Mammal and Domestic and Exotic Avian Surveillance Activities Plan

I. Introduction

Although members of the *Corvidae* family (crows and jays), and to a lesser degree, raptors appear to be the best early indicators of WNV activity in an area, other birds and mammals can be affected by the disease or used as sentinels. Of all the types of bird and mammal surveillance systems for WNV, surveillance by testing sick animals is likely to be the least sensitive and specific system, because most animals that become ill with clinical signs of encephalitis are more likely to have other causes of illness than WNV. However, occasional cases of WNV infection may be detected by laboratory testing, particularly in sick horses and exotic birds, and such information will be utilized as part of the geographic and temporal surveillance for the disease

II. Objective

Provide an appropriate protocol for determining appropriate mammals and domestic and exotic birds to test for WNV in Virginia.

III. Implementation Plan

This part of the plan includes equines, other domestic animals, wildlife, animals being tested for rabies, and domestic and exotic birds. The following are general statements regarding WNV surveillance for all these groups of animals:

(1) **Information and Education** – Virginia Department of Agriculture and Consumer Services (VDACS), with assistance from Virginia Department of Health (VDH), will develop information to provide to appropriate groups such as owners and breeders of equines and exotic birds and to veterinarians to increase awareness about WNV and importance of reporting symptomatic animals.

(2) **Laboratory Test Interpretation** - Clear guidelines for interpretation of laboratory tests will be developed by the VDH and the laboratories performing testing (Division of Consolidated Laboratory Services [DCLS], VDACS Laboratory Services, and Norfolk Public Health Laboratory [NPHL]). The need to determine whether test results indicate current or previous infection will be considered to avoid taking public health or animal health actions based on false positive or false negative results.

(3) **Communication of Results** - Testing of animals and reporting of results by laboratories will occur in a timely manner, allowing for appropriate quality control. All positive reports will be telephoned, faxed or electronically transmitted to the Office of Epidemiology. Staff from that office will telephone the involved Local Health Department (LHD) and VDACS if the animal came through one of the Regional Animal Health Laboratories and was not tested by VDACS. VDACS will notify submitting veterinarians

and/or animal owners and will work with the Office of Epidemiology and the involved LHD to notify local government, the media and the public.

(4) Release of Information - Rapid sharing of surveillance results with government agencies and the public is essential for development of appropriate disease prevention and control measures. However, some confidentiality should attach to identification of affected privately owned animals to assure individual privacy of the owner and the treating veterinarian, if any. Therefore, to encourage reporting, owners' names and street addresses, treating veterinarians' names and street addresses, and names and addresses of persons submitting specimens shall be kept confidential. Information that will be available to agencies and the public with respect to privately owned animals will include the town and county where the specimen was collected, the species, the date of collection, and the WNV test results.

A. Equines

Surveillance for WNV in equines should be an ongoing part of the state plan because equines are potential sentinels for WNV epizootic activity and the horse industry is important to the economy of Virginia. Veterinary practitioners, equine associations, and VDACS are important partners in this endeavor.

Any equine with neurologic signs should receive a veterinary evaluation and appropriate diagnostic testing, with consideration for both rabies and arboviruses. Such animals should be reported to the nearest Regional Animal Health Laboratory (RAHL) (Appendix 2). The laboratory will advise on how to obtain and submit specimens (serum and/or CSF from live animals or necropsy tissues from dead animals), and coordinate testing. IgM Capture ELISA serologic testing on equine samples will be performed at the Warrenton RAHL and the National Veterinary Services Laboratories (NVSL).

B. Other Domestic Mammals

The occurrence of WNV in mammals other than equines appears to be rare. Veterinarians who are considering WNV in the differential diagnosis should contact the nearest RAHL before submitting specimens. For each request, the RAHL will determine, based on the history associated with the submission and/or the results of the necropsy examination, whether testing for WNV is warranted. Portions of the brain, heart, liver, and kidney will be submitted for histopathology and a second portion of the same tissues will be held frozen on all specimens submitted. Any rapid screening tests developed for WNV, for example immunohistochemistry or immunoflourescence, will be utilized by RAHL on tissue specimens as appropriate. Tissues forwarded to DCLS will have virus isolation (VI) and /or RT-PCR testing to detect WNV. An exception is in the Eastern region where virus isolation will be conducted at the NPHL. Any positive VI cultures will be submitted to DCLS for confirmation of results with RT-PCR.

