On July 21 of this year, public health officials announced a case of paralytic polio in a young adult in Rockland County, New York, northwest of New York City—the first reported instance of polio in the US since 2013.

Although the case was caused by vaccine-derived poliovirus, the patient was unvaccinated and had not traveled to a country where polio is a risk. Genomic sequencing suggests that the virus has been circulating locally under the radar for up to a year, according to the Centers for Disease Control and Prevention (CDC).

Infection with poliovirus, an enterovirus that primarily infects the intestinal tract, is asymptomatic only about 25% of the time, typically causing a flu-like illness. Depending on the virus type, 1% to 5% of people with infections will develop meningitis. About 0.5% to 0.05% of those who are infected—1 in 200 to 1 in 2000 individuals—will develop paralysis after the virus infects the spinal cord, and a small proportion of them will die as a result of breathing problems, according to the CDC.

Based on these numbers, “a paralytic case is a red flag that tells you there could be 100 people or more in the community who are not showing symptoms,” polio researcher Yvonne Maldonado, MD, chief of the Division of Pediatric Infectious Diseases at Stanford University Medical School, said in an interview with JAMA.

Indeed, genetically similar poliovirus has now been detected in several wastewater samples collected from New York’s Rockland and Orange counties in May, June, and July, as well as in New York City sewage, providing additional evidence of community circulation.

“The detection of poliovirus in wastewater samples in New York City is alarming, but not surprising,” New York State Health Commissioner Mary T. Bassett, MD, MPH, said in a statement. “Already, the State Health Department—working with local and federal partners—is responding urgently, continuing case investigation and aggressively assessing spread.”

It’s also not surprising that the paralytic case occurred in an unvaccinated individual who lives in an area with a low polio vaccination rate, according to Aaron E. Glatt, MD. Poliovirus “could potentially spread like wildfire in a small, consolidated group that has a significant percentage of unvaccinated people,” said Glatt, who is chair of medicine and chief of infectious diseases at Mount Sinai South Nassau in Oceanside and professor of medicine at the Icahn School of Medicine at Mount Sinai, New York.

As of this August, only about 60% of 2-year-olds in Rockland County had had the recommended 3 doses of the inactivated poliovirus vaccine (IPV), with the rate as low as about 37% in 1 zip code. That compares with a New York statewide average of about 79% and a national average of almost 93% for infants born in 2017 and 2018.

Because state and national vaccination rates are high, Glatt believes a general outbreak is unlikely. “One patient does not mean a pandemic, but we do have to be concerned about it, so there isn’t a second, third, and hundredth patient,” he said in an interview. He emphasized that local outbreaks could happen anywhere: “Nobody has a lock on this; every group, every ethnicity, every region of the country has its pockets of unvaccinated people.”

Generally, only unvaccinated or incompletely vaccinated individuals are at risk of symptomatic polio. And because there are no antiviral or other treatments for polio, vaccination is the key to preventing the disease.

“You just don’t see cases in people who have been vaccinated,” Maldonado said. Immediate reporting to public health agencies is important if polio infection is suspected. The CDC has a worksheet for submitting suspected samples for confirmation.

Here are some additional steps physicians can take to assess and address polio risk among patients.

Understand the Vaccines

Today, 2 types of polio vaccines are in use around the world. Since 2000, the US has exclusively administered IPV, which is
greater than 99% effective after the recommended 3 doses, according to the CDC. IPV uses killed wild-type poliovirus to induce what’s believed to be lifelong immunity in the bloodstream. Because it is inactivated, IPV cannot cause poliovirus infection.

Oral polio vaccine (OPV), which previously was used in the US and is still administered in many other countries, is about 95% effective after 3 doses, the CDC noted. It uses a weakened poliovirus strain to induce immunity in the digestive tract and is also thought to provide lifelong protection. In rare instances, the weakened virus in OPV regains its ability to infect the nervous system. This results in symptomatic polio in about 1 in 3 million vaccinees, William Schaffner, MD, a professor of preventive medicine and health policy at Vanderbilt University in Nashville, said in an interview. The reverted virus also is excreted and passed on from person to person, which likely was the source of the Rockland County paralytic polio case, he added.

