

TREATMENT

- There is no cure for polio, nor are there any antiviral drugs effective in the treatment of poliomyelitis.
- Treatment of poliomyelitis is accomplished primarily through supportive therapy. Mechanical ventilation is often needed in cases of bulbar paralysis in which the respiratory system is compromised.
- Physical therapy is often employed for cases of paralytic disease.
- Some symptoms, such as fever, headache, and muscle aches may be treated as necessary.

DISINFECTION ^α

DISINFECTANT	CONCENTRATION	DURATION
Bleach	1 part bleach to 1 part water	60 minutes
Chloroform	Not effective	Not effective
Dry Heat (oven)	180°C / 356°F	60 minutes
Ether	Not effective	Not effective
Formaldehyde	3.7%	20 minutes
Glutaraldehyde	3.4%	20 minutes
Moist Heat (autoclave)	120°C / 248°F	20 minutes
Ozone (dissolved)	0.4 mg/L	4 minutes
UV Light ^β	50,000 μWs/cm ²	15 minutes

^α Please note the recommendations listed in this table have not been verified by our staff. Please research the appropriate disinfectant based on your needs.

^β Not generally recommended.

RESOURCES

The Centers for Disease Control and Prevention
1600 Clifton Road
Atlanta, GA 30333
800.311.3435 (Public Inquiries)
404.639.3311 (Telephone)

<http://www.cdc.gov/>

Chin, J. Control of Communicable Diseases Manual, 17th ed. Washington D.C. 2000. American Public Health Association. p. 398-405.

eMedicine

Estrada, B. "Poliomyelitis." eMedicine Consumer Journal. 2001.

<http://www.emedicine.com/ped/topic1843.htm>

The World Health Organization

525, 23rd Street, N.W.
Washington D.C. 20037
202.974.3000 (Telephone)
202.974.3663 (Facsimile)

<http://www.who.int/en/>

United States Environmental Protection Agency

US EPA Headquarters
Ariel Rios Building
1200 Pennsylvania Ave., N.W.
Washington, DC 20460
New England Region: 888.372.7341 (Telephone)

<http://www.epa.gov>

University of New Hampshire Office of Environmental Health and Safety

11 Leavitt Lane, Perpetuity Hall
Durham, NH 03824

<http://www.unh.edu/ehs>



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Poliomyelitis: Safety Pamphlet

The University of New Hampshire's Office of Environmental Health and Safety has produced this pamphlet on polio for educational purposes and for general laboratory safety. This document is a guide and should not replace the expertise of your health care provider.

BACKGROUND

- Poliomyelitis is a highly infectious and contagious disease caused by the poliovirus, an enterovirus within the *Picornaviridae* family.
- Prior to the 19th century poliomyelitis occurred sporadically. During the 19th and 20th centuries poliomyelitis became an epidemic, reaching a peak in the mid 1950s.
- There has been a major decrease in the worldwide prevalence of poliovirus since the implementation of aggressive immunization.
- Clusters of wild-type poliomyelitis (*i.e.* disease resulting from naturally occurring forms of the virus) are still found in some areas of Africa, Southeast Asia, and India.
- The last outbreak of poliomyelitis in the United States (by wild poliovirus) occurred in 1979 among non-immunized communities in the Midwest.
- In 2000 a polio outbreak, which was linked to low immunization rates, occurred in Haiti and the Dominican Republic.
- Eradication of polio is one of the World Health Organization's top priorities.

TRANSMISSION

- Poliovirus is spread via the fecal-oral route. The virus is shed in the feces, and is transmitted from person to person via contaminated hands, objects, or water that enters or contacts the mouth. It is also possible to spread poliovirus through respiratory secretions, urine, and saliva.
- Children and persons with a compromised immune system are most susceptible to contract poliomyelitis although anyone can become infected.
- The virus enters through the mouth and then multiplies in the throat and intestines. Once poliovirus is present in the intestines it can enter the bloodstream and spread to the central nervous system.
- The incubation period for poliomyelitis ranges from three to 35 days.
- Poliomyelitis is most infectious seven to ten days before and after the onset of symptoms. The virus is transmissible as long as it is present in the throat and feces.
- Poliovirus is present in throat secretions as early as 36 hours after exposure, and persists in the throat for approximately one week.
- The virus can be found in feces 72 hours after exposure and may be excreted in the stool for three to six weeks after the onset of illness.
- Once the virus invades the nervous system it destroys the nerve cells (motor neurons) responsible for muscle activation. These nerve cells do not regenerate and the affected muscles cease to function, which leads to paralysis.
- In cases of the most severe form, paralytic bulbar polio, the virus attacks the motor neurons of the brain stem, causing reduced breathing capacity and difficulty swallowing and speaking.



PREVENTION

- The single most effective way to prevent poliomyelitis is through vaccination. The vaccine is safe and effective in protecting against all three types of poliovirus: P1, P2, and P3.
- The first polio vaccine, called the Inactivated Polio Virus (IPV), consisted of an inactivated form of poliovirus and was introduced in 1955.
- IPV was widely used until the early 1960s when the Oral Attenuated Vaccine (OPV) was developed. Since OPV uses an altered form of the live poliovirus, it creates a stronger immune response than IPV. OPV replaced IPV and is responsible for the significant decrease in the worldwide prevalence of the disease.
- Although OPV is extremely effective, there are rare cases of vaccine-associated poliomyelitis that can result from using a live form of the virus.
- An enhanced form of IPV, eIPV, was developed using an inactivated form of the virus. This creates an immune response equal to that of OPV without the risk of vaccine-associated disease.
- Countries in which there are no reported cases of wild-type polio disease, such as the United States, have adopted eIPV immunization. Developing countries, which may still have cases of wild-type poliovirus, use OPV.
- In the United States, children receive a total of four doses of eIPV. A dose is given at 2 months, 4 months, 6-18 months, and 4-6 years of age.
- Unvaccinated adults are usually advised to receive two doses and a booster of eIPV.
- Currently, OPV and eIPV are administered as routine childhood immunizations around the world.



SYMPTOMS

- Approximately 90% of poliomyelitis cases are inapparent infection. This form has no symptoms, although individuals are still capable of transmitting the disease.
- Approximately 5-10% of all cases are abortive poliomyelitis. This form can present any combination of the following non-specific symptoms:
 - ✓ Fever
 - ✓ Malaise
 - ✓ Drowsiness
 - ✓ Headache
 - ✓ Nausea
 - ✓ Vomiting
 - ✓ Constipation
 - ✓ Abdominal pain
 - ✓ Sore throat

Recovery usually occurs within one week.
- Approximately 1-2% of all cases result in nonparalytic aseptic meningitis (inflammation of the membranes surrounding the brain and spinal cord). Patients usually have initial symptoms similar to those listed above for several days, followed by stiffness or pain in the neck, back, and/or legs. These symptoms will typically last for 2-10 days and is generally followed by a complete recovery.
- Approximately 1% of polio infections result in paralysis. Symptoms are similar to those above, with the addition of loss of reflexes and severe muscle aches and spasms in the limbs or back. Paralysis usually progresses to its maximum extent within a few days of the onset, and usually does not progress any further once fever has resolved.
- Most patients with paralytic poliomyelitis will fully recover and will have their muscle function return. Others may be left with permanent paralysis. Fatality occurs most commonly with bulbar polio.

