Penn State Extension
Reduce Your Risk for West Nile Virus

West Nile Virus is a disease that primarily infects birds. It is spread from bird to bird by mosquitoes. On occasion a mosquito that has fed on an infected bird will later feed on, and infect, a person or a horse.

West Nile Virus was first detected in North America in New York City in 1999. It quickly spread across the continental US and is now endemic to the continent. West Nile Virus can cause illness in many organisms, and people are no exception. Although 80% of those who are infected do not get sick, about 1 in 150 will develop West Nile Fever and the symptoms can include:
- Fever
- Headache
- Body-aches
- Fatigue/weakness
- Swollen glands
- Minor loss of coordination
- Rash on trunk of body

About 1 in 3 horses that are infected with West Nile Virus die from the disease. Those that do not die are severely sickened and may or may not make a full recovery.

The symptoms of Equine West Nile Encephalitis include:
- Weakness, especially of the hind end
- Stumbling
- Down, difficulty getting back up without help
- Do not like being touched around the head
- Muscle and/or muzzle twitches
- Mild fever
- Tired or not wanting to move quickly

Vaccine
A vaccine is available for horses & will prevent sickness in most cases. It can also be modified for birds.

The vaccine must be given in advance of infection & requires a 2nd dose 3 weeks after the first dose to become effective. A yearly booster is needed to maintain protection. It is suggested that horses be fully vaccinated before April & the beginning of mosquito season.

As with any vaccine, there is the remote possibility of an adverse reaction and you should consult with your veterinarian.

A blood test is necessary to make an accurate diagnosis.

The elderly and those with otherwise weakened immune systems are most at risk for more severe illness.
Sunset—it’s not just romantic, it is also feeding time for mosquitoes. Dusk and Dawn are the most important times to take bite prevention measures.

**Repellants**

There are several types of repellants that can be applied to skin or clothing. Use caution when applying to the face and avoid the eyes and mouth. Don’t allow young children to apply repellants by themselves.

**DEET or N,N-Diethyl toluamide**

In independent studies, it is easily the most effective and longest lasting repellant.

**Picaridin (Cutter Advanced)**

**Oil of Lemon Eucalyptus**

**Soybean Oil (Bite Blocker, CitroGuard)**

**Permethrin (Permanone, etc.)**

Sprayed on clothing, this product kills mosquitoes, ticks, and other arthropods for up to two weeks.

**Control Mosquitoes by Breaking The Cycle**

Adult mosquitoes have a needle-like mouth and are about the size of a fingernail.

Mosquito larvae are found near the surface of the water as "wigglers" and "tumblers".

Mosquitoes spend the first part of their lives in any sort of still water that lacks predators such as fish. In hot weather it takes about a week for the larvae mature and the adult to emerge.

**Get rid of the water or dump it out weekly.**

- Store containers upside-down
- Clean out gutters
- Properly dispose of or drill holes in tires
- Change water in un-filtered pools weekly

**Mosquito Control**

**Mosquito Control Products**

- BTi or Bacillus thuringiensis israelensis (QuickKill, etc)
- Methoprene (Altosid, PreStrike)
- Adult Mosquitoes—Permethrin, Deltamethrin, Resmethrin, and other "-methrins"
- Fish. Yes fish. From minnows to the humble goldfish, fish think mosquito larvae are delicious.

If you are in an area with lots of mosquitoes, wearing long loose clothing keeps mosquitoes away from your skin. They are also less attracted to lighter colors than to darker ones.

Keep screens in good repair on any open windows or doors to keep mosquitoes out.
West Nile virus is now in most of the United States.
The most important way people become infected is through the bite of an infected mosquito. You can reduce your chance of getting infected by avoiding mosquito bites.

Adults are at highest risk.
People over age 50 and people who have ever received a solid organ transplant are more likely to develop serious symptoms of West Nile virus if they do get sick and should take special care to avoid mosquito bites.

What happens if I get infected?
A small number of people (about 1 in 150) who get infected with West Nile virus develop severe disease, called West Nile encephalitis or West Nile meningitis (inflammation of the brain or the area around the brain). Symptoms of severe illness include headache, high fever, stiff neck, mental confusion, muscle weakness, tremors (shaking), convulsions, coma, and paralysis. These symptoms may last several weeks, and neurological effects may be permanent. See your health care provider if you develop these symptoms.

Some people who become infected have symptoms such as fever, headache, body aches, nausea, vomiting, swollen lymph glands or a skin rash on the chest, stomach and back. Symptoms can last for a few days to several weeks. Call your health care provider if you have questions about your symptoms.

Most people who get infected with West Nile virus do not have any symptoms. There is no specific treatment for West Nile virus infection. There is no vaccine available for people.

for more information
www.cdc.gov/westnile
800-CDC-INFO (232-4636)
in English, en Español
Three steps you can take to reduce your risk...

