

## **POLIO SURVIVORS EXERCISE? NO WAY!**

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*In January I shoveled snow and my left leg became very weak. My knee buckled twice but I caught myself before I fell. I went to my doctor and he sent me right to physical therapy. In the first session I was on the treadmill for 10 minutes, on the bike for 5 and I did straight leg raises with weights around my ankles. I barely made it home, where I fell to the kitchen floor. My legs are even weaker now and they are always burning. Don't polio survivors need exercise to make weak muscles stronger?*

Your body is answering that question for you. But let me tell you about the research on exercise in polio survivors. There have only been about half a dozen small studies that tested around 12 subjects each. And although 90% of the subjects were said to have "Post-Polio Syndrome" or reported new muscle weakness, their legs were stronger than yours. Subjects were able to ride a bike for 5 minutes and then straighten their legs many times while a weight was attached to the ankles 2 to 4 times a week for from six weeks to two years -- something you couldn't do one time. The studies tested polio survivors' ability to strengthen their quadriceps muscle, the muscle in the front of your upper leg that allows you to lift your lower leg up off the floor while you're sitting and to "lock" your knee. The quadriceps is the muscle that gave out when you fell in the kitchen.

The studies differed in the way exercises were performed. Two studies asked polio survivors to limit the number of leg lifts if they felt fatigue, told them to rest between bouts of exercise and increased the amount of weight lifted only if there was no "excessive fatigue." Other studies described their exercise regime as "high-intensity," "heavy resistance," or "aggressive." Two studies required polio survivors do five minutes on an exercise bicycle before they did as many as 30 leg lifts three times each week. In the most aggressive study polio survivors did five minutes on the bicycle followed by a 60 minute exercise class twice a week for 5 months! A polio survivor who is able to do that kind of exercise doesn't have PPS. Clearly, the subjects in the studies had more strength, more endurance, more ability to function and fewer symptoms than you do or do the patients we treat.

Still, when you read the researchers' conclusions it sounds like exercises is just the thing to restore muscle strength in polio survivors with PPS: "a supervised training program can lead to significant gains in strength." Unfortunately, when you look at the studies findings the benefits of exercise are far from clear. Only 53% of those who exercised had an increase in leg muscle strength of about 26%. Twenty-six percent of subjects had no change in strength while 21% had a decrease in strength of about 10%. So, more often than not, exercise either had no effect or actually decreased muscle strength.

But there's more. Well, actually less. Only three studies asked whether exercise had an impact on polio survivors' ability to function in their daily lives. In one study where exercise was limited by fatigue, there was no measurable change in muscle strength over 2 years, although half of the subjects thought their walking and stair climbing had improved. In one aggressive study there was a 29% muscle strength increase, no improvement in subjects' ability to do their daily activities, but an increase in muscle fatigue of from 150% to 300%! Muscle fatigue also increased by 21% in another aggressive study in which strength increased by 36%. You have to ask what good comes from any small increases in muscle strength that are not related to improved functional

ability but are related to muscle fatigue that increases more than strength does.

Dr. Alan McComas' performed a study showing that polio survivors who are not treating their muscle weakness and were getting weaker lost 7% of their motor neurons each year. McComas concluded that "polio survivors should not engage in fatiguing exercise or activities that further stress metabolically damaged neurons that are already overworking." Muscles weakness is a sign of neurons failing and dying. I know that you were taught to "use it or lose it" and to exercise until you "feel the burn." But when you feel the burn you are burning out your neurons.

What's the bottom line regarding exercise to strengthen newly weakened muscles? ***Don't.***