

# **West Nile Virus Encephalitis Fact Sheet**

## **Q. What is West Nile virus encephalitis?**

A. West Nile virus (WNV) encephalitis is a mosquito-borne viral disease, which can cause an inflammation of the brain. WNV is commonly found in Africa, West Asia, the Middle East and Europe. For the first time in North America, WNV was confirmed in the New York metropolitan area during the summer and fall of 1999. WNV successfully over-wintered in the northeastern United States and has been present in humans, horses, birds, and mosquitoes since that time.

## **Q. How do people get West Nile virus encephalitis?**

A. WNV is transmitted to people by the bite of a mosquito that has become infectious after feeding on a bird infected with the virus. Birds serve as the reservoir hosts of WNV, and the principal vector in the transmission from one bird to another is the northern house mosquito, *Culex pipiens* and other *Culex* mosquitoes. WNV has also been found in several species of *Aedes* mosquitoes, which could serve as bridge vectors by transmitting it to humans or horses. Humans and horses are known as dead end hosts, because once a human or horse is infected, the virus is no longer transmitted.

## **Q. What are the symptoms of West Nile virus infection?**

A. Most infections produce no symptoms in people, or symptoms are mild or moderate. Approximately 80% of people (4 out of 5) who are infected with WNV will show no symptoms. About 20% of cases produce mild symptoms including: fever, headache, and body aches, often with skin rash and swollen lymph glands. Less than 1% of cases show more severe infections marked by headache, high fever, neck stiffness, muscle weakness, stupor, disorientation, convulsions, paralysis, coma, and, rarely, death. Persons age 50 years or older and immune-compromised individuals are at a higher risk of developing a more severe infection.

## **Q. How long do the symptoms of West Nile virus last?**

A. Symptoms of WNV will generally last a few days, although even some healthy people report having the illness last for several weeks. The symptoms of severe disease (encephalitis or meningitis) may last several weeks, although neurological effects may be permanent.

## **Q. If I am ill, how can I be tested for WNV?**

A. To test potential cases for WNV, blood and/or cerebrospinal fluid samples from patients with clinical symptoms are sent to the NJ Department of Health and Senior Services (DHSS) Public Health and Environmental Laboratory (PHEL) for an Enzyme-Linked Immunosorbent Assay (ELISA) test that detects WNV antibodies. In some cases, a follow-up (convalescent) sample is needed to confirm diagnosis, and in rare cases, samples are to the Centers for Disease Control and Prevention (CDC) for definitive confirmation.

## **Q. What if my results from a commercial lab are positive for WNV?**

A. Due to variability in commercial testing results, it is mandatory for commercial labs to report all WNV positive results to the DHSS for confirmatory testing. A patient can be counted as a WNV case only after the Public Health and Environmental Laboratory (PHEL) tests the blood and cerebrospinal fluid samples and

confirms them to be WNV positive.

**Q. How is West Nile encephalitis treated?**

A. There is no specific therapy. In more severe cases, intensive supportive therapy might be needed, such as hospitalization, intravenous (IV) fluids, airway management and respiratory support (ventilator). When hospitalized, prevention of secondary infections (for example, pneumonia, and urinary tract infection) and good nursing care might also be necessary.

**Q. What is the incubation period in humans?**

A. Symptoms usually appear 5 to 15 days from the time of an infected mosquito bite.

**Q. Can you get WNV directly from crows or from other people?**

A. No. There is no evidence that a person can get the virus from handling live or dead infected birds. However, it is always best to avoid barehanded contact when handling any dead animal. When handling a dead bird or animal for disposal, use gloves and carefully place the bird in double-plastic bags. Your local health department will assist with specific instructions for storage if the dead bird is suitable for testing. WNV is NOT transmitted from person-to-person. There is some evidence that crow-to-crow transmission of WNV is possible without mosquito vectors.

**Q. What is the basic transmission cycle for WNV?**

A. Mosquitoes become infected by feeding on birds with the virus circulating in their blood. After an incubation period of 10 days to two weeks, the infected mosquitoes can then transmit the virus to other animals or humans when biting to take a second blood meal.

**Q. Why are crows, but not most other dead birds, tested for WNV?**

A. Although other birds can also become infected with the virus, the mortality rate is much lower in other birds. Because crows are extremely susceptible to WNV, they are very useful as sentinels to monitor viral activity. However, NJDHSS has been accepting all birds from the corvid family for WNV testing.

**Q. Can other species of dead birds be tested for WNV?**

A. New Jersey is currently testing other birds from the corvid family for WNV testing and will consider testing other species on a case-by-case basis. The Division of Fish and Wildlife test raptors, including eagles, hawks and falcons, as they can also become infected with WNV. Your local health department or mosquito control agency can assist you with determining if a given bird is appropriate for WNV testing.

