Prince Edward Island
CANADA

Health and Wellness

Prince Edward Island Guidelines for the Management and Control of Lyme Disease

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Department of Health and Wellness
Chief Public Health Office

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Case Definition (9)

Confirmed Case

Clinical evidence of illness **with laboratory confirmation by one of the following methods**:

- Isolation of *Borrelia burgdorferi* (*B. burgdorferi*) from a clinical specimen as specified by current guidelines (1,8).
- Detection of *B. burgdorferi* DNA by PCR testing on synovial fluid, cerebrospinal fluid, erythema migrans (EM) tissue biopsies or blood and by methods specified by current guidelines.

OR

Clinical evidence of illness ***with*** **a history of residence in, or visit to,** a Lyme disease risk area; **and** laboratory evidence of infection in the form of a positive serologic test using the two-tiered approach. The two-tiered testing approach consists of a screening EIA followed by an immunoblot assay.

Probable Case

Clinical evidence of illness ***without*** **a history of residence in, or visit to,** a Lyme disease risk area; **and** laboratory evidence of infection in the form of a positive serologic test as defined above under confirmed cases.

OR

Clinician-observed erythema migrans (>5cm) *without* laboratory evidence but ***with*** **history of residence in, or visit to,** a Lyme disease risk area*.

* Lyme disease risk areas in Canada are defined as a locality in which there is evidence for the occurrence of reproducing populations of known tick vector species (particularly *Ixodes scapularis* [known as the deer or black legged tick] and *Ixodes pacificus* [western black-legged tick]) and the likely transmission of *B. burgdorferi* as determined by one of the methods noted in Appendix A.

Endemic or ***risk areas for the Ixodes*** **ticks** in Canada include Southern British Columbia, southeastern Manitoba, southeastern Ontario to southern Quebec along the St. Lawrence River, southern New Brunswick Moncton-Saint John and bordering areas along the Bay of Fundy) and Nova Scotia.

Areas with ***moderate-high risk of Lyme disease*** in the tick population include northeastern United States and Wisconsin; Kingston, Ontario and surrounding area; New Brunswick Counties

of Saint John, Charlotte, Kings, Albert, and Westmorland (Moncton) and all of Nova Scotia except for Cape Breton.

For at-risk areas, visit Lyme disease risk areas or visit the websites of the relevant provincial and territorial public health organizations. Information on areas outside Canada where Lyme disease risk occurs can be found at Travel Health and Tickborne Diseases Abroad.

Reporting Requirements (7)

Health Care Providers

- Health care providers shall in accordance with the Prince Edward Island (PEI) *Public Health Act* report clinical and suspect cases to the Chief Public Health Officer (CPHO) when observed, and in any case not later than 24 hours after observation.

Laboratories

- The Provincial Laboratory shall in accordance with the PEI *Public Health Act*, report all laboratory confirmed case results to the CPHO (or designate) by phone and mail, fax, or electronic transfer as soon as the result is known.

Etiology (2)

Clinical evidence of Lyme disease is documented in Europe as early as 1883 by German physician Dr. Alfred Buchwald. He described the skin rash characteristic of Lyme disease in Europe, subsequently known as acrodermatitis chronica atrophicans (ACA). Nearly a century later, in 1976 in the United States, clusters of children with juvenile rheumatoid arthritis in Lyme, Connecticut were diagnosed with a condition called Lyme disease. In 1982, Dr. Alan Steere at Yale University and colleagues first identified *Borrelia burgdorferi* as the causative bacterium of Lyme disease in North America. In Europe, three *Borrelia* species are known to cause disease; *B. burgdorferi* sensu stricto, *B. garinii* and *B. afzelii*. The latter two species are also found in Asia.

Clinical Presentation (15)

Lyme disease is a multi-system inflammatory disease that ranges from asymptomatic or mild illness to chronic, debilitating illness, and may manifest in three stages: early localized, early disseminated, and late persistent infection. A small proportion of infected individuals have no recognized illness or rash or manifest only non-specific symptoms, making the clinical diagnosis of Lyme disease difficult. In addition, manifestations of Lyme disease may depend on the infecting *Borrelia* species, which have been shown to have a predilection for specific organs and sites. For example, infections with *Borrelia species* in Europe mainly result in localized erythema

migrans (EM), whereas in the United States and Canada, disseminated illness with chronic arthritis is a more frequent manifestation.