C. Wild Mammals

Inquiries about sick and dead wildlife other than birds should be directed to the nearest Virginia Department of Game and Inland Fisheries (VDGIF) office (Appendix 3). The utility of testing wild mammals for WNV remains in the research realm and will not be routinely conducted due to limited resources

D. Rabies Suspect Animals

In Virginia, mammals that have died of encephalitis are more likely to have died of rabies than WNV, and rabies can be transmitted to people by those mammals before they die (unlike WNV for which no direct transmission between animals and humans in nature has been documented). Thus, it continues to be critical that all mammals with neurologic signs that could result in rabies exposure to people, pets, or domestic animals be submitted for rabies testing to one of the DCLS Rabies Laboratories (Richmond or Abingdon) or one of the District Rabies Laboratories (Fairfax or Norfolk) according to the guidelines established by those laboratories. WNV testing of dead mammals that have been submitted for rabies testing will take place according to the following guidelines:

1. Rabies negative species will be tested for WNV as resources permit and after consultation with VDH, VDACS, and DCLS.

2. A priority for WNV and EEE testing will be given to specimens from rabies-negative dead equines because of the previous incidence of illness and death in equines.

3. Other domestic and wild species will be tested as resources permit, and for research purposes to document the frequency of WNV-related illness and death in mammals.

E. Exotic and Domestic Birds

Some exotic birds such as those found in zoos and aviaries may be more susceptible to WNV. Keepers of such birds should be informed about WNV and sickness or death among such birds be reported to a RAHL.

1. Veterinarians who are considering WNV in the differential diagnosis should contact the nearest RAHL before submitting specimens. For each request, the RAHL will determine, based on the history associated with the submission and/or the results of the necropsy examination, whether testing for WNV is warranted.

2. If appropriate and resources allow, VDACS will assist VDH in identifying options for testing existing flocks of birds. These birds could include

those that already have routine blood samples taken, such as birds going to shows, birds in existing flocks that could be easily tested (for example, 4-H birds), or birds on egg farms.

3. Agencies that utilize sentinel chicken flocks for EEE surveillance should also have birds monitored for seroconversion to WNV. Although information from the early years of WNV in the northeast U.S, indicated that sentinel chickens were not useful for WNV surveillance, that may not be true for states that are further south. In Virginia, sentinel chicken flocks may help determine areas of WNV activity and be used to focus control and prevention activities.

Human Surveillance Activities Plan

I. Introduction

West Nile virus (WNV) was first identified in the United States (U. S.) in 1999, in an epizootic outbreak among birds and horses and an epidemic of meningitis and encephalitis in humans in the greater New York metropolitan area. Throughout 2000-2001, avian mortality surveillance documented geographic spread to about half of the U.S. From 1999 through 2001, there were 149 cases of WNV human illness in the U. S. reported to the Centers for Disease Control and Prevention (CDC) and confirmed, including 18 deaths. In 2002, major epidemics of human WNV infection were detected in many parts of the U. S. The number of human cases far exceeded those reported from 1999 through 2001. Many states, including Virginia, detected human WNV infection for the first time in 2002. Through surveillance, human WNV infection was detected in over 4,000 persons, including 274 deaths, from 39 states and the District of Columbia. It is believed that the peak of the current WNV epidemic in the U. S. occurred in August - September and abated, as the weather became cooler and mosquito activity declined.

In 2002, between August and October, the CDC had received reports of patients with confirmed WNV meningoencephalitis or meningitis diagnosed after receiving blood within one month of illness onset. All of the case-patients resided in areas of high WNV activity. Investigations confirmed that WNV can be transmitted through blood transfusion. In addition, to these patients, investigations in Georgia and Florida have demonstrated transmission of WNV in four recipients of solid organs from a single organ donor. Transplacental transmission of WNV infection was also reported in 2002 and WNV was found in the breast milk of a nursing mother and implicated in transmission to an infant. Two laboratory workers were thought to be infected through percutaneous inoculation. These various transmission mechanisms will have to be considered when doing human surveillance in Virginia.

