

What doctors want patients to know about polio

JAN 23, 2026



Sara Berg, MS

News Editor

Once a leading cause of paralysis in children, poliomyelitis—commonly known as polio—is now largely absent from daily life in the U.S. This is a public health success that can be traced directly to vaccination. Polio is a contagious viral disease caused by *poliovirus*, which can infect cells in the central nervous system, potentially causing paralysis. This was the case for Franklin Delano Roosevelt, the 32nd President of the United States, who contracted polio in 1921 at the age of 39.

In the early 1900s, polio paralyzed and killed thousands of people—it was one of the most feared diseases in the U.S. But the polio vaccine helped eliminate wild polio in the country. While polio has been eliminated in the U.S., the country remains at risk because the illness has not been globally eradicated. That is why it is important to understand what polio is, how the virus spreads and why polio vaccination remains essential to protecting individuals and public health.

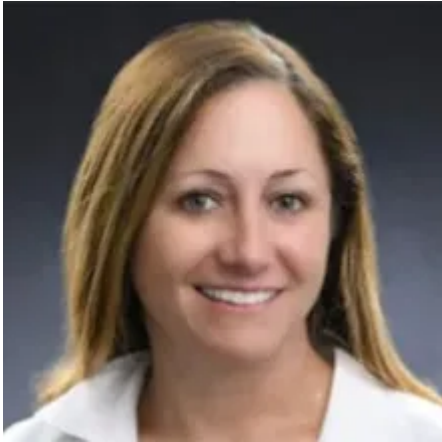
The AMA's What Doctors Want Patients to Know™ series gives physicians a platform to share what they want patients to understand about today's health care headlines and how to take charge of their health through preventive care.

In this installment, Danielle D. Grant, MD, a pediatrician and associate medical director for Texas Children's Pediatrics in Austin, Texas, took time to discuss what patients should know about the polio virus and vaccination.

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Polio is caused by a virus

“It’s a highly contagious viral disease that can ultimately infect cells in the central nervous system and cause paralysis,” said Dr. Grant, noting that “most of the infections are mild. But then that severity of causing paralysis is what makes it a very serious disease.”



Danielle Grant, MD

“*Poliovirus* is a type of enterovirus. There are three types of wild polio virus that exist. There are two countries that still have wild type polio and that’s Pakistan and Afghanistan,” she said. “The virus enters through the mouth, it replicates in the intestine and then can spread to the brainstem and the spinal cord causing neurologic symptoms.”

Some people have no symptoms of polio

“The scary thing is that most patients can have no symptoms of polio, so they can be infected by it and transmit it, but they don’t know that they have it,” said Dr. Grant, noting that about “25 out of 100 cases tend to have flu-like symptoms, so sore throat, fever, nausea and vomiting.

“Other patients can have meningitis symptoms, which is going to be headache and neck stiffness,” she added. “And then, ultimately, a small percentage can have the paralytic symptoms.”

“The rates of meningitis would be one to five out of 100 cases. And then the rates of paralysis would be one to 200 and one to 1,000, depending on the virus type,” Dr. Grant said.

Polio is spread through fecal-oral transmission

The main way *poliovirus* is spread is through the fecal-oral route, “but there’s also transmission through saliva and respiratory droplets,” Dr. Grant explained. This means the virus—found in the stool of an infected person—enters another person’s mouth, often from unwashed hands touching food or surfaces. Spreading through respiratory droplets from sneeze or coughs is less common.

“But there’s a high percentage of people who don’t have any symptoms, and they’re spreading it to people who aren’t protected from it,” she said. “So, we could see a higher risk in areas of poor sanitation,” which also often have low polio vaccination rates too.

An infected person can spread *poliovirus* to others immediately before and up to two weeks after symptoms appear. Even without symptoms, people can still pass the virus to others.

Polio leads to further health complications

“Paralysis affects the muscles. For example, President Franklin Delano Roosevelt experienced paralysis resulting in him losing the use of his legs,” said Dr. Grant. “Paralysis can also affect the respiratory muscles, which can compromise breathing.”

“The other thing you hear about is patients needing the iron lung machine back in the day,” she explained. “That was a negative pressure ventilation system that helped assist respiratory muscles when the polio caused the paralysis of those muscles to actually compromise breathing of patients.”