In the absence of antibiotic treatment, some *Borrelia* infections will spontaneously resolve and generalized systemic symptoms will decrease. However in some patients, the organism can survive for several years in isolated niches within the body subsequently causing relapsing arthritis, polyneuropathy or other systemic symptoms.

1) Stage 1 - Early (Localized) Infection

Within 3 to 30 days of a tick bite, a distinctive rash, erythema migrans (EM), occurs at the site of the tick bite in about 70-80% of individuals. EM is a round or oval expanding erythematous area of the skin greater than 5cm in diameter that enlarges slowly over a period of several days to weeks. It appears one to two weeks (range 3-30 days) after infection and persists for up to eight weeks. Some lesions are homogeneously red, whereas others have prominent central clearing or a distinctive target-like appearance. Signs of acute or chronic inflammation are not prominent. There is usually little pain, itching, swelling, scaling, exudation or crusting, erosion or ulceration, except that some inflammation associated with the tick bite itself may be present at the very centre of the lesion. On the lower extremities, the lesion may be partially purpuric.

With or without EM, early symptoms may also include malaise, fatigue, fever, headache, stiff neck, myalgia, migratory arthralgias, and/or lymphadenopathy, possibly lasting several weeks or more in untreated persons.

Note: An erythematous skin lesion present while a tick vector is still attached or that has developed within 48 hours of detachment is most likely a tick bite hypersensitivity reaction (i.e., a non-infectious process), rather than EM. Tick bite hypersensitivity reactions are usually less than 5 cm in diameter, sometimes have an urticarial appearance and typically begin to disappear within 24-48 hours. Diagnosis of EM requires careful examination by a health care provider (HCP) to eliminate alternative types of skin rash. Note that it is recommended that HCPs would normally treat patients with EM and recent travel history to Lyme risk areas (without recourse to serological testing) since specific antibodies may not be detectable in early Lyme disease. (1)

2) Stage 2 – Early (Disseminated) Infection

The most commonly reported manifestation of disseminated infection is multiple EMs. They may develop within several days to weeks of the onset of the initial EM and may be similar to but smaller than the primary lesion. These lesions reflect spirochetemia

with cutaneous dissemination and usually fade within three to four weeks (range: one day to fourteen months).

Systemic symptoms such as fatigue and lethargy are often constant, while musculoskeletal symptoms such as: Lyme arthritis, which presents as a monoarticular or oligoarticular form of arthritis, most commonly involving the knee. Other large joints or the temperomandibular joint can be affected as well. Large effusions that are out of proportion to the pain are typical. Lyme arthritis is often intermittent if untreated, with episodes of joint inflammation spontaneously resolving after a few weeks to a few months. Persistent swelling of the same joint for twelve months or more is not a usual presentation (2).

After several weeks to months, approximately 15% of untreated individuals will develop other symptoms of early disseminated illness. Early neurological Lyme disease encompasses acute peripheral nervous system involvement, including radiculopathy, cranial neuropathy and mononeuropathy multiplex (multifocal involvement of anatomically unrelated nerves), and CNS involvement, including lymphocytic meningitis and, rarely, encephalomyelitis (parenchymal inflammation of brain and/ or spinal cord with focal abnormalities) (2).

Cardiac manifestations associated with Lyme disease includes intermittent atrioventricular heart block often involving the atrioventricular node (although heart block may occur at multiple levels) and sometimes associated with myopericarditis. Carditis can occur in the early stages of the disease. Cardiac symptoms develop in up to 5% of untreated cases and may last 3 days to 6 weeks. Cardiac involvement is uncommon in children.

3) <u>Stage 3 – Late (Persistent) Infection</u>

The most commonly reported symptom in 60% of untreated individuals is relapsing arthritis that usually affects the large joints, especially the knees and may occur weeks to years (average 6 months) after the onset of EM. Attacks may last from a few weeks to months with periods of complete remission in between. Arthritis may occur without prior signs and symptoms of illness (including EM). Chronic arthritis is uncommon in children who are treated with antimicrobial agents in the early stage of the disease.

