

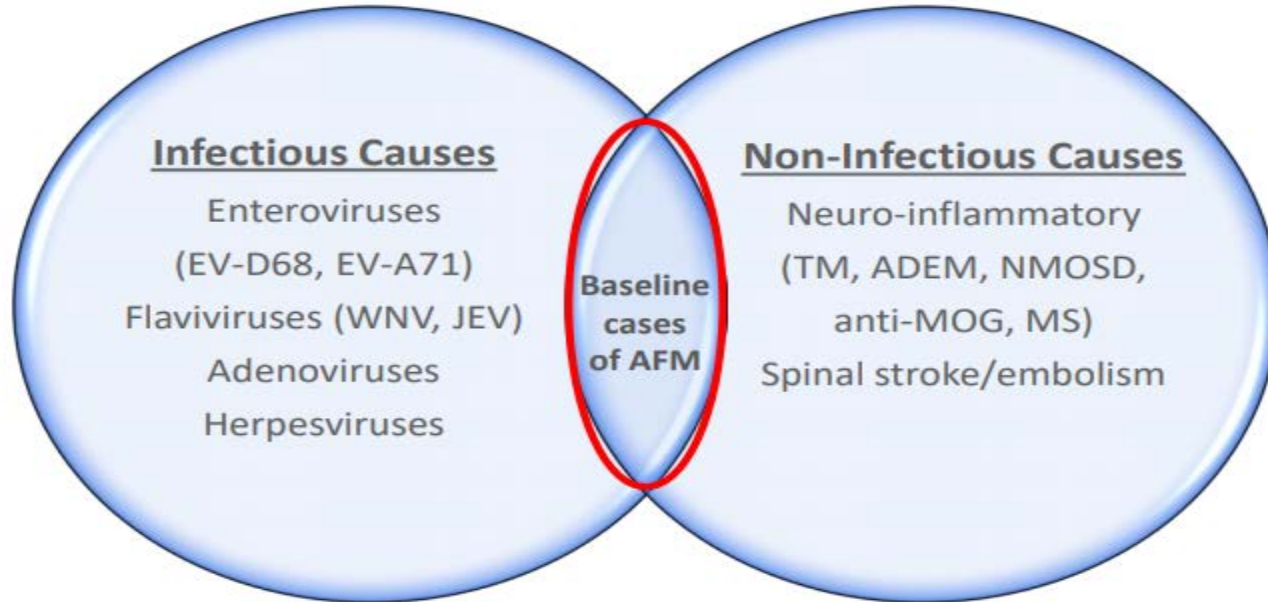


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Infectious Diseases Approach to Patients with Possible Acute Flaccid Myelitis

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Baseline cases of AFM have multiple causes



Excerpted from Routh, CDC, AFM Update 2019

<https://www.cdc.gov/ddid/bsc/afm/docs/CDC-BSC-AFM-update-6Dec2019-H.pdf>



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AFM: Differential Diagnosis

	Poliomyelitis	Acute Flaccid Myelitis	Transverse Myelitis	Guillain-Barre	Stroke
Symptom onset	Days	Hours-Days	Hours-Days	Days	Minutes
Weakness	Lower>Upper, Asymmetric	Usually 1 limb but can be multiple) Upper>Lower	Multiple limbs	Legs>Arm Symmetric	Usually lateralized
Reflexes	Diminished or absent	Diminished/ absent (may be present early)	Diminished/ Absent acutely	Diminished/ absent (may be present early)	Diminished/ absent acutely; then hyperreflexic
CSF	pleocytosis	pleocytosis	pleocytosis	Cytoalbumino-dissociation	Usually normal
MRI Finding	Gray matter predominant	Gray matter predominant	Gray and white matter	Nerve root enhancement only	Often anterior with diffusion restriction

Also consider: Acute Disseminated Encephalomyelitis, **Botulism**, Tick paralysis

Key Exposure, Epidemiologic, and Physical Examination Aspects of Infectious Diseases Evaluation

