



Dengue-like Illness, Dengue, Severe Dengue

Disease Plan

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Last updated: June 29, 2015, by JoDee Baker

Questions about this disease plan?

Contact the Utah Department of Health Bureau of Epidemiology: 801-538-6191.

Dengue Fever

(Dengue-like Illness, Dengue, Severe Dengue)

✓ WHY IS DENGUE FEVER IMPORTANT TO PUBLIC HEALTH?

Dengue is a potentially life-threatening illness caused by the bite of a mosquito infected with a virus associated with dengue fever. Although dengue is not endemic in Utah, public health investigations can assist in determining the locations of exposure, and can therefore assist in determining if there is possible movement of mosquitoes potentially due to climate change.

✓ DISEASE AND EPIDEMIOLOGY

Clinical Description

Dengue is an acute, viral illness characterized by sudden onset of fever, severe headache, eye pain, muscle and joint pain, and rash. Gastrointestinal upset and loss of appetite often occur. Swollen lymph nodes, petechiae (small bleeds into the skin that resemble flea bites), nosebleeds, and bleeding gums occur frequently. Recovery is often associated with prolonged fatigue and depression.

Severe dengue, often referred to as dengue hemorrhagic fever (DHF), is a more serious form of dengue, characterized by sudden onset of fever as well as bleeding (often severe) from mucosal surfaces (e.g., nasal, gastrointestinal, vaginal, gums), liver enlargement, and in severe cases, circulatory failure. Severe dengue also often includes abnormal blood clotting, low platelet count (thrombocytopenia), and evidence of plasma leaking through capillaries. Patients who develop gastrointestinal bleeding have a higher mortality rate than those who do not. Severe dengue can result in life-threatening hypotension (severely reduced blood pressure, shock) and generally occurs in people with a history of exposure to multiple dengue virus serotypes; the partial immune reaction contributes to the severity of the disease.

Causative Agent

The viruses of dengue fever are flaviviruses and include serotypes 1, 2, 3, and 4. These same viruses cause severe dengue.

Differential Diagnosis

Dengue fever can easily be confused with non-dengue illnesses, particularly in non-epidemic situations. Depending on the geographical origin of the patient, other etiologies – including non-dengue flavivirus infections – should be ruled out. These include yellow

fever, Chikungunya Virus, Japanese encephalitis, St. Louis encephalitis, Zika, West Nile, and other causes of fever such as malaria, leptospirosis, typhoid, Rickettsial diseases (*Rickettsia prowazeki*, *R. mooseri*, *R. conori*, *R. rickettsi*, *Orientia tsutsugamushi*, *Coxiella burneti*, etc.), measles, enteroviruses, influenza and influenza-like illnesses, and hemorrhagic fevers (Arenaviridae:Junin, etc.; Filoviridae: Marburg, Ebola; Bunyaviridae: hantaviruses, Crimean-Congo hemorrhagic fever, etc.).

Laboratory Identification

Dengue can be diagnosed by isolation of the virus, by serological tests, or by molecular methods. Diagnosis of acute (on-going) or recent dengue infection can be established by testing serum samples during the first five days of symptoms and/or early convalescent phase (more than five days of symptoms). Acute infection with dengue virus is confirmed when the virus is isolated from serum or autopsy tissue specimens, or the specific dengue virus genome is identified by reverse transcription-polymerase chain reaction (RT-PCR) from serum or plasma, cerebrospinal fluid, or autopsy tissue specimens during an acute febrile illness. Methods such as one-step, real time RT-PCR or nested RT-PCR are now widely used to detect dengue viral genes in acute-phase serum samples. This detection coincides with the viremia and the febrile phase of illness onset. Acute infections can also be laboratory confirmed by identification of dengue viral antigen or RNA in autopsy tissue specimens by immunofluorescence or immunohistochemical analysis, or by seroconversion from negative to positive IgM antibody to dengue or demonstration of a fourfold or greater increase in IgG antibody titers in paired (acute and convalescent) serum specimens.

