West Nile Virus Information for Horse Owners and Veterinarians

What is West Nile Encephalitis?
West Nile encephalitis is a viral disease of both humans and horses transmitted by infected mosquitoes. It was first detected in the United States in 1999. Since its initial discovery in New York City, the virus has spread westward across the United States. Clinical signs have been noted as early as mid-April through mid-December, but the disease tends to peak in August and September. The number of equine cases has dropped dramatically since West Nile virus (WNV) was first reported in horses. Minnesota has not had an equine case since 2007.

How does a horse become infected with the virus?
Infected mosquitoes can transmit WNV to horses and people. The virus is maintained in a transmission cycle between birds and mosquitoes. There is no documented evidence of natural transmission between people or from horses to humans. In other words, mammals are considered dead-end species for the virus.

What are the clinical signs of disease in the horse?
Horses may develop lethargy, fever, hindquarter weakness, involuntary muscle contractions, excitability, loss of coordination, head tilt, impaired vision, inability to swallow, circling, staggering gait, convulsions, paralysis, and coma. From a survey of Minnesota horse owners who had horses ill with WNV, the following were common signs of illness: ataxia (50%), muscle tremors (24%), depression (20%), fever (18%), recumbency (16%), lethargy (12%), and anorexia (9%). Differential diagnoses include: rabies, eastern equine encephalitis (EEE), western equine encephalitis (WEE), equine herpesvirus-1 (rhinopneumonitis), equine protozoal myeloencephalitis (EPM), wobbler syndrome, botulism and other toxicoses.

What diagnostic tests are available for horses?
Clinical signs and epidemiologic information about recent West Nile virus activity are important in making a tentative diagnosis. Samples of blood and cerebrospinal fluid (CSF) can be collected in an effort to reach a definitive diagnosis. Antibodies detected in the blood can be used to diagnose infection within 8-10 days of inoculation. Collection of CSF is a more invasive procedure but is frequently used for diagnosis of WNV infection. A cytologic assessment of the fluid is conducted, as well as evaluation for viral genetic material. Postmortem, nervous tissue can be submitted for diagnostics. Samples can be sent to the University of Minnesota Veterinary Diagnostic Laboratory for testing.

Do horses that develop illness due to West Nile Virus recover?
Early estimates from a Minnesota survey reveal that 40% of horses surviving West Nile virus illness will exhibit residual effects from the disease. These clinical signs typically include gait and behavioral abnormalities. Approximately 33% of symptomatic horses die or are euthanized because of WNV infection. In general, if a horse becomes recumbent from the disease and is unable to rise on its own, the chance of mortality increases to between 60 and 80%.

Is there a specific treatment for West Nile Encephalitis in the horse?
Currently, only supportive care can be offered to infected horses. This can include anti-inflammatory medications, diuretics to decrease brain swelling, neuro-protectant drugs, nutritional support, and antibiotics if called for. Often, horses with West Nile encephalitis need to be supported in an overhead sling.

Is there a vaccine available for West Nile Virus?
There are two West Nile virus vaccines available for horses: the West Nile Innovator vaccine produced by Fort Dodge Animal Health and the Recombitek
Equine West Nile vaccine produced by Merial. The recommended vaccination protocol includes an initial series of two injections, 3-6 weeks apart. Following this series, horses can be vaccinated yearly. It is recommended that vaccination be completed each spring, at least three weeks before mosquito season. Though neither of the vaccines has been licensed for use in pregnant mares, the American Association of Equine Practitioners guidelines for vaccination explain that vaccination of pregnant mares has become common, because in endemic areas, the risk of contracting West Nile virus outweighs the risk of vaccination. Mares are vaccinated annually in the spring as well as once at 4-6 weeks prior to foaling. This vaccination provides passive immunity to the foal for 3-4 months. At three months of age, the foal should receive the initial two-vaccine series, as well as an additional dose if located in a high-risk area. The American Association of Equine Practitioner’s West Nile Virus Vaccination Guidelines recommend that horses in endemic areas should be vaccinated semi annually or more frequently (every four months), depending on risk. Consult with your veterinarian to determine a specific schedule for your horse. In Minnesota, the majority of WNV cases occur in unvaccinated horses or horses not adequately vaccinated. Therefore, it is important to vaccinate early to stimulate adequate immunity.

How can horses be protected aside from vaccination?
Prevention measures include using mosquito repellents and avoiding outdoor activities at dawn or dusk. Horses should be housed in screened areas during these peak hours of mosquito activity. Steps should also be taken to eliminate mosquito breeding sites by paying special attention to natural or man-made places where water can collect and mosquitoes can lay their eggs—old tires, bird baths, and clogged rain gutters, etc.

Is it safe to use mosquito repellents on horses?
Many mosquito repellents are safe for use on horses. Many companies that sell horse-related products also sell insect repellents for use on horses or around the barn. For best results, use a DEET-based mosquito repellent labeled for equine use whenever your horse is outside and reply the repellent as directed by the manufacturer. Typically, repellents containing a higher concentration of active ingredient (such as DEET) provide longer-lasting protection. Some repellents are spray-on, while others are wipe-on or pour-on. Always follow the manufacturers’ guidelines when using insect repellents. Some repellents intended for human use may be used on horses if a patch test is done first. To do a patch test, apply the repellent to a clean cloth and then rub the cloth onto the horse’s neck. Check the area in one hour. If there is no redness or swelling, the product should be safe to use.

Always consult your veterinarian before combining any insecticide or medication to avoid any possible complication.

How and where should veterinarians report suspected case information?
Veterinarians should report the condition by contacting the Minnesota Board of Animal Health at (651) 296-2942.

Can the disease affect other animals?
WNV is rarely found in animals other than horses and birds. While cases have been reported in cats, dogs, camelids (alpacas and llamas), reindeer, seals, sheep, and squirrels, these animals generally appear to be resistant.

What should individuals/veterinarians do with dead birds?
West Nile virus has been identified in at least 140 species of birds. American crows and blue jays are especially susceptible. To report ill or dead birds, contact the Minnesota Department of Health.

What type of West Nile Virus surveillance program does Minnesota have in place?
Disease surveillance activities are being jointly executed by the Minnesota Department of Health, the Minnesota Board of Animal Health, the Department of Natural Resources, the Metropolitan Mosquito Control District, and the Minnesota Veterinary Diagnostic Laboratory.

Additional Information:
- Pennsylvania’s West Nile Virus Control Program
- Centers for Disease Control and Prevention

This fact sheet is meant to provide basic information. For specific health concerns please contact your physician or veterinarian. Updated 2011.