



Bruno Bytes

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From [Richard L. Bruno, HD, PhD](#)

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Internal Shivering

Question: I have been experiencing a lot of internal shivering. It used to wake me up at night but now is coming and going throughout the day as well. The problem seems to stem from my spine between and just below my shoulder blades, could this be something to do with my weakened respiratory and diaphragm muscles.

Dr. Bruno's Response: The first step to find a cause for shivering is to make sure nothing is going on, like an infection or thyroid abnormality.

That said, I have heard over the years from a number of polio survivors reporting "internal shivering". Your experience is probably not related to respiratory or diaphragm muscles. And it makes sense that you feel the shivering below your shoulder blades since it is your core muscles, especially in the lower chest, and also leg muscles that are the primary shivering muscles.

Remember the form and function of shivering: rhythmic contraction of muscles to generate heat and help you stay warm. Polio survivors should shiver more easily because poliovirus-damage opens skin blood vessels, allowing hot blood to flow to the skin surface, dump heat into the environment and drop your core body temperature.

There may also be a brain reason for polio survivors to shiver more easily. The "shivering center" in the brain (the posterior hypothalamus) was consistently damaged by the poliovirus, possibly making polio survivors more sensitive to being even slightly cold (for example not being warm enough in bed) and therefore shivering more easily.

Speaking of being in bed, many polio survivors have reported internal shivering in the early morning while they're still in bed, shivering sometimes waking them from sleep. Sleepy-time shivering may have to do with your circadian body temperature rhythm. By early morning your core body temperature is at its nadir, about 3°F lower than usual, a temperature drop possibly triggering shivering.

A drop in core body temperature also may be one of the factors responsible for shivering associated with anesthesia. Studies have reported shivering in as many as 65% of non-polio survivors after general anesthesia and up to 33% after epidural/spinal anesthesia. Shivering after anesthesia is why we recommend all polio survivors' physicians order a heating device called a "Bair Hugger" (www.bairhugger.com/3M/en_US/bair-hugger-us/) postoperatively to prevent both discomfort and shivering-caused postoperative problems.

[Preventing Complications in Polio Survivors Undergoing Surgery \(or\) Receiving Anesthesia](#)

(www.polionetwork.org/archive/gcg461wb8969dk5mp76gdidut3hnhx?rq=anesthesia)

For more information about temperature regulation in polio survivors, look for the topic of Temperature in the Index of the [Encyclopedia of Polio and PPS](#) www.polionetwork.org/encyclopedia

Neurogenic Bladder

Question: Do we have a Neurogenic Bladder?

Dr. Bruno's Response: It could be.

"Millions of Americans have neurogenic bladder. Neurogenic bladder is the name given to a number of urinary conditions in people who lack bladder control due to a brain, spinal cord or nerve problem. This nerve damage can be the result of diseases such as multiple sclerosis (MS), Parkinson's disease or diabetes. It can also be caused by infection of the brain or spinal cord, heavy metal poisoning, stroke, spinal cord injury, or major pelvic surgery. People who are born with problems of the spinal cord, such as spina bifida, may also have this type of bladder problem.

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Nerves in the body control how the bladder stores or empties urine, and problems with these nerves cause overactive bladder (OAB), incontinence, and underactive bladder (UAB) or obstructive bladder, in which the flow of urine is blocked.” ([University of Michigan](#))

As you know the vagus nerve control centers in the brain stem were damaged by the poliovirus and vagus nerve activity is an essential factor in controlling the bladder. There are several types of neurogenic bladder. But just as with all things PPS don't automatically blame Polio if you're having bladder issues. Talk to your doctor and be evaluated.

“Physiatrist” (Rehabilitative Physician)

Original Post: I am so discouraged. My doctor (a physiatrist) questions whether I have PPS.

Additional Post: My PPS was diagnosed by a Physiatrist. He encouraged me not to overdo, he spoke to the PT, explained PPS and what should and should not be done. He suggested what assistive aids would help me and explained it was my decision to decide when I was ready. I got my cane, my brace, then KFO, walker and finally my scooter. When I found I could no longer work, he filled out all my papers for disability. I am thankful to him because I learned "early" not to overdo and the need to preserve.