Patients who have IgM antibodies to dengue detected in their serum specimen via an IgM antibody capture enzyme-linked immunosorbent assay (MAC-ELISA) and had either 1) a negative RT-PCR result in the acute phase specimen, or 2) did not submit an acute phase specimen, are classified as having a **recent probable dengue infection**. This is due to the fact that IgM antibodies for dengue may remain elevated for 2-3 months after the illness; the elevated IgM observed in a sample could be the result of an infection that occurred 2-3 months ago.

There may be cross reactivity with other flaviviruses, including West Nile virus (WNV), St. Louis encephalitis virus (SLE), Japanese encephalitis virus (JEV) and yellow fever virus (YFV). The provider should review the patient's past medical history, recent travel history, and vaccination record (especially yellow fever vaccination) to determine the likelihood that the current acute febrile illness is due to an infection with dengue virus.

Often, both acute and convalescent phase specimens are needed to make a diagnosis of dengue infection. This is especially true for those who submit a day five acute specimen because the virus and IgM antibodies may be at undetectable levels. If a patient with suspected dengue infection submits a late acute phase specimen that is negative (e.g., by RT-PCR and MAC-ELISA), and they do not submit a convalescent specimen, they are classified as a laboratory-indeterminate case.

The Utah Public Health Laboratory (UPHL) acts as a referral agent to the CDC for confirmation of dengue viruses.

Treatment

There is no specific treatment available for arboviral infections, including dengue. Persons who think they have dengue should use analgesics (pain relievers) with acetaminophen and avoid those containing aspirin. They should also rest, drink plenty of fluids, and consult a physician. If they feel worse (e.g., develop vomiting and severe abdominal pain) in the first 24 hours after the fever declines, they should go immediately to the hospital for evaluation. No licensed vaccine is available for preventing dengue.

Case Fatality

Fatalities associated with dengue fever are rare. With severe dengue, case fatality rates without treatment approach 50%; treated severe dengue is associated with a 3% fatality rate.

Reservoir

Dengue viruses are transmitted to humans by the bite of an infected mosquito. In the Western Hemisphere, the *Aedes aegypti* mosquito is the most important transmitter or vector of dengue viruses, although a 2001 outbreak in Hawaii was transmitted by *Aedes albopictus*. In parts of Southeast Asia and West Africa, the viruses may be maintained in a cycle involving monkeys and mosquitoes.

Transmission

Dengue is spread to humans by the bite of an infected mosquito (principally the *Aedes aegypti* mosquito). This mosquito has not been found in Utah, although the *aegypti* mosquito is currently expanding its range. Direct person-to-person spread of dengue does not occur.

Susceptibility

The elderly and children are most susceptible to dengue-related illness. Children have higher rates of dengue in endemic areas because infection confers immunity to the circulating serotype. As with most other arboviruses, infection confers immunity, but only short-term immunity to non-endemic serotypes.

Incubation Period

The incubation period for dengue is usually 4-7 days, although it may range from 3-14 days.

Period of Communicability

Arboviral infectious agents are not communicable from person-to-person, except in rare instances (blood transfusion, organ donation).

Epidemiology

Dengue has been called the most important mosquito-transmitted viral disease in terms of morbidity and mortality. Today, about 2.5 billion people, or 40% of the world's population, live in areas where there is a risk of dengue transmission. Dengue virus causes about 100 million cases of acute febrile disease annually, including more than 500,000 reported cases of severe dengue.

Currently, dengue is endemic in 112 countries. Dengue viruses are endemic in most tropical countries, including Australia and countries in Asia, Africa, the Caribbean, Central America, and South America. Hawaii, southern Texas, and the southeastern U.S., where *A. aegypti* is found, are at risk for dengue transmission and sporadic outbreaks. Puerto Rico is endemic for dengue. The world's largest known epidemic of severe dengue occurred in Cuba in 1981, with more than 116,000 persons hospitalized and as many as 11,000 cases reported in a single day. In the United States, dengue has been reported in 48 states, with nearly all cases acquiring it elsewhere through travel or immigration. This is also the case with Utah, as Utah does not have the appropriate vector to effectively transmit dengue.

