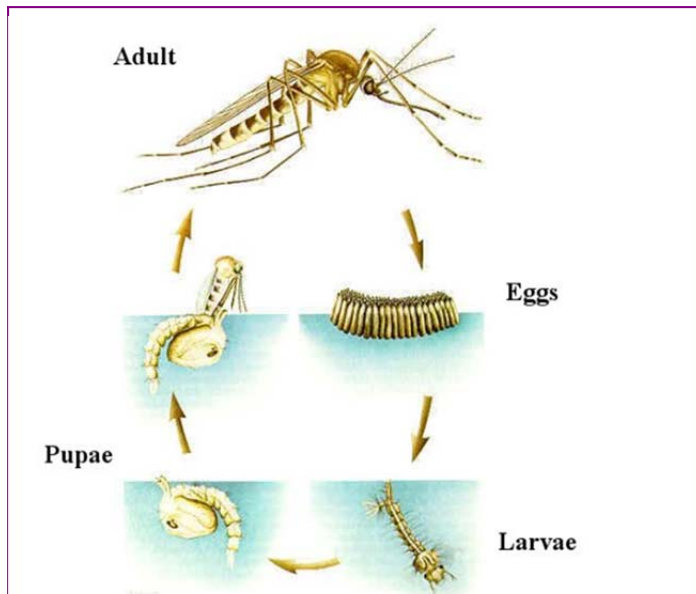




## INSIDE THIS ISSUE: FROM DUSK TO DAWN... MOSQUITOES SUCK!

Mosquitoes can cause numerous health problems due to their ability to transfer (vector), viruses and other disease-causing pathogens. West Nile virus (WNV) is a mosquito-borne virus contracted through mosquito bites. So far in 2012, 42 states have reported WNV infections in people, birds, and mosquitoes. A total of 241 cases of WNV disease have been reported to the CDC. This is the highest number of cases reported through the end of July since 2004.



Mosquitoes need water to complete their life-cycle.

### The Cycle of West Nile Virus

WNV is transmitted to people by infected mosquitoes. In the United States, most people are infected from June through September, and the number of these infections usually peaks in mid-August.

**People of all ages (including children) can contract the virus.** Approximately 1 in 5 people who are infected with WNV will develop symptoms such as fever, headache, body aches, joint pains, vomiting, diarrhea, and or rash. Less than 1 percent

will develop a serious neurological illness such as encephalitis or meningitis (inflammation of the brain or surrounding tissues). About 10 percent of people who develop neurologic infection due to WNV will die. People over 50 years of age and those with certain medical conditions such as cancer, diabetes, hypertension, and kidney disease are at greater risk for serious illness.

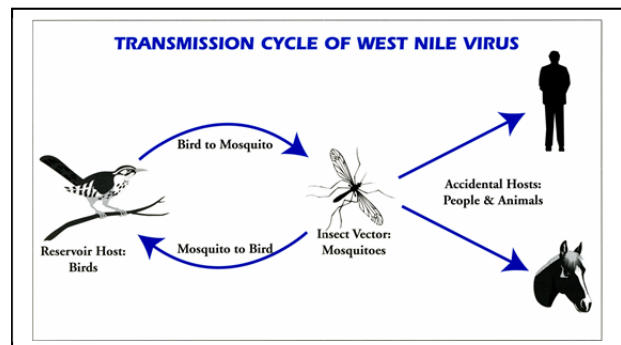
Symptoms of encephalitis or meningitis include:

- \* High fever
- \* Neck stiffness
- \* Disorientation
- \* Convulsions
- \* Paralysis
- \* Headache
- \* Stupor
- \* Tremors
- \* Coma
- \* Muscle weakness

### The Cycle

After a mosquito feeds on the blood of a bird infected with WNV, the virus goes through a short growth period before it is capable of being retransmitted – as few as four days in some mosquito species. The infected mosquito, full of the virus and ready to feed again, will look for a bird, human, or other animal for its next blood meal.

This is the basic transmission cycle of the virus as it moves from bird (reservoir host) to mosquito (vector) and then - incidentally - to humans or other animals.



Humans are *incidental hosts* for the WNV. A mosquito cannot become infected by biting a human with WNV.

## Prevention

The best way to prevent WNV is to minimize the number of mosquitoes since that is how the virus moves from bird host to human.



Mosquitoes need wet conditions to lay their eggs and grow from an aquatic larva into a flying adult.

