

2025 Vector-borne Diseases Update Lyme Disease, West Nile virus, Anaplasmosis, Babesiosis, and Powassan virus

Attention: Physicians, Hospitals, CNE, ER Manager, ER Physician, Infection Control Practitioners, Occupational Health Professionals, Community Health Centres, Walk-In Urgent Care Clinic, Nurse Practitioner, Ontario Health, Ontario Health Teams, Midwives, Family Health Team, Indigenous Healthcare & Community, Long-Term Care Homes, Retirement Homes, Neighbouring Health Units, Paramedic Services, Corrections

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Lyme Disease

Lyme disease is a growing health risk for residents and visitors of Simcoe Muskoka due to climate change. There were 18 human cases of Lyme disease reported in 2022, 29 human cases reported in 2023, and 47 human cases reported in 2024 for the Simcoe Muskoka region, evidencing the continued upward trend.

With the addition of new vector-borne diseases to the Diseases of Public Health Significance listing in 2023, Public Health Ontario (PHO) has updated its annual risk map to be a [Blacklegged Tick Established Risk Areas map](#). Passive surveillance has identified blacklegged ticks throughout Simcoe Muskoka.

Clinical Supports:

Further to the IDSA Guidance on the evaluation and management of Lyme disease update in 2020, the following revisions in other supporting resources have taken place:

- In 2024, Ontario Health updated the document: [Management of Tick Bites and Investigation of Early Localized Lyme Disease](#):
 - Post-Exposure Prophylaxis (PEP): **One dose of doxycycline 200mg can now be used for all ages and pregnant people.**
 - Recommendations for Treatment of Early Localized Lyme Disease: **Doxycycline treatment can be used for all ages except for pregnant people. Also, Doxycycline is considered to be the preferred antibiotic treatment option by some guidelines for early Lyme disease (erythema migrans) in both children and adults based on its ability to treat potential extracutaneous manifestations of infection (particularly neurological involvement) and potential coinfection or infection with the less prevalent Anaplasma phagocytophilum (anaplasmosis) or Ehrlichia muris-like agent.** The range of duration continues to be 10 to 21 days depending on the antibiotic.
- The Center for Effective Practice (CEFP) has [guidance and information for clinicians and patients](#).
- The Infectious Disease Society of America (IDSA) has a [summary of their guidance](#).
- [SMDHU recorded a webinar for clinicians](#) led by Dr. Colin Lee in May 2021 which discusses (at the 36 min 20 sec mark) the differences between the CEFP and the Ontario Health treatment guidelines.



Lyme Disease Laboratory Testing:

As of 2023, the **modified two-tier testing (MTTT)** approach replaced the previous standard two-tier testing (STTT). The MTTT is more sensitive without a loss in specificity, however, the sensitivity is still relatively low (~58%) for early localized disease. Please refer to the [PHO Lyme Disease test information sheet](#) for details.

What is the clinical guidance for the new MTTT modified two-tier test?

- The first step involves testing using a Tier 1 ELISA test.
- If the initial ELISA test is non-reactive, health care providers should consider an alternative diagnosis or submit a follow-up specimen (2-4 weeks apart) if clinically indicated.
- If the initial ELISA result is reactive or indeterminate, the sample is tested further using Tier 2 ELISA assay.

Blood tests may be negative in patients with early-stage Lyme disease or in patients with early disease who were treated with antibiotics. The stage of the infection and the possible impact of treatment on the outcomes of blood testing should be considered during diagnosis. The sensitivity of tests increases as the infection progresses. The current specimen submission process remains the same and there is no impact on the test frequency, turnaround time, however, is expected to decrease.

Note: PHO does not routinely test for European Lyme disease. If European Lyme disease is suspected, submit a request for European Lyme disease along with appropriate travel history.

Tick Submission Process:

For healthcare providers: Tick submissions are not accepted at local health unit offices. Healthcare providers should consider using eTick.ca for rapid identification of the tick species. Healthcare providers can submit ticks directly to the PHO laboratory for identification. PHO provides a [surveillance form](#) to complete and submit with the tick. **PHO does not do Lyme testing on ticks.** For more information on tick submission to PHO, click [here](#).

