



## Bruno Bytes

Second Quarter 2021

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

Bits and Tidbits from the Post-Polio Coffee House

### 2nd Quarter 2021 Topics Include:

Anesthesia, Alzheimer's, Bladder Issues in Men, Bulbar Polio, CBD, Cholesterol Medications, Compression Sleeves, Compromised Immune System, Diaphragm Pacemaker, Exercise, MRI, Osteoporosis, Prolotherapy, Muscle Weakness and Spinal Taps.

### On the topic of Alzheimer's Disease and Polio Survivors

Question: Is it true most polio victims do not get Alzheimer's? I read that it has something to do with our chromosomes.

Dr. Bruno's Response: Well, can't say "most" don't get Alzheimer's. But one study showed polio survivors had 12 times less Alzheimer's disease than those who didn't have polio:

From *The Polio Paradox* . . .

**"Polio: a Good, Bad Thing?"** I may sound like Pollyanna, but there may actually be benefits to having gotten polio, or at least a benefit to being susceptible to it. Biology graduate student Shanda Davis surveyed polio survivors and the alumni of Drew University, asking if they had been diagnosed with Alzheimer's disease. Remarkably, 3.6% of the Drew Alumni had Alzheimer's but only 0.3% of the polio survivors did. Polio survivors had 12 times less Alzheimer's disease than those who didn't have polio. I bet you're thinking this must be a mistake. But we went back to our own patients and found that only 0.4% of the polio survivors who have ever been evaluated at The Post-Polio Institute had Alzheimer's disease. If these percentages are correct how could having had polio protect you from getting Alzheimer's disease? Shanda Davis had a hunch. We discussed that the gene which makes the poliovirus receptor is found on chromosome 19. Well the poliovirus receptor gene shares its DNA on chromosome 19 with a gene that makes another protein, called APOE-4, a protein that has been associated with getting Alzheimer's disease. You can inherit one APOE-4 gene from each parent. Those who get two APOE-4 genes have the highest risk for Alzheimer's. Those who only inherit one APOE-4 gene have a lesser risk, while those who inherit no APOE-4 genes have the lowest risk of all. Without an APOE-4 gene on chromosome 19, the poliovirus receptor gene doesn't have to share any of its DNA and may be more able to make poliovirus receptors. Without the APOE-4 you would be more likely to have more poliovirus receptors and to get polio as a child, but be less likely to get Alzheimer's disease as an adult. Maybe even the dark cloud of polio has a silver lining."

### On the topic of Lingering Effects of Anesthesia

Question: Why have I heard that polio survivors shouldn't be sent home immediately after having any anesthesia?

1st Comment: I've taken to telling anesthesiologist that if they insist on "moderate" sedation they should plan on me being overnight. I'm tired of being dressed by a nurse and carted out to my car to go home and sleep for the next 24 hours completely unaware!

2nd Comment: I had a colonoscopy and told the anesthesiologist about PPS. I drove my car to the clinic, my neighbor brought me home and I fell asleep. Around 9:30 PM I woke up but I fell asleep again, this time in a chair close to my driveway. Around 11:00 PM I woke up to flashing lights and looked outside and saw yellow tape around my property. I started to go outside but saw a large truck I thought was a gas truck so I went to bed. My phone started ringing around 6:00 AM. There had been a neighborhood shooting, part of which happened close to my driveway. *I slept through the entire*

*thing only 30 feet from my window thanks to colonoscopy anesthesia. I will never go home after anesthesia again.*

Dr. Bruno's Response: Sadly, these two stories about the lingering effects of anesthesia in polio survivors are not unusual. Please see "Preventing Complications in Polio Survivors Undergoing Surgery Receiving Anesthesia" under the topic [Anesthesia](#) ([www.papolionetwork.org/brunoarticles](http://www.papolionetwork.org/brunoarticles)) in the [Encyclopedia of Polio and PPS](#) .

