Notes for Clinicians – Lyme Disease

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Lyme disease is a frequent concern among patients with various complaints, in part because of increased coverage in public and social media. Some information provided in the media is accurate and helpful, but an overwhelming amount appears to be subjective, anecdotal-based evidence that is not accurate and which is prone to convince individuals they have Lyme disease. Some concerned individuals have the following conditions or complaints:

- suspected tick exposures
- neurological syndromes (e.g. multiple sclerosis, neuropathies)
- chronic arthritis or joint pain
- chronic fatigue
- clusters of non-specific constitutional complaints
- suspected "chronic Lyme disease"

Referrals of patients with proven or probable Lyme disease to the Infectious Disease Clinic are welcome. We share the eagerness of patients and providers alike to make this diagnosis and effectively treat the disease when appropriate. The following guidance is provided to referring clinicians in order to avoid wasting the patients' time by accepting referrals for patients who are unlikely to have Lyme disease.

<u>Before referring patients to an infectious disease specialist please consider the following:</u>

1. A patient with appropriate tick exposure within 30 days preceding the onset of erythema migrans (EM) may be referred without serology (often negative in early infection) or alternatively the clinician can initiate appropriate therapy or simply request advice by phone.
   a. A tick bite in Alberta is most likely from a dog tick (*Dermacentor variablis*). The patient should be monitored for fever and rash as Rocky Mountain spotted fever is occasionally acquired in Alberta or nearby mountains.
   b. A tick from a patient can be submitted to the ProvLab for tick speciation to rule out *Ixodes*.
2. A patient with possible exposure to ticks in a known endemic area and symptoms or findings compatible with late Lyme disease should have Lyme serology from ProvLab before referral.
3. Infectious disease specialists welcome inquiries by phone, fax, page or email to discuss cases before referral.

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BACKGROUND

Lyme disease has been intensively studied by practitioners and researchers in areas where the disease is highly prevalent and diagnostic criteria well tested (i.e. north-eastern USA). From their clinical experience and research, clear and reliable criteria have emerged to define Lyme disease.

2011 Alberta Lyme Disease Case Definition

Lyme Disease Case Classification	A. Exposure Criteria	B. Clinical Criteria	C. Laboratory Criteria	MD Diagnosis
Confirmed	yes	yes	yes	yes
	no	yes	yes	yes
Probable	no	yes	yes	yes
	yes	yes	no	yes

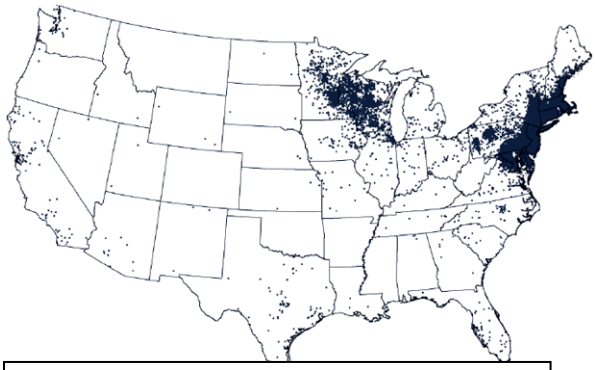
*typical musculoskeletal, nervous system or cardiac manifestations

A. Exposure Criteria

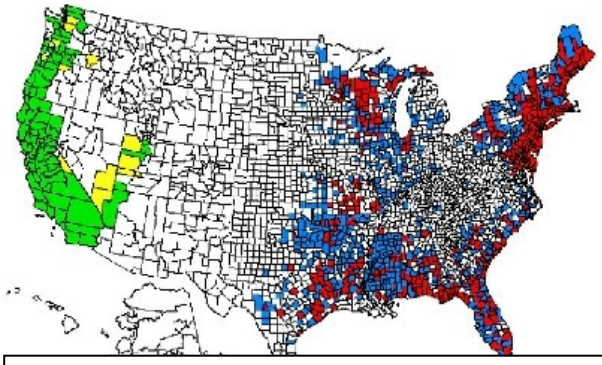
Time spent in wooded, brushy or grassy areas (tick habitat) in a location **where Lyme disease is known to be transmitted**,** for a period less than or equal to 30 days before onset of erythema migrans. A known tick bite is not required. Transmission is unlikely in winter.

