



7-1-2000

## West Nile Virus Infection in Horses

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the Section of Medical Genetics refined the test, which is capable of detecting affected dogs, carrier dogs, and “clear” dogs. In March of 2000 the DNA screening test for myotonia congenita in miniature schnauzers was ready. Since then numerous carriers have been detected

among the first 200 dogs tested. Breeders now have the tool to identify carrier animals which then can be dropped from the breeding pool. If everyone is diligent, the disease can be readily eliminated from the breed in a few generations.

The test for myotonia congenita in

miniature schnauzers is one of several tests for inherited diseases developed or refined by Penn’s Section of Medical Genetics and offered by the Josephine Deubler Genetic Disease Testing. These tests are not easy to develop, and frequently they are breed

*(continued on page 23)*

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**W**est Nile Virus (WNV) primarily causes disease in birds and is usually spread by mosquitoes but it occasionally causes disease in horses. Horses become infected with WNV by the bite of a mosquito which previously (at least six to ten days earlier) fed on a bird infected with WNV. Infection does not always cause clinical disease in horses. In the recent outbreak of WNV on Long Island, NY, as many as a third of the horses on the outbreak farms may have been infected but only 14% developed disease. When horses have clinical signs, the disease can be very serious. Half of the clinically affected horses on Long Island died or were euthanized. This is the only outbreak of WNV in horses ever reported in North America, but the disease in horses has been frequently reported in Europe and Africa with similar results.

Horses with West Nile Fever can have a variety of clinical signs. They may have a mild flu-like syndrome with fever, depression, listlessness, and occasionally somnolence. When fever occurs it may be biphasic with the early fever associated with mild flu-like signs and a second fever a week later associated with the onset of more serious neurologic signs. Some cases will develop muscle fasciculations and an unusual muzzle twitching. They may show more serious neurologic signs including incoordination and ataxia (stumbling), circling, aimless wandering, head pressing, and hyperexcitability followed by convulsions, coma, and death. In some outbreaks a progressive hind limb paresis (incoordination, ataxia, stumbling) progressing to complete hind limb paralysis (inability to rise behind) and finally front leg involvement is reported as typical. Simultaneously, brain signs will be pro-

gressive (depression, somnolence or hyperexcitability, convulsions, coma). Death may occur within five to ten days of development of serious signs in half of the cases. The other half will recover with the most dramatic improvement within three weeks.

West Nile virus is primarily transmitted between birds by mosquitoes. Occasionally virus-carrying mosquitoes will bite mammals exposing them. The Veterinary Services section of APHIS, US Department of Agriculture, has concluded, based on experimental inoculations carried out on horses, that horses are not involved in the transmission cycle of WNV. That is, horses are terminal hosts because they do not maintain a sufficient viremia to infect mosquitoes or other mammals (see the USDA web site at <http://www.aphis.usda.gov/vs/ep/WNV/>). Previous studies in horses support this conclusion. This means, as stated by the Centers for Disease Control and Prevention, (see the CDC web site at [http://www.cdc.gov/ncidod/dvbid/arbor/West\\_Nile\\_QA.htm](http://www.cdc.gov/ncidod/dvbid/arbor/West_Nile_QA.htm)) that infected horses will not transmit WNV to other horses or to people. So an infected horse is not a threat to other horses in contact with it and people cannot contract West Nile Fever by caring for an infected horse. However, special care should be taken when handling blood, spinal fluid, or nervous tissue from suspect animals since these may contain virus.

The virus has not yet been identified in Pennsylvania or Delaware; however it has been found in birds in New York, Connecticut, New Jersey, and in one bird in Maryland (see USDA web site for a map). The virus is introduced into an area through infected birds. In the outbreak last fall, some infected birds developed neurologic signs such as ataxia

(loss of coordination), tremors, abnormal head posture, circling, and convulsions followed by death. The appearance of dead birds in an area may be an early warning that the virus is present. When handling dead birds that may have died from WNV infection, care should be taken. There is no evidence that people can catch this disease from dead birds, but the Center for Disease Control and Prevention recommends that no one should ever touch any dead animal barehanded. Call your local health department for proper procedures for handling of dead birds.

How can horses be protected from WNV infection if the virus enters the area? The key is mosquito control to stop the bird-mosquito infection cycle. The primary mosquito vector is *Culex spp.* This mosquito spends its entire life within a range of about 1000 yards. Thus local control can be very effective in stopping WNV transmission. The most effective method of mosquito control is to destroy the mosquito larval habitat. *Culex* mosquitoes can breed in any puddle that lasts more than four days. So it is important to reduce the amount of standing water available for breeding such as water troughs (should be cleaned at least once or twice a week), water buckets not in use, plastic wading pools, bird baths, wheelbarrows, clogged roof gutters, discarded tires, tin cans, plastic containers, ceramic pots, or any water-holding container. Although less effective than preventing mosquito breeding, efforts to limit the horse’s exposure to adult mosquitoes can also be attempted. Horses should be stabled inside during peak mosquito feeding times which are dusk and dawn. Also, insect repellent approved for horses can be used (always follow label instructions). 