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Maine Health Alert Network (HAN) System

PUBLIC HEALTH ADVISORY

To: Health Care Providers

From: Dr. Isaac Benowitz, State Epidemiologist

Subject: **U.S. CDC: Important Updates on Locally Acquired Malaria Cases Identified in Florida, Texas, and Maryland**

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Please review this information from U.S. CDC on malaria acquired in the United States. In addition to the clinical resources available here, you can also learn more about the clinical management of malaria from the recent U.S. CDC Clinician Outreach and Communication Activity (COCA) call held on July 20, 2023. A recording of that webinar is available at https://emergency.cdc.gov/coca/calls/2023/callinfo_072023.asp.

In Maine, *Anopheles* mosquito vectors are present. While the risk in Maine remains low, it is possible for local mosquitoes to acquire *Plasmodium spp*. parasites from an infected person and transmit the parasites to a susceptible, non-infected person.

Providers should consider a malaria diagnosis in patients with unexplained febrile illnesses, particularly patients returning from areas with local malaria transmission. Confirmed and suspected patients with malaria should be reported to Maine CDC. Providers with questions about malaria diagnosis and treatment can call the U.S. CDC Malaria Hotline at 770-488-7788.

For more information on malaria, please visit www.maine.gov/dhhs/malaria or www.cdc.gov/malaria.

U.S. CDC: Important Updates on Locally Acquired Malaria Cases Identified in Florida, Texas, and Maryland

Summary
The U.S. Centers for Disease Control and Prevention (U.S. CDC) is issuing this Health Alert Network (HAN) Health Update to share new information with clinicians, public health authorities, and the public about locally acquired malaria cases identified in the United States. On August 18, 2023, a single case of locally acquired malaria was reported in Maryland in the National Capital Region. This case was caused by the *Plasmodium falciparum (P. falciparum)* species and is unrelated to the cases involving local transmission of *Plasmodium vivax (P. vivax)* malaria in Florida and Texas described in the HAN Health Advisory 494 issued on June 26, 2023. As an update to that report, to date, Florida has identified seven cases and Texas has identified one case of locally acquired *P. vivax* malaria, but there have been no reports of local transmission of malaria in Florida or Texas since mid-July 2023.

P. falciparum malaria can rapidly cause severe illness and even death if not quickly diagnosed, therefore rapid diagnosis and treatment is imperative. In addition to routinely considering malaria as a cause of febrile illness among patients with a history of international travel to areas where malaria is transmitted, clinicians should consider a malaria diagnosis in any person with an unexplained cause of fever, regardless of their travel history. The risk to the U.S. public for locally acquired mosquito-transmitted malaria remains very low. The most effective way to prevent malaria in the United States is for travelers to malaria-endemic areas to take appropriate steps to prevent acquiring malaria while traveling—including taking medications to prevent malaria—and ensuring early diagnosis and treatment of imported cases of malaria and preventing mosquito bites.

Background
U.S. CDC is collaborating with the Maryland Department of Health on the investigation of a single case of locally transmitted *P. falciparum* malaria identified in the National Capital Region this month. This follows the identification of two states' unrelated episodes of local transmission of malaria—seven cases of *P. vivax* within close geographic proximity in Florida, with the last case identified in mid-July 2023, and one case of *P. vivax* in Texas in June 2023. All patients received treatment and are improving clinically. Surveillance for additional cases of malaria, as well as malaria-related mosquito surveillance and control, will continue in all three states for a period of 8 weeks following the most recent case in each state.

Before this year, locally acquired mosquito-borne malaria had not occurred in the United States since 2003, when eight cases of locally acquired *P. vivax* malaria were identified in Palm Beach County, FL (1). Despite recent cases, the risk of locally acquired malaria remains very low in the United States. However, *Anopheles* mosquito vectors, found throughout many regions of the country, are capable of transmitting malaria if they feed on a malaria-infected person (2). The risk of malaria transmission is higher in areas where local climatic conditions allow the *Anopheles* mosquito to survive during most of or the entire year and in locations with travelers from malaria-endemic areas. In addition to routinely considering malaria as a cause of febrile illness among patients with a history of international travel to areas where malaria is transmitted, clinicians should consider a malaria diagnosis in any person with an unexplained cause of fever, regardless of their travel history, particularly in patients with new anemia or thrombocytopenia. Clinicians practicing in areas of the United States where locally acquired malaria cases have occurred should follow guidance from their state and local health departments. Promptly diagnosing and treating people with malaria can prevent progression to severe disease or death and limit ongoing transmission to local *Anopheles* mosquitoes. Individuals can take steps to prevent mosquito bites and control mosquitoes at home to prevent malaria and other mosquito-borne illnesses.

