



Saint Louis Encephalitis

Revised 10/4/2004

Epidemiology

Saint Louis Encephalitis (SLE) virus is a flavivirus belonging taxonomically to the Japanese encephalitis subgroup that includes the serologically closely related, Japanese Encephalitis virus, West Nile virus (WNV), and Murray Valley virus. Other flaviviruses that can cause human infection include Yellow Fever and Dengue viruses. All of these viruses are transmitted to humans through the bite of an infected mosquito. Some flaviviruses, like Powassan, are transmitted by ticks.

Like the West Nile virus, the natural reservoir for the St. Louis virus is birds and the virus is transmitted from bird to bird through mosquito bites. Arboviral surveillance in Louisiana has identified a number of bird species positive for SLE virus including blue jays, cardinals and sparrows. These same bird species are often found to be positive for WN, however, there is very high mortality associated with WN infected birds while SLE is detected in live-caught birds. Chickens are often used as sentinel birds for both viruses and also for East Equine encephalitis (EEE). The SLE virus can be detected in mosquito pools and has also been found in overwintering mosquitoes.

SLE is transmitted principally by Culex species mosquitoes. The actual vector species is dependent on geographic area and abundance. In the Gulf coast and Mississippi River valley this includes, *Culex quinquefasciatus* and *Cx. pipiens*, in Florida, *Cx. nigrapalpus*, and in the western states, *Cx. tarsalis*.

In Louisiana, *Culex quinquefasciatus*, the Southern House Mosquito, is the main vector of SLE and WNV. The females lay single raft of 140-340 eggs on heavily polluted small water collection after each blood meal. The eggs hatch in 1-2 days and become adults in 8-12 days. Preferred breeding places include; collections of ground water, storm sewer catch basin, ground pools, ditches, run off from sewage plants, small or large artificial containers, cesspits, drains, septic tanks, unused wells, and storm water canals. The flying range of adult female Culex is limited, up to 3,600 feet (1,200m) /night. They prefer feeding on birds and poultry, however, they also readily bite humans. They are most active at dusk and dawn but usually bite humans towards the middle of the night both indoors and outdoors.

Before the introduction of WNV to the New York City area in 1999, SLE was the arbovirus most often responsible for seasonal transmission and occasional outbreaks in the U.S. Since 1964, there has been an average of 128 cases reported annually. The last major national epidemic occurred in the Midwest from 1974-1977 with over 2,500 cases from 35 states. In Louisiana, the last outbreak occurred in 2001 in the Monroe area with 63 cases from Ouachita parish and an additional 10 cases around the state.

The incubation period for St Louis encephalitis is 5 to 15 days.

Infectivity period: In birds the virus is most likely present in blood for several days to a week. Humans have viremia for a few days before onset of disease. Humans cannot infect a mosquito because of the relatively low viremia produced, but may be able to transmit the virus through blood or other bodily fluids or tissues containing virus.

Clinical Description

The majority of those infected are asymptomatic. Like West Nile infections, clinical illness ranges in severity from a simple febrile headache to meningoencephalitis.

A small proportion have SLE fever, presenting with febrile, influenza-like illness with abrupt onset of moderate to high fever, headache, sore throat, backache, myalgia, arthralgia, fatigue and a mild and transient rash and lymphadenopathy.

A minority of infected people have acute aseptic meningitis or encephalitis. While some cases can easily be differentiated between encephalitis or meningitis, some are more difficult to classify. These cases should be classified as SLE Neuro-Invasive Disease (SLE-NID) and not as meningo-encephalitis which is a term reserved for those who have both meningeal and CNS cortical involvement. Encephalitis is diagnosed by the central nervous system (CNS) involvement, including altered mental status (altered level of consciousness, confusion, agitation, or lethargy) or other cortical signs (cranial nerve palsies, paresis or paralysis, parkinsonian signs, tremors, ataxia or convulsions).

Some individuals have severe muscle weakness or complete flaccid paralysis which is mostly due to axonal degeneration (poliomyelitis) rather than demyelinating syndromes like Guillain-Barre syndrome.

