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**Salk produces polio vaccine
1952**

Poliomyelitis has been around since ancient times. There is still no cure for the disease. But at the peak of its devastation in the United States, [Jonas Salk](#) introduced a way to prevent it.

This infectious viral disease attacks the nerve cells and sometimes the central nervous system, often causing muscle wasting and paralysis and even death. Since 1900 there had been cycles of epidemics, each seeming to get stronger and more disastrous. The disease, whose early symptoms are like the flu, struck mostly children, although adults, including Franklin Roosevelt, caught it too.

As a medical student and later a researcher at the University of Michigan, Salk studied viruses, such as influenza, and ways to vaccinate against them. Successful vaccines already existed for diseases such as smallpox. For each virus, a vaccine must be custom-made, but the principles are the same: if your body is exposed to a very weak or small amount of the disease virus, it will produce antibodies, chemicals to resist and kill the virus. Then when a full-strength version of the disease virus comes along, your body is prepared to fight it.

In 1947 Salk became head of the Virus Research Lab at the University of Pittsburgh. He began investigating the poliovirus. To start with, he had to sort the 125 strains of the virus. He found that they fell into three basic types and knew that a vaccine would have to include these three types to protect against all polio. One of the hardest things about working with poliovirus was manufacturing enough to experiment with and to make vaccine production practical.

In 1948 researchers at Harvard (J.F. Enders, T.H. Weller, and F.C. Robbins) made a breakthrough with this. They found that the virus could grow on scraps of tissue,

without needing an intact organism like a chick embryo. Bacteria usually contaminated the tissue, but Enders' team was now able to get penicillin -- discovered 20 years earlier by [Alexander Fleming](#) and developed in the 1940s by [Ernst Chain](#) and Howard Florey -- and prevent the bacterial growth. Now viruses like mumps or polio could be created in large quantities for study. This team won the 1954 Nobel Prize in physiology/medicine.

Now Salk could speed up his research. Using formaldehyde, he killed the polio virus but kept it intact enough to trigger the body's response. On July 2, 1952, Salk tried a refined vaccine on children who'd already had polio and recovered. After the vaccination, their antibodies increased. He then tried it on volunteers who had not had polio, including himself, his wife, and their children. The volunteers all produced antibodies, and none got sick.

In 1953 Salk reported his findings in *The Journal of the American Medical Association*. A nationwide testing of the vaccine was launched in April 1954 with the mass inoculation of school children. The results were amazing -- 60-70 percent prevention -- and Salk was praised to the skies. But suddenly, some 200 cases of the disease were caused by the vaccine and 11 people died. All testing was halted. It seemed that people's hopes were dashed until investigators found that the disease-causing vaccine all came from one poorly made batch at one drug company. Higher production standards were adopted and vaccinations resumed, with over 4 million given by August 1955. The impact was dramatic: In 1955 there were 28,985 cases of polio; in 1956, 14,647; in 1957, 5,894. By 1959, 90 other countries used Salk's vaccine.

Another researcher, Albert Sabin, didn't think Salk's killed-virus vaccine was strong enough. He wanted to mimic the real-life infection as much as possible; that meant using a weakened form of the live virus. He experimented with more than 9,000 monkeys and 100 chimpanzees before isolating a rare form of poliovirus that would reproduce in the intestinal tract but not in the central nervous system. In 1957 he was ready for human trials of a vaccine people could swallow, not get in a shot. It was tested in other countries, including the Soviet Union and Eastern Europe. In 1958 other researchers tested a strain in the U.S. and they tried to cast doubts on Sabin's "communist vaccine." In spite of this, his vaccine was licensed in 1962 and quickly became the vaccine of choice. It was cheaper to make and easier to take than Salk's injectable vaccine.

In the U.S., cases of polio are now extremely rare, and ironically, are almost always caused by the Sabin vaccine itself -- being live, the virus can mutate to a stronger form. Elsewhere there are still about 250,000 cases per year, mostly in developing nations where vaccination has not become widespread. The World Health Organization has goals to eradicate polio completely in the first decade of the twenty-first century.

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