Acute Flaccid Myelitis (AFM): Evolution of the Case Definition and Public Health Surveillance, United States

Last updated March 7, 2019

Objectives

- Provide a history of the evolution of the case definition for AFM

- Describe the information needed to report cases suspected of having AFM to public health for case classification

Slide 2 notes

This presentation provides a history of the evolution of the case definition for AFM that is used for surveillance in the United States. Slides will also emphasize the importance of identifying and reporting cases of AFM and the information needed when reporting cases suspected of having AFM.

Investigation of AFM in the US, 2014

- **On September 12, 2014 CDC was notified of 9 children in Colorado with:**
  - Focal extremity weakness, cranial nerve dysfunction or both
  - MRI: multi-level gray matter lesions of the spinal cord, brainstem, or ventral nerve roots

- **A large outbreak of respiratory illness due to enterovirus D-68 (EV-D68) occurred at the same time in Colorado; although a temporal association was noted, laboratory testing of cerebrospinal fluid did not provide conclusive evidence of a single pathogen as a cause**

- **In response to these cases, CDC launched a surveillance system to capture AFM cases nationwide**

Slide 4 notes

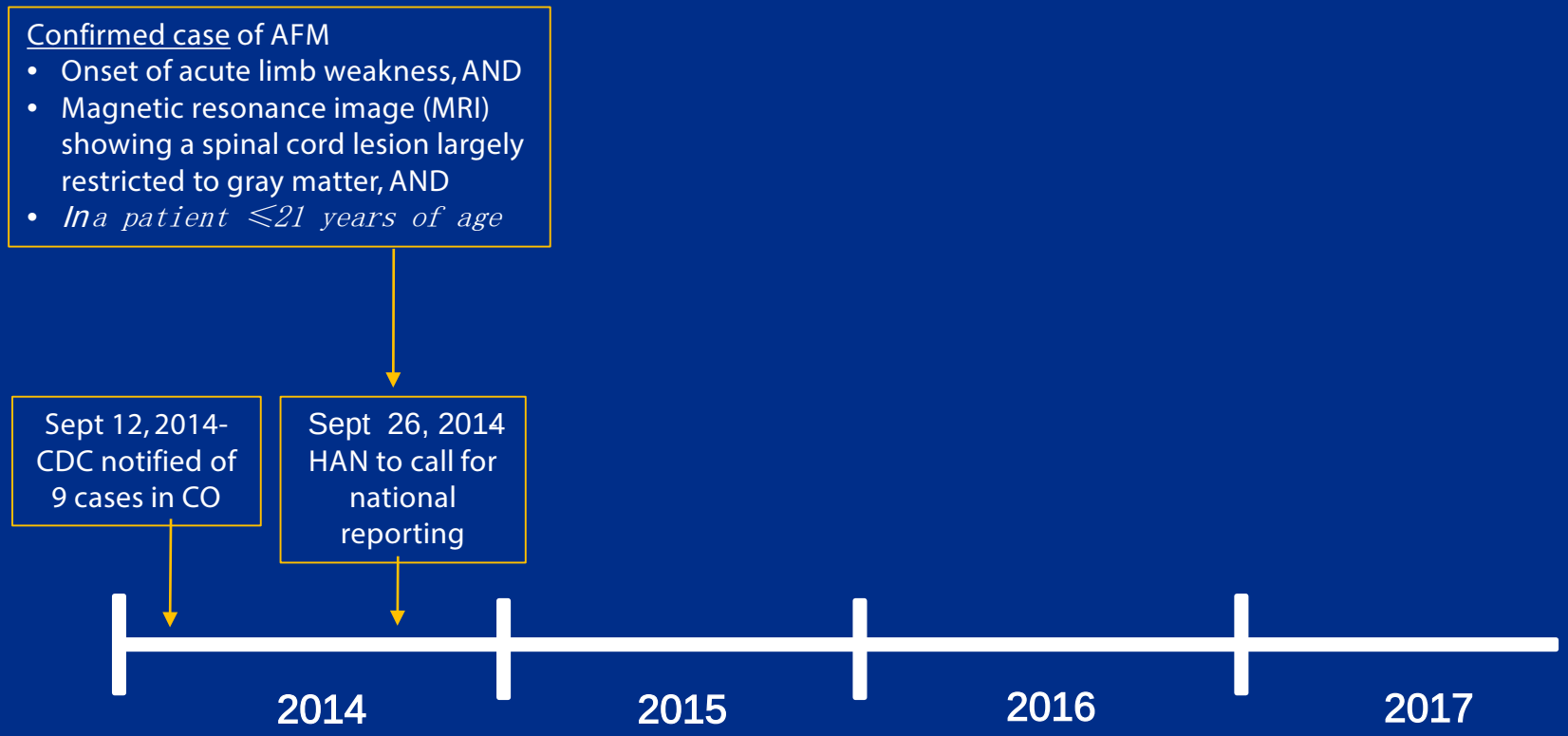
The national investigation of AFM began when CDC was notified on September 12, 2014 of 9 children in Colorado presenting with:

- Focal extremity weakness, cranial nerve dysfunction or both AND
- An MRI with gray matter lesions involving multiple segments of the spinal cord, brainstem, or ventral nerve roots

A large number of cases of respiratory illness due to enterovirus D-68, or EV-D68 were happening at the same time in Colorado. Although a temporal association was noted, laboratory testing of cerebrospinal fluid did not provide conclusive evidence of a single pathogen as a cause.

In response to these cases, CDC launched a surveillance system to capture AFM cases nationwide.

Evolution of the surveillance case definition for AFM

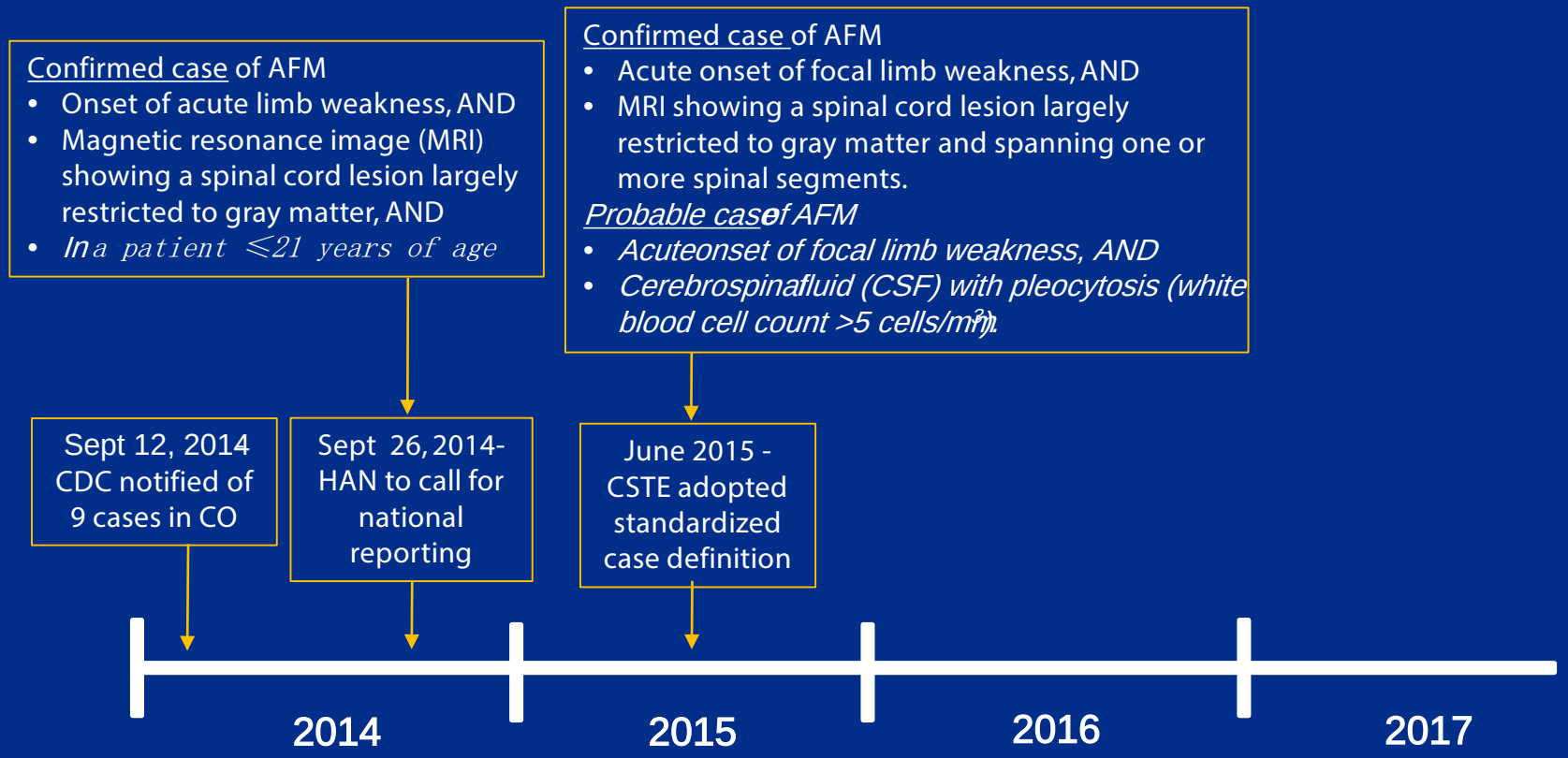


Slide 6 notes

To determine the extent of the problem, CDC released an official Health Advisory through the Health Alert Network on September 26, 2014 requesting that states with patients meeting the case definition for AFM report them to CDC.