Long term sequelae are very common and may include asthenia, emotional lability, anxiety, irritability, forgetfulness, tremor, dizziness, unsteadiness. Young children frequently exhibit significant neurologic sequelae when discharged, but psychomotor function is usually recovered on later follow-up.

The case fatality rates range from 3-30 % and are elevated among the elderly, particularly among those 75 years and older.

Surveillance

All SLE infections are reportable conditions.

Report and Confirm Early Cases

Patients presenting with the following clinical syndromes should be suspected of having SLE illness particularly during the transmission season (May to November) and in transmission foci (Check the OPH website for recent data):

- (1) Viral encephalitis, characterized by:
 - Fever, ≥ 38 °C or 100 °F, and

- CNS involvement, including altered mental status (altered level of consciousness, confusion, agitation, or lethargy) or other cortical signs (cranial nerve palsies, paresis or paralysis, parkinsonian signs, tremors, ataxia or convulsions), and
- An abnormal CSF profile suggesting a viral etiology (a negative bacterial stain and culture with pleocytosis [WBC between 5 and 1500 cells/mm³] and/or elevated protein level [\geq 40 mg/dl]).

(2) Aseptic meningitis (among persons aged 12 years and up), characterized by:

- Fever \geq 38 °C or 100 °F, and
- Headache, stiff neck and/or other meningeal signs, and
- An abnormal CSF profile suggesting a viral etiology (a negative bacterial stain and culture with pleocytosis [WBC between 5 and 1500 cells/mm³] and/or elevated protein level [\geq 40 mg/dl]).

(3) Acute cases of Guillain-Barré syndrome, especially if associated with atypical features, such as fever, altered mental status and/or a pleocytosis

(4) Acute flaccid paralysis

(5) Rhabdomyolysis

Indications for testing

Testing for arboviruses at the State Public Health Laboratory is being prioritized for hospitalized patients with viral encephalitis, aseptic meningitis, Guillain-Barré syndrome, acute flaccid paralysis or rhabdomyolysis.

In order to keep the number of lab tests manageable, avoid testing asymptomatic patients bitten by mosquitoes, the worried well, those who have a viral infection, and those who are suspected of SLE Fever (fever and headache without any cerebral or meningeal involvement).

There is no charge for arboviral encephalitis testing.

Specimens to obtain:

Acute phase (collected within 8 days of illness onset): 2 mL serum in labeled red top tube and CSF (if collected): 2 mL without preservatives

Convalescent phase (collected within 14-21 days of illness onset) At least 2 mL serum in labeled red top tube

Specimen labeling, packaging and mailing

-Label: patient's name, date of birth, medical record number, and date of specimen collection

All specimens should be accompanied by the appropriate form: *“Lab submission form for Arboviral Testing in Humans”*

Unless there is an emergency, avoid sending samples over the weekend or on holidays. Hold the samples for delivery until the next business day. In case of emergency, make prior arrangements with the laboratory (Virology Section 504-568-4039 or Infectious Disease Epidemiology Section 504-568-5005).

-Storage:

- **CSF:** Keep specimens refrigerated. Do not send or store at room temperature.
- **Sera:** Centrifuge, separate from clots, dispense into two sterile tubes (at least 2 cc each) for transport, and refrigerate (do not freeze).

-Packaging: Package CSF and sera in separate bags for transport to OPH. Pack blue ice or other coolants along with serum sample. Do not freeze. Do not use dry ice.

Ship to the following address:

*Office of Public Health Virology Laboratory
325 Loyola Avenue, Room 709
New Orleans, LA 70112*

Reporting test results:

All arboviral testing results will be faxed to the submitter (physician, hospital laboratories) by OPH lab.

Laboratory Tests

Test Methods

Screening EIA Assay: This ELISA test is used as a screening tool. It is a more rapid method than the CDC Antigen capture EIA. There are very few false negatives but many false positives. Therefore it is a good screening tool to rapidly identify positive tests but all positives must be confirmed by a more specific method.

Antigen Capture Enzyme Immuno Assay following CDC protocols. This test requires a 24-hour incubation period. Depending on the timing of receipt of specimens, results will take from 48 to 72 hours to be reported.

-The bottom of the tube is coated with an Anti-Human IgM. Then the serum of the patient is added, then the antigen (extract of cell culture infected with SLE), then an anti-SLE antibody tagged with an enzyme, then a substrate that will change color in the presence of the enzyme.

