Arboviral Disease
(except West Nile virus and Yellow Fever)

1. DISEASE REPORTING

A. Purpose of Reporting and Surveillance

1. To distinguish arboviral infections acquired locally from those related to travel.
2. To better understand the epidemiology of these infections in Washington State in order to target education and control measures.
3. To identify emerging arboviral infections in Washington.

B. Legal Reporting Requirements

1. Health care providers: notifiable to local health jurisdiction within 3 business days.
2. Health care facilities: notifiable to local health jurisdiction within 3 business days.
3. Laboratories: Arboviruses (eastern and western equine encephalitis, dengue, St. Louis encephalitis, La Crosse encephalitis, Japanese encephalitis, Powassan, California serogroup, Chikungunya) acute infection by IgM positivity, PCR positivity, and viral isolation, within 2 business days. Specimen submission is on request only.
5. Local health jurisdictions: notifiable to Washington State Department of Health (DOH) Office of Communicable Disease Epidemiology (OCDE) within 7 days of case investigation completion or summary information required within 21 days.

C. Local Health Jurisdiction Investigation Responsibilities

1. Consult OCDE about endemically acquired cases or for assistance with testing.
2. Facilitate transport of specimens (e.g., serum or CSF) to the Washington State Public Health Laboratories (PHL) if initial testing or confirmatory testing is needed. Please call OCDE prior to submitting specimens (206-418-5500).
3. Report all confirmed, probable, and suspect cases to OCDE (see definitions below). Complete the Arboviral Disease case report form (http://www.doh.wa.gov/Portals/1/Documents/5100/210-066-ReportForm-Arbovirus.pdf) and enter the data into the Public Health Issues Management System (PHIMS) as “Arboviral Disease.” Cases of West Nile virus disease and yellow fever are discussed in separate guidelines and should be reported separately in PHIMS as “West Nile Virus” and “Yellow Fever.”
2. THE DISEASE AND ITS EPIDEMIOLOGY


Background

Arboviral (arthropod-borne viral) diseases are transmitted by arthropods (e.g., mosquitoes, sandflies, ticks, or midges). More than 130 arboviruses are known to cause human disease. Most arboviruses of public health importance belong to one of three virus genuses: Flavivirus, Alphavirus, and Bunyavirus.

Arboviral diseases include West Nile virus disease (discussed separately), eastern and western equine encephalitis (WEE), dengue, chikungunya, St. Louis encephalitis (SLE), La Crosse encephalitis, Japanese encephalitis, Powassan virus encephalitis, yellow fever (discussed separately), and other less common infections. In addition, there are other arthropod-borne viruses that cause hemorrhagic fevers and other illnesses that are important as diseases with international importance (e.g., Rift Valley fever and Congo-Crimean hemorrhagic fever viruses); for reporting purposes in Washington they have been included under the condition “Rare Diseases of Public Health Significance.”

A. Etiological Agent

See Table 1 for selected arboviral agents (excludes West Nile virus and yellow fever, which are discussed separately).

B. Description of Illness

Arboviral infections cause four main clinical syndromes: 1) acute central nervous system (CNS) illnesses, 2) acute benign fevers of short duration with or without rash, 3) hemorrhagic fevers, and 4) polyarthritis and rash with or without fevers (see Table 1).

C. Arboviral Diseases in Washington State

Each year, 0 to 19 cases of travel-associated dengue fever are reported in Washington residents. In 2014, 11 cases of chikungunya virus infection were identified in travelers returning from the Caribbean; previously, chikungunya cases were rarely reported, with recent cases in travelers to Sri Lanka (2006), Indonesia (2 in 2010), and East Timor (2010). In 2004, one case of Japanese encephalitis was reported after travel to Thailand; a 2008 case was reported in a visitor to Cambodia and Vietnam. In 2009, a Toscana virus case was reported in a traveler returning from Italy and a case of SLE was reported after travel to Arizona.

Other than West Nile virus, the last reported human illness due to an arboviral infection acquired in Washington State was WEE in 1988. SLE has also occurred in Washington, primarily in the central valleys east of the Cascade Mountains. SLE infections were detected in sentinel chickens in Benton county in 2005 (Source: DOH Environmental Health-Zoonotic Disease Program).

