EXIT POLIO

"Munch it then swallow it. It's all so easy. Today, two or three drops of vaccine on a lump of sugar, that's all there is to being vaccinated against polio. Yet it was only three years ago, a great concern was being voiced because so few people were ready to accept that Salk injectable vaccine.
In fact, it took the death of a famous sportsman to drive people to the clinics. There after, the adult population showed a little more readiness to accept polio jabs. But since then, an oral vaccine has been successfully developed. This rapid advance has posed certain questions. How is live polio vaccine produced? How is it different from Salk vaccine? Why is it a superior vaccine? This film attempts to answer these questions."

In 1959, the year that footballer Jeff Hall died, the pharmaceutical industry began constructing new sterile facilities to produce Sabin oral polio vaccine. Doctor Albert Sabin's research provided the seed strains that would make possible the large scale production of this oral vaccine. And he acted as technical consultant to the virologists.

The live oral vaccine is produced under sterile conditions conforming to the regulations of the Ministry of health. Constant vigil is maintained against the presence of unwanted microorganisms. Quarantined for six weeks, healthy monkeys provide the kidney cell host where the virus will grow and multiply. Kidneys from each monkey are minced before processing. The yield of each pair of kidneys will be separately processed and tested before being pooled with the output of other kidneys.
Vaccines of all three strains are produced under identical procedure but at separate times.
The minced kidneys are then agitated mechanically in trypsin, an enzyme that causes the kidney fragments to break down into separate cells. At intervals the fluid is drawn off and replenished with fresh trypsin until the kidney clumps are completely broken down.
These bottles of fluid are carefully balanced and placed in a centrifuge where the monkey cells are separated from the trypsin. A standard measure of monkey kidney cells is then inoculated into flasks containing a nutrient medium. The isolated cells are then incubated for seven days. They multiply, and a thin layer of tissue forms which, if found free of contamination, is bathed in fresh medium. Fluids from each flask are then pooled and added to a series of four tissue cultures to test for living microbial agents.
Here again, if a contaminant is found, the tissue cultures are discarded. Only tissue cultures that are completely free of living microbial agents are passed into the live virus area. The Sabin seed strains of the three types of poliovirus are stored in a deep freezer until needed. A quarter of all tissue cultures that have passed into the live virus area, are set aside as controls. At this point, the seed virus is added to the remaining tissue cultures. During three to four days of incubation, the virus invades the cell, thrives, and multiplies.
Meanwhile, a pooled sample of the control tissue cultures is tested in the four tissue culture system previously used to protect against the presence of living microbial agents. Following these tests, the virus laden fluid is harvested. It is maintained in deep freeze for ten days when a second test of the control is conducted, using again the four tissue culture system.
If this reveals no active microbial agents vaccine samples then undergo tissue culture testing and specific checks for sterility and potency. If tests prove satisfactory, batches of virus fluid are pooled and studied further for effect in rabbits, guinea pigs, and suckling and adult mice. The virus fluid is passed through sterile filters which will prevent the passage of bacteria. Tests are again conducted to determine sterility, virus assay, potency and safety. A series of genetic marker tests further demonstrates that the virus in each pool is a Sabin attenuated strain.
All monkeys are observed for 17 to 21 days under the supervision of a qualified pathologist, a physician or a veterinary surgeon for evidence of polio or other viral infections.
The manufacturer must submit to the Medical Research Council all documents relating to the history of the manufacture of each batch of vaccine. Also included are the results of all tests

performed. In the United Kingdom duplicate control tests are carried out by the biological standards control laboratories of the Medical Research Council. The virus pool under test is satisfactory only if the comparative analysis reveals that it is not significantly different from the live seed from which it was made. Before licensing, Sabin vaccine was submitted to searching trial work in this country and in many other parts of the world.
There are some who consider mass campaigns with oral vaccine unnecessary. Their ideas may stem from a failure to appreciate how significant are the differences between the two vaccines. Briefly there are these.
One of the big advantages as far as the patient is concerned is that live Sabin vaccine is taken orally in one form or another while Salk vaccine is taken by injection.
Moreover, the live vaccine's greater acceptability plus the speed of administration, gives mass campaigns more chance of success.
Immunity is produced very quickly by the oral vaccine. In fact, protection begins to build up within a week of swallowing a single dose of any one of the three types of vaccine. So, oral vaccine can be extremely effectively used in mass campaigns. Now, why should the vaccine be used in this way? This man has had an injection of Salk vaccine. As a result, antibodies appear in his blood stream. They do not affect his intestine. This man on the other hand has swallowed a dose of Sabin vaccine. Antibodies appear in the blood stream as before, but unlike Salk vaccine, immunity also develops in the intestine and produces a resistance there quite independent of the protection in the blood. And this is what gives the development of live vaccine so great a significance. Salk vaccine allows a person still to carry the poliovirus in the bowel. It remains a danger to others. But Sabin vaccine, by producing resistance in the bowel, breaks the chain of transmission and prevents people acting as carriers of wild viruses. During 1960, Dr Sabin carried out an extensive trial of his vaccine, in Cincinnati. The population of the city and its suburbs is nearly one million. Approximately 75% of the children within the city and a small proportion of suburban children received the oral vaccine. Careful observation indicated that up to the end of the following year, 1961, in the entire population, there was not one single case of paralytic polio caused by polio viruses of local origin.

"The many trials to which it has been subjected have confirmed the claimed advantages of Sabin oral vaccine over Salk vaccine. Therefore, we must accept the need to vaccinate everyone with oral vaccine, whether or not they have already received Salk injections. Only in this way can we insure that wild virus does not infiltrate the community by way of carriers. And only in this way will Sabin's vaccine be used to its full advantage."

THE END

A PFIZER PRESENTATION

PRODUCED BY STAR SOUND STUDIOS
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