



Cardiac Conditioning In Polio Survivors

A Bruno Byte

From Dr. Richard L. Bruno, HD, PhD
Director, International Centre for Polio Education

Question: I have a clogged artery in my heart and my doctor told me to walk around the high school track. I walked every night after dinner and worked my way up to ten times around. After a month I could only do five times, then two. Now I can't even walk to the track. My doctor is mad at me but I just can't walk the track anymore. What can I do for my heart?

Dr. Bruno's Response: Your body has two conflicting needs: one important muscle needs exercise and a bunch of other muscles need rest. There are only a few studies of heart exercise in polio survivors. One was aggressive, where polio survivors did five minutes of bicycle exercise followed by a 60-minute exercise class twice a week for 5 months. This study found that polio survivors' legs became 4% weaker while their maximum heart rate during exercise (an indicator of heart muscle conditioning) increased by 12 beats per minute. This is exactly the tradeoff you describe: the heart muscle gets stronger while the leg muscles get weaker.

Other studies of heart exercise in polio survivors were not aggressive. In fact, the amount of exercise in the studies was reduced if polio survivors reported discomfort, pain or fatigue. In these experiments polio survivors peddled an exercise bicycle, either with their legs or with their arms, doing "interval training" -- peddling for two minutes and then resting for one minute. In this way, with fatigue and pain as their guides, polio survivors peddled for 20 minutes, increasing their peddling from 2 to 4 minutes per interval by the end of the study. Those who used the leg bicycle increased their maximum heart rate by 5 beats per minute, while those who used the arm bicycle increased it by 11 beats per minute.

Since most polio survivors' legs are weaker than their arms, non-fatiguing arm bicycle exercise should be both a more effective heart exercise and more possible to accomplish, as long as arms don't get weaker or shoulders more painful with exercise.

But herein lies the problem. The overwhelming majority of polio survivors cannot do cardiac conditioning exercise because they just don't have the muscle endurance. This is the same reason polio survivors need to have a drug-induced cardiac stress test and cannot stress their hearts sufficiently by using a bicycle or treadmill. To get a cardiac conditioning effect you need to do 20 minutes of conditioning exercise with your heart rate at least at 55% of maximum. A minimum conditioning heart rate is calculated by subtracting your age from 220 and multiplying by 55%. So a 65-year-old polio survivors' conditioning heart rate would be $(220-65) \times .55$ or 85 beats per minute sustained for 20 minutes. A rule of thumb is that your normal resting heart rate should be equal to your age. So a 65-year-old polio survivor increasing their heart rate by 11 or 12 beats per minute would get them to 77, not the cardiac conditioning level of a minimum of 85.

So you have to ask your cardiologist one basic question: is losing the use of my arms or legs worth doing maybe five minutes of exercise to increase my heart rate by 12 beats per minute?

The Encyclopedia of Polio and Post-Polio Sequelae

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