

Information for Clinicians: *Aedes aegypti* and *Aedes albopictus* Mosquitoes in California and Reporting Patients with Suspected Dengue or Chikungunya to Public Health

Aedes albopictus, the Asian tiger mosquito, and *Aedes aegypti*, the yellow fever mosquito, are invasive species that have become established in some [California counties](#), and there is the potential for them to spread into other regions of the state. Both species are aggressive day-biters and capable vectors of several arboviruses including those that cause dengue and chikungunya disease in humans. They can lay eggs in any small artificial or natural container that holds water.

Currently in California the risk of local dengue or chikungunya transmission is very low. However, either species can initiate local transmission of dengue or chikungunya virus after biting a viremic visitor to California or returned traveler from an endemic area. The California Department of Public Health (CDPH) monitors reported cases of dengue and chikungunya and works with local public health and mosquito and vector control agencies to enhance surveillance and implement aggressive control measures for these *Aedes* mosquitoes.

Clinicians play an important role in public health surveillance for these exotic arboviruses. Clinicians in or near California counties where *Aedes aegypti* and *Aedes albopictus* mosquitoes are established should be aware that these mosquitoes have the potential to transmit dengue and chikungunya locally. Dengue is a reportable disease in California. Chikungunya became a nationally notifiable disease in January 2015.

What clinicians can do:

- Review the epidemiology and signs and symptoms of dengue and chikungunya.
- Consider dengue or chikungunya in the differential diagnosis of febrile patients with signs and symptoms consistent with each disease who:
 - Have traveled to a dengue- or chikungunya-endemic area or a region with known virus transmission in the two weeks prior to symptom onset OR
 - Live, work, or have recently visited areas where *Aedes aegypti* or *Aedes albopictus* are established in California regardless of history of travel.
- Report suspect cases of dengue and chikungunya to the local health department, which can assist with coordinating tests needed to help confirm the diagnosis.
- Immediately report to the local health department any suspect dengue or chikungunya case without known travel to an endemic region.
- If chikungunya is suspected, request tests for both dengue and chikungunya as

the viruses are transmitted by the same vector, have similar clinical features, and may co-circulate. Establishing the diagnosis of dengue is important because proper clinical management of dengue can improve outcome.

- Advise symptomatic patients with suspect dengue or chikungunya to take measures to avoid being bitten by mosquitoes during the first week of illness to decrease risk of spreading the virus; patients should remain indoors, apply mosquito repellent, and empty water-holding containers around the home.

Dengue: Epidemiology and Clinical Presentation

Dengue is a mosquito-borne infection caused by any of four distinct but closely related dengue virus (a flavivirus) serotypes (DENV-1 to -4). Worldwide, dengue is a major public health problem in the tropics and subtropics. It is the most frequent cause of acute febrile illness among U.S. travelers returning from parts of Asia, Latin America, and the Caribbean. In the U.S. since 2000, locally-acquired dengue has been documented periodically in Hawaii, Texas, and Florida where *Aedes aegypti* and/or *Aedes albopictus* are established. The first locally-acquired cases of dengue in California were documented in 2023.

Dengue has no animal reservoir and is not contagious person-to-person. In rare cases, dengue can be transmitted through organ transplants, blood transfusions, or from infected pregnant mother to infant in utero or during delivery.

The incubation period for dengue is typically 3-14 days. A high proportion of infected people are asymptomatic or have a mild, non-specific febrile illness. Patients are viremic from approximately 1 day before to 4-5 days after onset of fever.

Classic dengue fever (or "breakbone fever") is characterized by acute onset of high fever 3-14 days after the bite of an infected mosquito. Symptoms often include frontal headache, retro-orbital pain, myalgia, arthralgia, and maculopapular rash. Some patients progress to more severe disease, such as dengue hemorrhagic fever with hemorrhagic manifestations, thrombocytopenia, and plasma leakage, and then dengue shock syndrome, which can be fatal. Treatment is supportive. The U.S. Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO) provide guidance on diagnosis, management, and treatment of dengue (see [Resources](#) below).