✓ PUBLIC HEALTH CONTROL MEASURES

Public Health Responsibility

- Investigate all suspect cases of disease and fill out and submit appropriate disease investigation forms.
- Provide education to the general public, clinicians, and first responders regarding disease transmission and prevention.
- Identify clusters or outbreaks of disease.
- Identify sources of exposure and stop further transmission.

Prevention

Environmental measures

People should be encouraged to reduce mosquito populations around their homes and neighborhoods by getting rid of any standing water that might support mosquito breeding. Mosquitoes will begin to breed in any puddle or standing water that lasts for more than four days. People should be advised of the following:

- Dispose of or regularly empty any metal cans, plastic containers, ceramic pots, and other containers (including trash cans) on their property that might hold water.
- Pay special attention to discarded tires. Stagnant water in tires is a common place for mosquitoes to breed.
- Drill holes in the bottom of recycling containers that are left outdoors so that water can drain out.

- Clean clogged roof gutters; remove leaves and debris that may prevent drainage of rainwater.
- Turn over plastic wading pools and wheelbarrows when not in use.
- Do not allow water to stagnate in birdbaths; aerate ornamental ponds or stock them with fish.
- Keep swimming pools clean and properly chlorinated; remove standing water from pool covers.
- Use landscaping to eliminate standing water.

Personal preventive measures/education

- Repair any holes in screens, and make sure they are tightly attached to all doors and windows.
- Use mosquito netting when sleeping.
- Use repellents containing DEET (N,N-diethyl-m-toluamide), and choose a product that will provide sufficient protection for the amount of time spent outdoors. Product labels often indicate the length of time that someone can expect protection from a product. DEET is considered safe when used according to the manufacturer's directions. The efficacy of DEET levels off at a concentration of 30%, which is the highest concentration recommended for children and adults. The following should be noted when using DEET:
 - DEET products should not be used on children less than two months of age. Mosquito netting may be used to cover infant carriers or to protect other areas for children less than two months of age.
 - Avoid using DEET products that combine the repellent with a sunscreen. Sunscreens may need to be reapplied often, resulting in an over-application of DEET.
 - Apply DEET on exposed skin, using only as much as needed.
 - Do not use DEET on the hands of young children, and avoid applying repellent to areas around the eyes and the mouth.
 - Do not use DEET over cuts, wounds, or irritated skin.
 - Wash treated skin with soap and water after returning indoors, and wash treated clothing.
 - Avoid spraying DEET products in enclosed areas.
- Picaridin (KBR 3023) is a relatively new repellent that is now available in the U.S. Recent studies have shown it to be safe and effective. Picaridin-containing repellents should be used according to the manufacturer's recommendations.
- A number of plant-derived products are available for use as repellents, but most of these products do not provide the same level or duration of protection as products containing DEET. However, there are studies that show that oil of lemon eucalyptus [p-methane 3,8-diol(PMD)] provides as much protection as low concentrations of DEET when tested against mosquitoes found in the U.S.

Chemoprophylaxis

None.

Vaccine

No vaccine exists for dengue.

Isolation and Quarantine Requirements

Isolation: None

Hospital: Standard body substance precautions.

Quarantine: None

✓ CASE INVESTIGATION

Reporting

Report all suspect and confirmed cases of dengue infection.

Table of criteria to determine whether a case should be reported to public health authorities

Criterion	Reporting	
	1	2
Clinical Evidence		
Fever as reported by the patient or healthcare provider	N	N
Laboratory Evidence		
For any patient with history of fever, the detection in serum, plasma, CSF or tissue of DENV- specific genome sequences by RT-PCR or another molecular diagnostic test; <i>OR</i>	<input type="radio"/>	
Detection in serum or plasma of DENV NS1 antigen by immunoassay; <i>OR</i>	<input type="radio"/>	
Cell culture isolation of DENV from serum, plasma, CSF or other clinical specimens; <i>OR</i>	<input type="radio"/>	
Detection of DENV antigen in tissue from a fatal case by immunofluorescence or immunohistochemistry; <i>OR</i>	<input type="radio"/>	
Detection of IgM anti-DENV 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 irrespective of whether there is other flavivirus transmission (e.g., WNV, SLEV) occurring or whether the person has had recent vaccination against a flavivirus (e.g., YFV, JEV); <i>OR</i>	<input type="radio"/>	
Detection of IgM anti-DENV in a serum specimen or CSF by validated immunoassay 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); <i>OR</i>	<input type="radio"/>	

