

SHASTA COUNTY—Health and Human Services Agency

Public Health

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WEST NILE VIRUS HEALTH UPDATE

Date: August 6, 2014

To: Shasta County Primary Care MDs (Family Practice, General Internal Medicine, OB/GYN, Pediatricians, General Practitioners), Infectious Disease Specialists, Intensivists, Neurologists, Geriatricians, Endocrinologists, ER Medical & Nursing Directors, Clinic and Urgent Care Medical Directors, Nurse Practitioners, Physician Assistants, Clinical Lab Directors

From: Andrew Deckert, MD, MPH, Health Officer

RE: West Nile Virus-associated Death in Shasta County

A Shasta County adult died here recently and today Shasta County Public Health received confirmation from the California Department of Public Health's Viral and Rickettsial Disease Laboratory that the patient's death was associated with West Nile Virus. The patient had signs and symptoms compatible with the neuroinvasive form of WNV. This adult was the second reported human death associated with WNV in California for 2014. This update is to provide you with practical information for the 2014 West Nile Virus (WNV) season in Shasta County.

Our key concerns are the following:

- Please maintain a high index of suspicion for WNV and test for WNV when clinically indicated.
- Encourage your patients to protect themselves and their families from mosquito bites to reduce their risk for WNV – especially those at increased risk for severe WNV illness.

A free physician's packet of detailed WNV clinical, prevention, and patient information is available on the Shasta County Public Health (SCPH) website (www.shastahhsa.net then click "Medical Professionals", the bottom right hand picture, then scroll down to "WNV") or on request at 225-5591.

West Nile Virus is now well established in California and it is important to maintain a high degree of clinic suspicion for WNV during the midsummer to fall months. WNV activity characteristically varies widely year to year. Weather affects mosquito numbers to a great degree, which are directly related to the risk of mosquito bites and the risk of West Nile Virus infection.

Clinical Features of WNV Infection

West Nile Fever

- **Most persons who become infected with West Nile virus (WNV) develop no clinical illness or symptoms.** In previous outbreaks in the Northern Hemisphere, an estimated 80% of people who became infected with WNV never developed symptoms attributable to the infection.
- **Of the approximately 20% of infected people who do develop symptoms, most develop West Nile Fever,** which can result in long-term fatigue, headache, myalgia, weakness; and, walking and memory difficulties (about 15-20% of cases).

- About 1% develop severe illness (**WNV meningitis, encephalitis, poliomyelitis**).
- The incubation period for WNV infection generally ranges from about 2 to 14 days; longer incubation periods have been documented in immunosuppressed persons.

Clinical Features of West Nile Fever

- Fever
- Headache
- Fatigue
- Skin rash on the trunk of the body (occasionally)
- Swollen lymph glands (occasionally)
- Eye pain (occasionally)

Severe Disease: West Nile Meningitis, West Nile Encephalitis, and West Nile Poliomyelitis

- When the central nervous system (CNS) is affected, clinical syndromes ranging from febrile headache to aseptic meningitis to encephalitis may occur, and these are often clinically indistinguishable from similar syndromes caused by other viruses. Sometimes, proximal weakness without sensory deficit is a clinical clue towards WNV.
- People over 50 years are at higher risk for serious disease although serious disease may occur at any age. Certain immunosuppressed patients (eg. chemotherapy) are also at higher risk of serious disease.
- Headache can be a prominent feature of WNV fever, meningitis, or encephalitis and is not a useful indicator of neuroinvasive disease.
- West Nile meningitis usually involves fever, headache, and stiff neck. Pleocytosis is present. Changes in consciousness are not usually seen and are mild when present.
- West Nile encephalitis, the most severe form of neuroinvasive West Nile viral disease, involves fever and headache, and more global symptoms. Alteration of consciousness or thinking is present, which may be mild and result in lethargy but may progress to confusion or coma. Focal neurologic deficits, including limb paralysis and cranial nerve palsies, may be observed. Tremors and movement disorders also have been noted.
- West Nile poliomyelitis, a flaccid paralysis syndrome associated with WNV infection, is less common than meningitis or encephalitis. This syndrome is generally characterized by the acute onset of asymmetric limb weakness or paralysis in the absence of sensory loss. Pain sometimes precedes the paralysis. The paralysis can occur in the absence of fever, headache, or other common symptoms associated with WNV infection. Involvement of respiratory muscles, leading to acute respiratory failure, can sometimes occur.

