

Surveillance for Arbovirus Infections

To monitor for human West Nile virus (WNV) infection and other arbovirus infections in Connecticut, the Department of Public Health (DPH) tests specimens from persons hospitalized with specified neurologic syndromes. In 2001, a total of 96 serum and cerebrospinal fluid specimens from 58 persons were tested by the State Laboratory. Of these, 30 (52%) were diagnosed with encephalitis or meningoencephalitis, 25 (43%) with aseptic meningitis, and 3 (5%) with Guillain-Barré syndrome.

Six persons hospitalized with severe neurologic diseases were identified with WNV infection. The patients ranged in age from 37-89 years (median 68 years) and included residents in Fairfield and New Haven counties. One person, a resident of a Western state, stayed in a Fairfield County town and New York City for the 10 days before onset of illness. Infection resulted in the death of one elderly but active person 20 days after onset of symptoms (fatigue, fever, and anemia), and 15 days after admission to the hospital with progressive weakness.

In all six cases, the diagnosis was made based on the finding of elevated IgM serum levels specific to WNV. Onset of illness preceded hospital admission by 0-14 days (median 4.5 days). Several patients initially presented to the hospital with non-specific syndromes lasting from several days to as long as two weeks including "dehydration and weakness" and "fatigue, fever". Length of hospital stay ranged from 6 to 66 days (median 12 days). Three patients required special rehabilitation care after discharge. One continues care in a rehabilitation facility.

Onset of symptoms occurred between the second week of August and the last week of September and coincided with statewide increased positive findings in birds, mosquitoes, and horses. The infected persons or family members consistently reported spending time outdoors around the home and not using measures to avoid mosquito bites.

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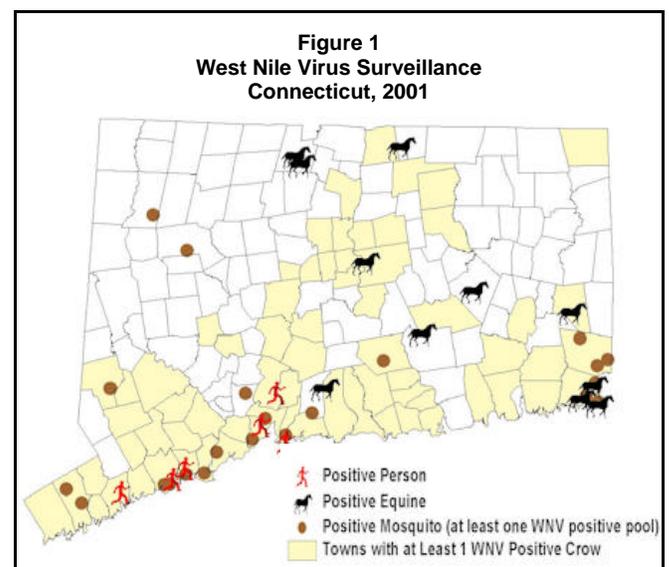
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Also identified was a case of Jamestown Canyon virus (JCV) infection. The patient was a teenage resident of Simsbury. Onset of illness occurred the last week of August. Symptoms included fever, headache, vomiting, double vision, sensitivity to light, and malaise. The patient fully recovered. Diagnosis was based on identification of IgM antibody in serum samples by an indirect fluorescent antibody (IFA) test and confirmed by plaque reduction neutralization testing.

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Editorial:

In 2001, WNV activity was reported from 27 states and the District of Columbia. In Connecticut, WNV in mosquitoes, birds, horses, or people was identified in all eight counties (Figure 1). A total of



444 birds tested positive for WNV. These included 422 crows (57% of those tested) and 22 other birds (10 species, 6% of non-crow species tested) collected between May 4-October 25 in 69 towns. West Nile virus was also identified in 11 horses and 53 pools of mosquitoes.

Since 1999, a total of 149 human cases of illness resulting in 18 deaths have been attributed to WNV infections. During 2001, 66 cases and 9 deaths were reported from 10 states including NY (15, 2 deaths), FL (12), NJ (12, 1 death), CT (6, 1 death), GA (6, 1 death), MD (6, 2 deaths), MA (3, 1 death), PA (3), AL (2, 1 death), and LA (1). The median age was 66 years.

The six human cases of WNV are the first documented cases of Connecticut-acquired severe mosquito-borne disease since malaria was eliminated more than 50 years ago. The only local indicator of risk of WNV infection at the time each of the WNV cases acquired their infection was that each lived in a town in which at least one WNV positive bird had been found and a number of dead crows had been reported. Despite the presence of WNV in their towns, none of the cases routinely took personal precautions to avoid mosquito bites. These cases serve as a reminder that mosquitoes can transmit organisms capable of causing severe disease in Connecticut and that it is important, particularly for older persons, to take warnings based on finding WNV seriously.

The human case of JCV infection was the first such case confirmed in Connecticut. In 2001, Mayo and colleagues reported the results of two Connecticut seroprevalence surveys done with standard IFA tests to detect IgG antibodies to JCV (http://www.cdc.gov/ncidod/eid/vol7no5/mayo_letter.htm). The seroprevalence rates ranged from 3.9% to 10.1% and the authors concluded that JCV infection is fairly frequent in Connecticut and that illness may occur. Enhanced surveillance for arbovirus infections is likely to result in the identification of other human cases of JCV infection in the future.

