

MIRACLE WORKERS

ON APRIL 12, 1955, IT WAS PROVEN THAT DR. JONAS SALK HAD SUCCESSFULLY FOUND A SAFE, POTENT, AND EFFECTIVE VACCINE FOR POLIO.



DR. JONAS SALK



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MIRACLE WORKERS

By David Oshinsky

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By the 1950s, polio had become America's most dreaded infectious disease, as it fell cruelly and inescapably every summer, putting children in particular at risk. There was no prevention and no cure—no way of telling who would get it and who would be spared. Fearing that the virus spread through water, health officials closed down swimming pools and beaches.



Dr. Jonas Salk administering a polio vaccine to a child.

On April 26, 1954, six-year-old Randy Kerr stood first in line at his elementary school gymnasium in McLean, Virginia, sporting a crew cut and a smile. With assembly-line precision, a nurse rolled up his left sleeve, a doctor administered the injection, a clerk recorded the details, and the next child stepped into place. “I could hardly feel it,” boasted Kerr, America’s first polio pioneer. “It hurt less than a penicillin shot.”

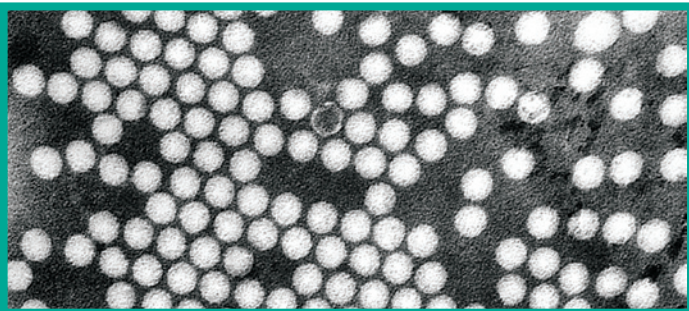
This procedure would become nationally routine in the coming weeks as more than a million children took part in the Salk poliomyelitis vaccine trials of 1954, the largest public health experiment in American history. National attention would be riveted on the outcome, with news coverage rivaling the other big stories from that remarkable spring—the Army-McCarthy hearings, the Supreme Court’s decision in *Brown v. Board of Education*, and the stunning French defeat at Dien Bien Phu. Jonas Salk’s picture adorned the cover of *Time* magazine. A Gallup poll showed that more Americans were aware of the polio vaccine trials than knew “the full name of the President of the United States.” Never before, it appeared, had the nation been as captivated by the pursuit of a medical or scientific objective.

Such fascination was understandable: by the 1950s, polio had become America’s most dreaded infectious disease, as it fell cruelly and inescapably every summer, putting children in particular at risk. There was no prevention and no cure—no way of telling who would get it and who would be spared. Fearing that the virus spread through water, health officials closed down swimming pools and beaches. Children were told to rest and warned to stay out of crowds. Parents gave their kids a daily “polio test.” It became the crack in America’s

middle-class picture window, leaving vivid reminders for all to see: wheelchairs, crutches, leg braces, iron lungs, and deformed limbs.

Ironically, the nation’s most famous polio survivor—Franklin Delano Roosevelt—had contracted the disease at age 39 in 1921. Polio, then called “infantile paralysis,” did not reach epidemic levels in the United States until the years following World War II. As president, Roosevelt had helped found the National Foundation for Infantile Paralysis, which would become the March of Dimes, a foundation devoted to helping rehabilitate polio survivors and supporting the quest for a vaccine. The organization revolutionized the way charities raised money, recruited volunteers, and penetrated the mysterious world of medical research. Among the scientists it funded were the bitter laboratory rivals Albert Sabin at the University of Cincinnati and Jonas Salk at the University of Pittsburgh. Sabin championed a live-virus oral polio vaccine (the sugar-cube method) designed to trigger a natural infection strong enough to generate lasting antibodies against polio, yet too weak to cause a serious case of the disease. Salk favored a simpler killed-virus polio vaccine intended to produce antibodies (through injection) without creating a natural infection. Speed was on Salk’s side in the race.