Malaria is a serious and potentially fatal disease transmitted through the bite of an infective female anopheline mosquito. Though rare, malaria also can be transmitted congenitally from mother to fetus

or to the neonate at birth, through blood transfusion or organ transplantation, or through unsafe needle-sharing practices. Malaria is caused by any of five species of protozoan parasite of the genus *Plasmodium*: *P. falciparum*, *P. vivax*, *P. malariae*, *P. ovale,* or *P. knowlesi*. Worldwide, more than 240 million cases of malaria occur each year (95% in Africa). Almost all cases of malaria in the United States are imported and occur in people traveling from countries with malaria transmission, many from sub-Saharan Africa or South Asia. Before the COVID-19 pandemic, approximately 2,000 cases of mostly travel-related malaria were diagnosed in the United States each year; approximately 300 people experienced severe disease (most *P. falciparum*), and 5 to 10 people with malaria died yearly (3). Most imported cases of malaria in the United States are diagnosed among travelers during summer and early fall seasons. In 2023, U.S. CDC expects international travel by U.S. residents to increase to pre-COVID-19 pandemic levels (4).

Clinical manifestations of malaria are non-specific and may include fever, chills, headache, myalgias, and fatigue. Nausea, vomiting, and diarrhea may also occur. For most people, symptoms begin 10 days to 4 weeks after infection, although a person may feel ill as early as 7 days or as late as 1 year after infection. If not treated promptly, malaria may progress to severe disease, a life-threatening stage in which mental status changes, seizures, renal failure, acute respiratory distress syndrome, and coma may occur. Malaria in pregnant people is associated with high risks of both maternal and perinatal morbidity and mortality. *P. falciparum* and *P. knowlesi* infections can cause rapidly progressive severe illness or death, while the other species, including *P. vivax*, are less likely to cause severe disease. Laboratory abnormalities can include anemia, thrombocytopenia, hyperbilirubinemia, and elevated transaminases, varying from normal or mildly altered in uncomplicated disease to very abnormal in severe disease. *P. vivax* and *P. ovale* can remain dormant in the liver. Such infections require additional treatment; failure to treat the dormant hepatic stages may result in chronic infection, causing relapsing episodes. Relapses may occur after months or even years without symptoms.

Malaria is a medical emergency and should be treated accordingly. Patients suspected of having malaria should be urgently evaluated in a facility that is able to provide rapid diagnosis and treatment as soon as possible, within 24 hours of the patient's presentation. Order microscopic examination of thin and thick blood smears and a rapid diagnostic test (RDT), if available, to diagnose malaria as soon as possible. Hospitals should have a plan to rapidly diagnose and treat malaria as soon as possible, within 24 hours of the patient's presentation. Key recommendations on treatment are below. Additional information on diagnosing and treating malaria, including details of treating the dormant liver stages caused by certain species of *Plasmodium*, is available on the U.S. CDC website.

Recommendations for Clinicians

- Consider the diagnosis of malaria in any person with an unexplained cause of fever, regardless of international travel history, particularly if they have been to areas with recent locally acquired malaria.
- Routinely obtain a travel history and consider malaria in a symptomatic person who traveled to an area with malaria in the weeks to months preceding symptom onset.
- Treatment recommendations for malaria vary by species and severity. Please refer to U.S. CDC's Malaria Diagnosis and Treatment Guidelines for U.S. Clinicians for specific detailed instructions.
    - Malaria is a medical emergency. If not diagnosed and treated promptly, illness may progress to severe disease, a life-threatening stage, in which mental status changes, seizures, renal failure, acute respiratory distress syndrome, and coma may occur. An algorithm for diagnosis and treatment of malaria is available here.
    - Patients suspected of having malaria should be urgently evaluated in a facility, such as an emergency department able to provide rapid diagnosis and treatment as soon as possible, within 24 hours of the patient's presentation.
    - Order microscopic examination of thin and thick blood smears and a rapid diagnostic test (RDT), if available, to diagnose malaria as soon as possible.

