

2017 Arbovirus Management Protocol

Contact: Rebecca Osborn,
Vectorborne Disease Epidemiologist,
Division of Public Health,
Department of Health Services
Phone: 608-261-6388/Fax 608-261-4976
rebecca.osborn@wi.gov

Important information for 2017

- A. As during previous years, we will continue to confirm all presumptive positive laboratory results reported by physicians and private laboratories at the Wisconsin State Laboratory of Hygiene (WSLH). Case-patients testing positive at the WSLH with confirmatory testing at the Centers for Disease Control and Prevention (CDC) will be reported to CDC as confirmed. Case-patients for whom specimens are unavailable for confirmatory testing at the CDC will be reported to CDC as probable. Prompt notification of all immunoglobulin M (IgM) antibody test results to the Wisconsin Division of Public Health (DPH) is essential in order for us to obtain specimens at commercial laboratories for confirmation.
- B. The Dead Bird Reporting Hotline (1-800-433-1610) and dead bird testing for West Nile virus (WNV) will again be available for callers starting May 1 through October 31, 2017. DPH will update its website with a listing of the number of confirmed and probable cases and update the Wisconsin map for all WNV activities by county as new information is being received.

The hotline staff at the USDA Wildlife Services office will answer all questions regarding dead birds. To report a sick or dead bird and to coordinate WNV testing of a dead bird, please contact the **Dead Bird Reporting Hotline at 1-800-433-1610** (if you are calling from a Wisconsin area code). For a non-Wisconsin area code, please call 608-837-2727. As soon as a county has **one** positive dead bird result, WNV testing of dead birds in that particular county will be discontinued for the remainder of the season. All avian reports will be entered into WEDSS, animal module.

***Please see the 2017 Bird Surveillance Instructions below for current procedure. Dead bird samples will be sent via UPS shipping (refer to attachment C); do not use old labels because the shipping company and the account number may change from year to year and the old account may no longer be active. UPS shipping labels can be sent by mail or email to local health departments (LHDs) upon request as needed; the UPS account number is for internal use only and should not be given to the public.**

- C. Wisconsin will continue to perform enhanced surveillance for Powassan virus (POWV) and Jamestown canyon virus (JCV). Test requests and samples will be sent to WSLH for POW and JCV testing. All positive results will be forwarded to CDC for confirmatory testing. POWV and JCV are reportable under the Wisconsin statutory mandates and are nationally notifiable as part of the arbovirus group.
- D. As of February 2016, Wisconsin implemented Zika virus surveillance in symptomatic patients with either travel to a Zika-affected area or sexual contact with a traveler to a Zika-affected area, and in asymptomatic pregnant women with either travel to a Zika-affected area or sexual contact with a traveler to a Zika-affected area. For more information relating to Zika virus surveillance in Wisconsin, please go to <https://www.dhs.wisconsin.gov/zika/index.htm>.

Arbovirus Surveillance in Wisconsin

Arboviral infections may be asymptomatic or result in a febrile illness of variable severity, sometimes associated with neurologic symptoms ranging from headache to aseptic meningitis and encephalitis. Arboviral encephalitis cannot be distinguished clinically from infection with other neurotropic viruses. Symptoms may include fever, headache, nausea, vomiting, confusion, or other sensory alterations. Signs of severe illness may include evidence of elevated intracranial pressure, meningeal irritation, cranial nerve palsies, paresis or paralysis, altered reflexes, or convulsions. Less common neurological syndromes can include cranial and peripheral neuritis/neuropathies, including Guillain-Barré syndrome.

Arboviruses may also cause non-neuroinvasive syndromes, most commonly manifesting as febrile illnesses. These are non-localized, self-limited illnesses with headache, myalgias, and arthralgias and sometimes accompanied by a skin rash or lymphadenopathy. Although rare, non-neuroinvasive syndromes caused by these viruses may also include myocarditis, pancreatitis, or hepatitis. Laboratory confirmation of arboviral illnesses lacking a documented fever does occur, and overlap of the various clinical syndromes is common.

