



## Bruno Bytes

Third Quarter 2021

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

Bits and Tidbits from the Post-Polio Coffee House

### 3rd Quarter 2021 Topics Include:

Attention and Memory, Axon Therapy, COVID Vaccine, “Good” & “Bad” Legs, Hips and Knees

#### On the topic of the Anatomy of the Hip

Dr. Bruno’s original post: This [video](#) is well done and explains much about the hip.

<https://www.youtube.com/watch?v=qICvKEOZtpo>

#### On the topic of the Anatomy of the Knee

Dr. Bruno’s original post: This [video](#) describing the anatomy of our knees is well done and explains much about the knee.

<https://www.youtube.com/watch?v=q-Jxj5sT0g>

#### On the topic of Attention and Memory

Dr. Bruno’s Original Post:

### **Memory problem? It’s not Alzheimer’s. It’s Attention.**

Many of you know that our research has found that polio survivors with fatigue have impaired ability to pay attention, not impaired memory. The article below describes just what we found.

(Search the ARTICLES, “BRUNO BYTES” and INDEX of the [ENCYCLOPEDIA of POLIO & PPS](#) for “FATIGUE”

#### ***Struggling to recall something?***

#### ***You may not have a memory problem - just an attention problem.***

SCIENCE. Sep 29, 2021 / By Lisa Genova

“Not long ago, when I was somewhere in my mid-40s, I drove to Cambridge, Massachusetts, from Cape Cod and parked my car in a garage. I was scheduled to give a talk a couple of blocks away and had hoped to arrive earlier. Normally I take a photo of the floor number or the row letter whenever I park in a garage. But worried I was late, I raced out of there without getting a photo and, worse, without consciously registering where I had parked.

I arrived on time, gave my 45-minute talk, answered questions and signed books. When I returned to the garage, I walked to where I thought I had parked, but my car wasn’t there. I paced up and down ramps, becoming increasingly frustrated and hopeless. I was sure I had parked on the fourth floor, but maybe it was the third or the fifth? And did I park in section A, B or C? No idea.

I knew I was in the right garage, but that’s all. I was just about to report my car stolen when I stumbled upon it in 4B. Relieved, embarrassed and sweating, I wanted to blame the whole experience on my memory, but the neuroscientist in me knew better. I couldn’t find my car not because I had a horrible memory, amnesia, dementia or Alzheimer’s - I couldn’t find my car because I never paid attention to where I had parked it in the first place.

If we want to remember something, above all else we need to notice. And noticing requires two things: perception (seeing, hearing, smelling, feeling) and attention. Your memory isn’t a video camera, recording a constant stream of every sight and sound you’re exposed to - you can only capture and retain what you pay attention to. . . . “

<https://ideas.ted.com/struggling-to-recall-something-you-may-not-have-a-memory-problem-just-an-attention-problem/>



### On the topic of Axon Therapy

Question: Does Axon therapy work for people who have had polio?

Dr. Bruno's Response: According to the Jun 17, 2021 press release, "Axon Therapy delivers focused magnetic pulses which activate the damaged peripheral nerve axons that are required to provide relief from chronic nerve pain." I think with this sentence actually means is that the Axon Therapy machine's magnetic pulses activate damaged peripheral nerve axons to provide relief from chronic nerve pain. But the manufacturer is tricky, saying the device provides "Chronic Pain Relief" in some places in their literature and in other places is specific about it only providing "relief from chronic nerve pain." The bottom line is that the Axon Therapy machine only treats pain that is the result of peripheral (arm, hand, foot, leg) traumatic SENSORY nerve injury, "caused by surgical procedures, limb loss, severe burns, car accidents and other injuries." Polio does not cause damage of any kind to sensory nerves. The first large, randomized, controlled Axon Therapy study began at the end of May, 2021. If you have a traumatic peripheral nerve injury causing pain I might wait until the study findings are published. But Axon Therapy is not Intended to treat any other type of pain.