### On the topic of Anesthesia's Possible Long-Term Effects

Question: I had a mild case of polio. My parents were told I'd have no after-effects. At age 60 a neurologist discovered damage in my upper back muscles. Over the years, I've had quite a bit of surgery involving anesthesia. I noticed some permanent differences in my memory after one surgery that lasted several hours. I was a college professor and found it harder to learn students' names. I can no longer do the part of the standard cognitive test that involves repeating back words. I retired at 70, because I was no longer at my peak in my work (as well as having more physical fatigue). It's gotten harder for me to remember what I read. I'm considering consulting a doctor, perhaps a neurologist, primarily to discuss these symptoms and my prognosis.

Dr. Bruno's Response: The jury is still out on the long-term effects of anesthesia in anyone, including polio survivors. Anesthesia in older patients can be a risk for long-lasting impairments in thinking and memory. You also have to remember the detrimental effects of trauma caused by surgery on vital organs; for example systemic inflammatory responses following surgery can cause organ injury/dysfunction including cognitive impairment.  
(<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6443620>)

I think word finding difficulty would be a candidate for polio-related "memory" problems affected by anesthesia, for word finding difficulty – especially remembering people's names -- is not uncommon in polio survivors. (<https://pubmed.ncbi.nlm.nih.gov/8215857>) That's why I caution polio survivors not to put credence in the standard doctor's office cognitive test, which involves repeating back words. Certainly see a neurologist if you are concerned. Testing by a neuropsychologist may be more enlightening. (<https://pubmed.ncbi.nlm.nih.gov/10892620/>) These articles from the Encyclopedia of Polio and PPS may help:

[False Positives in Polio Survivors with Post-Polio Sequelae, Who Are Given Mental Status Examinations](#)  
[www.papolionetwork.org/uploads/9/9/7/0/99704804/mental\\_status\\_exam\\_caution.pdf](http://www.papolionetwork.org/uploads/9/9/7/0/99704804/mental_status_exam_caution.pdf)

[Word Finding Difficulty and Post-Polio Sequelae](#)  
[www.papolionetwork.org/uploads/9/9/7/0/99704804/word\\_finding\\_difficulty\\_and\\_pps.pdf](http://www.papolionetwork.org/uploads/9/9/7/0/99704804/word_finding_difficulty_and_pps.pdf)

### On the topic of Bladder Issues in Men

Question: I've been prescribed FloMax for a urinary sphincter problem (it doesn't open fully or easily). I'm a 72 year old male who had bulbar and paralytic polio. A CT shows bladder wall thickening and enlarged prostate. Any thoughts on this medication for polio survivors?

Dr. Bruno's Response: I don't have experience with Flomax in polio survivors. Acute polio patients had urinary problems – especially retention and incomplete emptying of the bladder in men - because pelvic floor and bladder detrusor muscles had been paralyzed. Flomax (tamsulosin) works by blocking an adrenaline receptor and allows relaxation of bladder muscles that connect the bladder to the urethra, in the prostate, the ureter and in the urethra itself. But the adrenaline receptor in the bladder is similar to the adrenaline receptor that shrinks the size of blood vessels. Flomax, while blocking the bladder receptor, may also block the blood vessel receptor, cause blood vessels to open and blood pressure to drop, which explains why dizziness and lightheadedness can be Flomax side effects.

Talk to your doctor about the potential for possible drops in blood pressure if you start Flomax and get up slowly when rising from a sitting or lying position (especially when getting out of bed in the middle of the night) so your blood pressure - and you - don't fall.

### On the topic of Damage to the Bulb of the Brain vs Clinical Bulbar Polio

Question: I seem to remember you saying that every survivor has some degree of bulbar polio. What does this mean for polio survivors and PPS?"

