



U. S. Department of Labor  
Occupational Safety and Health Administration  
Directorate of Enforcement Programs  
Office of Health Enforcement

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## Workplace Precautions Against West Nile Virus

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### Safety and Health Information Bulletin

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#### Purpose

OSHA has developed this safety and health bulletin on Workplace Precautions against West Nile Virus to provide relevant information regarding this illness to employers, employees, and other interested parties.

#### Introduction

West Nile Virus (WNV) infection is an illness transmitted to humans primarily by mosquitoes. The pathogen that causes WNV infection is a virus that, until recently, was not found in the USA. WNV was found mainly in Africa, the Middle East and West Asia and is known to infect birds and other animals as well as humans. While it is not known exactly how long this virus has been in the United States, the Centers for Disease Control and Prevention (CDC) has documented human cases of the infection in the eastern part of the U.S. since 1999. In 2002, there were 4,156 cases and 284 deaths from WNV infection in the U.S. In 2003, through August 22, thirty-three states have reported 772 human cases of WNV infection, including 17 deaths, to the CDC. Up-to-date information on the number of cases and fatalities due to West Nile Virus infection can be obtained on the CDC's West Nile Virus web page at: <http://www.cdc.gov/ncidod/dvbid/westnile/surv&control.htm>.

In most cases, persons infected with West Nile Virus either show no symptoms or have very mild flu-like symptoms, called West Nile fever. These mild cases of West Nile fever normally last only a few days and are not be-

This Safety and Health Information Bulletin is **not** a standard or regulation, and it creates no new legal obligations. The Bulletin is advisory in nature, informational in content, and is intended to assist employers in providing a safe and healthful workplace. The Occupational Safety and Health Act requires employers to comply with hazard-specific safety and health standards. In addition, pursuant to Section 5(a)(1), the General Duty Clause of the Act, employers must provide their employees with a workplace free from recognized hazards likely to cause death or serious physical harm. Employers can be cited for violating the General Duty Clause if there is a recognized hazard and they do not take reasonable steps to prevent or abate the hazard. However, failure to implement these recommendations is not, in itself, a violation of the General Duty Clause. Citations can only be based on standards, regulations, and the General Duty Clause.

lieved to cause any long-term effects. According to the CDC, severe cases have resulted in "West Nile encephalitis," an inflammation of the brain, "West Nile meningitis," inflammation of the membrane around the brain, or "West Nile meningoencephalitis," an inflammation of the brain and the membrane around it. The signs and symptoms of severe disease may last several weeks and may have permanent neurological effects.

The typical time from infection to the onset of signs and symptoms is 3 to 14 days. Signs and symptoms of the milder illness, West Nile fever, include:

- Headache
- Fever
- Body aches
- Sometimes, swollen lymph nodes
- Sometimes, a skin rash on the body

The CDC reports that with more severe infection (West Nile encephalitis or meningitis), the signs and symptoms include:

- Headache
- High fever
- Stiffness in the neck
- Disorientation (in very severe cases, coma)
- Tremors and convulsions
- Muscle weakness (in very severe cases, paralysis)

Although the infection has been documented in laboratory workers working with the virus itself, most documented human cases in the U.S. have resulted from mosquito bites. The risk of getting infected with WNV can often be reduced or eliminated with use of preventive measures that minimize or eliminate mosquito bites. To lessen the chances of mosquito bites:

- **Reduce or eliminate mosquito populations by disrupting mosquito breeding grounds (i.e., get rid of sources of stagnant or standing water weekly, for mosquitoes can breed in any stagnant puddle that lasts more than 4 days).**
- Cover as much of the skin as possible by wearing shirts with long sleeves, long pants and socks whenever possible.
- Use insect repellents containing DEET. According to the CDC, the most effective repellents contain DEET (N, N-diethyl-m-toluamide or N, N-diethyl-3-methylbenzamide).

*Note: In order to avoid reaction to DEET or other ingredients of insect repellents, it is important that employees read and follow the directions on all insect repellent before use. Repellents should not be applied to skin that is already irritated, or to cuts/lacerations.*

These and other methods of reducing risk of WNV-infection are discussed in the sections that follow.

## What occupations are at risk?

In general, WNV is transmitted to humans via mosquito vectors, therefore employees working outside are at risk, particularly in warmer weather (when mosquitoes are more likely to be present). In regions of the U.S. with warm climates, employees are at risk for a longer period. At risk occupations include farm workers, loggers, landscapers/groundskeepers, construction workers, painters, summer camp workers, pavers, and other outdoor workers.

