

MEDICINE

Polio Research Brings Hope

You may have had disease and never knew it. Blood and drugs give hope of immunity. And when paralysis comes, new treatments help.

By JANE STAFFORD

➤ ALL OVER the land today and for the rest of this month, dimes are being given to fight polio. Many a dime is dropped into the collection bottle by someone inwardly shuddering with fear of the disease. Many are dropped with a prayer that beloved children will be spared from an attack.

Sometimes crippling and occasionally killing, poliomyelitis, also called infantile paralysis, is perhaps the most terrifying of any disease to parents and children alike. Yet the accomplishments of the past dozen years renew hope that research such as the March of Dimes supports will some day free mankind from this particular disease horror.

Here are reassuring facts: Fully half of those who get an acute attack recover completely without any trace of muscle weakness, much less crippling or deformity. The other half will have some muscle weakness and mild to severe paralysis. With proper treatment some half of these (a quarter of the total who get an acute attack) can be so helped that the muscle weakness or paralysis is too slight to handicap them.

Polio does kill. The number varies from epidemic to epidemic. Newer methods of treatment, however, are steadily improving the chances of survival for the victims.

Bad Polio Year

Last year was a bad polio year, second worst on record. By the middle of December 33,000 cases had been reported at U. S. Public Health Service headquarters in Washington.

But in the same first 50 weeks of 1950, about 10 times as many children were stricken by measles, and half again as many had scarlet fever. More than three times as many had whooping cough. These childhood diseases are all dangerous, and all take their toll in deaths each year.

Here's another reassuring fact about polio:

A large proportion of the population, including children, may have been attacked by polio virus without ever knowing it. They may have had an attack so mild that they passed it off as a cold or an upset stomach. Or they may have gotten the virus of the disease into their bodies without having any symptoms of sickness. After such infection the blood for a time contains antibodies to the polio virus. The antibodies, if they are like those in other diseases, make a person immune, or resistant, to further attacks so long as they are in the blood in sufficiently high concentration.

Blood containing these antibodies can be transferred, along with the potential polio-protecting property, to another person. This is called passive immunity. It is not so lasting as the kind acquired by getting the infection itself.

Whole Blood Used

As long ago as the early 1930's scientists tried using whole blood from adults to protect children against polio. More recently, blood serum from patients just recovered from an acute attack of polio has been tried as a polio-protecting measure. In these trials, however, there were no "controls." No group of children equally exposed to polio was purposely deprived of the blood or serum. Consequently, scientists do not know whether the children who got the blood or serum were really protected or whether they would have escaped polio anyway.

The polio-protecting antibodies are in the globulin part of the blood plasma. Recently scientists have developed ways of separating this globulin part from the rest of the blood, and some of it is being used to give protection from measles. On the basis of animal experiments, as well as theory, it could be used to give children short-time, passive immunity against polio. But before it is used in this way extensive trials should be made with careful controls, leading authorities think.

This kind of immunization is not the same as vaccination. The immunization with gamma globulin from blood would make use of polio antibodies formed in another person's body. Vaccination would make use of polio virus itself to stimulate antibody production by the blood of the vaccinated person, just as an attack of polio does.

Vaccination against polio was tried in the early 1930's. One vaccine was made from killed polio virus, another from living but weakened virus. Neither vaccine proved effective, and one was reported responsible

for several deaths. Many polio authorities now are pessimistic about the possibilities of ever stopping polio by a vaccine, though others are still hopeful.

As everyone knows, polio does not attack all children in a community even during a severe epidemic. Some, in fact most, escape being sick though probably many get a small dose of the virus. Why some get sick and others do not is still something of a mystery. Presumably the ones who escape have developed polio-fighting antibodies previously. Some may have gotten protection from their mother's milk. Within the past year an anti-polio substance has been discovered in human breast milk. This may be the reason why in regions where babies are nursed until they are two years old or so the infants and small children escape polio even during severe epidemics. The significance and practical application of this discovery await further scientific study.

A real headache for scientists fighting polio comes from the disturbing report of a link between susceptibility to infantile paralysis and the "shots" given to protect children against diphtheria and whooping cough. These two diseases are greater killers than polio, and they will attack far more children than polio if the "shots" are not given. Yet in Australia and in England scientists found that babies routinely given these immunizing shots contracted infantile paralysis more often than children who had not gotten the anti-diphtheria and anti-whooping cough "shots."

But there is a silver lining to this cloud. The shots to protect babies against diphtheria and whooping cough can be given at a season when there is little or no polio around.

Polio apparently does not spread through food, water, flies, mosquitoes or other insects. Any of these may have the virus on them, but scientists are pretty well convinced that polio spreads through the intimate contact of close, daily living. In that, it is something like the common cold.

