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Overview^(1,2,3)

Polioviruses are enteroviruses and consist of serotypes 1, 2, and 3. Poliovirus infections occur only in humans. Spread is by the fecal-oral and respiratory routes. Infection is more common in infants and young children and occurs at an earlier age among children living in poor hygienic conditions. The risk of paralytic disease after infection increases with age. In temperate climates, poliovirus infections are most common during summer and autumn; in the tropics, the seasonal pattern is less pronounced.¹

Approximately 95% of poliovirus infections are asymptomatic. Nonspecific illness with low-grade fever and sore throat (minor illness) occurs in four percent to eight percent of people who become infected. Aseptic meningitis, sometimes with paresthesias, occurs in one percent to five percent of patients a few days after the minor illness has resolved. Rapid onset of asymmetric acute flaccid paralysis with areflexia of the involved limb occurs in 0.1 percent to two percent of infections, and residual paralytic disease involving the motor neurons (paralytic poliomyelitis) occurs in approximately two thirds of people with acute motor neuron disease. Cranial nerve involvement and paralysis of respiratory tract muscles can occur. Findings in cerebrospinal fluid are characteristic of viral meningitis with mild pleocytosis and lymphocytic predominance.¹ Adults who contracted paralytic poliomyelitis during childhood may develop the postpolio syndrome 30 to 40 years later. Postpolio syndrome is characterized by slow and often significant onset of muscle pain and exacerbation of weakness.¹

Communicability of poliovirus is greatest shortly before and after onset of clinical illness when the virus is present in the throat and excreted in high concentration in feces. The virus persists in the throat for approximately one week after onset of illness and is excreted in feces for several weeks. Patients potentially are contagious for as long as fecal excretion persists. In recipients of OPV vaccine, the virus persists in the throat for one to two weeks and is excreted in feces for several weeks, although in rare cases, excretion for more than two months can occur. Immunodeficient patients have excreted virus for periods of more than ten years.²

The **incubation period** of asymptomatic or nonparalytic poliomyelitis is three to six days. For onset of paralysis in paralytic poliomyelitis, the incubation period is usually seven to 21 days.¹

Routine polio vaccination schedules are available from CDC's National Immunization Program website at: <http://www.cdc.gov/vaccines/recs/schedules/child-schedule.htm#printable>

For a more complete description of Poliomyelitis, refer to the following texts:

- *Control of Communicable Diseases Manual*. (CCDM), American Public Health Association. 19th ed. 2008.
- American Academy of Pediatrics. *Red Book: 2009 Report of the Committee on Infectious Diseases*. 28th ed. 2009.
- Department of Health and Human Services, Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases*, 12th ed. 2011.

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Case Definitions^(4,5)

Clinical description: Poliomyelitis, Paralytic⁵

Acute onset of a flaccid paralysis of one or more limbs with decreased or absent tendon reflexes in the affected limbs, without other apparent cause, and without sensory or cognitive loss (as reported by a physician).

Case classification:

Confirmed: a case that meets the clinical case definition, AND in which the patient has a neurologic deficit 60 days after onset of initial symptoms; OR has died; OR has unknown follow-up status.

Probable: a case that meets the clinical case definition.

Comment

All suspected cases of paralytic poliomyelitis are reviewed by a panel of expert consultants before final classification occurs. Only confirmed cases are included in Table 1 of the Morbidity and Mortality Weekly Report (MMWR). Suspected cases are enumerated in a footnote to the MMWR table.

Clinical description: Poliovirus infection, nonparalytic⁴

Any person without symptoms of paralytic poliomyelitis in whom a poliovirus isolate was identified in an appropriate clinical specimen, with confirmatory typing and sequencing performed by the CDC Poliovirus Laboratory, as needed.

Confirmed: Meets clinical description.

Information Needed for Investigation

Verify clinical diagnosis. What laboratory tests were conducted? What were the results? What are the patient's clinical symptoms?

Establish the extent of illness. Determine if household or other close contacts are, or have been, ill by contacting the health care provider, patient or family member.

Determine the source of infection to prevent other cases.

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Notification

- Contact the [District Communicable Disease Coordinator](#), or the [Senior Epidemiology Specialist](#), or the Department of Health and Senior Services' Situation Room (DSR) at 800-392-0272 (24/7) immediately if an outbreak* Poliomyelitis of is suspected.
- Contact the Bureau of Environmental Health Services at (573) 751-6095 and the Section for Child Care Regulation at (573) 751-2450, if the case is associated with a child care center.
- Contact the Section for Long Term Care Regulation at (573) 526-8524, if cases are associated with a long term-care facility.
- Contact the Bureau of Health Services Regulation at (573) 751-6303, if cases are associated with a hospital, hospital-based long-term care facility, or ambulatory surgical center.