-If the serum contains anti-SLE antibodies, the sandwich is complete and the substrate will change color: this is a positive reaction.

-If the serum does NOT contain anti- SLE antibodies, one of the layers of the sandwich is missing, and the upper layers of the sandwich do not stick. When the substrate is added, there is no change in color. This is a negative reaction.

-For each serum several tests are done:

1-Test with patient serum and SLE antigen. This the “test antigen”.

2-Test with patient serum and material on which SLE grew but free of SLE. This is the “normal antigen”. The ratio of patient/test antigen over patient/normal antigen must meet certain criteria to be acceptable.

3-Test with negative control

The ratio of patient/test antigen over negative control must meet certain criteria to be acceptable.

These sets of reactions are performed in triplicate and an average of the 3 is reported.

Tests are done with both SLE and WNV antigens. SLE infections are those with higher results with the SLE antigen than with the WNV antigen.

The optical density of the reaction measures the intensity of the reaction. The numeric result presented is **not a titer**, but the ratio of optical density of the patient test over the control test (extract of cell culture infected without WNV). **A ratio of 7.0 is a minimum to be interpreted as positive, 2.0 to 7.0 will be**

reported as indeterminate. A SLE positive serum will also show positive with the same technique using a WNV antigen. To be interpreted as SLE positive, the ratio using SLE antigen should be at least twice higher than that using WNV antigen.

Testing is also performed for Saint Louis Encephalitis (SLE), Eastern Equine Encephalitis (EEE) and California Virus encephalitis using an **immunofluorescence technique**.

Reverse transcriptase polymerase chain reaction (RT-PCR) is used to detect viral RNA. Because of low sensitivity, (since the virus is not usually present in acutely ill patients) these tests will not be routinely used for the diagnosis of SLE neuro-invasive disease. It is however available for special circumstances at OPH lab.

A **Plaque Reduction Neutralization Test (PRNT)** will also be used by OPH lab as soon as a facility with the appropriate biosafety level become available. The serum of the suspect is incubated with the live SLE virus then added to a cell culture. If there are antibodies against the virus in the test serum, there is reduction in virus damage compared to control with no antibodies (hence the term “Plaque Reduction”). This is the “gold-standard” test for differentiating SLE from WNV, Dengue or Yellow Fever. But it requires handling cell cultures and live virus and it may take several days to a week to evaluate plaque reduction.

Interpretation of Lab Test Results for the Clinician

To correctly interpret a test result it is absolutely necessary to have the following information (requested in the lab submission form)

- Delay between symptom onset (Onset Date) and specimen collection
- Signs and symptoms (those listed in the lab submission form are essential for an accurate interpretation)

Interpreting the results of an antigen capture EIA test:

OPH will be using an antigen capture enzyme immuno-assay (EIA) techniques detecting IgM and /or IgG antibodies to West Nile and Saint Louis encephalitis viruses following CDC protocols. This test requires a 16-hr incubation period and results may take 48 to 72 hours to be reported.

Positive test results are those with a numeric ratio of 7.0 or higher

This number is not a titer but a ratio of the optical density of the patient test over a control test. (See Testing Handout for more detailed explanations). Patients are likely to have a positive ratio for both Saint Louis and West Nile viruses. In order to be considered SLE positive, the SLE ratio should be at least twice that of WNV ratio.

Case Definition

A case definition becomes important when it comes time to monitor progress of an outbreak. Case definitions are used for epidemiologic purposes to ensure consistency across jurisdictions and time, a case definition has to be somewhat rigid. Without a case definition a migraine headache with antibodies to SLE may become a case. A case definition **is not** a diagnosis. It may be important to explain this difference to a clinician.

