

## **POLIOMYELITIS, PARALYTIC AND POLIOVIRUS INFECTION, NONPARALYTIC** (Polio, Paralytic Polio, Infantile Paralysis)

### **REPORTING INFORMATION**

- **Class B:** Report by the end of the next business day after the case or suspected case presents and/or a positive laboratory result to the local public health department where the patient resides. If patient residence is unknown, report to the local public health department in which the reporting health care provider or laboratory is located.
- Reporting Form(s) and/or Mechanism: [Ohio Confidential Reportable Disease form](#) (HEA 3334, rev. 1/09), [Positive Laboratory Findings for Reportable Disease form](#) (HEA 3333, rev. 8/05), the local health department via the Ohio Disease Reporting System (ODRS), or telephone.
- [Ohio Department of Health \(ODH\) Suspected Polio Case Worksheet](#) is available for use to assist in local health department disease investigation. Information collected from this form should be entered into ODRS and sent to ODH for forwarding to CDC.

### **AGENT**

Poliovirus types 1, 2 and 3, a Picornavirus, Enterovirus subgroup.

### **CASE DEFINITION**

#### **Poliomyelitis [Paralytic]**

##### **Clinical Case Definition**

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.

##### **Case Classification**

Probable: a case that meets the clinical case definition.

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.

Not a Case: This status will not generally be used when reporting a case, but may be used to reclassify a report if investigation revealed that it was not a case.

##### **Comment**

All suspected cases of paralytic poliomyelitis are reviewed by a panel of expert consultants before final classification occurs. Confirmed cases are then further classified based on epidemiologic and laboratory criteria.

#### **Poliovirus Infection [nonparalytic]**

##### **Clinical Description**

Most poliovirus infections are asymptomatic or cause mild febrile disease. Poliovirus infections occasionally cause aseptic meningitis and one out of 200 infections from poliovirus type 1 results in paralytic poliomyelitis, characterized by acute onset of flaccid paralysis that is typically asymmetric and associated with a prodromal fever. Poliovirus is spread through fecal material, oral secretions, some aerosols and fomites.

**Note** that this case definition for nonparalytic polio applies only to poliovirus infections found in asymptomatic persons or those with mild, nonparalytic disease (e.g. those with a nonspecific febrile illness, diarrhea, or aseptic meningitis). Isolation of polioviruses from persons with acute paralytic poliomyelitis should continue to be reported as "paralytic poliomyelitis."

## Case Classification

**Confirmed:** Any person without symptoms of paralytic poliomyelitis in whom a poliovirus isolate was identified in an appropriate clinical specimen (e.g. stool, cerebrospinal fluid, oropharyngeal secretions), with confirmatory typing and sequencing performed by the CDC Poliovirus Laboratory, as needed.

**Not a Case:** This status will not generally be used when reporting a case, but may be used to reclassify a report if investigation revealed that it was not a case.

## Comments

In 2005, a vaccine-derived poliovirus (VDPV) type 1 was identified in a stool specimen obtained from an immunodeficient Amish infant and, subsequently, from 4 other children in 2 other families in the infant's central Minnesota community. Epidemiological and laboratory investigations determined that the VDPV had been introduced into the community about 3 months before the infant was identified and that there had been virus circulation in the community. Investigations in other communities in Minnesota and nearby states and Canada did not identify any additional infections or any cases of paralytic poliomyelitis.

Although oral poliovirus vaccine (OPV) is still widely used in most countries, inactivated poliovirus vaccine (IPV) replaced OPV in the United States in 2000. Therefore, the Minnesota poliovirus infections were the result of importation of a vaccine-derived poliovirus into the United States and the first time a VDPV has been shown to circulate in a community in a developed country. Circulating VDPVs commonly revert to a wild poliovirus phenotype and have increased transmissibility and high risk for paralytic disease; they have recently caused polio infections and outbreaks of paralytic poliomyelitis in several countries. Contacts between persons in communities with low polio vaccination coverage pose the potential for transmission of polioviruses and outbreaks of paralytic poliomyelitis.

Because of the success of the routine childhood immunization program in the U.S. and the Global Polio Eradication Initiative, polio has been eliminated in the Americas since 1991. Because the U.S. has used IPV exclusively since 2000, the occurrence of any poliovirus infection in the U.S. is a cause for concern. Reflecting the global concern for poliovirus importations into previously polio-free countries, the World Health Assembly, the decision-making body for the World Health Organization (WHO), has added circulating poliovirus to the notifiable events in the International Health Regulations (IHR).

## SIGNS AND SYMPTOMS

Poliovirus infection is highly variable and has been categorized into the following:

- Inapparent or Asymptomatic Infection: Up to 95% of all polio infections are inapparent or subclinical.
- Minor Illness (non-CNS illness): 4% - 8% of polio infections consist of a nonspecific illness characterized by complete recovery in less than a week. Three syndromes of this form are: upper respiratory tract infection (sore throat and fever); gastrointestinal disturbances (nausea, vomiting, abdominal pain, constipation or rarely diarrhea); and influenza-like illness (fatigue, muscle pain in the limbs).
- Nonparalytic Poliomyelitis (Aseptic meningitis): 1% - 2% of polio infections result in aseptic meningitis (stiffness of the neck, back and/or legs) usually following several days of symptoms similar to the minor illness. This lasts from 2-10 days and the patient completely recovers.
- Paralytic Poliomyelitis: Fewer than 1% of cases result in flaccid paralysis. The major illness begins with the same symptoms as nonparalytic polio but, in addition, there is a

loss of superficial reflexes progressing to paralysis, without loss of sensation. Strength then begins to return. In most patients muscle function returns to some degree, and many completely recover. Any weakness or paralysis that persists at 12 months is usually permanent.