In 2002, surveillance will again be conducted for WNV in wild birds, domestic animals, mosquitoes, and people. The surveillance goals are to determine whether WNV is present and amplifying, and to guide prevention activities.

Since exposure to mosquitoes varies by season and geographic region, clinicians should take a

thorough travel history from patients with neurologic illness and be alert to the possibility of arbovirus infection, especially in persons with heavy mosquito exposure around the home. In Connecticut, the risk of humans acquiring WNV infection is highest during August - September.

Encephalitis is a reportable disease in Connecticut. To report a case of encephalitis, please call the local health department in the patient's town of residence and the DPH Epidemiology Program at (860) 509-7994 or (860) 509-8000 after hours.

Laboratory Testing for WNV

Free arbovirus testing will be performed at the State Laboratory on acute and paired specimens from persons hospitalized with: encephalitis, meningoencephalitis, Guillain-Barré syndrome with fever, or aseptic meningitis in persons aged > 17 years. In addition to the Virology Form, OL42A, an Encephalitis/Meningoencephalitis Initial Report Form (see page 7) must accompany requests for free testing. The case report form includes the minimum information needed for WNV surveillance.

A convalescent specimen should be submitted from all patients with negative specimens collected during the first week of illness for accurate interpretation. In some confirmed cases of WNV infection, acute specimens have tested negative for WNV IgM antibodies.

Mild illness

Testing for WNV is generally not provided at the State Laboratory for persons suspected of having WNV infection on the basis of mild illness or recent mosquito bites. Community levels of WNV activity would have to be very high for such symptoms to be likely due to WNV infection. In addition, persons with mild illness will likely recover completely and testing is not necessary for prognostication. These persons should be advised to seek medical attention if more severe symptoms develop such as confusion, severe muscle weakness, lethargy, severe headache, stiff neck, or photophobia. Specimens from outpatients can be submitted to commercial or hospital laboratories that perform testing for WNV antibodies or cross-reacting St. Louis encephalitis virus antibodies.

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State of Connecticut Department of Public Health

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**Encephalitis / Meningoencephalitis
 Initial Reporting Form**

A completed form must accompany requests for West Nile virus testing in addition to the laboratory request form, OL42A. If you have questions concerning the information requested please contact the Epidemiology Program at (860) 509-7994.

Rev. 4/2002

Patient Information

Last Name _____ First Name _____ Date of Birth ____ / ____ / ____ Age ____
 Address _____ City _____ County _____
 State _____ Zip Code _____
 Telephone Home (____) _____ Work (____) _____ Sex Male Female
 Race White Black Am Indian/Alaskan Asian Other Unknown Hispanic Yes No Unknown

Clinical Information

Hospitalized Yes No Hospital Name _____ City _____ State _____
 Date of Admission ____ / ____ / ____ Date of Symptom Onset ____ / ____ / ____
 Date of First Neurologic Symptom ____ / ____ / ____
 Current Diagnosis Encephalitis Meningoencephalitis Meningitis Other _____
 Did patient die of this illness? Yes No Unknown

Travel History

	City	State	Country
Travel during the 14 days before onset of illness:	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

Specimens Being Submitted for Testing

<input type="checkbox"/> CSF	Date collected	____ / ____ / ____
<input type="checkbox"/> Serum	Date collected	____ / ____ / ____
<input type="checkbox"/> Other (specify) _____	Date collected	____ / ____ / ____

Requesting Physician

Date of Report ____ / ____ / ____
mm dd yyyy

Last Name _____ First Name _____
 Work Address _____ State _____ Zip Code _____
 Telephone Numbers Work (____) _____ Pager (____) _____ Work (____) _____

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Specimen types and amounts:

- Acute specimens should be collected within 14 days of onset of symptoms. Convalescent specimens should be collected 2-3 weeks later.
- Please send ≥ 5.0 ml of serum and ≥ 1.0 ml of CSF. *Do not send whole blood.*
- Frozen brain tissue and acute CSF specimens can be submitted for virus isolation free of charge. Unless specifically requested, virus isolation will not be attempted.
- To obtain free testing, please write "WNV testing" or "encephalitis" on the Virology Form OL42A. Convalescent specimens should be clearly labeled as such so appropriate testing can be done. Forms can be obtained by calling (860) 509-8501.
- The Encephalitis/Meningoencephalitis Initial Report Form must be completed and accompany each specimen or set of specimens submitted for testing. Testing may be delayed on specimens that are not accompanied by the necessary forms.

Tests to be done and reporting of test results

- Acute serum and CSF specimens will be examined for IgM antibodies to WNV and several other arboviruses including eastern equine encephalitis, western equine encephalitis, California encephalitis group, St. Louis encephalitis and Powassan virus. Negative results will be reported 2-4 days after receiving the specimens and completed case report form. Final positive results will take longer as confirmatory testing is done by the Centers for Disease Control and Prevention.
- Paired serum specimens will be examined for IgM and IgG antibodies to WNV, eastern equine encephalitis, western equine encephalitis, California encephalitis group, and St. Louis encephalitis. In addition, tests for IgG antibodies to herpes, varicella, cytomegalovirus, and JCV will be included.

If you have additional questions concerning WNV surveillance, please contact the Epidemiology Program at (860) 509-7994.

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