

MEDICINE

Treatments Paralyze Poliomyelitis

Discovery of five types of brain damage led to more specific treatment, cut death rate to 30% in usually fatal form of infantile paralysis.

By JANE STAFFORD

► INFANTILE PARALYSIS victims this summer have a better chance than ever before to escape death and severe crippling.

There should be no deaths in four of the five previously most dangerous forms of the disease.

Only one in five is likely to be left severely paralyzed.

Many can be relieved of the cold, clammy, swollen feet and hands that plague patients who have recovered from the acute stages of the disease.

Some patients, even some who had the disease years ago, can be given greater strength and use of long weakened, almost useless muscles.

Cure Not Discovered

These accomplishments have come without the discovery of any miracle drug to cure the disease or any specific remedy for warding it off. The cure and preventive of infantile paralysis, or polio as many call it, are yet to be discovered.

The biggest life-saving accomplishment was made in the frantic days last summer when cases throughout the nation were climbing to a near-record total of more than 25,000, and deaths were mounting into the hundreds.

Minnesota was for weeks the hot spot of the epidemic. Cases in that state alone reached a total of 2,875. Almost 200 of them were of the dreaded, usually fatal bulbar type. Patients with this type of the disease used to suffocate or choke to death, usually within a very short time. Although they were dying because they could not get enough air into their lungs, the ordinary iron lung did not help them and was even dangerous in some cases.

When these patients with bulbar polio began coming to the University of Minnesota Hospital, in three or four times the number usually expected in an epidemic, a special team of medical scientists was alerted from the University's staff. They are: Drs. A. B. Baker, Joe R. Brown, James O. Elam, Clifford Grulee, Jr., and Allen Hemingway. A wartime secret development of the Army Air

Forces and March of Dimes funds from the National Foundation for Infantile Paralysis were sent to help them.

At the end of the epidemic, only 56 of the 183 bulbar cases they treated had died. One of these should have lived, would have been saved if his parents had consented soon enough to one of the new treatments. Some of the 56 died before the doctors had made the discoveries that led to the new treatments. At that, the 56 deaths, representing a fatality of 30%, was far below the expected 90% to 100% fatality.

Clues from the dead bodies of the first victims led to the new methods of treatment which saved other victims, will save still more in the future.

Most important was the discovery that bulbar polio can take five different forms, each with different symptoms and needing a different and specific treatment. When this discovery was made, the doctors began saving patients.

Bulbar polio gets its name from the



PHYSICAL THERAPY — Stair-climbing is part of treatment that overcomes handicaps.

fact that in this form, the virus cause of the disease attacks a small bulb or cone of nervous tissue at the base of the brain. This nervous tissue is called the medulla oblongata. Formerly it was supposed that the infection involved the whole medulla. The University of Minnesota scientists found that any of five regions of the medulla may be involved.

One type of bulbar polio they now call the cranial nerve nuclei type. In this type the nerves controlling the muscles of the face and throat are affected. The patient has trouble swallowing, which not only makes it hard to feed him but, more important, brings the danger that he will choke to death from accumulations of mucus and other material. To save the patient, the doctor must keep the airways free of this obstructing material.

If this cannot be done by ordinary measures, such as suction through the mouth, an opening must be cut into the windpipe from outside the throat. This operation is called tracheotomy. The patient breathes through a tube inserted into the opening. Refusal to permit this operation in time cost the life of one victim in the Minnesota epidemic. He was the only one of the 100 patients with cranial nerve nuclei polio to die.

Lack of Oxygen

Also located within the medulla or bulb of the brain is the respiratory center which controls the rate of breathing. Patients with respiratory center type of bulbar polio lose control of the rhythmic rate of breathing. As a result, they do not get enough oxygen in their blood and may quickly die.

The rate of blood flow, as well as the rate of breathing, is controlled by a special region of the brain bulb. When this circulatory center is attacked by the polio virus, the patient's pulse rate changes, his blood pressure falls rapidly and he shows the general symptoms of a person in shock. Fortunately, this circulatory center type of the disease is rare, because it is the one most difficult to treat successfully. There is no specific treatment for it except oxygen, which has not been too helpful.

Fourth of the newly defined types of bulbar polio is the encephalitic type, in which the patient shows signs of confusion, apprehension and anxiety. The symptoms are chiefly due to lack of oxygen in the brain.

The bulbar cervical spinal type is the fifth. In this type both the bulb and the adjacent areas of the spinal cord may be involved. The patients may have a mixture of the symptoms of the other types and in addition may have paralysis of the upper torso, particularly the muscles of the chest controlling breathing.

Treatment is given according to the symptoms of the patient which show the type of bulbar polio he is suffering. To save lives, doctors must be quick and keen in interpreting the symptoms and applying the suitable treatment. The tracheotomy operation, feeding by a tube through the nose and oxygen, are among the measures used. A special kind of iron lung has been built with a punched-in head to leave room for the tracheotomy.