Arboviruses causing illnesses among Wisconsin residents include the following:

- Mosquito-borne viruses occurring in the United States:
 - West Nile virus (WNV)
 - St. Louis encephalitis (SLEV)
 - California serogroup viruses (serogroup includes La Crosse [LACV], JCV, Snowshoe Hare [SSHV], and California encephalitis [CEV])
 - Eastern equine encephalitis (EEEV)
 - Western equine encephalitis (WEEV)
- Tickborne virus occurring in the United States: POWV
- Some common mosquito-borne viruses associated with traveling to an endemic country:
 - Dengue virus (DENV)
 - Chikungunya virus (CHIKV)
 - Zika virus

WISCONSIN CASE DEFINITION: An illness is classified as a case if it meets one or more of the following clinical criteria, **AND** one or more of the following laboratory criteria, **AND** occurred when and where there is a high likelihood of vector activity.

A. **REPORTING CRITERIA:** Laboratory evidence with a compatible clinical illness.

- Laboratories should report all positive test results.
- Providers should report patient's demographic and clinical information and onset date.

B. **CLINICAL CRITERIA FOR DIAGNOSIS:** Clinical cases of arboviral diseases are classified according to the following criteria:

Neuroinvasive disease requires the presence of fever ($\geq 100.4^{\circ}\text{F}$ or 38°C) as documented by a patient or a health care provider and at least one of the following signs and symptoms, and in the absence of a more likely clinical explanation:

- Acutely altered mental status (e.g., disorientation, confusion, memory deficit, stupor, coma), OR
- Aseptic meningitis, encephalitis, OR
- Acute flaccid paralysis (AFP), which may result from anterior "polio" myelitis, peripheral neuritis, or post-infection peripheral demyelinating neuropathy (i.e., Guillain-Barre syndrome), OR
- Stiff neck, seizures, limb weakness, sensory deficits, abnormal reflexes, abnormal movements, cranial nerve palsies, OR
- Pleocytosis (increased white blood cell count) in cerebrospinal fluid (CSF) or abnormal neuroimaging.

Non-neuroinvasive disease requires the presence of documented fever ($\geq 100.4^{\circ}\text{F}$ or 38°C), as measured by the patient or clinician, the absence of neuroinvasive disease (above), and the absence of a more likely clinical explanation for the illness. Signs and symptoms may include fever, headache, stiff neck, myalgias, arthralgias, rash, lymphadenopathy, nausea, or vomiting.

C. **LABORATORY CRITERIA FOR CONFIRMATION:** Cases of arboviral disease are classified according to the following laboratory criteria:

Confirmed result:

- Isolation of virus from or demonstration of specific viral antigen or nucleic acid in tissue, blood, CSF, or other body fluid, OR
- Fourfold or greater change in virus-specific quantitative antibody titers between acute (within two weeks after onset date) and convalescent sample (two to four weeks after onset date), OR
- Virus-specific immunoglobulin M (IgM) antibodies in serum by antibody-capture enzyme immunoassay (MAC-ELISA) or microsphere immunoassay (MIA) AND confirmed by demonstration of virus specific neutralizing antibodies (PRNT) in the same or later specimen, OR
- Virus-specific IgM antibodies in CSF and a negative result for other arbovirus IgM antibodies in CSF endemic to the region where exposure occurred.

Probable result: Virus-specific IgM antibodies in CSF or serum, but with no other testing in the same or later specimen.

Arboviral transmission varies according to local climatic conditions, and WNV-specific IgM antibody can be detectable for more than a year following infection. IgG antibody can be detected throughout a person's lifetime after an infection. Thus, a positive IgG and a negative IgM may indicate previous infection at some point in time or a cross-reactive result.

2017 Laboratory Testing to Detect Human Infections

Positive results from a single serologic test can be misleading because serologic cross-reactivity often occurs between closely related arboviruses. Therefore, it is recommended that an arbovirus panel, which includes testing for arboviruses occurring in Wisconsin (WN, SLE, LAC/CA, EEE, JC, and POW viruses), be requested when there is clinical suspicion of arboviral disease, rather than requesting individual tests.

Available diagnostic tests at the Wisconsin State Laboratory of Hygiene (WSLH) include IgM capture enzyme immunoassays (IgM CEIA) that will identify IgM antibodies in serum and cerebrospinal fluid (CSF) specific to LAC, EEE, JC, and POW viruses. A microsphere immunoassay (MIA) is used to test serum and CSF for IgM specific to WN and SLE viruses. Clinicians should also consider enterovirus PCR (WSLH test code VR01703) testing of the CSF for patients with suspect aseptic meningitis. Requests for testing for other arboviruses will be forwarded to the CDC.

