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To: all ordering providers

Serologic testing for tick borne diseases

To align available lab tests with appropriate clinical decision-making, the clinical laboratory at DHMC Lebanon is now using a fourth generation multi-antigen Lyme assay (Borrelia VlsE1/pepC10 IgG/IgM - test order "Lyme antibody screen") that has excellent sensitivity (90% to 99% in early to late disseminated disease) and specificity (>95% at all stages). The negative predictive value of this test after symptoms appear is 99%(1,2). Positives will be reflexively tested by IgG & IgM western blot, but the IgM western blot will no longer be done without consultation since this test is rarely informative, and is not indicated after the first month of symptoms (3).

The Tick Borne Disease Antibody Panel (Mayo 83265) will no longer be sent out. It includes four tests, only two of which are likely to be useful in our area. Testing is still available for each of the four components of this test. The Lyme serology will be performed at DHMC as above. *Anaplasma* antibodies will be sent to Mayo. *Ehrlichia chaffeensis* antibodies require a history of exposure in an endemic area (Midwest, southern and midatlantic states, we are in a very low prevalence area), and *Babesia* antibodies are not recommended for guiding treatment decisions.

In all instances, testing for tick borne diseases should only be conducted in patients with the appropriate clinical presentation as suggested in the guidelines below.

Lyme disease

Test: Lyme Antibody Screen, if positive will prompt a reflex IgG & IgM Western blot (Lyme antibody confirmation by immunoblot).

Syndromes that should prompt testing in patients with appropriate risks of exposure:

1. A single acutely hot swollen joint
2. Aseptic meningitis
3. Facial palsy or other unexplained acute cranial neuritis
4. Acute heart block

Syndromes that should NOT prompt testing:

1. Unexplained fatigue
2. Afebrile polyarthralgia
3. Dementia

Note: a rash consistent with erythema migrans should be treated as Lyme disease and does not require testing or a positive result.

Anaplasmosis (*Ehrlichia* testing requires travel history or consultation)

Test: Anaplasma phagocytophilum antibody, serum or, for a syndrome of under 2 weeks' duration, PCR (Anaplasma/Ehrlichia molecular detection, blood)

Syndromes that should prompt testing:

1. Febrile hepatitis
2. Hepatitis in a patient with Lyme or another tick-borne illness

3. High fever, thrombocytopenia, or leukopenia in a patient with suspected Lyme disease
4. Fever, thrombocytopenia and leukopenia

Babesia

Test: Blood parasite exam (by microscopy) PCR only by consultation with Clinical Pathologist.

Syndromes that should prompt testing:

1. Hemolytic anemia, particularly if febrile
 2. Unexplained anemia in a patient with another tick-borne illness
- * Note: Babesia antibody is only appropriate to use in rare settings and should not be used as a routine test

References

1. Bacon RM, Biggerstaff BJ, Schriefer ME, Gilmore RD, Philipp MT, Steere AC, et al. Serodiagnosis of Lyme disease by kinetic enzyme-linked immunosorbent assay using recombinant VlsE1 or peptide antigens of *Borrelia burgdorferi* compared with 2-tiered testing using whole-cell lysates. *Journal of Infectious Diseases*. 2003;187(8):1187-99.
2. Porwancher RB, Hagerty CG, Fan J, Landsberg L, Johnson BJ, Kopnitsky M, et al. Multiplex immunoassay for Lyme disease using VlsE1-IgG and pepC10-IgM antibodies: improving test performance through bioinformatics. *Clinical and Vaccine Immunology*. 2011;18(5):851-9.
3. Sivak SL, Aguero-Rosenfeld ME, Nowakowski J, Nadelman RB, Wormser GP. Accuracy of IgM immunoblotting to confirm the clinical diagnosis of early Lyme disease. *Archives of Internal Medicine*. 1996;156:2105-9.