- **History**
 - Symptoms: Respiratory or Diarrheal Illnesses and timing
 - Travel: International, Regional US
 - Exposures
 - Tick and Mosquito
 - Animals
 - Food/Water
 - Sick Contacts
 - Sexual Exposures
 - Vaccination history and timing
- **Physical Findings**
 - Detailed Skin Examination: Vesicular rashes, Embolic Lesions
 - Intra-oral enanthems
 - Hepatosplenomegaly



Infectious Differential Diagnosis of Transverse Myelitis

Viruses

- Enteroviruses
 - EV71, EVD68
- Parechovirus
- Herpesviruses
 - **HSV**, VZV, EBV, CMV
- Flaviviruses
 - West Nile Virus
 - Zika Virus
 - Japanese Encephalitis Virus
 - Other Arboviruses
- Parvovirus
- HIV
- Hepatitis B
- MMR
- Respiratory Viruses: Influenza, Adenovirus

Bacteria

- **Borrelia burgdorferi**
- Syphilis
- Tuberculosis
- Actinomycosis
- Mycoplasma

Fungi

- Aspergillus
- Endemic Fungi
 - Cocci, Blasto, Histo
- Cryptococcus

Parasite

- Toxoplasma
- Cysticercosis
- Schistosomiasis
- Angiostrongyloides



Infectious Differential Diagnosis of Poliomyelitis-like

Viruses

- Enteroviruses
 - Poliovirus
 - EV71, EVD68
- Flaviviruses
 - West Nile Virus
 - Japanese Encephalitis Virus
 - Other Arboviruses
 - Powassan



Empiric Antimicrobials in setting of Possible AFM

- Most of the infectious differential does not have targeted antimicrobial therapy, or when available not emergent
- Key Exceptions:
 - HSV: Acyclovir (intravenous)
 - 5-10 mg/kg/dose IV q8 hours
 - Lyme: Ceftriaxone (intravenous)
 - 50 mg/kg/day IV q 24 hours , to max of 2 grams q24

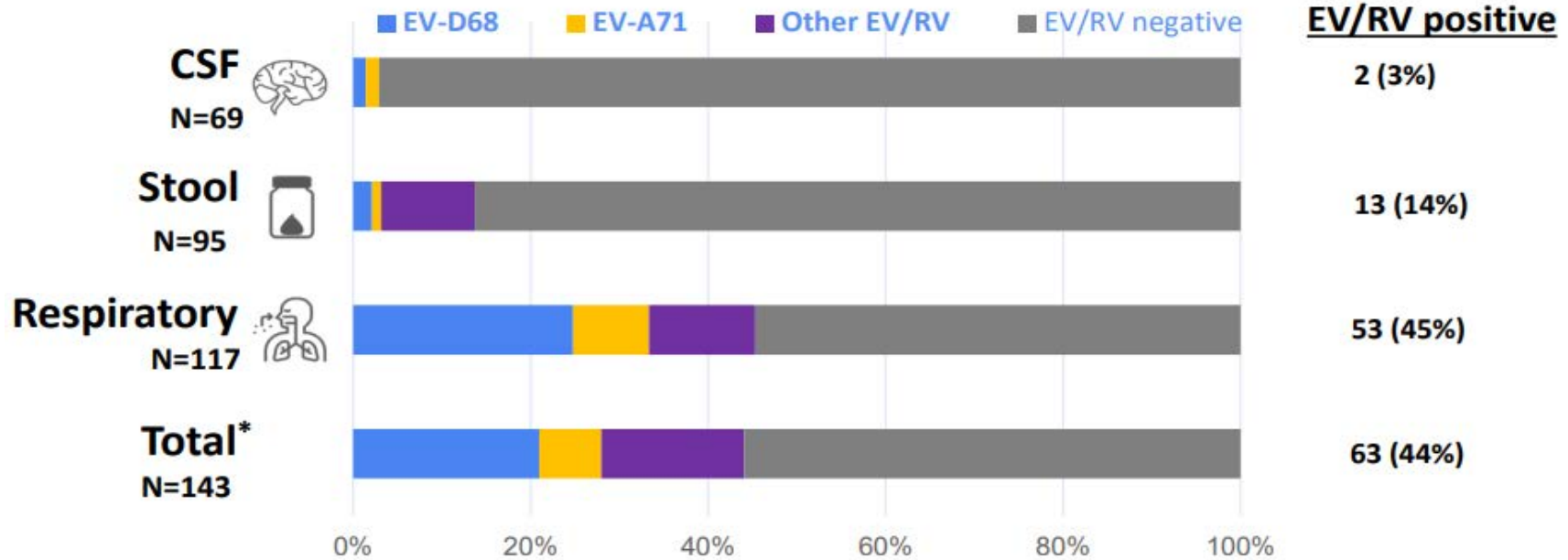
Infectious Laboratory Testing in setting of Possible AFM