Confirmatory testing: Confirmatory testing for arboviruses using plaque reduction neutralization test (PRNT) will continue to be performed by the CDC. The decision to perform confirmatory testing will require approval of DPH or the WSLH.

Fee-exempt testing: Fee-exempt testing for arbovirus infection will be offered to clinicians whose patients meet one of the following criteria:

- Confirmatory testing of positive test results performed at laboratories other than the WSLH; OR

- The patient is over 65 years of age with signs and symptoms of meningitis (fever, headache, and stiff neck) or encephalitis (fever, headache, and altered mental status ranging from confusion to coma) with no other laboratory diagnosis; OR
- The patient has a diagnosis of Guillain-Barré syndrome and no other laboratory diagnosis; OR
- The local health department or DPH requests fee-exempt testing during an investigation.

Fee-for-service: With the exception of Zika virus testing, the WSLH will again provide fee-for-service testing for arbovirus infections. Meeting clinical criteria is **not** required to submit serum or CSF specimens to the WSLH for fee-for-service, non-Zika, arboviral screening.

Collection and shipping of clinical specimens to the WSLH

- Specimens submitted to the WSLH for fee-exempt testing must include the **WSLH Enhanced Wisconsin Arbovirus Surveillance Form** (Attachment A).
- Specimens submitted for fee-for-service testing must use the **WSLH CDD Requisition Form B**.
- At least 3-7 mls of serum (SST tube) and/or ≥ 1 ml of CSF in sterile screw-capped vials should be submitted on cold packs. Please contact the WSLH-Clinical Stock Orders at 1-800-862-1088 or 608-265-2966 to order kits and to obtain WSLH CDD Requisition Form B.
- To facilitate testing, it is **essential** that the lab requisition forms be completed to include **the patient's name, address, date of birth, specimen type, submitting agency, collection date, onset date, clinical signs and symptoms, and any travel**.

2017 Positive Human Arbovirus Reporting and Follow-Up

- The WSLH will report all human arboviral test results by electronic reporting (ELR) or by fax to DPH. All test results will also be reported to the agency submitting the sample.
- The LHD should report any presumptive positive IgM results by phone to DPH or enter information into the Wisconsin Electronic Disease Surveillance System (WEDSS) within 24 hours so that specimens can be quickly obtained from the commercial laboratories for confirmation. LHDs should use the Arbovirus Infection Follow-Up form (available in WEDSS) for follow-up investigation. When follow-up has been completed and entered into WEDSS, please send to state as **suspect** status for review and finalizing.
- If it is determined that the patient does not reside within the jurisdiction of the LHD, that health department is expected to forward the case to the appropriate LHD for follow-up.
- The LHD should ensure the test results have been relayed to the health care provider, patient, or hospital IPs before any patient follow-up investigation.
- With the exception of the first human **confirmed case** of WNV infection identified in the state for the season, an unusual outbreak of cases, or introduction of a new arbovirus into the state, any of which may prompt a statewide press release, the decision about releasing information on subsequent positive cases will be up to the LHD. DPH can provide the LHD with a press release template if needed.
- The only information DPH will release regarding positive human cases includes acknowledgement of the positive case, the onset date of the illness, and county of residence of the positive individual. No patient demographic information (address, phone, physician, where patient is hospitalized, or illness status) will be released. Protection of an individual's privacy is of paramount concern when releasing information on human infections. The same criteria will apply should any individuals succumb to the disease.

2017 Bird Surveillance for WNV

Corvid Surveillance (crows, blue jays, and ravens):

DPH is requesting the report of **all** sick and dead corvids for WNV testing from May 1 to October 31, 2017. Reporting of other dead/sick species is also encouraged.

