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To help infection preventionists quickly activate polio prevention efforts, APIC’s Emerging Infectious Diseases Task Force has created a **Poliovirus Playbook** that IPs can download and customize for use in their facilities. The Playbook is a concise workflow document that is designed to be user-friendly and operational for busy IPs.

**Playbook: Poliovirus**

Potential to impact the respiratory, gastrointestinal, muscular, and nervous system.

Risk/Triage Scale - Level 1: Recommend situation awareness and planning.

* Transmission is limited in specific countries.
* Vaccine is widely and readily available.

Prioritized Audiences – Hospitals and public health

# Identification

## Screening Criteria

* 1. Case Definition ([CDC, September 23, 2020](https://www.cdc.gov/vaccines/pubs/surv-manual/chpt12-polio.html))
		1. **Probable**: 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.
		2. **Confirmed**: 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; AND in which the patient
			1. has a neurologic deficit 60 days after onset of initial symptoms, or
			2. has died, or
			3. has unknown follow-up status.
	2. Symptoms: [(CDC, January 9, 2023)](https://www.cdc.gov/polio/what-is-polio/index.htm) [(CDC, August 24, 2022)](https://www.cdc.gov/polio/what-is-polio/faq/index.htm) ([CDC, Not Dated](https://www.cdc.gov/polio/pdf/Polio-Fact-Sheet-Suspect-Polio-508.pdf))
		1. Prevalence of symptoms in Polio positive patients
			1. **Asymptomatic infection is common (72% of cases).**
			2. 25% of people develop flu-like symptoms: fever, sore throat, fatigue, nausea, headache, stomach pain (symptoms last 2-5 days and resolve without intervention).
			3. <1% of people have more serious symptoms: meningitis, paralysis, paresthesia.
		2. Symptoms
			1. Rapid progression of weakness
			2. Asymmetric weakness
			3. Proximal weakness more pronounced
			4. Low muscle tone
			5. Deep tendon reflexes absent or diminished
			6. Fever
			7. Muscle pain
			8. History of fever, sore throat, nausea, and malaise up to one week before weakness onset
			9. Difficulty speaking or swallowing
			10. Respiratory distress
	3. Polio Vaccination Status: Unvaccinated or incompletely vaccinated [(CDC, October 12, 2022)](https://www.cdc.gov/vaccines/vpd/polio/public/index.html)
	4. Travel History – see Section 2
	5. Part of High-risk Group – see Section 3

## Travel Considerations

* 1. Travel history to a country where Polio is endemic
		1. ([PGEI, Not Dated](https://polioeradication.org/where-we-work/polio-endemic-countries/)) – Afghanistan and Pakistan
	2. Travel history to a country at high risk of international spread/experiencing an outbreak
		1. ([PGEI, Not Dated](https://polioeradication.org/polio-today/polio-now/public-health-emergency-status/))
		2. ([CDC, March 22, 2023](https://wwwnc.cdc.gov/travel/notices/alert/global-polio))

## Exposure Definition

* 1. Assess for symptoms within screening criteria above
	2. Assess for recent travel, close contact/exposure to polio positive person, or close contact to individual with recent travel within travel considerations above
	3. High-risk groups [(CDC, August 24, 2022)](https://www.cdc.gov/polio/what-is-polio/faq/index.htm)
		1. Travelers who recently visited polio endemic countries, or countries experiencing polio outbreaks
		2. Laboratory and healthcare workers handling specimens that might contain polioviruses
		3. Healthcare workers who are treating patients who could have polio or have close contact with a person who could be infected with poliovirus.
		4. People who are in contact with or are caring for a person who could be infected with polio or has been exposed to polio.
		5. Unvaccinated adults whose children may be receiving oral poliovirus vaccine while living abroad.

## Test Detection for Poliovirus

* 1. Viral isolation ([CDC, September 28, 202](https://www.cdc.gov/polio/what-is-polio/lab-testing/diagnostic.html#:~:text=Poliovirus%20can%20be%20detected%20in,Intratypic%20differentiation)1)
		1. Most sensitive method to diagnose poliovirus infection
		2. Most likely to be isolated from stool and pharyngeal swabs.
		3. E.g., Cell culture
	2. Serology ([CDC, September 28, 2021](https://www.cdc.gov/polio/what-is-polio/lab-testing/diagnostic.html#:~:text=Poliovirus%20can%20be%20detected%20in,Intratypic%20differentiation))
		1. May be helpful in supporting the diagnosis of paralytic poliomyelitis.
	3. Nucleic acid-based methods
		1. PCR
		2. Genome sequencing ([CDC, September 28, 2021](https://www.cdc.gov/polio/what-is-polio/lab-testing/diagnostic.html#:~:text=Poliovirus%20can%20be%20detected%20in,Intratypic%20differentiation))
	4. Cerebrospinal fluid analysis