<https://www.prnewswire.com/news-releases/neuralace-announces-fda-510k-clearance-and-us-launch-of-axon-therapy-peripheral-nerve-stimulation-system-for-chronic-pain-relief-301314525.html?fbclid=IwAR3pIAp7X26pxZnTmW--MfZ8V9Qaf2vKQAthmq8vHUPr8tevGZoM5SVUruw>

### On the topic of "Brain Rewiring" in Polio Survivors

Dr. Bruno's Post: This excellent [study](#) was recently released from Dublin. It says is that the polio survivors brains rewired to compensate for the damage done when so many neurons were killed. So, the post-polio brain did in a big way what the axonal sprouts did for spinal cord motor units.

[www.sciencedirect.com/science/article/pii/S2352340921006004?via%3Dihub](http://www.sciencedirect.com/science/article/pii/S2352340921006004?via%3Dihub)

### On the topic of the COVID Vaccine and Polio Survivors

Question: I feel as though I have been pressured heavily into (1) wearing a mask and (2) getting vaccinated for COVID or whatever the latest virus's name may be. I think I already am immune, having contracted COVID earlier this year would give me a natural immunity. My question is this: What you're your thoughts on polio survivors being forced to get the vaccine.

Dr. Bruno's Response: You are not being forced to get the COVID vaccine or wear a mask. But you are doing yourself a tremendous disservice to yourself and others if you don't do both.

Antibodies levels are lower after you have had the COVID virus than they would be if you also were vaccinated. This is no different than the situation with the polio vaccine. Polio survivors received boosted immunity, plus immunity against the types of polio they did not have, when they were given the vaccine. Now, especially with so many of the unvaccinated allowing the development of COVID variants, everyone needs as many antibodies as possible.

As for wearing a mask, since COVID is a respiratory virus that grows in your throat, you are protecting yourself against reinfection and, even if you are re-infected without symptoms, the mask prevents you from passing the virus growing in your throat to someone else.

### On the topic of Electric Muscle Stimulators

Question: I had bought EMS (electric muscle stimulator) to enhance the muscle size and strength Have anyone tried it before or any recommendations?

Dr. Bruno's Response: Enhance muscle size and strength with an electric muscle stimulator? Oh boy. Before you try, please read this: Surviving, poliovirus-damaged motor neurons allowed polio survivors to recover muscle strength by turning on 16 times the number of muscle fibers they'd activated before polio by sending out sprouts — like extra telephone lines — to muscle fibers orphaned when their

motor neuron died. Then, survivors' individual muscles grew, as they do in weight lifters, and have on average muscle fibers twice the size of those who didn't have polio. But these fibers look abnormal, appearing "moth eaten" and showing damage typically found only in heavy weight lifters. Several studies have found that the number of muscle fibers stimulated by a single post-polio motor neuron increases by about 14% each year. So, as polio survivors age, their remaining, poliovirus-damaged motor neurons are forced to turn on more and more oversized muscle fibers...and they fail, causing muscle weakness and muscle atrophy. How could poliovirus-damaged motor neurons not be overworked, exhausted, fail and even die when they have been turning on 16 times more double-sized muscle fibers for decades? The last thing you want to do is use electric stimulation, or any means, to increase muscle size.

### [On the topic of a "Good" Leg and a "Bad" Leg](#)

Dr. Bruno's Original Post: It's well-known that "good" limbs, those thought to be unaffected by polio, commonly show electromyography (EMG) evidence of prior poliovirus damage. A large study from India brings home this point (*Ann Indian Acad Neurol.* 2016; 19(1): 44–47). EMGs were performed on all four limbs (not something we recommend) in 116 polio survivors. In 42% of limbs that survivors said were "unaffected by polio," EMG revealed evidence of poliovirus damage. On manual muscle testing, 26% of the "unaffected" muscles with poliovirus damage on EMG had decreased strength.

This study is a reminder that "non-paralytic" polio (NPP) wasn't necessarily "damage free" polio. For example, it was reported in 1953 that 39% of those diagnosed with NPP had measurable weakness on manual muscle testing in at least one muscle group. A 1954 paper - "The Infrequent Incidence of Nonparalytic Poliomyelitis" - documented that 89% of polio survivors who were acutely "persuasively nonparalytic" had "very definite muscle weakness" as long as three years after the diagnosis of NPP. So, it should be no surprise that more recent studies have documented late-onset weakness and fatigue in NPP survivors. A study of 828 polio survivors found new muscle weakness and fatigue, respectively, in 38% and 34% of those who had been paralyzed and in 14% and 21% of those diagnosed with NPP.

