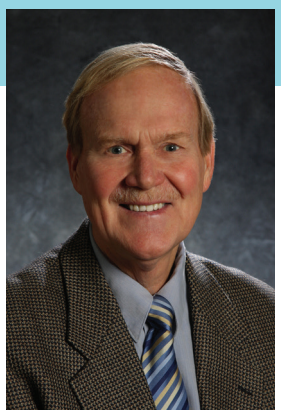

Frederick M. Maynard, MD

Ask Dr. Maynard

Send your questions for Dr. Maynard to info@post-polio.org.

See other questions at www.post-polio.org/edu/askdrmay.html.

Question: I contracted polio at 10 months old in 1953 and it affected my left leg (knee down) and right foot. It's been recommended to me recently to try using an FES Bike with the goal of strengthening my upper leg muscles. Has anyone experienced a gain in muscle strength after using such a machine? I am luckily blessed with almost no pain. My goal is to strengthen my upper leg muscles which are now getting weaker due to post-polio affects. I have fallen twice in the last two years, when my knees gave out for no apparent reason.

Answer: Please don't become involved with regular use of an FES bicycle. It will not benefit you and may cause you harm. I will try to explain why. And, I will add that anyone recommending FES for a polio survivor with residual weakness and post-polio syndrome does not understand the basis for muscle weakness after a poliovirus infection, let alone what is happening with PPS.

FES (Functional Electric Stimulation) is used to stimulate nerves going to muscles when a person is unable to fire those nerves themselves through voluntary effort or intent. The classic example is after a spinal cord injury when nerve pathways in the spinal cord have been damaged, and therefore, messages from the brain "to move" a leg muscle are blocked from reaching the motor nerve cells in the lower spinal cord that are still alive, and capable of sending a signal to the muscle to contract.

The FES bicycles are a very sophisticated way to electrically stimulate leg muscles in the correct sequences to contract and power the bicycle wheel mechanism. Regular use of this device does strengthen the otherwise weakened and paralyzed leg muscles. What makes this beneficial is primarily the cardiopulmonary conditioning benefits derived from exercising the paralyzed legs.

People with a history of polio have residual weakness after their viral infection due to the death of significant portions of the motor nerve cells that normally innervate and provide the signal to the limb muscles. They have a reduced population of functioning nerve cells and they are usually connected to more muscle cells and tissue than in a non-polio person (3-6 times more). This is largely responsible for the rapid fatiguing of post-polio muscles with repetitive high-resistance work.

If one was to "artificially" stimulate the surviving motor nerves of a polio survivor with a modality such as FES, all of the nerve cells will fire each time the electrical stimulus occurs. They will never get any rest-and-recovery time between repetitions, such as normally occurs with repetitive voluntary effort when groups of nerves fire together and then rest, while their cohort nerves fire in rotating on and off.

There are good reasons to be concerned that repetitive use of FES in polio-involved muscles may become "overworked" and sustain some damage that may hasten further degenerative changes already occurring in PPS muscles (i.e., post-polio weakened muscles that are weakening further due to post-polio syndrome).

I hope that this explanation helps you understand why I made such a strong negative statement about your potential use of an FES bicycle in the opening of this response.

To help yourself with weakening of proximal leg muscles, stick with non-fatiguing relatively low repetition and high resistance (for your muscle strength) exercises. Go to www.polioplace.org/living-with-polio and select "exercise" in Category. If these do not help enough to prevent falling, then pursue other options such as the use of canes/crutches or bracing. I would recommend a comprehensive post-polio evaluation and view this on Polio Place (www.polioplace.org/post-polio-evaluation). ■

A Message from Dr. Calmes

Selma Calmes, MD, retired anesthesiologist, informs PHI that she no longer can accept consults or questions regarding anesthesia. She reports that she has kept notes on all of the consultations and hopes to compile the information for the benefit of all once she is feeling better.

PHI wishes to thank her for her hours of volunteer work assisting polio survivors facing surgery. Her dedication and caring approach was tireless. ■

Family

The next issue of *Post-Polio Health* (Volume 33, Number 3) will feature comments by polio survivors about the importance of family to them, particularly as they age and get weaker. Would you like to participate? The word limit is 350 and a photo would be welcomed. The deadline is no later than June 15, 2017.

In Appreciation

Thank you for recognizing your friends and loved ones with contributions to the activities of PHI and IVUN and for your generous Membership contributions.

Please contact us if we made an error.

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