*Outbreak is defined as the occurrence in a community or region, illness(es) similar in nature, clearly in excess of normal expectancy and derived from a common or a propagated source.

Control Measures

General

- Obtain details of vaccine history, lot number, virus type, severity and persistence of residual paralysis 60 days after onset (if vaccine-associated).
- Isolate patient with Standard Precautions in hospital. Exclude from schools and children's settings until at least 14 days after onset of illness and until receipt of a medical release form.
- Disinfect throat discharges, feces and soiled articles.
- Determine whether the patient's disease represents an indigenous or imported case.

Laboratory Procedures

The Missouri State Public Health Laboratory (SPHL) can perform virus culture on stool and throat swab specimens (Stools are the preferred specimen; culture results can be available within two days, but may take as long as 16 days.). Two stool specimens should be obtained 24 hours apart from the patients with suspected poliomyelitis. **All specimens should be sent to the Missouri State Public Health Laboratory for primary isolation.** A PCR test for poliovirus is available from CDC; however arrangements have to be made by the SPHL to obtain the reagents from CDC, for testing here in Missouri. CDC can perform serological testing, but requests for such testing must be made through the SPHL before specimens can be submitted to CDC. (If a blood specimen is collected, it should be obtained before any polio immunizations are given.) Isolation of the virus from the cerebrospinal fluid (CSF) is diagnostic but is rarely accomplished. The SPHL will supply a virus isolation kit with instructions, which must be used when collecting and transporting any specimens for polio testing (i.e. stool, throat swabs, and blood/serum). Specific questions on laboratory testing should be directed to the SPHL at 573-751-4830 or 573-751-3334, or (800) 392-0272 (24 hours a day – 7 days a week) or for more information see: <http://health.mo.gov/lab/index.php>.

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Reporting Requirements

Poliomyelitis and Poliovirus infection, nonparalytic are Category 2 (A) diseases and shall be reported to the local health authority or to the Missouri Department of Health and Senior Services within one (1) calendar day of first knowledge or suspicion by telephone, facsimile or other rapid communication.

1. For confirmed and probable cases complete a “[Disease Case Report](#)” (CD-1) and the Poliomyelitis Report (IMMP-44).
2. Entry of the complete CD-1 into the WebSurv database negates the need for the paper CD-1 to be forwarded to the District Health Office.
3. Send the completed secondary investigation form to the District Health Office.
4. All outbreaks or “suspected” outbreaks must be reported as soon as possible (by phone, fax or e-mail) to the District Communicable Disease Coordinator. This can be accomplished by completing the [Missouri Outbreak Surveillance Report](#) (CD-51).
5. Within 90 days from the conclusion of an outbreak, submit the final outbreak report to the District Communicable Disease Coordinator.

References

1. American Academy of Pediatrics. “Poliovirus infections”. In: Pickering, Larry K., editor. *Red Book: 2009 Report of the Committee on Infectious Diseases*. 28th ed. Elk Grove Village, IL. American Academy of Pediatrics; 2009: 541 – 545.
2. Centers for Disease Control and Prevention. *Epidemiology and Prevention of Vaccine-Preventable Diseases*. Atkinson W, Hamborsky J, McIntyre L, Wolfe S, eds. 11th ed. Washington DC: Public Health Foundation, 2009: 231-243.
3. *Control of Communicable Diseases Manual*. (Poliomyelitis, Acute). Heymann, David L., ed. 19th ed. Washington, D.C.: American Public Health Association. 2008: 484-491.
4. Centers for Disease Control and Prevention, 2010 Case Definitions. http://www.cdc.gov/osels/ph_surveillance/nndss/casedef/poliovirus_nonparalytic.htm (5/2012)
5. Centers for Disease Control and Prevention, 2010 Case Definition. http://www.cdc.gov/osels/ph_surveillance/nndss/casedef/poliomyelitiscurrent.htm (5/2012)

Other Sources of Information:

1. Modlin, John F. “Poliovirus.” Gerald L. Mandell, John E. Bennett, & Raphael Dolin, Eds. *Principles and Practice of Infectious Diseases*, 7th ed. Pennsylvania: Churchill Livingstone Elsevier, 2010: 2345-2351.
2. CDC. *VPD Surveillance Manual*, 3rd Edition, 2002, Chapter 10, Poliomyelitis
3. Centers for Disease Control and Prevention. 2011 Child & Adolescent Immunization Schedules, <http://www.cdc.gov/vaccines/recs/schedules/child-schedule.htm#printable> (5/2012)
4. Centers for Disease Control and Prevention. Poliomyelitis prevention in the United States: updated recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 2000; 49(No. RR-5): 1 – 22.