## Integrated Pest Management (IPM) Mosquito Management – Fight the Bite!

Consider the following:

1. Check flower pots, bird-baths, fountains, depressions in tarpaulins, and backyard trampolines, drain the water regularly.
2. Store boats, canoes and other objects so they do not collect rainwater.
3. Keep rain gutters free of leaves and other debris that prevent water from draining.
4. Correct drainage problems in yards and playing fields to prevent rain and irrigation water from pooling for prolonged periods; report drainage problems in ditches, etc.
5. Fill holes or depressions in trees with sand.
6. Repair leaky pipes and outside faucets, and connect open waste-water drains to a sewage system, construct separate sump or leach lines.
7. Empty water containers for pets and check livestock watering troughs and tanks, or add *Gambusia* (mosquito eating fish).
8. Larvicides: mosquito “dunks” use bacteria (*Bti*) that is harmless to humans, pets and the environment. Dunks will kill mosquito larva in a non-consumptive water source.

**With education and awareness, we can limit the health threat posed by these pests.**

## Avoid Mosquito Bites

Wear loose fitting long-sleeves, long pants and socks when outdoors. Mosquitoes can bite through thin clothing, so spraying clothes with repellent adds an additional protective layer.

Apply **Insect Repellent** even if you are outside for just a short period of time. Approximately 40% of people diagnosed with WNV have no recollection of being bitten by mosquitoes.



Use a DEET product or picaridin and reapply frequently if you are outside for a prolonged amount of time. The higher the temperature, the more frequently you must reapply repellent for it to be effective.

- Apply repellents only to exposed skin and/or clothing (as directed on the product label). Do not use under clothing.
- Never use repellents over cuts, or wounds.
- Do not apply to eyes and mouth, and apply sparingly around ears. When using sprays do not spray directly onto the face; spray on hands first and then apply to the face.
- Do not allow young children to handle the products, and do not apply to children's hands. When using on children, apply to your own hands and then put it on the child.
- Do not spray in enclosed areas. Avoid breathing a repellent spray, and do not use it near food.
- After returning indoors, wash treated skin with soap and water. If a reaction to the repellent occurs, discontinue use, wash treated skin, and call local poison control if symptoms persist.

**When properly used, personal repellents can discourage biting arthropods from landing on treated skin or clothing.**

**Using repellent and sunscreen products at the same time is an acceptable practice. However, the use of combination products that contain both an insect repellent and a sunscreen is not recommended.**

### **Types of Repellants**

According to the Centers for Disease Control and Prevention (CDC) the three most common active ingredients in repellents are DEET, picaridin, and oil of lemon eucalyptus. The CDC considers DEET and picaridin to be the most effective. Between the two active ingredients, picaridin products are less problematic when used repeatedly over an extended period of time.



EPA characterizes the active ingredients DEET and picaridin as conventional repellents and oil of lemon eucalyptus, PMD, and IR3535 as bio-repellents, which are derived from natural materials. For more information on repellent active ingredients see ([http://www.epa.gov/pesticides/health/mosquitoes/ai\\_insectrp.htm](http://www.epa.gov/pesticides/health/mosquitoes/ai_insectrp.htm)).

### **Mosquito-Proof Your Home and Yard**

#### **Install or Repair Screens**

Some mosquitoes like to come indoors. Keep them outside by having well-fitting screens on windows and doors. Don't leave doors open after dark.

### **Check for Indoor Breeding Sites**

If a female mosquito wanders inside your home she will utilize any water reservoir she can find to lay eggs. Check for wriggling larvae in toilet cisterns that are not flushed daily. Maintain water in drain traps. Use sticky tape over floor drains, sink overflows, etc. to see if you can catch mosquitoes emerging from areas you cannot see.

### **Help Your Community**

Gently communicate with members of your community. Report areas that are breeding mosquitoes to the Vector Control Complaint Office if you have one in your area.

Use the poster as a reminder when checking for mosquito breeding sites.

### **After Bite Care**

Several strategies exist for relieving the itch of mosquito bites. The first step is to clean the bite area with soap and water. Topical corticosteroids can reduce the rash, itching, and discomfort. Topical diphenhydramine and caine-containing derivatives should be avoided because of concerns about inducing allergic contact sensitivity.

Oral antihistamines can be effective in reducing the symptoms of mosquito bites. Use of a cold compress can be helpful, but do not apply ice directly to the skin.

**For additional help selecting which repellent is right for you, go to the EPA search page:**

**<http://cfpub.epa.gov/oppref/insect/#searchform>**

#### **Information taken from:**

Bennett, G. W., J. M. Owens, & R. M. Corrigan. Truman's Scientific Guide to Pest Management Operations. 6th ed. Purdue University, 2003. 574 pp.

Barnard, D. R. & R. Xue. 2004. Laboratory evaluation of mosquito repellents against *Aedes albopictus*, *Culex nigripalpus*, and *Ochlerotatus triseriatus* (Diptera: Culicidae). *J. Med. Entomol.* 41(4):726-730.

