

ASK DR. PERRY

Dr. Jacqueline Perry is a renowned physiatrist who has worked with Polios and Post-Polios for many years at Rancho Los Amigos in California

Q. What is the natural progression of post-polio syndrome? Will a person return to the same degree of paralysis that was experienced at onset?

A. When focusing on the natural progression of PPS it is important to understand that muscle function depends on three systems:

- · Control from the brain.
- · Sensation from the Periphery
- · The lower motor system from the spinal nerve cell (anterior horn cell) down to the muscle.

The third system is the most important for people with PPS because if you lose the nerve, you lose the muscle. We talk about muscle weakness, but polio is actually a nerve disease that damaged or killed anterior horn cells. This makes a lot of difference in terms of exercise, etc.

ACUTE POLIO

During the acute phase of polio some spinal nerve cells died while others were injured but later recovered. Some people had paralysis, others did not. The effects were like spatter paint. If you had a lot of paint, you had a lot of damage, while others were just touched lightly. But all survivors were left with a damaged neuromuscular system.

RECOVERY

Recovery from polio entailed all three methods of recovering function:

Neuro recovery – Between 12% and 91% of the nerve cells that were injured not killed by the polio virus recovered.

Axon sprouting – New branches of the remaining nerve cells were sent out to adopt the orphaned muscle fibers. The result was that each nerve was then doing 50% more work or even up to four times as much as normal.

Hypertrophy – The muscles enlarged themselves up to about 400% so they could function.

It is not known how much a survivor's recovery was due to spontaneous nerve generation, how much could be credited to patching by the axon sprouting and what amount was due to hypertrophy. Upon recovery polio survivors had a random disability in regard to the amount of paralysis. The amount of muscle weakness a person had

was pure chance; it depended upon the amount of polio virus a person had and where it went. Some survivors remained paralyzed while others looked or felt normal although they were not.

RESEARCH

During the 1940's Bodian traced the polio virus in the motor cells of monkeys. He found that polio, a systemic disease, affects 95% of these cells by either injuring or destroying them.

Research confirms that there is some obvious weakness as a result of polio. Dr. James Agre found that polio survivors with no current symptoms had only 80% of normal muscle strength.

Symptomatic survivors had 60% or less muscle strength compared to the normal group.

Following a four year study Grimby reported a normal 2% to 5% loss of muscle strength in asymptomatic polio survivors but for symptomatic survivors this loss may be as high as 13%. A study by Grimby confirms that weaker muscles work longer and twice as hard. This research says that it is necessary to protect this overused muscle system. The muscles that are grade 3, 3+, and some 4's are getting all the exercise they can tolerate. In order to maintain this function, these muscles must be protected from overuse.

NOW

For many, many years polio survivors have been working with a damaged neuromuscular system that keeps working harder than ever to meet normal demands. We need to appreciate the fact that each anterior horn cell innervates several hundred muscle fibers and the surviving horn cells have been doing 50% more work than normal. Plus it appears they don't like being over-worked!

Because of this overuse of the neuromuscular system, new weakness is now developing. Survivors may develop new weakness not only in polio muscles but also in other muscles that did not seem to be involved during the acute phase.

Although the amount of weakness a polio survivor develops in later life depends upon the original involvement, age is a factor. Anterior horn cells do not have infinite durability. They begin aging at about 60 years of age. So polio patients aged 70 and up have a natural weakness just from age that needs to be appreciated and put in perspective also.

ADVICE

At least half of the 1.5 million people who had polio have post-polio syndrome. Nothing has been added; PPS is a loss of function. The problem is that a survivor's lifestyle now exceeds his physical ability.

Dr. Perry advises, Don't push the system. She believes a polio survivor can control loss of function by controlling overuse of muscles. The way to do this is by making lifestyle changes, modifying activities, and pacing.

Polio survivors should know their own muscle strengths and plan accordingly. A study by Agre related to exhaustive fatigue confirms that:

- · A person with normal muscles will recover fully from muscle fatigue in five minutes.
- · An asymptomatic polio survivors will recover in ten minutes.
- · A symptomatic polio survivor will have partial recovery in five minutes but then have further loss.

So, it becomes necessary to make lifestyle modifications. Dr. Perry advises patients to:

- · Figure out what you don't have to do.
- · Get others to do the heavy work.
- · Break up work periods with rest periods.
- · Don't pride yourself on working harder.
- · Pain is a sign of injury and overuse so just don't let it happen.
- · Figure out what causes your pain and don't do it again.

HOW YOU CAN HELP YOURSELF

Dr. Perry's general activity guideline is that a polio survivor can do anything as long as it causes:

1. NO PAIN and
2. NO FATIGUE THAT LASTS LONGER THAN 10 MINUTES.

Survivors can control their destiny by avoiding overuse strain. But Dr. Perry cautions: Polio survivors who overuse muscles will lose strength.

If you are experiencing new pain, weakness or fatigue, you can help yourself now by changing your lifestyle and pacing yourself.

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