Protecting Yourself from Disease Carrying Insects

A Reference Guide to Mosquitoes, West Nile Virus and Repellents
Customers letter,
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West Nile Virus and Mosquitoes

What is West Nile Virus?
West Nile virus (WNV) is a virus that is transmitted to people by the bite of an infected mosquito. WNV has affected many residents, sometimes resulting in serious illness and even death.

The West Nile Virus Transmission Cycle

- The natural transmission cycle of West Nile virus is between a few types of birds and some mosquitoes.
- Very few mosquitoes are actually infected with the West Nile virus.

A bird infected with WNV is bitten by a mosquito.

The mosquito picks up the virus from the bird and after about a week, the mosquito can transmit the virus.

The infected mosquito will then feed on an uninfected bird and transmit the virus to the bird.

- Sometimes, the infected mosquito will feed on humans or horses. Some of these humans and horses can get sick or die from the infection.

Courtesy of CDC

The West Nile Virus Transmission Cycle
Symptoms generally appear three to 15 days after being bitten by an infected mosquito.

- **SERIOUS SYMPTOMS in a few people:** About one in 150 people infected with West Nile virus will develop severe illness. This may include high fever, headache, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, vision loss, numbness or paralysis. These symptoms may last several weeks and neurological effects may be permanent. West Nile virus infection can be fatal.

- **MILD SYMPTOMS in some people:** Up to 20 percent of people infected with West Nile virus develop West Nile fever, symptoms of which may include fever, headache, body aches, nausea, vomiting and sometimes swollen lymph glands or a skin rash on the chest, stomach and back. Symptoms may last a few days to several weeks.

- **NO SYMPTOMS in most people:** Approximately 80 percent of people who are infected with West Nile virus will not show any symptoms at all.

While everyone is equally susceptible to West Nile virus, people over the age of 50 are at greatest risk for developing more severe forms of the disease. No vaccine against WNV is available for people at this time.
• There are four stages in the life of a mosquito: egg, larva, pupa and adult.

Mosquitoes eggs are laid so that they hatch in water.

A larva emerges from the egg and feeds and grows in the water for about a week.

The larva then turns into a pupa, which is also found in water but does not feed.

After about two days, the adult mosquito that has developed inside the pupa will emerge into the familiar flying form.

There are both male and female mosquitoes, but only the female bites because she needs the blood to provide nutrients for her eggs.

• Female mosquitoes will lay 200-300 eggs each time they have a blood meal. She may lay eggs three or four times during the month that she is alive.
• Applying a permethrin barrier spray to your yard will provide temporary relief from biting adult mosquitoes.

• Permethrin is an insecticide that both repels and kills mosquitoes.

• Permethrin has low human toxicity and is readily available in garden centers and hardware stores.

• When looking for permethrin products, make sure to check the labeling—permethrin is the name of the active ingredient, not the product brand name.

• Apply permethrin to ivy, shrubs, trees, ornamental grasses and to any other plants where mosquitoes are resting.

• Permethrin will not harm your garden plants.

• Treatment will last two to three weeks, depending on the rain.

• Reapply as needed depending on mosquito presence and annoyance.

• Always read and follow the label instructions before applying insecticides.

**How to Get Rid of Adult Mosquitoes Around Your Home**

**Applying Permethrin to Vegetation**
**Scientific names:** *Culex pipiens, Culex restuans*

**Appearance:** Small, brown mosquito.

**Personality:** Shy, not aggressive; likes to feed from dusk until dawn.

**Her Favorite Meal:** Birds, but she will occasionally feed on mammals.

**Preferred Breeding Sites:** Stagnant, organic, nutrient-rich water. Places like catch basins (storm drains), clogged rain gutters and sites where the water stands for a longer period of time (usually a few weeks).

**Hangouts:** Adults like to spend time in trees, bushes and tall grass during the day—as long as it’s cool and humid.

**Health Risk:** These are the most important mosquitoes in the West Nile virus transmission cycle. Even though they prefer to feed on birds, they will bite humans, horses and other mammals, which can get sick if they become infected.

**Additional comments:** These mosquitoes are not as aggressive as other mosquitoes, so you may not notice when one is biting you—another good reason to wear insect repellent.

Be sure to use the “Breeding Site Check List” on page nine to help get rid of mosquito larvae around your home.
Stop Mosquitoes Where They Start: How to Eliminate Mosquito Larvae Around Your Home

**Every Week**

- Eliminate standing water from containers such as flowerpot saucers, watering cans and buckets.
- Change the water and clean bird baths.
- Empty water that collects in folds of tarps used to cover woodpiles, boats, etc.
- Position corrugated drain pipes to ensure drainage or dump out water.

**Once a Month**

- Apply a larvicide (an insecticide applied to water to kill mosquito larvae), such as Mosquito Dunks®, to standing water that cannot be tipped and tossed or drained.

