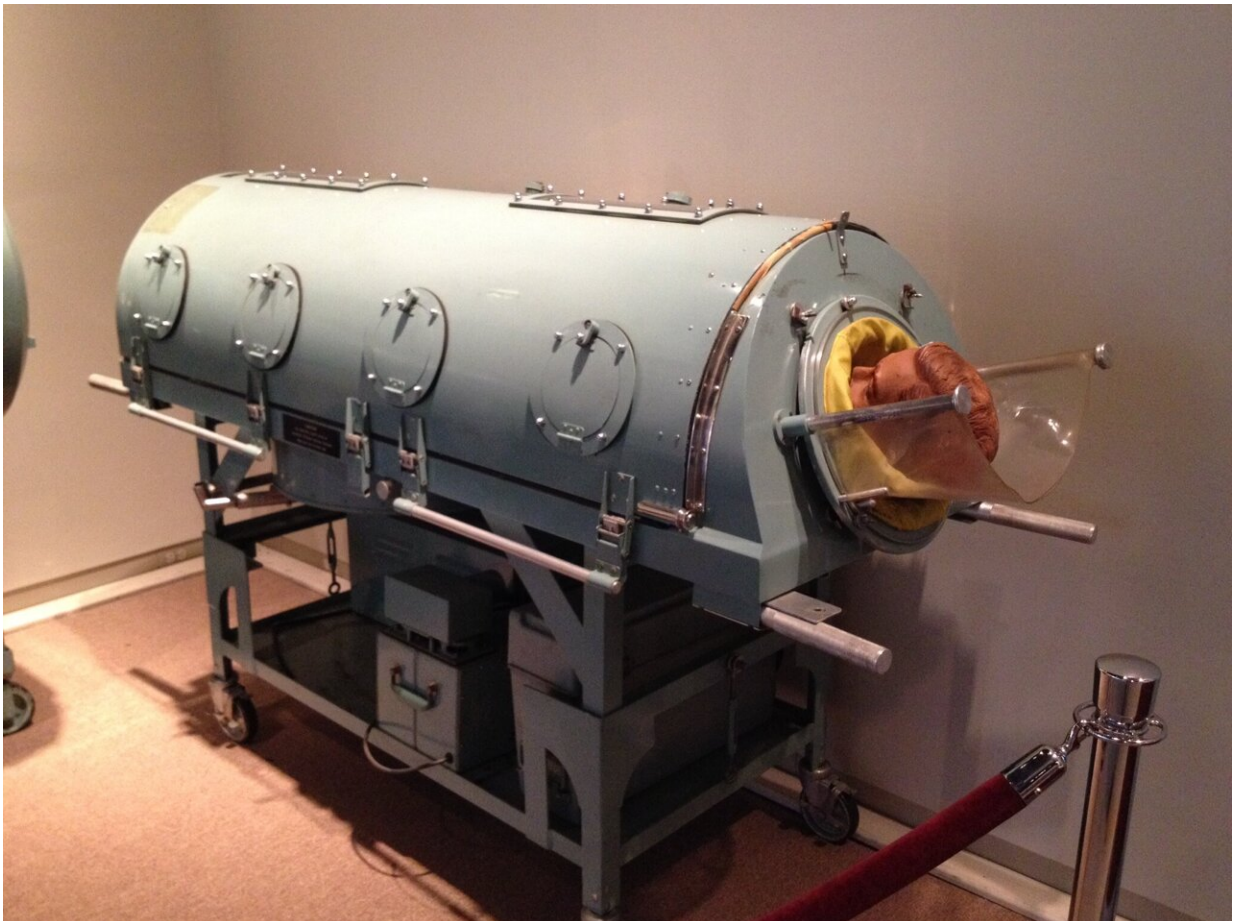


With polio's return, here's what back-to-schoolers need to know

September 19 2022, by Céline Gounder



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Before polio vaccines became available in the 1950s, people wary of the

disabling disease were afraid to allow their children outside, let alone go to school. As polio appears again decades after it was considered eliminated in the U.S., Americans unfamiliar with the dreaded disease need a primer on protecting themselves and their young children—many of whom are emerging from the trauma of the COVID-19 pandemic.

