

West Nile Virus in Florida: 2001-2002

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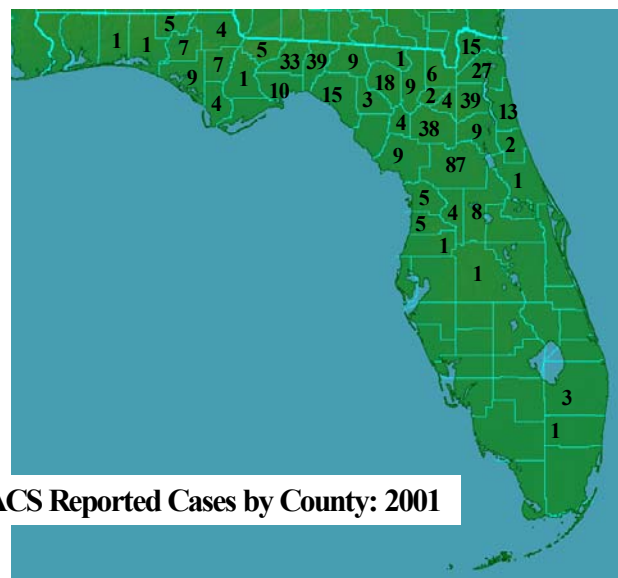
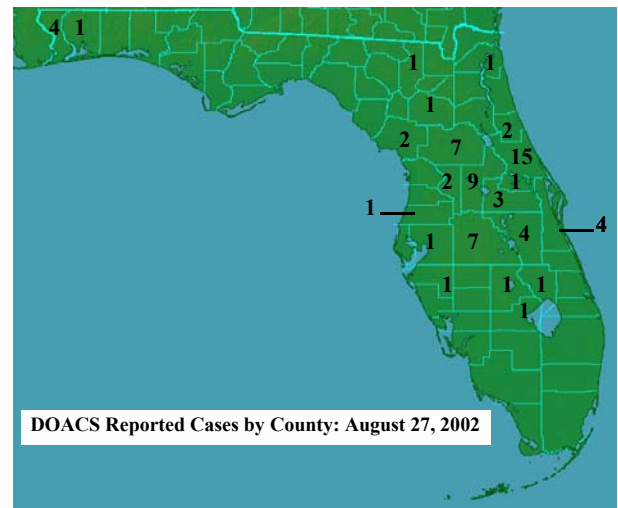
West Nile (WN) virus was recently introduced to the United States from Israel in 1999 and causes neurological disease in birds, horses, and humans. First evidence of progression of West Nile Virus into the Southeastern U.S. occurred in horses from Southern Georgia and Northern Florida in late July 2001. West Nile Virus primarily causes disease in birds, humans and horses and is transmitted by many different types of mosquitoes. Historically, the detection of infected birds coincides with both human and equine cases when local outbreaks occur. Like other viruses that infect the brain of horses (except for VEE), birds only appear to develop a significant level of virus in their blood and can thus transmit disease. *An infected WNV horse is not infectious and poses no risk to other horses, humans, or birds.*

West Nile Virus Horse Outbreaks in the U.S.

Several horse cases were diagnosed in 1999 in New York, and by 2000, sixty horses primarily from the New York and New Jersey were confirmed positive for WN encephalitis for the year 2000. During the 2001 mosquito season, **739** cases of WNV were reported in horses from **130** counties in 20 states. The first detection of WNV in Florida occurred in June of 2001 in a bird in North Florida. Testing confirmed 492 equine cases in the state of Florida alone. At least 33% of these horses died.

As of the last week of August 2002, the spread of WN virus does not appear to be slowing. Forty-three states have identified the virus in either mosquitoes, birds, humans or horses within their borders. At the national level, **630** cases of human WN encephalitis have been reported in **21** states with **8** deaths. Horse cases of WN virus encephalitis have been

reported in **28** states. Thus far, **1,424** horses have been confirmed positive by the National Veterinary Services Laboratory. In Florida, **more than 80** equine cases have been identified in **23** counties. This number is roughly equal to the same number of horses affect last year at this time.



Clinical Signs in Horses

In horses, a mild low-grade fever, feed refusal and depression are common systemic signs. Neurologic disease is frequently sudden and progressive, and characterized by problems in maintaining balance strength. Many horses have periods of hyperexcitability, apprehension, and/or sleepiness. Fine tremors and fasciculations of the face and neck muscles are very common and paralysis of the nerves of the head can occur. The disease is extremely unpredictable. About 1/3 of WN virus cases do experience an increase in severity of clinical signs within the first 7-10 days of onset. This can occur many times after the clinical signs have abated. Some horse progress to complete paralysis of one or more limbs. Most of these horses are euthanized due to humane reasons or die spontaneously. The mortality rate in horses is consistently around 33%.

Treatment Recommendations

All therapy is supportive; there is no specific treatment. The focus of therapy is to decrease brain inflammation, treat fever, and provide supportive care which may require 1-4 weeks of intermittent therapy. Common medications include flunixin meglumine (Banamine®), dimethyl sulfoxide (DMSO), and dexamethasone. Only anti-inflammatory doses are recommended. Some veterinarians express concern that signs can recur when steroids are decreased. Sometimes fluid therapy is needed for animals not able to drink. Oral or intravenous feeding may also be necessary. ***For recumbent horses, slinging is recommended 2 to 3 times per day. Head and leg protection is also frequently needed.*** In general, many horses will improve within 3 to 7 days of displaying clinical signs. After 3 to 5 days, horses that are recovering or stable may exhibit a sudden recurrence of clinical signs. This may be of short duration or horses may become suddenly recumbent and either die or require prolonged

treatment. Horses that become recumbent should be aggressively treated with anti-inflammatory therapy. Multiple attempts per day to assist standing is recommended.

