

# Polio Confidential: Stories from Those Who Lived It

## Part 3 – How A Virus Changed History



PODCAST 46

**00:18**

**Dr. Jane Caldwell**

Hi, this is Jane Caldwell. Welcome to the *On Medical Grounds* podcast, your source for engaging, relevant, evidence-based medical information. What you'll be listening to today is part three of a three-part series on polio, a serious disease that was almost totally eradicated in my lifetime due to polio vaccination programs worldwide. We'll be talking to polio survivors, healthcare providers who have treated polio patients, and a noted expert on polio and polio vaccines.

Today we discuss how a virus changed history. Let me introduce our guest, Dr. William Schaffner. Dr. Schaffner is a Professor of Preventive Medicine and Infectious Diseases at the Vanderbilt University School of Medicine.

Early in his career, he was commissioned as an Epidemic Intelligence Service Officer with the CDC in Atlanta, where he investigated outbreaks of communicable diseases in the U.S. and internationally. Dr. Schaffner has worked extensively for the effective use of vaccines in both pediatric and adult populations and has been a member of numerous expert advisory committees that establish national vaccine policy.

Because he is committed to public communication about medicine, he is often invited to comment in local and national media and translate public health events and scientific research into accessible language to promote understanding.

Hello, Dr. Schaffner. Thank you for joining us today.

**Dr. William Schaffner**

Good to be with you, Jane.

**01:56**

**Dr. Jane Caldwell**

We're interested in your experience and your personal stories about polio and polio vaccines. First of all, what attracted you to medicine as a profession?

**Dr. William Schaffner**

That was a long time ago, but I do remember being about eight years old and being so impressed with our family doctor coming to visit my brother and me when we became ill and visiting his offices on occasion.

And somehow, I'm the first in my family tree. I decided at that very young age that I wanted to be a doctor and everything else has flowed from that.

**02:37**

**Dr. Jane Caldwell**

You graduated from Cornell University Medical College in 1962. Was polio still filling the children's wards and hospitals when you were in school?

**Dr. William Schaffner**

Filling may be not accurate because before then we had started vaccination campaigns, fortunately. Yes, there were still children with acute onset of polio and obviously there were children in polio wards in iron lungs, which we'll talk about a little later, who were receiving chronic care. So, polio was still with us when I was in medical school.

**03:16**

**Dr. Jane Caldwell**

The polio vaccine was created by Jonas Salk, and it became available in 1955. Did you receive the polio vaccine as a precaution for your occupational exposure?

**Dr. William Schaffner**

I actually was a Polio Pioneer. I was one, I received the vaccine I think when I was about 18 years of age, still in high school or early college. And I remember receiving a button that I pinned on my jacket that said I was a Polio Pioneer. And then later when the Sabin oral vaccine became available, we took that also.

Now that was just for general protection. And of course, back in that day, all healthcare providers received polio vaccine. Today, it's no longer essential for being a healthcare provider because, as we'll discuss, there's no more polio.

**04:16**

**Dr. Jane Caldwell**

I didn't know you were Polio Pioneer. What was that experience like?

**Dr. William Schaffner**

Well back then of course, all moms and dads were so excited to get a vaccine against polio because it was so intensely feared. And the lines were long when the vaccine first became available. Every child had been brought out. As you may recall, the March of Dimes was a nonprofit organization that was set up in order to fund research that developed the polio vaccine. And those of us who were kids took our little monies, and we would put them, our dimes literally and other coins, quarters, and nickels into slots in cardboard containers that were in stores around the community. These were all gathered together and those were the resources that funded the development of polio vaccine.

We were in effect crowdsourcing, as we would say today, the development of the vaccine. We children funded the development of the vaccine by putting our little resources in those slots. That's how important we thought that was.

**05:44**

**Dr. Jane Caldwell**

Can you tell us about your most memorable encounter with a polio patient?

**Dr. William Schaffner**

Well, that was special. I can't recall whether I was an infectious disease fellow or a young faculty member. I think I was a young faculty member. And that patient was a lady who had had polio in the past and was left with paralysis such that she still had difficulty breathing.

And so, she was confined to an iron lung for most, but not all of the day. She was admitted with an infectious illness that we quickly diagnosed and treated. But the most heartwarming thing about this lady is that she was married. And while I cared for her in that iron lung, while she was confined to the iron lung, it was evident that she was pregnant.

She was married. And this is one of the most heartwarming things that I recall of any patient. Here, she and her husband wanted to express their love and their intimacy with each other and to have a child, to have another generation out of their deep love for each other. And they managed to do that during those parts of the day while she was able to be outside of the iron lung, breathing for herself. This is one of the most affirmative experiences that I have had in medicine. And I understand that she had a healthy baby. I heard that later. So, this is a moving expression of human affection for each other and surmounting what would appear on the surface to be insurmountable difficulties and this commitment to each other and wanting to continue to have a family. Obviously 40 plus years later it still affects me deeply.

