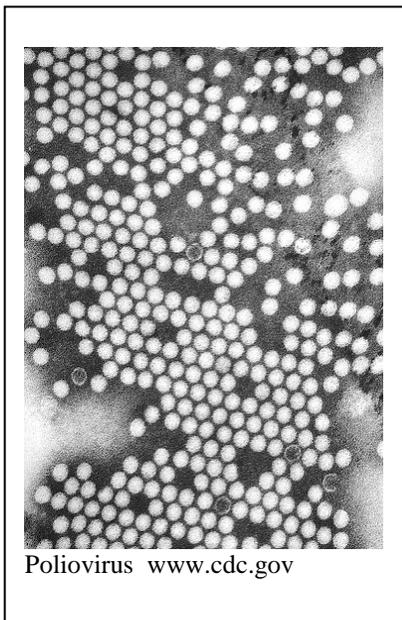


# *epi*TRENDS

A Monthly Bulletin on Epidemiology and Public Health Practice in Washington

Eradication of poliomyelitis (polio) is a global public health goal. As polio cases become increasingly rare, surveillance for the disease becomes more challenging. One approach is to conduct surveillance for related syndromes, such as flaccid paralysis.

## **Acute Flaccid Myelitis**



Acute flaccid myelitis (AFM) is a condition defined by acute focal limb weakness with either MRI abnormalities in the grey matter of the spinal cord or presence of pleocytosis (elevated white blood cell count) in cerebrospinal fluid (CSF). AFM can be caused by a variety of viruses. In the fall of 2014, Centers for Disease Control and Prevention (CDC) received an increased number of AFM reports of children across the United States. Cases have continued to be reported to CDC since then, and national efforts are being made to improve surveillance, establish risk factors and causes, and develop potential preventive measures or therapies for this condition.

AFM is a subset of the syndrome acute flaccid paralysis (AFP). AFP includes all conditions that can cause rapid onset of limb weakness, regardless of the etiology, and its surveillance is the gold standard defined by the World Health Organization (WHO) for polio eradication surveillance activities around the world. The expected incidence of non-polio AFP is one case per 100,000 population under 15 years of age per year, and its most common cause is Guillain-Barré syndrome. In the United States, AFP is not a notifiable condition.

Although polio virus has been eradicated in most countries including the United States, the disease remains endemic in Afghanistan and Pakistan

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(20 and 54 cases reported in 2015, respectively). Until disease transmission is interrupted in these countries, all regions remain at risk for importation of polio. As polio infection is one cause of AFM, maintaining an adequate surveillance system for AFM can also be effective for maintaining surveillance for polio.

### ***Epidemiology and Etiology of AFM***

Using the 2014 outbreak case definition (onset of acute limb weakness on or after August 1, 2014, and a MRI showing a spinal cord lesion largely restricted to gray matter in a patient age under age 21 years), CDC verified reports of 120 children in 34 states who developed AFM between August 2014 and July 2015. The median age of the children was about 7 years. Most patients had experienced fever and/or respiratory illness before the onset of neurologic symptoms. Almost all of these children were hospitalized, and some required ventilator support. About 70% of the children had pleocytosis in the CSF, often with elevated protein levels also present. Among a group of these children who were observed for a median of 19 days after their illness, two thirds reported some improvement in symptoms, while about one third showed no improvement. However, only two of the children have fully recovered.

In 2015, 20 confirmed AFM cases from 12 states were reported to CDC. By April 2016, an additional five confirmed cases had been reported nation-wide.