No Escape Known

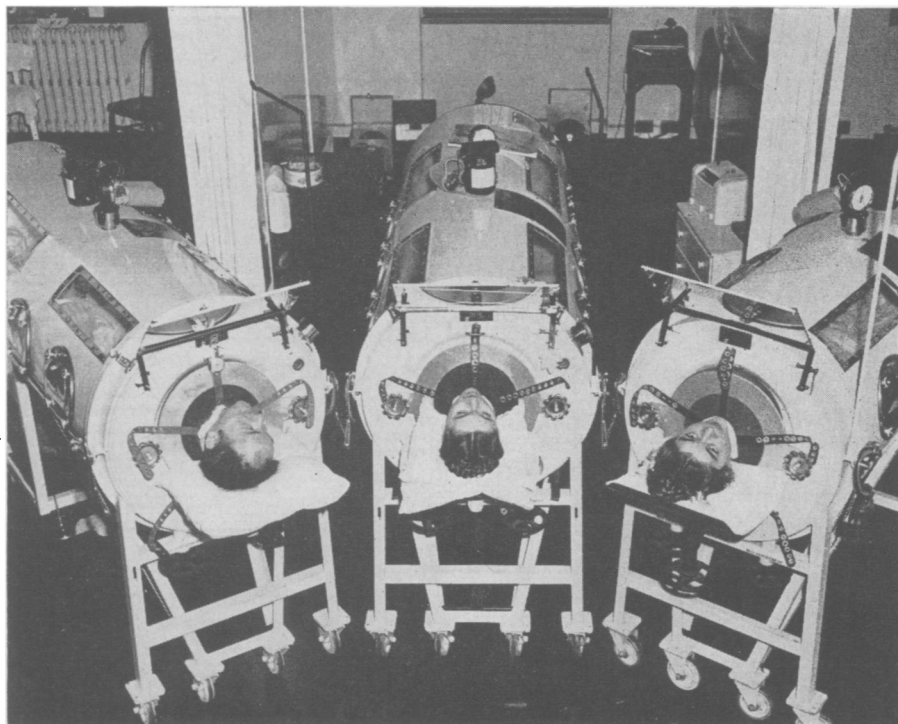
Since there is no known practical way of surely escaping polio, the universal hope is for a drug to cure it. So far, that is an unfulfilled hope. The antibiotics, so-called mold drugs, have not proved effective against polio, wonderful as they are in curing many other diseases. Some of the antibiotics, however, are effective against some viruses. There is therefore good reason to hope that one which is effective against the polio virus can be found.

Good treatment given early helps thousands of polio victims to recover with little or no paralysis. That is why parents and children should heed the warning signs of polio: sore throat, a "head cold," nausea and sometimes vomiting, fever, diarrhea or

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RELIEF—"Iron lungs" rescue polio patients until their own breathing can resume the job. This cheerful trio lives at the Respirator Center at Children's Hospital, Baltimore, established there in cooperation with the National Foundation for Infantile Paralysis.

sometimes constipation, poor appetite, pain particularly in arm and leg muscles. Trembling of the hands and other parts of the body and stiffness of neck and back are other symptoms.

If paralysis or crippling does occur, there are operations that help reduce the disability. Strong muscles can be transplanted to take over the job of weakened ones. Legs can be slowed in their growth or shortened by surgery to match the polio-shortened one when necessary. Exercises, sometimes in pools such as the famous one at Warm Springs, Ga., and in others close to the polio victim's home, help strengthen weakened muscles.

Respirators, or "iron lungs," are better and more numerous than they used to be. For those who cannot live outside a respirator, there are now special centers being developed where the iron lungers can be together, stimulate each other to try longer periods outside the respirator, and get all the expert attention needed from doctors and nurses.

The polio virus has an affinity for nerves. It paralyzes by destroying nerves. Muscles unable to contract and relax because their nerve controls are dead gradually wither and shrink. Recently, scientists have been able to get the polio viruses (there are several strains of polio virus) to grow outside the body in non-nervous tissue. This is expected to help in further studies of the virus and to speed tests of possible anti-polio drugs.

The past two years have been the worst polio years on record in this country. Thousands are still fighting their way back to health and useful activity. But they are getting more and better help than could be given two decades ago, or even 10 or five years ago. Polio may strike again and again in the next few years, but its victims can be sure of getting the best care that the ever-growing science of polio fighting can develop, thanks in large part to those dimes being given all over the nation this month.

Science News Letter, January 20, 1951

AGRICULTURE

Weed Control Method Uses Oil at Night

➤ A NEW way of weed control may develop because a California plant scientist has utilized the scientific fact that the air openings in leaves of crops are closed at night.

Weeds in a field of beans were killed without hurting the bean plants when sprayed at night with a light petroleum oil, in an experiment at the Shell Agricultural Laboratory experimental farm near Modesto, Calif.

Dr. Johannes van Overbeek, Shell plant physiologist, explains that after the sun sets, the leaves of the crop plants close their stomata, which are the openings in their leaves through which oxygen enters and carbon dioxide is expelled in the "breathing"

of the plant. The openings are not entered by water due to surface tension, even when they are open. But kerosene and other petroleum liquids can enter the stomata when they open, damaging the membranes of the plant cells so that the cell contents leak out. When the openings are closed, the oil spray cannot get in.

Grass is a principal weed of cultivated fields. The structure of grass is such that the delicate growing point is easily reached by oil creeping down between the rolled-up leaves of the young plant. Thus, oil at any time, in darkness or light, will enter and damage this tissue, and the night spraying will kill the grass.

A volatile oil is used in the spraying so that it has evaporated by the time daylight comes and the leaves of the beans or other crop plant get open for their daily business of growing.

The new spray is still merely experimental. Two difficulties stand in the way of a practical application: night work is involved, and the oil used is inflammable and constitutes a hazard.

Science News Letter, January 20, 1951

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