CNS manifestations may also occur including polyneuropathy, leukoencephalitis and encephalopathy, which may include such non-specific manifestations as sleep disturbance, behavioural changes and headaches.

About 5% of untreated individuals may develop chronic neurological manifestations such as spinal radicular pain or distal paresthesias.

Acrodermatitis chronica atrophicans ACA, described mainly in European Lyme disease cases, begins with red violaceous lesions that become sclerotic or atrophic. These lesions, which may be the presenting manifestation of the disease, may last for many years, and *Borrelia* has been cultured from such lesions as much as ten years after their onset in the untreated patient.

4) Antibiotic-Refractory Lyme Arthritis

While the majority of patients with Lyme arthritis respond to appropriate antibiotic treatment, approximately 10% may have persistent joint inflammation for months or years after completion of treatment. There is no ongoing infection in these cases.

5) Post-Lyme Disease Syndrome

A small percentage of patients complain of pain, and neurocognitive, or fatigue symptoms for months or years afterwards, despite resolution of the objective manifestations of the initial infection with antibiotic therapy. Indistinguishable from chronic fatigue syndrome or fibromyalgia, these patients tend to have more generalized or disabling symptoms: marked fatigue, severe headache, diffuse musculoskeletal pain, multiple symmetric tender points in characteristic locations, pain and stiffness in many joints, diffuse paresthesias, difficulty with concentration, or sleep disturbance.

Patients with these conditions lack evidence of joint inflammation; they have normal neurologic test results; and they usually have a greater degree of anxiety and depression. At the present time there is no evidence that persistent subjective symptoms after recommended courses of antibiotic therapy for Lyme disease are caused by active *B. burgdorferi* infection.

Diagnosis

Diagnosis is based on the clinical picture, epidemiological information and laboratory results, as a helpful adjunct. A clinical diagnosis can be made early in the disease course if the characteristic skin rash (EM) is observed and a history of travel to, or living in, an endemic or risk area is indicated.

Serology

Antibody detection and laboratory confirmation follows a two-tiered Enzyme Immunoassay (EIA) and western blot (WB) testing approach to reduce the risk of false-positive case diagnoses. This is in keeping with the recommendations of the Public Health Agency of Canada (PHAC) and the United States Centers

for Disease Control (CDC). The Prince Edward Island Lyme Disease Algorithm provides information on the testing process.

- IgM antibodies generally appear within two to four weeks of EM onset and peak around six weeks. Serology testing within seven days of exposure is not indicated.
- IgG antibodies appear within four to six weeks of EM onset and peak around two to three months. Repeating serological testing may be warranted to confirm positive diagnosis.
- IgM antibodies usually decline to undetectable levels after four to six months, while IgG can remain detectable for prolonged periods despite treatment. IgM antibodies are not to be used for diagnosis after the first 30 days of potential exposure or symptoms due to the high rate of false-positives.

Untreated individuals, who remain seronegative, despite continuing symptoms for six to eight weeks, are unlikely to have Lyme disease, and other potential diagnoses should be actively pursued.

1) **Enzyme Immunoassay**

Screening for antibodies to three known etiologic agents of Lyme disease (*B. burgdorferi, B. afzelii* and *B. garinii)* is by enzyme immunoassay (EIA) performed at the Queen Elizabeth II Health Sciences Centre (QEII) in Halifax, Nova Scotia. Sera that screen as reactive (positive) and equivocal/indeterminate are referred to the National Microbiology Laboratory (NML) in Winnipeg for confirmation, and when appropriate, for the species identity. Results are generally available within two weeks of referral. Sera that test negative in the screening assay performed at QEII are not referred to NML. If there is a chance your patient has traveled to Europe or Asia alternative testing is performed (see western blot below).

Sensitivity: During the first several weeks of *Borrelia* infection, serum antibody levels are low and infected individuals or individuals treated early with antibiotics may test negative in the EIA. Only 53.7% of individuals infected with the organism will test seropositive during Stage 1 of illness. Two to four weeks post-infection (Stage 2) the EIA has a 78.3–95.4% detection rate. The detection rate of EIA in the late (Stage 3) of Lyme disease is close to 100% (95.7-99.9%). (14)

Specificity: The EIA is specific for detecting antibodies to *B. burgdorferi, B. afzelii* and *B. garinii;* however this assay cannot distinguish between the three bacterial species. Additionally, individuals with the autoimmune disease, lupus, or those infected with

varicella or Epstein-Barr virus may have cross-reacting antibodies that cause false-positive results in the EIA test.