1. Avoid mosquito bites!
   - **Apply insect repellent** on exposed skin and clothing when you go outdoors. Use an EPA-registered insect repellent such as those containing DEET, picaridin or oil of lemon eucalyptus. Permethrin sprayed on clothing provides protection through several washes. Products with a higher percentage of DEET as active ingredient generally give longer protection. **Don't spray repellent on skin under clothing. Don't use permethrin on skin.**
   - For details on when and how to apply repellent, see [www.cdc.gov/westnile](http://www.cdc.gov/westnile), and look for Insect Repellent Use and Safety in the Questions and Answers pages.

2. Cover up!
   - Wearing long sleeve shirts, long pants and socks sprayed with repellent while outdoors can further help prevent mosquito bites.

3. Avoid mosquitoes!
   - Many mosquitoes bite between dusk and dawn. Limit time outdoors during these hours, or be especially sure to use repellents and protective clothing.

Mosquito-proof your home!

- **Screens:** Keep mosquitoes outside by fixing or installing window and door screens.
- **Drain standing water.** Don’t give mosquitoes a place to breed. A small amount of standing water can be enough for a mosquito to lay her eggs.
- **Look around every week for possible mosquito breeding places.** Empty water from buckets, cans, pool covers, flower pots and other items. Throw away or cover up stored tires and other items that aren’t being used. Clean pet water bowls weekly. Check if rain gutters are clogged. If you store water outside or have a well, make sure it’s covered up. Encourage your neighbors to do the same.

Help your community!

- Dead birds help health departments track West Nile virus. **Check with your local or state health department** to find out their policy for reporting dead birds.
WEST NILE VIRUS
AND TRANSPLANT
RECIPIENTS

RESOURCES

For detailed information about prevention and repellent use, see www.cdc.gov/westnile or call the CDC public response hotline at

1-800-CDC-INFO

For additional information on repellent safety see the National Pesticide Information Center at http://npic.orst.edu or call 1-800-858-PEST

For information about WNV transmission in your area consult your local or state health department.

AVOID MOSQUITO BITES!

Look for repellents with EPA-registered active ingredients:
Repellents containing DEET (N, N-diethyl-m-toluamide), picaridin (KBR 3023), or oil of lemon eucalyptus (p-menthane 3,8-diol) typically provide longer-lasting protection than other products.
Permethrin is registered for use on clothing, shoes, bed nets, and camping gear, though not directly on skin. It can provide protection through several washings.

Wear clothing that can help reduce mosquito bites
Wear long sleeves, long pants, and socks whenever possible outdoors. Mosquitoes may bite through thin clothing, so consider spraying clothes with repellent (including permethrin) for extra protection.

Be aware of peak mosquito hours
The hours from dusk to dawn are peak mosquito biting times. You can get bites even during a short time outdoors. Take extra care to use repellent and protective clothing.

Avoid Mosquito Bites!

West Nile virus (WNV) causes a potentially serious illness that affects the central nervous system. WNV is now in most of the United States. The most important way people become infected is through the bite of an infected mosquito. People who have ever received a transplant may be at significantly higher risk of developing serious WNV disease, including meningitis and encephalitis.
Transplant recipients are at increased risk of severe West Nile virus disease

Medicines taken by transplant recipients can make it hard to fight infections. Transplant recipients may develop the severe forms of WNV disease, including encephalitis, meningitis, and even death, more often than persons with normal immune systems.

The Disease

West Nile virus is a seasonal epidemic in North America that flares up in the summer and continues into the fall.

Some people infected with WNV will develop serious, and sometimes life-altering illnesses that usually require hospitalization, such as West Nile encephalitis and West Nile meningitis — conditions associated with inflammation of the brain or the area around the brain — or West Nile polio-like paralysis. WNV disease occurs between three and 14 days after being bitten by an infected mosquito. **Symptoms of severe WNV disease include high fever, headache, neck stiffness, stupor, disorientation, coma, tremors, muscle weakness, vision loss, numbness, and paralysis. Symptoms can last several weeks, and neurological effects can be permanent.**

WNV usually causes no symptoms or less severe illness with fever, headache, body aches, nausea, or vomiting. Sometimes this includes a skin rash on the chest, stomach, and back. These symptoms typically last a few days — but may last several weeks.

**There is no specific treatment for WNV disease. Human vaccines for WNV are still in the early stages of development.**

Special Considerations for Transplant Recipients

- WNV disease should be considered in any transplant recipient with unexplained fever and/or neurological symptoms during mosquito season. This is true even for recipients who develop the infection long after their transplant.
- As with any illness, contact your health care provider if you think you have symptoms of West Nile virus infection.
- Immunosuppressed recipients may have longer incubation periods, delayed development of antibody, and an increased likelihood of getting severe disease compared to people who are not immunosuppressed.

Remember!

Keep repellent close at hand during summer months. **The easiest and best way to avoid WNV disease is to prevent mosquito bites.**

- Use protective clothing and effective repellents whenever you go outdoors.
- Mosquito proof your home. Install or repair screens on windows and doors to keep mosquitoes outside.
- Empty water from buckets, cans, pool covers, flowerpots, pet water dishes, birdbaths, and other items weekly.