

Overview of West Nile Virus

Q: 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 which is also found in the United States. The virus can infect humans, birds, mosquitoes, horses and some other mammals.

West Nile Fever is a 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 West Nile 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. 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 until 1999 had 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. 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. I understand West Nile virus was found in "overwintering" mosquitoes in the New York City area in early 2000. What does this mean?

A. One of the species of mosquito found to carry West Nile virus is the Culex species which survive through the winter, or "overwinter," in the adult stage. That the virus survived along with the mosquitoes was documented by the widespread transmission the summer of 2000.

Q. Is West Nile virus now established in the Western Hemisphere?

A. The continued expansion of West Nile virus in the United States indicates that it is permanently established in the Western Hemisphere.

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.

Prevention

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

A. Here are preventive measures that you and your family can take:

Protect yourself from mosquito bites:

- Apply insect repellent sparingly to exposed skin. The more DEET a repellent contains the longer time it can protect you from mosquito bites. A higher percentage of DEET in a repellent does not mean that your protection is better-just that it will last longer. DEET concentrations higher than 50% do not increase the length of protection. Choose a repellent that provides protection for the amount of time that you will be outdoors.
- Repellents may irritate the eyes and mouth, so avoid applying repellent to the hands of children.
- 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.
- Spray clothing with repellents containing permethrin or DEET since mosquitoes may bite through thin clothing. Do not apply repellents containing permethrin directly to exposed skin. If you spray your clothing, there is no need to spray repellent containing DEET on the skin under your clothing.
- When possible, wear long-sleeved shirts and long pants whenever you are outdoors.
- Place mosquito netting over infant carriers when you are outdoors with infants.
- Consider staying indoors at dawn, dusk, and in the early evening, which are peak mosquito biting times.
- Install or repair window and door screens so that mosquitoes cannot get indoors.

Help reduce the number of mosquitoes in areas outdoors where you work or play, by draining sources of standing water. In this way, you reduce the number of places mosquitoes can lay their eggs and breed.

- At least once or twice a week, empty water from flower pots, pet food and water dishes, birdbaths, swimming pool covers, buckets, barrels, and cans.
- Check for clogged rain gutters and clean them out.
- Remove discarded tires, and other items that could collect water.



- Be sure to check for containers or trash in places that may be hard to see, such as under bushes or under your home.

Note: Vitamin B and "ultrasonic" devices are NOT effective in preventing mosquito bites.

Q. What can be done to prevent outbreaks of West Nile virus?

A. Prevention and control of West Nile virus and other arboviral diseases is most effectively accomplished through integrated vector management programs. These programs should include surveillance for West Nile virus activity in mosquito vectors, birds, horses, other animals, and humans, and implementation of appropriate mosquito control measures to reduce mosquito populations when necessary. Additionally, when virus activity is detected in an area, residents should be alerted and advised to increase measures to reduce contact with mosquitoes.

Q. Is there a vaccine against West Nile encephalitis?

A. No, but several companies are working towards developing a vaccine.

Q. Where can I get information about the use of pesticide sprays that are being used for mosquito control?

A. The federal agency responsible for pesticide evaluation is the Environmental Protection Agency (EPA). See the EPA Web site for detailed answers to the questions about pesticides used for mosquito control.

Symptoms of West Nile Virus

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

A. Most people who are infected with the West Nile virus will not have any type of illness. It is estimated that 20% of the people who become infected will develop West Nile fever: mild symptoms, including fever, headache, and body aches, occasionally with a skin rash on the trunk of the body and swollen lymph glands.

The symptoms of severe infection (West Nile encephalitis or meningitis) include headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, and paralysis. It is estimated that 1 in 150 persons infected with the West Nile virus will develop a more severe form of disease.

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 14 days.

Q. How long do symptoms last?

A. Symptoms of mild disease will generally last a few days. Symptoms of severe disease may last several weeks, although neurological effects may be permanent.

Q. If I have West Nile Fever, can it turn into West Nile encephalitis?

A. When someone is infected with West Nile virus (WNV) they will typically have one of three outcomes:

No symptoms (most likely),

West Nile Fever (WNF in about 20% of people)

or severe West Nile disease, such as meningitis or encephalitis (less than 1% of those who

get infected). If you develop a high fever with severe headache, consult your health care provider.

