

# Polio: Questions and Answers

## INFORMATION ABOUT THE DISEASE AND VACCINES

### What causes polio?

Polio is caused by a virus.

### How does polio spread?

Polio is usually spread via the fecal-oral route (i.e., the virus is transmitted from the stool of an infected person to the mouth of another person from contaminated hands or such objects as eating utensils). Some cases may be spread directly via an oral to oral route.

### How long does it take to show signs of polio after being exposed?

The incubation period for polio is commonly 6–20 days, with a range of 3–35 days.

### What are the symptoms of polio?

Surprisingly, 95% of all individuals infected with polio have no apparent symptoms.

Another 4%–8% of infected individuals have symptoms of a minor, non-specific nature, such as sore throat and fever, nausea, vomiting, and other common symptoms of any viral illness.

About 1%–2% of infected individuals develop non-paralytic aseptic (viral) meningitis, with temporary stiffness of the neck, back, and/or legs. Less than 1% of all polio infections result in the classic “flaccid paralysis,” where the patient is left with permanent weakness or paralysis of legs, arms, or both.

### How serious is polio?

Although most cases of polio are mild, the 1% of cases resulting in flaccid paralysis has made polio a feared disease for hundreds of years. Of people with paralytic polio, about 2%–5% of children die and up to 15%–30% of adults die.

### Are there any long-term concerns for persons who contracted paralytic polio in childhood?

About 25%–40% of people who suffered from paralytic polio as children develop new symptoms in

adulthood (usually after an interval of 30–40 years). This problem is called post-polio syndrome (PPS) and symptoms can include new muscle pain, weakness, or paralysis. PPS is not infectious. For more information or for support for people with post-polio syndrome, go to [www.post-polio.org](http://www.post-polio.org).

### How is polio diagnosed?

If a person is suspected of being infected, a sample from their stool or throat should be tested for the poliomyelitis virus.

### How long is a person with polio contagious?

Patients infected with the polio virus can pass the virus on for 7–10 days before the onset of disease. In addition, they can continue to shed the virus in their stool for 3–6 weeks.

### Is there a treatment for polio?

There is no “cure” for polio. People infected with polio need supportive therapy, such as bed rest and fluids. Standard precautions should be taken to avoid passing on the virus through any contamination from the patient’s stool.

### How common is polio in the U.S.?

Before a polio vaccine was developed, polio epidemics were common in the United States. For example, in the immediate pre-vaccine era (i.e., early 1950s), between 13,000 and 20,000 paralytic cases were reported each year. After the development of the inactivated (Salk) injectable vaccine in 1955 and the live (Sabin) oral vaccine in 1961, the number of polio cases dropped dramatically. In 1960, there were 2,525 paralytic cases reported, but by 1965 this number had fallen to 61.

Due to a concentrated effort to eradicate polio from the world, there have been no cases of “wild” (i.e., natural) polio acquired in the United States since 1979, and no cases of wild polio acquired in the entire Western Hemisphere since 1991.

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### How common is polio in the world?

In 1988, the World Health Organization (WHO) adopted the goal of global polio eradication. Although the initial target date of 2000 was not met, substantial progress has been made. In 1988, there were estimated to be 350,000 reported cases of polio in the world; in 2001, just 483 cases were reported. Unfortunately, rumors about the safety of polio vaccine in 2003, and subsequent refusal of vaccine by many parents in Nigeria, led to an increase in cases and spread of the virus to nearby countries that had previously been polio free. In 2003, there were 784 reported cases; in 2004, there were 1,255 reported cases.

Wild polio currently exists only in a few countries in Asia and Africa. In 2015 only 74 cases of polio were reported, all from Pakistan and Afghanistan. In 2016 cases were also reported from Nigeria, according to the Global Polio Eradication Initiative. Many organizations have been working hard toward eradicating polio including the World Health Organization, the United Nations Children’s Fund (UNICEF), the Centers for Disease Control and Prevention (CDC), Rotary International, the Bill and Melinda Gates Foundation, and many other international and national groups. Strategies include house-to-house vaccination and National Immunization Days, where even warring factions have called temporary cease fires to allow children to be vaccinated.

### When did the polio vaccine first become available?

The first polio vaccine was an inactivated, or killed, vaccine (IPV) developed by Dr. Jonas Salk and licensed in 1955.

### What are the polio vaccines that have followed the first Salk vaccine?

In 1961, a live attenuated (e.g., weakened) vaccine was developed by Dr. Albert Sabin. This vaccine was given as an oral preparation instead of as a shot. By 1963, this oral vaccine had been improved to include protection against three strains of polio and was licensed as “trivalent oral poliovirus vaccine” (OPV). OPV was the vaccine of choice for the United States

and most other countries of the world from 1963 until changes in U.S. policy in the 1990s.