- The USDA Wildlife Services office will continue to manage the **Wisconsin Dead Bird Reporting Hotline**. Please contact the **Dead Bird Reporting Hotline at 1-800-433-1610** to report all sick and dead corvids, to request shipping kits prior to shipment, to notify them when you are ready to ship a dead bird for testing, and to request new 2017 UPS shipping labels.
- **Bird data entry.** We are relying on assistance from LHDs as well as other local entities, including animal control staff, to enter information on dead birds (collected for testing) into the Wisconsin Electronic Disease Surveillance System (WEDSS) Animal Module. The USDA office will be entering into WEDSS any report of a dead or sick bird for which no sample was collected for testing. This will provide data entry and tracking capabilities for reporting sick and dead birds, printing reports, and accessing summaries of dead bird reporting and testing. LHDs should not send bird reporting forms to DPH, the Wisconsin Veterinary Diagnostic Lab (WVDL), or USDA for WEDSS data entry.
- **WEDSS access, Animal Module.** Please have your local health officer or local WEDSS administrator email dhswedss@wi.gov with a complete list of individuals at that health department needing access to the WEDSS Animal Module. Please make sure to indicate which individuals already have WEDSS access, and which do not. Users who do not currently have WEDSS access will need to fill out a user security agreement to be kept on file at the local public health agency and will be provided some additional instructions from the WEDSS program. Once you have access, you can log into WEDSS Reporter to look up or enter data at <https://wedss.wisconsin.gov/webvcmr/pages/login/login.aspx>.
- **LHD procedure for collecting birds for testing.** When a citizen calls the Wisconsin Dead Bird Reporting Hotline to request testing on a collected dead bird, the USDA Wildlife Services office will instruct the person to submit the dead bird to the LHD where he/she resides. The LHD should collect bird information and enter into WEDSS using the **Sick/Dead Bird Reporting Form** (Attachment C, required fields have been programmed into WEDSS). Please print the completed form and include it with the bird sample for shipping to WVDL for testing. If you have multiple birds collected at the same time and are using the same box for shipping, each bird and form should be given their own WEDSS number and should be packaged in a separate Ziploc bag. **All bird samples sent without a copy of the Sick/Dead Bird Reporting Form may be discarded.** When one WNV positive bird is detected within a county, corvid specimens from that county will no longer be accepted for testing.
- **New 2017 UPS shipping labels.** Before shipping the bird sample and form, please call the Dead Bird Reporting Hotline (1-800-433-1610) to let them know that you are sending out the shipment and the WEDSS number for the sample. Please leave your name and contact information if you get a voicemail message and a USDA Wildlife Services staff member will call you back. To request shipping kits and 2017 UPS shipping labels, Donna Jenkins can be contacted directly at 608-837-2727, or send an email to donna.m.jenkins@aphis.usda.gov. Please discard all **old UPS labels from previous years**. USDA will send you a new UPS shipping label by mail or email with the UPS account number to be used internally and not to be shared with the public.
- **Bird shipping location.** Birds that are suitable for testing as outlined in **West Nile Virus Corvid Collection/Shipment Instructions** (Attachment B) should be shipped to the Wisconsin Veterinary Diagnostic Laboratory (WVDL), Attention: Dr. Kathy Kurth, WNV, 445 Easterday Lane, Madison, Wisconsin 53706. WVDL will test dead birds for WNV using PCR performed on a skin biopsy.
- All WNV test results from corvid bird surveillance will be entered into the WEDSS Animal Module by the WVDL and will be available to LHDs as the tests are completed.

- DPH will promptly report only WNV positive bird(s) and WEDSS number by phone or email to the respective LHD. For other information, LHDs may access WEDSS for all tested birds.
- We request that the LHD contact the bird submitter (i.e., resident, DNR, animal control officer, or veterinarian) to inform them of a positive test result.
- With the exception of the first WNV birds identified in the state, which may be a statewide news event, the LHD will decide whether to release information to the public on subsequent positive cases. A press release template is available from DPH.
- Once the LHD is informed of positive test results, WNV positive bird data will be posted to the WNV surveillance activity map on the DPH website at <http://www.dhs.wisconsin.gov/communicable/arboviral diseases/westnilevirus/index.htm>.