**Q. Why have some areas stopped collecting dead birds in the middle of the mosquito season?**

A. Some states and jurisdictions are no longer collecting dead birds because they have sufficiently established that the virus is in an area, and additional testing will not reveal any more information. Shifting resources away from testing of dead birds allows those resources to be devoted elsewhere in surveillance and control.

**Q. What agencies conduct the surveillance and provide mosquito control services?**

A. The WNV surveillance plan is coordinated among a number of state and local agencies. They include the Department of Environmental Protection (DEP), Office of Mosquito Control and Coordination; NJ Department of Health and Senior Services (DHSS); Department of Agriculture, Division of Animal Health;

Rutgers University Center for Vector Biology; 21 county mosquito control agencies; local health departments; physicians and hospitals; the national Centers for Disease Control and Prevention (CDC); and other states in the region. The primary responsibility for mosquito control rests with the 21 county mosquito control agencies. Each agency conducts numerous activities that include: education, surveillance, source reduction and biological and chemical control of larval and adult mosquitoes.

**Q. How can I contact my county mosquito control agency?**

A. New Jersey offers a toll-free hotline with a complete listing of county mosquito control agency phone numbers. You can access this toll-free hotline by calling 1-888-NO NJ WNV (1-888-666-5968). You will be prompted to enter your telephone area code in order to locate the county mosquito control agency in your municipality.

**Q. Can West Nile virus cause illness in dogs and cats?**

A. The virus does not usually cause illness in dogs and cats. A serosurvey of dogs and cats in the New York WNV epidemic area in 1999 showed a low infection rate in healthy dogs and cats. There is no evidence that a dog or cat can transmit the virus to humans or other animals.

**Q. What can I do to reduce my risk of becoming infected with WNV?**

A.

- Mosquitoes breed in standing water, even in very small areas such as flowerpots or the pet food dishes. Eliminate stagnant water around the home in discarded tires, blocked gutters, unclean birdbaths, poorly maintained pools, and any type of receptacle with decaying organic matter.
- Mosquitoes are most active at dawn and dusk. Limit outdoor activities at dawn, dusk and in the early evening, when possible.
- Wear long-sleeved shirts and long pants whenever you are outdoors.
- Make sure screen doors and windows are in good condition.
- Place mosquito netting over infant carriers when you are outdoors with infants.
- When outside, apply insect repellent to exposed skin. Always use an EPA-approved repellent according to the directions on the product label.
- Spray clothing with repellents containing permethrin or another EPA-registered repellent since mosquitoes may bite through thin clothing. Do not apply repellents containing permethrin directly to exposed skin. Do not apply clothing repellent to skin under your clothing.
- Maintain your swimming pools. Empty or cover swimming pools when not in use.
- Keep birdbaths clean. Change the water at least once a week.

**Q. How can I choose a good insect repellent?**

A. CDC recommends using products that have been shown to work in scientific trials and that contain active ingredients which have been registered with the US Environmental Protection Agency (EPA) for use as insect repellents on skin or clothing. When EPA registers a repellent, they evaluate the product for efficacy and potential effects on human beings and the environment. EPA registration means that EPA does not expect a product, when used according to the instructions on the label, to cause unreasonable adverse effects to human health or the environment. Of the active ingredients registered with the EPA, CDC believes that two have demonstrated a higher degree of efficacy. Products containing these active ingredients typically provide longer-lasting protection than others:

- DEET (N,N-diethyl-m-toluamide)
- Picaridin (KBR 3023)

Oil of lemon eucalyptus [active ingredient: p-menthane 3,8-diol (PMD)], a plant-based repellent, is also registered with EPA. In two recent scientific publications, when oil of lemon eucalyptus was tested against mosquitoes found in the US it provided protection similar to repellents with low concentrations of DEET. Generally, the more active ingredient a repellent contains the longer it can protect you from mosquito bites. A higher percentage of active ingredient in a repellent does not mean that your protection is better-just that it will last longer. Choose a repellent that provides protection for the amount of time that you will be outdoors.

**Q. Where can I get more information about WNV?**

A. The following web sites are a source of additional information:

- New Jersey Department of Health and Senior Services ([www.state.nj.us/health](http://www.state.nj.us/health)),
- New Jersey Department of Environmental Protection ([www.state.nj.us/dep/mosquito](http://www.state.nj.us/dep/mosquito))
- New Jersey Mosquito Homepage ([www.njmosquito.org](http://www.njmosquito.org))
- New Jersey Department of Agriculture ([www.state.nj.us/agriculture](http://www.state.nj.us/agriculture))
- Centers for Disease Control and Prevention ([www.cdc.gov](http://www.cdc.gov))

Local mosquito surveillance and control information is available from your county mosquito control agency, and specific questions regarding WNV may be addressed to your local health department.

