

## Questions and Answers About West Nile Encephalitis



### **What are West Nile virus, West Nile fever, and West Nile encephalitis?**

A. “West Nile Virus is a flavivirus commonly found in Africa, West Asia, and the Middle East. It is closely related to St. Louis encephalitis virus found in the United States. The virus can infect humans, birds, mosquitoes, horses and some other mammals.

“West Nile fever is a case of mild disease in people, characterized by flu-like [symptoms](#). West Nile fever typically lasts only a few days and does not appear to cause any long-term health effects.

More severe disease due to a person being infected with this virus can be “West Nile encephalitis,” West Nile meningitis or West Nile meningoencephalitis.” Encephalitis refers to an inflammation of the brain, meningitis is an inflammation of the membrane around the brain and the spinal cord, and meningoencephalitis refers to inflammation of the brain and the membrane surrounding it.

### **Q. How long has West Nile virus been in the U.S.?**

A. It is not known how long it has been in the U.S., but CDC scientists believe the virus has probably been in the eastern U.S. since the early summer of 1999, possibly longer.

### **Q. Historically, where has West Nile encephalitis occurred worldwide?**

A. The virus is normally found in Africa, the Middle East and Europe.

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

A. By the bite of a mosquito (primarily the *Culex* species) that is infected with West Nile virus.

### **Q. What is the basic transmission cycle?**

A. Mosquitoes become infected when they feed on infected birds, which may circulate the virus in their blood for a few days. After an incubation period of 10 days to 2 weeks, infected mosquitoes can then transmit West Nile virus to humans and animals while biting to take blood. The virus is located in the mosquito's salivary glands. During blood feeding, the virus is then injected into the animal or human, where it then multiplies and may cause illness.

### **Q. Can you get West Nile encephalitis from another person?**

A. No. West Nile encephalitis is NOT transmitted from person-to-person. For example, you cannot get West Nile virus from touching or kissing a person who has the disease, or from a health care worker who has treated someone with the disease.

**Q. Can you get West Nile virus directly from birds?**

**A.** There is evidence that a person can get the virus from handling live or dead infected birds. Avoid barehanded contact when handling dead animals, including dead birds. Contact the **Vector Control Division** at **(260) 449-7459** for information on bird disposal.

**Q. Besides mosquitoes, can you get West Nile virus directly from other insects or ticks?**

**A.** Infected mosquitoes are the primary source for West Nile virus. Ticks infected with West Nile virus have been found in Asia and Africa. Their role in the transmission and maintenance of the virus is uncertain.

**Q. Where did West Nile virus come from?**

**A.** West Nile virus has been commonly found in humans and birds and other vertebrates in Africa, Eastern Europe, West Asia, and the Middle East, but has not previously been documented in the Western Hemisphere. It is not known from where the U.S. virus originated, but it is most closely related genetically to strains found in the Middle East.

**Q. What are the symptoms of West Nile encephalitis?**

**A.** Most infections are mild and symptoms include fever, headache, and body aches, often with skin rash and swollen lymph glands. More severe infection may be marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, paralysis and, rarely, death.

**Q. Is a woman's pregnancy at risk if she gets West Nile encephalitis?**

**A.** There are documented cases of transplacental (mother-to-child) transmission of WNV in humans. More research is needed to improve our understanding of the relationship between WNV infection and adverse birth outcomes.

Nevertheless, pregnant women should take precautions to reduce their risk for WNV and other arboviral infections by avoiding mosquitoes, using protective clothing and repellents containing DEET (See [Using Repellents Safely](#)) When WNV transmission is occurring in an area, pregnant women who become ill should see their health care provider. Those whose illness is consistent with acute WNV infection (see [Symptoms](#)) should undergo appropriate diagnostic testing.

For more details regarding the case described above, please see: [MMWR Dec 20, 2002.](#)

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

**A.** Based on recent finding, West Nile virus can be transmitted through breast milk.

**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. 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. During 1999-2001, no cases in children younger than one year of age were reported to CDC. Of the over 2500 total West Nile Virus cases in 2002, only four were less than one

year of age. We know that one of these infants was not breast-feeding, and investigation of the other infants is underway.

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

A. There is no specific therapy. In more severe cases, intensive supportive therapy is indicated, i.e., hospitalization, intravenous (IV) fluids and nutrition, airway management, ventilatory support (ventilator) if needed, prevention of secondary infections (pneumonia, urinary tract, etc.), and good nursing care.

