

This decision support tool is intended mainly for primary care clinicians. It is provided for information purposes only and should not replace the judgement of the clinician who performs reserved activities by an act or a regulation. The recommendations in this tool were developed using a systematic process and are supported by the scientific literature and the knowledge and experience of Québec clinicians, experts and patients. For further details, go to the "[Publications](#)" section of INESSS's website [inesss.qc.ca](https://www.INESSS.ca).

WHAT YOU NEED TO KNOW BEFORE INITIATING PEP

Transmission of Lyme disease

- In eastern Canada and the eastern United States: only by black-legged ticks that carry the bacterium *Borrelia burgdorferi*
- Risk of developing erythema migrans (EM) after being bitten by a black-legged tick in a high-risk area (12 to 50% of ticks carriers): 1 to 3% (all stages and durations of attachment combined)
 - If the tick is a carrier: risk low if the duration of attachment is < 24 hrs (tick found flat/not engorged), but this risk increases after 24 hrs
- The risk of the other clinical manifestations of Lyme disease occurring after a black-legged tick bite cannot be determined from the current state of knowledge

Manifestations of Lyme disease and treatment

- Isolated EM: often the first sign but not always present
- Early isolated EM can be mistaken for a local hypersensitivity reaction to the bite (see box [2](#))
- Isolated EM is treated with an antibiotic taken for about 2 weeks. The patient usually makes a full and speedy recovery.
- Other manifestations may point toward Lyme disease and require antibiotic therapy suited to the type of manifestation
 - Certain manifestations may take longer to resolve, and certain symptoms may persist for up to several months (e.g., facial palsy and arthritis)

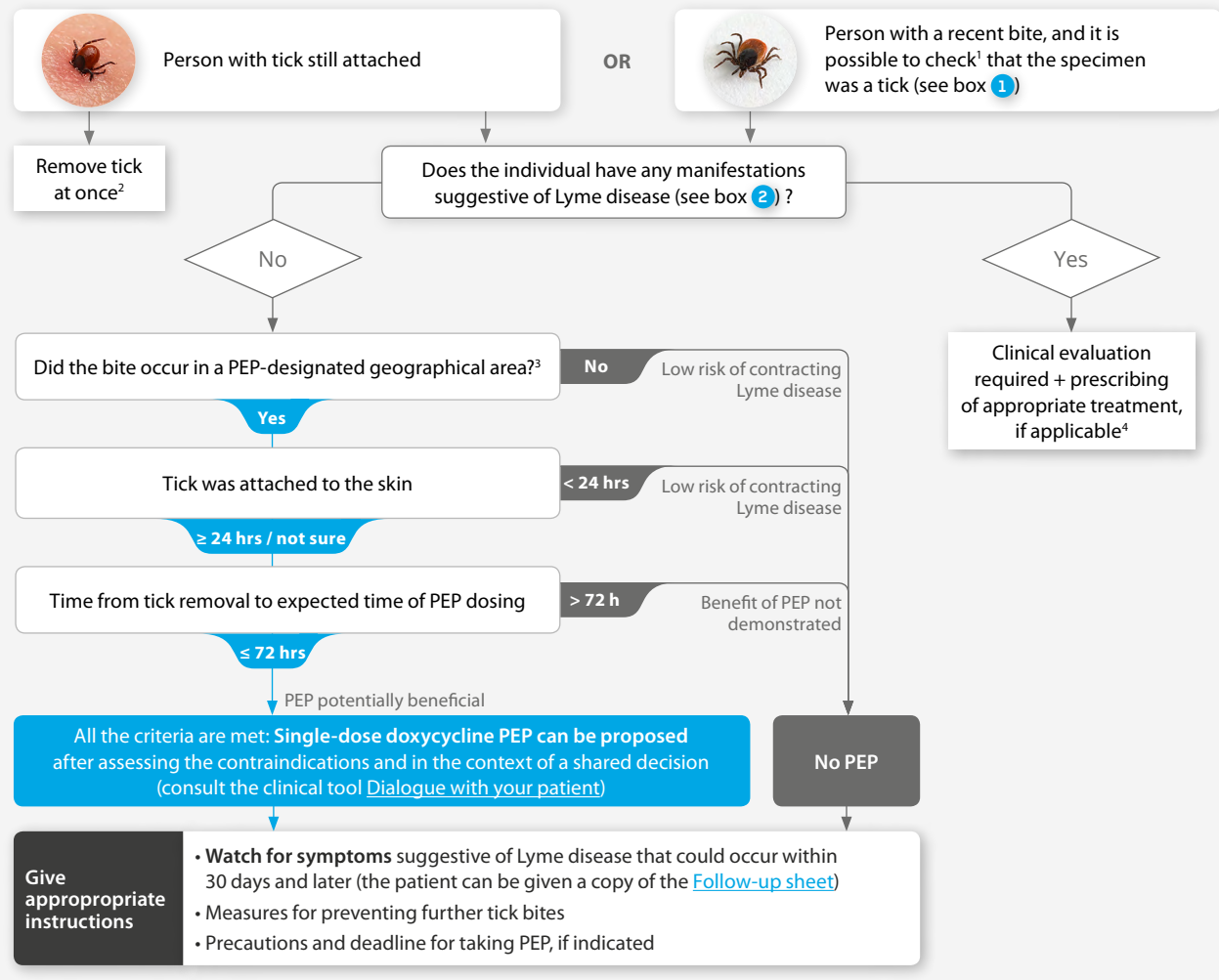
Before initiating PEP

- Confirm the indication by checking that all the criteria are met (see algorithm opposite [→](#))
- Inquire about and assess any contraindications to single-dose doxycycline (see box [4](#))
- If the indication is confirmed:
- Have the person participate in the decision-making (consult the clinical tool [Dialogue with your patient](#))

