

Acute Flaccid Myelitis rev Apr 2017

BASIC EPIDEMIOLOGY

Infectious Agent

There are multiple infectious agents that can cause acute flaccid myelitis (AFM). Conditions like AFM can be caused by a variety of germs, including several viruses:

- Enteroviruses
- West Nile Virus (WNV) and viruses in the same family as WNV, specifically Japanese encephalitis virus and South Louis encephalitis viruses, and
- Adenoviruses

Transmission

Mode of transmission is dependent on the infectious agent.

Incubation Period

Incubation period is dependent on the infectious agent.

Communicability

Although the underlying infection may be communicable, the condition of AFM is usually a rare complication.

Clinical Illness

Acute flaccid myelitis is a clinical syndrome characterized by sudden limb weakness (weakness or paralysis in one or more extremities, but not generalized to the entire body) and loss of muscle tone and reflexes. Some patients, in addition to the limb weakness, will experience:

- Facial droop/weakness
- Difficulty moving the eyes
- Drooping eyelids
- Difficulty with swallowing or slurred speech

Numbness or tingling is rare in patients with AFM, though some patients have pain in their arms or legs. Some patients with AFM may be unable to pass urine. The most severe symptoms of AFM is respiratory failure that can happen when the muscles involved with breathing become weak. This can require urgent ventilator support (breathing machines).

DEFINITIONS

Clinical Case Definition

An illness with onset of acute focal limb weakness. Multiple etiologic agents may cause acute flaccid myelitis.

Laboratory Criteria for Diagnosis

- A magnetic resonance image (MRI) showing a spinal cord lesion largely restricted to gray matter* and spanning one or more spinal segments
- A specific pathogen is not needed to confirm the diagnosis.

*Terms in the spinal cord MRI report such as “affecting mostly gray matter,” “affecting the anterior horn or anterior horn cells,” “affecting the central cord,” “anterior myelitis,” or “poliomyelitis” would all be consistent with this terminology. If still unsure if this criterion is met, consider consulting the neurologist or radiologist directly.

Case Classification

- **Confirmed:**
 - An illness with onset of acute focal limb weakness, **AND**
 - An MRI showing a spinal cord lesion largely restricted to gray matter and spanning one or more spinal segments.
- **Probable:**
 - An illness with onset of acute focal limb weakness, **AND**
 - Cerebrospinal fluid (CSF) with pleocytosis (white blood cell count >5 cells/mm³, may adjust for presence of red blood cells by subtracting 1 white blood cell for every 500 red blood cells present).

SURVEILLANCE AND CASE INVESTIGATION

Case Investigation

Local and regional health departments should investigate all reports of AFM. If an etiology is known and is a reportable condition (e.g., West Nile, varicella, or polio) the case should be investigated according to the etiology.

If the etiology is known and due to a non-reportable condition OR if the etiology is unknown, use this chapter for investigation purposes.

Case Investigation Checklist

- Confirm the clinical presentation of the patient.
- Ascertain what testing has been done, including lab testing, lumbar puncture, and MRI.
- Ask the treating physician, preferably the neurologist, to complete the [*Acute Flaccid Myelitis: Patient Summary Form*](#).
 - EAIDB does NOT recommend that the LHD complete the form themselves.
 - Submit the *Acute Flaccid Myelitis: Patient Summary Form* to EAIDB.
- EAIDB will obtain approval from CDC for testing.
- Collect specimens to submit to CDC for testing (Table 1).

Control Measures

Control measures will depend on the causative agent; however, proper hand hygiene will help in controlling spread. Standard precautions in healthcare facilities should be implemented.

Exclusion

Anyone with a fever should be excluded from work or school until 24 hours have passed fever-free without the use of an anti-fever medication. Anyone with diarrhea should be excluded from work or school until 24 hours have passed diarrhea-free without the use of an anti-diarrheal medication.

If the etiology is determined, there may be additional exclusion criteria that apply.

MANAGING SPECIAL SITUATIONS

Outbreaks

If an outbreak of AFM is suspected, notify the regional DSHS office or to EAIDB at (512) 776-7676.

REPORTING AND DATA ENTRY REQUIREMENTS

Provider, School & Child-Care Facilities, and General Public Reporting Requirements

Acute flaccid myelitis is not currently a reportable condition in and of itself. However, certain illnesses that cause AFM (e.g., polio, varicella, West Nile) may be reportable and should be reported according to Texas Administrative Code requirements for these conditions.

EAIDB requests that patients with suspected AFM be reported within one week to the local or regional health department or the Texas Department of State Health Services (DSHS), Emerging and Acute Infectious Disease Branch (EAIDB) at (800) 252-8239 or (512) 776-7676.

Local and Regional Reporting and Follow-up Responsibilities

Local and regional health departments should:

- Fax the *Acute Flaccid Myelitis: Patient Summary Form* as soon as possible to EAIDB. The form will be needed to facilitate lab testing with CDC.
 - Fax forms to **512-776-7616**
 - Forms should be faxed once enough information has been collected to establish that a patient meets probable or confirmed case status.
- Once the investigation is complete, fax or mail a completed *Acute Flaccid Myelitis: Patient Summary Form* within 30 days to EAIDB.
 - Fax forms to **512-776-7616** or mail to:

Infectious Disease Control Unit
Texas Department of State Health Services
Mail Code: 1960
PO Box 149347
Austin, TX 78714-9347

When an outbreak is investigated, local and regional health departments should:

- Report outbreaks within 24 hours of identification to the regional DSHS office or to EAIDB at 512-776-7676.