This year, the VDH will expand its enhanced and active surveillance for arboviral encephalitis to improve the quality and timeliness of reporting and be able to respond rapidly if any blood or organ recipients or newborns are at risk. An essential component of a suitable surveillance program for arboviral encephalitis includes rapid and complete laboratory diagnosis of all suspect cases. West Nile virus fever cases will only be investigated enough to determine that they do not fit the case definition for meningoencephalitis or are not involved in a unique transmission situation. Human surveillance is just one component of an effective arboviral surveillance program, and will be coordinated with mosquito, avian and mammal surveillance programs. Information from all of these programs will be used to determine the type of mosquito control that is needed in a community to prevent as many human cases as possible in Virginia.

Arboviral encephalitis is one of more than 70 reportable diseases and conditions in Virginia. Physicians are required to report all suspect cases to local health departments (LHDs) (see Appendix 1) in Virginia. However, physician reporting in general is not as reliable as laboratory-based reporting. Since most cases of arboviral encephalitis are

diagnosed based on clinical criteria, and the absence of bacterial pathogens on microbial testing of cerebrospinal fluid (CSF), significant under-reporting of arboviral encephalitis is likely.

Therefore, to ensure detection of an early or late human case enhanced passive surveillance for arboviral encephalitis will be conducted by all jurisdictions in Virginia during November through June. Active surveillance will be implemented during peak months of mosquito activity and virus amplification (July through October).

II. Objective

Improve our ability to promptly detect and respond to a human case or outbreak by instituting swift and appropriately targeted control measures to prevent further cases.

III. Implementation Plan

A. Surveillance Activities for WNV Encephalitis

There will be statewide, enhanced passive surveillance for arboviral encephalitis during the season when mosquitoes are least active (November through June) and active surveillance during the season when mosquitoes are most active and peak amplification of the virus is occurring (July through October). Active surveillance can be implemented earlier if resources permit and WNV activity intensifies in avian, mammal or mosquito populations in an area.

1. **Enhanced Passive Surveillance** - Recommended for all Virginia counties and cities from November through June

   a. Alerting the medical community. Using information generated by the VDH Office of Epidemiology, the Centers for Disease Control and Prevention (CDC) and locally developed materials, LHDs should alert hospital infection control personnel and physicians regarding the importance of reporting suspected arboviral encephalitis, the criteria for reporting and instructions for submission of appropriate laboratory specimens (see Attachment 2.A). Physicians should be encouraged to develop a high index of suspicion for arboviral encephalitis in patients hospitalized with encephalitis of unknown etiology. In addition, cases of suspected Guillain BarrJ syndrome, botulism, and muscle weakness or flaccid paralysis should have WNV infection as a rule out. Physician education materials should include the importance of determining if there is a history of donating or receiving blood or organs or if the patient is pregnant or breast-feeding.

b. Commercial laboratory surveillance. LHDs will receive reports of sero-positive cases of WNV and other arboviruses tested by commercial laboratories from hospitals, physicians, DCLS and the Office of Epidemiology. Since WNV may cross-react with SLE and other closely related flaviviruses on commercially available serologic tests, cases that are reported as SLE- positive or some other arboviral disease based on serologic testing should be confirmed by the DCLS. The DCLS will perform highly specific IgM antibody capture enzyme-linked immunosorbent assay (MAC-ELISA) and IgG ELISA to identify SLE, EEE, LAC, and WNV-reactive antibody. Reactive specimens will be tested for confirmation with a plaque reduction neutralization test (PRNT) either at DCLS or CDC. However, due to limited resources, testing by DCLS must be restricted to those patients who meet the clinical description for viral encephalitis. Many asymptomatic and mildly ill patients who have been bitten by mosquitoes may ask their physicians to test them for WNV. Even if infected, those with mild symptoms are likely to recover completely without the need for any specific medications and laboratory testing for WNV is not necessary. Should these patients develop more severe symptoms, such as confusion, lethargy, muscle weakness/paralysis, severe headache, or stiff neck, and therefore fit the criteria for WNV testing, appropriate specimens should be submitted to the DCLS.