Dr. Bruno's Response: Every polio survivor having some degree of "bulbar polio" is what Dr. [David Bodian](#) found performing scores of autopsies on people who had had polio. But here again is the important distinction that people seem never to appreciate: *Damage to the bulb of the brain as seen on autopsy is not the same as clinically diagnosed "bulbar polio"*. All polio survivors had damage to the bulb of the brain, but not all polio survivors had damage severe or widespread enough to cause symptoms - difficulty breathing swallowing and controlling blood pressure - that would *clinically* be diagnosed as "bulbar polio."

See the article "[Abnormal Eye Movements and PPS](#)" under the topic of Muscle Pain/Weakness in the Encyclopedia of Polio and PPS for more information about damage to the brain stem seen on autopsy vs clinically diagnosed "bulbar polio."  
([https://www.papolionetwork.org/uploads/9/9/7/0/99704804/abnormal\\_eye\\_movements\\_and\\_pps.pdf](https://www.papolionetwork.org/uploads/9/9/7/0/99704804/abnormal_eye_movements_and_pps.pdf))

### On the topic of CBD for Polio Survivors

Question: I talked to a rep who was selling CBD products. She said they were made with some sort of "nano tech" and could not be detected with the blood tests used for drug screenings. Is this possible? My primary care doctor is very wary when it comes to CBD products.

Dr. Bruno's Response: First, beware of drug dealers' claims. I am no cannabinoid expert and don't know about "nano tech". But CBD *can* be detected in blood and urine; the question is whether the laboratory doing the testing is looking for CBD or just THC.

(<https://www.consumerreports.org/cbd/can-you-take-cbd-and-pass-a-drug-test>)

As for beneficial effects, there is clear evidence that CBD treats two rare forms of childhood epilepsy. For other conditions, including PPS, the jury is still out. CBD research findings are mixed and there is a general lack of powerful, randomized, double-blind, placebo-controlled studies to allow definitive conclusions about treating any condition. (<https://link.springer.com/article/10.1007/s40429-020-00326-8>)

See pages 2-6 of the [February, 2019](#) Bruno Bytes for more CBD/THC articles:

([https://www.papolionetwork.org/uploads/9/9/7/0/99704804/bruno\\_bytes\\_february\\_2019.pdf](https://www.papolionetwork.org/uploads/9/9/7/0/99704804/bruno_bytes_february_2019.pdf))

This article from Consumer Reports may be of interest: [Can you Take CBD and Pass a Drug Test?](#) ([https://www.consumerreports.org/cbd/can-you-take-cbd-and-pass-a-drug-test/?fbclid=IwAR0g4Eq-TY-kyocMtU-16of\\_lm6-MPFVs-BSqr240pHgB11HqIr3VB8I0xk](https://www.consumerreports.org/cbd/can-you-take-cbd-and-pass-a-drug-test/?fbclid=IwAR0g4Eq-TY-kyocMtU-16of_lm6-MPFVs-BSqr240pHgB11HqIr3VB8I0xk))

### On the topic of Cholesterol Medications

Question: I have had muscle pain taking statins for high cholesterol. Is Livalo an option?

Dr. Bruno's Response: Statins *can* cause muscle pain which could be a problem for polio survivors. Livalo (pitavastatin) may be better for patients who have not tolerated other statins well and need a medication causing less muscle pain. Additionally, Livalo has fewer drug interactions compared to other statins, so it may be a good option for those who take multiple medications.

For those who can't take statins at all, doctors can prescribe a **fibrate**. Like the statins, fibrates reduce the body's cholesterol production, but they are less effective in lowering LDL ("bad") cholesterol levels. In other areas, though, fibrates actually have an edge. They are substantially better

at boosting HDL levels, and only two statins -- atorvastatin (Lipitor) and rosuvastatin (Crestor) -- can match their ability to reduce triglyceride levels.

