Dengue virus in Texas

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A locally acquired dengue virus infection was recently reported in Texas. This report reviews the characteristics and clinical implications of these infections in the southern United States.

Dengue virus (DENV) is an RNA virus with four antigenically different serotypes: DENV-1, DENV-2, DENV-3, and DENV-4. It is part of the Flavivirus family and is transmitted by the Aedes mosquito. It is the most prevalent arboviral disease in the world, but only an estimated one in four cases is symptomatic.[1]

Clinical manifestations of DENV infection can be divided into febrile, critical, and convalescent phases. The febrile phase begins after an incubation period of 5–7 days, and symptoms include high fever, headache, retro-orbital pain, myalgia, arthralgia, and macular rash, usually described as "white islands in a sea of red" (Figure 1). Minor hemorrhagic manifestations can also be present. Most notable laboratory features include leukopenia, thrombocytopenia, transaminase elevation, and an increased hematocrit. Warning signs suggestive of severe disease include abdominal pain, persistent emesis, mucosal bleeding, and hepatomegaly. The critical phase follows defervescence and lasts 1–2 days; manifestations include plasma leakage, such as pleural effusions and ascites, and severe hemorrhagic manifestations may appear. These events have the potential to cause severe shock and even death. The convalescent phase follows as plasma leakage resolves.[1]

The diagnosis involves clinical manifestations and laboratory testing; both nucleic acid amplification tests (NAAT), such as real-time PCR (RT-PCR), detection of nonstructural protein 1 antigen (NS1), and serology (IgM and IgG), are available. Nucleic acid amplification tests are most useful in the first 7 days after symptom onset. In patients presenting more than 7 days after symptom onset, IgM serology is useful since it becomes positive after approximately 5 days and remains positive for up to 90 days.[1,2]

Figure 1. Classic islands of white in a sea of red. Downloaded from Wikipedia on 1-17-2025.

Treatment for DENV infection is mainly supportive, as there are no specific antiviral agents. Treatment includes fluid resuscitation and acetaminophen instead of NSAIDS due to bleeding diathesis during the critical phase. In critical patients, a higher level of monitoring in the intensive care unit might be necessary. Platelet transfusions and corticosteroids are not recommended due to a lack of benefit and potential harm.[1] Two dengue vaccines have been licensed, Dengvaxia® (developed by Sanofi-Pasteur) and Qdega® (developed by Takeda), and a third vaccine is in the later stages of development. Only the Dengvaxia, a live-attenuated tetravalent vaccine, is available in the US. Given the requirement of pre-vaccination testing, this vaccine has not been widely implemented in endemic areas.[3]

According to the Centers for Disease Control and Prevention (CDC), over 3.9 billion people in more than 132 countries are at risk of contracting dengue.[4] In a communication in May 2025, the World Health

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DOI: 10.12746/swrccc.v13i54.1421

Organization reported 7.6 million dengue cases in the first 5 months of 2024; 16,000 were severe cases with over 3000 deaths.[5]

Although dengue is traditionally considered confined to tropical and subtropical areas, there has been an increase in reports of endemic transmission of dengue in previously uncommon areas, such as North America. In the first 6 months of 2024, 9.7 million cases of DENV infection in the Americas were reported to the CDC, double the cases in 2023.[6] The CDC released a health alert in June 2024 due to the higher than expected number of cases reported in the United States in the first 6 months of the year, with a total of 2,241 cases, 1,498 in Puerto Rico.[7] In addition, reports exist of locally-acquired dengue in Florida, Hawaii, and Texas, as well as sporadic cases in Arizona and California. According to the Texas Department of Health Services statement in November 2024, 665 cases of dengue virus were reported in Texas, most from returning travelers. Only 40 cases in the previous 11 years have been locally acquired, including one case in 2024 in Cameron County, the southernmost county of the state.[8]

With the increase in transmission in warmer months, the potential impact of climate change on dengue virus transmission is a cause for concern. As the climate warms and urbanization continues, projections report that over 6 billion people will be at risk of DENV infection by 2080.[8,9] Clinicians should consider these trends when evaluating patients with compatible symptoms.

Keywords: Dengue virus, epidemiology, infection

Article citation: Mora BL. Dengue virus in Texas. The Southwest Respiratory and Critical Care Chronicles 2025; 13(54):43–44
From: Department of Internal Medicine, Vanderbilt University Medical Center, Nashville, TN
Submitted: 1/14/2025
Accepted: 1/16/2025
Conflicts of interest: none

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