Human testing in the 1950s was, by current standards, a primitive affair. There were few rules or restrictions; researchers commonly used prisons and orphanages for their experiments without bothering with the modern-day niceties of “informed consent.” But the Salk trials, using a model in which some subjects would be given the real vaccine and others a placebo, required so many schoolchildren, in so many different regions of the country, that parental consent became an essential part of the process. No one could be certain that the Salk vaccine was safe or effective for



Poliomyelitis, or Polio for short, is an acute, viral disease spread from person to person. Polio vaccines were developed in the 1950's and have reduced the global number of polio cases per year from many hundreds of thousands to under a thousand today. This image shows an electron micrograph of the Polio Virus taken in 1975.

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—Continued—

humans; yet the parents of America volunteered their children in unprecedented numbers. Why? For one thing, many of them knew the March of Dimes, having worked as volunteers. For another, these parents had faced the terror of polio each summer for more than a decade. In their eyes, the risk of the vaccine paled in comparison to the promised reward. Finally, Americans of this era had an abiding faith in the power of scientific progress, especially medical research, which had discovered miraculous vaccines and wonder drugs against such scourges as pneumonia, tuberculosis, and yellow fever.

It took a full year to analyze the results of the polio trials. On April 12, 1955—the tenth anniversary of FDR’s death—the announcement was made: Salk had done it. His vaccine was “safe, potent, and effective.” Most heard the news huddled around their radios. In factories, department stores, and coffee shops, people wept openly with relief. To many, April 12 resembled another V-J Day—the end of a war. “We were safe again,” a journalist recalled. “We had conquered polio.” The following week, at a White House

Rose Garden ceremony for Salk, President Dwight D. Eisenhower fought back tears as he told the young researcher: “I have no words to thank you. I am very, very happy.”

Sabin’s oral version appeared a few years later. Together, the two vaccines would end polio in United States and much of the world. The current expectation is that polio will soon go the way of smallpox, becoming only the second infectious disease to be wiped from the face of the earth. Most people today have no memory of polio—the images of deserted movie theaters and swimming pools, the panicked feelings of parents, the daily counts of polio victims in the newspapers, the common sight of toddlers struggling in their braces, the haunting photos of hospital wards lined wall-to-wall with iron lungs. It was a time of terror and of triumph, when Americans came together in a massive voluntary effort to defeat the twentieth century’s most insidious childhood disease. ♦



One store owner's gratitude was expressed in his store front window on April 13, 1955 to Dr. Jonas Salk when he successfully created the Polio Vaccine.

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Transcript of Letter from Franklin Delano Roosevelt to Dr. Egleston Regarding his Polio Attack, 10/24/1924

<http://www.archives.gov/research/americans-with-disabilities/transcriptions/naid-6037479-letter-from-fdr-to-dr-egleston.html>

Franklin D. Roosevelt
Hyde Park, Dutchess County
New York at Warm Springs, Georgia
October 11, 1924

My dear Dr. Egleston:

Please excuse my delay in replying to your letter which has been forwarded to me down here in your neighboring state where I am spending a few weeks swimming and getting sunlight for my legs.

I am very glad to tell you what I can in regard to my case and as I have talked it over with a great many doctors can, I think, give you a history of the case which would be equal to theirs.

First symptoms of the illness appeared in August, 1921, when I was thoroughly tired from overwork. I first had a chill in the evening which lasted practically all night. The following morning the muscles of the right knee appeared weak and by afternoon I was unable to support my weight on my right leg. That evening the left knee began to weaken also and by the following morning I was unable to stand up. This was accompanied by a continuing temperature of about 102 and I felt thoroughly achy all over. By the end of the third day practically all muscles from the chest down were involved. Above the chest the only symptom was a weakening of the two large thumb muscles making it impossible to write. There was no special pain along the spine and no rigidity of the neck.