Recognize risk factors of polio

A big risk factor associated with polio is not being up to date with polio vaccination “because that puts you at risk of getting the virus,” Dr. Grant said. “The other big risk factor would be traveling to areas with ongoing transmission, especially in the world that we live in. People travel often and even though we’ve eliminated polio in our country, it’s not necessarily the case worldwide.

“And then because polio is spread through the fecal-oral route, areas of poor sanitation would be at higher risk as well,” she added, noting there is also high risk for “someone who is immunocompromised or has a weakened immune system.”

Polio diagnosis starts with recognizing symptoms

When it comes to diagnosing polio, “the first thing is recognizing symptoms,” said Dr. Grant. “The symptom that would prompt us to refer for further testing would be a rapidly progressing weakness, difficulty breathing, difficulty swallowing.

“It’s about what’s causing this rapid progression of a paralytic-type situation where patients are all of a sudden presenting with weakness on one side of their body, and difficulty using the muscles to allow them to breath and swallow effectively,” she added. “Then the lab test that we would do or the emergency room would do would be looking for that virus through PCR technology in stool. Rarely, we can find it in cerebral spinal fluid or the throat.”

Get the polio vaccine

The best way to protect against polio is to get vaccinated. There are two types: the inactivated polio vaccine (IPV) and the oral polio vaccine (OPV). IPV is the only polio vaccine that has been given in the U.S. for more than 20 years. However, the OPV polio vaccine is used in other countries.

“Our vaccine series for polio starts at 2 months. Then there is a dose at 4 months and a third dose between 6 to 18 months,” Dr. Grant said. “And then the last dose in the series is at 4 to 6 years old.”

“The vaccination works, so we’ve been able to eliminate polio in our country and other countries have as well,” she said. “So, it really speaks to the point that vaccines do work.”

“There were concerns with the oral polio vaccine that is still used in some other countries because that’s a weakened live virus,” Dr. Grant said, noting “it could cause polio-type symptoms in a very small percentage of patients—about one per 2.4 million.

“But the United States developed and switched to the inactivated polio vaccine in 2000, and the risk from that vaccine is extremely low. A serious allergic reaction to that vaccine would be about one in a million,” she said. “The other side effects would be very minimal, which would be soreness of the muscle at the injection site or redness at the injection site.”

“The oral polio vaccine is economical and it’s really easy to administer, so a lot of countries like to use it to ensure immunity and herd immunity,” said Dr. Grant. “But then that oral polio vaccine, because it’s given orally, that virus can be shed in the intestines and then ultimately in the stool, and it can spread to others.

If those who are exposed “aren’t vaccinated, then they’re at risk for getting polio that way. It’s complicated because it’s a way to immunize, but then it also poses a risk of having a non-wild type of polio out there,” she added.

There is no cure for polio

“The majority of patients will recover if they have the mild symptoms of polio,” said Dr. Grant. “But for those who develop meningitis or paralysis, there’s no cure.

“They will need treatment for pain relief, physical therapy to assist their rehabilitation and then maybe assisted devices such as a ventilator or braces or a wheelchair, as was the case for Franklin Delano Roosevelt,” she said.

Some may develop post-polio syndrome

“There are also cases of people who do recover from polio, but then they start having symptoms years later,” said Dr. Grant. “Sometimes even 40 years later, they’re having

fatigue and muscle weakness,” but it is not contagious.

“It is called post-polio syndrome, and it is attributed to having an infection 10 to 40 years prior,” she said.

Post-polio syndrome (PPS) results from long-term stress on surviving nerve cells. Management of PPS focuses on non-fatiguing exercises, mobility aids and lifestyle changes to cope with symptoms such as sleep problems, breathing issues and brain fog.

In the U.S., polio is eliminated

“Even though we eliminated polio in the United States, there are still cases of polio worldwide and we’re such a global economy and people travel and could be exposed to the virus that way,” said Dr. Grant. “We could start to see more cases happen in the United States if fewer people get polio immunization.”

“If people want to travel, they want to feel protected if they’re going to other countries for work, education or leisure,” she said, emphasizing that the “polio vaccine helps to prevent the spread of the virus. And since there is no cure, the focus should be to get vaccinated to avoid the disease and to help protect others.”