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West Nile Virus

By: James L. Holly, MD

Southeast Texas has recently been introduced to the West Nile Virus by the death of several horses possibly related to the virus. News reports all over the nation have begun to appear about West Nile (WN) virus which has emerged in recent years in temperate regions of Europe and North America, presenting a threat to public, equine, and animal health. The most serious manifestation of WN virus infection is fatal encephalitis (inflammation of the brain) in humans and horses, as well as mortality in certain domestic and wild birds.

West Nile virus was first isolated from a woman in the West Nile District of Uganda in 1937. The appearance of West Nile virus in North America in 1999, with encephalitis reported in humans and horses, may be an important milestone in the evolving history of this virus. WN virus has been documented in Connecticut, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and the District of Columbia. Because of the potential for severe illness associated with West Nile virus and because the mosquito is the means of transmitting the disease to humans, temperate regions of the United States with high mosquito populations should know the facts. It must be remembered however that there has not been a case of West Nile encephalitis documented in the Southwestern United States.

The following questions and answers are provided by the Center For Disease Control in Atlanta, Georgia.

Q. What is West Nile encephalitis?

A. "Encephalitis" means an inflammation of the brain and can be caused by viruses and bacteria, including viruses transmitted by mosquitoes. West Nile encephalitis is an infection of the brain caused by West Nile virus, 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.

Q. How do people get West Nile encephalitis?

A. By the bite of mosquitoes infected with West Nile virus.

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 mosquitoes do carry the virus, very few mosquitoes-much less than 1%-are infected. 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. 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.

Spray clothing with repellents containing permethrin or DEET since mosquitoes may bite through thin clothing.

Apply insect repellent sparingly to exposed skin. An effective repellent will contain 35% DEET (N,N-diethyl-meta-toluamide). DEET in high concentrations greater than 35% provides no additional protection.

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.

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

Q. How many cases of West Nile encephalitis in humans have occurred in the U.S. ?

A. In 1999, 62 cases of severe disease, including 7 deaths, occurred in the New York area. In 2000, 17 cases have been reported through September, including 1 death.

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. What precautions are needed 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 governments' 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 larvicides, should be implemented.

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

A. There is no documented evidence that a pregnancy is at risk due to infection with West Nile virus.

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, through September 2000 CDC has received reports of WN virus infection in horses, cats, bats, chipmunks, skunks, squirrels, domestic rabbits, and raccoons.

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. 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. What proportion of people with severe illness due to West Nile virus die?

A. Among those with severe illness due to West Nile virus, case-fatality rates range from 3% to 15% and are highest among the elderly. Less than 1% of those infected with West Nile virus will develop severe illness.

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. Is there a vaccine against West Nile encephalitis?

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

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 older than 50 years have the highest risk of severe disease.

Q. What are the symptoms of West Nile encephalitis?

A. Most infections are mild, and symptoms include fever, headache, and body aches, occasionally 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. How do health care providers test for West Nile virus?

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. How is West Nile encephalitis treated?

A. There is no specific therapy. In more severe cases, intensive supportive therapy is indicated, often involving hospitalization, intravenous fluids, airway management, respiratory support (ventilator), prevention of secondary infections (pneumonia, urinary tract, etc.), and good nursing care.

Q. Can infected dogs or cats be carriers (i.e., reservoirs) for West Nile virus and transmit the 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. Are duck and other wild game hunters at risk for West Nile virus infection?

A. Because of their outdoor exposure, game hunters may be at risk if they become bitten by mosquitoes in areas with West Nile virus activity. The extent to which West Nile virus may be present in wild game is unknown. Surveillance studies are currently underway in collaboration with the U.S. Geological Survey (USGS) National Wildlife Health Center (in Madison, Wisconsin) and with 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. Hunters should follow the usual precautions when handling wild animals. If they anticipate being exposed to mosquitoes, they should apply insect repellents to clothing and skin, according to label instructions, to prevent mosquito bites. Hunters should wear gloves when handling and cleaning animals to prevent blood exposure to bare hands and meat should be cooked thoroughly.

West Nile virus is serious but is not a crisis. If you are at risk take proper precautions and you should be fine.

Remember, it is your life and it is your health.