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#### ***epi*TRENDS Monthly Posting Alert**

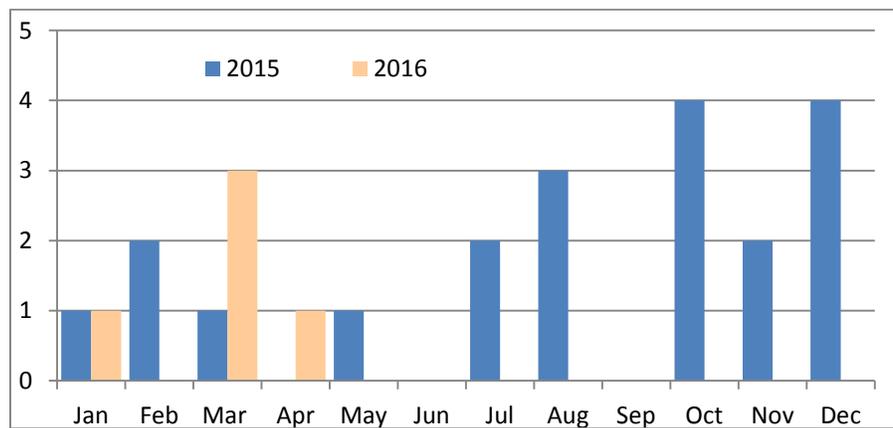
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**Figure 1. Number of confirmed acute flaccid myelitis cases reported to CDC, January 2015 – March 2016**