2. **Active Surveillance -** The first activity (a.) should be conducted from July through October, or earlier if resources permit and WNV activity intensifies in an area. The other activities are optional for LHDs as resources permit. Viral meningoencephalitis should be included as an event LHDs monitor through syndromic surveillance systems.

a. Active surveillance by weekly contact. LHDs should contact key medical staff (e.g., infectious disease, neurology or intensive care subspecialists) at acute-care hospitals to ask about potential cases of arboviral encephalitis and assure that appropriate laboratory specimens are obtained on all suspect cases and sent to DCLS for WNV and other arbovirus testing. In addition, cases of suspected Guillain-BarrJ syndrome, botulism, and muscle weakness or flaccid paralysis should have WNV infection as a rule out.

b. Laboratory-based surveillance at hospitals (optional). LHDs will ask laboratory staff to store all CSF samples that have parameters suggestive of a viral cause of infection of unknown etiology (e.g., increased protein, pleocytosis and negative bacterial gram stain and culture). Samples should be transported to the DCLS weekly where they will be screened for arboviruses by MAC-ELISA as resources permit and should be cleared with the DCLS before being implemented. This laboratory-based system will provide a back-up to ensure that viral meningoencephalitis cases that are not reported by clinicians are tested for arboviruses.

c. Retrospective surveillance (optional). Patients discharged with a diagnosis of encephalitis (and aseptic meningitis as resources permit) of unknown etiology will be identified. The VDH Office of Epidemiology will work with LHDs to have hospitals search their databases for patients discharged with specific ICD codes. Hospital laboratory directors will be contacted to determine if sera or CSF are available on identified suspect cases and, if so, arrangements will be made for testing at the DCLS. Patients without available clinical specimens will be contacted to obtain convalescent sera.

3. **Non-traditional Arboviral Surveillance Methods** (Potential alternative options to be considered by jurisdictions if resources are available.) Such activities should be undertaken in consultation with the Office of Epidemiology because they may be useful for other diseases and conditions.

a. Monitor existing clinical datasets (911 data, emergency departments, managed care visits, nurses' hotlines) to detect increases in milder illnesses that may represent infection with WNV (e.g., fever/rash or fever/lymphadenopathy).

b. Establish surveillance for liver disease or myocarditis of unknown etiology.

c. Conduct laboratory surveillance to monitor volume of tests requested for other causes of encephalitis (e.g., herpes simplex).

B. Surveillance Guidelines for Human Encephalitis

1. **Recommended Criteria for Suspect Case of WNV** - Any adult or pediatric patient with viral encephalitis (Criteria a, b and c below) with or without associated muscle weakness (Criteria d)

a. Fever $\geq$ 38°C or 100°F, and

b. Altered mental status (altered level of consciousness, agitation, lethargy) and/or other evidence of cortical involvement (e.g., focal neurologic findings, seizures), and

c. CSF pleocytosis with predominant lymphocytes and/or elevated protein and a negative gram stain and culture, and/or elevated protein and a negative gram stain and culture, and/or

d. Muscle weakness (especially flaccid paralysis) confirmed by neurologic exam or by electromyogram (EMG).

2. **Other Conditions Associated with WNV Infection**

During the 1999 outbreak in New York, two-thirds of the encephalitis cases were associated with severe muscle weakness. Documentation of muscle weakness was based on neurologic examination and/or EMG findings. In 2002 flaccid paralysis/poliomyelitis was reported in a number of cases. A supplemental surveillance form (See Attachment 2.C) exists for reporting these cases to a neurologist at the CDC. Therefore, case ascertainment should include encephalitis with muscle weakness, and flaccid paralysis.

3. **Transmission Issues**

a. Recent evidence of organ transplant and blood transfusion transmission of WNV make it important for LHDs to rapidly determine if any human cases of probable or confirmed WNV infection had a organ transplant or blood transfusion within the four weeks prior to illness onset or was a blood donor during two weeks prior to illness onset. The VDH Office of Epidemiology should be notified immediately of potential transplant/transfusion related cases. A trace back investigation of the cases will involve the CDC and the Food and Drug Administration (FDA).

b. Recent evidence of intrauterine and possible breast milk transmission make it important to identify and monitor pregnant and nursing mothers if WNV infection is suspected. The VDH Office of Epidemiology should be contacted about such cases.