In at least two cases, laboratory workers handling WNV-infected fluids or tissues have become infected; therefore, these workers should also take precautions against WNV infection. An exposure may occur due to a needlestick, an accidental cut, or an existing open wound that comes in contact with infectious fluid or tissues. Laboratory workers who work with WNV-infected animals or who handle other tissue, fluid or other WNV-infected material, should report to their supervisors if they believe they may have had an exposure that could result in infection. Laboratory workers handling human blood or other potentially infectious material require protection as described in OSHA's Bloodborne Pathogens Standard, 29 CFR 1910.1030.

As of August 20, 2003, there are no documented cases of healthcare workers who have become infected following treatment of patients with WNV infection. Nevertheless, healthcare workers and emergency response personnel must continue to use universal precautions to protect against exposure to human blood and other potentially infectious materials (OPIM) as required by OSHA's Bloodborne Pathogens Standard, 29 CFR 1910.1030.

## How can employers protect employees?

As with all workplace hazards, employers should use the following hierarchy of control-measures to minimize or eliminate WNV infections among their employees:

### *Engineering/Administrative Controls*

*Employers with employees working outdoors:*

- Be aware of outside working conditions, i.e., the presence of equipment or areas where water may accumulate.
- Inspect work areas and, where possible, get rid of sources of stagnant or standing water to remove a potential breeding ground of mosquitoes.
- Encourage workers to take extra precautions whenever mosquitoes are present and biting (for example, mosquito swarms are often present at dusk or at dawn).
- Encourage workers to report dead birds and forward the report to local authorities. (CDC has links to state and local government sites on their web page).

*Healthcare/Laboratory employers:*

- Use of standard precautions is recommended.
- If workers are exposed to blood and /or other potentially infectious materials, OSHA's bloodborne pathogens standard, 29 CFR 1910.1030, must be followed, including establishing and implementing a workplace Exposure Control Plan and the providing sharps with engineered sharps injury protection (SESIP) to avoid sharps-related injuries.
- Monitor and record incidents as well as actual injuries in laboratories involving possible exposure to WNV. Encourage employees to report injuries and illnesses that occur in laboratories where WNV-infected tissues or fluid is present. Keep track of employees who report symptoms that are consistent with WNV infection in labs where WNV is present.

### *Employee Training*

Employers should provide training to employees who may be at risk. Training should cover the potential hazards and the risks of WNV exposure and infection. Knowing key steps that employees themselves can take to minimize the risk of getting bitten by mosquitoes can help to reduce the risk of WNV infection. Employees who work outdoors in warm climates should be made aware of the appropriate personal protective equipment and work practices that protect against mosquito bites. Employees should also be made aware that mosquitoes are more likely to swarm during late evening and early morning hours and extra precautions should be followed at these times. Employees should also be encouraged to report dead birds and should be instructed not to pick up dead birds with bare hands.

### *Personal Protection*

*Employers with employees working outdoors:*

In warm weather, encourage employees who work outdoors to wear light-weight, loose clothing. This type of clothing protects employees against the sun's harmful rays, and also provides a barrier to mosquitoes. Employers may also want to have insect repellents available for employees to protect against mosquitoes.

*Healthcare/Laboratory employers:*

In laboratories and healthcare settings employers must provide gloves. As some employees may have allergies to latex gloves, employers should also make available non-latex gloves as an alternative. In workplaces where animal studies are performed on WNV-infected animals, employers must provide gloves that will prevent cutting injuries (e.g. stainless steel mesh gloves). Under 29 CFR 1910.132, employers must evaluate the work environment and, where there is a potential for skin or mucous membrane contact with blood and or other tissues, also provide additional personal protective equipment

(PPE) to affected employees (e.g., safety glasses, and/or face shields, where appropriate, and gowns). OSHA's bloodborne pathogen standard has provisions requiring the use of PPE when working with human blood.

## **How can employers reduce or eliminate mosquito breeding grounds?**

Employers should keep in mind that elimination of mosquito breeding grounds is a highly effective way of reducing mosquito populations and reducing the number of mosquito bites. Mosquitoes lay eggs in standing water. The following steps are among the possible means of ridding the workplace of standing water:

- Avoid leaving containers that can accumulate water in an uncovered or upright position, such as, wheelbarrows, drums, buckets, cans, tarps and other containers.
- Drain or pump out collected water from newly constructed swimming pools, rain gutters and ditches.
- Properly store any open containers in the work area that are not being used such as buckets and cans.
- Create holes to drain water from containers that cannot be thrown out.
- Fill in any potholes, patches and other areas where water is likely to accumulate.
- Frequently check ponds, birdbaths, animal feeding and drinking troughs and other bodies of standing water. Use aeration, wherever possible, as a way to prevent mosquito growth.
- Change water in animal feeders every few days.