> *** at least two confirmed cases of Lyme disease acquisition or established Ixodes tick vector known to carry Borrelia burgdorferi.*

Areas of potential exposure in Canada include those adjacent to the Great Lakes and St. Lawrence River especially in south-central Ontario, the Maritimes and low risk in south-eastern Manitoba, Vancouver island and the Fraser valley in B.C. The at-risk Canadian territories border the most prevalent areas in the U.S.A. (see below).



2005 Reported Lyme Disease Cases in the United States by County of Residence



Lyme Disease Tick Vectors: Ixodes pacificus (west) and *I. scapularis* (east) in the USA up to 1996 (CDC)

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Note:

- *Ixodes* ticks are not endemic in Alberta at this time. Occasionally they have been found on migrating birds. Dog ticks (*Dermacenter variabilis*) are common here and do not carry Lyme disease.
- Surveillance of ticks infected with *B.burgdorferi* collected off dogs is on-going.
- Lyme disease is not being transmitted from dogs to humans living in Alberta or the eastern portions of B.C. at present.
- There are many areas of Europe where Lyme disease or other *Borrelia* infections may be transmitted by ticks. Serologic tests used in Alberta have been shown to detect most of these *Borrelia* infections.

B. Clinical Criteria

Erythema Migrans (EM) (60%-80% of patients)

Skin rash beginning as red macule or papule and expanding over days or weeks to large round lesion which may show central clearing. Secondary lesions may occur. May be accompanied by fever, fatigue, headache, stiff neck, arthralgia or myalgia which may be intermittent.

Not EM: erythema surrounding a tick bite within 3-48 hours is likely just hypersensitivity.

Photo of Erythema Migrans from acute Lyme Disease (Source CDC Website)

Late syndromes:

Musculoskeletal system

Brief (weeks to months) recurrent bouts of arthritis with objective joint swelling in one or a few large joints (asymmetric oligoarthritis). Chronic arthritis may follow.

Following are not MSK criteria: chronic progressive arthritis without initial brief attacks; chronic symmetrical polyarthritis; arthralgia, myalgia or fibromyalgia alone

Nervous system

Lymphocytic meningitis; cranial neuritis (i.e. facial palsy); radiculoneuropathy; encephalomyelitis (confirmed by CSF>serum antibody to *B. burgdorferi*).

Following are not neurologic criteria: headache, fatigue, paresthesia, or mildly stiff neck alone.

Cardiovascular system

Acute 2nd or 3rd-degree AV block resolving in days or weeks with or without myocarditis.

Not CVS criteria: palpitations, bradycardia, bundle branch block, myocarditis without AV block.

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C. Laboratory Criteria

Positive one of:

1. Two-tier serology interpreted (EIA/ELISA followed by Western blot) *
2. Molecular detection (e.g., PCR) for *B. burgdorferi*
3. Culture for *B. burgdorferi*

   * *must be interpreted according to established criteria*

The Provincial Laboratory for Public Health (ProvLab) does the EIA testing and sera with positive/equivocal results are sent to the National Microbiology Laboratory (NML) for Western Blot confirmatory testing. PCR is done at NML whereas culture is not normally performed because of speciality media requirements, and much lower sensitivity of this procedure.

Note:

- Many commercial laboratories outside of Canada offer testing for Lyme disease and other tick-borne illnesses through the mail at considerable cost to patients.
- These laboratories often do not comply with CDC-recommended methods for testing and interpretation of the Western Blots.
- Some commercial laboratories have regularly produced results inconsistent with those from reputable laboratories, and inconsistent with the clinical picture. Results from these commercial laboratories **are not considered** in the evaluation of patients for Lyme disease.

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