Non-Corvid, Significant Avian Mortality, and Mammal Surveillance

Wisconsin Department of Natural Resources (WDNR) West Nile Virus Non-Corvid Surveillance Plan for 2017:

Reports of sick/dead non-corvid birds should be referred to the local DNR office/wildlife biologist or the Wisconsin Dead Bird Reporting Hotline (1-800-433-1610). As part of the ongoing collaboration to conduct avian disease surveillance, the Wisconsin Dead Bird Reporting Hotline will relay any reports of a die-off (five or more sick/dead wild birds) to the WDNR. Reports of sick/dead mammals should be referred to the local DNR office/wildlife biologist.

2017 Equine WNV Surveillance

- The Wisconsin Veterinary Diagnostic Laboratory (WVDL) and the Department of Agriculture, Trade and Consumer Protection (DATCP) will continue to notify DPH of positive WNV results in equines.
- DPH will forward, either by phone or by FAX, basic information on the animal and test results to the LHD where the animal or animal owner resides. Specific information on individual cases will not be entered into WEDSS. Please be aware that equine information related to arboviral surveillance held by LHD staff **is not** protected by medical confidentiality. Past requests to LHDs for equine information resulted in health departments being legally obligated to provide the information requested.
- Once the LHD, veterinarian, and horse owner are informed of the test results, WNV positive horse case counts will be posted to the DPH WNV website and reported to the CDC. Information posted will only identify a positive horse and the county of residence.

Attachments:

- **Attachment A**: Enhanced Wisconsin Arbovirus Surveillance (Rev. 04/2017). This form should be used to order human arbovirus testing, enclosed with the samples, and sent to the WSLH.
- **Attachment B**: West Nile Virus Corvid Collection/Shipment Instructions (Rev. 04/2017).
- **Attachment C**: West Nile Virus Surveillance- Sick/Dead Bird Reporting (Rev 04/2017).

Attachment A

ENHANCED WISCONSIN ARBOVIRUS SURVEILLANCE WISCONSIN STATE LABORATORY OF HYGIENE (WSLH)

Patient Information		SUBMITTING AGENCY	
Name (Last, First, MI)		Agency Name and Address (Print or use stamp/label)	
Patient Street Address			
City			
Patient State if not Wisconsin		Physician's Name	
Patient Telephone No.		Agency Telephone No.	
Age or Date of Birth	Patient Sex	WSLH Agency No.	Bill to: 609 Study: Arbo Surv

SPECIMEN TYPE (Note: Both CSF and serum are recommended in acute cases transport with cold packs)		Collection Date	Illness/Symptoms Onset Date
<input type="checkbox"/> CSF <input type="checkbox"/> Acute Serum <input type="checkbox"/> Convalescent Serum			
Hospitalized	Travel	If Yes, provide destination and date(s):	
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		

Reason for Testing: (Note: The request must meet one of the following criteria to qualify for fee-exempt testing)

- Confirmatory testing of positive test results performed at laboratories other than the WSLH.
- The patient is over 65 years old with signs and symptoms of meningitis (fever, headache, and stiff neck) or encephalitis (fever, headache, and altered mental status ranging from confusion to coma) with no other laboratory diagnosis.
- The patient is diagnosed with Guillain-Barre' syndrome with no other laboratory diagnosis.
- Approved by local health department/Division of Public Health

WSLH Test Names & Codes	Commercial lab arboviral positive test results:
<input type="checkbox"/> Arbovirus IgM Panel (SS02201)	<input type="checkbox"/> Powassan virus IgM CEIA Ab (SS02201)
<input type="checkbox"/> Eastern Equine encephalitis IgM CEIA Ab (SS02211)	<input type="checkbox"/> West Nile virus/ St. Louis encephalitis IgM (SS02241)
<input type="checkbox"/> Jamestown canyon IgM CEIA Ab (SS02201)	CDC request:
<input type="checkbox"/> La Crosse encephalitis IgM CEIA Ab (SS02231)	

Specimen Shipping Instructions: CSF and serum **MUST** be shipped with cool-pack, SLH kit #22 or equivalent.

Ship Specimen(s) To:

Wisconsin State Laboratory of Hygiene, 2601 Agriculture Drive, PO Box 7904, Madison, WI 53718

(Note: Separate specimen(s) and form should be submitted if other testing is desired.)

