CASE DEFINITION FOR TICK-BORNE DISEASES (EXCLUDING LYME DISEASE)

Report any patient less than 18 years of age (up to their 18th birthday) with a **confirmed** *OR* **suspected** case of one of the following tick-borne diseases (TBDs):

- *Anaplasmosis*
- *Babesiosis*
- *Powassan virus*
- *Relapsing fever (hard tick relapsing fever or soft tick relapsing fever)*
- *Rocky Mountain spotted fever*

  A **confirmed** case meets confirmatory laboratory criteria, with or without meeting clinical criteria (see Appendix 1).

  A **suspected** case meets supportive laboratory criteria AND clinical criteria (see Appendix 1).

- *Tick paralysis*

  A **confirmed** case meets confirmatory clinical criteria (see Appendix 1).

Exclusion criteria

- Cases with confirmation of an alternative diagnosis, including other TBDs not listed here, which fully explains all symptoms
- Cases diagnosed by methods and/or laboratories not recommended by the Public Health Agency of Canada or the U.S. Centers for Disease Control and Prevention

Appendix 1

Anaplasmosis

Confirmatory laboratory tests include:

- Four-fold or greater increase in *Anaplasma phagocytophilum* IgG-specific antibody titres by indirect immunofluorescence assay (IFA) between acute and convalescent sera taken 2-4 weeks apart; **OR**
- Detection of *A. phagocytophilum* nucleic acid by molecular methods from an appropriate clinical specimen (e.g., whole blood, buffy coat, cerebrospinal fluid [CSF], or bone marrow/tissue biopsy); **OR**
- Detection of *A. phagocytophilum* antigen by immunohistochemistry (IHC) in a biopsy/autopsy sample; **OR**
- Isolation of *A. phagocytophilum* in cell culture from an appropriate clinical specimen followed by molecular confirmation

Supportive laboratory tests include:

- Elevated *A. phagocytophilum* IgG antibody titres by IFA where the endpoint titre is four-fold greater than the screening dilution of the assay; **OR**
- Identification of typical morulae (microcolonies of *A. phagocytophilum*) in the cytoplasm of granulocytes by microscopic examination from a peripheral blood smear

Clinical criteria include:

- Fever AND at least one of the following: headache, malaise/asthenia, arthralgia/myalgia, mild anemia, thrombocytopenia, leukopenia, elevated hepatic transaminase concentrations, or elevated numbers of immature neutrophils

Babesiosis

Confirmatory laboratory tests include:

- Detection of *Babesia* species *(*e.g., *Babesia microti, B. duncani*, *B. divergens, B. venatorum)* nucleic acid by molecular methods from a whole blood specimen; **OR**
- Identification of *Babesia* sp. organisms by microscopic examination from an appropriate specimen (e.g., Giemsa-stained blood smear)

Supportive laboratory tests include:

- *B. microti* total or IgG antibody titres ≥ 1:64 by IFA; **OR**
- *B. divergens* total or IgG antibody titres ≥ 1:256 by IFA; **OR**
- *B. duncani* total or IgG antibody titres ≥ 1:512 by IFA

Clinical criteria include:

- Fever AND at least one of the following: fatigue, chills, sweats, headache, anorexia, dark urine, jaundice, myalgia, arthralgia, hepatosplenomegaly, hemolytic anemia, or thrombocytopenia

Relapsing fever (hard tick relapsing fever [HTRF] and soft tick relapsing fever [STRF])

Confirmatory laboratory tests include:

- Detection of relapsing fever *Borrelia* sp. (e.g., *B. miyamotoi*, *B. hermsii*) nucleic acid in an appropriate clinical specimen by molecular method;
- Four-fold increase in *B. hermsii* total antibody titre by IFA between acute and convalescent serum (for STRF only)

Supportive laboratory tests include:

- Direct observance of spirochetes suggestive of *Borrelia* sp. on peripheral blood smear, bone marrow, or cerebrospinal fluid;
- Elevated *B. hermsii* antibody titres by IFA (for STRF only)

Clinical criteria include:

- Acute onset of fever or chills AND one or more of the following symptoms or signs: headache, sweats/chills, myalgia, arthralgia, malaise/fatigue, rash, abdominal cramps, nausea, vomiting, diarrhea, dizziness, confusion/altered mental status, photophobia, leukopenia, thrombocytopenia, or elevated aminotransferase levels

Powassan virus (POWV)

Confirmatory laboratory tests include:

- Serological detection of POWV IgM by enzyme immunoassay (EIA) and observation of an increase in POWV neutralizing antibody titres by plaque reduction neutralization testing (PRNT) between acute and convalescent serum; **OR**
- Four-fold increase in total antibody titre by hemagglutination inhibition (HI) assay between acute and convalescent serum and detection of neutralizing antibodies by PRNTs ≥20; **OR**
- Seroconversion (negative to positive) of POWV IgM by EIA or total antibody titre by HI assay between acute and convalescent sera and detection of neutralizing antibodies by PRNT ≥20; **OR**
- POWV IgM in CSF by EIA and a neutralizing antibody titre by PRNT ≥20; **OR**
- Isolation of POWV in cell culture from an appropriate clinical specimen (e.g., tissue, blood, CSF, or other body fluid); **OR**
- Detection of POWV antigen by IHC from an appropriate clinical specimen; **OR**
- Detection of POWV nucleic acid by molecular methods from an appropriate specimen

Supportive laboratory tests include:

- Serological detection of POWV IgM by EIA or HI titre ≥20 AND detection of neutralizing antibody titres by PRNT ≥20 on a single serum sample;
- Serological detection of POWV IgM by EIA without a significant increase in neutralizing antibody titre by PRNTs between acute and convalescent serum samples

Clinical criteria include:

- At least one of the symptoms of the initial febrile phase (include fever, sore throat, drowsiness, headache, and disorientation) or neuroinvasive disease (fever, vomiting, respiratory distress, loss of coordination, speech difficulties, paralysis, or seizures)

Rocky Mountain spotted fever

Confirmatory laboratory tests include:

- Detection of *Rickettsia rickettsii* nucleic acid in an appropriate clinical specimen by molecular methods; **OR**
- Four-fold increase in IgG-specific antibody titre reactive with *R. rickettsii* antigen by IFA between paired serum specimens (one taken in the first two weeks after illness onset and a second taken two to ten weeks after acute specimen collection); **OR**
- *R. rickettsii* antigen in a biopsy or autopsy specimen by IHC

Supportive laboratory tests include:

- Elevated IgG antibody reactive with *R. rickettsii* antigen by IFA within 60 days of illness onset

Clinical criteria include:

- Fever AND one or more of the following: rash, headache, myalgia, anemia, thrombocytopenia, or any hepatic transaminase elevation

Tick paralysis

Confirmatory clinical criteria include:

- Acute, ascending flaccid paralysis with rapid resolution of symptoms following tick removal