In 1988, an enhanced-potency IPV formulation became available and by 1997 had become part of the routine schedule for infants and children, given in a sequential combination with OPV. In 2000, an all-IPV vaccine schedule was adopted in the United States. IPV is also available in combination with other vaccines (e.g., DTaP-HepB-IPV, DTaP-IPV/Hib, or DTaP-IPV).

### How is the vaccine administered?

- IPV is given as a shot in the arm or leg.
- OPV is given as an oral liquid. OPV is no longer used in the United States, but is still given in other parts of the world.

### Why was the U.S. polio immunization recommendation changed from OPV to IPV?

The change to an all-IPV schedule in the United States occurred because the few cases of polio that were occurring (8–10 per year) were caused by the OPV vaccine itself and not the wild virus. The change to IPV protects individuals against paralytic polio, while eliminating the small chance (about once in every 2.4 million doses) of actually contracting polio from the live oral vaccine. OPV is better at stopping the spread of the virus to others, but now that wild (natural) polio has been eliminated from the Western Hemisphere, this advantage is no longer a consideration in the United States. IPV has been used exclusively in the United States since 2000. However, in other countries, such as those where wild polio is still a threat, OPV is still used.

### Who should get this vaccine?

All infants should get this vaccine unless they have a medical reason not to. A primary series of IPV consists of three properly spaced doses, usually given at two months, four months, and 6–18 months. A booster dose is given at 4–6 years (before or at school entry), unless the primary series was given so late that the third dose was given on or after the fourth birthday.

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**Does my child need additional doses of polio vaccine if he received a combination of OPV and IPV?**

No, any properly spaced combination of IPV or OPV, is considered a complete poliovirus vaccination series. The last dose in the series must be given on or after the 4th birthday and at least 6 months after the previous dose.

**Why should I vaccinate my child against polio if this disease has been eliminated from the Western Hemisphere since 1991?**

Polio still exists in parts of Africa and Asia and can easily be imported. When the effort to eliminate polio from the world is successful, polio vaccine will become part of history. But we are not to that point yet.

**Should adults get vaccinated against polio?**

In the United States, routine vaccination of people 18 years of age and older against polio is not recommended because most adults are already immune and also have little risk of being exposed to wild polio virus. Vaccination is recommended, however, for certain adults who are at increased risk of infection, including travelers to areas where polio is common, laboratory workers who handle specimens that might contain polioviruses, and healthcare workers in close contact with patients who might be excreting wild polioviruses in their stool (e.g., those caring for recent immigrants from central Africa or parts of Asia).

If an adult is at increased risk of exposure and has never been vaccinated against polio, he or she should receive three doses of IPV, the first two doses given 1–2 months apart, and the third 6–12 months after the second. If time will not allow the completion of this schedule, a more accelerated schedule is possible (e.g., each dose separated four weeks from the previous dose).

If an adult at risk previously received only one or two doses of polio vaccine (either OPV or IPV), he or she should receive the remaining dose(s) of IPV, regardless of the interval since the last dose.

If an adult at increased risk previously completed a primary course of polio vaccine (three or more

doses of either OPV or IPV), he or she may be given another dose of IPV to ensure protection. Only one “booster” dose of polio vaccine in a person’s lifetime is recommended. It is not necessary to receive a booster dose each time a person travels to an area where polio may still occur.

**Who recommends this vaccine?**

The Centers for Disease Control and Prevention (CDC), the American Academy of Pediatrics (AAP), and the American Academy of Family Physicians (AAFP) have all recommended that children receive this vaccine.

**How safe is this vaccine?**

The IPV vaccine is very safe; no serious adverse reactions to IPV have been documented.

**What side effects have been reported with this vaccine?**

Possible side effects include minor local reactions at the site of injection (e.g., pain, redness).

**How effective is this vaccine?**

IPV is very effective in preventing polio, but only when all recommended doses are completed. A single dose of IPV produces little or no immunity, but 99% of recipients are immune after three doses.

**Who should not receive the polio vaccine?**

- Anyone who has ever had a life-threatening allergic reaction to neomycin, streptomycin, or polymyxin B should not get the IPV shot because it contains trace amounts of these antibiotics.
- Anyone who has had a severe allergic reaction to a dose of polio vaccine should not get another one.
- Anyone who is moderately or severely ill at the time the shot is scheduled should usually wait until they recover to get vaccination.

**Can the IPV vaccine cause polio?**

No, the inactivated polio vaccine (IPV) cannot cause paralytic polio because it contains killed virus only.