D. Vectors and Reservoirs

Most arboviruses are maintained in enzootic cycles involving arthropods and birds or small mammals. Humans are usually “dead end hosts,” in that they do not contribute to
the spread of the virus. However, some arboviral infections (e.g., dengue, yellow fever, chikungunya) can be indirectly spread from one person to another by a mosquito. Vector mosquitoes and ticks are present in Washington for some (SLE, WEE), but not all (dengue, chikungunya) arboviruses. See Table 1 below.

E. Modes of Transmission

Arboviruses are most commonly transmitted by the bites of arthropods (e.g., mosquitoes, ticks, flies, or midges). Some arboviruses have been shown to be transmitted on rare occasions through blood transfusions, organ transplantation, consumption of unpasteurized dairy products, breast feeding, and laboratory exposures; rare transmission has also been reported transplacentally (perinatal transmission).

F. Incubation Period

Varies with agent. See Table 1.

G. Period of Communicability

Except for rare cases of transplacental transmission, organ transplantation, or blood transfusion, most arboviruses are transmitted by an arthropod vector from animal to human. Dengue, chikungunya, and yellow fever are exceptions because mosquitoes can transmit the virus from one viremic human to an uninfected human. For dengue, human patients can infect mosquitoes during their period of high viremia, usually 3-5 days before fever onset until the fever subsides.

H. Treatment

Treatment is supportive.

Table 1: Geographic Distribution and Clinical Characteristics of Selected Arboviral Infections*  
Note that separate guidelines are available for both West Nile virus and Yellow fever.

<table>
<thead>
<tr>
<th>Disease (Etiologic agent)</th>
<th>Arthropod</th>
<th>Geographic distribution</th>
<th>Incubation period</th>
<th>Clinical syndrome</th>
</tr>
</thead>
<tbody>
<tr>
<td>California serogroup viral encephalitis (La Crosse, Jamestown Canyon, Keystone, Snowshoe hare, Trivittatus, and California encephalitis viruses)</td>
<td>Mosquito</td>
<td>Widespread in the United States and Canada; most prevalent in upper Midwest; also South America, Europe, Asia</td>
<td>5–15 days</td>
<td>Encephalitis</td>
</tr>
<tr>
<td>Chikungunya fever (Chikungunya virus)</td>
<td>Mosquito</td>
<td>Africa; Asia; Caribbean; potentially Florida (2014)</td>
<td>3-7 days (range 1-12 days)</td>
<td>Fever, arthralgia, rash (hemorrhage rare)</td>
</tr>
<tr>
<td>Colorado tick fever (Colorado tick fever virus)</td>
<td>Tick</td>
<td>Western United States and Canada</td>
<td>1–14 days</td>
<td>Febrile illness, rarely with encephalitis or myocarditis</td>
</tr>
<tr>
<td>Dengue fever (DF), dengue hemorrhagic fever (DHF), and dengue shock syndrome (DSS) (dengue viruses)</td>
<td>Mosquito</td>
<td>Tropical areas worldwide: Central and South America, Caribbean, Asia, Australia, Oceania, Africa; recently reported from Florida</td>
<td>Commonly 4–7 days (range: 3-14 days)</td>
<td>Febrile illness; hemorrhagic fever and shock (particularly with second infection)</td>
</tr>
</tbody>
</table>
Eastern equine encephalitis (EEE virus)  | Mosquito  | Eastern seaboard and Gulf states of the United States; Canada; South and Central America | 3–10 days | Encephalitis  

Japanese encephalitis (Japanese encephalitis virus)  | Mosquito  | Asia; Pacific Islands; Northern Australia | 5–15 days | Encephalitis, fever  

Powassan encephalitis (Powassan encephalitis virus)  | Tick  | Canada; northeastern, north central, and western United States; Russian Federation | 4–18 days | Encephalitis  

St. Louis encephalitis (SLE virus)  | Mosquito  | Central, southern, northeastern and western United States; Manitoba and southern Ontario; Caribbean area; South America | 4–14 days | Encephalitis, fever  

Venezuelan equine encephalitis (VEE virus)  | Mosquito  | Central and South America; southern United States | 1–4 days | Fever, encephalitis  

Western equine encephalitis (WEE virus)  | Mosquito  | Central and western United States; Canada; Argentina, Uruguay, Brazil | 2–10 days | Fever, encephalitis  


3. CASE DEFINITION

NOTE: - West Nile and yellow fever are discussed in separate guidelines;  
- Dengue is discussed in Section 3B of this guideline.