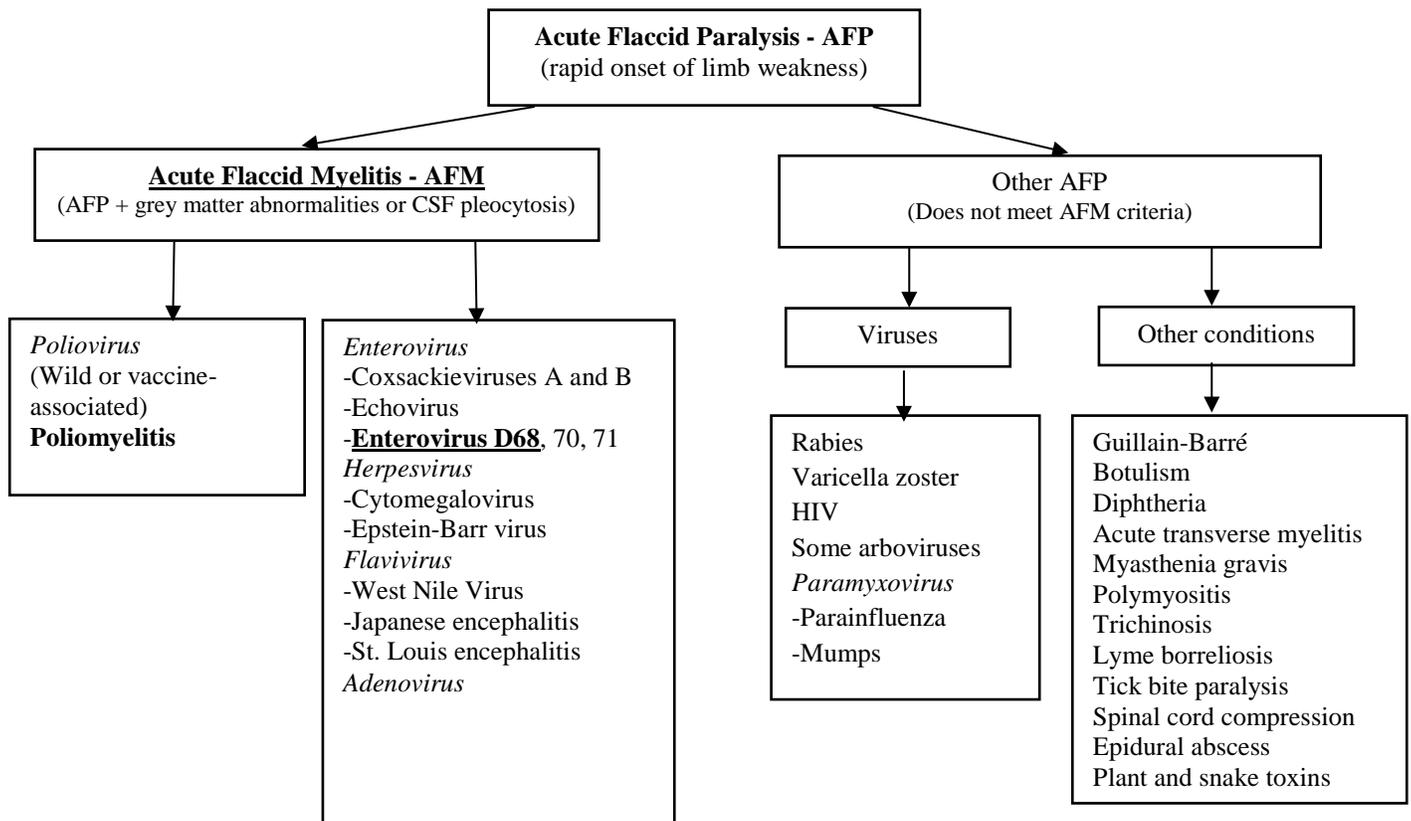


The apparent increase in cases of AFM in 2014 coincided with a national outbreak of severe respiratory illnesses among children caused by enterovirus D68 (EV-D68). However, despite this close association in timing, a single cause for the 2014 acute flaccid myelitis cases has not been determined. CDC tested many different

specimens from these patients for a wide range of pathogens that can cause AFM. One CSF specimen was positive for both EV-D68 and Epstein-Barr virus by real-time PCR, but was noted to have 1500 red blood cells, making interpretation of these results challenging. All other CSF specimens were negative. A total of 20 cases had respiratory specimens that tested positive for enterovirus/rhinovirus. Of these, eight were positive for EV-D68, ten for a variety of rhinoviruses, and two for other enteroviruses. None of 50 stool specimens obtained tested positive for poliovirus.

Although the specific cause of this increase in AFM cases is still under investigation, the illnesses are most similar to others that were confirmed as having a viral etiology. Viruses that have been associated with AFM include: Enteroviruses (polio and non-polio), West Nile virus (WNV), Japanese encephalitis virus, Saint Louis encephalitis virus, Herpesviruses (such as cytomegalovirus and Epstein-Barr virus), and Adenoviruses. It is likely that the increase in AFM is due to increased surveillance that detected cases due to a range of agents rather than an outbreak due to a single etiology.

**Figure 2. Acute flaccid paralysis and acute flaccid myelitis – most common etiologies**



### **Washington Surveillance**

Washington State reported three cases of AFM in the fall of 2014. Coxsackie virus A16 was found by a CDC laboratory in two stool samples from one patient. The other two patients tested negative for enteroviruses or other causative organisms. No cases were reported from Washington in 2015 in any age group. As of May 2016, one probable AFM case in an adult had been reported. This patient tested negative for enteroviruses.

Washington State Department of Health is again emphasizing the importance of continuing the vigilance and notification of AFM cases among all age groups, irrespective of laboratory results. Clinicians suspecting AFM should notify their local health jurisdiction to arrange laboratory testing. Specimens from suspected AFM patients should be collected as early as possible, ideally on the day of weakness onset. CSF, serum, nasopharyngeal/oropharyngeal swab, and two stools should be collected. A detailed exposure history, particularly recent travel, is essential.

Emerging pathogens may be difficult to detect initially. Even rare conditions can rapidly cross oceans and continents in an era of global travel. Detecting an increase in an unusual syndrome such as AFM may be an indication that a new agent is present or that a condition such as polio has expanded its range. Surveillance and testing may then identify the agent involved. Until polio is eradicated, it is important to maintain surveillance that could detect a case so that public health response could be rapidly initiated.

### ***Resources***

CDC case notification form for AFM

<http://www.cdc.gov/acute-flaccid-myelitis/downloads/patient-summary-form.pdf>

CDC specimen collection instructions for AFM

<http://www.cdc.gov/acute-flaccid-myelitis/hcp/instructions.html>

CDC interim guidelines for AFM clinical management

<http://www.cdc.gov/acute-flaccid-myelitis/downloads/acute-flaccid-myelitis.pdf>

CDC AFM surveillance

<http://www.cdc.gov/acute-flaccid-myelitis/afm-surveillance.html>

Washington State local health jurisdictions

<http://www.doh.wa.gov/AboutUs/PublicHealthSystem/LocalHealthJurisdictions>