The case definition proposed for national reporting included the following: A patient with acute onset of focal limb weakness AND predominant gray matter lesions on spinal MRI, in a person 21 years of age or younger, occurring on or after August 1, 2014

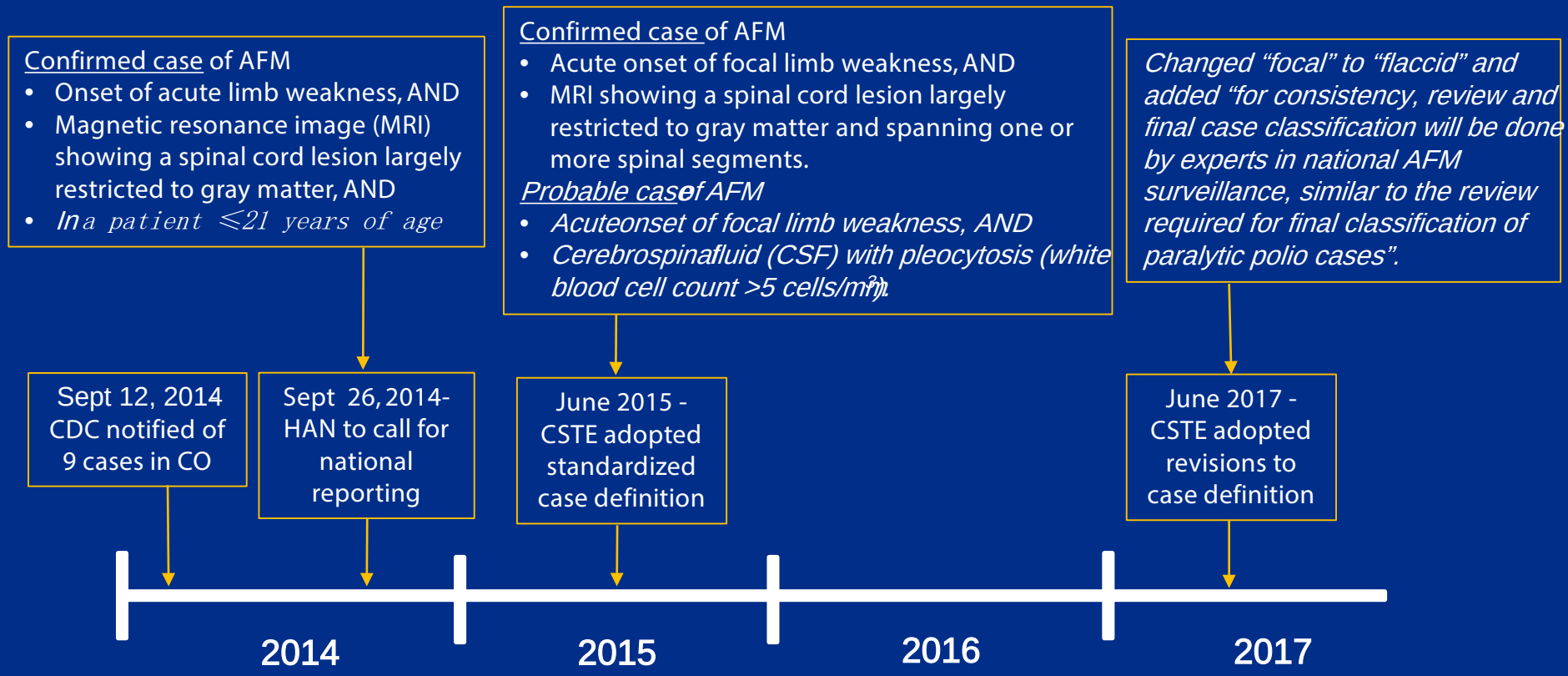
Evolution of the surveillance case definition for AFM



Slide 8 notes

In 2015, the case definition was opened to persons of all ages to cast a wider net for cases. In addition, a probable case definition was added to include cases without MRI findings but with CSF pleocytosis. We know that MRI images can be normal in the first 72hrs after limb weakness, so this probable definition allowed us to capture cases who never got a repeat MRI. Case counts were low in 2015 despite heightened awareness after the spike in 2014.