## **How can employees working outdoors protect themselves?**

It may not always be possible to eliminate all potential mosquito breeding grounds. For example, workers in logging operations may not be able to determine all areas of water accumulation in their work environment. Knowledge of some key steps that employees can take to minimize the risk of mosquito bites

is, therefore, important in reducing the risk of WNV infection. Employees who work outdoors should be aware that the use of personal protective equipment and techniques is essential to preventing mosquito bites. Especially when working at sites where mosquitoes may be active and biting, employees should use the following steps to minimize the likelihood of getting bitten:

- Cover as much of your skin as possible by wearing shirts with long-sleeves, long pants, and socks whenever possible (use light weight clothing to minimize the potential for heat-induced illnesses).
- Avoid use of perfumes and colognes when working outdoors during peak times when mosquitoes may be active; mosquitoes may be more attracted to individuals wearing perfumes and colognes.
- Use an insect repellent on skin that is not covered by clothing. The most widely studied and according to CDC, the most effective repellents contain DEET (N, N-diethyl-m-toluamide, or N, N-diethyl-3-methylbenzamide).
- **Choose a repellent that provides protection for the amount of time that you will be outdoors. The more DEET a repellent contains, the longer time it can protect you from mosquito bites, with protection times ranging from 1 hour (4.75% DEET) to 5 hours (23.8% DEET).**
- Spray insect repellent on the outside of your clothing, as it is possible for mosquitoes to bite through thin clothing.
- Do NOT spray insect repellent on skin that is under clothing.
- Do NOT spray aerosol or pump products in enclosed areas. Do NOT spray a pump or aerosol product directly on your face. First spray on hands and carefully rub on face (do not allow insect repellent to contact your eyes and mouth).
- After returning indoors, use soap and water to wash skin that has been treated with insect repellent.

- Employees should protect themselves from skin contact with dead birds. CDC recommends using gloves or an inverted plastic bag when handling dead birds.

*Note: Additional resources are provided below for information on the safe use of insect repellent.*

The U.S. Environmental Protection Agency (EPA) provides information on how to safely use insect repellents. Information is located on line in U.S. EPA: How to Use Insect Repellents Safely at:

<http://www.epa.gov/pesticides/factsheets/insectrp.htm>

Additional information on the safe use of insect repellents can be obtained from a question and answer document posted on the Centers for Disease Control's (CDC) Website. The document is titled *CDC: Insect Repellent Use and Safety* and is located at:

[http://www.cdc.gov/ncidod/dvbid/westnile/qa/insect\\_repellent.htm](http://www.cdc.gov/ncidod/dvbid/westnile/qa/insect_repellent.htm)

The National Pesticide Information Center (NPIC) provides useful contact information for persons with further questions on the use of insect repellents for mosquito control at a website located at:

<http://npic.orst.edu/wnv/>

## **What can healthcare/laboratory employees do to protect themselves?**

Healthcare workers, emergency personnel and laboratory workers who may be in contact with human blood or OPIM must follow OSHA's Bloodborne Pathogens Standard (29 CFR 1910.1030). These workers who are not exposed to human blood or OPIM, but may be exposed to WNV should follow the recommendations below:

- Follow workplace standard operating procedures (in other words, workplace exposure control plans) and use the engineering controls and work practices available in the workplace to prevent exposure to blood or other potentially infectious materials.

- Do NOT bend, recap, or remove contaminated needles or other contaminated sharps.
- Use sharps with engineered sharps injury protection (SESIP) to avoid sharps-related injuries.
- Minimize the aerosolization of blood or body fluids as much as possible.
- Always wash hands after removing gloves and prior to leaving the workplace.
- Use personal protective equipment (i.e., gloves, gowns, safety glasses, and/or face shields, where appropriate).
- Report all needlesticks, lacerations, and other exposure incidents as soon as possible to supervisors.

## **Where can I get additional information on West Nile Virus?**

Several public health agencies have published information on the prevention of West Nile Virus infection. Information published by the Centers for Disease Control and Prevention can be obtained at the CDC West Nile Virus Home Page at:

<http://www.cdc.gov/ncidod/dvbid/westnile/index.htm>

Contacts for state and local health departments are listed at:

[http://www.cdc.gov/ncidod/dvbid/westnile/city\\_states.htm](http://www.cdc.gov/ncidod/dvbid/westnile/city_states.htm)

The National Institute for Occupational Safety and Health offers information for employers and employees at:

<http://www.cdc.gov/niosh/topics/westnile/>

There is also available information at the US Department of Agriculture's webpage at:

<http://www.aphis.usda.gov/lpa/issues/wnv/wnv.html>

Links/Citations to the websites listed above are offered for the reader's convenience. Since OSHA does not control the information contained in the websites, OSHA cannot assure the accuracy, relevance, timeliness, or completeness of all of this information. Moreover, providing links/citations to such websites does not constitute an endorsement of the websites, or their content, nor does it suggest that these websites are the exclusive or most useful sources of relevant information.