A. Neuroinvasive and Non-Neuroinvasive Domestic Arboviral Diseases (2014)

1. Clinical Description (for Dengue, see Section 3B)

Most arboviral infections are asymptomatic. Clinical disease ranges from mild febrile illness to severe encephalitis. For the purposes of surveillance and reporting, arboviral disease cases are often categorized into two primary groups based on their clinical presentation: neuroinvasive disease and non-neuroinvasive disease.

**Neuroinvasive disease**: Many arboviruses cause neuroinvasive disease such as aseptic meningitis, encephalitis, or acute flaccid paralysis (AFP). These illnesses are usually characterized by the acute onset of fever with stiff neck, altered mental status, seizures, limb weakness, cerebrospinal fluid (CSF) pleocytosis, or abnormal neuroimaging. AFP may result from anterior ("polio") myelitis, peripheral neuritis, or post-infectious peripheral demyelinating neuropathy (i.e., Guillain-Barré syndrome). Less common neurological manifestations, such as cranial nerve palsies, also occur.

**Non-neuroinvasive disease**: Most arboviruses are capable of causing an acute systemic febrile illness that may include headache, myalgias, arthralgias, rash, or gastrointestinal symptoms. Other physical complaints may include vertigo, stiff neck, or muscle weakness without progression to more clinically apparent neurological involvement.
2. **Clinical Criteria for Diagnosis** *(for Dengue, see Section 3B)*

A clinically compatible case of arboviral disease is defined as follows:

**Neuroinvasive disease**
- Meningitis, encephalitis, acute flaccid paralysis, or other acute signs of central or peripheral neurologic dysfunction, as documented by a physician, **AND**
- Absence of a more likely clinical explanation.

**Non-neuroinvasive disease**
- Fever or chills as reported by the patient or a health-care provider, **AND**
- Absence of neuroinvasive disease, **AND**
- Absence of a more likely clinical explanation.

3. **Laboratory Criteria for Diagnosis** *(for Dengue, see Section 3B)*

**Neuroinvasive disease**

*Confirmatory*:
- Isolation of virus from or demonstration of specific viral antigen or nucleic acid in tissue, blood, CSF, or other body fluid, **OR**
- Four-fold or greater change in virus-specific quantitative antibody titers in paired sera, **OR**
- Virus-specific immunoglobulin M (IgM) antibodies in serum with confirmatory* virus-specific neutralizing antibodies in the same or a later specimen, **OR**
- Virus-specific IgM antibodies in CSF and a negative result for other IgM antibodies in CSF for arboviruses endemic to the region where exposure occurred.

*Presumptive*:
- Virus-specific IgM antibodies in CSF or serum but with no other testing.

**Non-neuroinvasive disease**

*Confirmatory*:
- Isolation of virus from or demonstration of specific viral antigen or nucleic acid in tissue, blood, or other body fluid, *excluding CSF*, **OR**
- Four-fold or greater change in virus-specific quantitative antibody titers in paired sera, **OR**
- Virus-specific immunoglobulin M (IgM) antibodies in serum with confirmatory* virus-specific neutralizing antibodies in the same or a later specimen.

*Presumptive*:
- Virus-specific IgM antibodies in serum but with no other testing.

*Arboviral serologic assays:* Assays for the detection of IgM and IgG antibodies commonly include enzyme-linked immunosorbent assay (ELISA), microsphere immunoassay (MIA), or immunofluorescence assay (IFA). These assays provide a presumptive diagnosis and should have confirmatory testing.
performed. Confirmatory testing involves the detection of arboviral-specific neutralizing antibodies utilizing assays such as plaque reduction neutralization test (PRNT).

4. **Case Definition (for Dengue, see Section 3B)**

   **Confirmed:**
   - **Neuroinvasive:** a case that meets the clinical criteria and one or more of the confirmatory laboratory criteria for neuroinvasive disease.
   - **Non-neuroinvasive:** a case that meets the clinical criteria for and one or more of the confirmatory laboratory criteria for non-neuroinvasive disease.

   **Probable:**
   - **Neuroinvasive:** a case that meets the clinical criteria and the presumptive laboratory criterion for neuroinvasive disease.
   - **Non-neuroinvasive:** a case that meets the clinical criteria and the presumptive laboratory criterion for non-neuroinvasive disease.