Tests for detecting microbial agents in ticks

- These tests are not indicated for guiding the decision to initiate PEP

DECISION SUPPORT ALGORITHM FOR DETERMINING WHETHER TO INITIATE PEP



1 CLUES FOR DETERMINING IF THE SPECIMEN IS/WAS A TICK

The specimen is/was firmly attached to the skin

- If the tick is still attached, check if its legs move by touching them
- The tick is the only arthropod in Québec capable of remaining firmly attached to the skin for more than 24 hours

The tick looks like a small spider

Common features:

✓ 4 pairs of legs

✗ No wings

✗ No antennae

Difference:

✗ No constriction between the abdomen and the rest of the body



Engorged female black-legged tick*



Slightly engorged female black-legged tick*



Spider (constriction)

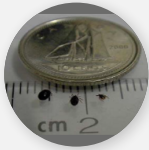


Use a smartphone:

An enlarged photo will help you to examine these clues

Size

- Nymphs or fasting adults: < 5 mm (sesame seeds)
- Engorged female: approximately 1 cm (a small kernel of corn)



Black-legged tick nymphs at the various stages of engorgement†



Female black-legged tick at the various stages of engorgement†

Identifying tick gender and species

- Not necessary for prescribing PEP
- However, if the possibility that the specimen is a black-legged tick (*Ixodes scapularis*) can be ruled out, PEP should not be prescribed
- If necessary, consult: [Guide d'identification des tiques du Québec](#)

2 MANIFESTATIONS SUGGESTIVE OF LYME DISEASE

Before initiating PEP, check that the patient does not have any of the following:

- Redness that could be EM at the bite site or elsewhere on the body
- Neurological manifestation, e.g., facial palsy
- Cardiac manifestations, e.g., chest pain, palpitations or dizziness
- Musculoskeletal manifestations, e.g., severe swelling of the knee
- General systemic symptoms that have occurred since the bite, e.g., headache, fever/chills, nuchal pain or stiffness, or muscle or joint pain (with no swelling)
- If necessary, consult the [Lyme disease diagnostic support tool](#)

Redness at the site of the tick bite: Early EM or hypersensitivity reaction?

- The initial size of the redness is not the best discriminating criterion
- If in doubt about the nature of the redness, it is advisable to monitor its course and to wait 24 to 48 hrs before administering PEP, time permitting⁵ (second visit or explanation given to person)
- To monitor the course of the redness, the contour can be marked and the diameter measured during the visit and again 24 to 48 hrs later (photo with a measuring device useful for comparative purposes)
- If the redness expands to more than 5 cm or if redness < 5 cm persists for more than 72 hrs after the tick is removed, the person should seek medical attention for a full course of antibiotic therapy for EM

[Photos available as a diagnostic aid](#) 📷

Hypersensitivity reaction more likely if :

- Redness appears within the first 24 hours after the bite and regresses in a few days
- Is pruriginous (but not always)
- Size < 5 cm

PEP an option

Early EM more likely if:

- Redness appears a few days after the bite
- Gradually expands over several days (the most specific criterion)
- Size ≥ 5 cm (but can be smaller)

No PEP. Consider complete treatment.

3 DOXYCYCLINE DOSAGE FOR PEP

Age	≥ 12 years	Single dose PO: 200 mg
	8 to 11 years ⁶	Single dose PO: - If weight < 45 kg: 4.4mg/kg (max.: 200 mg)
	< 8 years ^{6,7}	- If weight ≥ 45 kg: 200 mg

Maximum of 72 hours from tick removal to doxycycline dosing

4 CONTRE-INDICATIONS À LA DOXYCYCLINE EN DOSE UNIQUE POUR LA PPE

Absolute	History of allergic reaction to tetracycline antibiotics, e.g., doxycycline, minocycline or tetracycline
Relative ⁸	- Pregnancy - Active liver disease - Decompensated or poorly controlled myasthenia gravis - An obstructive esophageal disorder, e.g., stenosis or achalasia

Do not substitute another antibiotic for single-dose doxycycline. Advise the person with the tick bite to watch for the possible occurrence of symptoms suggestive of LD and to seek medical attention if any appear. (The [Follow-up sheet](#) may be useful for this purpose).

* Source: Laboratoire de santé publique du Québec (LSPQ).

† Source: Health Canada.

5. PEP should be taken no more than 72 hours after tick removal.
6. The use of PEP in these age groups is based on data from subjects aged 12 years and older. There is no commercially available pediatric formulation. However, if need be, an individualized formulation can be prepared by the pharmacy (e.g., a compounded oral suspension).
7. In the doxycycline product monographs, age less than 8 years is a relative contraindication. However, according to the available data, a single dose of doxycycline would have no effect on teeth (low level of evidence). If need be, consult the Québec medical protocol for further details on the data and the informed discussion to be had with the family.
8. In the doxycycline product monographs, breastfeeding too, is a relative contraindication. However, based on INESSS's systematic review, taking a single dose of doxycycline is compatible with breastfeeding. For further information on the relative contraindications, consult, if necessary, the Québec's national medical protocol.