**08:03**

**Dr. Jane Caldwell**

Thank you for that memory. So, prior to your experience as a healthcare provider, did you know friends, family, or even classmates who were affected by polio?

**Dr. William Schaffner**

Sure, I mean, growing up polio was an illness that was clearly feared, and you knew kids in school who had had polio, some of whom recovered. My cousin had polio, he was left with just a little bit of residual paralysis, not enough for the Navy to detect it when he volunteered to join the Navy.

So, they took him in, so he recovered almost completely. Back in those days, polio was so feared, it was, it is an enterovirus, spreads more readily in the summer and the autumn. I couldn't go swimming in community pools because although the virus was poorly understood by the population, there was a sense that if you gathered together with lots of other kids, you could pick up the virus and become infected so I couldn't go swimming during many summers.

**09:16**

**Dr. Jane Caldwell**

So, could you please relate to us some of the symptoms and morbidities of polio?

**Dr. William Schaffner**

Well, polio is a virus that lives in the intestinal tract. And in order to create paralysis, it has to leave the

intestinal tract, find the spinal cord and particular cells in the spinal cord, infect those. And these are the cells that direct our capacity. They send signals to our muscles to be able to move.

And if those particular cells are infected and destroyed, the signal cannot occur, and paralysis occurs. That's how polio occurs. Now, polio is a very interesting virus because the vast number of individuals, back then often children, who were infected, had no symptoms at all. Only about 10 % of them developed an illness characterized by fever, fatigue, headache, loss of appetite, muscle aches and pains, and sore throat. This might last two or three days, and then they would get better completely. Only 1-2 % had this paralytic illness where the virus left the intestinal tract and then infected the spinal cord cells resulting in muscle spasms and respiratory difficulty. If the muscles to breathing were involved, you obviously couldn't breathe for yourself because they were paralyzed. Hence the need for the iron lung, which of course was a machine devised to help you breathe.

**11:05**

**Dr. Jane Caldwell**

So, I'd wager that most of our listeners have never seen an iron lung, let alone worked around one. Could you describe the iron lung in more detail and how to train someone to use it?

**Dr. William Schaffner**

The iron lung was a wonderful technology of the past. We have better machines to help you breathe today, but back then if you were paralyzed you couldn't breathe, and you probably had paralysis in your other limbs, also your arms and legs. So, you would be put into a tube. That tube had windows in it so we could look into your body.

It was secured around your neck. You probably had a tracheostomy, a breathing tube, to make it easier for the machine to work. You're in the machine and the device actually acts like a bellows. It reduces the pressure in the tube, therefore expanding your chest and the good air comes in.

And then it reverses itself and, vroom, increases the pressure in the tube, pushing the bad air out. And that machine then goes in and out and in and out and breathes with you. Note, you're paralyzed. You have no control over anything that happens. You're totally dependent on, first of all, on an electric supply that keeps the machine going, and the personnel who can care for you.

It's a profound psychological illness as well as a physical illness. And the people who cared for such patients were trained to care for patients psychologically as well as physically. And yes, that meant your bodily excretions, your fluid, your eating... all were within the control of the people who care for you. Fortunately, the initial inflammation that caused the paralysis often receded and people began to recover either completely or partially. And so, you could then withdraw people from care in the iron lungs.

**13:39**

**Dr. Jane Caldwell**

That's an aspect of iron lung I didn't know about, the psychological aspect.

You did mention in a previous interview that more than 20 years ago when the design for the Monroe Carell Jr. Children's Hospital in Vanderbilt was first being considered, the planners didn't have to make allowances for the treatment of children using iron lungs. How huge was that?

**Dr. William Schaffner**

Well, I often tell this story in the context of speaking to people who want to know about vaccines and the impact of vaccines. You see, our children's hospital at Vanderbilt in Nashville, Tennessee was a center in the southeastern United States for the care of patients with poliomyelitis. We had a large ward devoted to patients in iron lungs.

And what I usually say to people is, I don't mention the disease. I don't describe the ward. But we had a big ward for disease for which patients were referred throughout the southeast. And then when we built our fancy, wonderful new children's hospital, we didn't include a ward for that disease. And then I would look out at the audience and say, why didn't we do that?

We were a regional center for the care of these patients. What was the disease? And of course, the disease was polio. And the reason we didn't have to put a new, I must admit I get emotional about this, a new polio ward in our fancy up-to-date children's hospital was because there was no more polio. We vaccinated every child. The disease was gone. It was eliminated. And isn't that wonderful?

