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Mayor

## HEALTH UPDATE

May 9, 2006

### WEST NILE VIRUS (WNV)

This update provides information about WNV recognition, testing, reporting procedures, surveillance activities, and information resources for San Francisco. This update and additional information on WNV is posted on the San Francisco Health Department's website: [www.sfdph.org/cdcp](http://www.sfdph.org/cdcp). Click on "West Nile Virus" in the Quick Links box.

#### **ACTIONS REQUESTED OF ALL CLINICIANS:**

1. Be alert for human cases of WNV. (See clinical description below.)
2. WNV is now legally reportable. Report suspect cases and positive test results to the San Francisco Communicable Disease Control Unit (CDCU) at (415) 554-2830. Fax the WNV Case History Form to (415) 554-2848.
3. If requesting WNV testing, obtain CDCU approval and follow guidelines (see below) for collecting and sending clinical specimens to the SFDPH Public Health Laboratory.

#### **BACKGROUND INFORMATION**

WNV, an arbovirus in the flavivirus family, is transmitted by a mosquito bite. Mosquitoes become infected when they feed on infected birds, the reservoir for WNV. Human-to-human transmission of WNV generally does not occur; however, human WNV infections have been associated with blood transfusions and organ transplants.

WNV was first identified in the US in 1999 and has since been found in mosquitoes, birds, mammals or humans in every state except Hawaii. Human cases have occurred in Alaska but were not locally acquired. In 2005, nationally 2949 human infections and 116 fatalities nationwide were reported to the CDC. In California 935 human infections (CDC figure is 873) and 19 fatalities were reported, predominantly in the Sacramento region, and WNV infected birds were found in 52 counties. This year, as of 5/5/06, 15 dead birds have tested positive for WNV, from Orange, Sacramento, San Diego, San Mateo, Santa Clara, and Ventura counties. Five mosquito samples have tested positive for WNV in 2006, from Riverside County.

#### **CLINICAL DESCRIPTION**

Less than 1% of WNV infections result in neuroinvasive disease (WNV NID). The central nervous system (CNS) syndromes caused by WNV are clinically similar to those caused by other infectious agents. Possible clinical manifestations of WNV NID include:

- **WNV encephalitis:** fever, headache, and altered mental status, at times complicated by seizures. 60-75% of WNV NID cases present with encephalitis or meningoencephalitis. *Report and pursue testing in all cases of suspected WNV encephalitis.*
- **WNV meningitis:** fever, headache, stiff neck, and pleocytosis in cerebral spinal fluid. 25-35% of WNV NID cases present with meningitis. *Report all cases of meningitis, and pursue testing in suspect cases that are 18 years of age or older. In suspect cases younger than 18 years please evaluate for enteroviruses prior to pursuing WNV testing.*

- WNV poliomyelitis: acute onset of asymmetric limb weakness or paralysis in the absence of sensory loss, sometimes preceded by pain. The paralysis can occur in the absence of fever, headache, or other symptoms commonly seen in WNV infection. Respiratory failure may occur. *Report and pursue testing in all cases of suspected WNV poliomyelitis.*

Approximately 20% of infected people will experience:

- West Nile Fever: fever ( $T \geq 38^{\circ}\text{C}$ ), commonly associated with headache, muscle pain or weakness, and fatigue; weakness and muscle weakness may persist for over 1 month. Other symptoms include anorexia, eye pain, rash, neck or joint pain, nausea, vomiting, and lymph node swelling. *Report suspect cases of West Nile Fever (WNV) lasting  $\geq 7$  days and seen by a health care provider. Testing for WNV by the SF Public Health Lab (PHL) will be recommended on a case-by-case basis in consultation with the CDCU.*

## HUMAN CASE REPORTING

All West Nile virus infections, both suspected and laboratory confirmed, are legally reportable by health care providers in California as of June 30, 2005. This includes reporting of encephalitis\*, meningitis\*, poliomyelitis or fever due to WNV.

**Report all suspected cases and positive WNV test results from commercial and hospital labs to the CDCU (415) 554-2830, fax (415) 554-2848.** Use the 2006 WNV Case History Form attached to this Update, and available on our website ([www.sfdph.org/cdcp](http://www.sfdph.org/cdcp) click on "West Nile"), to report suspected and laboratory confirmed cases and/or to request testing for WNV. Your reports help us to assess the burden of illness and to target mosquito control and public education activities.