Q: What is poliomyelitis?

A: Polio is short for "poliomyelitis," a neurological disease caused by a poliovirus infection. Of the three types of wild poliovirus—serotypes 1, 2 and 3—serotype 1 is the most virulent and the most likely to cause paralysis.

Most people infected with poliovirus don't get sick and won't have symptoms. About a quarter of those infected might experience mild symptoms like fatigue, fever, headache, neck stiffness, sore throat, nausea, vomiting, and abdominal pain. So, as with COVID-19, people who don't have symptoms can unknowingly spread it as they interact with others. But in up to 1 in 200 people with a poliovirus infection, the virus may attack the [spinal cord](#) and brain. When it infects the spinal cord, people may develop muscle weakness or paralysis, including of the legs, arm, or chest wall. Poliovirus may also infect the brain, leading to difficulty breathing or swallowing.

People can develop post-[polio](#) syndrome decades after infection. Symptoms may include muscle pain, weakness, and wasting.

People with poliomyelitis may remain wheelchair-bound or unable to breathe without the help of a ventilator for the rest of their lives.

Q: How does polio spread?

A: The virus that causes polio spreads through the "oral-fecal route," which means it enters the body through the mouth by way of the hands, water, food, or other items contaminated with poliovirus-containing feces. Rarely, poliovirus may spread through saliva and upper respiratory droplets. The virus then infects the throat and gastrointestinal tract, spreads to the blood, and invades the nervous system.

Q: How do doctors diagnose polio?

A: Poliomyelitis is diagnosed through a combination of patient interviews, physical examinations, lab testing, and scans of the spinal cord or brain. Health care providers may send feces, throat swabs, spinal fluid, and other specimens for lab testing. But because polio has been vanishingly rare in the United States for decades, doctors may not consider the diagnosis for patients with symptoms. And tests for suspected polio must be sent to the Centers for Disease Control and Prevention, since even academic centers no longer perform the tests.

Q: How can poliovirus transmission be prevented?

A: The CDC recommends that all children be vaccinated against polio at ages 2 months, 4 months, 6 to 18 months, and 4 to 6 years, for a total of four doses. All 50 states and the District of Columbia require that children attending day care or public school be immunized against polio, but some states allow medical, religious, or personal exemptions. The Vaccines for Children program provides [polio vaccine](#) free of charge for children who are eligible for Medicaid, uninsured, or underinsured, or who are American Indian or Alaska Native. Most people born in the United States after 1955 likely have been vaccinated for polio. But in some areas the [vaccination rates](#) are dangerously low, such as New York's Rockland County, where it is 60%, and Yates County, where it is 54%, because so many families there claim religious exemptions.

There are two types of polio vaccine: killed, inactivated polio vaccine (IPV) and weakened, live, oral polio vaccine (OPV). IPV is an injectable vaccine. OPV may be given by drops in the mouth or on a sugar cube, so it's easier to administer. Both vaccines are highly effective against paralytic poliomyelitis, but OPV appears to be more effective in preventing infection and transmission.

Both the wild poliovirus and the live, weakened OPV viruses can cause infection. Because IPV is a killed virus vaccine, it cannot infect or replicate, give rise to vaccine-derived poliovirus, or cause paralytic poliomyelitis disease. The weakened, OPV viruses can mutate and regain their ability to cause paralysis—what's called vaccine-derived poliomyelitis.

Since 2000, only IPV has been given in the United States. Two doses of IPV are at least 90% effective and three doses of IPV are at least 99% effective in preventing paralytic poliomyelitis disease. The United States stopped using OPV due to a 1-in-2,000 risk of paralysis among unvaccinated persons receiving OPV. Some countries still use OPV.