**Blood Transfusions , Organ Donations, and Breastfeeding**

**Q. Can West Nile virus (WNV) be transmitted by blood transfusion or organ donation?**

A. Some cases investigated indicate that WNV can be transmitted by organ transplantation and by blood transfusion. CDC is continuing to investigate these modes of transmission. The FDA has issued an alert to blood banks and other related organizations to be vigilant in excluding individuals who may have early symptoms of WNV from donating blood. CDC has requested physicians to notify public health authorities of any patients who develop symptoms of WNV with 4 weeks of blood transfusion or organ transplantation. Organ donors are screened to identify infectious risks on the basis of national organ-procurement standards.

**Q. Should people avoid donating blood or getting blood transfusions or organ transplants?**

A. No. All blood banks in the United States have been screening blood donors and donations for WNV since 2003. Any blood donations found to be potentially infectious are destroyed. Donating blood is safe and is still strongly encouraged. Approximately 4.5 million people receive blood or blood products annually. Although persons needing blood transfusion or organ transplants should be aware of the risk for WNV infection, the benefits of receiving needed transfusions or transplants most usually outweigh the potential risk for WNV infection.

**Q. If a person has had West Nile virus, can they still donate blood?**

A. Yes. West Nile virus infections do not last very long and people with WNV clear the virus very quickly. Blood centers will take precautions to be sure that donors who have been diagnosed with West Nile virus have fully recovered before donating.

**Q. If I recently had a transfusion or transplant, should I be concerned about getting West Nile virus?**

A. You should be aware of the potential risk for WNV infection and the need to monitor your health. If you have symptoms of West Nile virus or other concerns, you should contact your physician.

**Q. Can West Nile virus be transmitted through breast milk?**

A. Based on a case in Michigan in 2002, it appears that West Nile virus can be transmitted through breast milk. A new mother in Michigan contracted West Nile virus from a blood transfusion shortly after giving birth. She breastfed her infant, and three weeks later, her baby's blood tested positive for West Nile virus. Laboratory analysis showed evidence of West Nile virus in her breast milk. Because of the infant's minimal outdoor exposure, it is unlikely that infection was acquired from a mosquito. The infant was most likely infected through breast milk. The child remained healthy, and did not get symptoms of West Nile virus.

**Q. Should I continue breast-feeding if I am symptomatic for West Nile virus?**

A. Because the health benefits of breast-feeding are well established, and the risk for West Nile virus transmission through breast-feeding is unknown, the new findings do not suggest a change in breast-feeding recommendations. The American Academy of Pediatrics and the American Academy of Family Physicians recommend that infants be breastfed for a full year of life.

Lactating women who are ill or who are having difficulty breast-feeding for any reason, as always, should consult their physicians.

**Q. If I am breast-feeding, should I be tested for West Nile virus?**

A. No. There is no need to be tested just because you are breast-feeding.

**Q. If I am breast-feeding, should I use insect repellent containing DEET?**

A. Yes. Insect repellents help people reduce their exposure to mosquito bites that may carry potentially serious viruses such as West Nile virus, and allow them to continue to play and work outdoors. There are no reported adverse events following use of repellents containing DEET in pregnant or breast-feeding women.

**Q. Can West Nile virus be transmitted to my baby during pregnancy?**

A. Based on the limited number of cases studied so far, it is not yet possible to determine what percentage of WNV infections during pregnancy result in infection of the fetus or medical problems in newborns. In 2002, one case of transplacental (mother-to-child) transmission of WNV was reported to CDC. In this case, the infant was born with WNV infection and severe medical problems. It is unclear, however, whether WNV infection caused these problems or whether they were due to other causes. After the report of this case, CDC and state and local health departments formed a registry to follow birth outcomes among women with WNV illness in pregnancy. Three additional pregnancies in which the expectant mother became infected with WNV were detected and evaluated in 2002; none of these 3 resulted in fetal infection. In one additional case it remains unclear whether the fetus was infected; appropriate testing was not done. CDC is continuing to gather clinical and laboratory information on outcomes of pregnancies of women with WNV illness during pregnancy. Pregnant women who think they may have become infected with WNV should contact their health care providers. Clinicians who are aware of WNV infections of pregnant women are encouraged to report such cases by calling their state or local health department.

**Q. Are there any special precautions for pregnant woman to protect themselves against West Nile virus?**

A. There are no special precautions for pregnant women, however, because of ongoing concerns that mother-to-child WNV transmission can occur with possible adverse health effects, pregnant women should take precautions to reduce their risk for WNV and other mosquito-borne infections by avoiding mosquitoes, using protective clothing, and using repellents containing DEET. Repellents with DEET are safe for pregnant women, and there are other options as well such as a soybean oil based repellent that provides good, though

quite limited, protection, as judged by a study published in the New England Journal of Medicine. Pregnant women who become ill should see their health care provider, and those who have an illness consistent with acute WNV infection should undergo appropriate diagnostic testing.

**Q. Are infants at higher risk than other groups for illness with West Nile virus?**

A. No. West Nile virus illnesses in children younger than 1-year-old are infrequent.