

# Keeping Safe From West Nile Virus

## *What is West Nile Virus?*

West Nile virus is a disease spread primarily by mosquitoes. Typically, infections occur in the summer and continue into the fall. People infected with the virus rarely experience symptoms. Only about 20% of infected people develop mild symptoms such as fever, headache, swollen lymph nodes, and body aches. Less than 1% of infected people experience more severe symptoms such as brain inflammation (encephalitis), muscle weakness, altered mental status, seizures, coma, and rarely, death. Symptoms often develop within about three to 14 days of becoming infected. There's no specific treatment for West Nile virus except to relieve symptoms.

## *How is West Nile virus spread?*

Mosquitoes pick up the virus by feeding on the blood of infected birds. The virus is spread to humans when infected mosquitoes bite them.

## *Can I catch West Nile virus from other people or animals?*

West Nile virus is not contagious. Coming in contact with infected people or animals is not harmful. But it's possible the virus can be spread through blood transfusions, organ transplants, breastfeeding, and even during pregnancy from mother to baby.

## *Am I at risk for catching West Nile virus?*

Anybody can catch the virus if they're bitten by mosquitoes that carry it. But very few people will actually develop symptoms. People over 50 or with low immunity have the greatest risk for developing severe symptoms.

## *How can I protect myself from infection?*

- Avoid getting bitten by mosquitoes. Limit the time spent outdoors when mosquitoes are most active (dusk and dawn).
- When going outside, wear long sleeves and pants. Avoid wearing tight clothes since mosquitoes may bite through them.
- Use insect repellent while outdoors.

## *Which is the best insect repellent?*

Products that contain DEET (*OFF!*, *Cutter*, *Ultrathon*, etc.) are some of the best. These products contain different concentrations of DEET. Higher concentrations don't work better, they just last longer. For example, 7% DEET lasts about two hours and 24% DEET lasts about five hours. Products containing more than 50% DEET don't last for much longer. Keep in mind that most products won't say DEET. Instead, look under the ingredients section of the product labeling and search for the chemical name of DEET (N,N-diethyl-m-toluamide or N,N-diethyl-3-methylbenzamide).

A good alternative to DEET is the insect repellent picaridin (*Cutter Advanced*, etc). Picaridin works as well as similar concentrations of DEET. It also doesn't irritate the skin or damage plastic or clothing. As with DEET, products with higher concentrations of picaridin will last longer than those with lower concentrations.

Oil of lemon eucalyptus (*Repel Lemon Eucalyptus*, etc.) is a good choice if you want a "natural" or plant-based repellent. Oil of lemon eucalyptus (about 30%), also known as p-menthane-3,8-diol or PMD, is an alternative to repellents with a low concentration of DEET. Other plant-based products that contain citronella oil (*Buzz Away*) or soybean oil (*Bite Blocker*) can repel mosquitos, but only for a very short time.

Products that contain permethrin (*Repel Permanone*, *Fite Bite*, etc.) also work well. You can use permethrin along with DEET to enhance protection. You should spray permethrin onto clothes, **but not on the skin**. Allow clothes to dry completely before wearing.

Before using any insect repellent, always read and closely follow the directions on the label of the product you choose.

## *How do I keep mosquitoes from my home?*

You can reduce the number of mosquitoes by removing water sources that could serve as mosquito breeding habitats. Mosquitoes breed in water that stands for more than four days. Store away buckets, barrels, old tires, or other items that collect water. Routinely clean and chlorinate your pool. If you own a home, clean rain gutters around your house regularly.



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## Updated Information Concerning Mosquito Repellents

*The following excerpts are reprinted from the Centers for Disease Control and Prevention April 22, 2005 update on the use of non-DEET insect repellents. <http://www.cdc.gov/ncidod/dvbid/westnile/RepellentUpdates.htm>.*

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### **Repellents are an important tool to assist people in protecting themselves from mosquito-borne diseases.**

A wide variety of insect repellent products are available. CDC recommends the use of products containing active ingredients which have been registered with the U.S. Environmental Protection Agency (EPA) for use as repellents applied to skin and clothing. EPA registration of repellent active ingredients indicates the materials have been reviewed and approved for efficacy and human safety when applied according to the instructions on the label.