**15:34**

**Dr. Jane Caldwell**

Yes, I'd have to agree with you.

So, polio can also have some long-term effects. Could you describe the post-polio syndrome?

**Dr. William Schaffner**

So, there are people who are left with residual paralysis. They can learn to function in society. But we have discovered that 20 to 30 years later, some of those individuals develop further muscle weakness and muscle pain and cramps. That's the post-polio syndrome. And they have to get more physical therapy in order to learn how to function with this surprising but gradually diminished physical capacity. We don't exactly know why that is. We don't think it's the virus still causing illness in the body. It may be that those nerves that are left somehow were impaired through, shall we say, overuse over 20 or 30 years and they're now no longer as functional. So even 20 or 30 years later, the residual of polio has come upon us again and given us new patient care challenges.

**16:54**

**Dr. Jane Caldwell**

Very few healthcare providers today have seen a polio patient. What could you tell doctors and nurses about diagnosing for polio and caring for polio patients?

**Dr. William Schaffner**

I've talked a little bit about that before. And I guess my first response to that question is, yes, very few physicians and nurses are around today who've taken care of polio patients. And that's marvelous. I love that deficit.

We're now using polio vaccine, as you know, globally to try to actually eliminate polio, to eradicate it from the world. There are challenges there which we needn't get into, but the risk of polio today is very, very low. But just a quick anecdote, I have been part of training physicians along with the head nurse back on that polio ward, in caring for patients in the iron lung in the old days. And after these bright young people are

well-trained and the nurse will end the training session with saying, are there any questions you have? And they say, no, no. And then she looks them right in the eye, opens up the iron lung and says, get in. And she makes them get in. She closes the machine, the lung turns on the bellows and says, now you know what it feels like to be a patient. Very impressive.

**12:40**

**Dr. Jane Caldwell**

Do you think non-medical exemptions from vaccinations should be allowed for healthcare workers?

**Dr. William Schaffner**

Well, speaking about all vaccinations, you know that polio is not an obligatory vaccine for healthcare workers because we don't have polio, but there is an array of other vaccines. And my answer is generally for all children, I think there should be medical exemptions, but I'm of that group of people who thinks there should be no non-medical exemptions, no personal belief or religious exemptions. I know of no structured religion that has any concern with vaccines and religious leaders of all sorts have spoken on this. In order to eliminate illnesses, we're going to have to all sign up and be vaccinated. Remember, there are those of us who are weaker brothers and sisters, who have immune systems that cannot respond to the vaccines or who have a medical reason not to get them. The way we protect our neighbors who are weaker than we are is for all of us, all of us to be protected and create a cocoon of protection around them. I'm unhesitating in saying we have that obligation to our more frail brothers and sisters.

**21:16**

**Dr. Jane Caldwell**

How should we tell parents about polio and other childhood vaccinations?

**Dr. William Schaffner**

That they're gone but not forgotten. And the reason they're gone here is because we've all been vaccinated. But they're still out there in the world. And as measles, that most infectious of viruses, has demonstrated, when we have pockets of children in the United States who go unvaccinated, measles can be imported into the United States and then spread widely among them.

And measles is not a disease that's trivial. Of the children, and this has been demonstrated in these measles outbreak, 10% of them have to be hospitalized. That's not a good thing. Back in the day, and I surprise medical students when I tell them this, before we had vaccines in the United States, 400-500 children each year died of measles and its complications. They died. The number today is zero. The reason it's zero is that every child is vaccinated. We must maintain that barrier of protection for all of the children in the United States. And we've eliminated disparities in that regard in the United States by vaccinating all of our children.

**21:47**

**Dr. Jane Caldwell**

Given your personal history with polio and other preventable diseases, what keeps you up at night?

**Dr. William Schaffner**

I've alluded to that, Jane. Vaccine hesitancy and skepticism and indeed the anti-vaccine movement, a lack of confidence in science. Some of this comes because we've had so much success. If the mother hasn't

experienced and doesn't know about vaccine preventable diseases and the grandmother doesn't know either, this kind of information usually comes down through the maternal side of the family. These vaccine preventable diseases are not respected or even feared, and therefore the vaccine isn't valued enough.

We have to do better in educating children in school about vaccine preventable diseases and the benefits of vaccine. That's another soapbox of mine. We need to enhance the health education about vaccine in middle and high schools in this country. But I guess an optimistic thing I would always end with is speak to your doctor. Have a conversation with your doctor. The doctor is there caring for you and your children day in and day out, year in and year out. You can have confidence in your doctor. Speak with them.

**Dr. Jane Caldwell**

Dr. Schaffner, thank you so much for joining us today.

**Dr. William Schaffner**

It's been my great pleasure.

**Dr. Jane Caldwell**

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