C. Laboratory Testing for WNV

1. Although suspect cases can be reported to LHDs or the VDH Office of Epidemiology using the Epi-1 reporting form or the initial case report form (See Attachment 2.B), if enhanced passive or active surveillance has been initiated it should result in rapid and direct communication between medical care providers and the LHDs. LHDs will screen reports to assess that the clinical presentation meets the case criteria for viral encephalitis and therefore for testing by the DCLS. As part of enhanced passive or active surveillance, LHDs should insure that hospitals and laboratories have on hand and are aware of the latest surveillance criteria and information on how to submit appropriate diagnostic specimens for testing at the DCLS.

2. Since a negative reverse transcriptase polymerase chain reaction (RT-PCR) or enzyme linked immunoassay (ELISA) test on a specimen taken soon after illness onset (<8 days) does not rule out arboviral infection, convalescent sera are needed to definitively determine if WNV infection is present or absent. Therefore, LHDs will have to insure that convalescent sera are obtained on all suspected case-patients with encephalitis of unknown etiology, if acute sera or CSF obtained <8 days after illness onset is negative for WNV. It is important that paired acute- and convalescent-phase serum samples be submitted to insure accurate interpretation of the serologic tests

3. The DCLS will perform all testing for WNV, including MAC-ELISA, IgG ELISA, on sera and CSF and RT-PCR on post mortem tissue and acute serum and CSF.

4. Health care providers will be informed that appropriate specimens for testing include:

   a. Sera - Appropriately timed acute and convalescent sera for testing by MAC-ELISA and IgG ELISA

   b. CSF - Testing by MAC-ELISA, real-time RT-PCR, or viral isolation

   c. IgM-positive sera should be confirmed by convalescent sera (MAC-ELISA and PRNT)

   d. Brain tissue – Real-time RT-PCR and viral isolation.

5. LHDs need to encourage physicians and laboratories to complete all essential information on the laboratory submission forms or to complete it themselves by contacting appropriate parties, including

the patient or patient's family, if necessary. Accurate interpretation of serological findings requires knowledge of the clinical history. For human specimens, it is important that the following data accompany specimens submitted for serology before testing can proceed or results can be properly interpreted and reported:

a. Symptom onset date (Critical information that frequently is not documented on the initial case report form)

b. Date of sample collection

c. Unusual immunological status of patient (immunosuppression)

d. Current address and travel history in flavivirus-endemic area

e. History of prior vaccination against flavivirus disease (Yellow fever, Japanese Encephalitis, or CEE)

f. Brief clinical summary including suspected diagnosis

5. Patient information and laboratory data will be shared between the VDH Office of Epidemiology and LHDs in person, via telephone and facsimile and when available on a secure e-mail system to facilitate case surveillance and timely reporting of laboratory results back to LHDs.

6. In the event that acute specimens (obtained within 8 days of illness onset) are negative by ELISA testing, laboratory diagnosis of WNV will require that a follow-up (convalescent) blood sample be obtained 14-21 days after the acute specimen to evaluate for the presence of convalescent antibody to the virus. Since most patients will have been discharged from the hospital, LHDs will need to have the capacity of obtaining convalescent blood specimens on all suspect case-patients who have indeterminate or negative initial test results.

7. LHDs will work with hospitals and physicians to encourage testing only for those patients that meet criteria for encephalitis. Patients with milder illnesses (e.g., fever and headache, fever and rash, fever and lymphadenopathy) or no symptoms (e.g., persons with a recent mosquito bite but no acute symptoms) do not need to be tested for WNV.