Gemfibrozil (Lopid) and Fenofibrate (TriCor) appear equally safe and effective. Fenofibrate is more convenient, since it is taken once a day, but generic gemfibrozil is substantially less expensive. The fibrates are particularly effective in patients with high triglycerides, low HDL or diabetes. However, some patients with high triglyceride levels may experience a paradoxical rise in LDL levels. Side effects are uncommon but can include liver inflammation, muscle damage, abdominal pain, gallstones, dizziness, and interactions with the anticoagulant ("blood thinner") warfarin (Coumadin).

Read these articles and talk to your doctor: ([https://reference.medscape.com/drug/livalo-zypitamag-pitavastatin-999209?src=ppc\\_google\\_rlsa-traf\\_mscp\\_ref\\_md\\_us](https://reference.medscape.com/drug/livalo-zypitamag-pitavastatin-999209?src=ppc_google_rlsa-traf_mscp_ref_md_us)) and ([https://www.health.harvard.edu/newsletter\\_article/help-for-your-cholesterol-when-the-statins-wont-do](https://www.health.harvard.edu/newsletter_article/help-for-your-cholesterol-when-the-statins-wont-do))

### On the topic of Compromised Immune System and Viruses

Question: Weren't polio survivors' immune systems compromised when we got the poliovirus? Why else would it take hold rather than being fought off, as would be the flu?

Dr. Bruno's Response: Being infected with and having neurons damaged by the poliovirus does not mean that your immune system was compromised. Unlike the flu viruses, to which people are exposed at least yearly, you were a "poliovirus virgin" having never before been exposed to the poliovirus. Your immune system (as with COVID today) had no antibodies or B cells or T cells to fight it. But your immune system learned quickly to attack the poliovirus. Had you been immune compromised during the acute polio infection you quite likely would have died. The purpose of the polio vaccines was to expose the immune system to the poliovirus without causing neuronal damage, teach it to attack the poliovirus before it can cause neuron damage and death.

### On the topic of Having an MRI

Question: I had spinal fusion in with two stainless steel rods either side of my spine. They're still there. It's my understanding that I cannot have an MRI because of steel. Is that correct or not?

Dr. Bruno's Response: MRI works by a powerful magnet "spinning" water molecules inside your body. Anything that is attracted to a magnet (iron-based) will be attracted to or heated by the MRI magnet. If that "anything" is inside your body, an MRI won't be pleasant!

<https://stanfordhealthcare.org/medical-tests/m/mri/risk-factors.html?fbclid=IwAR137ASJjnQS5Q7i6Erxl7U1gdkjkexlSbw1ZGT1qgHPwKI8ftLuhn2w5uY>

### On the topic of Intense Exercise and Polio Survivors

Question: I saw this article: [Motor Neurone Disease: Intense exercise increases risk](#). Does it apply to polio survivors exercising and causing muscle weakness?

[https://www.bbc.com/news/health-57431412?fbclid=IwAR0nnJc\\_oHzuTRt69XxPCxWjVLmB\\_QDBHCgNlnBVXaQfuXdGvZtH\\_JeSAGc](https://www.bbc.com/news/health-57431412?fbclid=IwAR0nnJc_oHzuTRt69XxPCxWjVLmB_QDBHCgNlnBVXaQfuXdGvZtH_JeSAGc)

Dr. Bruno's Response: I think so! Read about Gary and the finding that motor neuron diseases, like ALS, are more common in professional athletes.

From *The Polio Paradox...*

"After I recovered from the polio I had when I was three I refused to use a wheelchair or braces, even though my legs were weak. The way I looked was important to me. Physical strength was important too. So a few years back, I began to power lift. I would spend three days a week doing 500 lb. leg presses at the gym thinking I would make my legs stronger and keep them strong. My legs got weaker. I fell down a flight of stairs and had

two surgeries to fix torn ligaments in my feet. Four months later I fell in the shower and broke three toes. I stopped lifting and started using crutches outside my house. I thought if I just kept walking I'd get stronger. I didn't."

