

Date: Friday, July 31, 2015
To: All Physicians, Central Zone
From: Dr. Ifeoma Achebe, on behalf of the Medical Officer of Health, Central Zone

Colleagues:

This memo is a response to several enquiries from physicians on the management of a suspect Lyme disease (LD), LD testing and tick submission through the Alberta Health tick surveillance program.

Lyme disease is a tick borne zoonotic disease occurring in North America, Europe and Asia. Endemic areas in Canada include southeastern Manitoba, southern and eastern Ontario, southwestern Quebec, New Brunswick and Nova Scotia and in British Columbia-Vancouver Island, the lower mainland and Fraser Valley. Alberta is not considered to be an endemic area for LD although a small number of infected ticks have been found through the ongoing tick surveillance program. Most patients with LD will present with a round skin lesion (*erythema migrans*) which may be followed by fatigue, chills, fever, headache, muscle and joint pain and swollen lymph nodes. To diagnose LD, exposure, clinical and laboratory criteria must be met (see attached "Notes for Clinicians" for more details). When you see a suspect case of LD who has spent time in wooded, grassy or bushy areas where LD is endemic, please consider consulting with an infectious disease specialist for further guidance.

Testing for Lyme disease: Serological and molecular assay (PCR) tests are available through the ProVLab. As there are specific clinical indications for the PCR testing, the Microbiologist-on-call must be contacted prior to sample collection. Antibody detection and confirmation follows a two-step approach in line with the Public Health Agency of Canada (PHAC) and US Center for Disease Control (US-CDC) to prevent the reporting of false positives as confirmed cases. Note that the species of *Borrelia*, the causative bacteria, are different in North America than in Europe and Asia. Different testing is required to confirm non-North-American species, so it is important to include details of travel history on the requisition. For more details on lab testing and interpretation of results, please go to: <http://www.health.alberta.ca/documents/Lyme-Disease-Laboratory-Testing-2015.pdf>. Please note that many commercial labs outside of Canada offer tests for LD and other tick borne illnesses through the mail at considerable costs to patients. These labs often do not comply with the PHAC and US-CDC standards for testing and the results from these labs are not considered valid in the evaluation of patients for LD.

Tick Submission: Physicians can submit ticks found on patients for speciation and *Borrelia* testing in appropriate tick species to the ProVLab – please refer to the ProVLab Guide to Services document found on: <http://www.provlab.ab.ca/guide-to-services.pdf>

Alberta Health also has a tick surveillance program "Submit-a-Tick" for non-diagnostic purposes to help understand the risk of LD in Alberta. Individuals are encouraged to submit ticks found on themselves, pets and the environment through this program. Information on the program; including locations in the community where the ticks can be submitted can be found here: <http://www.health.alberta.ca/documents/Tick-Surveillance-InfoSheet.pdf>

Should you have any questions about this information or the links provided, please feel free to contact me at ifeoma.achebe@albertahealthservices.ca

Sincerely,

Dr. Ifeoma Achebe
Medical Officer of Health
Alberta Health Services, Central Zone

Notes for Clinicians – Lyme Disease

By Dr. Andrew Pattullo
June 2015

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 that is not accurate and 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 an infectious disease specialist 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 unnecessary referrals for patients who are unlikely to have Lyme disease.

Before referring patients to an infectious disease specialist please consider the following:

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 variabilis*). 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 Provincial Laboratory for Public Health \(ProvLab\)](#) for tick speciation to rule out *Ixodes* species.
2. A patient with possible exposure to ticks in a known endemic area (refer to Exposure Criteria) 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.

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. The Public Health Agency of Canada has applied this knowledge to develop the national case definition for Lyme disease. Alberta also uses this case definition.

Canada/Alberta Lyme Disease Case Definition*

Case Classification	Exposure Criteria Required (A)	Clinical Criteria Required (B)	Laboratory Criteria (C)	Testing	MD Diagnosis
Confirmed	Yes	Yes*	Yes	Two Step: 1. EIA Positive 2. Western Blot (IgM and/or IgG) Positive	Yes
	No	Yes*	Yes	PCR or culture	Yes
Probable	No	Yes*	Yes	Two Step: 1. EIA Positive 2. Western Blot (IgM and/or IgG) Positive	Yes
	Yes	Yes*	Not Required		Yes

* Typical musculoskeletal, nervous system or cardiac manifestations. Erythema migrans may or may not be present.

A. Exposure Criteria

- Travel to a location **where Lyme disease is known to be transmitted**** and time spent in wooded, brushy or grassy areas (i.e., tick habitat). A known tick bite is not required. Currently, Alberta is not known to have any established Ixodes tick populations. The risk of acquiring Lyme disease from a tick in Alberta, although possible, is very low.

** At least two confirmed cases of Lyme disease acquisition or established Ixodes tick vector known to carry *Borrelia burgdorferi* and other non-North American strains (e.g., *B. afzelii* and *B. garinii*).