**Q. Is there a vaccine against West Nile encephalitis?**

A. No, not for humans.

**Q. What is the incubation period in humans (i.e., time from infection to onset of disease symptoms) for West Nile encephalitis?**

A. Usually 3 to 15 days.

**Q. What should a person do if he/she thinks they have West Nile encephalitis?**

A. Seek medical care as soon as possible.

**Q. How do health care providers test for West Nile encephalitis?**

A. Your physician will first take a medical history to assess your risk for West Nile virus. People who live in or traveled to areas where West Nile virus activity has been identified are at risk of getting West Nile encephalitis; persons older than 50 years of age have the highest risk of severe disease. If you are determined to be at high risk and have symptoms of West Nile encephalitis, your provider will draw a blood sample and send it to a commercial or public health laboratory for confirmation.

**Q. If a person contracts West Nile virus, does that person develop a natural immunity to future infection by the virus?**

A. It is assumed that immunity will be lifelong; however, it may wane in later years.

**Q. Who is at risk for getting West Nile encephalitis?**

A. All residents of areas where virus activity has been identified are at risk of getting West Nile encephalitis; persons greater than 50 years of age have the highest risk of severe disease.

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

A. A recent investigation has identified transplanted organs as the source of WNV infection in four recipients of organs from a single donor. How the organ donor became infected is unknown. The organ donor might have become infected from a mosquito bite or possibly acquired the infection through transfusion; an investigation of the numerous transfusions received by the organ donor is ongoing. Since the report of these cases, CDC

has been informed of other patients who developed WNV infection within several weeks of receiving blood products or organs. Investigations are ongoing to determine whether WNV was transmitted by transfusion or transplantation in any of these cases.

**Q. What is being done about the possibility of transfusion-related WNV transmission?**

A. CDC, FDA, blood collection agencies, and state and local health departments are investigating possible cases of WNV transmission through blood transfusion and organ transplantation. For cases currently under investigation, any remaining blood products from donors whose blood was transfused to patients with confirmed or suspected WNV infection have been withdrawn and efforts are underway to contact these donors as well as other recipients of blood products from these donors for follow up.

As part of the investigation, CDC has asked that physicians notify public health authorities of any patients who develop symptoms of WNV infection within 4 weeks of receiving a blood transfusion or organ transplantation. In addition, patients with WNV infection whose symptoms begin in the weeks preceding blood or organ donation should also be reported. Prompt reporting of these persons will help facilitate withdrawal of potentially infected blood components.

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

A. Blood is lifesaving and is currently in short supply. Donating blood is safe, and we encourage blood donation now and in the future. Approximately 4.5 million persons receive blood or blood products annually. Although persons needing blood transfusions or organ transplants should be aware of the risk for WNV infection, the benefits of receiving needed transfusions or transplants outweigh the potential risk for WNV infection.

**Q. How can blood banks avoid collecting blood from donors who may have West Nile virus?**

A. The FDA has issued an alert to blood banks and organizations to be vigilant in excluding individuals who may have early symptoms of West Nile virus from donating blood. Most people who have West Nile virus do not show symptoms, making it difficult to defer them from donation. However, some individuals develop minor symptoms of fever and headache. Blood banks need to be vigilant to defer all of those who may have minor illnesses, especially in areas where West Nile virus is most active.

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

A. With West Nile virus infection, the viremia usually is transient, and people clear the virus very quickly. Blood centers will take precautions (see preceding question and answer) 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. However, it is important to remember that a large number of WNV infections due to mosquito bites have occurred among persons in the United States this year. By chance alone, some of these persons will have received blood transfusions and/or organ transplantations. Recent receipt of a blood transfusion or organ transplantation by a person with WNV infection does not necessarily implicate the transfusion/transplantation as the source of infection.

**Q. When did the outbreak in New York end?**

**A.** The risk for infection in the New York City area ended when mosquito activity ceased for the season, i.e., when sustained freezing temperatures occurred.

**Q. What precautions need to be taken to prevent a recurrent outbreak?**

**A.** Active sampling for West Nile virus (i.e., surveillance) in mosquito and bird populations will greatly enhance state and local government's early detection systems. When the first virus activity is detected in a community, prior to the occurrence of human disease, rapid mosquito control measures, such as targeted application of adulticides and larvacides, should be implemented.

**Q. What proportion of people die when infected with West Nile virus?**

**A.** Case-fatality rates range from 3% to 15% and are highest in the elderly.

**Q. How does West Nile virus actually cause death in humans?**

**A.** Following transmission by an infected mosquito, West Nile virus multiplies in the person's blood system and crosses the blood-brain barrier to reach the brain. The virus interferes with normal central nervous system functioning and causes inflammation of brain tissue.