Blood Bank Reporting for WNV-Infected Donors. West Nile virus infections, both confirmed infections and presumptively viremic donors (PVD), detected by blood banks are reportable by the blood bank directly to the local health department. Further investigation may be necessary in order to determine if the donor was symptomatic. If a person identified with WNV donated blood or organs within 2 weeks of illness, the blood collection facility/hospital will be notified in order to track the infected blood products or organs.

WNV Surveillance During Pregnancy. Enhanced surveillance to learn more about intrauterine WNV transmission and birth outcomes is ongoing. The objectives of this enhanced surveillance are to evaluate the physical, ophthalmologic and cognitive development of children previously enrolled in a voluntary WNV pregnancy registry, and to prospectively identify pregnant, WNV-infected women and evaluate their risk of adverse birth and developmental outcomes using a cohort design.

\*Encephalitis and meningitis from any etiology remain legally reportable according to Title 17, California Code of Regulations.

## HUMAN DIAGNOSTIC TESTING

Testing for WNV infection is based on clinical suspicion and risk for exposure such as residence, travel, or outdoor activity in an area with WNV activity. Although nucleic acid amplification tests (e.g., Polymerase Chain Reaction) are used to screen blood donations, they have limited usefulness in diagnosing clinically evident infections because WNV viremia may be transient and low level. **Serology is the preferred clinical diagnostic test.** Paired acute and convalescent serum samples should be collected whenever WNV is suspected. Although a single acute serum may provide evidence of recent WNV infection, a negative acute serum may not rule out infection if collected too early to demonstrate antibody response. Thus, if WNV is highly suspected, request a second serum sample to be collected 3 to 5 days after the first acute serum sample.

The SFDPH Public Health Lab will test serum for antibodies against WNV free of charge and forward specimens to the state Viral and Rickettsial Diseases Lab for confirmatory testing. If CSF sample is available, it will also be forwarded for testing at the state laboratory. The CDCU must approve requests for

WNV testing by the PHL and receive a completed Case History Form. See the following “WNV Lab Testing Guidelines” for details regarding specimen collection and transport.

**Interpretation of West Nile Virus antibody test results\***

Tests	Results	Interpretation
IgM IgG	negative negative	Antibody not detected
IgM IgG	negative positive	Infection with a flavivirus at undetermined time
IgM IgG	positive negative	Possible evidence of recent or current infection; further confirmatory testing necessary**
IgM IgG	positive positive	Evidence of recent or current infection
IgM IgG	indeterminate negative	Inconclusive ***request convalescent serum

\* Due to heterotypic antibody responses and/or cross-reactions, serologic results should be interpreted on the basis of clinical and epidemiological information

\*\* False positive IgM results may occur

\*\*\* Paired acute and convalescent serum samples may demonstrate seroconversion

**TREATMENT**

Treatment is supportive and includes hospitalization, intravenous fluids, and respiratory support. Potential therapies being studied include interferon- $\alpha$ , high-titer anti-WNV immunoglobulin (IG), and 3<sup>rd</sup> generation anti-sense (viral replication inhibitor). These agents have shown some promise in animal models, human case reports, or unblinded trials; randomized, double-blinded, placebo-controlled trials are currently underway in the U.S. Information on treatment trials is available at [www.westnile.ca.gov/clinician.htm](http://www.westnile.ca.gov/clinician.htm).

**ANIMAL SURVEILLANCE**

Animal surveillance for WNV in California includes testing of mosquitoes, sentinel chickens, live and dead wild birds, tree squirrels, and horses with encephalitis. To report a dead bird, please call **1-877-WNV-BIRD**.

**PREVENTION**

Currently no human vaccine is available, although several are in trials. WNV prevention relies on controlling mosquito sources and educating the public to avoid exposure to infective mosquitoes. Individuals can significantly reduce their risk of disease if they follow at least 2 of the first 5 recommendations below.