Division of Consolidated Laboratory Services (DCLS) - Arbovirus Testing

Testing Criteria for Encephalitis: Any adult or pediatric patient admitted to a hospital with a presumed diagnosis of viral encephalitis, or with focal CNS findings and fever should submit a whole blood or serum sample for diagnostic testing at DCLS following the guidelines listed below. **Recommended Criteria for Suspect Cases of WNV** - Any patient with viral encephalitis (Criteria a, b and c below) with or without associated muscle weakness (Criteria d)

a. Fever $\geq 38^{o}$C or 100^{o}F, and
b. Altered mental status (altered level of consciousness, agitation, lethargy) and/or other evidence of cortical involvement (e.g., focal neurologic findings, seizures), and
c. CSF pleocytosis with predominant lymphocytes and/or elevated protein and a negative gram stain and culture, and/or
d. Muscle weakness (especially flaccid paralysis) confirmed by neurologic exam or by EMG.

Testing Systems Employed: Serological specimens submitted for arbovirus testing will be evaluated using an IgM Antibody Capture Enzyme-linked Immunosorbent Assay (MAC-ELISA) and an IgG ELISA to identify St. Louis Encephalitis (SLE), Eastern Equine Encephalitis (EEE), LaCrosse Encephalitis (LAC), and WNV -reactive antibody. If SLE, EEE, LAC, or WNV-reactive antibodies are present, specimens will be forwarded to CDC for Plaque Reduction Neutralization Testing (PRNT) confirmation. Real-time RT-PCR will be performed on biopsy and postmortem tissue specimens, and acute serum and CSF. Viral isolation is available upon request.

Specimen Types and Amounts:

Specimen	Test	Specimen volume	Shipment
Paired acute-phase (0-8 days post-onset of illness) and convalescent-phase (14-21 days after acute specimen) sera	MAC-ELISA IgG ELISA	2 ml sera in plastic tube (preferred) or 5 ml whole coagulated blood	Refrigerated
Acute-phase CSF	MAC-ELISA Viral Isolation Real-time RT-PCR	1.0 ml in plastic tube	Frozen
Brain, biopsy or postmortem tissue	Viral Isolation Real-time RT-PCR	1 gram	Frozen

Submission Form: Include a Encephalitis/Initial Case Report Form for each patient to be tested. Fill out the form as completely as possible. Accurate interpretation of serologic findings requires knowledge of the specimen. It is imperative that the following data accompany specimens submitted: 1) symptom onset date; 2) date of sample collection; 3) unusual immunological status of patient; 4) current address and travel history; 5) history of prior vaccination against flavivirus disease; and 6) brief clinical summary including suspected diagnosis.

Packaging for Shipment:
Serum or whole coagulated blood samples: If you are requesting serology, the specimen should be kept cool but there is no need to keep it frozen. Wrap your specimen in absorbent material, pack it in a sealable plastic bag, place the bag in a rigid container (styrofoam box or cardboard mailing container), place the container and a cold pack in a styrofoam cooler for shipment.
CSF or tissue: If you are requesting virus isolation or Real-time RT-PCR for WNV on tissue or CSF, the specimen should be frozen in a sterile container prior to shipment and it should be sent on enough dry ice to insure it will remain frozen until receipt. These specimens should be wrapped in absorbent material, packed in a sealable plastic bag, placed in a second sealable bag, and then placed in a cooler with dry ice for shipment.

Coolers should be shipped 24 hour/overnight delivery.
If you are hand carrying the specimen, please observe the packing instructions above to secure the specimen in transit.

Sample Shipment:
Non-courier shipment:
Package specimens as indicated above and send to DCLS using the following address:
Division of Consolidated Laboratory Services
1 North 14th Street, SRM Room 151
Richmond, Virginia 23219-3691
Courier shipment:
Package specimens as indicated above and send via DCLS courier.

Reporting of Test Results: Test results are normally available 10 days to 2 weeks after receipt of specimens. During periods of heavy submission, turn around times may be longer. Receipt of a hard copy of the results may take 2 weeks after completion of testing. If initial screening tests are positive, results will be communicated to Dr. Suzanne Jenkins prior to the availability of confirmatory test results. Confirmatory testing performed on screen positive samples will delay the reporting of results to the submitter.

Please contact Denise Pettit (804-786-9715) at DCLS if you have questions regarding sample collection or shipment.