**As Necessary**

- Clear debris to allow water to flow freely from drainage ditches and culverts.
- Clean leaves and debris from roof gutters.
- Recycle old tires.
- Filter or aerate ornamental ponds using a circulation pump or stock the pond with fish.
- Drain or fill-in puddles and areas of your yard that remain wet and soggy for more than a week.
- Check window and door screens and repair as needed to ensure that mosquitoes cannot enter.
- Organize a neighborhood clean-up.
## Protecting Yourself from Disease Carrying Insects

### Potential Breeding Sites

<table>
<thead>
<tr>
<th>Potential Breeding Site</th>
<th>How to Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roof gutters</td>
<td>Clean out leaves and debris frequently to ensure water flows freely and does not accumulate.</td>
</tr>
<tr>
<td>Black corrugated pipes for downspout drainage</td>
<td>Grooves in plastic pipes can hold enough water to breed mosquitoes. Treat with a larvicide.</td>
</tr>
<tr>
<td>Buckets, watering cans, drinking glasses, plastic cups, bottle caps or any trash that can hold water</td>
<td>Store indoors or turn over. If trash, recycle or throw away.</td>
</tr>
<tr>
<td>Cans and containers</td>
<td>Throw away, store indoors, turn upside down, drill holes in the bottom, or empty after rain showers.</td>
</tr>
<tr>
<td>Old tires</td>
<td>Recycle or store where they won’t collect rainwater. For playground use, drill water drainage holes.</td>
</tr>
<tr>
<td>Bird baths</td>
<td>Change the water or flush out and clean with a garden hose at least once a week.</td>
</tr>
<tr>
<td>Ornamental ponds</td>
<td>Stock with fish (fish eat mosquito larvae), filter/aerate the water with a recirculation pump or treat with a larvicide as needed.</td>
</tr>
<tr>
<td>Potted plants with saucers</td>
<td>Empty saucers or flush out with garden hose once a week.</td>
</tr>
<tr>
<td>Dripping outdoor faucets and window air conditioners</td>
<td>If water puddles, repair faucet. Place rocks under window air conditioner to ensure water runoff.</td>
</tr>
<tr>
<td>Swimming pools</td>
<td>If unused or abandoned, treat with Mosquito Dunks® once a month. Mosquitoes can’t breed in maintained swimming pools because of the chemicals used.</td>
</tr>
<tr>
<td>Children’s toys</td>
<td>Store indoors or in a manner that prevents water accumulation. Note that some toys have inner compartments that can hold water.</td>
</tr>
<tr>
<td>Tarps on woodpiles and garden equipment</td>
<td>Empty water that collects in folds and sagging areas. Tighten or straighten so water runs off.</td>
</tr>
<tr>
<td>Wheelbarrows</td>
<td>Turn over when not in use.</td>
</tr>
<tr>
<td>Under decks, porches or outbuildings</td>
<td>Fill in depressions where water can collect. Remove any container that can collect water.</td>
</tr>
<tr>
<td>Garbage cans, recycle bins, other barrels</td>
<td>Keep covered or drill drainage holes in bottom. Place lids on garbage cans. Store bins and barrels to allow water runoff.</td>
</tr>
<tr>
<td>Canoes, boats</td>
<td>Cover with a tight-fitting tarp or store upside down.</td>
</tr>
</tbody>
</table>
What is the Best Repellent?

DEET

| Repels Mosquitoes | Yes |
| Repels Ticks      | Yes |
| Hours of Protection (25% formula) | 5 |
| Use in Children   | Over 2 months |
| CDC* Recommended | Yes |

DEET-based repellents have provided effective, dependable protection since the 1950s. They are available in various concentrations and their length of effectiveness is usually related to concentration. These products are available as aerosols, pump sprays or wipes. DEET is the most effective and best studied repellent available.

Picaridin

| Repels Mosquitoes | Yes |
| Repels Ticks      | Maybe |
| Hours of Protection (25% formula) | 5 |
| Use in Children   | N/A |
| CDC* Recommended | Yes |

Picaridin is a synthetic repellent developed in the 1990s that has been commercially available in the U.S. since 2005. It is colorless and nearly odorless. Like DEET, the length of effectiveness is related to concentration. It is available as an aerosol, pump spray or wipe.

Oil of Lemon Eucalyptus

| Repels Mosquitoes | Yes |
| Repels Ticks      | Maybe |
| Hours of Protection (25% formula) | 4 |
| Use in Children   | Over 3 years |
| CDC* Recommended | Yes |

Oil of lemon eucalyptus is a natural, plant-based repellent that is derived from tree leaves. Its effectiveness is similar to products containing low concentrations of DEET. Products tend to have a strong botanical smell and are available as pump sprays or lotions.

IR3535

| Repels Mosquitoes | Yes |
| Repels Ticks      | Maybe |
| Hours of Protection (25% formula) | 3 |
| Use in Children   | Over 6 months |
| CDC* Recommended | Yes |

IR3535, also called Merck 3535, is registered with the EPA as a biopesticide, but has been used as a synthetic repellent in Europe for over 20 years with no significant harmful effects. IR3535 was approved for use in the United States in 1999, and is currently available in aerosol, pump sprays, and wipes. While EPA recognizes the use of IR3535 as safe for adults and children, be advised that it is an eye irritant.

*Centers for Disease Control and Prevention
What You Should Know About Your Children and DEET

Everyone, especially children, likes to spend time outdoors. It’s a good idea to protect yourself and your family from disease-carrying insects.

The American Academy of Pediatrics Committee on Environmental Health has reported that products containing up to 30% DEET are safe to use on anyone over two months of age.

Parents should choose the type and concentration of repellent to be used on their children based on the amount of time the child will be outdoors.

• When applying repellent:
  - **DO NOT** spray the face.
  - Spray repellent on your hands and rub onto exposed areas.
  - Avoid the eyes and mouth and use sparingly around the ears.
  - **DO NOT** apply repellent to children’s hands, because children put their hands in their mouths.
  - **DO NOT** allow children to apply repellent by themselves; have an adult do it for them.
  - Keep repellents out of reach of children.
  - Always read and follow label instructions.

Apply Repellent to Your Children

Courtesy of R. Castañeda
Your logo and
contact information here

Courtesy of Fairfax County Health Department