Of the active ingredients registered with the EPA, two have demonstrated a higher degree of efficacy in the peer-reviewed, scientific literature.<sup>1,2</sup> Products containing these active ingredients typically provide longer-lasting protection than others:

- DEET (N,N-diethyl-m-toluamide)
- Picaridin (KBR 3023)

Oil of lemon eucalyptus [p-menthane 3,8-diol (PMD)], a plant based repellent, is also registered with EPA. In two recent scientific publications, when oil of lemon eucalyptus was tested against mosquitoes found in the US it provided protection similar to repellents with low concentrations of DEET.

Oil of lemon eucalyptus has not been tested against mosquitoes that spread malaria and some other diseases which occur internationally. See CDC Travelers' Health website (<http://www.cdc.gov/travel/bugs.htm>) for specific recommendations concerning protection from insects when traveling outside the United States.

In addition, certain products which contain permethrin are recommended for use on clothing, shoes, bed nets, and camping gear, and are registered with EPA for this use. Permethrin is highly effective as an insecticide and as a repellent. Permethrin-treated clothing repels and kills ticks, mosquitoes, and other arthropods and retains this effect after repeated laundering. The permethrin insecticide should be reapplied following the label instructions. Some commercial products are available pretreated with permethrin.

Length of protection from mosquito bites varies with the amount of active ingredient, ambient temperature, amount of physical activity/perspiration, any water exposure, abrasive removal, and other factors. For long duration protection, use a long lasting (micro-encapsulated) formula and re-apply as necessary, according to label instructions.

### **EPA recommends the following precautions when using insect repellents:**

- Apply repellents only to exposed skin and/or clothing (as directed on the product label.) Do not use repellents under clothing.
- Never use repellents over cuts, wounds or irritated skin.
- Do not apply to eyes or mouth, and apply sparingly around ears. When using sprays, do not spray directly on face—spray on hands first and then apply to face.
- Do not allow children to handle the product. When using on children, apply to your own hands first and then put it on the child. You may not want to apply to children's hands.
- Use just enough repellent to cover exposed skin and/or clothing. Heavy application and saturation are generally

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unnecessary for effectiveness. If biting insects do not respond to a thin film of repellent, then apply a bit more.

- After returning indoors, wash treated skin with soap and water or bathe. This is particularly important when repellents are used repeatedly in a day or on consecutive days. Also, wash treated clothing before wearing it again. (This precaution may vary with different repellents—check the product label.)
- If you or your child get a rash or other bad reaction from an insect repellent, stop using the repellent, wash the repellent off with mild soap and water, and call a local poison control center for further guidance. If you go to a doctor because of the repellent, take the repellent with you to show the doctor.

Note that the label for products containing oil of lemon eucalyptus specifies that they should not be used on children under the age of three years. Other than those listed above, EPA does not recommend any additional precautions for using registered repellents on pregnant or lactating women, or on children. For additional information regarding the use of repellent on children, please see CDC's Frequently Asked Questions about Repellent Use. [[http://www.cdc.gov/ncidod/dvbid/westnile/qa/insect\\_repellent.htm](http://www.cdc.gov/ncidod/dvbid/westnile/qa/insect_repellent.htm)]. [Please note the American Academy of Pediatrics recommends that no more

than 30% concentrations of DEET be used on infants and children and that DEET should not be used in infants < two months of age. In general DEET should not be applied more than once daily.]

DEET-based repellents applied according to label instructions may be used along with a separate sunscreen. No data are available at this time regarding the use of other active repellent ingredients in combination with a sunscreen.

See <http://www.epa.gov/pesticides/factsheets/insectrep.htm> for additional information on using EPA-registered repellents.

### References

1. Fradin MS, Day JF. Comparative efficacy of insect repellents against mosquito bites. *N Engl J Med* 2002;347:13-8.
2. Barnard DR, Xue RD. Laboratory evaluation of mosquito repellents against *Aedes albopictus*, *Culex nigripalpus*, and *Ochlerotatus triseriatus* (Diptera: Culicidae). *J Med Entomol.* 2004;41:726-30.

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