Be Aware of Local Conditions
Although poliovirus infections in the US currently are rare and have not been identified outside New York State, risk factors vary regionally, so it’s prudent to be aware of any local risk or sign of the disease.

State and local health departments generally issue warnings to health care professionals, as New York State did on August 4. In partnership with the CDC, health departments operate a nationwide disease surveillance network. Practitioners are required to report suspected paralytic polio cases to health departments within 4 hours and suspected nonparalytic polio cases within 1 day.

State and local health agencies also work with the CDC to conduct wastewater surveillance for certain pathogens, such as SARS-CoV-2. Wastewater sampling for poliovirus was initiated in New York after the paralytic case was reported.

Although wastewater surveillance is helpful, it may be incomplete and “given the ease of travel, any area may be at risk,” Jesse Hackell, MD, chair of the American Academy of Pediatrics (AAP) Committee on Practice and Ambulatory Care, said in an interview.

Get Patients Vaccinated
“IT is very sad to see at this point, after a highly impactful global pandemic, that a vaccine-preventable disease we thought we had vanquished reappears because of lack of vaccination,” Maldonado said.

Increasing polio vaccination rates begins with taking a complete vaccination history from every patient—not just those living where the virus has been detected—according to Schaffner. Most people who are not up to date with polio vaccines should be immunized, including infants and older children, adults of all ages, and pregnant people at risk of exposure, such as those in New York State.

In addition to reviewing vaccine histories during visits, Hackell recommends routinely screening patient records for polio vaccinations and contacting patients who are behind on them. State immunization information systems and school records are sources of vaccination records, he added. These systems consolidate vaccination data regardless of where they were administered. Even so, they may not be complete.

Hackell said it’s a safe bet that anyone who went to public schools in the US in the past 70 years has been vaccinated. But if there is any question of this, offering the polio vaccine—either as a booster or a full 3-dose course—is a low-risk way to make sure patients are protected. As Schaffner put it, “When in doubt, vaccinate.”

For patients who are not vaccinated or are incompletely vaccinated, a first dose should be given immediately, if possible, Tochi Iroku-Malize, MD, MPH, MBA, president-elect of American Academy of Family Physicians and a practicing physician in Long Island, New York, said in an interview. Follow-up doses should then be scheduled according to CDC recommendations.

The CDC guidance includes specific schedules for children, adults, and people vaccinated in other countries with a bivalent OPV, which does not protect against type 2 poliovirus. Accelerated schedules are included for those planning travel to areas where polio is endemic, as are catch-up dose recommendations for incompletely immunized individuals.

Consider Booster Doses
The CDC recommends 1 lifetime booster shot for adults who have had 3 doses of IPV and are at high risk of polio exposure. This includes people who are traveling to areas where the virus is epidemic or endemic, laboratory technicians who handle poliovirus specimens, and health care workers and others caring for infected people. Health care workers who administer vaccines are not at higher risk, Maldonado said.

In New York State, the health department is now recommending booster shots for anyone exposed to a person with confirmed or suspected polio or such person’s household members or other close contacts. Boosters are also recommended for health care workers in areas with community transmission, such as Rockland and Orange counties, who might treat patients or handle specimens from patients who may be infected with polio. These include emergency department, urgent care, neurology, and virology laboratory workers. Boosters should be considered for people exposed to New York wastewater as part of their job. As of August 19, boosters were not recommended for people traveling to Rockland or Orange counties or the New York metropolitan area.

Still, Glatt said that it’s important to remember that all public health efforts should be focused on vaccinating people who are unvaccinated or partially vaccinated. Fully vaccinated people even in high-risk environments are at a very low if not negligible risk of getting paralytic polio, which has not been reported in the fully vaccinated population.