5. **Comments on Interpreting Arboviral Laboratory Results**

   - **Serologic cross-reactivity.** In some instances, arboviruses from the same genus produce cross-reactive antibodies. In geographic areas where two or more closely-related arboviruses occur, serologic testing for more than one virus may be needed and results compared to determine the specific causative virus. For example, such testing might be needed to distinguish antibodies resulting from infections from viruses within a genus, e.g., flaviviruses such as West Nile, St. Louis encephalitis, Powassan, dengue, or Japanese encephalitis viruses.

   - **Rise and fall of IgM antibodies.** For most arboviral infections, IgM antibodies are generally first detectable at 3 to 8 days after onset of illness and persist for 30 to 90 days, but longer persistence has been documented (e.g., up to 500 days for West Nile virus). Serum collected within 8 days of illness onset may not have detectable IgM and testing should be repeated on a convalescent-phase sample to rule out arboviral infection in those with a compatible clinical syndrome.

   - **Persistence of IgM antibodies.** Arboviral IgM antibodies may still be detected in some patients months or years after their acute infection. Therefore, the presence of these virus-specific IgM antibodies may signify a past infection and be unrelated to the current acute illness. Finding virus-specific IgM antibodies in CSF or a fourfold or greater change in virus-specific antibody titers between acute- and convalescent-phase serum specimens provides additional laboratory evidence that the arbovirus was the likely cause of the patient’s recent illness. Clinical and epidemiologic history also should be carefully considered.

   - **Persistence of IgG and neutralizing antibodies.** Arboviral IgG and neutralizing antibodies can persist for many years following a symptomatic or asymptomatic infection. Therefore, the presence of these antibodies alone is only evidence of previous infection and clinically compatible cases with the presence of IgG, but not IgM, should be evaluated for other etiologic agents.
• **Other information to consider.** Vaccination history, detailed travel history, date of onset of symptoms, and potentially cross-reactive arboviruses known to circulate in the geographic area of exposure should be considered when interpreting results.

• **Imported arboviral diseases.** Many exotic arboviruses (e.g., dengue, Chikungunya, Japanese encephalitis, Tick-borne encephalitis, Venezuelan equine encephalitis, and Rift Valley fever viruses) are potential public health risks for the United States as competent vectors exist in some states that could allow for sustained transmission upon establishment of imported arboviral pathogens. Healthcare providers and public health officials should maintain a high index of clinical suspicion for cases of potentially exotic or unusual arboviral etiology, particularly in international travelers. If a suspected case occurs, it should be reported to the local health jurisdiction, then to DOH Office of Communicable Disease Epidemiology for reporting to the Centers for Disease Control and Prevention (CDC).


1. **Clinical Description**
   
   • **Dengue-like Illness** is defined by fever as reported by the patient or healthcare provider.

   • **Dengue** is an acute febrile illness defined by the presence of fever as reported by the patient or healthcare provider and the presence of one or more of the following signs and symptoms: nausea/vomiting, rash, headache, retro-orbital or ocular pain, myalgia, arthralgia, tourniquet test positive, leukopenia (a total leukocyte count <5,000/mm³), abdominal pain or tenderness, extravascular fluid accumulation (e.g., pleural or pericardial effusion, ascites), mucosal bleeding at any site, liver enlargement, or increasing hematocrit concurrent with rapid decrease in platelet count.

   • **Severe Dengue** is defined as dengue (above) with one or more of the following:
     
     o Severe plasma leakage evidenced by hypovolemic shock and/or extravascular fluid accumulation (e.g., pleural or pericardial effusion, ascites) with respiratory distress. A high hematocrit value (an increase in hematocrit ≥20% above average for age or a decrease in hematocrit ≤20% of baseline following fluid replacement therapy) for patient age and sex offers further evidence of plasma leakage.

     o Severe bleeding from the gastrointestinal tract (e.g., hematemesis, melena) or vagina (menorrhagia) as defined by requirement for medical intervention including intravenous fluid resuscitation or blood transfusion.

     o Severe organ involvement, including any of the following:
       