Submission of ticks to the public health laboratory is unhelpful for the clinical management of Lyme disease, as results are received well beyond the time when clinical decisions need to be made.

Reporting Requirements:

Lyme disease is designated as a disease of public health significance in Ontario and is reported from clinicians using the [Disease of Public Health Significance reporting form](#), formerly known as the *Communicable Disease Reporting Form*.

Pharmacist Prescribing for Lyme Disease Post-Exposure Prophylaxis

As of 2023, pharmacists in Ontario are authorized to prescribe post-exposure prophylaxis following tick bites to prevent Lyme disease. A new resource entitled "[Assessment and Prescribing Algorithm for Pharmacists: Antibiotic Prophylaxis to Prevent Lyme Disease following a Tick Bite](#)" has been developed.

Prevention and Patient Counselling

Direct your patients to the following resources that highlight key protective behaviours:

- smdhu.org/lyme
- [Ticks & Lyme Disease Fact Sheet](#) (Ontario Ministry of Health)

Additional Tick-borne Diseases of Public Health Significance

In 2023, anaplasmosis, babesiosis, and Powassan virus infection were added to the Diseases of Public Health Significance list. PHO has information on these [diseases and laboratory testing](#). The main vector for transmission is the blacklegged tick (*Ixodes scapularis*). Due to climate change and expanding ranges of blacklegged ticks in Ontario, the risk of contracting these diseases is expected to increase. In Simcoe Muskoka, there were 2 human cases of anaplasmosis reported in 2024 and 1 human case of babesiosis reported in 2023. Powassan virus infection, though rare, is a serious tick-borne illness due to its potential for severe neurological outcomes. In 2024, 1 human case of Powassan virus was reported to the SMDHU. PHO published a [2023 Ontario epidemiological report on babesiosis and anaplasmosis](#).

West Nile Infection

West Nile infection continues to be a risk in Simcoe Muskoka. Five individuals were confirmed to have West Nile virus (WNV) infection in 2024 with 4 cases likely acquiring it within Simcoe and Muskoka. This is beyond the average annual incidence of 0-1 cases.

The period of greatest risk for human WNV acquisition is from July to October. In 2024, traps set weekly resulted in 5 mosquito pools testing positive for WNV (3 in New Tecumseth and 2 in Barrie). These are the first positive WNV mosquito pools collected since 2020.

West Nile virus Clinical Presentation:

- There are 3 clinical manifestations of WNV: asymptomatic, non-neurological, and neurological. The majority of WNV cases are asymptomatic.
- About 20% of infected people develop the less severe symptom complex known as WNV non-neurological syndrome. This presents with a mild flu-like illness with fever, headache, and body aches, occasionally with a skin rash and swollen lymph nodes or other non-specific symptoms that last several days. Other symptoms may include nausea, vomiting, eye pain, or photophobia. WNV neurological symptoms can present as encephalitis, acute flaccid paralysis, or with a clinical presentation similar to Parkinson's disease. Less than 1% of infected people will develop neurological symptoms.
- WNV disease should be considered in individuals with a febrile or acute neurological illness AND recent exposure to mosquitoes, a blood transfusion, or organ transplantation.
 - WNV should be considered in the differential diagnosis in cases of suspected encephalitis and aseptic meningitis (e.g. herpes simplex virus, enteroviruses, among others) or infections caused by other arboviruses with a similar geographic distribution (e.g. Eastern equine encephalitis, Powassan virus, among others).
 - The diagnosis should also be considered in any infant born to a mother infected with the virus during pregnancy or while breastfeeding.

West Nile virus Laboratory Testing:

- Laboratory diagnosis of WNV infection can be accomplished by testing serum or CSF for virus-specific antibodies or nucleic acids. **Serology testing is preferred for individuals suspected of WNV infection.** Testing by PCR is not routinely recommended due to brief episodes of viremia and should be considered only for individuals that are immune compromised. Testing of asymptomatic individuals is not recommended.
- A [specific requisition](#) is required for West Nile virus testing.
 - Include mosquito bite history, symptoms, onset date, relevant travel history.

For more information on vector-borne diseases in Simcoe Muskoka, please visit our [Health Professionals Portal](#) and our [Diseases of Public Health Significance](#) toolkit.