        - "BinaxNOW™ Malaria," a malaria RDT, is approved for use in the United States. RDTs are less sensitive than microscopy and cannot confirm each specific species of the malaria parasite or determine the parasite density.
        - Therefore, microscopy should also be obtained in conjunction with an RDT as soon as possible.
    - If blood smears or RDT are positive and species determination is not available, antimalarial treatment effective against chloroquine-resistant *P. falciparum* must be initiated immediately.
    - Artemether-lumefantrine (Coartem®) is the preferred option, if readily available, for the initial treatment of uncomplicated *P. falciparum* or unknown species of malaria acquired in areas of chloroquine resistance. Atovaquone-proguanil (Malarone®) is another recommended option. *P. vivax* infections acquired from regions other than Papua New Guinea or Indonesia should initially be treated with chloroquine (or hydroxychloroquine).
    - IV artesunate is the first-line drug for treatment of severe malaria in the United States. Artesunate for Injection™, manufactured by Amivas, is approved by the FDA for treating severe malaria and is commercially available. More information on how to acquire IV artesunate in the United States can be found here.
    - Species determination is important because *P. vivax* and *P. ovale* can remain dormant in the liver and require additional anti-relapse treatment; failure to treat the dormant hepatic parasites may result in chronic infection with relapsing episodes. Relapses may occur after months or even years without symptoms.
- After an urgent infectious disease consultation, if there are still questions about diagnosing and treating malaria, U.S. CDC malaria clinicians are on call 24/7 to provide advice to healthcare providers. Additional contact information can be found here.
- Suspected or confirmed locally acquired malaria is a public health emergency and should be reported immediately to your state, territorial, local, or tribal health department. Imported (or travel-associated malaria) is also reportable in all states through routine reporting methods.
  You can contact Maine CDC via phone at 800-821-5821.
- Discuss travel plans with patients; prescribe a U.S. CDC-recommended malaria chemoprophylaxis regimen and discuss mosquito bite prevention for those traveling to an international area with malaria; encourage patients to adhere to the regimen before, during, and after travel. Malaria chemoprophylaxis is not needed for domestic travel at this time.

Recommendations for Hospitals and Laboratories

- Have malaria diagnostic tests available (blood smear or BinaxNow™ rapid diagnostic test [RDT] followed by blood smear) and ensure that qualified personnel who can perform and interpret these tests are always available.
    - If malaria blood smear or RDT results are not readily available, refer patients for whom malaria is suspected to a higher level of care for prompt evaluation for malaria.
    - Bench aids for blood smear preparation, staining, diagnosis, and calculating the percent parasitemia are available here.
- Stock IV artesunate (Artesunate for Injection™) or have a plan in place for emergency procurement.
    - More information on how to acquire IV artesunate in the United States can be found here.
- Stock artemether-lumefantrine (Coartem®), the first-line drug in the United States for most cases of uncomplicated *P. falciparum* or unknown malaria species. Atovaquone-proguanil (Malarone®) is another recommended option.

Recommendations for the Public

- If you have traveled to an area where malaria occurs and develop fever, chills, headache, body aches, and fatigue, seek medical care and tell your healthcare provider that you have traveled.
- Take steps to prevent mosquito bites and control mosquitoes at home to protect yourself from any mosquito-borne illness.
- Before you travel, learn about the health risks and precautions for malaria and other diseases for your destination. If you are traveling internationally to an area where malaria occurs, talk to your healthcare provider about medicines to prevent you from getting malaria, and strategies to prevent mosquito bites.

For More Information

Malaria Prevention, Diagnosis, and Treatment

- U.S. CDC - Treatment of Malaria: Guidelines for Clinicians (United States)
- U.S. CDC - DPDx - Diagnostic Procedures
- Malaria - U.S. CDC Yellow Book 2024
- U.S. CDC - Malaria Information and Prophylaxis, by Country
- U.S. CDC - Parasites - Continuing Education - Malaria 101 for the Healthcare Provider
- U.S. CDC - Malaria - Travelers - Risk Assessment

Mosquito-Borne Disease Prevention

- Prevent Mosquito Bites - Mosquitoes | U.S. CDC

References

1. U.S. CDC. Local Transmission of Plasmodium vivax Malaria --- Palm Beach County, Florida, 2003.
   MMWR. 2003 Sep 26; 52(38):908-911.
2. Dye-Braumuller KC, Kanyangarara M. Malaria in the USA: How Vulnerable Are We to Future Outbreaks? *Curr Trop Med Rep*. 2021; 8(1):43-51.
3. Mace KE, Lucchi NW, Tan KR. Malaria Surveillance — United States, 2018. *MMWR Surveill Summ* 2022 Sep 2; 71(No. SS-8):1–29.
4. Schultz JS, Mace KE, Tan KR. Return to Travel in the Coronavirus Disease 2019 Pandemic Recovery Period and Implications for Imported Malaria: Reinforcing Prevention, Early Diagnosis, and Appropriate Treatment of Malaria. *Clin Infect Dis*. 2023 Apr 1; 76(7):1161-1163.