       ▪ Elevated liver transaminases: aspartate aminotransferase (AST) or alanine aminotransferase (ALT) ≥1,000 units per liter (U/L)
       ▪ Impaired level of consciousness and/or diagnosis of encephalitis, encephalopathy, or meningitis
       ▪ Heart or other organ involvement including myocarditis, cholecystitis, and pancreatitis
2. **Laboratory Criteria for Diagnosis** (*Dengue only*)

**Confirmatory:**

- Isolation of dengue virus or demonstration of specific arboviral antigen or genomic sequences in tissue, blood, serum, cerebrospinal fluid (CSF), or other body fluid by polymerase chain reaction (PCR) test **OR**
- Detection of dengue virus antigens in tissue of a fatal case by a validated immunofluorescence or immunohistochemistry assay, **OR**
- Detection in serum or plasma of dengue virus NS1 antigen by a validated immunoassay, **OR**
- Cell culture isolation of dengue virus from a serum, plasma, or CSF specimen, **OR**
- Detection of dengue-specific IgM antibodies by validated immunoassay in a serum specimen or CSF in a person living in a dengue endemic or non-endemic area of the United States without evidence of other flavivirus transmission (e.g., WNV, SLEV, or recent vaccination against a flavivirus (e.g., YFV, JEV)); **OR**
- Detection of dengue-specific IgM antibodies by validated immunoassay in a serum specimen or CSF in a traveler returning from a dengue endemic area without ongoing transmission of another flavivirus (e.g., WNV, JEV, YFV), clinical evidence of co-infection with one of these flaviviruses, or recent vaccination against a flavivirus (e.g., YFV, JEV), **OR**
- Seroconversion from negative dengue virus-specific serum immunoglobulin M (IgM) antibody in an acute phase specimen (collected ≤5 days after symptom onset) to positive dengue-specific serum IgM antibodies in a convalescent-phase specimen (collected ≥5 days after symptom onset), **OR**
- Dengue-specific IgG antibody seroconversion or ≥4-fold rise in titer by a validated immunoassay in serum specimens collected >2 weeks apart, AND confirmed by a neutralization test (e.g. plaque reduction neutralization test) with a >4-fold higher end point titer as compared to other flaviviruses tested.

**Presumptive:**

- Detection of dengue-specific IgM antibodies by validated immunoassay in a serum specimen or CSF in a person living in an area of the United States with evidence of other flavivirus transmission, OR a traveler returning from a dengue endemic area with ongoing transmission of another flavivirus, OR clinical evidence of co-infection with another flavivirus, OR recent vaccination against a flavivirus (e.g., YFV, JEV).

3. **Exposure** (*Dengue only*)

Criteria for epidemiologic linkage are dependent upon exposure, which is defined as:

- Travel to an dengue endemic country or presence at location with ongoing outbreak of dengue-like illness within two weeks of illness onset, OR
4. Case Definition (Dengue only)

Suspect: a clinically compatible case of dengue-like illness, dengue, or severe dengue that is epidemiologically linked to a confirmed case.

Probable: a clinically compatible case of dengue-like illness, dengue, or severe dengue with laboratory results indicative of presumptive infection.

Confirmed: a clinically compatible case of dengue-like illness, dengue, or severe dengue with confirmatory laboratory results.

5. Comment

An asymptomatic blood or tissue donor is defined as having dengue virus-specific viral antigen or genomic sequences demonstrated in donated blood or organs during screening and confirmatory testing in the absence of symptoms in the donor. In 2009, CDC requested reporting of dengue virus positive asymptomatic donors, however, no cases have been identified. Reporting is now limited to persons with symptomatic dengue virus infection.

Dengue viruses are flaviviruses and have sufficient antigenic similarity to yellow fever virus, Japanese encephalitis virus, and West Nile virus that previous infection or vaccination may raise cross-reactive serum antibodies. In such situations, the result of ELISA testing may be unreliable and PRNT may be needed to correctly identify the infecting virus. However, high-titers of cross-reactive antibody produced from multiple previous flavivirus infections cannot be resolved by PRNT.

4. DIAGNOSIS AND LABORATORY SERVICES

A. Diagnosis

Laboratory diagnosis is primarily made by detection of viral specific antibodies in serum or CSF. See Section 3A (5) for additional information about serologic testing.