Lab samples

- Acute CSF: collected within 8 days of onset
- OR
- Acute serum: collected within 8 days of onset AND

- Convalescent serum: collected within 14 - 21 days of onset

Clinical description

- Febrile illness of variable severity with neurologic symptoms ranging from headache to aseptic meningitis or encephalitis, nausea or vomiting
- Neurologic symptoms can include: headache, photophobia, confusion or other alteration of mental status.
- Neurologic signs: meningismus (stiff neck), cranial nerve palsies, paresis or paralysis, sensory deficits, altered reflexes, convulsions, abnormal movements and coma of varying degrees

Meningitis

Clinical signs of meningeal inflammation: nuchal rigidity, Kernig or Brudzinski sign, or photophobia or phonophobia

And one of the following:

- Fever $\geq 38^{\circ}\text{C}$ or 100°F , or hypothermia $<35^{\circ}\text{C}$
- CSF pleocytosis ≥ 5 WBC
- Peripheral WBC $\geq 10,000$ WBC / mm^3

Viral encephalitis

CNS involvement, including altered mental status, altered level of consciousness, confusion, agitation, lethargy or personality change

And two or more of the following:

- Fever $\geq 38^{\circ}\text{C}$ or 100°F , or hypothermia $<35^{\circ}\text{C}$
- CSF pleocytosis ≥ 5 WBC
- Peripheral WBC $\geq 10,000$ WBC / mm^3
- Neuroimaging findings consistent with acute inflammation (with or without involvement of the meninges) or acute demyelination;
- Focal neurologic deficit: cranial nerve palsies, paresis or paralysis, parkinsonian signs, tremors, ataxia
- Electroencephalographic finding consistent with encephalitis
- Seizures

Acute flaccid paralysis

Acute onset of limb weakness with marked progression over 48 hours

And at least two of the following:

- Asymmetry to weakness
- Areflexia /hyporeflexia of affected limb(s)
- Absence of pain, paresthesia or numbness in affected limb(s)
- CSF pleocytosis ≥ 5 WBC and elevated protein level ≥ 40 mg/dL
- Electrodiagnostic studies consistent with an anterior horn cell process
- Spinal cord MRI documenting abnormal increased signal in the anterior gray matter

Probable Case (CDC)

Clinical description +

- SLE EIA IgM positive in acute serum
- Or SLE IgG positive in convalescent serum with 4 fold elevation relative to acute serum + PRNT positive

Confirmed Case (CDC)

Clinical description + SLE EIA IgM positive in CSF

OR

Clinical description +

- SLE EIA IgM positive + SLE EIA IgG positive + PRNT positive
- Or 4fold change in PRNT antibody titer to SLE in paired, appropriately times acute and convalescent serum samples
- Or SLE virus isolation in blood, CSF, other body fluid or tissue
- Or SLE genomic sequence in blood, CSF, other body fluid or tissue
- Or SLE antigen in blood, CSF, other body fluid or tissue

Fatal Encephalitis Cases

Fatal viral encephalitis cases of unknown etiology must be reported to the Infectious Disease Epidemiology Section (IDES).

- At least 5 cc of whole blood and 5 cc of serum may be frozen and held until decisions are made as to what specimens and tests are needed for further testing.
- Freezing at or below -20 degrees C is sufficient for short-term storage.

For specimen collection questions: During business hours, please call 504-568-5005 and ask to speak the Arboviral Surveillance Coordinator. After hours, call (800) 256-2748 or 504-568-5005 and request to speak to the epidemiologist on call.

Case Investigation and Follow-up

Cross-Reactivity between Flaviviruses

West Nile Encephalitis, Saint Louis Encephalitis, Japanese Encephalitis, and Murray Valley Fever all belong to the same encephalitis virus complex, along with Yellow Fever and Dengue Fever, all these viruses are in the same family of Flaviviruses. They all cross-react in serologic testing. Therefore it is important to obtain a history of Yellow Fever or Japanese Encephalitis vaccine or history of a trip to a dengue endemic area that would explain a positive test, particularly an IgG positive result.

Make sure to differentiate from IgG and IgM

IgG for any of the flaviviral infection or vaccine will last for years, even a lifetime. Therefore interpretation of an IgG positive test for flavivirus with IgM negative result reflect an old infection and is not useful for the diagnosis of a recent clinical infection.

IgM antibodies do not cross the blood brain barrier therefore IgM antibodies in CSF strongly suggest central nervous system involvement. **IgM in blood may persist**, therefore there must be a strong clinical correlation for onset of symptoms consistent with the laboratory evidence. Convalescent blood samples should be drawn.

