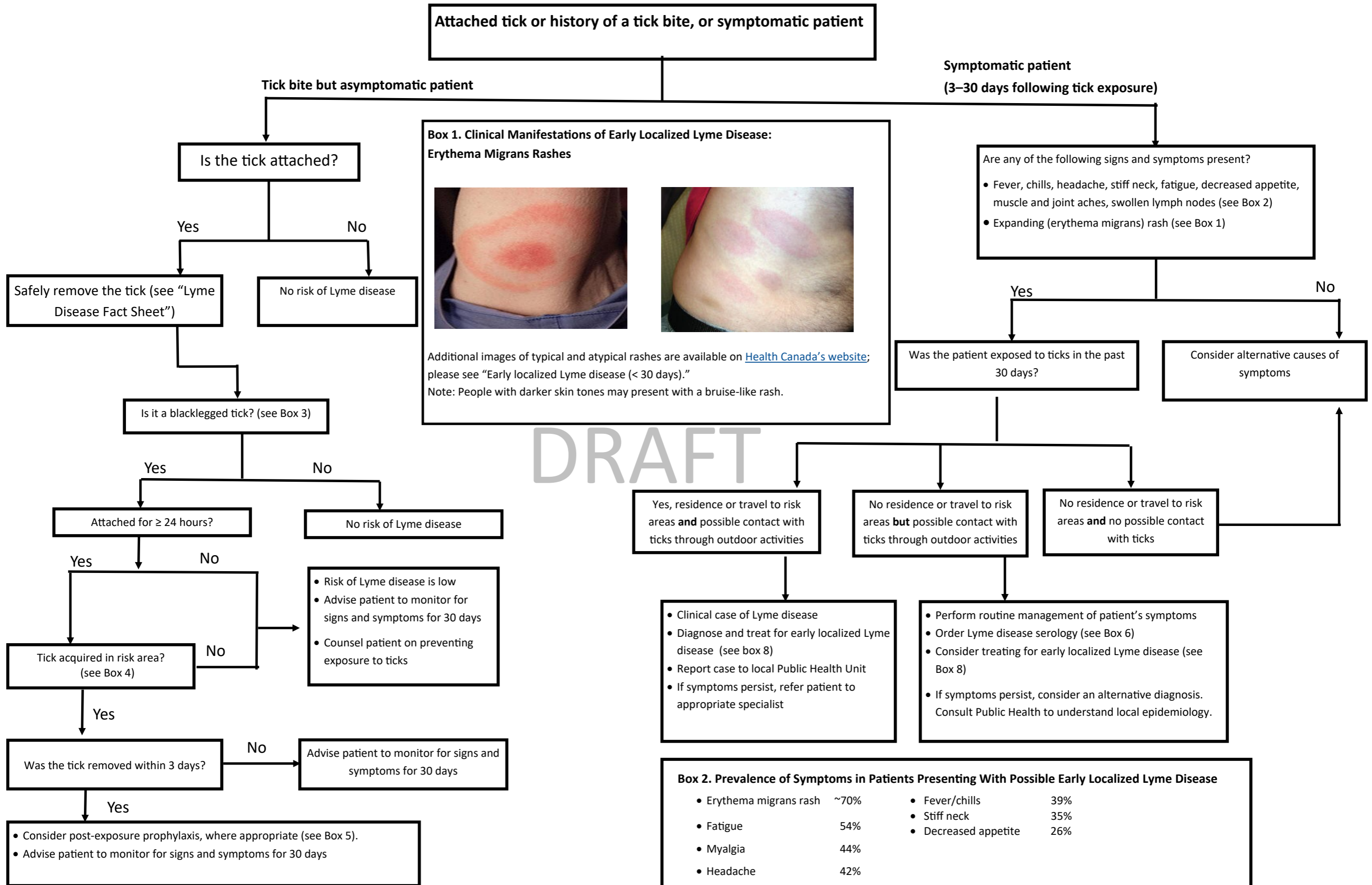
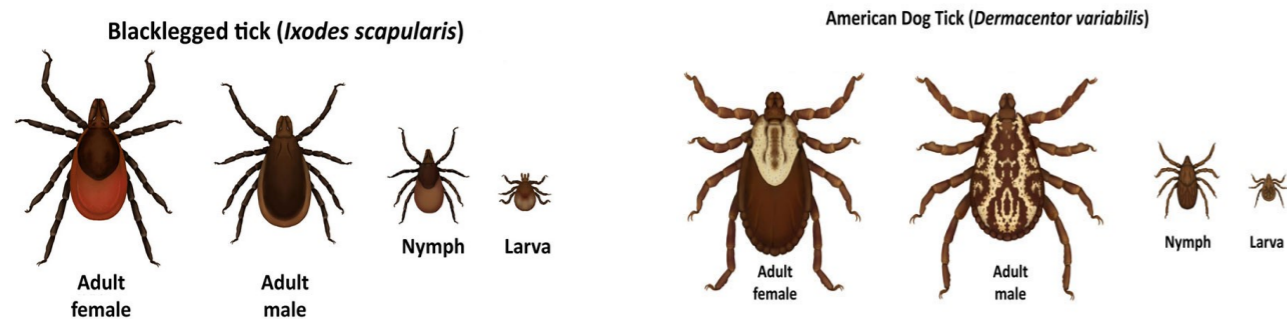


Management of Tick Bites and Investigation of Early Localized Lyme Disease



Box 3. Blacklegged and American Dog Ticks at Various Stages



Source: [Centers for Disease Prevention and Control](#).
A scaled image of a blacklegged tick can be viewed [here](#).

