

# West Nile Virus

*West Nile virus (WNV) spread rapidly after its introduction in 1999; vaccination is recommended*

## Overview

West Nile virus (WNV) causes a potentially fatal encephalomyelitis (inflammation of the brain and spinal cord) in a variety of mammals such as birds, horses, and humans. While long recognized in Africa, Eastern Europe, West Asia, and elsewhere, WNV was first diagnosed in North America in 1999. Since then the disease has spread rapidly throughout the continent.

West Nile virus is maintained in the wild bird population and is spread between birds by mosquitoes. Humans and horses become infected after being bitten by mosquitoes infected with WNV that have fed on infected birds. The virus enters the horse's bloodstream and spreads to the spinal cord and brain causing a wide-spread inflammation. Clinical signs of disease typically present within three to 15 days of exposure.

Horses and humans are considered dead-end hosts of the virus and do not contribute to the transmission cycle. The virus is not directly contagious from horse to horse or horse to human. Indirect transmission via mosquitoes from infected horses is highly unlikely because horses have negligible amounts of virus circulating in their blood. Mechanical transmission of the virus, such as through a blood transfusion, is possible.

## Clinical Signs

Classic clinical signs of horses infected with the WNV include fever, ataxia (incoordination), stumbling, hind limb weakness, depression, anorexia, recumbency with the inability to rise, muscle tremors, teeth grinding, dysphagia (inability to swallow), head pressing, signs of colic, a flaccid (limp) paralysis of the lower lip, aimless wandering, excessive sweating, behavior changes, and convulsions or even coma.

## Diagnosis

If your horse exhibits abnormal behavior or any neurological signs (such as ataxia), call your veterinarian immediately. It is



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Horses should be vaccinated against West Nile virus according to guidelines approved by the American Association of Equine Practitioners. Those can be found at [AAEP.org](http://AAEP.org).

very important to rule out other neurological diseases such as rabies, equine protozoal myeloencephalitis (EPM), the viral encephalitides (e.g., Eastern, Western, and Venezuelan equine encephalitis), the neurologic form of equine herpesvirus-1 (EHV-1), botulism, or wobbler syndrome (cervical vertebral myelopathy), among others.

There are several tests available to help diagnose WNV in horses exhibiting clinical signs of disease. These include identifying the virus, viral antigens, viral genetic material, or antibodies produced by the horse in response to WNV infection. Examples include virus isolation, hemagglutination inhibition, complement fixation, immunohistochemistry, and polymerase chain reaction (PCR). One of the most useful tests at present is the IgM-capture ELISA, which measures IgM antibodies produced by the horse in response to the virus. The WNV-IgM antibodies are elevated for approximately four to six weeks post-infection.

When interpreting test results, it is important to consider the vaccination status of the horse as some tests are incapable of

distinguishing between infected and vaccinated horses. Good recordkeeping regarding vaccine history is recommended.

## Treatment

There is no specific treatment or cure for infected horses. Veterinary care includes administration of anti-inflammatory drugs and intravenous fluids (if necessary). Supportive care is exceedingly important for infected horses to ensure adequate food and water intake, protect the safety of the horse (to prevent injuries in ataxic horses), and to prevent pressure sores in recumbent horses. Some veterinarians have attempted treating horses with antiviral drugs such as interferon and passive antibody products for WNV, but published clinical trials demonstrating efficacy or safety of this approach are lacking at present.

## Prognosis

The mortality rate for infected horses is estimated to be approximately 35%. That means almost two-thirds of infected horses recover. Horses that are recumbent are at

higher risk of dying than infected horses that remain standing during the course of disease. Older horses have been reported to have a higher fatality rate. Many infected horses will recover completely; however, some horses (approximately 40%) might experience residual clinical signs. Caution must be used around horses who continue to exhibit neurological deficits after recovering from West Nile virus.

### Prevention

Since there is no cure for WNV, prevention is key to minimizing the chances of horses becoming infected with the virus. Current preventative measures include vaccination, management strategies, and ensuring your horse is in optimal health.

The American Association of Equine Practitioners (AAEP) recommends vaccinating all horses against WNV. Unvaccinated adult horses should be vaccinated twice, four to six weeks apart. Thereafter, horses can be re-vaccinated based on risk of exposure, up to once every four months. In the north it is recommended to vaccinate horses in the spring prior to peak mosquito levels. In the south, where mosquito

populations are present year-round, horses can be vaccinated biannually or more. Horses less than 5 years of age appear to be more susceptible than adult horses that have likely been vaccinated and/or had subclinical exposure. Horses greater than 15 years of age have higher susceptibility to West Nile virus. Therefore, the AAEP recommends more frequent vaccination of these classes of horses. (Complete recommendations can be found on AAEP.org.)

In addition to vaccination, it is important to minimize mosquito populations near your horses by eliminating breeding and resting areas and keeping mosquitoes away from horses. For example, reduce or eliminate sources of stagnant or standing water; remove muck from areas near the horses; stable your horses during peak mosquito periods (i.e., dawn and dusk), use equine-approved mosquito repellents, place fans inside the barns or stalls to maintain air movement (mosquitoes don't fly well in wind), and avoid using incandescent bulbs inside stables at night. Instead, place incandescent bulbs away from the stables. This will attract the mosquitoes to areas outside the stables.

## FAST FACTS

- Infection with the West Nile virus (WNV) causes a potentially fatal encephalomyelitis (inflammation of the brain and spinal cord).
- WNV affects a variety of animals, including birds, horses, humans, and some other mammals.
- Signs of WNV in horses include ataxia, weakness of the hind limbs, recumbency, muscle tremors, convulsions, and coma.
- Diagnosis is typically achieved by one or more blood tests and by ruling out other causes of neurologic disease.
- Treatment is primarily supportive, and approximately two-thirds of affected horses recover from infection.
- Some horses (approximately 40%) will have residual neurologic deficits after recovering from WNV.
- Preventing WNV involves vaccination and minimizing exposure of your horse to mosquitoes and infected birds.

Finally, discourage wild birds from roosting near or in your stables. Report any dead birds—particularly crows, blue jays, owls, and hawks—to your local Department of Health as they might want to test the birds for West Nile virus. 🦋



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