Category	NID Clinical Criteria &	Delay Onset /Collection	Interpretation	Fup needed
CSF				
Early Neg CSF	SLE IgM EIA Neg	< 8 days	Probably Not SLE-NID	None
Late Neg CSF	SLE IgM EIA Neg	≥ 8 days	Probably Not SLE-NID	None
Pos CSF	SLE IgM EIA Pos	anytime	SLE-NID	None
Serum				
Private Lab	SLE IgM EIA Pos	anytime	Suspect	Convalescent
Early Neg Serum	SLE IgM EIA Neg	< 8 days	Suspect(1)	Convalescent
Late Neg Serum	SLE IgM EIA Neg	≥ 8 days	NotACase	None
Pos IgM /IgG	SLE IgM EIA Pos and SLE IgG EIA Pos	anytime	SLE Probable	Convalescent
IgM Pos early	SLE IgM EIA Pos W>S	< 8 days	SLE Probable	PRNT*
IgM Pos late	SLE IgM EIA Pos W>S	≥ 8 days	SLE Probable	PRNT*, IgG*
Old Flaviviral infection	SLE IgM EIA Neg and SLE IgG EIA Pos	< 8 days	Old infection or New Inf in Old case	Convalescent
Flavi Old	SLE IgM EIA Neg and SLE IgG EIA Pos	≥ 8 days	Flavi Old	None
PRNT Pos	SLE IgM EIA Pos SLE IgG EIA Pos Neutralization Pos	anytime	SLE Confirmed	None
Fuzzy Neut	acute serum Pos for SLE IgM but Pos SLE neut not clearly distinguishable from the titers to other flaviviruses used in tests	<20days		Convalescent

CSF = CerebroSpinal Fluid

Convalescent = Patients who need convalescent serum

IgG* = If processed for PRNT wait for results, if not get serum for PRNT

SLE-NID: St. Louis Neuro Invasive Disease

Case management

Each case (positive lab, suspect needing follow up) is assigned to an Infectious Disease Epidemiologist / Disease Surveillance Specialist based on parish of residence or hospital which takes the lead to follow up the person and does the following:

1-Collect basic Demographic information (Name, age, gender, address, parish of residence, family contacts) if not collected on the form “*Laboratory Submission Form for Arboviral Testing in Humans*” which includes:

Clinical History: Try to standardize by using the following terms: Fever, headache, stiff neck, myalgias, arthralgias, photophobia, flaccid paralysis, meningitis, mental status changes (confusion, disorientation), coma, slurred speech, tremors, hearing or vision disturbance, ataxia and seizures.

Important: Get an accurate date for onset of symptoms.

Note if the patient if the patient has history of having a surgery, receiving a transfusion, donating blood, being pregnant, giving birth or breastfeeding in the four weeks prior to onset of first symptoms.

Deceased patients: attempt to get information on course of treatment.

Hospitalization: Name of hospital, admission and discharge date, type of unit (ICU or regular ward).

Travel: Record dates and location of any recent travel. If travel is to a region endemic for Dengue or Yellow Fever, make sure to ask if patient received a vaccine for either.

2-Update hospitalization date and disposition

3-Obtain copies of any lab tests made in other laboratories

4-Update information in the central office database (LaArbo)

5- Reporting results to health care provider and regional staff.

Note that reporting of confidential information (identifiers) need to follow strict privacy rules. In general do not report name and personal identifiers; report address (to the block level), date of blood collection, date of onset. Check with State Epidemiologist or one of the Assistant State Epidemiologists when in doubt.

In communication with media or public: Report age, gender, city and parish. Do not report hospital name. For patient condition, report if ICU, regular ward or home. All public reports are in the Excel file named Handout.

Cases reported from a private laboratory

- Enter in LaArbo database
- Call to obtain the blood submitted to the laboratory or request to submit another blood sample
- If there is no address, call the reporting entity to obtain residence information as well as additional clinical information
- Report as suspect to mosquito control if address is known
- Do not count as cases until confirmed by state lab.

Cases accepted by OPH:

Report and discuss significance of results with ICP or clinician: This is very important and should be completed before reporting new cases to the press.