## Test Collection Instructions

* + [CDC, July 1, 2022](https://www.cdc.gov/acute-flaccid-myelitis/hcp/specimen-collection.html#specimens-to-collect) can be referenced for polio specimen collection.
	+ Likelihood of poliovirus isolation is highest from stool specimens, intermediate from pharyngeal swabs, and very low from blood or spinal fluid. ([CDC, January 11, 2023](https://www.cdc.gov/vaccines/pubs/surv-manual/chpt22-lab-support.html)).
	+ Contact local public health for guidance regarding specimen type, and collection instructions. In the absence of instructions see [CDC, July 1, 2022](https://www.cdc.gov/acute-flaccid-myelitis/hcp/specimen-collection.html#specimens-to-collect).

Collection instructions by Specimen Type

* 1. Stool Samples **(cell culture/molecular technique)**

Collect two specimens 24-hours apart [(CDC, January 9, 2023)](https://www.cdc.gov/polio/what-is-polio/index.htm)

Collection should be completed as soon as possible, minimally within 14 days of disease onset [(CDC, January 9, 2023)](https://www.cdc.gov/polio/what-is-polio/index.htm)

Minimum volume: 1 gram. 10-20 grams preferred ([CDC, April 10, 2023](https://www.cdc.gov/laboratory/specimen-submission/detail.html?CDCTestCode=CDC-10376))

Collect in sterile, wide-mouth container ([NJ DPH, October 5, 2022](https://www.nj.gov/health/cd/documents/topics/Polio/polio_provider_information_document.pdf), [NY DPH, Sept. 28, 2022](https://www.health.ny.gov/diseases/communicable/polio/docs/2022-09-28_health_advisory.pdf))

Do not add transport medium ([CDC, April 10, 2023](https://www.cdc.gov/laboratory/specimen-submission/detail.html?CDCTestCode=CDC-10376))

* 1. Throat specimens (oropharyngeal and/or nasopharyngeal swabs)

Collect two specimens 24-hours apart [(CDC, January 9, 2023)](https://www.cdc.gov/polio/what-is-polio/index.htm)

Collection should be completed within 14 days of disease onset [(CDC, January 9, 2023)](https://www.cdc.gov/polio/what-is-polio/index.htm)

Minimum volume: 0.5ml. 1mL preferred. ([CDC, July 1, 2022](https://www.cdc.gov/acute-flaccid-myelitis/hcp/specimen-collection.html#specimens-to-collect))

Oropharyngeal ([NJ DPH, October 5, 2022](https://www.nj.gov/health/cd/documents/topics/Polio/polio_provider_information_document.pdf), [NY DPH, September 28, 2022](https://www.health.ny.gov/diseases/communicable/polio/docs/2022-09-28_health_advisory.pdf))

Flocked swabs preferred.

Sterile Dacron or rayon swabs with plastic or metal handles may be used.

Do not use cotton or calcium alginate swabs, or swabs with wooden sticks.

The same swabs and media used for COVID, or influenza PCR testing can be used.

Place in VTM or universal transport media.

Do not use saline or send dry swabs.

* 1. Serum

Collect prior to treatment with IVIG ([NJ DPH, October 5, 2022](https://www.nj.gov/health/cd/documents/topics/Polio/polio_provider_information_document.pdf)).

Collect in red or tiger-top tube ([NY DPH, September 28, 2022](https://www.health.ny.gov/diseases/communicable/polio/docs/2022-09-28_health_advisory.pdf)).

From clotted whole blood, or through serum separated tubes (SST) ([CDC, April 10, 2023](https://www.cdc.gov/laboratory/specimen-submission/detail.html?CDCTestCode=CDC-10377)).

Minimum volume: 0.5mL, 1mL preferred ([CDC, April 10, 2023](https://www.cdc.gov/laboratory/specimen-submission/detail.html?CDCTestCode=CDC-10377)).

Timing for specimen collection: ([CDC, January 11, 2023](https://www.cdc.gov/vaccines/pubs/surv-manual/chpt22-lab-support.html))

Acute: ASAP

Convalescent: 3 weeks after acute

* 1. CSF

**NOTE:** Detection of poliovirus in CSF is uncommon and a negative CSF test result cannot be used to rule out polio. [(CDC, August 10, 2022)](https://www.cdc.gov/polio/what-is-polio/hcp.html) ([CDC, September 28, 2021](https://www.cdc.gov/polio/what-is-polio/lab-testing/diagnostic.html#:~:text=Poliovirus%20can%20be%20detected%20in,Intratypic%20differentiation))

Minimum volume: 0.15 mL. 0.5-2mL preferred ([CDC, July 1, 2022](https://www.cdc.gov/acute-flaccid-myelitis/hcp/specimen-collection.html#specimens-to-collect)).