Address Vaccine Hesitancy
With vaccine hesitancy on the rise, addressing it is essential to protect against polio and other vaccine-preventable diseases. Hackell, who coauthored an AAP clinical report on the topic in 2016, said that individuals’ reasons for hesitancy and the strength of their resistance varies and must be addressed case-by-case. Some people believe vaccines are no longer necessary while others lack trust in the health care system. Some merely have concerns about vaccines and can be persuaded while other are adamantly opposed to them. Others will allow vaccinations required for school while refusing others.

Hackell recommends asking patients or, if they’re minors, their parents why they are hesitant about polio vaccination. When asked about vaccine hesitancy, “Most people say, ‘I don’t know’ or ‘I am just not ready,’” he noted. Reminding them of the toll infectious diseases took before current vaccines were available can be persuasive. One eye-opening statistic: in the early 1950s about 15 000 paralytic polio cases occurred annually in the US.
Disease resurgence in a community can be a powerful motivator, as Hackell, who recently retired from practice in Rockland County, knows first-hand. During the 2019 measles outbreak, which also involved Rockland County, reaching out to hesitant parents convinced many to have their children vaccinated. "It was in our face; it was a crisis and we used it," Hackell said. In his view, the reappearance of polio offers a similar opportunity to increase vaccine uptake.

Glatt agreed: "This is a great teaching opportunity to say to unvaccinated people or to the parents of unvaccinated children, 'This is a real case of polio with paralysis. Is this what you want for your children, when it can easily and safely be prevented with a series of vaccinations?'"

Iroku-Malize emphasized listening patiently and responding with facts. Having ongoing trusting relationships with patients also helps. In an August 19 health advisory, the New York State Department of Health (NYSDOH) recommended that clinicians use their influence: "In view of misinformation and rumors spreading in the involved areas, we strongly encourage healthcare providers, who tend to be highly trusted, to speak out about the reality of the threat and the presence of circulating poliovirus in New York State."

Know the Workup
Hackell recommends the CDC and medical specialty societies as good sources of information for physicians to refresh clinical knowledge on polio.

Diagnosing poliovirus infection is complicated because the majority of people who are infected never develop symptoms. Those who do mostly have nonspecific viral symptoms such as fever, sore throat, tiredness, headache, nausea, and stomach pain. Clinical screening involves testing a stool or oropharyngeal sample for enterovirus. Confirming poliovirus infection involves collecting stool samples over 2 days and sending them to health department and CDC laboratories. This is complicated, expensive, and impractical for a disease that is quite rare.

Even so, screening some patients with nonspecific viral symptoms may be warranted in areas with known community spread of poliovirus. The NYSDOH recommends it for unvaccinated patients with at least 2 of these symptoms, including fever or sore throat, who are living in the currently affected areas. Patients with meningitis in these areas also should be screened.

More specific to poliovirus infection is weakness in the limbs that progresses over a few days, called acute flaccid paralysis. It’s usually, but not always, worse on 1 side of the body, and progresses from proximal to distal muscles. Muscle strength and tone are affected, and reflexes decreased, but sensation is not affected, Maldonado said. Difficulty speaking or swallowing, as well as respiratory distress, may also occur, suggesting anterior myelitis.

Acute flaccid paralysis is more often associated with other diseases, including other enteroviruses, adenoviruses, West Nile virus, Guillain-Barré syndrome, and botulism, according to the CDC. Nonetheless, polio should be considered in the presence of other factors, Glatt said. These include polio disease in the area, unvaccinated or incomplete vaccination, travel to or exposure to people from countries at high polio risk, or contact with someone who is infected.

Per Glatt: "When you see a patient who is unvaccinated and has symptoms that are potentially consistent with a polio diagnosis, put it in the differential diagnosis."