## **DIAGNOSIS**

Isolation of the virus from cerebrospinal fluid (CSF), stool or pharynx early in the course of illness is presumptive evidence of infection. Contact the ODH Laboratory at 614-728-0544 (Monday – Friday; 8 AM – 5 PM) for specimen submission criteria.

## **EPIDEMIOLOGY**

### **Source**

Humans, most frequently persons with inapparent infections, especially children.

### **Occurrence**

Worldwide, peaking in summer months in temperate climates and occurring year-round in tropical climates.

### **Mode of Transmission**

Via the fecal-oral route. Direct fecal contamination of the hands, and from the hands to food or eating utensils, is probably responsible for most person-to-person spread. Virus may rarely be spread by the oral-oral route.

### **Period of Communicability**

Polio is highly communicable with 90% - 100% of susceptible household contacts acquiring the infection. The patient is probably most infectious from 7-10 days before and after the onset of symptoms, but poliovirus may be present in the stool for 3-6 weeks. Susceptibility is general and the possibility of paralytic disease increases with age. Prior infection confers immunity to only the one infecting virus type while the patient remains susceptible to the other two types of polio.

### **Incubation Period**

Commonly 6-20 days from exposure, with a range of 3-35 days.

## **PUBLIC HEALTH MANAGEMENT**

### **Case**

#### Treatment

There is no specific treatment and immune globulin (IG) will not alter the course of the disease.

#### Isolation

Isolation is prudent in institutional settings. Otherwise it is of little value because the greatest risk of exposure is in the prodromal period and because of the large number of asymptomatic cases.

### **Contacts**

Vaccination with live oral polio vaccine (OPV) may interfere with simultaneous infection by the wild virus (preferably with monovalent vaccine of the type causing the outbreak, if known). OPV is no longer available in the U.S., but is used elsewhere throughout the world.

### **Prevention and Control**

Maintenance of a highly immune population is the most important measure for control of poliomyelitis. For immunization details, refer to the ODH Vaccine Protocol Manual.

Ohio School Requirement: In 2010 the progressive polio vaccine requirement for school entry was updated requiring the final dose to be received on or after four years of age, with a minimum of three doses received. Other rules still apply; see the Director's Journal and ODH's Vaccine Protocol Manual for complete information.

**What is polio?**

Polio is caused by a virus that enters a person's body through the mouth. Sometimes it does not cause serious illness, but sometimes it causes paralysis (can't move arm or leg). It can even kill people who get it, usually by paralyzing the muscles that help them breathe. Polio used to be very common in the United States. It paralyzed and killed thousands of people a year before there was a vaccine for it.

**Who gets polio?**

The last case of wild-virus polio acquired in the United States was in 1979. Several countries in Africa and Asia still have cases of polio; however, with continued use of polio vaccination, global polio eradication may be achieved.

**How is polio spread?**

Polio is predominately spread through the feces.

**What are the symptoms of polio?**

Infection ranges in severity from an inapparent infection to a paralytic disease which may result in death. Symptoms include fever, malaise, headache, nausea and vomiting, excruciating muscle pain and stiffness in the neck and back.

**How soon after infection do symptoms appear?**

The incubation period is usually 6 to 20 days for paralytic cases, with a range of 3 to 35 days.

**When and for how long is a person able to spread polio?**

Patients are most infectious from 7 to 10 days before and after the onset of symptoms. However, patients are potentially contagious as long as the virus is present in the throat and feces. The virus persists in the throat for approximately one week after the onset of illness and is excreted in the feces for several weeks or, occasionally, months.

**Does past infection with polio make a person immune?**

There are three types of polio virus. Lifelong immunity usually depends on which type of virus a person contracts. Second attacks are rare and result from infection with a polio virus of a different type than the first attack.

**What is the treatment for polio?**

There is presently no cure for polio. Treatment involves supportive care.

**What are the complications associated with polio?**

Complications include paralysis (most commonly of the legs). Paralysis of the muscles of respiration and swallowing can be fatal.

**Is there a vaccine for polio?**

Two types of polio vaccine are available: oral polio vaccine (OPV) and inactivated polio vaccine (IPV). Since oral polio vaccine is made of live polio virus, in rare cases, oral polio vaccine caused paralytic polio in a person who received the vaccine or in a person who was a close contact of a vaccine recipient. Thus, in July 1999, the American Academy of Pediatrics and the Advisory Committee on Immunization Practices recommended that IPV (which is inactivated and does not contain live virus) be used exclusively in the United States beginning in 2000. The recommended schedule for childhood immunization is for IPV to be given at two, four, and 6 to 18 months of age and between 4 to 6 years of age. Adults traveling to countries where polio cases are occurring should review their immunization status.

**How can polio be prevented?**

Maintaining high levels of polio immunization in the community is the single most effective preventive measure.