IgM anti-DENV seroconversion by validated¶ immunoassay in acute (i.e., collected ≤5 days of illness onset) and convalescent (i.e., collected >5 days after illness onset) serum specimens; <i>OR</i>	○	
The absence of IgM anti-DENV by validated ¶ immunoassay in a serum or CSF specimen collected ≤5 days after illness onset and in which molecular diagnostic testing was not performed, in a patient with an epidemiologic linkage, and without recent vaccination against a flavivirus (e.g., YFV, JEV).	○	
IgG anti-DENV 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 [12]) with a ≥4-fold higher end point titer as compared to other flaviviruses tested.	○	
<i>Epidemiological Evidence</i>		
During the two weeks prior to onset of fever, travel to a dengue endemic country or presence in a location experiencing an ongoing dengue outbreak, <i>OR</i>	○	
During the two weeks prior to onset of fever, association in time and place with a confirmed or probable dengue case.	○	

Notes:

S = This criterion alone is Sufficient to report a case.

N = All - Nil criteria in the same column are Necessary to report a case.

O = At least one of these - Oll (Optional) criteria in each category (e.g., clinical evidence and laboratory evidence) in the same column - in conjunction with all - Nil criteria in the same column - is required to report a case.

*A requisition or order for any of the - Sll laboratory tests is sufficient to meet the reporting criteria.

¶Validated diagnostic tests are defined as FDA-approved or laboratory-developed assays if supported by evaluation studies.

Case Definition

Dengue Virus Infections (2015)

Clinical Criteria

Dengue-like illness is defined by fever as reported by the patient or healthcare provider.

Dengue is defined by 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
- Aches and pains (e.g., headache, retro-orbital pain, joint pain, myalgia, arthralgia)
- Tourniquet test positive
- Leukopenia (a total white blood cell count of <5,000/mm³), **or**
- Any warning sign for severe dengue:
 - Abdominal pain or tenderness

- Persistent vomiting
- Extravascular fluid accumulation (e.g., pleural or pericardial effusion, ascites)
- Mucosal bleeding at any site
- Liver enlargement >2 centimeters
- Increasing hematocrit concurrent with rapid decrease in platelet count

Severe dengue is defined as dengue with any one, or more, of the following scenarios:

- 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 for patient age and sex offers further evidence of plasma leakage.
- 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.
- 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

Laboratory Criteria

Diagnostic testing should be requested for patients in whom there is a high index of suspicion for dengue, based either on signs and symptoms, or epidemiological linkage to a confirmed or probable dengue case.

Confirmatory

- Detection of dengue virus (DENV) nucleic acid in serum, plasma, blood, cerebrospinal fluid (CSF), other body fluid or tissue by validated reverse transcriptase-polymerase chain reaction (PCR), or
- Detection of DENV antigens in tissue a fatal case by a validated immunofluorescence or immunohistochemistry assay, or
- Detection in serum or plasma of DENV NS1 antigen by a validated immunoassay; or
- Cell culture isolation of DENV from a serum, plasma, or CSF specimen; or
- Detection of IgM anti-DENV 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 IgM anti-DENV in a serum specimen or CSF by validated immunoassay 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

- IgM anti-DENV seroconversion by validated immunoassay in acute (i.e., collected <5 days of illness onset) and convalescent (i.e., collected >5 days after illness onset) serum specimens; or
- IgG anti-DENV 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 [12]) with a >4-fold higher end point titer as compared to other flaviviruses tested.

Probable

Detection of IgM anti-DENV 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 with evidence of other flavivirus transmission (e.g., WNV, SLEV), or recent vaccination against a flavivirus (e.g., YFV, JEV).

- Detection of IgM anti-DENV in a serum specimen or CSF by validated immunoassay in a traveler returning from a dengue endemic area with 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).

Suspected

- The absence of IgM anti-DENV by validated immunoassay in a serum or CSF specimen collected <5 days after illness onset and in which molecular diagnostic testing was not performed in a patient with an epidemiologic linkage.