Chikungunya: Epidemiology and Clinical Presentation

Chikungunya is a mosquito-borne infection caused by chikungunya virus (CHIKV), an alphavirus. It is characterized by acute onset of fever and severe polyarthralgia. Worldwide, outbreaks have occurred in countries in Africa, Asia, Latin America, and the Indian and Pacific oceans. In late 2013, chikungunya arrived in the Americas with locally-acquired cases reported in the Caribbean. By October 2015, local transmission was identified in many countries and territories of South, Central, and North America, and the Caribbean. Local transmission of chikungunya occurred in Florida in 2014 and in Texas in 2015. Travel-associated cases have been reported throughout the United States since 2014, but to date, there have been no locally-acquired cases in California.

Similar to dengue, chikungunya has no animal reservoir and is not contagious person-to-person. In rare instances, chikungunya has been transmitted from an infected pregnant mother to infant in utero or during delivery. Transmission has been reported in laboratory workers and a healthcare worker via a needle stick. CHIKV may potentially be transmitted by an infected donor through organ transplants or blood transfusions.

Chikungunya fever occurs 3-7 days (range 1-12 days) after the bite of an infected *Aedes* mosquito; unlike dengue, most people infected with CHIKV become symptomatic. Chikungunya is usually characterized by acute onset of fever (typically >39°C [102°F]) and polyarthralgia. Joint symptoms are usually bilateral and symmetric involving the hands and feet and can be severe and debilitating. Other symptoms may include headache, myalgia, arthritis, conjunctivitis, nausea/vomiting, or maculopapular rash.

Acute symptoms typically resolve within 7-10 days. However, some studies report variable proportions of patients with persistent joint pains for months to years. Rare complications include uveitis, retinitis, myocarditis, hepatitis, nephritis, bullous skin lesions, hemorrhage, meningoencephalitis, myelitis, Guillain-Barré syndrome, and cranial nerve palsies. Persons at risk for severe disease include neonates exposed intrapartum, older adults (e.g., >65 years), and persons with underlying medical conditions (e.g., hypertension, diabetes, or cardiovascular disease). Some patients might have relapse of rheumatologic symptoms (e.g., polyarthralgia, polyarthritis, tenosynovitis) in the months following acute illness. Mortality is rare and occurs mostly in older adults.

Laboratory Diagnosis for Dengue and Chikungunya

Dengue and chikungunya can be diagnosed by serological or molecular methods:

Serology: DENV or CHIKV-specific IgM antibodies are often detected by 6 days after onset of symptoms. Acute and convalescent sera (2-3 weeks between samples) for detection of dengue or chikungunya-specific IgM and IgG antibodies are encouraged for

generating the most accurate evidence of acute arbovirus illness. Antibodies to dengue and chikungunya may cross-react with other flaviviruses and alphaviruses respectively in serologic assays.

Molecular testing: DENV and CHIKV can be detected in blood (serum) and other body fluids from patients using reverse-transcription-polymerase chain reaction (RT-PCR) during the first 7 (for DENV) to 8 (for CHIKV) days of symptoms.

Diagnostic tests are available through some commercial laboratories, CDPH, and CDC. The CDPH Viral and Rickettsial Disease Laboratory (CDPH-VRDL) offers RT-PCR testing for detection of DENV and CHIKV RNA, and serologic tests for the diagnosis of dengue and chikungunya. Please contact your local health department for guidance on submitting specimens.

Resources

[CDPH Vector Borne Diseases Section](#): Invasive *Aedes* information and educational materials

- [Map: *Aedes aegypti* and *Aedes albopictus* Mosquitoes in California by County](#)

[CDPH-VRDL](#): Guidelines for laboratory services and specimen submittal forms

[CDC Information on Dengue](#)

- [CDC HealthMap Collaboration: Global Map on Dengue](#)
- [CDC Dengue Information for Healthcare Providers](#)
- [CDC Dengue Data and Maps](#)

[WHO Dengue Guidelines for Diagnosis, Treatment, Prevention, and Control, 2009](#)

[CDC Information on Chikungunya](#)

- [CDC Chikungunya Virus Information for Health Care Providers](#)
- [CDC Areas at Risk for Chikungunya](#)

[APHA: Control of Communicable Diseases Manual](#), 18th Edition, DL Heymann, Editor (available for purchase at <https://www.apha.org/Publications/Published-Books/CCDM>)

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