WNF is typically a mild disease in people, characterized by symptoms such as fever, body aches, headache and sometimes swollen lymph glands and rash. WNF generally lasts only a few days, though in some cases symptoms have been reported to last longer, even up to several weeks. WNF does not appear to cause any long-term health effects. There is no specific treatment for WNV infection. People with WNF recover on their own, though symptoms can be relieved through various treatments (e.g. medication for headache and body aches, etc.).

Some people may develop a brief, WNF-like illness (early symptoms) before they develop more severe disease, though the percentage of patients in whom this occurs is not known.

Occasionally, an infected person may develop more severe disease such as "West Nile encephalitis," "West Nile meningitis" or "West Nile meningoencephalitis." Encephalitis refers to a n 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. Although there is no treatment for WNV infection itself, the person with severe disease often needs to be hospitalized. Care may involve nursing IV fluids, respiratory support, and prevention of secondary infections

Transmission of West Nile Virus

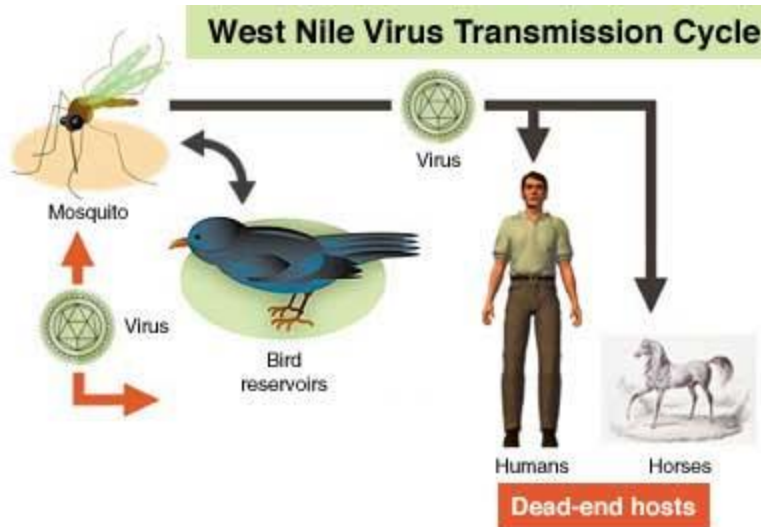
Q. How do people get infected with West Nile virus (WNV)?

A. The main route of human infection with West Nile virus is through the bite of an infected mosquito. Mosquitoes become infected when they feed on infected birds, which may circulate the virus in their blood for a few days. The virus eventually gets into the mosquito's salivary glands. During later blood meals (when mosquitoes bite), the virus may be injected into humans and animals, where it can multiply and possibly cause illness.

Additional routes of human infection became apparent during the 2002 West Nile epidemic. It is important to note that these other methods of transmission represent a very small proportion of cases. Investigations have identified WNV transmission through transplanted organs and through blood transfusions.

Q. What is the basic transmission cycle of West Nile virus?

A. Mosquitoes become infected when they feed on infected birds, which may circulate the virus in their blood for a few days. 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 may be injected into the animal or human, where it may multiply, possibly causing illness.



Q. If I live in an area where birds or mosquitoes with West Nile virus have been reported and a mosquito bites me, am I likely to get sick?

A.No. Even in areas where the virus is circulating, very few mosquitoes are infected with the virus. Even if the mosquito is infected, less than 1% of people who get bitten and become infected will get severely ill. The chances you will become severely ill from any one mosquito bite are extremely small.

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. Is West Nile virus now established in the Western Hemisphere?

A. The continued expansion of West Nile virus in the United States indicates that it is permanently established in the Western Hemisphere.