- Serum samples
 - Serology:
 - West Nile Virus IgG/IgM
 - VZV, CMV IgG/IgM
 - EBV acute antibody panel: VCA IgM, VCA IgG, EBNA IgG
 - Lyme Antibody Screen/Reflex WB
- Respiratory samples
 - Multiplex PCR:
 - includes Enterovirus/rhinovirus, Adenovirus, Influenza
- CSF
 - Multiplex PCR:
 - includes Enterovirus, HSV, EBV, CMV, VZV
 - Antibody:
 - West Nile virus IgG/IgM and PCR
 - Lyme CSF Indexing panel
- GI tract:
 - EV PCR throat and rectal
- Samples for CDC molecular testing – the earlier the better



AFM diagnostic testing remains low yield

CDC testing results, 2018



*Some patients had multiple positive specimens

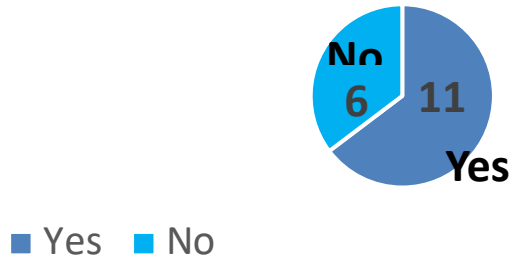
Lopez, et al. Vital Signs: Surveillance for Acute Flaccid Myelitis – US, 2018, MMWR 2019

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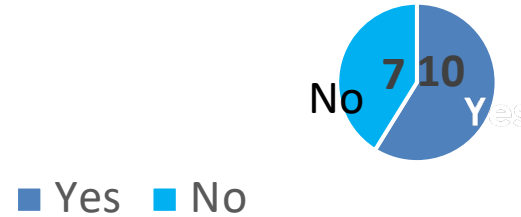
Children's National AFM Cases

- 17 patients
 - 2014-2018
 - Average age **6.4** years (6 months-16 years)

CSF Pleocytosis



Presented with single limb weakness



Other presenting neurological symptoms:

- Generalized weakness/ataxia(3)
- BLE weakness (2)
- Ophthalmoplegia

Childrens National AFM Infectious Evaluation to Date

- **CNH Cases** → Positive infectious work-up in 8 of 17 cases
 - **Enterovirus (5)**
 - Coxsackie B (2; CSF, NP, Stool, Serum)
 - Enterovirus A71 (1; stool)
 - Unspecified Enterovirus (2)
 - **West Nile Virus** (1; serum IgM)
 - **Parvovirus** (1)
 - **Parechovirus** (1; stool)
- **CDC data (596 cases)**
 - Only 4 cases with pathogens identified in CSF
 - Coxsackie A16, EV-A71, EV-D68



Children's National Teams for Response to Emerging Infectious Diseases

Special Pathogens Isolation Unit and Response Team



Infectious Diseases and Infection Control Divisions



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