**Q. Is the disease seasonal in its occurrence?**

**A.** In the Temperate Zone of the world (i.e., between latitudes 23.5° and 66.5° north and south), West Nile encephalitis cases occur primarily in the late summer or early fall. In the southern climates where temperatures are milder, West Nile virus can be transmitted year round.

**Q. Do wild birds infected with West Nile virus die or become ill?**

**A.** This has not been previously reported in nature, but occurred in the New York area epidemic, where there was a large die-off of American crows. A total of 70 native bird species have demonstrated morbidity or mortality. Also, domestic geese were reported as dying from West Nile virus infection in Israel in late 1999.

**Q. What birds in the United States can harbor the West Nile virus?**

**A.** There are 160 species of birds that can harbor the West Nile virus. View the list by clicking the following website address:

[http://www.nwhc.usgs.gov/research/west\\_nile/wnvaffected.html](http://www.nwhc.usgs.gov/research/west_nile/wnvaffected.html)

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

**A.** There is a published report of West Nile virus isolated from a dog in southern Africa (Botswana) in 1982. There are no published reports regarding cats, but West Nile virus

was isolated from a dead cat in the New York area epidemic. However, a serosurvey of these animals in the epidemic area showed a low infection rate.

**Q. Can infected dogs or cats be carriers (i.e., reservoirs) for, and transmit West Nile virus to humans?**

**A.** West Nile virus is transmitted by infectious mosquitoes. There is no documented evidence of person-to-person, animal-to-animal, or animal-to-person transmission of West Nile virus. Veterinarians should take normal infection control precautions when caring for an animal suspected to have this or any viral infection.

**Q. How do dogs or cats become infected with West Nile virus?**

**A.** The same way humans become infected, by the bite of infectious mosquitoes. The virus is located in the mosquito's salivary glands. During blood feeding, the virus is injected into the animal. The virus then multiplies and may cause illness. Mosquitoes become infected when they feed on infected birds, which may circulate the virus in their blood for a few days. It is possible that eating dead infected animals such as birds could infect dogs and cats, but this is unproven.

**Q. Can a dog or cat infected with West Nile virus infect other dogs or cats?**

**A.** No. There is no documented evidence that West Nile virus is transmitted from animal-to-animal.

**Q. How long can a dog or cat be infected with West Nile virus?**

**A.** The answer is not known at this time.

**Q. Should a dog or cat infected with West Nile virus be destroyed? What is the treatment for an animal infected with West Nile virus?**

**A.** No. There is no reason to destroy an animal just because it has been infected with West Nile virus. Full recovery from the infection is likely. Treatment would be supportive and consistent with standard veterinary practices for animals infected with a viral agent. Any questions about destroying an animal can be directed to Fort Wayne Animal Care & Control at (260) 427-1244.

**Q. Are duck and other wild game hunters at risk for West Nile virus infection?**

**A.** We do not know the extent to which West Nile virus may be present in wild game. Surveillance studies are currently underway in collaboration with the U.S. Geological Survey (USGS) National Wildlife Health Center, Madison, WI, and state and local wildlife biologists and naturalists, to answer this question.

**Q. What should wild game hunters do to protect against West Nile virus infection?**

**A.** A hunter should follow the usual precautions when handling wild animals. If you anticipate being exposed to mosquitoes, apply insect repellents to clothing and skin, according to label instructions, to prevent mosquito bites. Wear gloves when handling and cleaning animals to prevent blood exposure to bare hands. Cook meat thoroughly.

**Q. Who should wild game hunters contact for information about the risk for West Nile virus infection in specific geographic areas?**

**A.** Hunters should check with their local area department of wildlife and naturalist

resources, state epidemiologist at the state health department, or the U.S. Geological Survey (USGS) National Wildlife Health Center, Madison, WI, **608-270-2400** for information on local area risk.

**Q. Has West Nile virus caused severe illness or death in horses?**

**A.** Yes, while data suggest that most horses infected with West Nile virus recover, results of investigations indicate that West Nile virus has caused deaths in horses in the United States.

**Q. How do the horses become infected with West Nile virus?**

**A.** The same way humans become infected, by the bite of infectious mosquitoes while biting to take blood. The virus is located in the mosquito's salivary glands. During the blood meal, the virus is injected into the blood system of the horse. The virus then multiplies and may cause illness. The mosquitoes become infected when they feed on infected birds or other animals.

**Q. What actually causes the horse's death?**

**A.** Following transmission by an infected mosquito, West Nile virus multiplies in the horse's blood system and crosses the blood brain barrier infecting the brain. The virus interferes with normal central nervous system functioning and causes inflammation of the brain.