Clinical Features of Severe Disease

- Fever
- Gastrointestinal symptoms
- Ataxia and extrapyramidal signs
- Optic neuritis
- Seizures
- Weakness
- Change in mental status
- Myelitis
- Polyradiculitis
- A minority of patients with severe disease develop a maculopapular or morbilliform rash involving the neck, trunk, arms, or legs.
- Flaccid paralysis is sometimes seen.
- Although not observed in recent outbreaks, myocarditis, pancreatitis, and fulminant hepatitis have been described.

Common Laboratory Findings of Severe Disease

- Total leukocyte counts in peripheral blood are mostly normal or elevated with lymphocytopenia and anemia also occurring.
- Hyponatremia is sometimes present, particularly among patients with encephalitis.
- Examination of the cerebrospinal fluid (CSF) shows pleocytosis, usually with a predominance of lymphocytes. Protein is universally elevated. Glucose is normal.
- Computed tomography is not useful in the diagnosis of WNV infection, but is useful in excluding other etiologies of acute meningoencephalitis. Brain MRI is often normal, but will sometimes display leptomeningeal enhancement or parenchymal signal changes.

Clinical Suspicion

Diagnosis of WNV infection is based on a high index of clinical suspicion and obtaining specific laboratory tests.

- WNV, or other arboviral diseases such as St. Louis encephalitis (SLE), should be strongly considered in adults >50 years who develop unexplained encephalitis or meningitis in summer or early fall. A enterovirus meningitis outbreak has occurred in the past in Shasta County, so consider these food borne illnesses in your differential as well.
- The local presence of WNV enzootic activity or other human cases should further raise suspicion.
- A travel history may be very important.
- Severe neurological disease due to WNV infection has occurred in patients of all ages. Year-round transmission is possible in some areas. Therefore, WNV should be considered in all persons with unexplained encephalitis and meningitis.

Laboratory Testing for West Nile Virus in Northern California

WNV serologic testing has some peculiarities. It tends not to become positive until 7 days after onset of symptoms. **A negative test early in the illness may be a false negative.** Rarely, the serum IgG has become positive before IgM. The IgM may remain positive for up to a year following infection. History of symptoms consistent with WNV is helpful in interpreting test results. Patients who have been recently vaccinated against or recently infected with related flaviviruses (e.g., yellow fever, Japanese encephalitis, dengue, SLE) may have cross-reactivity with WNV testing.

WNV testing is recommended on individuals with the following:

- A. Viral encephalitis
- B. Aseptic meningitis (Note: enterovirus testing for individuals \leq 18 years of age is also recommended)
- C. Acute flaccid paralysis; atypical Guillain-Barré Syndrome; transverse myelitis; or
- D. Febrile illness compatible with West Nile fever and lasting \geq 7 days (must be seen by health care provider)

IMPORTANT: Timing and Type of Lab Specimens for WNV Testing

- The **optimal laboratory specimen** for WNV testing is **serum collected at least 7 days after the onset** of symptoms. Specimens collected earlier may show a false negative.
- **CSF fluid is also useful**, especially if other viral encephalitis, eg HSV, enterovirus, are in the differential. WNV IgM EIA or WNV PCR of CSF are the most confirmatory-- if positive.