ENCEPHALITIS / INITIAL CASE REPORT FORM

PATIENT INFORMATION

Last Name_____ First Name _____ County_____
Address_____ City _____ Zipcode_____ State_____
Telephone-H (____)_____-_____ W (____)_____-_____ Date of Birth_____/_____/_____ Age_____
Occupation:_____ Race: ☐ White ☐ Black ☐ Am Indian/Alaskan ☐ Asian ☐ Other
Ethnicity: ☐ Hispanic ☐ Non-Hispanic ☐ Unknown Sex: ☐ Male ☐ Female Pregnant: ☐ Yes ☐ No ☐ Unknown

CLINICAL INFORMATION

Hospitalized? ☐ Yes ☐ No Hospital Name_____
Street Address_____ City_____ State_____ Zip _____
Medical record # _____ Date of admission____/____/____ Date of discharge/transfer____/_____/____
Date of first symptoms____/____/____ Date of first neurologic symptoms____/____/____
Current Diagnosis: ☐ encephalitis ☐ meningoencephalitis ☐ meningitis ☐ other_____
Initial Diagnosis: ☐ encephalitis ☐ meningoencephalitis ☐ meningitis ☐ other_____

Fever (≥ 38EC or 100EF)	☐ Yes	☐ No	☐ Unknown	Altered mental status	☐ Yes	☐ No	☐ Unknown
Headache	☐ Yes	☐ No	☐ Unknown	Stiff neck/Meningeal signs	☐ Yes	☐ No	☐ Unknown
Seizures	☐ Yes	☐ No	☐ Unknown	Muscle weakness	☐ Yes	☐ No	☐ Unknown
Altered immune status	☐ Yes	☐ No	☐ Unknown	Previous Flavirus vaccination	☐ Yes	☐ No	☐ Unknown
Rash	☐ Yes	☐ No	☐ Unknown	If yes, describe_____			
Other neurologic signs	☐ Yes	☐ No	☐ Unknown	If yes, describe_____			

Other symptoms (current or 1 month before onset)_____
Outcome ☐ Recovered ☐ Died ☐ Unknown If patient died, date of death _____/_____/_____

LABORATORY INFORMATION / TEST RESULTS

CSF (specify units) Date _____/_____/_____ Abnormal? ☐ Yes ☐ No ☐ Unknown
Glu _____ Prot _____ RBC _____ WBC _____ Diff: Segs _____% Lymphs_____%
Gram stain _____ Culture _____
CBC (specify units) Date _____/_____/_____ WBC _____ Diff: Segs _____% Lymphs _____%
MRI Date _____/_____/_____ Results _____
CT Date _____/_____/_____ Results _____
EEG Date _____/_____/_____ Results _____
Microbiology / serology Results _____

CURRENT TREATMENT

(antiviral or antibacterial) **Type:** _____ **Date started:** _____/_____/_____

RISK FACTOR INFORMATION (during **2 weeks** before onset)

				Location	**Dates**
Travel outside USA?	☐ Yes	☐ No	☐ Unk	_____	_____
Travel outside Virginia?	☐ Yes	☐ No	☐ Unk	_____	_____
Travel outside county of residence?	☐ Yes	☐ No	☐ Unk	_____	_____
Animal or arthropod contact?	☐ Yes	☐ No	☐ Unk	_____	_____

If yes specify species: _____
Blood donor? ☐ Yes ☐ No ☐ Unk
If yes, contact the VDH Office of Epidemiology immediately
Blood transfusion or organ transplant (during **1 month** before onset)? ☐ Yes ☐ No ☐ Unk
If yes, contact the VDH Office of Epidemiology immediately

SPECIMENS BEING SUBMITTED TO LAB FOR TESTING

Name of Lab _____ CSF ☐ Yes ☐ No If yes, date collected _____/_____/_____ ☐ Initial ☐ Repeat
If no, was a lumbar puncture performed? ☐ Yes ☐ No
Name of Lab _____ Serum ☐ Yes ☐ No If yes, date collected _____/_____/_____ ☐ Initial ☐ Repeat
Name of Lab _____ Other _____ Date collected _____/_____/_____ ☐ Initial ☐ Repeat