For the following two weeks I had to be catheterized and there was slight, though not severe, difficulty in controlling the bowels. The fever lasted for only 6 or 7 days, but all the muscles from the hips down were extremely sensitive to the touch and I had to have the knees supported by pillows. This condition of extreme discomfort lasted about three weeks. I was then moved to a New York hospital and finally moved home in November, being able by that time to sit up in a wheel chair, but the leg muscles remained extremely sensitive and this sensitiveness [sic] disappeared gradually over a period of 6 months, the last remaining point being the calf muscles.

As to treatment—the mistake was made for the first 10 days of giving my feet and lower legs rather heavy massage. This was stopped by Dr. Lovett of Boston who was, without doubt, the greatest specialist on infantile paralysis. In January, 1922, 5 months after the attack he found that the muscles behind the knees had contracted and that there was a tendency to foot-drop in the right foot. These were corrected by the use of plaster casts

Transcript of Letter from Franklin Delano Roosevelt to Dr. Egleston Regarding his Polio Attack, 10/24/1924

—Continued—

during 2 weeks. In February, 1922, braces were fitted on each leg from the hips to the shoes and I was able to stand up and learned gradually to walk with crutches. At the same time gentle exercises were begun, first every other day, then daily, exercising each muscle 10 times and seeking to avoid any undue strain by giving each muscle the correct movement with gravity. These exercises I did on a board placed on the bed.

The recovery of muscle paralysis began at this time, though for many months it seemed to make little progress. In the summer of 1922 I began swimming and found that this exercise seemed better adapted than any other because all weight was removed from the legs and I was able to move the legs in the water far better than I had expected. Since that time, i.e. for the last two years, I have as far as possible in connection with my work and other duties, carried out practically the same treatment with the result that the muscles have increased in power to a remarkable extent and the improvement in the past six months has been even more rapid than at any previous time.

I still wear braces, of course, because the quadriceps are not yet strong enough to bear my weight. One year ago I was able to stand in fresh water without braces when the water was up to my chin. Six months ago I could stand in water up to the top of my shoulders and today can stand in water just level with my armpits. This is a very simple method for me of determining how fast the quadriceps are coming back. Aside from these muscles the waist muscles on the right side are still weak and the outside muscles on the right leg have strengthened so much more than the inside muscles that they pull my right foot outward. I continue corrective exercise for all the muscles.

To sum up I would give you the following "Don'ts."

Don't use heavy massage but use light massage rubbing always towards the heart.

Don't let the patient over-exercise any muscle or get tired.

Don't let the patient feel cold, especially the legs, feet or any other part affected.

Progress stops entirely when the legs or feet are cold.

Don't let the patient get too fat.

The following treatment is so far the best judging from my own experience and that of hundreds of other cases which I have studied.

1. Gentle exercises especially for the muscles which seem to be worst affected.
2. Gentle skin rubbing—not muscle kneading—bearing in mind that good circulation is a prime requisite.
3. Swimming in warm water—lots of it.
4. Sunlight—all the patient can get, especially direct sunlight on the affected parts. It would be ideal to lie in the sun all day with nothing on. This is difficult to accomplish but the nearest approach to it is a bathing suit.
5. Belief on the patient's part that the muscles are coming back and will eventually regain recovery of the affected parts.

Transcript of Letter from Franklin Delano Roosevelt to Dr. Egleston Regarding his Polio Attack, 10/24/1924

—Continued—

There are cases known in Norway where adults have taken the disease and not been able to walk until after a lapse of 10 or even 12 years.

I hope that your patient has not got a very severe case. They all differ, of course, in the degree in which the parts are affected. If braces are necessary there is a man in New York whose name I will send you if you wish when I get back to New York, who makes remarkable light braces of duraluminum. My first braces of steel weighed 7 lbs. apiece—my new ones weigh only 4 lbs. apiece. Remember that braces are only for the convenience of the patient in getting around—a leg in a brace does not have a chance for muscle development. This muscle development must come through exercise when the brace is not on—such as swimming, etc.

I trust that your own daughter is wholly well again.

William Egleston, M.D.
Hartsville, S.C.

Very truly yours,



Franklin D. Roosevelt



In August 1921, President Franklin D. Roosevelt contracted polio. It resulted in the president being paralyzed from the waist down. This photo shows FDR in his wheelchair in 1941.