Dr. Bruno's Response: Physiatrists (rehabilitation medicine physicians) are not new. Physical medicine and rehabilitation (PM&R) dates back to the second world war and was really expanded, in terms of numbers of doctors and knowledge, by the polio epidemics. Polio survivors actually promoted an entire medical specialty!

Physiatrists don't want to "fix" everything by cutting, like orthopedists do, or "cover" problems over, like pain management docs do by using narcotics. What physiatrists do is treat the cause of a problem to reduce symptoms and to make you as functional as you can be by using therapy and assistive devices, from a cane to a power wheelchair. For more information, this article can help: [What is a Physiatrist?](#)

PPS – It's a Chronic Health Condition

Original Post:

"I had the strangest thought. I have an illness. I have a chronic health condition that affects every day of my life, hourly, minute by minute, daily, everyday, all month, all week, all year. It dictates my life. Where I go, what I do and what I don't do because of what I can't do. It affects my ADLs, my home making chores, my social life and lack of.

Shame, guilt, embarrassment have nothing to do with it although I do have these feelings more often than I want or like. Shame, guilt, fear, emotional turmoil; they provide nothing of what I need. Perhaps I should concentrate on moving away from those always present, always constant, always debilitating, always shameful feelings.

My chronic illness is polio and PPS. I also have Gastroparesis, a bit of arthritis and a somewhat serious back issue.

It's just the weirdest thing to me. It's such a new information, discovery, realization. Admission.

It seems I have fought so hard against everything all my life. Although old emotions and habits die hard and I am tired of it.

That was hard to say out loud." Survivor Ryn Daughertry

Walking More and Enjoying It Less

Question: I had polio when I was 8 months old, it affected my right leg. More than 50 years later, I have started to feel the effects of PPS. I wear a brace on my right leg. I have stopped the kickboxing classes I used to do, and started water aerobics. It worked okay for a while but wasn't enough cardio and I gained 10 lb. I have started walking more and am using a stationary row machine.

My left leg (good leg) has started to get very muscular (calf areas mostly) and is often very stiff and painful. I can hardly stand on it sometimes. I have been using, biofreeze, magnesium and massage therapy, but nothing seems to help. Any thoughts?

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You may think that your "good leg" was not affected by the polio. But remember that polio survivors needed to lose 60% of the motor neurons in a given muscle for there to be any weakness at all. So your "good" left leg could have lost more than half of its motor neurons to polio and still have normal strength.

The fact that your left leg is getting very muscular in the calf shows that you are increasing the size of muscle fibers as a result of your exercising. Bigger fibers are a problem because the bigger the muscle fiber the more work poliovirus-damaged motor neurons have to do to make the fiber contract, which leads to more "overuse abuse" of the already damaged neurons.

My thoughts are to stop the damaging exercise, look at the Post-Polio diet to lose weight and in general "Conserve to Preserve" your remaining poliovirus - damaged motor neurons.

To start with, take a look at these 2 articles:

- [Exercise - Use It and Lose It](#) and
- [Post-Polio Protein Power: Eat Well, Be Well](#)

Look in the Index of the [Encyclopedia of Polio and PPS](#) under the topics of "Diet" and "Exercise" for more information that can help.

Physical Therapy – A Reminder

For those being pushed by a PT to exercise and "feel the burn."

AUTOPSY OF A POLIO SURVIVOR WITH MUSCLE WEAKNESS

This isn't the first autopsy of a polio survivor with PPS. But it does remind us that:

1. Progressive muscle weakness means motor neurons are dying;
2. The original poliovirus attack killed motor neurons not only in the spinal cord area that controlled this man's the left leg but also caused "silent damage" THROUGHOUT THE SPINAL CORD, silent in that the patient had no muscle weakness in the right leg or his arms after polio but did have arm and leg muscle weakness beginning at age 58;
3. Neuron death caused glial scars in the spinal cord, the same type of scar our MRI studies found in fatigued polio survivors' brain activating systems;
4. NONE of the markers for ALS were found.

Conserve to preserve. The neurons you save will be your own!

An Autopsy Case Of Progressive Generalized Muscle Atrophy Over 14 Years Due To Post-polio Syndrome.