What's more, study of 34 sets of twins found PPS symptoms in 71% of the twins who had had paralytic polio and "PPS-like symptoms" in 42% who had had no symptoms of paralysis. (Bruno, RL. [Paralytic Versus "Non-Paralytic" Polio: A Distinction without a Difference?](#) *Am J Physical Med Rehabil*, 2000; 79: 1-9.)

I wasn't surprised when Post-Polio Institute patients would report that their "good" (unaffected) muscles were becoming weaker while their obviously polio-affected muscles were not. Taken together, the studies above are reminders that overworking your "unaffected good muscles" could make a good limb turn "bad."

### [On the topic of Hip Replacements for Polio Survivors](#)

Dr. Bruno's Original Post: We often ask whether polio survivors can have joint replacements if they have muscle weakness. The workability of hip replacement is the most common concern. This is a too technical article on hip replacement in polio survivors with associated references from the National Library of Medicine.

(I don't expect you to read the articles, except for the abstracts or conclusions.) I would suggest that you bookmark this address for your orthopedists' information if hip replacement is suggested.

<https://pubmed.ncbi.nlm.nih.gov/34465165/>

### On the topic of Poor “Touch” Response

Question: Why doesn't my cell phone respond to my polio hand when my fingers are cold?

Dr. Bruno's Response: STOP Post-Polio "Zombie Finger!" cell phone screens - actually almost all screens that respond to touch – sit above scores of small, individual electric fields created beneath each “button”. When your finger touches the screen (or even hovers above the surface) the skin's capacitance (its ability to hold an electric charge) disturbs the electric fields and activates the buttons. The skin's capacitance is not dependent on the temperature of your skin but on how much electrically-conductive liquid (moisture, blood) is in the tip of your finger. (You'll notice that your fingernail will not activate a touchscreen button because it's made of keratin, a dry, hardened protein.)

As polio survivors know all too well, low temperatures cause significant cooling of the skin by decreasing the amount of blood in your fingers and can thereby decrease capacitance of finger tips. Low humidity dries out your skin and will also decrease skin capacitance. Without even measuring blood flow, skin temperature or humidity, one study found that skin capacitance decreased by 21% between summer and winter. (Lubriderm anyone?) If your fingertip blood flow drops and your skin becomes dry, polio survivors can develop low capacitance “Zombie Finger,” where all the button pushing in the world will not make your phone respond. So, when the cold weather comes, wear gloves and moisturize. The “Zombie Finger” you prevent will be your own.

### On the topic of Hyperbaric Oxygen Therapy

Question: Would Hyperbaric Oxygen (HBOT) therapy help reduce inflammation? I seem to have more pain and more need for my cane lately.

Dr. Bruno's Response: There is no evidence that hyperbaric oxygen therapy helps polio survivors with PPS. Decreasing inflammation is not an FDA approved use of hyperbaric oxygen, which is used to increase oxygen to deprived tissues. <https://www.medicalnewstoday.com/articles/313155>

If you have atrophy, instability, pain and more need for your cane, you need an evaluation by a rehabilitation doctor to diagnose the causes and, if you have PPS, manage your symptoms.

Hyperbaric oxygen therapy: Benefits, controversy, and risks

[www.medicalnewstoday.com/articles/313155?fbclid=IwAR0cXQt3fX8n0IGM3A82MCM8ih2PR4t1wTHahzGp6lLxx1omJK7uXwIRLH4](http://www.medicalnewstoday.com/articles/313155?fbclid=IwAR0cXQt3fX8n0IGM3A82MCM8ih2PR4t1wTHahzGp6lLxx1omJK7uXwIRLH4)

### [The Encyclopedia of Polio and Post-Polio Sequelae](#)

contains all of [Dr. Richard Bruno's](#) articles, monographs, commentaries, “Bruno Bytes” (Questions & Answer articles) and his Video Library.

The Encyclopedia of Polio and PPS is also available by a direct link from: [www.postpolioinfo.com](http://www.postpolioinfo.com)

### **Are you looking for a specific topic?**

The [Encyclopedia Index](#) (By Subject) is available.