Vaccination against polio began in 1955 in the United States. Cases of paralytic poliomyelitis disease plummeted from over 15,000 a year in the early 1950s to under 100 in the 1960s and then down to fewer than 10 in the 1970s. Today, poliovirus is most likely to spread where hygiene and sanitation are poor and vaccination rates are low.

Q: Why is polio spreading again?

A: The World Health Organization declared North and South America polio-free as of 1994, but in June 2022, a young adult living in Rockland County, New York, was diagnosed with serotype 2 vaccine-derived poliovirus. The patient complained of fever, neck stiffness, and leg weakness. The patient had not traveled recently outside the country and

was presumably infected in the United States. The CDC has since started to monitor wastewater for poliovirus. Poliovirus genetically linked to the Rockland County case has been detected in wastewater samples from Rockland, Orange, and Sullivan counties, demonstrating community spread as far back as May 2022. Unrelated vaccine-derived poliovirus has also been detected in New York City wastewater.

Q: How do I know if I've been vaccinated against polio?

A: There is no national database of immunization records, but all 50 states and the District of Columbia have immunization information systems with records going as far back as the 1990s. Your state or territorial health department may also have records of your vaccinations. People immunized in Arizona, the District of Columbia, Louisiana, Maryland, Mississippi, North Dakota, and Washington can access their immunization records using the MyIR Mobile app, and those who got vaccines in Idaho, Minnesota, New Jersey, and Utah can do so using the Docket app.

You may also ask your parents, your childhood pediatrician, your current doctor or pharmacist, or the K-12 schools, colleges, or universities you attended if they have records of your vaccinations. Some employers, like health care systems, may also keep records of your vaccinations in their occupational health office.

There is no test to determine if you're immune to polio.

Q: Do I need a polio vaccine booster if I was fully vaccinated against polio as a child?

A: All children and unvaccinated adults should complete the CDC-

recommended four-dose series of polio vaccinations. You do not need an IPV booster if you received OPV.

Adults who are immunocompromised, traveling to a country where poliovirus is circulating, or at increased risk for exposure to poliovirus on the job, such as some lab workers and health care workers, may get a one-time IPV booster.

Q: How is polio treated?

A: People with mild poliovirus infection don't require treatment. Symptoms usually go away on their own within a couple of days.

There is no cure for paralytic poliomyelitis. Treatment focuses on physical and occupational therapy to help patients adapt and regain function.

Q: Why hasn't poliovirus been eradicated?

A: Smallpox is the only human virus to have been declared eradicated to date. A disease may be eradicated if it infects only humans, if viral infection induces long-term immunity to reinfection, and if an effective vaccine or other preventive exists. The more infectious a virus, the more difficult it is to eradicate. Viruses that spread asymptotically are also more difficult to eradicate.

In 1988, the World Health Assembly resolved to eradicate polio by 2000. Violent conflict, the spread of conspiracy theories, vaccine skepticism, inadequate funding and political will, and poor-quality vaccination efforts slowed progress toward eradication, but before the COVID-19 pandemic, the world had gotten very close to eradicating polio. During the pandemic, childhood immunizations, including polio

vaccinations, dipped in the U.S. and around the world.

To eradicate polio, the world must eradicate all wild polioviruses and vaccine-derived polioviruses. Wild poliovirus serotypes 2 and 3 have been eradicated. Wild poliovirus serotype 1, the most virulent form, remains endemic only in Pakistan and Afghanistan, but vaccine-derived polioviruses continue to circulate in some countries in Africa and other parts of the world. A staged approach involving the use of OPV, then a combination of OPV and IPV, and then IPV alone would likely be needed to finally eradicate polio from the planet.

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Distributed by Tribune Content Agency, LLC.

Citation: With polio's return, here's what back-to-schoolers need to know (2022, September 19) retrieved 27 April 2024 from

<https://medicalxpress.com/news/2022-09-polio-back-to-schoolers.html>

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