



Recommendations for

Protecting Laboratory, Field, and Clinical Workers from West Nile Virus Exposure



DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health





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DHHS (NIOSH) Publication No. 2006-115

December 2005

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Introduction

The West Nile virus (WNV) is most often spread to humans from the bite of an infected mosquito. The virus may also be transmitted in other ways—through organ transplants, blood transfusions, and breast milk, and from mother to fetus. But the risk of such transmission is very low. WNV was first reported in the United States in 1999, and occupational exposures have been documented. By 2004, the virus was reported throughout the continental United States.



WNV is most often spread to humans from the bite of an infected mosquito. However, the virus may also be transmitted through contact with infected animals, their blood, or other tissues. *Photograph courtesy of Jim Gathany, Centers for Disease Control and Prevention (CDC).*

Most human infections with WNV (about 80%) cause no symptoms, and about 20% cause flu-like symptoms—including fever, fatigue, headache, and muscle or joint pain. Fewer than 1% of humans infected with WNV become severely ill. Severe symptoms include high fever, stiff neck, disorientation, tremors, muscle weakness, and paralysis. Severely affected persons may develop encephalitis (inflammation of the brain) or meningitis (inflammation of the membranes of the brain or spinal cord). Severe cases may be fatal. People of all ages and conditions may be affected. However, those who are above age 50 or who have had an organ transplant are at increased risk of severe illness.

Frequently Asked Questions

Which workers may be exposed to WNV?

Outdoor, laboratory, field, and clinical workers are at risk of WNV exposure.



Laboratory workers who handle WNV-infected tissues or fluids are at risk of WNV exposure.



Field workers are at risk of WNV infection from mosquitoes. They also are at risk if they handle infected animals or tissues and their skin is penetrated or cut.

Photograph courtesy of CDC.

Although WNV is most often transmitted by the bite of infected mosquitoes, the virus can also be transmitted through contact with infected animals, their blood, or other tissues. Thus laboratory, field, and clinical workers who handle tissues or fluids infected with WNV or who perform necropsies are at risk of WNV exposure. Outdoor workers are at risk of WNV exposure whenever mosquitoes are biting.*

Many types of laboratory workers and workers in other occupations may be exposed to WNV. These workers include laboratory diagnosticians and technicians, pathologists, researchers, veterinarians and their staff, wildlife rehabilitators, entomologists, ornithologists, wildlife biologists, zoo and aviary curators, health care workers, emergency response and public safety personnel, public health workers, and others in related occupations.

Who is at risk of WNV infection?

Workers who handle and process WNV-infected tissues or animals are at risk of infection if their skin is penetrated or cut. Also, anyone who lives or works in an area where there are WNV-infected mosquitoes is at risk of WNV infection. People of all ages are at risk of the flu-like symptoms of this infection. Although people usually recover, the symptoms may be severe enough to result in lost workdays for extended periods.

*See *Recommendations for Protecting Outdoor Workers from West Nile Virus Exposure* (NIOSH Publication No. 2005-155). Single copies are available free from NIOSH (1-800-35-NIOSH); or visit the NIOSH Web site at www.cdc.gov/niosh.

People above age 50 and those who have had organ transplants are known to have the highest risk of severe illness from WNV infection. Others with compromised immune systems are also likely to be at high risk. However, people of all ages and conditions can become severely ill. Therefore, ALL workers should be careful to follow the recommendations listed in this brochure to reduce their potential for WNV exposure and infection. When workers are outside, they should also follow the recommendations for outdoor workers.

Have any laboratory workers been infected with WNV on the job?

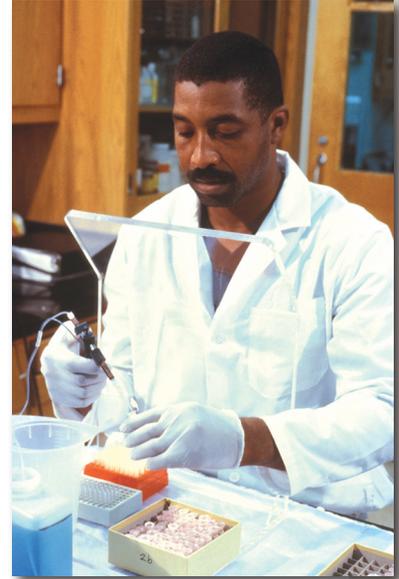
Laboratory workers have been infected with WNV on the job. One case involved a worker whose skin was cut with a scalpel while doing a necropsy of an infected bird. Another worker was infected as a result of a finger puncture with a contaminated needle.

What should I do if I must handle dead animals?

Avoid handling dead animals when possible. If you must handle them, avoid direct contact and wear gloves that provide a protective barrier. See additional recommendations at the end of this brochure.

How does WNV affect a woman's pregnancy?

The Centers for Disease Control and Prevention (CDC) has followed a number of women who became ill with WNV during pregnancy. Most of these women delivered apparently healthy babies with no evidence



Laboratory workers have been infected with WNV on the job.
Photograph courtesy of CDC.



Wear gloves if you must handle dead animals.



When pregnant workers are outside, they should avoid mosquitoes, wear protective clothing, and use an effective repellent. Photograph courtesy of CDC.

of WNV infection. Although some of the babies born to WNV-infected mothers did have health problems, it is unknown whether the WNV infection caused these problems. Because of 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. More research is needed to understand the possible effects of WNV on pregnancy.