2) **Western Blot**

The Lyme disease western blot (WB) test is highly sensitive, and can differentiate between immunoglobulin (IgG or IgM) classes and *Borrelia* species. The WB should not be performed without a reactive (positive) or equivocal/indeterminate EIA result due to the increased risk of false positive results. Western IgM tests are highly cross-reactive and have little diagnostic utility after the first 30 days of exposure or symptoms.

In the absence of any travel history and travel outside of North America, samples referred to the NML are only tested for *B. burgdorferi*. However, when travel history to Europe and/or Asia is provided, a Western blot to each species is performed. There is no cross-reactivity between the *Borrelia* species antigens on the Western Blot, thus providing travel history is critically important to trigger the additional testing for species identification.

Other Supplementary Tests

3) **Molecular Detection**

Polymerase chain reaction (PCR) testing has been used to detect *B. burgdorferi DNA* in a variety of samples. Skin lesions have the highest yield, followed by a much lower rate in joint fluids and CSF of serologically positive patients. Testing is available from the NML by special request by the Provincial Lab only. This is a rarely performed test

4) **Urine Antigen Detection**

Results obtained from the Lyme urine antigen test have been unreliable and are not recommended in the diagnosis of Lyme disease.

5) **Culture**

B. burgdorferi has been isolated from EM lesions, joints, blood and CSF but is not used for clinical diagnostic purposes.

Clinical and epidemiological history need to be taken into account when interpreting all laboratory results. Consultation with the infectious disease consultant is recommended as differential diagnoses among Lyme arthritis, encephalopathy or polyneuropathy, and other syndromes such as chronic fatigue or fibromyalgia is difficult and the management differs significantly. There are other tick-associated and zoonotic conditions other than Lyme that can produce similar symptoms.

Epidemiology (15)

Reservoir

The survival and spread of *B. burgdorferi* depends on the availability of a suitable tick vector as ticks are the primary means by which the bacteria can move from one habitat to another. The spread of *B. burgdorferi* into new geographic areas requires the presence of suitable vectors and hosts. Infected hosts can move the disease into areas with uninfected vectors and vice versa. Two species of Ixodid ticks act as the primary reservoirs for Lyme disease in Canada: *Ixodes scapularis* in the east (known as the blacklegged or deer tick) and *Ixodes pacificus* (western blacklegged tick) on the west coast.

In North America, the nymphal stage of *I. scapularis* is most active in biting small mammals and humans in late-spring and summer. The adult stage is more active in biting large mammals such as deer, elk, and moose, which allow it to survive over the winter.

Ixodes ticks have been found to also carry other parasites such as *Babesia microti* and *Anaplasma phagocytophilum*, which cause the human diseases babesiosis and anaplasmosis, respectively. Ixodes ticks can also carry the Powassan virus and Francisella tularensis (Tularemia).

In PEI, the *Ixodes* tick is not known to be endemic. The adults are not believed to survive winter and/or reproduce sufficiently on PEI due to the absence of deer or other large mammals. Carriage on migrating birds is thought to be the primary vehicle for ticks found on PEI.

Transmission (12)

Lyme disease is a tickborne disease. Infection is transmitted most often through the bite of infected nymphs. Transmission does not occur between infected female ticks and their eggs. In order to transmit disease, the tick must have its mouthparts buried in the skin for 36 hours (24-72hrs).

- **Incubation Period**
  The incubation period from infection to the onset of EM is typically seven to fourteen days, but may be as short as three days and as long as thirty days.

- **Period of Communicability**
  There has been no conclusive evidence of natural transmission from person to person although there is a theoretical transmission risk as bacterium has been found in breast milk and stored blood from blood donations in the United States.

- **Host susceptibility**
  It is believed that susceptibility is universal. Re-infection has occurred in those previously treated with antibiotics for early disease. Infection with Lyme disease does not produce lifelong immunity. Untreated Lyme disease during pregnancy may cause complications; fetal death is extremely rare.