 2-3 cc collected in sterile collection tube without additives ([NY DPH, September 28, 2022](https://www.health.ny.gov/diseases/communicable/polio/docs/2022-09-28_health_advisory.pdf)).

Storage, Handling & Shipping Instructions

**Inter-facility Shipping**

1. Specimens should be stored and shipped frozen (-20 °C or lower) [(CDC, January 9, 2023)](https://www.cdc.gov/polio/what-is-polio/index.htm).
2. **Serology:** Refrigerate (2-8 °C ) after collection for short term storage (not to exceed 24 hours) and frozen (-20 °C or lower) until shipment without exceeding 1 month ([CDC, April 10, 2023](https://www.cdc.gov/laboratory/specimen-submission/detail.html?CDCTestCode=CDC-10377)).

**Intra-facility Shipping**

* + - 1. The CDC does not address the process for safely transporting and shipping specimens within the facility. Contact the receiving lab for specific directions. At a minimum:
				1. Ensure the specimens are correctly labeled, per facility policy.
				2. Place the specimen in a tightly sealed, leakproof container.
				3. Transport in a sealable, leakproof plastic bag.
				4. Avoid any risk that may result in aerosolization.

## Differentiation from Similar Diseases

* 1. Acute flaccid paralysis (AFP) caused by enterovirus, adenovirus, Guillain-Barre Syndrome, and botulism [(CDC, January 9, 2023)](https://www.cdc.gov/polio/what-is-polio/index.htm)

## Bioterrorism Threat

* 1. No guidance
	2. [CDC, April 4, 2018](https://emergency.cdc.gov/agent/agentlist-category.asp)

## Antimicrobial Resistance

* 1. No guidance

# Prevention of Transmission

## Required Precautions for Patient Care

* 1. Contact and Standard Precautions for the duration of illness, [(CDC, May 2022).](https://urldefense.com/v3/__https%3A/www.cdc.gov/infectioncontrol/pdf/guidelines/isolation-guidelines-H.pdf__;!!LgPfcEISpGU!sCIlhQeWYUz-SPRsdAl008TJNpRttBdN9mDqwM2DNZkx-GS7ok1tLZKmKV-tzoaC$)
		1. Evaluate stock of gowns, gloves, and procedure masks.
	2. Consider contacting your State Department of Health for additional PPE guidance.
	3. Additional consideration: The New Jersey Department of Health recommends the wearing of gloves, gowns, and masks [(NJDOH, October 5, 2022.](https://urldefense.com/v3/__https%3A/www.nj.gov/health/cd/documents/topics/Polio/polio_provider_information_document.pdf__;!!LgPfcEISpGU!sCIlhQeWYUz-SPRsdAl008TJNpRttBdN9mDqwM2DNZkx-GS7ok1tLZKmKbrh8PrC$))
	4. Only healthcare workers with evidence of poliovirus immunity should attend the patient, ([CDC, Not Dated](https://www.cdc.gov/polio/pdf/Polio-Fact-Sheet-Suspect-Polio-508.pdf)) ([CDC, August 10, 2022](https://www.cdc.gov/polio/what-is-polio/hcp.html)).

## Patient Room Placement

* 1. A single-patient room is preferred for patients who require Contact Precautions [(CDC, May 2022)](https://urldefense.com/v3/__https%3A/www.cdc.gov/infectioncontrol/pdf/guidelines/isolation-guidelines-H.pdf__;!!LgPfcEISpGU!sCIlhQeWYUz-SPRsdAl008TJNpRttBdN9mDqwM2DNZkx-GS7ok1tLZKmKV-tzoaC$).