Attachment B

INSTRUCTIONS: WEST NILE VIRUS CORVID COLLECTION/SHIPMENT

1. Collect freshly dead, non-scavenged crows, blue jays, and ravens. The corvid carcass should be intact and skin must be present. **For other bird species, contact the Dead Bird hotline or local DNR office to find out whether it can be tested for WNV or other diseases by the DNR.**
2. Live sick birds should be humanely euthanized by injection of barbiturate euthanasia solution or by cervical dislocation.
3. Wear rubber gloves when handling sick or dead birds. If you have no gloves, insert your hand into a clean plastic bag, pick up the bird with the bagged hand, invert the bag over the bird, and seal the bag.
4. Freeze birds as soon as possible after collection.
5. Place each bird in an individual plastic bag and seal. If more than one bird is shipped, each bag must be identified. Double bag the individual carcasses as a group.
6. For each bird or group of birds submitted from one location, complete an Wisconsin West Nile Virus Surveillance: Sick/Dead Bird Reporting Form (Attachment C). Include a copy of this form with each submitted bird. Information needed for each bird must include:
 - a. Species and date collected.
 - b. Location (e.g. street address/city/zip code, or township/section/range).
 - c. Whether the bird was found dead or euthanized.
 - d. Additional history as requested on the Sick/Dead Bird Reporting Form.

Cooperators (who have WEDSS access) may enter the information in WEDSS and then include the printout of the reporting form.

7. Birds can be shipped in Styrofoam or plastic coolers placed inside a cardboard box as the final shipping container. Insert newspaper or other fill into the space between the sides of the box and the cooler to prevent breakage or leakage. Line the cooler with a large plastic bag and pack the carcasses in the cooler with ice packs. Place crumpled newspaper or similar absorbent material into the cooler with the bagged carcasses to fill unused space, and keep the ice packs in contact with the carcasses.. Tape the cooler or box shut with shipping tape.
8. Place the “Sick/Dead Bird Reporting Form” in a Ziploc bag and place the Ziploc bag in the shipping container with specimen.

Notify the Dead Bird Reporting Hotline at the USDA, Wildlife Services office at 1-800-433-1610 that you have a shipment and the WEDSS number. They will send you a **new UPS label. Do not use old UPS labels.** Arrange shipment via UPS for delivery to WVDL. **DO NOT SHIP PACKAGES ON FRIDAYS!**

 - a. Fill out the date, your name, company/agency, address, and telephone number.
 - b. Check to make sure the recipient’s information on the label is correct with the following information:

**WI Veterinary Diagnostic Laboratory
Attention: Dr. Kathy Kurth, WNV
445 Easterday Lane
Madison, WI 53706**

9. Styrofoam boxes, cold packs, and shipping labels for shipping birds can be sent to you upon request. Please contact the Dead Bird Hotline staff at 1-800-433-1610 to request containers for corvid shipments.

Attachment C

WEST NILE VIRUS SURVEILLANCE: SICK / DEAD BIRD REPORTING FORM

Wisconsin Veterinary Diagnostic Laboratory
For Office Use Only

WEDSS No. _____

CONTACT INFORMATION

Name of Person Completing Information	Agency
Reported Date	Telephone No.

DEAD CORVID INFORMATION

Species (crow, blue jay, raven)	Date bird found	Bird mortality <input type="checkbox"/> Found dead <input type="checkbox"/> Euthanized
Address (Location where dead bird was found)	City	
Name (of person who found the bird)	Telephone No.	
County	State	Zip Code

1. Were other sick/dead birds found near this bird? Yes No

2. Describe behavior of sick bird _____

3. Other information _____

Is bird being submitted for WNV testing? Yes No

Date collected: ____ / ____ / ____

Date Shipped: ____ / ____ / ____

Lab Information – To be completed by Lab Staff Only

Please check all samples collected:

Sample collected: Skin Brain

Bird age indicate fledging or adult: _____

TO SHIP A DEAD CORVID:

When shipping a bird for WNV testing include a copy of this form with the carcass and mail to:

Wisconsin Veterinary Diagnostic Laboratory,
Attn: Dr. Kathy Kurth, West Nile Virus,
445 Easterday Lane
Madison, WI 53706

TO REPORT A DEAD CORVID:

Prior approved access is needed to enter information into the WEDSS, animal module.
FAX the form to 608-837-6754 or call the Dead Bird Hotline 1-800-433-1610.