Iron Lung Problems

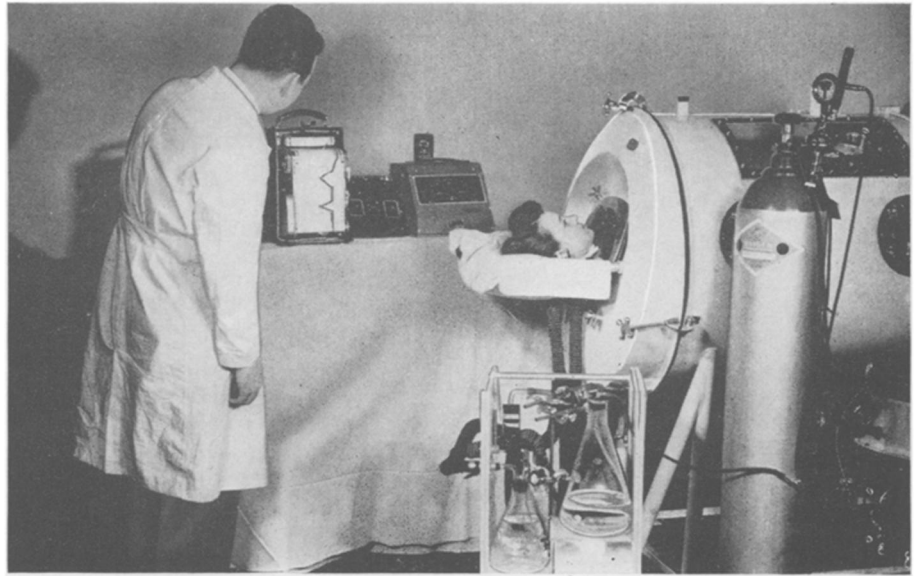
When a patient needs oxygen, how much he needs, and how long he can safely remain out of the iron lung when he is beginning to improve are vitally important questions which in the past have had to be answered by the nurse's or doctor's observations. Even with constant, skilled attendance, it is often hard to answer these questions accurately and quickly. The amount of oxygen within the blood and cells of the body may vary widely within a few seconds. By the time the oxygen lack produces symptoms that nurse or doctor can see, it may be so great that the patient is in grave danger.

A dual photoelectric device which clips on the patient's ear helped the Minnesota doctors answer vital questions about oxygen lack and save patients' lives. The device, called an oximeter, was invented by Dr. Glenn A. Millikan, son of the Nobel Prize winner, Dr. Robert A. Millikan, and himself a distinguished physiologist whose promising career was stopped by a fatal accident this spring.

Record of Oxygen

The oximeter, operating through two color filters, gives an immediate and continuous record of the amount of oxygen circulating in the bloodstream. It was first used by the Army Air Forces to combat oxygen lack in high altitude flying. Part of the recording equipment was a war secret. The instrument was released last summer to help fight polio.

With more patients being saved from polio death, physical therapy, which overcomes the crippling and paralysis the diseases leaves in its wake, becomes more than ever important. Modern methods



FIGHTING POLIO—New life-saving equipment for fighting polio consists of (1) new type iron lung with punched out head to permit access to (2) tracheotomy tube which provides open airway in the patient's throat for (3) giving oxygen that has been bubbled through humidifying apparatus and (4) oximeter clipped to patient's ear to show at once when oxygen in patient's blood falls to dangerous level. Dr. James E. Olam, University of Minnesota physiologist, is reading the oximeter record.

now make it possible for 50% of the victims to recover without any handicap and for another 20% to escape with mild, non-handicapping paralysis. But these good results depend to a large extent on early diagnosis and early, continuous use of physical therapy.

Treatment for infantile paralysis is expensive, but no parent need worry about the cost. The National Foundation for Infantile Paralysis will pay part or all of the cost of treatment for any patient needing such aid. The chief jobs for parents are to avoid getting panicky or letting the children get panicky, to be alert for symptoms that might mean polio, to call the doctor promptly if these symptoms develop and to follow his advice about treatment.

Science News Letter, August 2, 1947

MEDICINE

Better Germ-Killers Built in Laboratory

➤ NEW CHEMICAL drugs that may be better than the wonder germ-killer, penicillin, are being built in the laboratory, the International Chemical Congress in London was told by several teams of chemists.

Intermediate compounds that lead toward new forms of penicillin have been prepared, Dr. A. H. Cook reported for

a group working under Sir Ian Heilbron of London's Imperial College of Science.

The synthesis of benzilpenicillin was announced by Prof. Vincent du Vigneaud of Cornell Medical College, New York City, who first synthesized penicillin itself.

Many steps toward making artificial streptomycin, the other wonder mold chemical, have been taken, Dr. Karl Folkers of Merck Laboratories in New Jersey, told the congress. The synthesis of this drug will be more difficult than that of penicillin, he admitted.

Science News Letter, August 2, 1947

YOUR

HAIR

AND ITS CARE

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