**Q. Can I get infected with West Nile virus by caring for an infected horse?**

**A.** West Nile virus is transmitted by infectious mosquitoes. There is no documented evidence of person-to-person, or animal-to-person transmission of West Nile virus. Normal veterinary infection control precautions should be followed when caring for a horse suspected to have this or any viral infection.

**Q. Can a horse infected with West Nile virus infect horses in neighboring stalls?**

**A.** No. There is no documented evidence that West Nile virus is transmitted from horse-to-horse. However, horses with suspected West Nile virus should be isolated from mosquito bites, if at all possible.

**Q. My horse is vaccinated against eastern equine encephalitis (EEE), western equine encephalitis (WEE), and Venezuelan equine encephalitis (VEE). Will these vaccines protect my horse against West Nile virus infection?**

**A.** No. EEE, WEE, and VEE belong to another family of viruses for which there is no cross-protection. There is an approved vaccine currently available for West Nile virus. Contact your veterinarian for information.

**Q. How long will a horse infected with West Nile virus be infectious?**

**A.** The answer is not known for sure at this time, but previously published data suggest that the virus is detectable in the blood for only a few days.

**Q. Should a horse infected with West Nile virus be destroyed? What is the treatment for a horse infected with West Nile virus?**

**A.** No. There is no reason to destroy a horse just because it has been infected with West Nile virus. Data suggest that most horses recover from the infection. Treatment would be

supportive and consistent with standard veterinary practices for animals infected with a viral agent.

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

**A.**

- Stay indoors at dawn, dusk, and in the early evening.
- Wear long-sleeved shirts and long pants whenever you are outdoors.
- Apply insect repellent sparingly to exposed skin. An effective repellent will contain 10% to 30% DEET (N,N-diethyl-meta-toluamide). DEET in high concentrations (greater than 30%) may cause side effects, particularly in children; avoid products containing more than 30% DEET.
- Repellents may irritate the eyes and mouth, so avoid applying repellent to the hands of children. Insect repellents should not be applied to very young children (< 2 months old). American Academy of Pediatrics recommendations - <http://www.aap.org/family/wnv%2Djun03.htm>
- Spray clothing with repellents containing permethrin or DEET, as mosquitoes may bite through thin clothing.
- Whenever you use an insecticide or insect repellent, be sure to read and follow the manufacturer's **DIRECTIONS FOR USE**, as printed on the product.
- Note: Vitamin B and "ultrasonic" devices are NOT effective in preventing mosquito bites.

**Q. What chemicals are being used to control the adult mosquitoes?**

**A.** If West Nile virus is found in Allen County and/or the municipalities, the Vector Control Division will spray Anvil 2+2 ULV, an EPA-approved synthetic pyrethroid, from truck-mounted units to reduce disease transmission.

**Q. Where can I get more information on pesticides used to control mosquito populations?**

**A.** Visit the Environmental Protection Agency (EPA) website at <http://www.epa.gov/pesticides/citizens/mosquitocontrol.htm>

**Q. Where can I get more information on mosquito-borne viral encephalitis?**

**A.** Visit the CDC website at <http://www.cdc.gov/ncidod/dvbid/arbor/arboinfo.htm>

**Q. What should I do if I observe a dead bird, specifically a crow or blue jay?**

**A.** Call (260) 449-7459 to report the location, species and date found. Then dispose the bird by burying it 4 feet deep, placing the bird in a bag and dropping it off at Fort Wayne Animal Care & Control, 3020 Hillegas Road or putting the bird in a bag and in the trash. **Wear gloves or turn the bag inside out when picking up a dead bird.**

**Q. Who can I call locally to get more information on the West Nile virus?**

**A.** Call the Vector Control Division of the Fort Wayne-Allen County Department of Health at (260) 449-7459 or check the department's web site at <http://www.fw-ac-deptofhealth.com/> under Vector Control/Mosquito Control for more information.<sup>1</sup>

## Symptoms in Humans

Most people infected with West Nile virus have no symptoms of illness, but some may become ill three to 15 days after the bite of an infected mosquito.

Based on preliminary evidence, about one in four infected persons will have mild illness with:

- Fever
- Headache
- Body aches
- Skin rash (sometimes)
- Swollen lymph glands

A more severe infection, encephalitis, is less common and may be marked by:

- Headache
- High fever
- Stiff neck
- Stupor
- Disorientation
- Coma
- Tremors
- Convulsions
- Muscle weakness
- Paralysis

In a few cases, mostly among the elderly, death may occur.

## Symptoms in Birds

- Weakness
- Lethargy
- Lack of response to human approach
- Leg paralysis

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