Occurrence

General **(2, 12)**
Lyme disease occurs mainly in temperate regions of the Northern Hemisphere including Canada, United States, Europe, Russia, China, and Japan. Lyme disease has also been reported in some African and South American countries. The risk of getting a tick bite starts when the weather warms up in the spring, through the fall. Ticks can also be active in the winter, if the winter is mild and there is not much snow. However, the greatest risk occurs during the spring and summer months.

Lyme disease is the most commonly reported vector-borne infection in the US, concentrated along the upper Atlantic coast, the upper Midwest, and on the West Coast. Potential factors contributing to this increase include growing populations of deer that support the tick vector, increased residential development of wooded areas, tick dispersal to new areas, improved disease recognition, and enhanced reporting.

Canada (12, 15)
Lyme disease was made nationally notifiable in Canada since 2009. The rates of Lyme disease in Canada have been increasing over the past several years.

Established *I. scapularis* populations (risk areas) have been identified in southern Ontario, Nova Scotia, New Brunswick, southeastern Manitoba, and *I. pacificus* in parts of southern British Columbia. The prevalence of *B. burgdorferi* in *I. pacificus* is much lower than in *I. scapularis*. In addition, up to 12% of bird-borne nymph ticks that survive and moult into adults may be infected with *B. burgdorferi.*

Prince Edward Island
PEI's first case of lab confirmed Lyme disease without travel outside of PEI was diagnosed in 2012; there has not been a lab confirmed case without history of travel to an area of risk since that time. Historically there have been less than 5 cases of confirmed or probable Lyme disease on PEI each year.

Control

Prophylaxis

Prophylaxis treatment can be started if the patient meets **all** of the following criteria.

1. The tick can be reliably identified as an *Ixodes* blacklegged tick and is estimated to have been attached for more than 24-36 hours.
    - This is based on the degree of engorgement or by certainty of when the individual was bitten.
2. Prophylaxis must be started within 72 hours after the feeding tick has been removed. Strong recommendation for prophylaxis if the individual has been recently traveling to Lyme disease risk areas.
3. Doxycycline is not contraindicated.

If all of the above criteria are met, a single dose of 200 mg of doxycycline may be given to:

- adults
- children older than 8 years of age (if over 45 kg)

It should be given at 4.4 mg/kg for patients under 45 kg, up to a maximum dose of 200 mg.

Doxycycline is not recommended for children younger than 8 years of age or for pregnant women.

There may be other circumstances where prophylaxis could be considered. This can be discussed on a case by case basis with the CPHO or Infectious Diseases Consultant.

Treatment of a case (12)

The treatment regimens listed in the chart below are guidelines for localized (early) Lyme disease. The regimens may need to be adjusted depending on a patient's:

- age
- allergies
- medical history
- pregnancy status
- underlying health conditions

- Doxycycline is contraindicated and amoxicillin is the drug of choice for:
    - children younger than 8 years of age
    - women who are pregnant or lactating

Table 1. Treatment of early localized disease

	Age category	Drug	Dosage	Maximum	Duration (days)
Adults	**1st line**	Doxycycline	100 mg, p.o., q 12 h	N/A	14*
	2nd line (Pregnancy)	Amoxicillin	500 mg, p.o., q 8 h	N/A	14*
	Penicillin allergic	Cefuroxime axetil	500 mg, p.o., q 12 h	N/A	14*
Children	**1st Line**	Amoxicillin	50 mg/kg per day p.o., divided in 3 doses	500 mg per dose	14*
	2nd Line (age 8+ years old)	Doxycycline	4 mg/kg per day p.o., divided into 2 doses	100 mg per dose	14*
	Penicillin allergic	Cefuroxime axetil	30 mg/kg per day p.o., divided into 2 doses	500 mg per dose	14*

* Increase to 21 days for immunocompromised individuals

If further assistance is required or for individual patient treatment decisions, including contraindications or extended therapies, please consult an Infectious Diseases Consultant.

Management of contacts (12)

- Lyme disease is not passed from person to person, however, it may be prudent to identify others who may have been exposed to the same source so they can be educated in order to monitor for the signs and symptoms of Lyme disease.
- Infants born to women infected with Lyme disease while pregnant should be assessed by a paediatric infectious disease specialist.