WNV testing is available through many private laboratories. The Shasta County Public Health Laboratory (SCPHL) and the California Department of Public Health's Virus and Rickettsia Diagnostic Laboratory (VRDL) can consult regarding WNV testing questions according to the CDC's recommended WNV testing methods and algorithms. SCPH Lab does not perform WNV testing; however, in special situations of public health concern only, such as the unclear differential diagnosis of viral encephalitis, we can request from the state VRDL WNV testing free of charge to Shasta County residents with suspect CNS WNV, on CSF specimens sent by their healthcare providers. The turn around time is approximately 5-7 business days from the time we receive the specimen.

Specimen submittal forms for WNV lab testing are available on the SCPH website under "Medical Professionals" or by phoning the **SCPH Laboratory at 225-5072**. Suspect or known WNV is reportable within one working day (see below) due to potential public health implications such as blood product transfusion or pinpointing enhanced mosquito control effort needs; however, a CMR or Case History Form is not required in order to submit specimens for lab testing for WNV.

For information **after hours and weekends** contact the Public Health Nurse on call at 225-3767.

Treatment

Treatment is supportive. Severe illness may involve hospitalization, intravenous fluids, respiratory support, and prevention of secondary infections.

There have been at least three **clinical trials** for treatment of West Nile Virus; descriptions of the studies with contact information are available on the California Department of Health Services website at <http://westnile.ca.gov/clinician.htm>.

Requirements for Reporting West Nile Virus

Clinicians and Laboratories are required to report WNV disease within 1 working day:

- **WNV encephalitis**
- **WNV meningitis**
- **WNV Fever**
- **WNV Asymptomatic (positive lab tests)**

When you or a laboratory reports a case of invasive WNV disease to SCPH, a Public Health Nurse will contact your office or the hospital and the patient/patient's family to collect epidemiological information. Or you may complete a WNV Case History Form (available from our website, www.shastahhsa.net then click "Medical Professionals" then "West Nile Virus") and return it to Public Health via **Confidential Fax number 225-5074**.

The epidemiological information gathered on the Case History Form is used to investigate each case for possible rare non-mosquito transmission of WNV (e.g. blood or organ donation, breast feeding or vertical transmission in pregnancy), to track the incidence of WNV disease in our area, and to determine areas of the County where increased mosquito control efforts may be currently needed.

To report a case of WNV or for more information, phone: 225-5591 and tell the receptionist that you are reporting a communicable disease.

After hours or on weekends: 225-3767

Targeted Prevention for Your High Risk Patients

People over 50 years are at higher risk for serious disease although serious disease may occur at any age. Certain immunosuppressed patients (eg. chemotherapy) are also at higher risk of serious disease. **Outdoor workers and people involved in other outdoor activities or recreation**, also

have increased risk for developing West Nile Virus infections because of increased exposure to mosquitoes.

Individual protection against WNV is primarily reduction of risk for mosquito bites. Patient education materials are available from our website, www.shastahhsa.net (then click “Medical Professionals” then “West Nile Virus” then “West Nile Patient Education Materials”).

For more information or to request a West Nile Virus Physicians Packet at no charge:

- Call Shasta County Public Health at 225-5591 or 1- 800-971-1999
- Check our web site at www.shastahhsa.net .

WNV Surveillance Shasta County 2012-2014

County	Human Cases	Horses	Dead Birds	Mosquito Pools	Sentinel Chickens	Squirrels
Shasta 2014	1	0	2	12	0	0
Shasta 2013	1	0	38	15	21	1
Shasta 2012	1	5	36	17	6	1

CONTACT INFORMATION:



- Shasta County Public Health Laboratory 225-5072
- After hours and weekends 225-3767
- Cindy Lakmann, Lead Communicable Disease PHN 225-5067
- Dave Maron, Communicable Disease Manager 225-5593
- William Ung, Communicable Disease PHN..... 245-6853
- Andrew Deckert, MD, MPH, Health Officer 225-5594
- Confidential Fax..... 225-5074
- www.shastahhsa.net