

Poliovirus Infections



Case Definition

Confirmed Case: All of the following:

- acute flaccid paralysis of one or more limbs;
- decreased or absent deep-tendon reflexes on the affected limbs;
- no sensory or cognitive loss;
- no other apparent cause (including laboratory investigation to rule out other causes of a similar syndrome);
- neurologic deficit present 60 days after onset of initial symptoms unless the patient has died;
- isolation of either vaccine or wild poliovirus from a clinical specimen or serologic evidence of recent poliovirus infection.

Reporting Requirements

- All positive laboratory specimens must be reported by laboratory.
- All hospitalized cases must be reported by attending health care professional.
- Non-paralytic cases will be reported under Viral Meningitis.

Clinical Presentation/Natural History

Most cases of polio are non-paralytic and therefore do not come to attention. In children there may be a “minor” stage evidenced by listlessness, headache, nausea, vomiting and fever, followed by a symptomless period of two to five days. This can lead to a later “major” stage including fever, neck stiffness, headache, vomiting and muscle pain, followed by muscle weakness and paralysis within one to two days. Adults tend to have a single phase of illness with a longer duration of the same prodromal symptoms prior to paralysis.

Paralysis can range from weakness of a portion of one muscle, to brain stem involvement, quadraplegia and death.

Any recovery from paralysis usually begins within one month.

Etiology

Poliovirus, an enterovirus of the family picornaviridae. There are three types: type 1, 2, and 3.

Epidemiology

Reservoir and Source: Reservoir is humans. The source is infected humans or immunization with oral polio virus vaccine (OPV). Wild type polio virus does not normally circulate in the Western Hemisphere. However, circulation in Canada was documented in 1993 in a Canadian unimmunized religious group that had contact with infected European group members. Wild type infections in Canada are therefore associated with importation or foreign travel. Vaccine associated paralysis can occur in recipients or, more commonly, unimmunized contacts.

Transmission: Polio is transmitted through the fecal-oral route or, in developed countries, more frequently through direct contact with oral secretions.

Transmission to both OPV recipients or their contacts occurs with an estimated frequency of one case per 2.6 million doses of OPV. Transmission occurs primarily with the first dose.

Occurrence:

General: Cases of wild type polio still occur in parts of Asia and Africa. The World Health Organization set a year 2000 target for the worldwide elimination of polio.

Canada: The most recent paralytic wild type case occurred in 1988 as a result of an imported strain from Pakistan. The most recent documentation of wild type virus occurred in 1996 in a child who had travelled to India.

Incubation Period: Nine to 12 days (range five to 35 days) to the onset of prodromal symptoms and 11 to 17 (range eight to 36) to the onset of paralysis. Most recipient cases of paralysis from OPV occur seven to 21 days following vaccine administration while contact cases appear within 20 to 29 days.

Susceptibility and Resistance: Persons who are immunodeficient are generally at increased risk for acquiring polio.

Viral type specific immunity for life follows natural infection. Travellers and health care workers may require boosters to maintain vaccine-induced immunity in certain circumstances.

Period of Communicability: For as long as virus is shed in the throat (36 hours to 12 days after exposure) or stool (72 hours to six weeks after exposure). Highest in the few days before and after onset of symptoms.

Diagnosis

All suspected cases of polio should have a throat swab, stool and CSF submitted for viral isolation. Cultures should be submitted to a reference laboratory to determine whether the virus is wild type or vaccine strain. In the absence of a positive culture, acute and convalescent neutralizing antibody titres can be examined to detect a four-fold rise indicative of infection. However, in some cases, these antibodies may already be present at the time of paralysis and no rise can be demonstrated.

Key Investigations

See **Diagnosis** above.

Control

Management of Cases:

Treatment:

- No specific treatment is available.

Public Health Measures:

- Isolation with routine precautions for hospitalized cases.
- Household measures are felt to be of little use since infection has usually spread by the time the first case is detected.

Management of Contacts:

- Public Health will identify contacts.
- Immunization of familial and other close contacts with booster doses (OPV) or a primary series is warranted, but may be ineffective since they may have already been infected.

Management of Outbreaks:

- Unimmunized or partially immunized persons should receive OPV doses to complete a primary immunization series and previously immunized persons should receive a booster.

Preventive Measures:

- Immunization of the general population, travellers and health care workers.