Preventative measures (12)

- Educate the public about ways to reduce transmission of tick-borne diseases, including:
  - removing brush and leaf litter
  - creating a buffer zone of wood chips or gravel between forest and lawn
  - avoiding tick-infested areas when possible
  - wearing long sleeved shirts and long pants that are tight at the wrist and ankles or tucked into gloves or socks
  - wearing light coloured clothing which can aid in the detection of ticks that have not yet attached
  - wearing a hat where contact with vegetation cannot be avoided such as in dense woods, high grasses, or thickets

  - applying insect repellents containing 20–30% N,N-diethyl-3-methylbenzamide (DEET) to the skin (adults) or icaridin (hydroxyethyl isobutyl piperidine carboxylate, also known as picaridin)
- For children age 2 to 12 years, insect repellent with <10% DEET may be used up to 3 times per day and once per day for children 6 months to 2 years of age. It is not recommended for use on children under 6 months of age. *However, the efficacy of 5% to 10% DEET to repel ticks is not certain.*
- Icaridin is considered to be the repellent of first choice by the Public Health Agency of Canada's Canadian Advisory Committee on Tropical Medicine and Travel for travellers six months to 12 years of age. Products containing up to 20% icaridin are considered to be safe and efficacious.
  - Daily inspection and prompt removal of ticks for pets that spend time outdoors.
- Consult with a veterinarian about the best tick repellent medications for pets.
- If working or playing in a tick-infested area, daily inspection and prompt removal can prevent transmission.
  - Removal of ticks within 36 hours of attachment usually prevents transmission of *B. burgdorferi*.
  - Showering after being in an area where ticks are present can cause them to detach before they firmly attach.
  - Ticks often attach to moist or hairy areas of the body such as the groin, axillae, neck or head.
  - In small children, ticks may be found on the head and neck, which are uncommon places for them to attach in adults.
- Remove any attached ticks carefully without crushing.
  - Grasp gently with tweezers as close to its mouth as possible (the part sticking into the skin)
  - Slowly pull the tick straight out without jerking or twisting.
  - Afterwards, wash the bite site with soap and water or disinfect with alcohol hand sanitizer.
  - Check the bite area daily for at least two weeks.
  - If a red rash appears or the bite appears to be infected, seek medical attention.
  - Protect hands with gloves, cloth or tissue when removing ticks from humans or animals.
  - Wash hands thoroughly following tick removal.
- For more information see Appendices B, C and D and the Public Health Agency of Canada's website .

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Appendix A

Methods of determining risk areas for Lyme disease in Canada (9)

A Lyme disease risk area in Canada is defined as a locality in which there is evidence for the occurrence of reproducing populations of known tick vector species (particularly *Ixodes scapularis* and *Ixodes pacificus*) and the likely transmission of *B. burgdorferi* as determined by one of the following methods:

i) active field surveillance involving capture of wild rodent reservoirs as well as drag sampling on multiple occasions to ensure that ticks have become established (as evidenced by demonstration of all three feeding stages of the tick over more than one year) and *that B. burgdorferi* is being transmitted (as evidenced by molecular detection or culture of ticks or rodent samples);

ii) active field surveillance involving only drag sampling for ticks;

iii) evidence from passive tick surveillance when using field-validated methods of analysis of these data to improve their specificity in detecting tick populations (these may include high numbers of submitted ticks, immature ticks and multiple ticks found feeding on humans or animals);