Q. Is a woman's pregnancy at risk if she gets infected with West Nile virus?

A. There is one documented case of transplacental (mother-to-child) transmission of WNV in a human. Although the newborn in this case was infected with WNV at birth and had severe medical problems, it is unknown whether the WNV infection itself caused these problems or whether they were coincidental. More research will be needed to improve our understanding of the relationship - if any - 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 using repellents containing DEET. When WNV transmission is occurring in an area, pregnant women who become ill should see their health care provider, and those whose illness is consistent with WNV infection, should undergo appropriate diagnostic testing.

Q. Can West Nile virus be transmitted through blood transfusions?

A.Please refer to the following link:
<http://www.cdc.gov/ncidod/dvbid/westnile/qa/transfusion.htm>

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. Although 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. However, there is no information to suggest that ticks played any role in the cases identified in the United States.

Q. How many types of animals have been found to be infected with West Nile virus?

A. Although the vast majority of infections have been identified in birds, WN virus has been shown to infect horses, cats, bats, chipmunks, skunks, squirrels, and domestic rabbits.

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

A. There is no evidence that a person can get the virus from handling live or dead infected birds. However, persons should avoid bare-handed contact when handling any dead animals and use gloves or double plastic bags to place the carcass in a garbage can.

Q. Can you 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 you get WNV from eating game birds or animals that have been infected?

A. There is no evidence that WNV virus can be transmitted to humans through consuming infected birds or animals. In keeping with overall public health practice, and due to the risk of known food-borne pathogens, people should always follow procedures for fully cooking meat from either birds or mammals.

Q. How does West Nile virus actually cause severe illness and 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. How long does the West Nile virus remain in a person's body after they are infected?

A. There is no scientific evidence indicating that people can be chronically infected with West Nile virus. What remain in a person's body for long periods of time are antibodies and "memory" white blood cells (T-lymphocytes) that the body produces to the virus. These antibodies and T-lymphocytes last for years, and may last for the rest of a person's life. Antibodies are what many diagnostic tests look for when clinical laboratories testing is performed. Both antibodies and "memory" T-lymphocytes provide future protection from the virus.

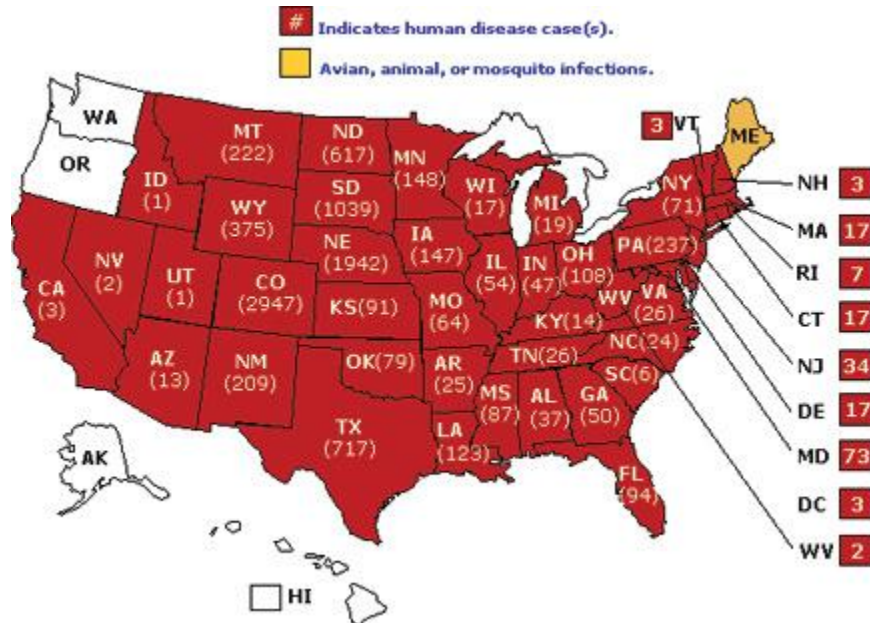
Q. If a person contracts West Nile virus, does that person develop a natural immunity to future infection by the virus?

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

Who's at Risk for West Nile Virus

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 over 50 years of age have the highest risk of severe disease. It is unknown if immunocompromised persons are at increased risk for WNV disease.



Source: Department of Health and Human Services - Centers for Disease Control and Prevention, <http://www.cdc.gov>