- Drain standing water; as little as a tablespoon of water can support mosquito breeding.
- Install or repair screens on doors and windows.
- Avoid outdoor activity when mosquitoes are most active (dawn and dusk).
- Wear protective clothing with long pants and long sleeves.
- Apply a repellent containing permethrin, picaridin, oil of lemon eucalyptus, or DEET when mosquitoes are active. For guidance on use of DEET on children, refer to the CDC website below.
- Report significant mosquito activity or standing water in San Francisco to the SFDPH Mosquito Control program at (415) 252-3806.

**INFORMATIONAL LINKS**

- **SF Health Department:** [www.sfdph.org/cdcp](http://www.sfdph.org/cdcp) click on “West Nile” in the Quick Links box
- **California State:** WNV Website, [www.westnile.ca.gov](http://www.westnile.ca.gov) WNV Hotline, 1-877-WNV-BIRD.
- **CDC:** [www.cdc.gov/ncidod/dvbid/westnile/index.htm](http://www.cdc.gov/ncidod/dvbid/westnile/index.htm)
- **US Geological Survey:** Maps of WNV activity, <http://westnilemaps.usgs.gov>



**City and County of San Francisco  
Public Health Laboratory**

## West Nile Virus Laboratory Testing Guidelines

The San Francisco Public Health Laboratory must be notified prior to submission of specimens.  
Tel: 415-554-2800/ Fax: 415-431-0651

**WNV testing is recommended on individuals with the following:**

- A. Encephalitis**
- B. Aseptic Meningitis (individuals > 18 years of age)**
- C. Aseptic Meningitis (individuals ≤ 18 years of age):**
  - After workup for enteroviruses (e.g. CSF PCR, throat or stool isolation)
- D. Acute Flaccid Paralysis/Atypical Guillain-Barré Syndrome/Transverse Myelitis**
- E. Febrile illness:**
  - Illness compatible with West Nile fever and lasting ≥ 7 days
  - Must be seen by a health care provider.

### Instructions For Sending Specimens

**Prior to sending specimens a completed West Nile Case History must be faxed to the Communicable Disease Control Unit (CDCU) at 554-2848 and approval for testing obtained from the CDCU at 554-2830.**

- **Acute Serum** (Serum is the best specimen): ≥ 2cc serum or a full (8.0 cc) red top tube collected ≤ 7 days after onset. Specimen may be stored at 2 - 8°C for up to five days.
- **Cerebral Spinal Fluid** (If lumbar puncture is performed): 1-2cc CSF. Store frozen.
- **A 2<sup>nd</sup> serum** (If WNV is highly suspected): ≥ 2 cc serum or a full (8.0 cc) red top tube collected 3-5 days after the acute serum.

- Each specimen should be labeled with **date of collection**, **specimen type**, and **patient name**
- For hospital-based patients, send specimens to the hospital clinical laboratory.
- For non-hospital-based patients, send specimens with a completed San Francisco Public Health Laboratory Form ([www.dph.sf.ca.us/HealthInfo/WestNileVirus/SF\\_LABFORM4.pdf](http://www.dph.sf.ca.us/HealthInfo/WestNileVirus/SF_LABFORM4.pdf)) to:

San Francisco Public Health Laboratory  
101 Grove Street, Room 412  
San Francisco, CA 94102

- Specimens should be sent on **cold pack** using an overnight courier. Refrigerate/freeze specimens overnight/weekend & send on the following morning or Monday if it can't be delivered within 24 hours and before 4 PM.

For Questions or to Obtain Forms Call: 415-554-2800

San Francisco Public Health Laboratory  
101 Grove Street, Room 419 • San Francisco, CA 94102  
Phone: (415) 554-2800 • Fax: (415) 431-0651



2006 West Nile Case History Form \*\*\*required for specimen testing\*\*\*

Fax this form to (415) 554-2848

Send Specimens to:

San Francisco Public Health Laboratory, 101 Grove Street, Room 412, SF, CA 94102

To report by phone or for questions regarding testing or specimen submission, call the CD Control Unit, at (415) 554-2830 (24 hours/7 days a week).