Other problems occur with horses with WN virus that occur secondary to prolonged sickness. Multiple injections of flunixin meglumine in the muscle are not a good idea. If horse has clinical signs that last a long time, intravenous catheterization or hospitalization is recommended. Joint and tendon sheath infections, pneumonia, and diarrhea can all occur as secondary events. Monitoring for appropriate fecal output is also important and horses may need to be treated with mineral oil during the course of disease. Once the horse has demonstrated significant improvement, full recovery within 1 to 6 months can be expected in 90% of the patients. Residual weakness and ataxia appear to be the main problems.

Tests That Will Help Diagnose WNV

The IgM capture enzyme-linked immunosorbent assay (MAC) is the test of choice for confirmation of acute infection because horses develop an antibody called IgM early in the course of disease. This test is run at two test sites in the state of Florida; Kissimmee State Diagnostic Laboratory and the University of Florida, Gainesville. A titer of 400 or greater during first 30 days of clinical signs normally occurs. ***A veterinarian must submit the test and any horse demonstrating clinical symptoms must be reported to the Department of Agriculture and Consumer Services/Division of Animal Industry/Fax: 850-410-0946 (Dr. William Jeter) by way of an arboviral form.*** At present the National Veterinary Services Laboratory recommends that if a horse tests positive to WN virus on the MAC, and the horse is demonstrating clinical signs, then this is consistent with a confirmed case.

Other Diseases Must Be Ruled Out and these include:

1) Rabies: Florida does have cases of equine rabies. *All encephalitic horses should be handled with caution and if they die, their brain should be tested for rabies. The public health department for the state does the testing at no charge.* The state also tests for WN virus at the same time.

2) Equine Protozoal Myeloencephalitis (EPM): This is probably the most common rule out for WN virus horses in Florida. Concomitant testing should be performed on West Nile suspects. It is unknown if WN virus horses can also have activation of EPM during an episode. Preventative treatment may be pursued until confirmatory testing is obtained.

3) Eastern & Western Equine Encephalitis (EEE,WEE): Horses should be vaccinated for EEE in the state of Florida. At present, 20 EEE cases have been confirmed in 2002 for the state of Florida. All encephalitis cases should be also be tested for EEE.

4) Equine herpesvirus (EHV-1): Paired sera should be used to test for recent exposure to this disease. In addition, horses can be cultured for EHV-1.

5) Verminous encephalitis: *H. gingivalis* is a worm that does infect the brains of Florida horses. It is usually fatal and is diagnosed with a cerebrospinal fluid sample.

6) Liver disease: All suspect horses should have basic blood work to rule out other systemic diseases that can look neurological. There are many toxic plants in Florida that can cause liver failure.

7) Moldy corn poisoning: This toxin is elaborated in corn which is frequent component of complete feeds. It causes fissures in the brain. The toxin has been identified in animal feeds of the SE.

8) Botulism: Contamination of feed with *Clostridium botulinum* can result in a disease where horses can not eat and develop muscular weakness. This disease does occur sporadically in Florida horses.

Prevention

A killed vaccine has been marketed since Fall 2001. An initial injection is followed in 3 to 6 weeks with a booster. The optimal time for vaccination is **before** the mosquito season. The manufacturer recommends a twice yearly injection in epidemic or endemic areas. No information is available regarding long term immunity. *However, it is not expected that the initial series will provide long term protection.* Multiple yearly boosters will likely be required to maintain protection in mosquito-infested Florida. Horses that have recovered have long-term immunity against WNV and should not require immunization.

During outbreaks: 1) Use fly sprays frequently; re-apply spray repellents after rain. 2) Keep horses in at night if possible or spray with fly spray. 3) Use fans and movement to decrease the possibility of biting mosquitoes. 4) Remove standing water. 5) If stock tanks are used for livestock watering place mosquito-feeding fish in tanks. 6) If ponds are present, stock with mosquito-feeding fish. 7) For heavy mosquito infestations consider fogging. 8) Clean brush piles, gutters, and litter. 9) Cover pools.

Protect Yourself Also!

Any time one is working outside, mosquito protection is a good idea. Three main lines of defense should include avoidance of mosquito infested areas or increased air circulation, protective clothing, and use of repellents. Fans in barns and around work areas can aid in air movement. Long sleeve clothing and pants are helpful, but mosquitoes will bite through thin clothes. By far the best repellents appear to be those that contain DEET (N,N-diethyl-m-toluamide). A product containing 23.8% DEET provided an average of 5 hours of protection from mosquito bites. A product with

20% DEET provides about 4 hours of protection and with 6.65% DEET there is about 2 hours of protection. Mixed products like those that contain 4.75% DEET and 2% soybean oil provide only 1-1.5 hours of protection. Caution should be used when using DEET on children. Spray on your hand first, then wipe hands on children. Stick with products with a low concentration of DEET (10% or less). Most guidelines cite that it is acceptable to use repellents containing DEET on children over 2 years of age. It is recommended that for children under 2 years of age only one application per day of repellent containing DEET should be used and some experts are concerned about use of DEET in children less than 2 mos.

WN virus information can be accessed on the Internet. Most states have a devoted website.

- Florida Department of Agriculture and Consumer Services: <http://doacs.state.fl.us>
- Florida Department of Public Health: <http://www.doh.state.fl.us/disease>
- USDA: <http://www.aphis.usda.gov/oa/wnv>
- Centers for Disease Control and Prevention: <http://www.cdc.gov/ncidod/dvbid/westnile/index.htm>
- National Wildlife Service: <http://www.nwhc.usgs.gov>