

WEST NILE VIRUS

What is West Nile virus?

- West Nile virus (or WNV) causes a disease termed West Nile fever, or the more severe West Nile meningitis/encephalitis.
- This is a notifiable disease.
- WNV has only recently emerged as a health risk for humans in North America.
- The majority of humans infected with WNV remain asymptomatic (no symptoms).
- This virus first becomes active in the spring. It is maintained in wildlife by continuous transmission between birds and mosquitoes.

The name of this virus comes from West Nile province (in Uganda), where the first case of disease due to this virus was recognized in 1937.

- Late summer is the period with the greatest risk of infection, as mosquitoes who feed on birds and mammals reach their peak activity.
- Mammals (including humans) are dead end hosts. The virus doesn't accumulate enough in their system to transmit the virus to mosquitoes.

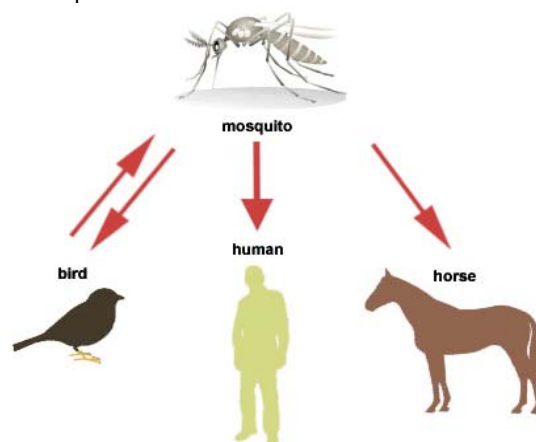


Photo courtesy of: <http://www.ci.berkeley.ca.us/ContentDisplay.aspx?id=16144>

- Birds are the most important wildlife reservoir of WNV.
- Infected birds are asymptomatic, and some amplify the disease by viremia (replication of the virus in the blood of the host).
- WNV has also been reported in 29 species of mammals, including the eastern chipmunk and striped skunks.



Photo courtesy of: CDC/James Gathany

Where is West Nile virus found?

Prevention methods

- The use of insecticides and larvicides reduce the number of mosquitoes.
- It is also important to remove or eliminate surrounding mosquito breeding grounds. Standing water should be removed from outdoor containers.
- Use of personal protective measures, such as:
 - Topical insect repellents
 - Screening in houses and bed netting
 - Wearing proper clothing
- Avoid heavily mosquito-populated areas.

- Avoid handling dead birds and animals.
- DEET (at a concentration of 23.8%) was found to be the most effective insect repellent. It has mosquito-protective effects lasting around 5 hours.
- Currently there is no licensed vaccine to protect humans against West Nile virus.

The first documented case of WNV in North America happened in New York city in 1999.



Photo courtesy of: CDC/James Gathany

Examples of protection: long sleeves and insect repellent. Far above: The mosquito, *Culex tarsalis* looking to feed.

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West Nile virus in humans

RISK

How common is West Nile virus in humans?

- The number of infections from the virus vary greatly from year to year.
- In 2008, there were 36 clinical cases in humans in Canada. The majority were in Manitoba and Saskatchewan. Two asymptomatic cases were also reported to the Public Health Agency of Canada.

How do people get the West Nile virus?

- Nearly all human infections are caused by mosquito bites.
- Therefore, infections are more likely in the late summer and early fall. In Canada this starts as early as mid-April, and runs until October.
- There are no recorded cases of humans becoming infected from consuming infected birds or animals.
- Several other methods of transmission have recently been identified. These include transmission by transfusion, by lactation, by organ transplantation, transplacentally as well as in laboratory settings.

What are the symptoms in humans?

- Disease from WNV infection tends to be milder in children than in adults.
- Generally, the incubation period is 2-14 days before symptoms develop, and they tend to last 3-6 days.
- 20 to 40% of infected patients will develop a sudden onset of symptoms. These present with flu-like symptoms, or West Nile fever.
- The symptoms are unspecific, and can include fever, headache, malaise, diarrhea and vomiting.
- Symptoms vary greatly. The majority of infections are asymptomatic. A marginal number of infections develop to severe neuroinvasive disease and even death.
- Most who are infected with the virus survive. Many others suffer from permanent disability.

Can it be treated?

- There is no specific antidote or antibiotic for the viral infection.
- Treatment is directed at intensive support therapy.

Who is most at risk of becoming infected?

- Individuals at greatest risk of acquiring the infection are those that spend a lot of time outdoors. They subsequently have increased exposure to possibly infected mosquitoes.
- Others at higher risk of infection are immunosuppressed individuals, as well as the elderly. They are at greater risk of developing serious neural symptoms, or having complications, and of having a higher magnitude and duration of virus in their blood.
- Other factors that may lead to increased risk of infection include hypertension, and cerebrovascular disease.



Photo courtesy of: CDC/P.E. Rollin

Transmission electron micrograph showing WNV.

In Canada, there are 74 known species of mosquitoes. WNV infections have been found in 10 of these

This disease is reportable in Ontario, meaning your doctor must report a suspected case to the medical officer of health for that region.



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