

DATE:	July 27, 2018
TO:	Health Alert Network
FROM:	Rachel Levine, MD, Secretary of Health
SUBJECT:	Heartland and Bourbon Virus Testing Guidance
DISTRIBUTION:	Statewide
LOCATION:	Statewide
STREET ADDRESS:	n/a
COUNTY:	n/a
MUNICIPALITY:	n/a
ZIP CODE:	n/a

This transmission is a “Health Advisory” provides important information for a specific incident or situation; may not require immediate action.

HOSPITALS: PLEASE SHARE WITH ALL MEDICAL, PEDIATRIC, INFECTION CONTROL, NURSING AND LABORATORY STAFF IN YOUR HOSPITAL; EMS COUNCILS: PLEASE DISTRIBUTE AS APPROPRIATE; FQHCs: PLEASE DISTRIBUTE AS APPROPRIATE LOCAL HEALTH JURISDICTIONS: PLEASE DISTRIBUTE AS APPROPRIATE; PROFESSIONAL ORGANIZATIONS: PLEASE DISTRIBUTE TO YOUR MEMBERSHIP

Summary

- CDC Arboviral Diseases Branch will now offer routine diagnostic testing for Heartland and Bourbon viruses (transmitted by the Lone Star tick).
- To submit samples for testing, send to PADOH BOL with both BOL and CDC submission forms.
- In addition to testing for more likely arboviruses in Pennsylvania (such as West Nile, Powassan, Eastern equine encephalitis, etc.), testing for Heartland or Bourbon virus should be considered for patients with an acute febrile illness within the past 3 months **AND** at least one epidemiologic criterion **AND** at least one clinical criterion (see below for details).

Background on Heartland and Bourbon virus

Heartland virus is an RNA virus in the genus *Phlebovirus*, family *Phenuiviridae* believed to be transmitted by the Lone Star tick (*Amblyomma americanum*). First discovered as a cause of human illness in 2009 in Missouri, more than 35 cases of Heartland virus disease have been reported from states in the midwestern and southern United States to date. Most people diagnosed with the disease become sick between May and September.

Bourbon virus is an RNA virus in the genus *Thogotovirus*, family *Orthomyxoviridae* that was recently discovered in Bourbon County, Kansas. Only a few cases of Bourbon virus disease have been identified in the United States, and the geographic distribution appears to be similar to that of Heartland virus. Although it is not yet known how people become infected with Bourbon virus, most patients reported exposure to ticks before becoming ill and the virus has been identified in Lone Star ticks. Symptoms for both diseases have included fever, fatigue, anorexia, nausea, and diarrhea. Patients with Bourbon virus disease might also present with a diffuse, maculopapular rash. Both viruses have been found to cause leukopenia, thrombocytopenia, and elevated liver transaminases.

Who should be tested for Heartland and Bourbon virus disease?

In addition to testing for more likely arboviruses in Pennsylvania (such as West Nile, Powassan, Eastern equine encephalitis, etc.), testing for Heartland or Bourbon virus should be considered for patients with an acute febrile illness within the past 3 months **AND** at least one epidemiologic criterion **AND** at least one clinical criterion.

Epidemiologic criteria

- 1) Known tick bite, finding tick on body, or potential exposure to ticks through outdoor activities in the 3 weeks prior to illness onset during spring through fall (e.g., April–October); **OR**
- 2) Resides in or recently traveled to an area with previous evidence of Heartland or Bourbon virus

Clinical criteria

- 1) Leukopenia (white blood cells <4,500 cells/ μ L) or thrombocytopenia (platelets <150,000 cells/mL) not explained by another known condition; **OR**
- 2) Suspected tickborne disease (e.g., ehrlichiosis, Rocky Mountain spotted fever) with no clinical response to appropriate treatment (e.g., doxycycline)

Samples collected >3 months after symptom onset will not be tested at this time.

Testing for evidence of Heartland and Bourbon virus disease

As of July 2018, the following tests for Heartland and Bourbon virus are available at CDC:

Test	Heartland virus	Bourbon virus
RT-PCR	Yes	Yes
IgM MIA	Yes	Not available
IgG MIA	Yes	Not available
PRNT	Yes	Yes

Abbreviations: IgM – immunoglobulin M; IgG – immunoglobulin G; MIA – microsphere-based immunoassay; RT-PCR – reverse transcriptase-polymerase chain reaction; PRNT – plaque reduction neutralization test

For specimens collected <7 days after onset of symptoms, serum and/or whole blood should be submitted for Heartland and Bourbon virus RT-PCR and antibody testing.

For specimens collected \geq 7 days after onset of symptoms, serum specimens should be submitted for antibody testing. If the patient is immunocompromised, RT-PCR also may be performed on serum collected >7 days after onset.

Because there is no specific IgM antibody test yet available for Bourbon virus, acute and convalescent samples will be needed to make the diagnosis of an acute Bourbon virus infection using serologic assays.

Submitting specimens to BOL for Heartland and Bourbon virus testing

To submit samples for Heartland or Bourbon virus testing at the CDC Arboviral Diseases Branch, please send the sample through the Pennsylvania Department of Health Bureau of Laboratories (PADOH BOL).

All samples should be submitted with both a complete [PADOH BOL form](#), and a CDC submission form ([CDC 50.34](#)) with the following information completed: 1) Patient name or unique ID, date of birth, and sex; 2) Date of illness onset; 3) Date of specimen collection; 4) Immunocompromising conditions or medications; and 5) Travel history within 3 months prior to symptom onset. More information on submitting a sample for testing at CDC Arboviral Diseases Branch is provided at: <https://www.cdc.gov/ncezid/dvbd/specimensub/arboviral-shipping.html>

Include the specific epidemiologic and clinical criteria used to determine that testing for Heartland and Bourbon virus disease is appropriate in the comments section on form CDC 50.34. Healthcare providers are encouraged to discuss whether a patient meets both the epidemiologic and clinical criteria by calling Krystal Mason, Arbovirus Coordinator, at 717-787-3350.

Reporting of Heartland or Bourbon virus disease cases

Report all tickborne diseases, confirmed or suspected, to the DOH web-based electronic disease

surveillance system, PA-NEDSS: <https://www.nedss.state.pa.us/nedss/default.aspx>. Since neither Heartland nor Bourbon virus disease cases are currently available as choices in PA-NEDSS, for the present please report as Rocky Mountain Spotted Fever and address the possibility of Heartland or Bourbon virus in the notes.

Additional information

CDC Bourbon virus website: <https://www.cdc.gov/ncezid/dvbd/bourbon/index.html>

CDC Heartland virus website: <https://www.cdc.gov/heartland-virus/index.html>

Missouri Department of Health and Senior Service Heartland and Bourbon virus fact sheet:
<https://health.mo.gov/living/healthcondiseases/communicable/tickscarrydisease/pdf/HeartlandBourbonVirus.pdf>

Categories of Health Alert messages:

Health Alert: conveys the highest level of importance; warrants immediate action or attention.

Health Advisory: provides important information for a specific incident or situation; may not require immediate action.

Health Update: provides updated information regarding an incident or situation; unlikely to require immediate action.

This information is current as of July 27, 2018, but may be modified in the future.
