Health Guidance:

Chikungunya Virus

July 24, 2014

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Health Guidances contain comprehensive information pertaining to a particular disease or condition, and include recommendations, guidelines, etc. endorsed by DHSS.

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Health Guidance
July 24, 2014

FROM: GAIL VASTERLING
DIRECTOR

SUBJECT: **Chikungunya Virus**

Link to: Emergency Room and Primary Care Providers' Reference Sheet

Summary

As of the date of this guidance, over 300 imported cases of chikungunya virus disease (CHIK) have been reported in 35 states and two territories according to the Centers for Disease Control and Prevention (CDC). On July 17, 2014, Florida public health officials confirmed two cases linked to locally infected mosquito populations rather than having been acquired through foreign travel. Local transmission had been expected in some geographically limited areas of the United States because the risk of introduction into resident mosquito populations is high due to travel importation of the virus, the existence in those areas of competent mosquito vectors (same vectors as dengue), and population susceptibility. CHIK virus (CHIKV) is not known to be circulating in Missouri. Most commonly, patients with CHIK experience fever and severe joint pain, usually in the hands and feet. The symptoms will appear within 3 – 7 days of being bitten by an infected mosquito. Presently, there are no anti-viral medications for treating CHIK, but there are medications that can help relieve the pain. No vaccine exists to prevent CHIK infection or disease. The CHIK threat to the United States must be met primarily with standard public health approaches such as mosquito control and avoidance. There is an important role for astute clinicians in diagnosing and reporting the disease when it occurs, and cooperation and collaboration among medical and public health professionals is needed to prevent the further introduction and establishment of this emerging disease.

CHIKV is a mosquito-borne alphavirus transmitted primarily by the yellow fever mosquito, *Aedes aegypti*, and the Asian tiger mosquito, *Ae. albopictus*. Humans are the primary reservoir during epidemics. Outbreaks have been documented in Africa, Southern Europe, Southeast Asia, the Indian subcontinent, and islands in the Indian and Pacific Oceans. In December 2013, an outbreak of CHIK appeared in Saint-Martin/Sint Maarten and spread to other Caribbean islands and contiguous Central and South American countries. As of the date of this guidance, the Pan American Health Organization has reported 442,310 suspected and confirmed cases of CHIK in 26 countries or jurisdictions in the Americas, with continuing local transmission and epidemic spread.

The Asian tiger mosquito (ATM) is a secondary vector in worldwide CHIKV transmission; however, it may play a significant role in the establishment of the virus outside tropical zones in the Americas. Unlike the yellow fever mosquito, the ATM is common in Missouri. It is an aggressive daytime biter and breeds prolifically by means of neglected water containers such as waste tires, flowerpot saucers, and buckets. Community-based Integrated Mosquito Management (IMM)

practices are recommended to prevent establishment of endemic CHIK transmission. The lay person can often eliminate breeding sources around the home, but professional vector management specialists should be consulted when a source is not apparent or area-wide control is needed. Simple precautions, such as using effective mosquito repellents and wearing proper attire, can reduce the risk of contracting this illness.

Public Health Reporting and Response to Patients with CHIK Clinical Illness

In June 2014, the Council of State and Territorial Epidemiologists (CSTE), in collaboration with CDC, put forward a position statement recommending that CHIK be added to the list of nationally notifiable conditions. CSTE members approved the resolution, but it does not take effect until January 1, 2015. However, given the potential of CHIK to create a substantial public health risk, the Missouri Department of Health and Senior Services (DHSS) requests that laboratories and medical care providers report suspected CHIK cases within three days as a "novel and/or emerging disease" in accordance with the state's disease reporting rule (19 CSR 20-20.020, *Reporting Communicable, Environmental and Occupational Diseases*; http://www.sos.mo.gov/adrules/csr/current/19csr/19c20-20.pdf). Reports should be made to the local public health agency (LPHA), or to DHSS (for the latter - Monday through Friday, 8:00 AM to 5:00 PM, telephone 573/751-6113 or fax 573/526-0235; after hours and weekends telephone 800/392-0272). Medical care providers are asked to include in their report a brief clinical summary, the type of diagnostic testing performed/pending, the illness onset date, and travel history with dates, when possible. DHSS encourages medical care providers to rule out other mosquito-borne illnesses endemic to the traveled area(s), including dengue fever and malaria.

