Acute Tick-Borne Disease Testing Algorithm

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
- 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 tick-borne relapsing fever (states with highest incidence are Arizona, California, Colorado, Idaho, Kansas, Montana, Nevada, New Mexico, Oklahoma, Oregon, Texas, Utah, Washington, and Wyoming).
- 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.

Perform SPSM / Morphology Evaluation (Special Smear), Blood for detection of relapsing fever Borrelia species spirochetes.

At risk for Rocky Mountain Spotted Fever with highest incidence include the states of Wyoming, Idaho, Utah, Montana, Washington, and Arizona.

Order: SFSGP / Spotted Fever Group Antibody, IgG and IgM, Serum
Empirc treatment encouraged for high risk patients while awaiting results.

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

At risk for Lyme disease in the US (states with highest incidence include New York, New Jersey, Connecticut, Massachusetts, Vermont, Rhode Island, Maine, and Minnesota).

Order: SLYME / Lyme Antibody, Modified 2-Tier, with Reflex, Serum

YES
Consider empiric treatment for ehrlichiosis/ anaplasmosis while awaiting test results.

NO

TKPNL Results

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

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

SLYME or ELYME Results

POSITIVE
- Order SLYME / Lyme Antibody, Modified 2-Tier, with Reflex, Serum
- If systemic symptoms are present (eg, fever, chills, arthralgias) also order TKPNL / Tick-Borne Panel, Molecular Detection, PCR, Blood.
- For patients with exposure to ticks in Europe, consider ELYME / Lyme Disease European Antibody Screen, Serum
- If patient presents with >7 days of symptoms, consider collecting baseline serology (STICK / Tick-Borne Antibodies, Modified 2-Tier, ELISA, Serum)

NEGATIVE OR EQUIVOCAL
- TLYME / Lyme IgM and IgG, Whole Cell Sonicate, ELISA, Serum (performed automatically when SLYME result is positive or equivocal)
- ELYMI / Lyme Disease European Antibody Screen, Serum (performed automatically when ELYME result is positive or equivocal)

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

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

In immunocompromised patient, consider PBORB / Lyme Disease, Molecular Detection, PCR, Varies (for CSF, synovial fluid, or fresh tissue samples)

See Lyme Neuroborreliosis Diagnostic Algorithm for more information.