Box 6. Laboratory Testing

- Laboratory testing is not indicated for asymptomatic patients
- Serological testing may not yield positive results during early localized Lyme disease, so management should not be based on serological testing results during this phase
- Antibiotic treatment in early disease may reduce seroconversion; testing should not be used to monitor treatment outcome
- Following exposure to *Borrelia burgdorferi*, immunoglobulin M (IgM) antibodies are detected within 2 weeks, and IgG antibodies within 1 month
- Public Health Ontario uses a two-step testing algorithm to maximize sensitivity and specificity (see Box 7)
- For serological testing, please complete the requisition fully and submit it, along with samples, to a Public Health laboratory for testing
- If European Lyme disease is suspected based on the patient’s travel history, please order serology testing specific to European Lyme disease

Box 4. Areas of Risk for Lyme Disease

- The risk of acquiring Lyme disease varies across geographical regions. Please click to see the risks in [Ontario](#), [Canada](#), and [the United States](#).
- **In Europe**, the areas of highest risk are in Central and Eastern Europe, but infected ticks have also been found in Southern Scandinavia and up to the northern Mediterranean region.

Box 7. Sensitivity of Serological (Two-Tier) Testing* in Patients With Lyme Disease

Early Localized Acute Phase	Early Localized Convalescent Phase [†]	Early Disseminated Disease	Late Disseminated Disease
29-40%	29-78%	87%	97%

*Two-tier testing algorithm is based on serum sample initially tested using enzyme-linked immunosorbent assay (ELISA) method. If results of ELISA method are reactive/indeterminate, separate IgM and IgG Western blot tests are performed.

[†]Following antibiotic treatment.

Source: Adapted from Aguero-Rosenfeld ME, Wang G, Schwartz I, Wormer GP. Diagnosis of Lyme borreliosis; Table 4. *Clin Microbiol Rev* [Internet]. 2005 Jul [cited 2018 Feb 9];18(3):484–509. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1195970/>

Box 5. Post-Exposure Prophylaxis

The risk of developing Lyme disease following a tick bite by an infected tick is between 1% and 3%. In Ontario, the prevalence of infected ticks varies by geographic region. In many instances, it is reasonable to adopt the “wait and see” approach and treat patients if they develop symptoms compatible with Lyme disease. Counsel patients to watch for the development of signs and symptoms for 30 days.

Based on the best available evidence, post-exposure prophylaxis can be considered if these four criteria are met:

1. The tick was attached > 24 hours
2. The tick was removed within the past 72 hours
3. The tick was acquired in an area with a prevalence of ticks infected with Lyme disease > 20% (e.g., Rouge National Urban Park and Morningside Park in the Greater Toronto Area, Brighton, Kingston and surrounding areas, Thousand Islands, Brockville, Perth-Smiths Falls and surrounding areas, Ottawa and surrounding areas, and Rondeau Provincial Park in Morpeth)
4. Doxycycline is not contraindicated (Doxycycline is contraindicated for pregnant people and for children < 8 years old. There is insufficient evidence for the prophylactic use of other medications, such as amoxicillin, in these populations)

Adults: 1 dose of doxycycline 200 mg, by mouth

Children ≥ 8 years: 1 dose of doxycycline 4 mg/kg, up to a maximum dose of 200 mg

Box 8. Recommendations for Treatment of Patients With Early Localized Lyme Disease

Drugs	Dosage for Adults	Dosage for Children
Preferred		
Doxycycline	100 mg twice a day for 14–21 d Contraindicated for pregnant or lactating people	Not recommended for children < 8 y For children aged > 8 y, 4 mg/kg/d, in 2 divided doses (maximum 100 mg/dose)
Amoxicillin	500 mg three times a day for 14–21 d	50 mg/kg/d divided in 3 doses (maximum 500 mg/d)
Cefuroxime	500 mg twice per day for 14–21 d	30 mg/kg/d divided in 2 doses (maximum 500 mg/d)
For Allergy or Intolerance*		
Azithromycin	500 mg/d for 7–10 d	10 mg/kg/d (maximum 500 mg/d)
Clarithromycin	500 mg twice a day for 14–21 d Relatively contraindicated in pregnant people	7.5 mg/kg twice a day (maximum 500 mg/d)
Erythromycin	500 mg four times a day for 14–21 d	12.5 mg/kg four times a day (maximum dose 500 mg/d)

*Patients treated with macrolides should be closely monitored to ensure resolution of clinical symptoms as macrolides are less effective.

Source: Adapted from Nadelman RB. Erythema migrans. *Infect Dis Clin N Am*. 2015 Jun [cited 2018 Feb 9];29(2):211–39.