Statistics:

- Report to Communication and Center Directors
- Prior to report to Regional Medical Directors, Regional Epidemiologists, Regional DSS, Sanitarian Services/Vector Control Program and Mosquito Control
- Report to Parish Officials is the responsibility of regional staff (Regional Medical Directors or assignee).

Report to CDC

Database (Central Office staff)

This is the main tool to track down suspects, cases, lab tests, questionnaires, produce statistics. The fields in RED are important. If left blank some of the queries, reports, forms will not function properly. Do Not Enter Lab Results. Lab results from OPH and CDC are uploaded through a series of queries. Please enter lab results that are from private repeats. Report positives with numeric ratios. We prefer to use ratios (12.3) than have “Positive” for example.

Main Patient Form

DateCollection:

Date first positive blood result or if negative, date first blood collected.

Lab Subform:

Source: Blood or CSF

LabName: OPH (State lab) or Private lab name

Lab #: OPH lab number, ex. AR04-000000

Access Label	Lab report label
EE_M	Alphavirus IFA IgM
EE_G	Alphavirus IFA IgG
CE_M	California virus IFA IgM
CE_G	California virus IFA IgG
Fl_If_M	Flavi virus IFA IgM
Fl_If_G	Flavi virus IFA IgG
SL_M_EI	SLE EIA IgM (CDC methods)
SL_G_EI	SLE EIA IgG
PanBio	WNV EIA IgM (Screening test)
WN_M_EI	WNV EIA IgM (CDC Methods)
WN_G_EI	WNVEIA IgG
SL_Neut	SLE Neutralization
WN_Neut	WNV Neutralization

Suspects considered NOT to have SLE infection: (lab tests not consistent with arboviral infection):

Check “NotaCase” in Final diagnosis field and ZNO in Case ID field.

Suspects with some significant lab tests: Enter final diagnosis choices from combo box.

“Clinical” field

SLEME:

Fever with 1 or more neurologic sign

Or 1 or more neurologic symptom + 1 or more neurologic sign

Or 1 or more neurologic symptom + CSF collected

Or abnormal CSF with pleiocytosis and high proteinemia

Or pos IgM EIA in CSF

AND Laboratory criteria met for probable or confirmed

SLE Fever (SLEFever):

Fever, no neurologic symptoms, no neurologic signs

Or Headache, no other neurologic symptoms, no neurologic signs, no fever, no collection of CSF

AND Laboratory criteria met

“Current Status”

Field name: [FinalDiag]

This field is used for internal classification

- SLE: Cases reported to the public include probable and confirmed cases of both SLE-NID and Fever
- SLESuspect: Cases coming from active surveillance with CNS involvement
- WNFSuspect: Cases coming from active surveillance with NO CNS involvement

- NotACase:
 - No clinical info, no CSF, serum negative
 - Or Serum & CSF negative, Follow up serum neg

“Case ID”

This field is ONLY used for ranking cases and suspect in queries.
Cases have a number starting at 001, NotACase are ZNO and Suspects are AA

“GET”

Use the Table to tag those who need follow up serum
Click “GET” on the labtestFUP line

“Outcome/Status”

Check Home, Regular Ward, ICU, Rehabilitation, Deceased (SLE associated) or DeadOther.

“Open/Closed”

Enter Closed when case reports are complete.

“OutbreakAssociated”

Click the OutbreakAssociated field only if we identify a specific outbreak. Do not use routinely.

St. Louis Encephalitis Surveillance in Sentinel Chickens and Mosquitoes

1. Sentinel Chickens

- Location of sentinel chickens must be based on entomological data to maximize benefits. Sentinel chickens may be used throughout the year.
- Chickens should be at least 9 weeks old. Maintain a supply of chickens in a mosquito free environment to replace infected chickens.
- Detection of antibodies by serologic tests is the method of choice. (The low viremia in chickens preclude the use of cloacal swabs.)
- Chickens should preferably be bled every week.
- Chickens should be replaced after sero-conversion (positive for antibodies to any other arboviruses).
- Test method:
 - IgM capture ELISA for Eastern equine encephalitis (EEE), St. Louis encephalitis (SLE), and West Nile virus (WNV).
 - Plaque Reduction Neutralization Test (PRNT) will be performed when necessary.
 - Lab tests done at the LSU Veterinary Lab. Results should be available within 5 days of sample receipt at the lab.

