West Virginia Department of Health and Human Resources
Information for Physicians – West Nile Virus

What is West Nile virus?

West Nile is a flavivirus, and the causative agent of a potentially lethal encephalitis that affects horses, birds, and people.

What are the signs and symptoms of West Nile virus?

West Nile is most commonly recognized in patients presenting with aseptic meningitis or encephalitis during the summer and early fall. Other neurological manifestations may include ataxia and extrapyramidal signs, cranial nerve abnormalities, myelitis, optic neuritis, polyradiculitis, and seizures. The greatest risk factor for severe neurological disease is advanced age.

West Nile fever is the mildest clinically recognized form of the disease. Patients may present with sudden onset of fever, malaise, gastrointestinal symptoms, eye pain, headache, myalgia, rash, and lymphadenopathy. Duration of this self-limited illness is three to six days.

Preliminary data from clinical investigations conducted during the 2002 Arbovirus season are elucidating an expanding spectrum of neurological disease. Emerging and evolving clinical syndromes include: movement disorders, parkinsonism, rhabdomyolysis and acute flaccid paralysis.

How can I make the diagnosis of West Nile virus?

Testing by the antibody capture enzyme-linked immunosorbent assay (MAC-ELISA) is available free of charge through the Office of Laboratory Services (OLS) at WVDHHR. Call 304-558-3530 to arrange:

- The most efficient diagnostic method is detection of IgM antibody to WNV in serum or cerebral spinal fluid (CSF) collected within 8 days of illness onset using the IgM antibody capture enzyme-linked immunosorbent assay (MAC-ELISA). Demonstration of West Nile IgM antibody in the CSF by MAC-ELISA is diagnostic. All specimens positive for WNV antibodies should be referred to OLS for confirmation.

- Patients with specimens drawn within 7 days of onset of symptoms that are found negative by MAC-ELISA should have a convalescent specimen drawn at least two weeks later.

Due to the fact that IgM antibodies may persist for greater than one year, residents in endemic areas may have persistent IgM antibodies from a previous infection that is unrelated to their current illness. Since West Nile virus was present in our state last year acute and convalescent serum specimen collection and submission are recommended to confirm acute infection.

- A four-fold rise in titer between acute and convalescent serum is also diagnostic. Acute sera should be drawn within seven days of onset, and convalescent sera should be drawn at least 2 weeks later.

- Patients with encephalitis/meningitis should also be tested for La Crosse encephalitis, eastern equine encephalitis, and St. Louis encephalitis during arbovirus season.

Other laboratory clues include CSF abnormalities. Elevated CSF WBC (range 0-1782 cells/mm^3) with a lymphocytic predominance has been described. Protein is universally elevated (51 to 899 mg/dL) and glucose is normal.

Peripheral WBC may be elevated and hyponatremia (Na <135 mmol/L) may also occur. A few patients may have abnormalities of bilirubin or transaminases.

Can West Nile virus infection be prevented?

Treatment is supportive, and there is no vaccine, so prevention is key for this mosquito-borne disease. We are asking physicians to be alert for this disease and report confirmed and suspect cases to the local health department immediately. Advise all patients to take the following precautions:

1. Remove all old tires, containers, and any item from the environment that can collect standing water and serve as a mosquito breeding site.
2. Empty and change the water in bird baths, fountains, wading pools, rain barrels, and potted plant trays at least once a week, if not more often.
3. Drain or fill temporary pools with dirt.
4. Keep swimming pools treated and circulating, and rain gutters unclogged.
5. Use mosquito repellents when necessary and follow label directions and precautions closely.
6. Use head nets, long sleeves, and long pants if you venture into areas with high mosquito populations.
7. Make sure window and door screens are "bug tight."

Five additional routes of infection have become apparent during the 2002 West Nile season. It is important to note that these other methods of transmission represent a very small proportion of cases. New modes of transmission are via: transplantation, transfusion, breastfeeding, transplacental and occupational exposures (mostly laboratory workers). (More information may be found on the CDC's website at: http://www.cdc.gov/ncidod/dvbid/westnile/clinical_guidance.htm

How can I get more information?

Patient education materials are available on the West Virginia Infectious Disease Epidemiology Program's website at: http://www.wvdhhr.org/bph/oehp/sdc/westnile.htm

Several clinical case series and reviews have recently been published:

1. *Ann Intern Med,* 2002; 137:173-179.
2. *Lancet Infect Dis*, 2002; 2:519-529.
3. *N Engl J Med,* 2001; 344:1807-14.
4. *Emerging Infectious Diseases,* 2001; 7:654-658; and
5. *Emerging Infectious Diseases,* 2001; 7:675-678.

CDC maintains an excellent web-site at: http://www.cdc.gov/ncidod/dvbid/westnile/index.htm