

Key Points — Investigation of Neurologic Illness with Limb Weakness of Unknown Cause in Children

Note: Newly added information is in red.

- In mid-August, CDC received a report from the Colorado Department of Public Health and Environment (CDPHE) about a cluster of 9 pediatric patients at Children’s Hospital Colorado with sudden onset of unexplained neurologic illness.
 - All children developed a sudden onset of muscle weakness in one or more arms or legs, and/or signs of impairment of brain function controlling head muscles, producing problems such as double vision (diplopia), sagging of the face (facial droop), difficulty swallowing (dysphagia), and/or difficulty controlling the muscles that help us speak (dysarthria).
 - All of the children had fever, most with symptoms of respiratory illness, about one week before onset of muscle weakness.
 - Nearly all of the children had MRI scans that detected abnormalities in the gray matter in the spinal cord.
 - It is too early to know if these children will fully recover
- Initial tests of the children’s cerebrospinal fluid (CSF) have been negative for all viruses, including West Nile virus and enteroviruses (polio and non-polio).
 - *Virus detected in the spinal fluid would be good evidence to indicate that virus caused the neurologic symptoms. But lab tests of spinal fluid sometimes fail to identify some viruses, even if they cause the disease. So we can’t rule out a virus because of a negative spinal fluid test.*
- Respiratory specimens from eight of the children were tested using a respiratory viral panel; two were negative and six were positive for rhinovirus/enterovirus. Of the six, four were positive for enterovirus D68 (EV-D68), one was positive for rhinovirus A24 and adenovirus, and one was positive for a rhinovirus/enterovirus other than EV-D68.
 - *Detecting common viruses in the nasal cavity is not unexpected and does not necessarily indicate cause of neurologic illness such as muscle weakness.*
- On September 26, CDC issued a request to all states to look for and report other similar neurologic illnesses, especially cases clustered in time and place, with particular interest in characterizing the epidemiology, clinical picture and causes of such cases.
 - **As of October 15, CDC has verified reports of 37 cases in 16 states that meet our case definition.** We are working with healthcare professionals and state and local officials to investigate all of these cases.
 - **We are also in the process of verifying more than a dozen additional reports.** These investigations take time and are in the early stages. Therefore, the number of cases will likely increase further as we update these numbers weekly on **Thursday starting next week**, but the increase will not necessarily reflect changes in occurrence of cases in real time.
- The United States is currently experiencing a nationwide outbreak of enterovirus D68 (EV-D68) associated with severe respiratory illness.
 - Among possible causes, we are investigating whether these cases of neurologic illness may be linked to this large EV-D68 outbreak.
- Enteroviruses are known to be one of the causes of neurologic illness in children. They most commonly cause aseptic meningitis, less commonly encephalitis, and rarely, acute myelitis and paralysis.
 - CDC is aware of two published reports of children with neurologic illnesses confirmed as enterovirus D68 (EV-D68) infection from cerebrospinal fluid (CSF) testing.
- Neurologic illness with muscle weakness can result from a variety of noninfectious and infectious causes, including Guillain-Barre syndrome, a disorder caused by an abnormal immune response; enterovirus (polio and non-polio); adenovirus; West Nile virus and similar viruses; and herpesviruses.
 - Attempts to identify the causes of neurologic illness with muscle weakness have historically been challenging, especially with respect to infectious agents.

Guidance for Healthcare Professionals

(on the next page)

Clinicians should

- immediately report to their state or local health department any patients who meet the following case definition:
 1. Patients \leq 21 years of age,
 2. Acute onset of focal limb weakness,
 3. Occurring on or after August 1, 2014, **and**
 4. an MRI showing a spinal cord lesion largely restricted to gray matter.
- consult with their local and state health department for laboratory testing of stool, respiratory and cerebrospinal fluid specimens for enteroviruses including poliovirus, West Nile virus and other known infectious etiologies for patients meeting the above case definition.

Health departments should

- report patients meeting the case definition to CDC by email at limbweakness@cdc.gov or secure fax at 404-471-8442, using a patient summary form available on the CDC website (<http://www.cdc.gov/ncird/investigation/viral/sep2014.html>).
- contact CDC for further laboratory and epidemiologic support by phone through the CDC Emergency Operations Center (770-488-7100), or by email at limbweakness@cdc.gov. Confirmation of the presence of EV-D68 currently requires typing by molecular sequencing.

Guidance for the General Public

- Being up to date on all recommended vaccinations is the best way to protect yourself and your family from a number of diseases that can result in severe illness and death including polio, and acute respiratory illnesses such as influenza, measles and whooping cough.
- The general public can help protect themselves from infections in general by
 - washing hands often with soap and water,
 - avoiding close contact with sick people, and
 - disinfecting frequently touched surfaces.
- Mosquito-borne viruses such as WNV can be avoided by protecting oneself from being bitten by mosquitoes (using mosquito repellent, avoiding being outdoors at dusk and dawn, the prime period for mosquitoes to bite).
- If a child appears very sick or seems to demonstrate features of acute limb weakness, caretakers should contact their physicians in order to have the child assessed for possible AFP.

More information

- CDC Investigation of Acute Neurologic Illness with Focal Limb Weakness of Unknown Etiology in Children, Fall 2014 website: <http://www.cdc.gov/ncird/investigation/viral/sep2014.html>
- CDC Unexplained Paralysis Hospitalizes Children webpage: <http://www.cdc.gov/features/unexplainedparalysis/index.html>
- Acute Neurologic Illness of Unknown Etiology in Children — Colorado, August—September, 2014, MMWR, October 3, 2014 (<http://www.cdc.gov/mmwr/>)
- Acute Neurologic Illness with Focal Limb Weakness of Unknown Etiology in Children, Health Alert Network, September 26, 2014 (<http://emergency.cdc.gov/han/han00370.asp>)
- Neurologic Illness with Limb Weakness in Children, COCA Call, October 3, 2014 (http://emergency.cdc.gov/coca/calls/2014/callinfo_100314.asp)