Gary, Class of '48

For polio survivors like Gary it is deja vu all over again. For no apparent reason his muscles were becoming weaker. Muscles he had worked so hard to make strong, muscles that had allowed him to be "normal" for decades, were failing him. In our 1985 Survey over 80% of polio survivors reported weakness in muscles paralyzed or weakened during their original bout with polio.

Unexpectedly, nearly half of the polio survivors surveyed reported weakness in muscles that seemed to have been unaffected by polio. And over 90% of polio survivors in the 1985 Survey reported that muscle weakness was triggered by physical overexertion and exercise, as Gary's experience shows. Individuals like Gary, who "pushed themselves beyond the competence" of their polio-damaged neurons, were most likely to develop weakness later in life.

Death of a Neuron. Polio survivors are getting weaker because their motor neurons are browning out, blacking out, breaking up and dying. Yes, neurons are dying. Why? Probably because polio-damaged neurons have been severely overworked, having "pumped iron" in one way or another for decades.

Given that physical overexertion is the most common trigger for muscle weakness in polio survivors, neurophysiologist Alan McComas believes that it is the combination of over-sprouting, overworking and reduced protein manufacturing that conspire to prematurely kill off poliovirus-damaged motor neurons.

*What's more McComas points out that it may not be a coincidence that motor neurons fail and die more frequently in athletes like Gary. McComas found that motor neuron disease, e.g., ALS, is more common in professional athletes. But Gary isn't the only polio survivor athlete. Given what the poliovirus did to the spinal cord, the amazing extent to which polio survivors' motor neurons compensated for the damage and degree to which polio survivors have recovered strength and then overused their muscles, all polio survivors have been athletes since they had polio!*

### [On the topic of Lycra Garments](#)

Question: Could you inform me please if you know of any evidence of research or provision of Lycra garments or body suits for people with PPS. About 10 years ago when I was an Occupational Therapist, I attended a training course in the use of such garments for stroke patients. I am wondering if this is something that is being used by people with PPS.

Dr. Bruno's Response: Polio and Post-Polio Sequelae muscle weakness are ultimately caused by spinal cord motor neuron damage, not damage to the brain. Polio survivors don't have sensory or perception problems as do those who have had strokes, e.g., neglect or loss of proprioception, for which Lycra garment compression could be of use to stimulate "attention" to the affected limb.

Although Lycra wouldn't help with PPS muscle weakness, polio survivors can have leg swelling that Lycra compression garments might decrease. But polio survivors almost uniformly tell me that they have trouble donning compression stockings by themselves. I would imagine that similar issues would occur with Lycra.

### [On the Topic of Osteoporosis Practice Recommendations](#)

Dr. Bruno's Original Post: An article in the Journal of Family Practice (2021 June;70(5):229-238 (doi: 10.12788/jfp.0197) provided new recommendations for detecting and treating osteoporosis. Please talk to your doctor:

## Screening Men ≥ 70 Years and In Younger Men at High Risk Of Fracture

- Consider Screening for Osteoporosis, Using Bone Mineral Density (BMD) by Dual-Energy X-Ray Absorptiometry (DXA), In *All* Postmenopausal Women ≥ 65 Years *and* In Women < 65 Years at High Risk Of Osteoporosis. (e.g., polio survivors)
- Consider Screening in Men ≥ 70 Years *and* In Younger Men At High Risk Of Fracture (e.g., polio survivors).
- Use the Trabecular Bone Score with DXA BMD to Screen Patients at High Risk of Fracture Who Have a Normal BMD – e.g., Patients with Type 2 Diabetes or Ankylosing Spondylitis.
- Offer Individualized Pharmacotherapy to Older Patients with a Diagnosis of Osteoporosis *and* to those at High Risk of Fracture. (e.g., polio survivors)

### On the topic of Polio Breathing Issues and Phrenic Nerve Pacemakers

Question: I spoke with a neurologist who indicated that there is a surgical procedure that implants a phrenic nerve stimulator to drive the diaphragm muscle. Do you have any observations to make about such a device?