2. Mosquito Pools

- Pools should consist of 5-50 mosquitoes of the same species, some should be sorted to genus only.
- Test method:
 - VecTest (Medical Analysis Systems, Inc.) for Culex quinquefasciatus during the peak transmission season. The test can be done as a field test by the Mosquito Control Programs after training. The test is very specific (no false positives). Its sensitivity is similar to EIA tests. Results are obtained in 15 mn. The test can be safely performed in the Mosquito Control District laboratories: Female mosquitoes are placed in a plastic culture

tube, then a 2.5 mL of grinding solution is added which inactivates the virus and makes the rest of the test safe.

- Reverse transcriptase - polymerase chain reaction (RT-PCR) TaqMan for all other species of mosquitoes and outside the peak transmission season. Lab tests done at the LSU Veterinary Lab. Results should be available within 5 days of sample receipt at the lab.
- Viral isolation: Because it is very sensitive it is the method of choice off-season. It is done at the LSU Veterinary Lab.



LABORATORY SUBMISSION FORM FOR ARBOVIRAL TESTING IN HUMAN 10/5/2004

For OPH Lab Use Only
SID _____
Date Received ___/___/___

Submitter, Last name _____ First name _____
Affiliation _____ Hospital ID _____
Address _____ City, ZIP, State _____
Telephone (____) _____ - _____ Fax (____) _____ - _____

Physician, Last name _____ First name _____
Telephone (____) _____ - _____ Fax (____) _____ - _____

Patient, Last name []
First name [] Middle name []
Hospitalized? No Yes, hospital _____ Date of admission ___/___/___
Medical Record/ Social Security Number _____
Address _____ City, ZIP, State _____
Parish _____ Telephone (____) _____ - _____
Date of Birth ___/___/___ (if not available, age _____ years / months / weeks)
Gender Male Female Race W B Asian Other

1. Specimen	Collected on	Convalescent?	2. Specimen	Collected on	Convalescent?
<input type="checkbox"/> CSF <input type="checkbox"/> Serum	___/___/___	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> CSF <input type="checkbox"/> Serum	___/___/___	<input type="checkbox"/> Yes <input type="checkbox"/> No

2cc serum in labeled red top tube. Pack with blue ice or other coolants. DO NOT FREEZE/DO NOT USE DRY ICE. Ship labeled specimen(s) with this form to: Office of Public Health Virology Laboratory, 325 Loyola Avenue, Room 709, New Orleans, LA 70112. If you need further information, call 504-568-4039 (Central Laboratory) or 504-568-5005 (Epidemiology Section).

Please, provide clinical information of the patient. This information is important for surveillance purposes.

Date of first symptoms ___/___/___ ← **This information is critical to evaluate serological results.**
If hospitalized, current status: Regular ward ICU Rehab Deceased on ___/___/___
 Discharged on ___/___/___ to Home Other institutions _____
Fever (≥ 38C or 100F) Yes No Unknown Mental status changes Yes No Unknown
Headache Yes No Unknown Slurred speech Yes No Unknown
Stiff neck Yes No Unknown Tremors Yes No Unknown
Myalgias, arthralgias Yes No Unknown Seizures Yes No Unknown
Photophobia Yes No Unknown Ataxia Yes No Unknown
Flaccid paralysis* Yes No Unknown Hearing or vision loss Yes No Unknown
Other neurologic signs _____

Current diagnosis / assessment / impression _____

Was a CSF sample obtained? Yes No Unknown date ___/___/___
CSF findings: WBC _____ % neutr _____ % lymph _____ RBC _____ Protein _____

During the 4 weeks prior to first symptoms, did the patient:
- receive a transfusion? Yes No Unknown - donate blood? Yes No Unknown
- have surgery? Yes No Unknown - travel outside Louisiana? Yes No Unknown
Where? _____

Is the patient pregnant or recently gave birth? Yes No Unknown Age of fetus _____ wks Age of infant _____ wks

Louisiana Office of Public Health - Infectious Disease Epidemiology Section - Infectious Disease Control Manual
Remarks / observations : _____