Criteria for epidemiologic linkage

- Travel to a dengue endemic country or presence at location with ongoing outbreak within previous two weeks of onset of an acute febrile illness or dengue, or
- Association in time and place (e.g., household member, family member, classmate, or neighbor) with a confirmed or probable dengue case.

Case Classification

Confirmed

A clinically compatible case of dengue-like illness, dengue, or severe dengue with confirmatory laboratory results, as listed above.

Probable

A clinically compatible case of dengue-like illness, dengue, or severe dengue with laboratory results indicative of probable infection, as listed above.

Suspect

A clinically compatible case of dengue-like illness, dengue, or severe dengue with an epidemiologic linkage as listed above.

Dengue Fever: Utah Public Health Disease Investigation Plan

Criterion	Reporting of Dengue		
	Confirmed	Probable	Suspected
<i>Clinical Evidence</i>			
<u><i>Dengue-like illness</i></u>			
Fever as reported by the patient or healthcare provider	N	N	S
<u><i>Dengue</i></u>			
Fever as reported by the patient or healthcare provider	N	N	N
Nausea/vomiting	O	O	O
Rash	O	O	O
Aches and pains (e.g. headache, retro-orbital pain, joint pain, myalgia)	O	O	O
Tourniquet test positive**	O	O	O
Leukopenia (total white blood cell count <5,000/mm3)	O	O	O
Any severe dengue warning sign***	O	O	O
<u><i>Severe Dengue</i></u>			
Dengue, as defined above	N	N	N
Severe plasma leakage leading to hypovolemic shock or fluid accumulation (e.g., pleural effusions, ascites, pericardial effusion) with respiratory distress	O	O	O
Severe bleeding from gastrointestinal tract or vagina	O	O	O
Severe organ involvement	O	O	O
<i>Laboratory Evidence</i>			
For any patient with signs or symptoms of suspect dengue, the detection in serum, plasma, CSF or tissue of DENV-specific genome sequences by RT-PCR or another molecular diagnostic test; OR	S		
Detection in serum or plasma of DENV NS1 antigen by immunoassay; OR	S		
Cell culture isolation of DENV from serum, plasma, CSF or other clinical specimens; OR	S		
Detection of DENV antigens in tissue from a fatal case by immunofluorescence or immunohistochemistry, OR	S		
Detection of IgM anti-DENV 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., YFV, JEV); OR	S		
Detection of IgM anti-DENV 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 with evidence of other flavivirus transmission (e.g. WNV, SLEV), or recent vaccination against a flavivirus (e.g., YFV, JEV);		S	

Dengue Fever: Utah Public Health Disease Investigation Plan

Detection of IgM anti-DENV in a serum specimen or CSF by validated immunoassay in a traveler returning from a dengue endemic area with 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);		S	
Detection of IgM anti-DENV in a serum specimen or CSF by validated¶ immunoassay 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	S		
IgM anti-DENV seroconversion by validated immunoassay in acute (i.e., collected <5 days of illness onset) and convalescent (i.e., collected >5 days of illness onset) serum specimens; OR	S		
IgG anti-DENV 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 [12]) with a >4-fold higher end point titer as compared to other flaviviruses tested.	S		
The absence of IgM anti-DENV by validated¶ immunoassay in a serum or CSF specimen collected <5 days after illness onset and in which molecular diagnostic testing was not performed, in a patient with an epidemiologic linkage.			S
Epidemiological Evidence			
During the previous two weeks prior to onset of fever, travel to a dengue endemic country or presence in a location experiencing an ongoing dengue outbreak, OR			S
During the previous two weeks prior to onset of fever, association in time and place with a confirmed or probable dengue case.			S

Notes:

S = This criterion alone is Sufficient to classify a case.

N = All “N” criteria in the same column are Necessary to classify a case. A number following an “N” indicates that this criterion is only required for a specific disease/condition subtype (see below).

A = This criterion must be absent (i.e., NOT present) for the case to meet the classification criteria.