As resources permit, DHSS and LPHA disease investigators will assess reported cases for possible travel-associated (versus locally-acquired) infections. For individuals with recent travel, investigators will attempt to determine the specific dates and locations of travel in the two weeks prior to illness onset. Investigators will also seek to determine the risk of a patient's having been viremic while in the United States before illness onset. Such investigations are critical to understanding the nature and scope of this disease should it be introduced into Missouri. This information could then be utilized to address concerns from the public, increase awareness within the medical community, provide advice to persons with travel plans to CHIK-endemic areas of the world, and prevent local transmission of this virus in the state.

To mitigate the risk of local CHIK transmission via mosquito bites, DHSS recommends that medical care providers counsel the case-patient to stay in air-conditioned or screened accommodations during the first week of illness. The case-patient should also use a mosquito repellent that contains an effective active ingredient like DEET or other CDC-recommended active ingredients. The likelihood of an individual serving as a source of infection for mosquitoes typically diminishes within a week of the illness onset.

Mosquito Management

Based on the assessed risk of local transmission, LPHA disease investigators may wish to consult with local vector control programs and DHSS to determine if vector control and mosquito trapping should be considered for the area. Municipal or county-level sanitation professionals can assess the neighborhood of the case-patient to identify and eliminate mosquito larval breeding areas.

The State of Missouri does not conduct mosquito control. The decision to establish and fund a mosquito control program is a local function and is based on factors such as public demand, assessments of risk for human disease, and available financial and public personnel resources. The authority to secure funding and conduct such a program is available to municipal or county governments. Local health departments may also use education and outreach programs for the general public to increase awareness of mosquito presence, prevention techniques, and population control activities that can be implemented with minimal resources.

Questions Regarding This CHIKV Health Guidance

For Missouri providers, questions can be directed to DHSS' Office of Veterinary Public Health, Monday through Friday, 8:00 AM to 5:00 PM, 573/526-4780; after hours and weekends, 800/392-0272.

Resources and References

1. Pan American Health Organization and CDC. Preparedness and response for chikungunya virus introduction in the Americas. Washington, DC: Pan American Health Organization, World Health Organization; 2011. http://new.paho.org/hq/index.php?option=com_docman&task=doc_download&gid=16984&itemid
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3. Morens DM, Fauci AS. Chikungunya at the Door - Deja Vu All Over Again? N Engl J Med, 2014. http://www.nejm.org/doi/full/10.1056/NEJMp1408509
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5. Armed Forces Health Surveillance Center. Images in health surveillance: dengue and chikungunya virus vectors and prevention. MSMR Jan; 21(1): 16-7. http://www.afhsc.mil/viewMSMR?file=2014/v21_n01.pdf#Page=16
6. Centers for Disease Control and Prevention. Chikungunya virus. Atlanta, GA: US Department of Health and Human Services; 2014. http://www.cdc.gov/chikungunya
7. Missouri Department of Health and Senior Services. Data and statistical reports Missouri mosquito-borne diseases. http://health.mo.gov/living/healthcondiseases/communicable/westnilevirus/reports.php

MO Emergency Room/Primary Care Providers' Reference Sheet: Chikungunya Virus Infection
Missouri Department of Health and Senior Services
July 24, 2014
*****Notify Public Health Agency Because Interventions May Be Required*****

Clinical Assessment

- Chikungunya virus disease (CHIK) onset is usually sudden:
  - Average incubation period of 3-7 days (range: 1–12 days).
  - Chikungunya virus (CHIKV) can coexist with other infections (e.g., dengue fever, malaria).
  - Approximately 25% of human CHIKV infections are subclinical.

- The most common symptoms:
  - High fever (typically greater than 102°F [39°C]); however, antipyretics may suppress fever.
  - Acute polyarthritis or polyarthralgia to the degree of severe incapacitation due to pain, swelling, inflammation, and stiffness.
    - Usually symmetric and most commonly in hands and feet.
    - Can affect more proximal joints.

- Other symptoms include headache, nausea/vomiting, conjunctivitis, myalgias, and maculopapular rash or diffuse erythema.