Pregnant workers should follow the recommendations at the end of this brochure to reduce their risk for WNV infection. When pregnant workers are outside, they should also follow recommendations for outdoor workers,[†] which include avoiding mosquitoes; wearing protective clothing; using repellents containing DEET (N,N-diethyl-m-toluamide), picaridin, or oil of lemon eucalyptus on the skin; and spraying clothes with one of these repellents or permethrin. Always follow label instructions for repellents. Pregnant women who become ill should see their health care providers.

What should I do if I suspect I have been infected with WNV?

- Immediately report any laboratory incidents involving possible WNV exposure to your supervisor.

[†]See *Recommendations for Protecting Outdoor Workers from West Nile Virus Exposure* (NIOSH Publication No. 2005-155). Single copies are available free from NIOSH (1-800-35-NIOSH); or visit the NIOSH Web site at www.cdc.gov/niosh.

- Contact your health care provider if you have health concerns.

The period between exposure to WNV and having symptoms is 3 to 14 days. Testing for WNV infection is available. No vaccine is currently available to prevent WNV infection in humans.

Recommendations for Employers of Laboratory, Field, and Clinical Workers

Employers of laboratory, field, and clinical workers should protect their workers from WNV exposure by taking the following steps:

- Provide training that describes how WNV is transmitted and reinforces knowledge about the risks of WNV exposure and infection.
- Supply workers with appropriate personal protective equipment that provides barrier protection—such as gloves, gowns, masks, goggles or glasses with solid side shields, and/or chin-length face shields.
- Provide alternatives to latex gloves for workers who need or want to avoid latex.
- Stress to workers the importance of reporting all work-related injuries and illnesses in a timely manner.



Visit your health care provider if you develop WNV symptoms.



Supply workers with gloves that provide barrier protection.

Photograph courtesy of Kimberly Smith and Christine Ford, CDC.

- Provide a medical surveillance system that monitors, records, and assesses the following:
 - Symptoms consistent with WNV infection
 - Laboratory incidents involving possible WNV exposure
 - Absenteeism associated with WNV infection



Wear medical examination gloves that provide a protective barrier between blood or other body fluids and your skin. Wear cotton or leather work gloves as the outer pair when heavy work gloves are needed.

Recommendations for Laboratory, Field, and Clinical Workers

Avoid handling dead animals when possible. If you must handle them, take the following precautions:

- Use tools such as shovels to avoid direct contact with the animals.
- Wear medical examination gloves that provide a protective barrier between blood or other body fluids and your skin:
 - Wear two pairs of gloves if one pair alone might tear.
 - Make sure that latex gloves are reduced-protein, powder-free gloves to reduce workers' exposure to allergy-causing proteins.
 - Wear cotton or leather work gloves as the outer pair when heavy work gloves are needed.

- Wear the medical examination gloves as the inner pair.
 - Discard both inner and outer gloves immediately after use.
 - Remember that cotton, leather, and other absorbent gloves are not protective when worn alone.
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- Avoid skin and mucous membrane contact with blood and other tissues by using personal protective equipment that provides barrier protection—such as gloves, gowns, masks, goggles or glasses with solid side shields, and/or chin-length face shields.
 - Wash hands and other skin surfaces with soap and water immediately after contact with blood or other tissues, after removing gloves, and before leaving the workplace.
 - Take precautions when using scalpels, forceps, and other sharp instruments.
 - Use medical devices with safety features to avoid sharps-related injuries.
 - Do not recap, bend, or remove contaminated needles and sharps. Never shear or break contaminated needles.
 - Dispose of sharp devices in labeled, puncture-resistant, leakproof sharps disposal containers immediately after use.



Dispose of sharp devices in sharps disposal containers immediately after use. *Photograph courtesy of Jim Gathany, CDC.*



Promptly dispose of contaminated materials in containers approved for biohazardous wastes. *Photograph courtesy of Kimberly Smith and Christine Ford, CDC.*

- Immediately after use, dispose of materials contaminated by infected animals, their blood, or other tissues in containers approved for bio-hazardous wastes.
- Minimize the generation of aerosols when working with infected tissues, samples, and animals.
- Immediately report the following to the supervisor:
 - All needlestick and other sharps-related injuries
 - Any laboratory incidents involving possible WNV exposure
 - Any symptoms consistent with WNV infection

Resources

For more comprehensive information about WNV, contact the Division of Vector-Borne Infectious Diseases, National Center for Infectious Diseases, Centers for Disease Control and Prevention at

www.cdc.gov/westnile

For further information about occupational safety and health topics, contact the National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention at

www.cdc.gov/niosh

For further information about the OSHA Bloodborne Pathogens Standard, contact the Occupational Safety and Health Administration at

www.osha.gov/SLTC/bloodbornepathogens

For the complete text of the U.S. Department of Health and Human Services publication *Biosafety in Microbiological and Biomedical Laboratories* (4th edition, 1999), see

<http://bmbi.od.nih.gov/>

For further information about biosafety, contact the Office of Health and Safety, Centers for Disease Control and Prevention at

www.cdc.gov/od/ohs/biosfty/biosfty.htm

Acknowledgments

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