O = At least one of these “O” (Optional) criteria in each category (e.g., clinical evidence and laboratory evidence) in the same column - in conjunction with all - Nll criteria in the same column - is required to classify a case. (These optional criteria are alternatives, which mean that a single column will have either no O criteria or multiple O criteria; no column should have only one O.) A number following an - Oll indicates that this criterion is only required for a specific disease/condition subtype.*The tourniquet test is performed by inflating a blood pressure cuff on the upper arm to a point midway between the systolic and diastolic pressures for 5 minutes.

**A test is considered positive when 10 or more petechiae per 2.5 cm² (1 in²) are observed after the cuff pressure has been released for 2 minutes. The test may be negative or mildly positive during the phase of profound shock. It usually becomes positive, sometimes strongly positive, if the test is conducted after recovery from shock.

*** Warning signs: Abdominal pain or tenderness, persistent vomiting, extravascular fluid accumulation (e.g., pleural or pericardial effusion, ascites), mucosal bleeding at any site, liver enlargement >2 centimeters, increasing hematocrit concurrent with rapid decrease in platelet count.

¶ Validated diagnostic tests are defined as FDA-approved or laboratory-developed assays if supported by evaluation studies.

Rarely, a person will present with two consecutive episodes of acute febrile illness or dengue. If they occur at least two weeks apart and are shown to be due to different infecting DENV serotypes by molecular diagnostic testing, they should be reported as two different cases. However, if diagnosed only by IgM anti-DENV in the second episode, they would be considered as separate cases only if they occur >90 days apart due to the persistence of detectable IgM anti-DENV for up to ~90 days.

Case Investigation Process

- Complete morbidity form.
- Verify case status.
- Complete disease investigation form.
- Determine whether patient had travel/exposure history consistent with acquisition of disease in Utah or elsewhere.
- If patient acquired disease in Utah, identify the source of transmission and eliminate it.

Outbreaks

An outbreak will be defined as:

- A larger than normal number of cases by county, or
- One case of an unusual or exotic arboviral etiology.

Identification of Case Contacts

This disease is not spread person-to-person.

Case Contact Management

None.

✓ REFERENCES

Centers for Disease Control and Prevention (2012). Dengue Laboratory Guidance and Diagnostic Testing. Retrieved from: <http://www.cdc.gov/dengue/clinicalLab/laboratory.html>. Accessed 26 Feb 2015.

Heymann, D.L. (2008). Control of Communicable Diseases Manual (19th Edition).

Pickering, L.K. (2012). 2012 Report of the Committee on Infectious Diseases (29th Edition), Red Book.

Massachusetts Department of Public Health (2006). Guide to Surveillance, Reporting and Control.

Emedicine (2014). Japanese Encephalitis, Dengue, Yellow Fever, Western Equine Encephalitis. Retrieved from: <http://www.emedicine.com>. Accessed 26 Feb 2015.

Council for State and Territorial Epidemiologists (CSTE) Position statements. Available from <http://www.cste.org/default.asp?page=PositionStatements>.

World Health Organization (2015). Dengue and Severe Dengue. Retrieved from: <http://www.who.int/mediacentre/factsheets/fs117/en/>. Accessed 19 Feb 2015.

UpToDate (2014) Prevention and Treatment of Dengue. Retrieved from: <http://www.uptodate.com>. Accessed 19 Feb 2015.

UpToDate (2014) Clinical Manifestations of Dengue. Retrieved from: <http://www.uptodate.com>. Accessed 19 Feb 2015.

✓ VERSION CONTROL

Updated March 2015 – Included the reporting and case definition tables from CSTE. Updated terminology to dengue-like illness, dengue, and severe dengue. Updated Laboratory and Epidemiology sections.