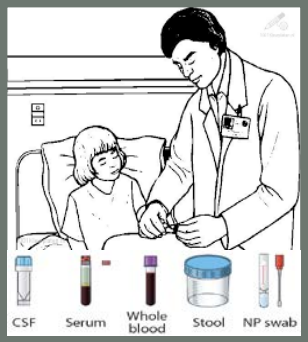
Evolution of the surveillance case definition for AFM



Slide 10 notes

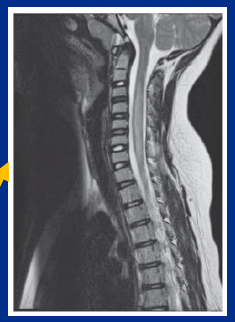
After a resurgence in cases in 2016, we modified the confirmed case definition in 2017 to change “focal” to “flaccid” to specify the type of weakness. We also added that the final case classification is to be done by a national panel of experts in AFM, similar to what is done for paralytic polio cases.

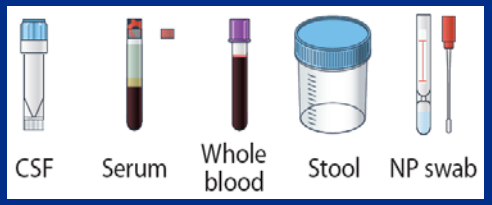
Reporting of cases of suspected AFM



Clinician suspects AFM and:

- **performs MRI**
- **obtains specimens**
- **completes patient summary form**

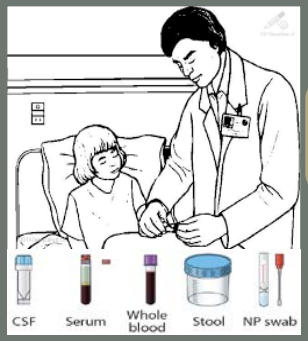




Slide 12 notes

When a clinician suspects a patient has AFM, an MRI should be performed and specimens collected. Clinicians should contact their state or local health department to report the suspected case of AFM as soon as possible. Specimen collection includes CSF, serum, stool and nasopharyngeal (NP) swabs which are used for both patient-specific diagnostic testing as well as to inform the overall national investigation into the etiology of AFM. Although certain tests can be performed at the local hospital or lab, all specimen types should still be sent to CDC as well for additional testing including enterovirus typing, pathogen discovery, and immune markers.

Reporting of cases of suspected AFM



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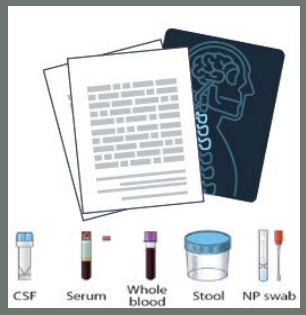
State and Local Health Department



State and local health departments:

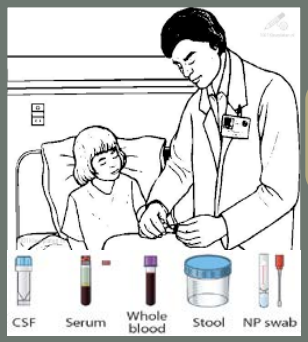
- **Reviews information from suspect case**
- **Collects medical data***
- **Coordinates specimen transport**

* Medical data includes: hospital notes, neurology and infectious disease consult notes, MRI reports and images, laboratory test results, vaccination history, and discharge summary when available

Slide 14 notes

The health department then reviews the information, works to collect the medical data, which includes hospital notes, neurology and infectious disease consult notes, MRI reports and images, laboratory test results, vaccination history, and discharge summary when available, and coordinates with CDC to send the information and samples. These data are used to classify cases and investigate potential etiologies and risk factors for AFM.