B. Tests Available at the Washington State Health Public Health Laboratories (PHL)

PHL can test for West Nile virus (WNV)-specific and St. Louis encephalitis (SLE) virus-specific IgM antibody in serum or CSF by microsphere immunoassay (MIA). In certain situations (e.g. inconclusive results), PHL will send samples to the CDC for additional testing by plaque reduction neutralization test (PRNT). See WNV guideline for additional information.

PHL sends specimens to the CDC for all other arboviral tests including Dengue.

Note that PHL require all clinical specimens have two patient identifiers, a name and a second identifier (e.g., date of birth) both on the specimen label and on the submission form. Due to laboratory accreditation standards, specimens will be rejected for testing if not properly identified. Also include specimen source and collection date.
C. Specimen Collection

Serum and/or CSF should be refrigerated and transported cold. Specimens should be submitted with a completed PHL Serology/Virology form (http://www.doh.wa.gov/Portals/1/Documents/5230/302-017-SerVirHIV.pdf).

Please call DOH Office of Communicable Disease Epidemiology (206-418-5500) to request testing and obtain shipping instructions for specimens other than serum or CSF.

5. ROUTINE CASE INVESTIGATIONS

Interview the case and others who may be able to provide pertinent information.

A. Evaluate the Diagnosis

If the case tests positive for an arboviral infection at a laboratory other than a Public Health Laboratories, discuss the need to perform confirmatory testing with DOH Office of Communicable Disease Epidemiology (206-418-5500). As needed, facilitate transport of the specimen to PHL for further testing.

Evaluate whether the patient had a previous infection with West Nile virus or another arboviral disease or was vaccinated for an arboviral disease (e.g., Japanese encephalitis, tick-borne encephalitis, or yellow fever).

B. Manage the Case

1. Hospitalized patients should be treated with standard precautions.
2. Infected persons should be advised not to donate blood, tissues or organs for at least 4 months after infection has cleared.
3. Infected lactating women should discuss breast-feeding with their medical care provider.
4. Assess evidence or risk of local transmission. Neither Aedes aegypti nor Ae. albopictus, the primary mosquito vectors for dengue and chikungunya, are endemic to Washington State, so the risk of a case infecting mosquitoes which could subsequently infect other humans is very low. However, autochthonous dengue infections have been identified in Florida, Texas, and Hawaii; likewise autochthonous chikungunya cases were identified in the Caribbean in late 2013 and in Florida in July 2014. Patients with dengue and chikungunya in areas where the vectors are likely present should be sequestered from mosquitoes while viremic to avoid local transmission.

C. Identify Potential Sources of Infection

Obtain a detailed travel history, including specific locations and travel dates, and ask about arthropod exposures during the likely exposure period. If exposure within the United States is suspected for dengue or chikungunya, notify DOH Communicable Disease Epidemiology immediately (206-418-5500).

Ask about receiving blood products or about organ or tissue transplants.

D. Identify Close Contacts or Other Potentially Exposed Persons

Identify others who traveled with the patient. Determine if the patient donated blood or organs, breastfed, or gave birth in the month preceding illness onset.
E. Management of Contacts/Others Exposed

Arboviral infections are not transmitted from person-to-person, except for rare cases of transplacental transmission, organ transplantation, or blood transfusion. If the patient donated blood or organs, inform the blood or tissue bank of the potential exposure. In cases of potential mother-to-infant transmission, monitor the infant for compatible signs and symptoms.

Instruct others persons potentially exposed to the same source to seek medical attention if symptoms of arboviral disease develop.

F. Environmental Evaluation/Management

Consider outreach to educate the public about avoiding arthropod exposure. Environmental measures to reduce local arboviral transmission may include the elimination of mosquito breeding habitats and the use of chemical (i.e., pesticides) and biological controls. Notify local environmental health program and/or vector control of locally acquired cases, so that they may determine and institute appropriate intervention measures. In outbreak settings, an investigation may assist in identifying and controlling factors favoring transmission.

6. MANAGING SPECIAL SITUATIONS

Not applicable

7. ROUTINE PREVENTION

A. Immunization Recommendations

Japanese Encephalitis Vaccine

Persons planning to travel or reside in areas where Japanese encephalitis is endemic or epidemic should consult with a travel medicine health provider regarding the need for Japanese encephalitis vaccine.