PHYSICIAN

Last name _____ First name _____
Work address_____ City _____ State_____ Zip Code _____
Telephone (_____) _____-_____ Pager (_____) _____-_____

SUBMITTER

Name _____
Address _____
_____
_____
Phone (_____) _____-_____

Date of Report: _____/_____/_____

Updated 11.10.2002

AFP Screening Form

CASE ID: _____

Patient demographics

Date/time this instrument first initiated: Date: _____/ _____/ _____ (mm/dd/yyyy) Person Receiving Call:

Last name: | First Name:

Address:

Hospital:

Patient agreeable to future follow-up? □ Yes □ No

1. Gender
   1. □ Male
   2. □ Female

2. Date of birth _____/ _____/ _____ (mm/dd/yyyy)

3. Date of illness onset _____/ _____/ _____ (mm/dd/yyyy)

4. Date of hospital admission/first assessment _____/ _____/ _____ | Medical Record Number: _____

5. Contacting Physician: Name

   Street Address:

   City: County: _____

   State: Zip code:

   Telephone number: (_____) _____- _____ Alt Telephone number: (_____) _____-_____

6. Race 1. □ White 2. □ Black/ African-American 3. □ Asian/ Pacific Islander
   4. □ American Indian/ Alaska Native 5. □ Other (specify) 9. □ Unknown

7. Ethnicity 1. □ Hispanic 2. □ Non-Hispanic 9. □ Unknown

9. Additional contact information:
   (close family member/friend) Name:

   Phone:

   Relationship:

10. Primary/Attending MD: Physician Phone:

    Physician Pager/Cell/Fax:

11. Consulting Neurologist (if applicable): Physician Phone:

    Physician Pager/Cell/Fax:

12. Consulting Infectious Disease Physician (if applicable): Physician Phone:

    Physician Pager/Cell/Fax:

AFP Screening Form

CASE ID: _____

WNV-associated AFP: Presenting signs/symptoms

1. Initial diagnosis:

2. Concurrent symptoms: 1. □ Fever 2. □ Headache 3. □ Nausea/Vomiting 4. □ Meningismus
5. □ Altered mental status 6. □ Other Specify: _____

3. Onset of weakness within first week of illness? 1. □ Yes 2. □ No 9. □ Unknown
Date of weakness onset: ____/____/_____ (mm/dd/yyyy)

4. Distribution of weakness: 1. □ Symmetric 2. □ Asymmetric 9. □ Unknown
Describe weakness distribution: _____

5. Sensory abnormalities present? 1. □ Yes 2. □ No 9. □ Unknown
Describe sensory abnormalities: _____

6. Pain present? 1. □ Yes 2. □ No 9. □ Unknown
Description/location of pain: _____

7. Bowel/Bladder involvement present? 1. □ Yes 2. □ No 9. □ Unknown
Description of bowel/bladder involvement: _____

8. Cerebrospinal fluid evaluation performed? 1. □ Yes 2. □ No 9. □ Unknown
CSF Results: Protein: Glucose: WBC: RBC:
Gram's stain: Culture:

9. Electromyography/Nerve conduction studies performed? 1. □ Yes 2. □ No 9. □ Unknown
If yes, date performed: ____/____/_____ (mm/dd/yyyy) Location: _____
Results (description): _____

10. Spinal neuroimaging performed? 1. □ Yes 2. □ No 9. □ Unknown
If yes, date performed: ____/____/_____ (mm/dd/yyyy)
Results/reading: _____

11. Treatment rendered? 1. □ Yes 2. □ No 9. □ Unknown
If yes, indicate treatment: 1. □ IVIG 2. □ Plasmapheresis 3. □ Anticoagulation
4. □ Antibiotics 5. □ Muscle biopsy 6. □ Other
Specify if other: _____

11. Serologically confirmed West Nile virus infection? 1. □ Yes 2. □ No 9. □ Unknown
If yes, results of EIA: _____

Please **Fax** this document to Dr. James Sejvar, Divison of Viral and Rickettsial Diseases, Centers for Disease Control and Prevention, at 404-639-3838. Questions or comments can be directed to 404-639-4657 (Dr. Sejvar)