See West Nile Virus Laboratory Testing Guidelines for clinical criteria for testing at the public health laboratory

Investigator # \_\_\_\_\_ Date of Report to San Francisco Department of Public Health: \_\_\_/\_\_\_/\_\_\_

Patient Information:

Last name \_\_\_\_\_ First name \_\_\_\_\_ Middle Name \_\_\_\_\_ DOB \_\_\_/\_\_\_/\_\_\_ Age: \_\_\_

Med Rec # \_\_\_\_\_ Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code \_\_\_\_\_

Home Phone: \_\_\_\_\_ Work : \_\_\_\_\_ Cell: \_\_\_\_\_

Sex:  Male  Female  Unk Ethnicity:  Hispanic  Non-Hispanic  Unk

Race:  White  Black  Native American  Asian/Pacific Islander  Other  Unk

Job/Type of Work: \_\_\_\_\_

City: \_\_\_\_\_

Physician Information: Mandatory

Name: \_\_\_\_\_ Facility: \_\_\_\_\_ Telephone: \_\_\_\_\_

Pager: \_\_\_\_\_ Cell: \_\_\_\_\_ Fax: \_\_\_\_\_ Email: \_\_\_\_\_

Symptom Onset: \_\_\_/\_\_\_/\_\_\_

Hospitalized  ER  Outpatient/Not admitted

Admit date: \_\_\_/\_\_\_/\_\_\_ Discharge date: \_\_\_/\_\_\_/\_\_\_

Survived  Died, Date of death \_\_\_/\_\_\_/\_\_\_  Unk

Do the following apply anytime during current illness:

In ICU  Yes  No  Unk

Fever ≥38°C (100.4°F)  Yes  No  Unk

Highest Temp. \_\_\_\_\_ # days fever \_\_\_\_\_

Headache  Yes  No  Unk

Rash  Yes  No  Unk

Stiff neck  Yes  No  Unk

Muscle Weakness  Yes  No  Unk

Altered Consciousness  Yes  No  Unk

Seizures  Yes  No  Unk

Clinical Syndrome:

Encephalitis  Yes  No  Unk

Aseptic Meningitis  Yes  No  Unk

Flaccid Paralysis  Yes  No  Unk

Suspect West Nile Fever  Yes  No  Unk

Asymptomatic  Yes  No  Unk

Other (specify) \_\_\_\_\_

CSF Results	CBC Results
Date: ___/___/___	Date: ___/___/___
RBC: _____	WBC: _____
WBC: _____	%Diff: _____
%Diff: _____	HCT: _____
Protein: _____	Plt: _____
Glucose: _____	

Other lab results (MRI/CT, LFTs, etc.): \_\_\_\_\_

Past medical history:

Hypertension:  Yes  No  Unk

Diabetes Type \_\_\_\_\_  Yes  No  Unk

Exposures within 4 wks of onset(specify location, dates):

Mosquito bites/exposure:  Yes  No  Unk

Outdoor activity (hiking, gardening, etc.)  Yes  No  Unk

Received blood transfusion or organ transplant:  Yes  No

If yes, Date: \_\_\_\_\_ Type: \_\_\_\_\_

Exact location: \_\_\_\_\_

Travel within 4 wks of onset (specify location, dates):

Within California (out of SF)  Yes  No  Unk

Within the United States?  Yes  No  Unk

Outside of the US?  Yes  No  Unk

Ever traveled outside the US?  Yes  No  Unk

Other pertinent information:

Immunocompromised patient:  Yes  No  Unk

Yellow fever vaccination:  Yes  No  Unk

Date: \_\_\_\_\_

Military service:  Yes  No  Unk

Dates: \_\_\_\_\_

Current pregnancy  Yes  No  Unk

Week of gestation: \_\_\_\_\_

Breast feeding?  Yes  No  Unk

Donated blood within 4 wks of onset:  Yes  No  Unk

If yes, Date: \_\_\_\_\_ Exact location: \_\_\_\_\_

Donated organ within 4 wks of onset:  Yes  No  Unk

If yes, Date: \_\_\_\_\_ Exact location: \_\_\_\_\_

If infant, breast-fed?  Yes  No  Unk

Significant Past History (medical, social, family) and other exposures:

\_\_\_\_\_

For CDCU Use ONLY:

1. Meets WNV criteria?  Yes  No 2. Specimen submitted?  Yes  No 3. If yes, date submitted? \_\_\_/\_\_\_/\_\_\_