## Precautions During Patient Transport

* 1. Limit transport and movement of patients outside of the room to medically-necessary purposes [(CDC January 7, 2016)](https://www.cdc.gov/infectioncontrol/basics/transmission-based-precautions.html).
	2. The receiving department should be notified of the type of the following prior to transfer:
		1. Isolation precautions
	3. Only healthcare workers with evidence of poliovirus immunity should attend the patient, ([CDC, Not Dated](https://www.cdc.gov/polio/pdf/Polio-Fact-Sheet-Suspect-Polio-508.pdf)) ([CDC, August 10, 2022](https://www.cdc.gov/polio/what-is-polio/hcp.html)).
	4. The patient should perform hand hygiene.
	5. The staff should provide a medical mask for the patient to wear, clean clothes, and clean sheets.
	6. The staff should wear PPE during the transfer per facility policy.
	7. Clean/disinfect the stretcher/bed upon the transfer completion with the hospital-approved germicidal wipe that has activity against the polio virus.
	8. Specimen/body fluid transport - Apply Standard Precautions, to include gloves if touching blood and other potentially infectious materials, a gown if anticipating clothing/exposed skin exposure, and mask, eye protection, and face shield if splashes or sprays are anticipated [(CDC, November 5, 2015)](https://urldefense.com/v3/__https%3A/www.cdc.gov/infectioncontrol/guidelines/isolation/appendix/standard-precautions.html__;!!LgPfcEISpGU!sCIlhQeWYUz-SPRsdAl008TJNpRttBdN9mDqwM2DNZkx-GS7ok1tLZKmKWNs2ksm$).

## Disinfecting the Environment and Shared Equipment

* 1. Provide dedicated noncritical medical equipment (e.g., stethoscope, blood pressure cuff, etc.). When this not possible, disinfection after use is recommended ([CDC May 2022)](https://urldefense.com/v3/__https%3A/www.cdc.gov/infectioncontrol/pdf/guidelines/isolation-guidelines-H.pdf__;!!LgPfcEISpGU!sCIlhQeWYUz-SPRsdAl008TJNpRttBdN9mDqwM2DNZkx-GS7ok1tLZKmKV-tzoaC$). Ensure the facility-approved, germicidal wipes have activity against the polio virus.
	2. See local and state guidance for regulated medical waste considerations.
	3. Consult your infectious waste hauler for additional assistance.

## Air handling Considerations

* 1. CDC is not prescriptive for polio. Ensure the room air changes per hour meet requirements and the airflow is positive. Check with engineering to ensure the HVAC filters have been changed, per the preventative maintenance schedule.

## Patient Census Trending

* 1. Tracking census of patients with poliovirus infection may be helpful in determining staffing, PPE, and infection prevention resources.

# Providing Patient Care

## High-Risk Procedures

* + - * 1. No known high-risk procedures. Apply Standard Precautions, to include gloves if touching blood and other potentially infectious materials, a gown if anticipating clothing/exposed skin exposure, and mask, eye protection, and face shield if splashes or sprays are anticipated [(CDC, November 5, 2015)](https://urldefense.com/v3/__https%3A/www.cdc.gov/infectioncontrol/guidelines/isolation/appendix/standard-precautions.html__;!!LgPfcEISpGU!sCIlhQeWYUz-SPRsdAl008TJNpRttBdN9mDqwM2DNZkx-GS7ok1tLZKmKWNs2ksm$).

## Facility Operations

* 1. Linen management – No specific guidance.
	2. Dietary considerations – No specific guidance.
	3. Oxygen – No specific guidance.

## Visitation management

Exclude visitors who are close contacts of patients using screening criteria above

* + 1. Note: Exceptions should be evaluated on a case by case basis. If exceptions are needed, a clinician should review PPE requirements, and visitation procedure prior to patient visitation.

## Infection Prevention Staffing Considerations

* 1. Facility should determine the patient with poliovirus infection threshold before mobilizing increased infection prevention resources.

## Postmortem

* 1. CDC is non-prescriptive for polio. Death care workers should take steps to reduce their exposure to potentially infectious body fluids where possible [(Washington State Department of Labor and Industries, April 10, 2020)](https://urldefense.com/v3/__https%3A/lni.wa.gov/safety-health/safety-research/files/2020/103_04_2020_DeathCareWorkers.pdf__;!!LgPfcEISpGU!sCIlhQeWYUz-SPRsdAl008TJNpRttBdN9mDqwM2DNZkx-GS7ok1tLZKmKYRjFq70$). Postmortem care is per facility policy, including notifying the death care workers of the type of isolation precautions (and not the disease). Consider notifying the department of health of the death.

# Patient Discharge

## Communication Considerations

* 1. Contact local public health prior to discharge.
	2. If the patient will be discharged to another facility, ensure the receiving facility is aware of the patient’s precaution status.

## Patient Discharge Information

* 1. “[What is Polio?](https://www.cdc.gov/polio/what-is-polio/index.htm)” informational sheet from the CDC can be used. ([CDC, January 9, 2023](https://www.cdc.gov/polio/what-is-polio/index.htm))

# Occupational Health

## Occupational Exposure Definition

* 1. Unprotected exposure or contact with the stool or respiratory droplets of a confirmed poliovirus case. Unprotected exposure is defined as without proper personal protective equipment (gown, gloves, and mask) and ineffective hand hygiene while performing patient care. Exposure can be confirmed after identifying employee activity and PPE use during patient care.
		1. Note: Virus can shed through stool for several weeks after infection and can contaminate the environment [(CDC, August 10, 2022)](https://www.cdc.gov/polio/what-is-polio/hcp.html#Prevention).
		2. Note: Rapid identification of wild type vs. vaccine-related in the confirmed case would help guide exposure confirmation.

