Prince Edward Island Lyme Disease Algorithm for Clinicians

Ixodes (black-legged deer) ticks in various fed stages:
A) Nymphal Female B) Adult Female

Example of an Erythema migrans (EM) rash. Often develops a central clearing (bull's eye shape).

Patient with suspected tick bite

If tick is still attached, remove as per PHAC instructions.*

Submit to etick.ca for identification. See Box 1

Symptomatic ?

Yes

Report treatment to CPHO 902-368-4996

No

Tick was attached for > 24 – 36 hours or unknown?

No

Low risk for Lyme Disease (See Box 1 and Box 2). Watch for symptoms of early disease for 30 days post-exposure.

Yes

Tick was removed less than 72 hours ago?

Yes

Consider Doxycycline prophylaxis (200 mg PO x1) if not contraindicated (see Box 3) & can be given within 72 hours of tick removal
Report prophylaxis to CPHO 902-368-4996

No

Watch for symptoms for 30 days post-exposure

Early localized disease (<30 days)

- Erythema migrans (EM) (Box 4)
- Low grade fever, fatigue, headache, neck stiffness, arthralgia, myalgia

Early disseminated disease (<3 months)

- Multiple EM
- Low grade fever, fatigue, headache, arthralgia
- Bell's Palsy

Late disseminated disease (>3 months)

- Recurrent arthritis affecting large joints
- Central nervous system manifestations – meningitis, encephalopathy

- Order Lyme disease Serology if > 7 days since tick bite (Box 5)
- Treatment if clinical suspicion high (Box 6)
- If initial symptoms persist, test again for Lyme serology in 4 weeks
- Consult with Infectious Diseases and CPHO if necessary

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- Treatment if clinical suspicion high (Box 6)
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* If no known tick bite but Lyme disease is in the differential, follow algorithm from the "Symptomatic" circle

Box 1. Lyme Disease Risk

- Most people who are bitten by a tick do not get Lyme disease.
- Ticks must carry the Lyme bacteria and be attached for >24 to 36 hours for transmission to occur.
- In PEI, only the black-legged tick can carry Lyme disease.
- Although PEI is not considered an endemic/high risk area for Lyme disease, ticks carrying Lyme-causing bacteria may be present.
- Higher risk areas for Lyme can be found here:

Lyme Disease Monitoring Canada.ca

Box 2. Other Tick-Borne Diseases

Contact CPHO or Infectious Disease if febrile after 7 days and history of tick bite, as this could be a few different tick transmitted illnesses.

Other Tick Associated Diseases include:

Black legged / Deer Ticks: Tick Borne Fever (*Borrelia miyamotoi*), Anaplasmosis, Powassan Virus infection, Babesiosis, and Tularemia

Dog Tick or Lone Star Tick: Ehrlichiosis, Rocky Mountain Spotted Fever

Box 3. Post exposure prophylaxis

For Lyme disease after a black-legged tick bite:

Adults: Doxycycline 200mg PO x 1 dose

Children ≥8 years: Doxycycline 4 mg/kg, up to maximum dose of 200mg

Doxycycline is contraindicated in pregnancy. No further testing/treatment required following post-exposure prophylaxis.

Box 4. Erythema migrans

- Single or multiple *erythema migrans* (EM) rash is present in most but not all cases (60-85% of cases).
- EM begins as red macule/papule at site of tick bite. Rapidly enlarges to diameter ≥ 5 cm. Often develops central clearing (bull's eye shape).

Box 5. Lyme Disease Serology

- Serology is not helpful if done within 7 days of a tick bite unless patient has had previous Lyme disease (very rare).
- Lyme disease serology is performed by Modified Two Tier Testing (MTTT) algorithm using 2 enzyme immunoassays (EIAs) at QEII HSC Microbiology Laboratory.
- It has a specificity at 99.6%.
- MTTT is more sensitive for detecting early infection (formal evaluation showed that the MTTT approach detected 28% more cases of early infection)
- All specimens sent for Lyme disease testing are also tested for anaplasmosis.
- Contact the microbiologist for assistance in interpreting lab results from private and/or labs in the USA. **Over 40% of healthy (non-infected) individuals will react falsely to private lab criteria.**

European or Asian Lyme disease requires specialized testing. *Please add travel history to the requisition or contact the microbiology laboratory for guidance.*

Age Category	Line	Drug	Dosage	Frequency	Maximum	Duration
Adults	**1st**	**Doxycycline**	**100 mg orally**	**Twice/day**	**N/A**	**21***
	2nd	Cefuroxime axetil	500 mg orally	Twice/day	N/A	21*
		Amoxicillin	500 mg orally	Three times/day	N/A	21*
Children (< 18 yrs)	**1st**	**Doxycycline**	**4 mg/kg orally**	**Daily, 2 divided doses**	**100 mg per dose**	**21***
	2nd	Amoxicillin	50 mg/kg orally	Daily, 3 divided doses	500 mg per dose	21*
		Cefuroxime axetil	30 mg/kg orally	Daily, 2 divided doses	500 mg per dose	21*

*https://cep.health/media/uploaded/CEP_EarlyLymeDisease_Provider_2020.pdf

April 2026