Reporting of cases of suspected AFM



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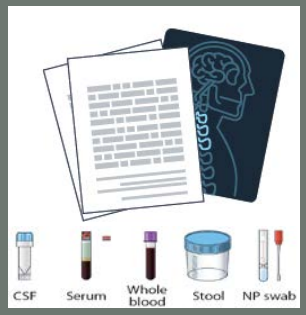

State and local health departments:
- **Reviews information from suspect case**
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CDC

Confirmed | Probable

Case determination made by expert panel
- **Patient form and medical data**
- **MRI reports and images**

* Medical data includes: hospital notes, neurology and infectious disease consult notes, MRI reports and images, laboratory test results, vaccination history, and discharge summary when available

Slide 16 notes

CDC will then forward the information to the expert neurology panel which is comprised of both CDC and external experts. The panel classifies cases as either Confirmed, Probable or Not a Case. Beginning in 2017, two neurologists are assigned to review each case. If their determinations are discordant, a third is brought in for adjudication.

Reporting of cases of suspected AFM

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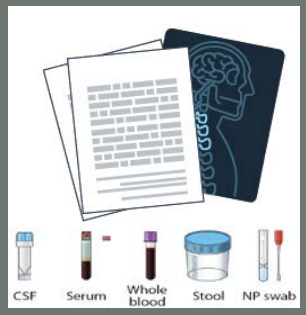
State and Local Health Department



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CDC

Confirmed | Probable

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Case determination sent to State/ Local Health Department by CDC

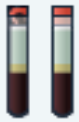
Case determination sent to clinician by State/Local Health Department

* Medical data includes: hospital notes, neurology and infectious disease consult notes, MRI reports and images, laboratory test results, vaccination history, and discharge summary when available

Slide 18 notes

The case classification report is then forwarded to the health department, who then communicates the information to the clinician. It is important to point out that this case classification DOES NOT take the place of the medical diagnosis for the patient. It is used for public health surveillance purposes, including measuring disease burden and evaluating trends. It is NOT meant to supersede the physician's final diagnosis for their patient.

Specimens to collect and send to CDC for testing of cases of suspected AFM

SAMPLE	AMOUNT	TUBE TYPE	PROCESSING	STORAGE	SHIPPING
CSF	1mL (collect at same time or within 24hrs of serum)	Cryovial 	Spun and CSF removed to cryovial	Freeze at -20°C	Ship on dry ice
Serum	≥0.4mL (collect at same time or within 24 hours of CSF)	Tiger/red top 	Spun and serum removed to tiger/red top.	Freeze at -20°C	Ship on dry ice
Stool	≥1 gram (2 samples collected 24hrs apart)	Sterile container 	n/a	Freeze at -20°C	Ship on dry ice. Rectal swabs should not be sent in place of stool.
Respiratory (NP)/ Oropharyngeal (OP) swab	1ml (minimum amount)	n/a 	Store in viral transport medium	Freeze at -20°C	Ship on dry ice

Slide 20 notes

This table illustrates which samples to collect and send to CDC for AFM testing.

CSF, respiratory, and stool specimens are now all being tested for enteroviruses and results are provided within 7-10 days of receipt at CDC. Stool specimens are also tested for poliovirus and those results are also communicated within 14 days.

Remaining CSF and serum specimens will be used to inform the overall pathogenesis and potential etiologies of AFM through pathogen discovery and evaluation of immune-mediated mechanisms. Since these tests are not intended to provide patient-specific diagnoses and are not CLIA-certified, results will not be provided to the submitter. Information learned from surveillance testing will be disseminated rapidly to health departments, providers, and the general public when available.

Summary

- **Clinician awareness is critical to understanding more about this rare illness**
  - We need all clinicians to be vigilant for AFM
    - Urgent care/emergency room physicians, general pediatricians, family physicians, nurse practitioners, infectious disease specialists, neurologists, radiologists, infection control practitioners, etc.
- **Suspected cases of AFM should be reported to the health department and specimens should be collected as soon as possible**
  - Sharing of information leads to improved understanding of AFM and its pathogenesis to help inform treatment and prevention strategies

Slide 22 notes

In summary, clinician awareness is critical to helping us better understand this rare illness.

That is why we need all clinicians to remain vigilant for AFM, including urgent care and emergency room physicians, general pediatricians, family physicians, nurse practitioners, infectious disease specialists, neurologists, radiologists, infection control practitioners, and others

Suspected cases of AFM should be reported to the health department and samples should be collected as soon as possible.

Sharing of information will lead to improved understanding of AFM and its pathogenesis which will help inform treatment and prevention strategies for your patients.

For additional information visit:

www.cdc.gov/afm

Contact CDC at: AFMinfo@cdc.gov