## Pre- and Post-Exposure Information

* 1. See vaccination information below.

## Vaccine Recommendations

* 1. Completion of vaccine series is strongly recommended. Unvaccinated healthcare professionals should receive: 3-dose series of IPV, two doses separated by 1 to 2 months, and a third dose 6 to 12 months after the second dose. Healthcare professionals who previously completed a routine series of poliovirus vaccine and who are at increased risk, can receive a lifetime booster dose of the IPV if they remain at increased risk for exposure [(CDC, September 28, 2022)](https://www.cdc.gov/vaccines/vpd/polio/hcp/recommendations.html).

## Exposure Workflow

* 1. Furlough - Confirmed cases should be furloughed for the duration of illness and after evaluation and appropriate clearance from a medical health professional.
	2. Return to work criteria should be based upon medical evaluation and appropriate clearance from a medical health professional.

## Contact Tracing

* 1. Use exposure definition above.

## High-risk Employees

* 1. None identified.

# Outreach Considerations for Healthcare Stakeholders

## Messaging for Senior Leadership

* 1. Resources required
		1. Consider how to escalate resource request to senior leaders/supervisor.
	2. Impact to business continuity
		1. Anticipate how polio may impact daily operations and communicate to senior leadership/supervisor.

## Marketing and Communications

* 1. Media management planning
		1. Ensure public information officer (PIO) is updated regularly. If no PIO has been identified, assign. This person is typically responsible for representing the facility during interviews and media information requests.
	2. Communication for hospital staff and physicians
		1. Consider how staff and physicians prefer communication.
		2. Create a dated template so team become familiar with update format.
		3. Consider how often staff and physicians want to be updated.
		4. Consider updates for patients, especially as guidance is updated.

## Public Health

* 1. Case reporting requirements
		1. Connect with local public health to understand what elements are required within reports, and how often information should be reported.
	2. Case testing
		1. Connect with local public health to understand testing criteria, and if permission must be granted for testing. If permission is not required, public health may require notification for testing.
	3. Patient transfer
		1. Connect with local public health to understand what reporting is needed prior to patient transfer, or discharge.
	4. Exposure communication
		1. Connect with local public health to understand reporting requirements for healthcare worker, patient, or visitor exposure.

## Pharmacy

* 1. Prophylaxis procurement
		1. Connect with pharmacy to understand prophylaxis options.
		2. If local public health distributes prophylaxis, understand criteria required for prophylaxis release.
	2. Vaccine procurement
		1. Connect with pharmacy to understand vaccine options.
		2. If local public health distributes vaccine, understand criteria required for vaccine release.
	3. Treatment requirements
		1. Connect with pharmacy to understand treatment options.
		2. If local public health distributes treatment, understand criteria required for treatment release.

## Partnering Laboratories

* 1. Testing methodologies
		1. Connect with the laboratory to understand available testing methodologies, and what supplies are required.
		2. See “Public Health” above if local public health is involved in testing.
	2. Testing procedure
		1. Connect with the laboratory to understand testing procedure.
		2. Include testing procedures in communication to clinical teams.
		3. See “Public Health” above if local public health is involved in testing.
	3. Specimen shipment
		1. Ensure the laboratory is aware of shipping requirements and has the supplies on hand for shipping requirements.
	4. Turnaround time for results
		1. Connect with the laboratory to understand testing turnaround times.
	5. Results reporting
		1. Connect with the laboratory to understand reporting workflow
		2. Plan with whom, and how, the laboratory will communicate results. If testing is sent out, ensure a point of contact is named.

## Supply Chain

* 1. PPE days on hand reporting
		1. Connect with supply chain to identify key PPE to monitor regularly.
		2. Include senior leadership in communication.
		3. Identify reporting cadence.
	2. Contingency planning for PPE
		1. Identify thresholds to begin conservation and contingency plans.
		2. Provide PPE requirements so supply chain can identify back-up, alternate supplies in the case of shortage.
	3. Specific supply planning: conduct planning for
		1. Specimen collection supplies, test, and reagent supplies
		2. Cleaning supplies and disinfectants
	4. Patient care supply identification
		1. Identify suppliers for products such as ventilators.
		2. Identify suppliers for treatment or supportive care supplies.