



Clinical suspicion of tick-borne disease based on patient characteristics:

- Illness during tick season: fever, chills, headache, muscle aches, joint pain, neck pain, skin rash, Bell's palsy, heart rhythm disturbances, hypotension, jaundice, sepsis.

AND

- Known tick exposure.

OR

- Environmental exposure (outdoor activities, wildlife).

Based on geographic exposure, consider the following tick-borne pathogens. (Choose all that are appropriate.)

At risk for Rocky Mountain Spotted Fever (states with the highest incidence include North Carolina, Oklahoma, Arkansas, Tennessee, Missouri, Arizona, and the tribal Southwest).

- At risk for Lyme disease, ehrlichiosis, anaplasmosis, babesiosis, and *Borrelia miyamotoi* disease (BMD).
- Endemic areas for Lyme disease, anaplasmosis, babesiosis, and BMD include the Northeastern and Upper Midwestern United States, into Canada.
- Ehrlichiosis is most frequently reported from the Southeastern and South Central United States.

YES

YES

SFGP / Spotted Fever Group Antibody, IgG and IgM, Serum
*Consider empiric treatment while awaiting test results.

Classic erythema migrans (target lesion or bull's-eye rash)

NEGATIVE

POSITIVE

NO

YES

- Report as negative.
- If short disease duration, submit follow-up specimen for repeat testing in 2-3 weeks if clinically indicated.

Treat as appropriate

- Perform LYME / Lyme Disease Serology, Serum (Enzyme-Linked Immunosorbent Assay) and if systemic symptoms are present (eg, fever, chills, sepsis) also perform TKPNL / Tick-Borne Panel, Molecular Detection, PCR, Blood^{1,2}
- Consider empiric treatment for ehrlichiosis/anaplasmosis while awaiting test results.
- Consider collecting baseline serology (TICKS / Tick-Borne Disease Antibodies Panel, Serum) if patient presents with >7 days of symptoms.

- No laboratory testing for Lyme disease is needed.
- Treat for Lyme disease.
- Monitor for symptoms of other tick-borne illness.

TKPNL Results

LYME Results

NEGATIVE

POSITIVE

NEGATIVE

POSITIVE OR EQUIVOCAL³

- Report as negative
- If short disease duration, consider follow-up specimen for serologic tests in 2-3 weeks if clinically indicated using: TICKS / Tick-Borne Disease Antibodies Panel, Serum (includes Lyme disease serology)

Treat as appropriate

- Report as negative.
- If short disease duration, submit follow-up specimen for repeat testing in 2-3 weeks if clinically indicated.

LYWB / Lyme Disease Antibody, Immunoblot, Serum (performed automatically when LYME result is positive or equivocal)

NEGATIVE

POSITIVE

- Report as negative.
- If short disease duration, submit follow-up specimen for repeat testing if clinically indicated.
- In immunocompromised patient, consider PBORR / Lyme Disease Molecular Detection, PCR (for CSF, synovial fluid, or fresh tissue samples).

AND/OR

PBORR / Lyme Disease Molecular Detection, PCR, Blood⁴

- Treat as appropriate
- If neurologic or joint symptoms, consider PBORR / Lyme Disease Molecular Detection, PCR (for CSF, synovial fluid, or fresh tissue samples)

OR

- CLYME / Lyme Disease Serology, Spinal Fluid

¹The TKPNL includes PCR tests for *Babesia species*, *Anaplasma phagocytophilum*, *Ehrlichia species*, and *Borrelia miyamotoi*.
²In place of the PCR panel, PCR tests for the individual organisms and/or smear for *Babesia species* can be ordered based on the suspected organism(s).
³If Western blot is positive for IgM and negative for IgG, this may reflect 1) acute Lyme disease, or 2) a false-positive IgM result. The IgM test should only be used to diagnose acute Lyme disease in patients with <4 weeks of symptoms. Typically, a follow-up serology is recommended to demonstrate seroconversion of IgG prior to confirming a case of Lyme disease.
⁴PCR testing of blood may be useful for detection of *Borrelia mayonii* (patients with exposure to ticks in Minnesota or Wisconsin).