✓ UT-NEDSS Minimum/Required Fields by Tab

Demographic

- County
- State
- Date of Birth
- Birth Gender
- Ethnicity
- Race
- First Name
- Last Name
- Middle Name
- Area Code
- Email Address
- Extension
- Phone Number

Clinical

- Date Diagnosed
- Date of Death
- Died (Field will change to "Did patient die from the illness or complications")
- Disease
- Onset Date
- Does the patient have fever?
- Was patient a blood donor?
- Does the patient have headache?
- Does the patient have myalgia?
- Does the patient have rash?
- Does the patient have vertigo?
- Is the patient vomiting?
- Does the patient have paresis?
- Does the patient have nuchal rigidity?
- Does the patient have aseptic meningitis?
- Does the patient have encephalitis?
- Does the patient have myelitis?
- Is the patient disoriented?
- Does the patient have obtundation?
- Does the patient have peripheral demyelinating neuropathy?
- Does the patient have acute flaccid paralysis?
- Does the patient have nerve palsies?
- Does the patient have sensory deficit?
- Does the patient have abnormal reflexes?
- Has the patient experienced seizures?
- Absence of a more likely clinical explanation for the illness?

Laboratory

- Lab Test Date
- Organism
- Specimen Source
- Test Result

Epidemiological

- Imported From

Investigation

- Is the patient being breastfed?
- Is the patient breastfeeding?
- During the exposure period, has patient traveled outside of Utah?
- Please list all places and dates:
 - During the above period, has the patient received a blood transfusion?
 - During the above period, has the patient donated blood or blood products?
 - During the above period, has the patient received an organ transplant?
 - During the above period, has the patient donated organ or tissues?
 - During the above period, has the patient received a bloodborne exposure (e.g., needle stick)?
- Was the patient an infant that was born to a mother who had a dengue infection during their pregnancy?
- Was the patient identified as having dengue infection through routine blood donation screening by the blood collection agency? (Patient may or may not be symptomatic)
- Lab Acquired
- Occupationally acquired/not lab
- What was the date of blood donation?
- What lab did the testing?
- Before the patient's infection, did a health care provider ever tell the patient that they had diabetes?
- Before the patient's infection, did a health care provider ever tell the patient that they had hypertension?
- Before the patient's infection, did a health care provider ever tell the patient that they had a heart attack??
- Before the patient's infection, did a health care provider ever tell the patient that they had angina or coronary artery disease?
- Before the patient's infection, did a health care provider ever tell the patient that they had congestive heart failure?
- Before the patient's infection, did a health care provider ever tell the patient that they had a stroke?
- Before the patient's infection, did a health care provider ever tell the patient that they had a chronic obstructive pulmonary disease (COPD)?
- Before the patient's infection, did a health care provider ever tell the patient that they had chronic liver disease?
- Before the patient's infection, did a health care provider ever tell the patient that they had kidney/renal disease or failure?
- Did the patient have a history of alcoholism?
- Did the patient have a history of bone marrow transplant?
- Did the patient have a history of a solid organ transplant?
- If the patient had an organ transplant, which organ was transplanted?
- If the patient had an organ transplant, in which year was the transplant?
- Did the patient have a history of cancer?
- If the patient had cancer, which type (S) of cancer did the patient have?
- If the patient had cancer, in which year was the cancer diagnosed?
- Is the patient currently being treated for cancer?
- At the time of the patient's diagnosis with dengue, was the patient immune suppressed?

- If the patient is immune suppressed, what is the immune condition?
- At the time of the patient's diagnosis with dengue, was the patient undergoing chemotherapy?
- At the time of the patient's diagnosis with dengue, was the patient receiving medications that suppress the immune system?
- At the time of the patient's diagnosis with dengue, was the patient undergoing other treatments for cancer?
- At the time of the patient's diagnosis with dengue, was the patient undergoing hemodialysis?
- At the time of the patient's diagnosis with dengue, was the patient undergoing other treatments for kidney disease?
- At the time of the patient's diagnosis with dengue, was the patient receiving oral or injected steroids?
- At the time of the patient's diagnosis with dengue, was the patient receiving insulin or other medications to treat diabetes?
- At the time of the patient's diagnosis with dengue, was the patient receiving insulin or other medications to treat high blood pressure?
- At the time of the patient's diagnosis with dengue, was the patient receiving medications to treat coronary artery disease?
- At the time of the patient's diagnosis with dengue, was the patient receiving medications to treat congestive heart failure?
- Was the patient the source of the medical information?
- Was the provider the source of the medical information?
- Was the patient's family the source of the medical information?
- Is the medical record the source of the medical information?

Contacts

N/A

Reporting

- Date first reported to public health

Administrative

- State Case Status
- Event Name