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Instructing Nurses on the Use of Respirator for a Polio Patient.

<http://www.archives.gov/historical-docs/todays-doc/index.html?dod-date=523>



In the photograph above, nurses are learning how to use a negative pressure ventilator. These ventilators enabled a person to breathe when normal muscle control had been lost or the work of breathing exceeded the person's ability.

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WorldMapper "Polio Cases"

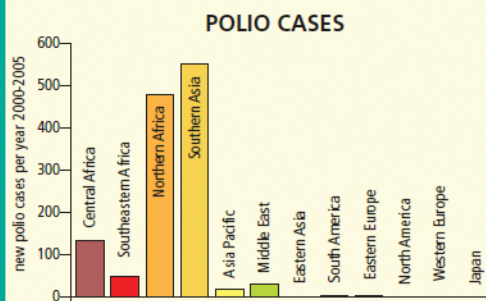
http://www.worldmapper.org/posters/worldmapper_map235_ver5.pdf

In the past 20 years the number of polio cases in the world have decreased significantly. Between 2000 and 2005 the worldwide number of new polio cases fell from 2971 to 155. In 2005, polio was detected in just 9 territories.

India and Nigeria recorded the most cases of polio between the years 2000 and 2005. Over this period there were 2508 cases in India and 2120 in Nigeria. Most territories had no new cases so they cannot be seen on the map.

Polio, or poliomyelitis, is a virus which can permanently paralyse groups of muscles. The disease cannot be cured, it is possible to vaccinate against it. Polio usually affects children under 5 years old.

Territory size shows the proportion of worldwide polio cases that were recorded there between 2000 and 2005.



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Many Faces of Polio

http://www.polioassociation.org/Faces_of_Polio.pdf



President Franklin Delano Roosevelt
This is the only known photograph of
President Roosevelt in a wheelchair.



March of Dimes coin banks.
These banks were placed near the cash registers of
retail merchants, restaurants, and theaters to receive
donations for the fight against polio.



Respiratory Polio Ward
Rancho Los Amigos National Rehabilitation Center
Downey, California

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Polio Clips and Polio-My Journey

<http://www.youtube.com/watch?v=f60lh9nBVZA&feature=related>

<http://www.youtube.com/watch?v=hGw9iYk4Fdo>



POLIO CLIPS
<http://www.youtube.com/watch?v=f60lh9nBVZA&feature=ated>

POLIO-MY JOURNEY
<http://www.youtube.com/watch?v=hGw9iYk4Fdo>

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The Dangers of the Antivaccine Movement (excerpt)

By Meredith Melnick

<http://www.time.com/time/health/article/0,8599,2053517,00.html>

Childhood inoculations protect us against deadly infectious diseases like measles, whooping cough and polio. But they are also the source of near constant conflict — most recently in the Feb. 22 Supreme Court decision that ruled in favor of a vaccine manufacturer over the family of a disabled girl. In recent years, some parents, influenced by fringe activists who believe vaccinations cause autism, brain damage and other ailments, have begun to refuse them for their children. Dr. Paul Offit, chief of the Division of Infectious Diseases and the director of the Vaccine Education Center at the Children's Hospital of Philadelphia, has seen the consequences: preventable childhood deaths, community outbreaks of outdated diseases and misinformed, angry parents. In a conversation with TIME and in his recent book, *Deadly Choices: How the Anti-Vaccine Movement Threatens Us All*, Offit describes the origins of our squeamishness with inoculation and why we should fight against it.

Vaccine refusal also spans non-Western cultures. In Nigeria, some people believe the polio vaccine causes AIDS. Why are vaccines so universally scary?

At the heart of it, vaccination is an aggressive act. You pin the child down, you inject them with a biological agent. And for many, it's unclear how the biological agent works. So I think it appeals to people's fears. Also, vaccines are given to most children but are designed to prevent only specific infections. They aren't designed to prevent everything that happens in the first few years of life, so there are definitely going to be temporal associations that aren't necessarily causal associations.

