is first line therapy for anaplasmosis. (See attached treatment guideline table).

**C) Babesiosis** is caused by the intraerythrocytic protozoa *Babesia microti*. Although most people infected with Babesia are asymptomatic, some people experience a viral infection-like illness with fever, chills, sweats, myalgia, arthralgias, anorexia, nausea, vomiting, or fatigue. Severe and fatal cases most often occur in patients who are older or have a weakened immune system, particularly those without a spleen. Symptoms typically occur within one to four weeks following the bite of an infected tick and there is not thought to be a chronic phase of illness (although rare cases of relapsing disease have been reported). Babesiosis can be successfully treated with antimicrobial therapy (see attached treatment guideline table).

**Prevention: Educate Your Patients**

- Avoid tick-infested areas when possible. Staying on the path is safer than hiking in the brush.
- Wear light-colored clothing that covers arms and legs so ticks can be more easily seen.
- Tuck pants into socks before going into wooded or grassy areas.
- Apply tick repellent (20% DEET) to exposed skin. Other repellent options may be found here: <http://www.epa.gov/pesticides/insect/choose.htm>
- Outdoor workers in NH are at particular risk of tick borne diseases and they should be reminded about methods of prevention.
- After time spent outdoors search the body for ticks, especially warm places like the behind the knees, the groin and the back and neck (this may require some help).
- Remove ticks promptly. (Tick removal within 24-36 hours of attachment can prevent disease).
- Monitor for signs and symptoms of tick-borne diseases for 30 days after the tick bite and patients should call their provider if these develop.

**For any questions regarding the contents of this message, please contact  
NH DHHS Bureau of Infectious Disease Control at 603-271-4496.  
For after hours / toll free, call 1-800-852-3345, ext. 4496.**

**Attachments:** 1. Tick-borne diseases treatment table  
2. Lyme prophylaxis guidelines

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## DEFINITION OF TERMS AND ALERTING VOCABULARY

### Message Type

Alert: Original alert  
Update: Prior alert has been updated and superseded  
Cancel: Prior alert has been cancelled  
Error: Prior alert has been retracted

### Status

Actual: Refers to a live event  
Exercise: Designated recipients must respond to the communication or alert  
Test: Related to a technical and/or system test

### Severity

Extreme: Extraordinary threat to life or property  
Severe: Significant threat to life or property  
Moderate: Possible threat to life or property  
Minor: Minimal threat to life or property  
Unknown: Unknown threat to life or property

### Sensitive

Sensitive: Indicates the alert contains sensitive content  
Not Sensitive: Indicates non-sensitive content

### Message Identifier

A unique alert identifier that is generated upon alert activation

### Delivery Time

Indicates the time frame for the delivery of the alert

### Acknowledgement

Indicates whether an acknowledgement on the part of the recipient is required to confirm that the alert was received, and the time frame in which a response is required.

### Originating Agency

A guaranteed unique identifier for the agency originating the alert.

### Alerting Program

The program sending the alert or engaging in alerts and communications using PHIN Communication and Alerting (PCA) as a vehicle for their delivery.

**You have received this message based upon the information contained within our emergency notification database.**

**If you have a different or additional e-mail or fax address that you would prefer to be used, please contact:**

Denise M. Krol, MS  
NH HAN Coordinator  
[Denise.Krol@dhhs.state.nh.us](mailto:Denise.Krol@dhhs.state.nh.us)

**Business Hours: 8 AM – 4 PM**  
Tel: 603-271-4596  
Fax: 603-271-0545



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29 HAZEN DRIVE, CONCORD, NH 03301-6527  
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Fax: 603-271-0545 TDD Access: 1-800-735-2964



**NH Division of Public Health Services (DPHS): Treatment Recommendations for Tick-borne Diseases  
Infectious Disease Society of America Guidelines**