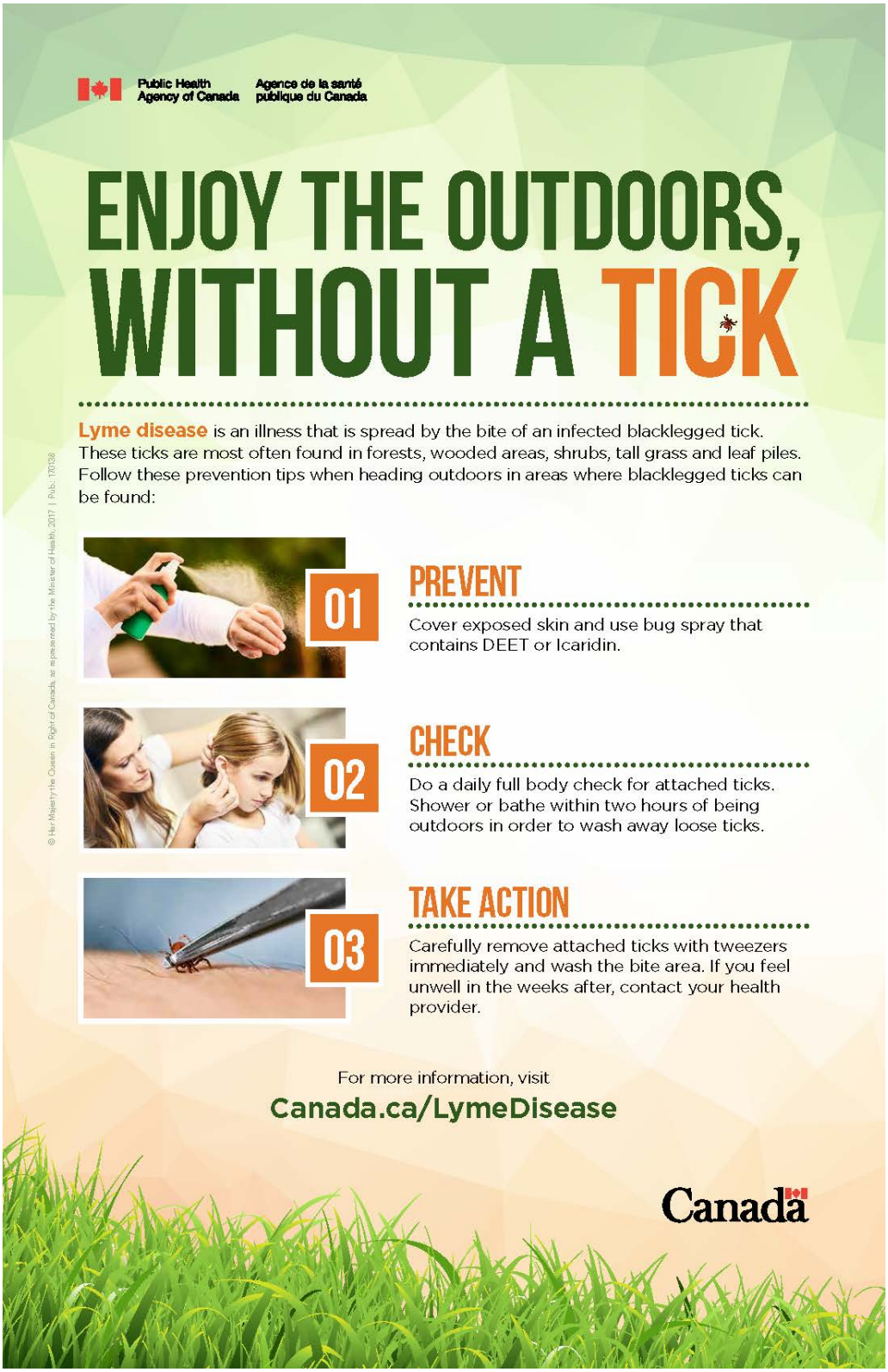
iv) field-validated signals from human case surveillance; or

v) field-validated ecological/niche models that predict risk. Method (i) is recommended to confirm the first occurrence of Lyme disease risk areas in Provinces and Territories where these have not been identified to date.

Methods (ii), (iii), (iv) and (v) are recommended only for those Provinces and Territories after the occurrence of one or more reproducing populations of tick vectors, and *B. burgdorferi* transmission, has been confirmed using method (i).

Appendix B

PHAC Lyme Disease Poster



Appendix C

Tick Prevention Landscape Checklist (12)

Here are some ways to limit exposure to ticks near your home:

- ☐ Mow the lawn regularly to keep the grass short
- ☐ Remove leaf litter, brush and weeds at the edge of the lawn and around stonewalls and woodpiles
- ☐ Stack firewood neatly and in a dry area
- ☐ Put barriers to exclude deer (if applicable) around your home and seal stonewalls and small openings to discourage rodent activity
- ☐ Place children's recreational playground sets, patios and decks away from the yard edges and trees. Place them on a woodchip or mulch foundation and in a sunny location, if possible.
- ☐ Treat pets that are commonly exposed to ticks with oral or topic acaricides (as recommended by your veterinarian) as they could carry ticks into the home
- ☐ Keep bird feeders away from play areas and home/building, and clean up spilled bird food.