LABORATORY PROCEDURES

Clinicians treating patients meeting the AFM case definition should pursue laboratory testing of cerebrospinal fluid (CSF), blood, serum, respiratory, and stool specimens for enteroviruses, West Nile virus, and other known infectious etiologies at their usual clinical and reference laboratories. Clinicians may contact the local health department and/or DSHS for assistance with any testing that is not available locally. Specimens should not be shipped to DSHS or CDC without first consulting with the local health department. Along with the specimens listed below, CDC would also require a copy of the MRI report for patients reported with suspect AFM.

Clinicians should collect specimens from patients suspected of having AFM as early as possible in the course of illness, preferably on the day of onset of limb weakness. Early specimen collection has the best chance to yield a diagnosis of AFM. The specimens which should be collected include the following:

- Cerebrospinal fluid (CSF) **AND**
- Blood (serum and whole blood), **AND**
- Stool (preferably two stool specimens collected as soon after onset of limb weakness and separated by 24 hours)

CDC advised overnight shipment of available clinical specimens, within 24-48 hours of specimen collection if possible, from patients that meet the clinical case definition. Please ship specimens overnight so they arrive at CDC on Tuesday through Friday. Do not ship specimens on Friday or over the weekend.

For specimens that should be frozen, please freeze them at -20°C and make arrangements to ship the specimens overnight to CDC frozen on dry ice.

For specimens that should be sent refrigerated, please store them at 4°C and make arrangements to ship the specimens overnight to CDC on cold packs. Specimens should not have direct contact with the cold packs during shipping.

Specimens from each patient should be shipped with completed hard copies of the following:

- The [Acute Flaccid Myelitis Patient Summary Form](#)
- A CDC [specimen submission form 50.34](#) **FOR EACH SPECIMEN**. Please note that, for the Test Order Name, select “Picornavirus Special Study.”

If ten or more patient specimens are submitted, please provide an electronic line listing by email. Use the following headers in this order: patient ID number; date of birth; sex; onset date; fatal y/n; specimen ID number; specimen collection date; specimen type; if culture isolate—cell line and passage number.

Prior to shipping, coordinate with Central Office staff regarding specimens shipped.

Additional instructions regarding specimen collection, storage, and shipping can be found at: <https://www.cdc.gov/acute-flaccid-myelitis/hcp/instructions.html>

*For stool specimens, CDC recommends that healthcare providers rule out poliovirus infection in cases of acute flaccid paralysis (AFP) that are clinically compatible with polio, including those with anterior myelitis. Recommendations for polio testing can be found at: <http://www.cdc.gov/polio/us/hcp.html>. CDC can do testing for polio if the reporting facility cannot.

TABLES

Table 1: Specimens to Collect from Suspect AFM Cases

Specimen Type		Minimum Amount	Collection	Storage	Shipping	Comments
Required Specimens						
Cerebrospinal fluid (CSF)		2 mL	Unspun; standard cryovial tube; collect at same time or within 24 hours as whole blood	Refrigerate at 4°C	Ship overnight on cold packs. Ship within 24-48 hours of collection*	Tubes should be insulated during shipping to ensure they are not in direct contact with cold pack
Cerebrospinal fluid (CSF)		1 mL	Spun and processed; standard cryovial tube; collect at same time or within 24 hours as whole blood	Freeze at -20°C	Ship on dry ice	
Serum		0.4 mL	Spun and processed; Tiger/red top tube	Freeze at -20°C	Ship on dry ice	
Whole blood		3-5 mL	Unspun; lavender/green top tube (with anticoagulant); collect at same time or within 24 hours as CSF	Refrigerate at 4°C	Ship overnight on cold packs. Ship within 24-48 hours of collection*	Tubes should be insulated during shipping to ensure they are not in direct contact with cold pack
Stool	Whole stool (preferred)	≥1gram	Collect in sterile container, no special medium required	Freeze at -20°C	Ship on dry ice	Two samples total, collected at least 24 hours apart, both collected as early in illness as possible and ideally within 14 days of illness onset
	Rectal swab	≥1gram	Store in viral transport medium	Freeze at -20°C	Ship on dry ice	Two samples total, collected at least 24 hours apart, both collected as early in illness as possible and ideally within 14 days of illness onset

Optional Specimens					
Respiratory - NP/OP swab	1ml	Store in viral transport medium	Freeze at -20°C	Ship on dry ice	Send only if EV/RV positive for typing
<i>In the event of death, please send the following specimens, if possible</i>					
Fresh-frozen tissue		Place directly on dry ice or liquid nitrogen	Freeze at -70°C	Ship on dry ice	Representative sections from various organs are requested, but particularly from brain/spinal cord (including gray and white matter), heart, lung, liver, kidney, and other organs as available.
Formalin-fixed or formalin-fixed, paraffin-embedded tissue		Avoid prolonged fixation—tissues should have been fixed in formalin for 3 days, then transferred to 100% ethanol	Room temperature	Ship at room temperature with paraffin blocks in carriers to prevent breakage	See comment above regarding frozen tissue

** If specimens cannot be shipped within 24-48 hours of collection, consider recollection, if feasible.*

UPDATES

April 2017

- Investigation form updated to fit CDC's case definition
- Links were updated to the most recent patient summary forms from the CDC
- Specimen collection tables were updated to reflect changes to testing procedures at the CDC