But we do ask a lot of our citizens. We ask them to get 14 vaccinations in the first few years of life and two more in adolescence. That's a lot of immunizations. If you look at immunization rates in the United States, they are pretty good: in the high 80% or low 90% range. What's changed is that now some communities are making the choice not to vaccinate — in Southern California, Ashland, Ore., or on Vashon Island, off the coast of Washington State. You have a lot of people in daycare centers or schools who are making the same choice, so there are communities where [infectious disease] outbreaks are starting to occur. We saw that with the whooping-cough epidemic in California this past year. It was the largest in more than 40 years.



At the university of Pittsburgh in 1957 where the Polio Vaccine was being administered.

Do you think skepticism about vaccines adds anything valuable to the conversation?

John Salamone, who had a child who suffered polio through a rare consequence of the oral polio vaccine, is a perfect example of a safety activist. He lobbied the American Academy of Pediatrics and the CDC to move from the live oral polio vaccine to the inactivated polio vaccine. He put a face to the children who suffered vaccine-associated paralytic polio every year, and that made a difference. But Salamone's contentions were science-based. The new antivaccine arguments aren't. Vaccines don't cause autism or brain damage, so when Barbara Loe Fisher or J.B. Handley or Jenny McCarthy or Jim Carrey or Bill Maher argue for safer vaccines, you can't make those vaccines any safer using their definition because vaccines aren't unsafe using their definition. Vaccines don't cause autism, so you can't make them safer by making them not cause autism. ♦

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Taliban Calls Off Attacks on Polio Vaccine Workers in Afghanistan

By Hayes Brown

<http://thinkprogress.org/health/2013/05/14/2003641/taliban-polio-workers/?mobile=nc>

In a change of tactics, the Taliban has called off its attacks against health workers in Afghanistan, providing space for polio workers to finally eradicate the deadly disease.

The former leaders of Afghanistan have gone back and forth on allowing aid workers to administer the polio vaccine to Afghan children over the years. Last year, the group decided to allow the program to go forward so long as workers “not use government resources, including vehicles and soldiers, and they should use their own resources so that they impartially execute their program.” At the time, their spokesperson also claimed that the Taliban has always supported vaccinations.

That commitment was questioned yet again this year, when in March the Taliban halted the program in Afghanistan’s Nuristan province. “For the past three years Waygal district has been under the Taliban, they are very strong there. For the last two years the vaccine process went on in the district, but this year they stopped it,” Nuristan governor Tamim Nuristani told the Guardian at the time.

It seems, however, that the Talibs have had a change of heart once more. In a statement issued from “The Islamic Emirate of Afghanistan” — the country’s full name when under Taliban rule — the vaccination push has been given the all-clear:

“According to the latest international medicine science, the polio disease can only be cured by preventive measures by the anti-polio drops and the vaccination of children against this disease.

“The Islamic Emirate of Afghanistan supports and lends a hand to all those programs which works for the health care of the helpless people of our country,” said a statement issued by the ‘Islamic Emirate of Afghanistan’.

But it warned the World Health Organisation and Unicef to employ only “unbiased people” in a campaign “harmonised with the regional conditions, Islamic values and local cultural traditions.”



Flag of Afghanistan

It also ordered its fighters to give polio workers “all necessary support”.

Afghanistan is one of only three countries — alongside Nigeria and Pakistan — where polio is still endemic. Last year, the country had thirty-six new cases of polio, with an estimated 160,000 to 180,000 children missing their scheduled vaccinations. In April, the Afghan government pledged to administer anti-polio and anti-measles vaccines to eight million Afghan children under the age of five this year.

And while the Taliban’s pledge to allow aid workers to complete their work is promising, it leaves questions remaining for the other two countries seeking to eradicate polio, both of which have also experienced numerous attacks on aid workers. In Nigeria, home of the most polio outbreaks in the world, the extremist group Boko Haram killed at least nine aid workers in February. Likewise, in Pakistan at least a dozen aid workers have been killed since the start of the year. ♦