Appendix D

Tick Check Poster

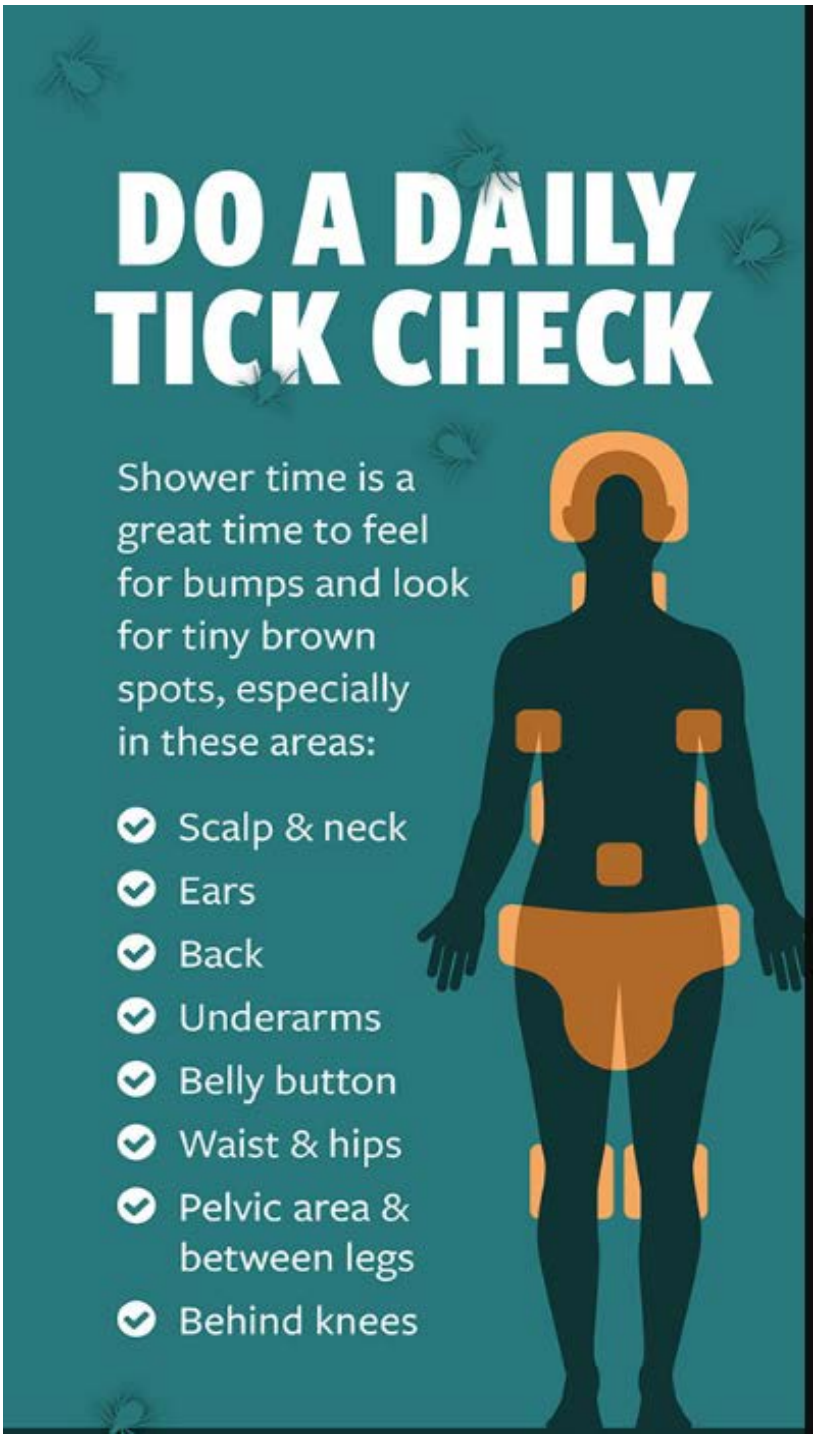


Image from:
http://www.healthvermont.gov/sites/default/files/images/2017/06/HS_ID_Tick_shower_card.jpg