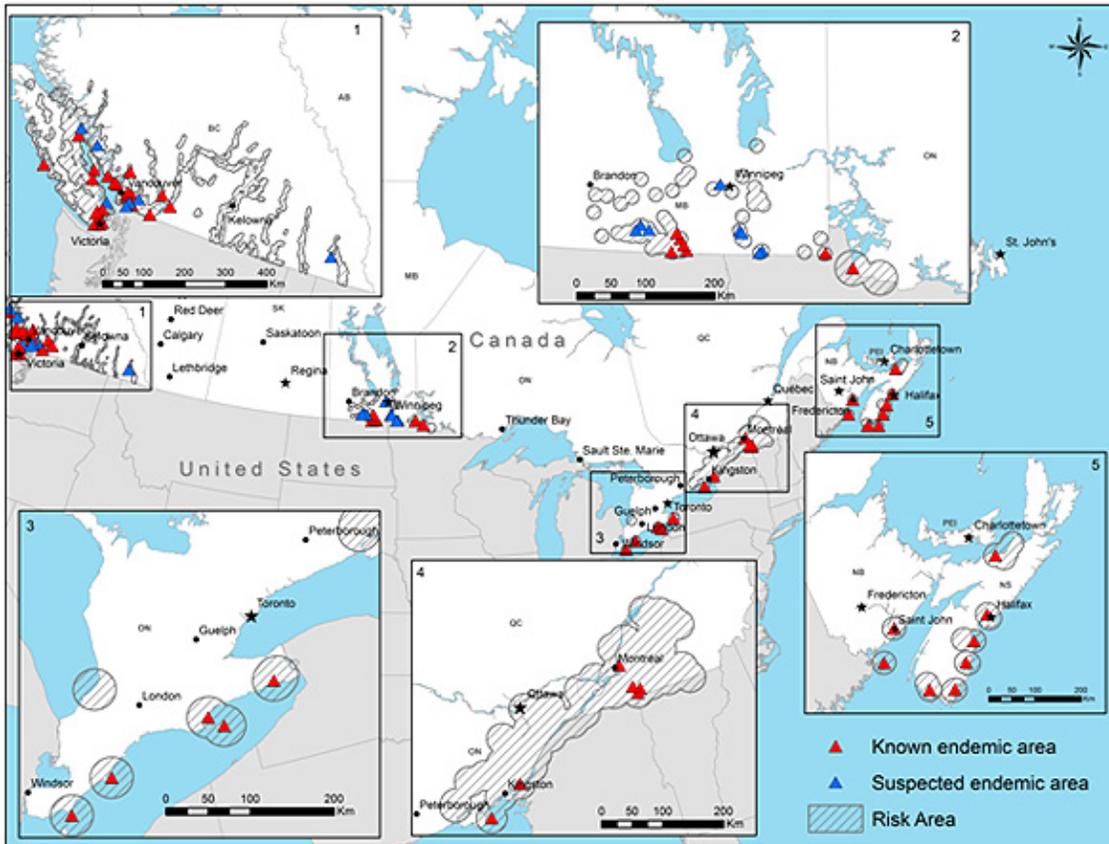
Notes:

- Physicians can submit ticks for diagnostic purposes through the Provlab (Refer to the Provlab Guide to Services).
- Alberta Health has a tick surveillance program and encourages people to “submit-a-tick” found on themselves, their pet or in the environment, for testing. This program will help Alberta Health better understand the risk of Lyme disease in Alberta. This surveillance program is for non-diagnostic purposes.
- While blacklegged ticks are not endemic (reproducing and established) to Alberta at this time it may be possible to be bit by a blacklegged tick here, although the risk is low.
- It is currently thought that blacklegged ticks are brought to Alberta by migrating birds and other mammals (e.g., companion animals and wildlife).
- Dog ticks (*Dermacentor variabilis*) are common in Alberta and do not carry Lyme disease.
- Lyme disease is not transmitted from animals to humans.

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 but the laboratory must be notified of the travel history in order to ensure appropriate Western Blot confirmatory tests are done for European strains.

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 United States. (see below).

Figure 1: Current Lyme disease Risk Areas in Canada – 2015

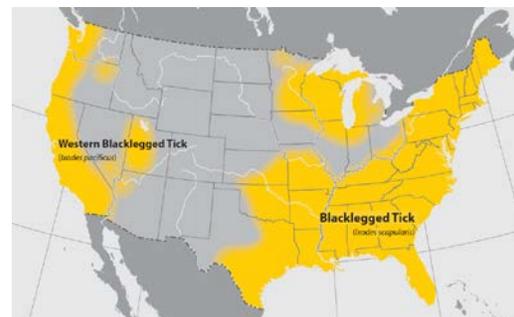


Source: Government of Canada, Risk of Lyme disease to Canadians. Website updated 2015-05-04. Available from: <http://www.healthycanadians.gc.ca/diseases-conditions-maladies-affections/disease-maladie/lyme/risks-risques-eng.php#a3>

Reported Cases of Lyme Disease -- United States, 2013



2013 Reported Lyme Disease Cases in the United States (CDC). <http://www.cdc.gov/lyme/stats/maps/interactiveMaps.html>



Lyme Disease Tick Vectors: *Ixodes pacificus* (west) and *I. scapularis* (east) in the USA up to 2010 (CDC). http://www.cdc.gov/ticks/geographic_distribution.html

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 (MSK)

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.

The following are not considered MSK criteria for Lyme disease: 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*).

The following are not considered neurologic criteria for Lyme disease: headache, fatigue, paresthesia, or mildly stiff neck alone.

Cardiovascular system (CVS)

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

The following are not considered CVS criteria for Lyme disease: palpitations, bradycardia, bundle branch block, myocarditis without AV block.

Other cutaneous findings such as acrodermatitis chronica atrophicans and lymphocytoma may be seen in infections with other *Borrelia spp.* (e.g., *B. afzelii*)

C. Laboratory Criteria

Positive one of:

1. Two-tier serology interpreted according to established criteria (EIA/ELISA followed by Western blot)
2. Molecular detection (e.g., PCR) for *B. burgdorferi* and other non-North American strains (e.g., *B. afzelii* and *B. garinii*)
3. Culture for *B. burgdorferi*

The ProvLab does the EIA testing of sera. 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, much lower sensitivity of this procedure and results are not available in a timely manner, therefore lack clinical usefulness.

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.