Disease	Treatment Regimens for Adults	Treatment Regimens for Children
Lyme disease	Oral options: Doxycycline 100 mg PO bid*	Doxycycline 2 mg/kg PO bid (max 100 mg/dose) <b>only if 8 years and older</b>
	Alternative: Amoxicillin 500 mg PO tid	Amoxicillin 50 mg/kg/d in 3 divided doses (max 500 mg/dose)
	Alternative: Cefuroxime axetil 500 mg PO bid	Cefuroxime axetil 30 mg/kg/d in 2 divided doses (max 500 mg/dose)
	Parenteral options: Ceftriaxone 2g IV qd	Ceftriaxone 50-75 mg/kg IV qd (max 2g) – preferred
	Alternative: Cefotaxime 2g IV q8h	Cefotaxime 150-200 mg/kg/d IV in 3-4 divided doses (max 6g/d)
	Alternative: Penicillin G 3-4 MU IV q4h	Penicillin G 200-400K U/kg/d divided every 4h (max 18-24MU/d)
	<b>Choice of regimen, route and length of treatment for Lyme depends on symptoms and stage of disease.</b>	
Anaplasmosis	Doxycycline 100 mg PO bid for 10 days*	<b>8 years and older:</b> Doxycycline 2 mg/kg PO bid for 10 days (max dose 100mg)
	Alternatives: <u>Severe OR coinfecting with Lyme:</u> Amoxicillin / cefuroxime axetil (dose as above for Lyme disease)  <u>No coinfection and mild disease:</u> Rifampin 300 mg PO bid for 7-10 days	<b>Under 8 years old:</b> <u>Severe disease:</u> Doxycycline (dose as above) for 4-5 days then complete a 14 days course with Amoxicillin OR Cefuroxime axetil (doses as above) <u>Mild disease:</u> Rifampin 10 mg/kg PO bid (max 300 mg/dose) for 7-10 days
Babesiosis	Atovaquone 750 mg PO bid + Azithromycin 500-1000 mg on day 1 then 250 mg PO qd  <u>Severe disease:</u> Clindamycin 300-600 mg IV q6h (or 600 mg PO q8h) + Quinine 650 mg PO q 6-8h. Consider exchange transfusion.	Atovaquone 20 mg/kg PO bid (max 750 mg/ dose) + azithromycin 10 mg/kg/d on day 1 (max 500 mg/d) then 5 mg/kg/d (max 250 mg/d)  <u>Severe disease:</u> Clindamycin 7-10 mg/kg q6-8h PO or IV (max 600 mg/dose) +quinine 8 mg/kg PO q8h (max 650 mg/dose). Consider exchange transfusion.

**\*NOTE: For pregnant women, doxycycline should not be used.**



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**Tick bites and single-dose doxycycline as prophylactic treatment for Lyme disease in NH**  
(Based on the 2006 Infectious Disease Society of America guidelines)

A full course of antimicrobial treatment, as used in the treatment of active Lyme disease (i.e., 10-14 days), is NOT recommended for prevention of Lyme disease after a recognized tick bite in the absence of clinical symptoms. A single dose of doxycycline (200 mg) may be offered to adult patients and to children  $\geq 8$  years of age (4 mg/kg up to a maximum dose of 200 mg) when ALL of the following conditions exist.

1. **The attached tick is a black-legged tick (deer tick, *Ixodes scapularis*).** Tick identification is most accurately performed by an individual trained in this discipline. However, black-legged ticks are very common in southeastern and central New Hampshire and there are many images available online to help in general identification.
2. **The tick has been attached for at least 36 hours.** This determination is most reliably made by an entomologist, but simply asking the patient about outdoor activity in the time before the tick bite was noticed can often lead to an accurate estimate of attachment time. Unengorged (unfed) black-legged ticks are typically flat. Any deviation from this “flatness,” which is often accompanied by a change in color from brick red to a gray or brown, is an indication that the tick has been feeding.
3. **Prophylaxis can be started within 72 hours of the time that the tick was removed.** This time limit is suggested because of an absence of data on the efficacy of prophylaxis for tick bites following longer time intervals after tick removal.
4. **Doxycycline prophylaxis.** Doxycycline is contraindicated in pregnant women and children less than 8 years old. The other common antibiotic treatment for Lyme disease, amoxicillin, should NOT be used for prophylaxis because of an absence of data on an effective short-course regimen for prophylaxis and the likely need for a multiday regimen and its associated adverse effects.

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