Dr. Bruno's Response: Phrenic nerve pacemakers to activate the diaphragm are used in those whose phrenic nerves have been disconnected from the brain neurons that drive them but are still functioning and able to be stimulated (for example in quadriplegics, like Christopher Reeve). A 1994 review in the journal *Sleep* (17(2):176-187) concluded, "patients who received diaphragmatic pacing and failed to benefit significantly include those with *polio-induced damage to the phrenic nerve.*" Noninvasive ventilation (BiPap, APAP and volume ventilators) seem to be the best treatment in polio survivors with breathing issues.

### On the topic of Polio Damaged Neurons

Question: Can our neurons that are dying be replaced?

Dr. Bruno's Response: Unfortunately, you can't replace spinal cord neurons, only preserve them.

### On the topic of Prolotherapy

Question: I have a painful shoulder from overuse that has plagued me for years. I am trying to find an alternative to total replacement surgery. Prolotherapy has been recommended to me.

Dr. Bruno's Response: Prolotherapy is injecting an irritant - a saline or dextrose solution - into a painful area, most often to treat tendon injuries resulting from overuse. It may also relieve pain due to osteoarthritis in certain joints. However, the American College of Rheumatology and Arthritis Foundation (ACR/AF) do not recommend using Prolotherapy for osteoarthritis of the knee or hip.

There is some evidence that dextrose Prolotherapy reduced the pain and disability of rotator cuff conditions. (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4938120>) But, it should be remembered that researchers have not been able to identify how Prolotherapy works. Any success may be due to the placebo effect.

And, as with *all* invasive procedures, Prolotherapy must always be performed by a clinician knowledgeable and thoroughly experienced in its use in the joint or area being injected. Getting a second opinion before any invasive procedure is always in order.

### On the topic of Spinal Taps and the Poliovirus

Question: How much of the poliovirus can they remove when doing a spinal tap?

Dr. Bruno's Response: Between 5 to 20 milliliters (ml), or about 2 to 8 oz, of cerebrospinal fluid (CSF) is collected in a spinal tap. In patients with a diagnosed meningitis caused by common enteroviruses (viruses that live in your gut, like poliovirus) an average viral load would be 500,000 copies of the virus in each ml of CSF. So in 5 ml, about 2,500,000 poliovirus particles could be found. In 20 ml there could be 10,000,000 poliovirus particles.

<https://academic.oup.com/jid/article/210/4/576/2908870>

FYI, about 17,000 poliovirus particles would cover the period at the end of this sentence.

### On the topic of Muscle Weakness and Visualization Strategies

Question: I am trying a seated Tai Chi class online. I visualized moving a paralyzed leg. The next day I felt the loose hip joint feeling that makes it too painful to step with that leg. Is it possible just visualizing I overused some struggling muscle neurons?

Dr. Bruno's Response: I doubt that visualizing moving your leg and then having hip pain are related. But it is your brain that makes your muscles move. There is fascinating research showing that just visualizing muscle movement causes EMG electrical activity in the muscle whose movement is being visualized. Athletes use visualization for motor learning (called "latent learning" or "learning without responding") and for mental preparation, e.g., visualizing winning.

So, here's my recommendation: Be cautious. Don't visualize "pumping iron."

[https://www.researchgate.net/publication/6247947\\_Muscular\\_responses\\_during\\_motor\\_imagery\\_as\\_a\\_function\\_of\\_muscle\\_contraction\\_types?fbclid=IwAR28yErE5dVjZGK3B-tQPG28Okz5i0NhP1-Yda9XhJQdN2pPD7FerXhL2CE](https://www.researchgate.net/publication/6247947_Muscular_responses_during_motor_imagery_as_a_function_of_muscle_contraction_types?fbclid=IwAR28yErE5dVjZGK3B-tQPG28Okz5i0NhP1-Yda9XhJQdN2pPD7FerXhL2CE)

### 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)

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