To learn more about vaccine indications, contraindications and side effects, see the CDC website (http://www.cdc.gov/japaneseencephalitis/qa/index.html) and the recommendations from the ACIP (Centers for Disease Control and Prevention. Inactivated Japanese Encephalitis Virus Vaccine Recommendations of the Advisory Committee on Immunization Practices [ACIP], MMWR. Jan. 8, 1993;42:11. Available at http://www.cdc.gov/mmwr/preview/mmwrhtml/00020599.htm).

B. Prevention Recommendations

To prevent arboviral diseases, persons should avoid arthropod bites by:

- Wearing a long sleeve shirt, long pants, and a hat when going into mosquito- or tick-infested areas, such as wetlands or woods. Tuck pant legs into socks or boots and shirts into pants to keep ticks on the outside of clothing where they can be more easily spotted and removed.

- Using mosquito repellent when necessary. The most effective mosquito repellents contain the EPA-approved active ingredients DEET (N, N-diethyl-m-toluamide), Picaridin, oil of lemon eucalyptus, or IR3535. Read and follow instructions on the label. Permethrin is another long-lasting repellent that is intended for application to

Last Revised: April 2015  Washington State Department of Health
clothing and gear, but not directly to skin. In general, the more active ingredient (higher concentration) a repellent contains, the longer time it protects against mosquito bites. Do not over use repellents. Take special care when using repellent on children.

- When traveling, using mosquito bed nets when exposure to mosquitoes may occur at night.
- Additional information regarding the use of repellents can be found on the CDC website at: [http://www.cdc.gov/westnile/faq/repellent.html](http://www.cdc.gov/westnile/faq/repellent.html).

Persons traveling to arboviral endemic areas should consult with a travel clinic health care provider regarding additional measures which should be taken in specific areas.

ACKNOWLEDGEMENTS

This document is a revision of the Washington State Guidelines for Notifiable Condition Reporting and Surveillance published in 2002 which were originally based on the Control of Communicable Diseases Manual (CCDM), 17th Edition; James Chin, Ed. APHA 2000. We would like to acknowledge the Oregon Department of Human Services for developing the format and select content of this document.

UPDATES

July 2008: In Section 2C, the number of dengue fever cases reported each year was changed from 0–8 to 0–10. In Section 8B, IR3535 was added as a safe and effective mosquito repellent.

March 2010: In Section 1B, requirements for the veterinarian were clarified to distinguish animal and human case reporting. In Section 1C, reporting of suspect cases was included (to reflect new 2010 CSTE dengue case definition). Section 3A was revised to include a clinical illness description and to differentiate the laboratory criteria for diagnosis from the case definitions. In Section 3B, the dengue case definition was updated. Sections 4B and 4C, the laboratory testing available at PHL was updated. In Section 5, case investigation guidelines were amended.

January 2011: The Legal Reporting Requirements section has been revised to reflect the 2011 Notifiable Conditions Rule revision. In section 2, modes of transmission were updated (E) and the CAL serogroup was updated in Table 1. Section 3A was completely replaced to reflect the 2011 CSTE case definition for Arboviral disease (non-Dengue). In Section 3B, the laboratory criteria were updated to clarify the requirements for P/N ratio. Section 4B was modified to reflect current test availability at PHL as of November 2010.

July 2014: Section 3A was revised to reflect the 2014 CSTE case definition for Arboviral disease (non-Dengue), in which the requirement about documented temperature of fever was changed. For arboviral diseases (other than Dengue), fever has been removed entirely from the criteria for neuroinvasive disease; it no longer needs to be measured for non-neuroinvasive disease. The laboratory criteria were differentiated for neuroinvasive disease and non-neuroinvasive disease. The “Routine Case Investigation” and “Controlling Further Spread” sections were merged into a single section.

January 2015: Section 2C was updated to reflect the recent travel-associated cases of chikungunya virus infection in Washington State. Section 3B was revised to reflect the 2015 CSTE case definition for Dengue. This revision changed the categories for clinical description from Dengue Fever, Dengue Hemorrhagic Fever, and Dengue Shock Syndrome to Dengue-like illness, Dengue, and Severe Dengue. Clinical and lab criteria for classification were updated to reflect the national definition. Section 5B was revised to include information on length of time a person diagnosed with a dengue infection is prohibited from blood or organ donation.

April 2015: Section 3B(2) was revised to include classification for a person living in a dengue endemic or non-endemic area of the United States without evidence of other flavivirus transmission.