- Atypical manifestations of CHIKV infection have included:
  - Meningoencephalitis, encephalopathy, seizures
  - Myocarditis, pericarditis
  - Photosensitive hyperpigmentation
  - In infants, high grade pain, convulsions, bullous dermatosis, and encephalitis

Routine Laboratory Tests

- Laboratory findings can include:
  - Mild thrombocytopenia (>100,000 per µL)
  - Leukopenia
  - Elevated liver function tests
  - Elevated erythrocyte sedimentation rate
  - Elevated C-reactive protein

Recommended Chikungunya Virus Diagnostic Assays

Optimal Timing	Test	Specimen	Sensitivity
≤5 days after illness onset	RT-PCR	Serum	• CHIKV RT-PCR is most sensitive when done within 8 days of illness onset.
≥5 days after illness onset	Antibody tests	Serum	• CHIKV IgM enzyme immunoassay (EIA) and immune-fluorescence assay (IFA) are most sensitive at least 4 days post illness onset. • Convalescent samples should be obtained on patients whose acute samples test negative. • The plaque reduction neutralization test (PRNT) detects virus-specific neutralizing antibodies. Paired acute and convalescent (2-4 weeks after acute) specimen analysis is the gold standard for confirming CHIKV infection.

Overlap/Confusion with Dengue Fever

It is difficult to distinguish CHIK and dengue on clinical findings alone; serologic diagnostics are necessary. The viruses can circulate in the same area, can be transmitted by the same mosquito species, and may cause occasional co-infections. Patients with suspected CHIK should be managed as dengue until dengue has been ruled out. Therefore, clinicians should test for both CHIK and dengue, obtain results, and manage patients accordingly. Proper clinical management of dengue reduces the risk of medical complications and death. Aspirin and other non-steroidal anti-inflammatory drugs (NSAIDs) can increase the risk of hemorrhage in patients with dengue.

- Principal features distinguishing CHIK from dengue fever include:
  - Shock or severe hemorrhage is very rarely observed with CHIK.
  - Onset is more acute for CHIK, and the duration of fever is much shorter.
  - Maculopapular rash is more frequent with CHIK.
  - With CHIK, body pain is typically more pronounced and localized to the joints and tendons.

Diagnostic Assay Availability

Requests for CHIK testing through the Missouri State Public Health Laboratory (MSPHL) and Centers for Disease Control and Prevention (CDC) are first reviewed by a Missouri Department of Health and Senior Services (DHSS) epidemiologist. Analyses are prioritized to support identification of settings that could lead to the introduction of CHIKV into Missouri.

- Before submitting a specimen, medical providers must call DHSS (Monday through Friday, 8:00 AM to 5:00 PM, 573/526-4780; after hours and weekends, 800/392-0272) for an epidemiologist consultation to confirm the patient meets testing criteria:
  - Clinical criteria:
    - Fever or chills as reported by the patient or a health-care provider, AND
    - Arthralgia or arthritis involving two or more joints, AND
    - Absence of a more likely clinical explanation.
  - Epidemiologic criteria: Illness onset date and travel history with dates.
- After a determination that the patient meets laboratory surveillance criteria, the medical provider should contact MSPHL (Monday through Friday, 8:00 AM to 5:00 PM, 573/751-3334; after hours and weekends, 800/392-0272) for guidance on specimen collection and shipping.
- Assays available through MSPHL and CDC are RT-PCR for direct detection of viral RNA, and EIA and PRNT for detecting antibody response.

CHIKV RNA detection by RT-PCR and CHIKV antibody detection with reflex to IFA titers are also available through Focus Diagnostics. Other commercial laboratories can forward specimens to Focus for testing. For more information, go to: www.focusdx.com/focus/1-reference_laboratory/index.asp or call 800/445-4032 or 800/445-0185.

Treatment

There is no specific antiviral drug treatment for CHIK. Symptomatic treatment is recommended after excluding more serious conditions like malaria, dengue, and bacterial infections.

Blood, Organ, and Tissue Safety

Laboratory personnel and health care workers are at risk of acquiring CHIKV infection by handling infected blood specimens. Biosafety measures are contained in the CDC document at: www.cdc.gov/biosafety/publications/bmbl5.

Public Health Reporting and Intervention

- CHIK could create a substantial public health risk. Laboratories and medical care providers are asked to report suspected CHIK cases within three calendar days to their local public health agency or DHSS (for the latter - Monday through Friday, 8:00 AM to 5:00 PM, 573/751-6113 or fax 573/526-0235; after hours and weekends, 800/392-0272).
- Humans are the primary reservoir of CHIKV. To prevent the infection of others in the community with CHIKV, patients with suspected acute infections should be instructed to stay indoors with air conditioning, window and door screens, or other measures to avoid being bitten by mosquitoes during the viremic phase of illness, which usually encompasses the first week of symptoms.

Questions Regarding This Providers' Reference Sheet: Chikungunya Virus Infection

For Missouri providers, direct questions to DHSS' Office of Veterinary Public Health, Monday through Friday, 8:00 AM to 5:00 PM, 573/526-4780; after hours/weekends, 800/392-0272.