

Dr. Charles Gardner, Medical Officer of Health
Dr. Colin Lee, Associate Medical Officer of Health
Dr. Lisa Simon, Associate Medical Officer of Health

New Vectorborne Diseases of Public Health Significance: Clinical Information, Preventive Measures & Options for Tick Submissions

Attention: Physicians, Emergency Departments, Infection Control Practitioners, Walk-In Clinics/Urgent Care Clinics, Nurse Practitioners, Ontario Health, EMS, Midwives, Community Health Centres, Family Health Teams, Pharmacies, Beausoleil First Nation, Moose Deer Point First Nation, Rama First Nation, Wahta First Nation

Date: July 7, 2023

As of July 1, 2023, the vectorborne diseases noted below are now required to be reported to the Simcoe Muskoka District Health Unit as Diseases of Public Health Significance (formerly known as Reportable Diseases). Environmental and human surveillance for these diseases has not been routinely conducted in Ontario therefore, local estimates of incidence and prevalence are currently not available.

Anaplasmosis

Anaplasmosis, also known as human granulocytic anaplasmosis, is a tickborne disease caused by the bacterium *Anaplasma phagocytophilum*. Primary transmission is through the bite of an infected tick. It usually requires at least 12 hours for the blood feeding tick to be attached to the body for the acquisition of *A. phagocytophilum* to occur.

Symptoms of anaplasmosis typically begin to show within 1-2 weeks (up to 21 days) from a bite of an infected tick. Symptoms can include fever, chills, severe headache, myalgia, abdominal pain, nausea, vomiting, diarrhea, and/or loss of appetite. Respiratory, central nervous symptoms, and rash are infrequently reported. Infections usually last 1-2 weeks if untreated, with persistent symptoms up to 60 days infrequently seen in subacute cases.

Rarely, if treatment is delayed or other medical conditions are present, anaplasmosis can lead to severe illness. Symptoms of severe illness can include respiratory failure, bleeding problems, organ failure, and/or death. Risk factors for severe illness include:

- Coinfection with other tick-borne diseases (e.g., *Borrelia burgdorferi*)
- Delayed treatment
- Advanced age
- Weakened immune system (due to cancer, AIDS, transplantation, or certain medications)

Testing for anaplasmosis is by serology, using a general test requisition. Clinical information is required on the requisition including symptomology, exposure to tick bite, travel history and date of onset. More information on testing is available at: <https://www.publichealthontario.ca/en/Laboratory-Services/Test-Information-Index/Anaplasma-Serology>.



Babesiosis

Babesiosis is a tickborne disease caused by intraerythrocytic protozoan parasites of the genus *Babesia*. *Babesia microti* is the most common species in North America. Primary transmission is through infected blacklegged ticks. *Babesia* infection can range from subclinical to severe. Symptoms typically occur after 1-4 weeks from a bite of an infected tick and up to 6 months after a contaminated blood transfusion. Most infections are asymptomatic; however, infected individuals may show mild to severe systemic symptoms such as fever, chills, sweats, headache, body aches, loss of appetite, nausea, or fatigue. Babesiosis can also cause hemolytic anemia. Chronic infections may last weeks to months.

Babesiosis can become severe and life-threatening in individuals with the following risk factors:

- *Babesia* parasitemia level \geq 4%;
- Hemoglobin < 100 g/L;
- Functional or anatomical asplenia or hyposplenism;
- Weakened immune system (e.g., due to cancer, AIDS, transplantation, or certain medications);
- Serious health conditions (e.g., chronic liver or kidney disease);
- Neonatal prematurity; or
- > 50 years of age.

Severe cases can be associated with marked thrombocytopenia, disseminated intravascular coagulation, hemodynamic instability, acute respiratory distress, myocardial infarction, renal failure, hepatic compromise, altered mental status, and death.

Testing for babesiosis is primarily by microscopy or PCR. Serology can be used however the Public Health Laboratory also recommends thick and thin smears, and EDTA blood for microscopy. Clinical information is required on the test requisition including symptomology, if patient is immunocompromised, travel history and/or if a new immigrant and exposure to blacklegged ticks. More information is available at:

<https://www.publichealthontario.ca/en/Diseases-and-Conditions/Infectious-Diseases/Vector-Borne-Zoonotic-Diseases/Babesiosis>

Powassan Virus Infection

Powassan virus infection is a tickborne disease caused by the RNA virus Powassan virus; a species under the genus *Flavivirus*. Powassan virus is spread to humans by the bite of an infected tick and it may take as little as 15 minutes for the virus to be acquired from a blood-feeding tick.

Symptoms typically occur 1-4 weeks after a bite of an infected blacklegged tick. Most Powassan virus infections are asymptomatic, however infected individuals may show mild to severe symptoms such as fever, headache, nausea, vomiting, asthenia, or myalgia. There may be a transient period of remission after the acute febrile phase, followed by worsening neurological deterioration. Neuroinvasive disease may take the form of meningitis and/or encephalitis syndromes. Approximately 50% of people who survive severe disease have long-term health problems, such as recurring headaches, loss of muscle mass and strength, and memory problems.

Both a general test requisition **and** a specific [arbovirus testing requisition](#) are required for Powassan virus testing and forms must include risk factors such as tick exposure and recent travel. More information is available at:

<https://www.publichealthontario.ca/en/Laboratory-Services/Test-Information-Index/Powassan-Encephalitis-Serology>

Prevention of Anaplasmosis, Babesiosis and Powassan Virus Infection

Preventive measures are similar to other tickborne diseases such as Lyme disease.

While outdoors:

- Wear closed shoes and light-coloured, long sleeve shirts and long pants, tucking pants into socks, and using DEET, icaridin insect repellents or permethrin treated clothing;
- Avoid tick-infested areas when possible;
- Avoid wooded and brushy areas with high grass and leaf litter; and
- Walk in the center of trails.

After you come indoors:

- Check your clothing for ticks;
- Examine gear and pets;
- Shower soon after being outdoors;
- Check your body for ticks after being outdoors;
- Create a tick-safe zone to reduce ticks in the yard; and
- Remove ticks from domestic animals.

Tick Submission Process

For Healthcare Providers: SMDHU encourages health care providers to submit ticks for identification and testing when they have been removed from a patient. PHO provides a [surveillance form](#) that is to be completed and submitted together with the tick. Before submitting the tick to PHO, health care providers may also wish to submit a tick image to [eTick.ca](#) to provide a more rapid identification of the tick species.

For the general public: SMDHU encourages the use of [eTick.ca](#) for tick identification and to contact their health care provider if the tick has been identified as a blacklegged tick. [eTick.ca](#) is a public image-based tick identification platform that can quickly and accurately identify a tick species.

The identification and bacterial testing of ticks is generally unhelpful for the clinical management of vectorborne diseases as results are often received well beyond the time when clinical decisions need to be made.

Anaplasmosis, Babesiosis and Powassan Virus Infection are now reportable as diseases of public health significance and any suspected or confirmed cases should be reported to the Infectious Diseases Program at (705) 721-7520 or 1-877-721-7520 extension 8809 during business hours or after hours to 1-888-225-7851.