

PATHOGEN SAFETY DATA SHEET

Polio virus

CHARACTERISTICS	
Morphology	Polio virus is the type species of the Enterovirus genus in the family Picornaviridae. Enteroviruses are transient inhabitants of the gastrointestinal tract, and are stable at an acidic pH. Picornaviruses are small with an RNA genome. There are three poliovirus serotypes (P1, P2, and P3). Immunity to one serotype does not produce immunity to the other serotypes.
Disease	Poliomyelitis, polioencephalitis
Zoonosis	Poliovirus only infects humans.

HEALTH HAZARDS	
Host Range	Humans. No endogenous reservoir exist in the United States.
Modes of Transmission	Person to person transmission can occur through fecal oral route and via infected feces and body fluids. Contact precautions should be used. Note that alcohol-based hand sanitizers do not kill poliovirus.
Signs and Symptoms	Polio invades the nervous system, and can cause total paralysis in a matter of hours. The virus enters the body through the mouth and multiplies in the intestine. Initial symptoms of polio include fever, fatigue, headache, vomiting, stiffness in the neck, and pain in the limbs. In a small proportion of cases, the disease causes paralysis, which is often permanent. Polioencephalitis is rare and generally occurs in infants. Between 25-50% of survivors may develop postpolio syndrome experienced over their remaining life as muscle weakness and extreme fatigue.
Infectious Dose	Unknown
Incubation Period	9-12 days

MEDICAL PRECAUTIONS/TREATMENT	
Prophylaxis	Vaccination.
Vaccines	If potential exposure, check antibody to Polio. A positive antibody indicates protection. IPV – Inactivated polio vaccine recommended if no antibody. OPV – Oral Polio vaccine- No longer distributed in the United States
Treatment	There is no specific treatment for polio. Persons infected with polio need supportive therapy, such as bed rest and fluids. Severe paralytic disease impacting diaphragm may require mechanical ventilation.
Surveillance	Polioviruses usually can be isolated from throat secretions in the first week of illness and from feces, often for several weeks. In the absence of a viral isolate, the diagnosis of poliovirus infection can be established serologically by testing paired acute and convalescent sera for neutralizing antibodies to each of the three poliovirus serotypes. Serologic tests cannot distinguish between wild-type virus and vaccine virus infection. These viruses can be detected by PCR.
MSU Requirements	Report any exposures.

LABORATORY HAZARDS	
Laboratory Acquired Infections (LAIs)	Many potential LAIs in vaccine production facilities.
Sources	Cultures, frozen stocks, other samples described in IBC protocol.

SUPPLEMENTAL REFERENCES	
Canadian MSDS:	n/a
BMBL	https://www.cdc.gov/labs/BMBL.html
CDC	https://www.cdc.gov/polio/what-is-polio/index.htm
NIH Guidelines	https://osp.od.nih.gov/wp-content/uploads/NIH_Guidelines.pdf

RISK GROUP & CONTAINMENT REQUIREMENTS	
Risk Group 2	Agents that are associated with human disease which is rarely serious and for which preventive or therapeutic interventions are often available.
BSL2	For all procedures involving suspected or known infectious specimen or cultures.
ABSL2	For all procedures utilizing infected animals.

SPILL PROCEDURES	
Small	Notify others working in the lab. Remove PPE and don new PPE. Cover area of the spill with absorbent material and add fresh 1:10 bleach:water. Allow 20 minutes (or as directed) of contact time. After 20 minutes, cleanup and dispose of materials.
Large	<ul style="list-style-type: none"> Immediately notify all personnel in the lab and clear all personnel from the area. Remove any contaminated PPE/clothing and leave the lab. Secure the area by locking doors, posting signage and guarding the area to keep people out of the space. For assistance, contact MSU's Biosafety Officer (406-994-6733) or Safety and Risk Management (406-994-2711).

EXPOSURE PROCEDURES	
Mucous membrane	Flush eyes, mouth, or nose for 15 minutes at eyewash station.
Other Exposures	Wash area with soap and water for 15 minutes.
Reporting	Immediately report incident to supervisor, complete a First Report of Injury form, and submit to Safety and Risk Management.
Medical Follow-up	During business hours: Bridger Occupational Health 3406 Laramie Drive Weekdays 8am -6pm. Weekends 9am-5pm After business hours: Bozeman Deaconess Hospital Emergency Room 915 Highland Blvd

VIABILITY	
Disinfection	0.5% bleach solution is recommended disinfectant.
Inactivation	Polio virus is resistant to inactivation by common laboratory disinfectants such as alcohol. The virus is rapidly destroyed by exposure to temperatures of 50°C or more, autoclaving or incineration. It is readily inactivated by dilute solutions of formaldehyde, bleach.
Survival Outside Host	Polio virus is very stable at an acidic pH and can remain infectious for long periods of time in food and water.

PERSONAL PROTECTIVE EQUIPMENT (PPE)	
Minimum PPE Requirements	Lab coat, disposable gloves, safety glasses, closed toed shoes, long pants
Additional Precautions	Additional PPE may be required depending on lab specific SOPs and IBC Protocol.