

West Nile fever

caused by the West Nile virus

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West Nile Fever is a viral neurologic disease seen primarily in birds, horses and people. The West Nile Virus (WNV) was first isolated from a female patient in the West Nile district of Uganda in 1937. Since then, it has developed a near worldwide distribution.

WNV was first reported in the United States (New York) in 1999, and has gradually spread westward across the nation. By October 2002 it was reported in mammals, primarily horses, and birds in many states west of the Mississippi, including North Dakota.

The virus circulates in nature between mosquitoes and avian (bird) reservoir hosts, with humans and horses as accidental, dead-end hosts. A dead-end host is incapable of transmitting the virus to another host; however, the dead-end host may develop the disease once bitten by an infected mosquito. Outcomes of infection range from the common subclinical case (no apparent symptoms) to the rare fatality. Experiments have shown that the virus can survive in over-wintering mosquitoes. Human cases in the United States peaked in 1999 and 2000; human cases peaked in August and horse cases peaked in September.

The key points are that WNV has become endemic in our state, and protecting yourself and your horse from West Nile Fever should now be a routine management practice.

The disease in humans

- Suspect cases include patients over the age of 50 with fever, illness and neurologic symptoms, especially if associated with gastrointestinal complaints or muscle weakness.
- Most infections are mild: fever, headache, body aches, skin rash, swollen lymph nodes.
- Some infections are more severe: headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, paralysis, death (rare).

- Various serologic (blood) tests and molecular (i.e., DNA fingerprinting) tests are available to detect and confirm the infection.
- Pregnant women are not known to be at increased risk of infection.

The disease in horses

- Clinical disease does not always occur.
- Handlers may see stumbling, weakness, and rear limb incoordination.
- Fever is not always present.
- Mildly affected horses can recover in two to seven days.
- The virus can cause acute, fatal neurologic disease that affects the brain and spinal cord.
- Horses that survive appear to recover fully.
- The disease can be diagnosed with a serum (blood) sample from a suspect horse.
- **Rabies should always be a consideration in horses with neurological symptoms.**
- A vaccine (produced by Fort Dodge Animal Health) is available. Because of the “newness” of this vaccine, the USDA has conditionally approved the vaccine for use in horses only and can only be given to a horse on the orders of a licensed veterinarian.

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- It is a killed vaccine.
 - * Two doses are given in the muscle the first year.
 - * One booster dose is used each year thereafter.
 - A cure is not available.
 - Supportive (nursing) care is essential.
 - **Many horses will survive if given aggressive therapy — call a veterinarian early in the disease.**
 - Do not destroy an animal simply because it has antibody to WNV; many horses never develop clinical illness.
- Chickens develop high levels of antibody once infected, but do not become viremic (virus in the blood in sufficient numbers to be picked up by a mosquito and passed to another bird).
 - House sparrows are implicated as an important reservoir host because they develop a high level of viremia and may serve as a source of virus for mosquitoes.
 - Experimentally, 3-week-old Canada geese can develop a high enough level of viremia to infect mosquitoes, but adults do not.
 - Goslings show depression, weight loss, death.
 - The virus circulates between birds and mosquitoes.
 - Mosquito feeds on infected bird and may
 - * a) infect another bird and maintain the virus in nature (reservoir host), or
 - * b) transmit it to humans and horses (dead-end host).
- Consider stocking ornamental ponds with fish
 - Fill in or drain low areas to eliminate puddles
 - Insure proper drainage (drains, ditches, culverts)
 - Repair leaky plumbing
 - Limit activity at dawn/dusk/early morning; mosquitoes are most active during these time periods.
 - Implement mosquito control measures; mosquitoes are attracted by perspiration, warmth, body odor, carbon dioxide and incandescent light.
 - Use insect repellents.
 - Wear long-sleeved shirts and pants.
 - Spray clothing with repellents (permethrin or DEET).
 - Spray skin with repellent (35% DEET).
 - Assure tight screening on homes.

The disease in birds

- The infection affects a variety of organ systems, but primarily the brain and heart.
- WNV has been reported in many species of birds, but corvids (crows, jays) appear to be particularly susceptible in North America.
- Most birds show no clinical illness.
- Migratory bird patterns likely play an important part in the spread of the disease:
 - stress of migration makes viral replication easier,
 - interhemispheric (between northern and southern) migratory patterns,
 - displacement of birds by tropical storms, and
 - legal and illegal bird importation.

Prevention

(from NDSU Extension Service publication E-472, *Mosquito Management*)

- Steps to consider in managing mosquitoes near buildings:
 - Remove water holding containers
 - Trim shrubs and greenery
 - Cover trash containers
 - Clean gutters and drain flat roofs
 - Empty wading pools frequently
 - Properly care for backyard pools
 - Change water in bird baths and fountains

EXPOSURE POINT!

- **Only through the bite of an infected mosquito can a person, horse or bird become infected with WNV.**
 - Even in endemic areas, less than 1% of mosquitoes are infected and less than 1% of people bitten by an infected mosquito become infected.
 - The virus is not transmitted person to person.
 - The virus is not transmitted horse to person.
 - The virus is not transmitted horse to horse.
 - The virus is not transmitted bird to person.

For more information on this and other topics, see: www.ag.ndsu.nodak.edu