Oki R, et al. Rinsho Shinkeigaku. November, 2015

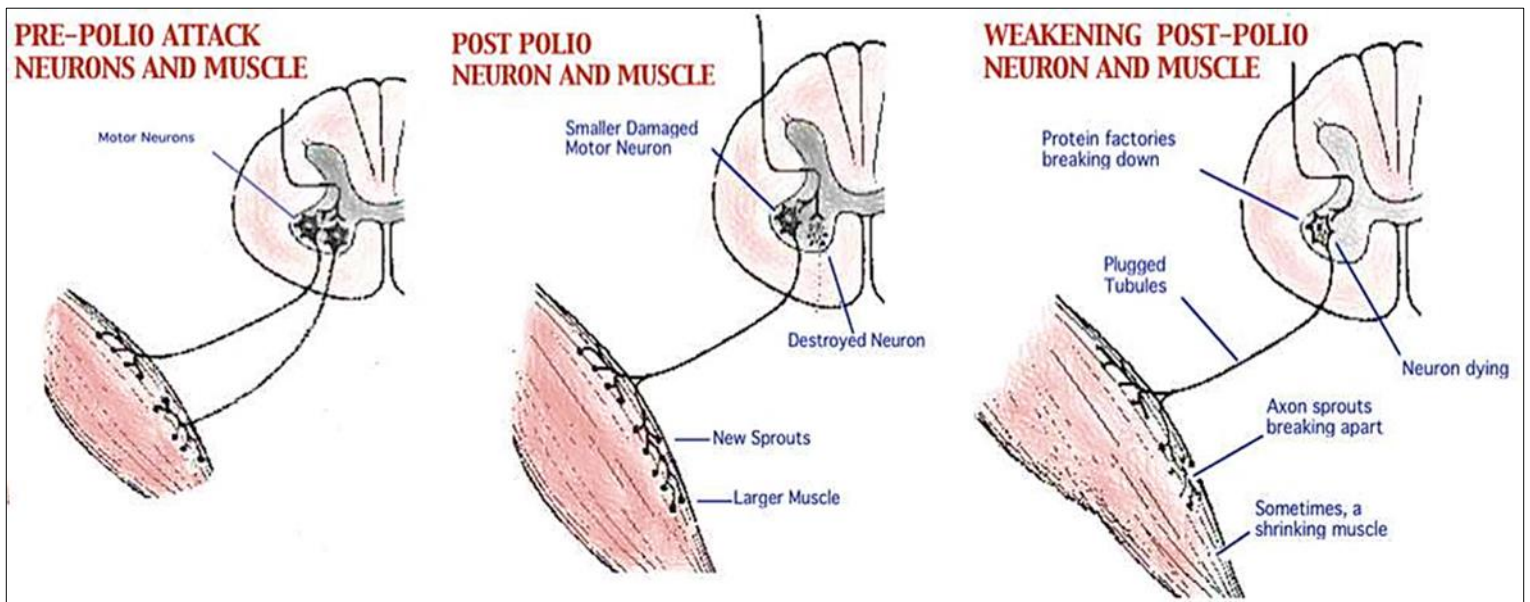
"We report the case of a 72-year-old man who had contracted acute paralytic poliomyelitis in his childhood. Thereafter, he had suffered from paresis involving the left lower limb with no relapse or progression of the disease."

"In his 60s he began noticing slowly progressive muscle weakness and atrophy in the upper and lower extremities. At the age of 72, muscle weakness developed rapidly, and he demonstrated shortness of breath on exertion and difficulty swallowing. He died after about 14 years from the onset of muscle weakness symptoms."

"Autopsy findings demonstrated MOTOR NEURON LOSS and GLIAL SCARS not only in the motor neurons in the anterior horns, which were result of his old poliomyelitis, BUT ALSO THROUGHOUT THE SPINE. NO Bunina bodies, TDP-43 or ubiquitin inclusions, which are seen in ALS, were found.

The pathological findings in the patient are considered to be related to the development of muscle weakness."

Article continued



Richard L. Bruno, HD, PhD has been publishing Bruno Bytes since 2014.

This ongoing collaborative is easily available on our website: www.polionetwork.org

Bruno Bytes: www.polionetwork.org/bruno-bytes

Dr. Bruno's entire inventory of articles (including Bruno Bytes): The Encyclopedia of Polio and PPS:
www.polionetwork.org/encyclopedia

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