CDC: [www.cdc.gov/westnile](http://www.cdc.gov/westnile) & [http://www.cdc.gov/media/releases/2012/p0801\\_west\\_nile.html](http://www.cdc.gov/media/releases/2012/p0801_west_nile.html)

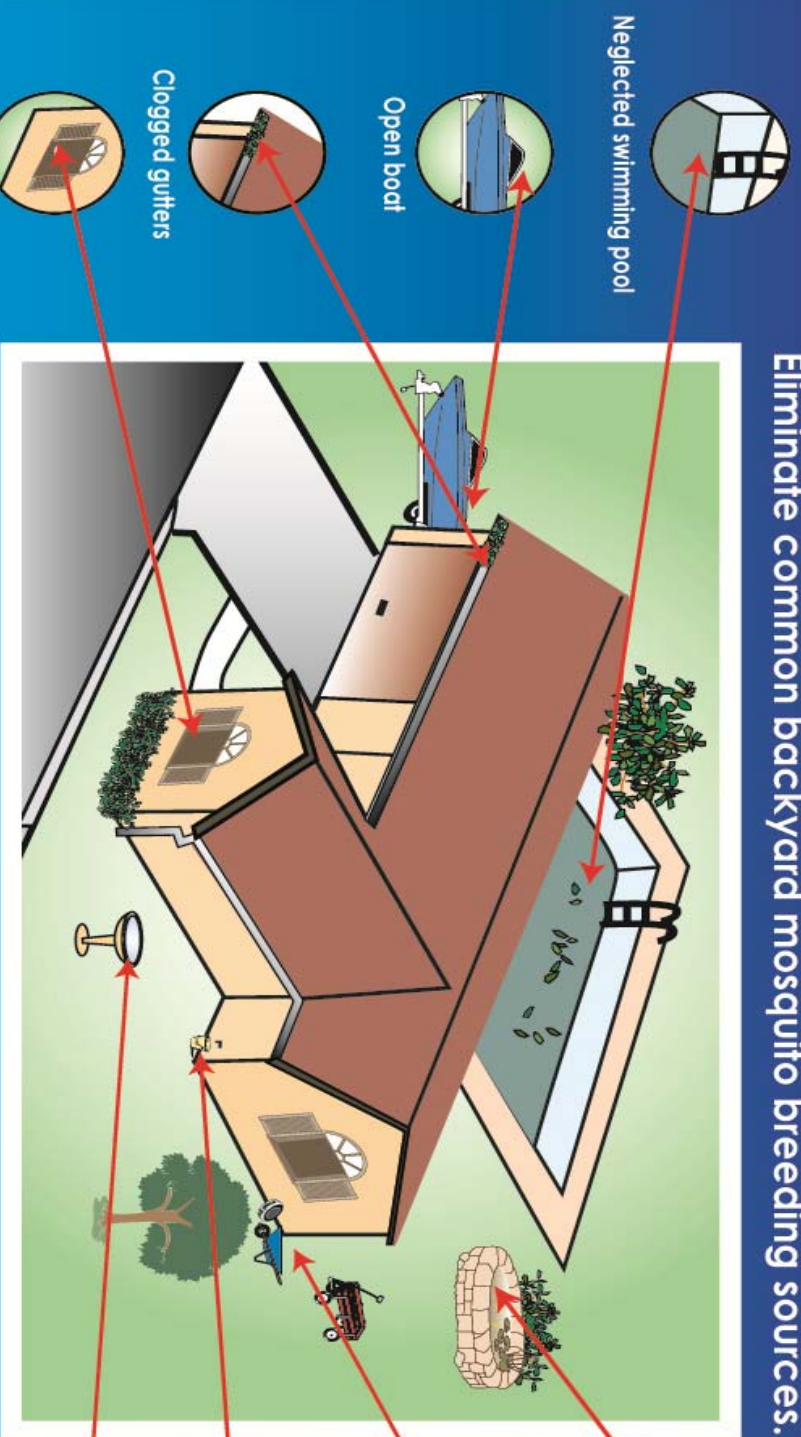
Fradin, M. F., & J. F. Day. Comparative efficacy of insect repellents against mosquito bites. *New England Journal of Medicine.* 2002. 4:347(1):13-8.

Marin/Sonoma Mosquito & Vector Control District website, Cotati, CA: <http://www.msosquito.com>

Olkowski, William, Sheila Daar, Helgo Olkowski. Common Sense Pest Control. The Taunton Press, 1991. 715 pp.

# Prevent West Nile Virus

Eliminate common backyard mosquito breeding sources.



Neglected swimming pool

Open boat

Clogged gutters

Broken screens

Poorly maintained pond  
(Stock with mosquito  
large-eating fish)

Items that hold water for  
more than a few days

Leaky watering equipment

Birdbath  
(Change water twice a week)

- Protect yourself from mosquito bites:
- Avoid outdoor activity during peak mosquito times – dusk to dawn
  - Wear long, loose, light-colored clothing
  - Use insect repellent when outdoors after sunset



This poster was adapted from the Virginia Department of Health and is posted here with permission. 2003

For more information, visit the Arizona Department of Health Services web site: [www.hs.state.az.us](http://www.hs.state.az.us)