

POLIO PERSPECTIVE

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EDITOR Millie Malone Lill Wilma J Hood PUBLISHER

IN THIS ISSUE

Mozart as Medicine

by James Clear

A Letter to Your Congressman About PT

courtesy of Pennsylvania Polio Survivor's Network

Trauma and Illness as Precipitants of PPS

by Dr. Richard L. Bruno

Stupidity Hurts

by Millie Malone Lill

Web Corner

A Little Bit of Humor



Mozart as Medicine: The Health Benefits of Music

By James Clear

David Binanay started playing the violin [when he was five](#). By age twelve, he performed at the world famous Carnegie Hall in New York City and, soon after, at the White House.

In 2006, fresh off graduation from Villanova University, Binanay was positioned perfectly to build his life around music. He had just moved into his own place and started a job at a high-end violin shop.

That's when he noticed the bleeding.

Music and The Mind

It was a gastrointestinal bleed. Binanay had experienced one before and he called his mom to let her know what was happening. She wanted to help, but David stopped her.

“Don’t worry about it. I’m going to handle it myself,” he said.

This was the first time Binanay tried to handle a serious health issue on his own. When he arrived at the hospital, things began to spiral out of control. His hands started shaking and his mind began to separate from reality. “It was my first psychotic episode,” David recalls.

The situation went downhill fast. After resolving the bleeding issue and leaving the hospital, Binanay’s psychosis continued. He started having delusions and became fearful of everything. “I couldn’t even walk into a grocery store because of the fear,” he says. “I didn’t really know what I was afraid of, but I feared for my life. In the span of one week I went from being normal to having a complete psychotic breakdown.”

This was the peak of David’s psychosis, but his battle was just beginning. He would struggle with schizophrenia for the next five years. His medications worked, but David had trouble sticking to them. There was one thing, however, that always seemed to help.

“My dad would look at me and say, ‘Dave, go get your violin.’”

The Healing Power of Music

Music stopped the pain. “Every time I played, I noticed a change,” David said. “I would channel my emotions through my music. The fear would turn to music. It would turn to sound.”

A new medication schedule helped too. David found it much easier to stick to his medication when he switched from pills to injections, which he only needed once per month.

Today, after a five year battle, Binanay has made a full recovery. He plays his violin up to ten hours per day and runs a non-profit, [Music Over Mind](#), that performs free music shows at hospitals for people suffering from mental illness. **“Music has been my catalyst for recovery,” Binanay says.** “It has been a 180 degree turnaround. From complete loss to total re-birth. I recently got married. I have my own place with my wife. I feel like I’m a better person than before my illness.”

David Binanay’s story raises an interesting series of questions. Can music help heal us? What role does music play in our health and happiness? Can music be a form of medicine?

Let me share what I’ve learned about the health benefits of music.

The Stroke Victim Who Was Healed by Music

In her book [The Power of Music](#), author Elena Mannes shares the story of a stroke patient who has lost the ability to speak. After struggling to re-learn normal speech patterns, the patient makes a breakthrough by singing her words rather than saying them. This approach is known as melodic intonation therapy and it engages the right side of the brain more than normal speech. As a result, this different section of the brain can stand in as a replacement for the normal language area and be used to communicate through song. [1]

At first glance, this story may seem like a very specific way to combine music and health, but it actually provides a good indication of the state of music therapy. There are many stories about music being used to help Parkinson’s patients move, autistic children focus and learn, or multiple sclerosis patients reduce spasms. These stories, however, have no research studies supporting them. My guess is that these are individualized results which, although true, are difficult to extrapolate to the entire population.

That said, there are a handful of health benefits of music that are well-accepted and scientifically proven.

The Research: Music as Medicine

First, music can be used to relieve pain in patients. For example, surgery patients at the Cleveland Clinic that listened to recorded music saw a four times decrease in post-surgical pain. Music has also been shown to reduce the amount of anesthesia needed during operations. [2, 3]

Second, music can be used to relieve stress and anxiety. Calming music decreases blood pressure, steadies the heart rate, and eases stress. Research has shown that music can reduce stress for patients undergoing surgeries and colonoscopies, for children undergoing medical procedures, and for patients with coronary heart disease. [4-7]

There is also preliminary evidence showing that listening to music can boost immune system function by decreasing stress hormones and increasing growth hormones. These changes should prime the body to be in a better state for recovering from and resisting illnesses, but the research is weak thus far and needs further investigation. [8]

Finally, there are a range of studies that link music to happiness and pleasure in different ways. Despite the differences in the individual studies, the scientific consensus on the topic is that music does stimulate the same areas of the brain that trigger pleasure in other activities. A range of studies have found that listening to pleasurable music stimulates the mesocorticolimbic system in the brain, which is the same “pleasure center” that is triggered by humor, tasty food, and even cocaine. In this way, you could say that music is like a drug. If music makes you happy, then it might be possible that it is good for your health. [9-12]

These benefits sound great, but is music unique in providing these benefits? Not really.

Given the current state of the research, it is not known if music is any better at healing than other alternatives. Music is not the only way to relieve pain or reduce stress. Music might work well for Person A while meditation is better for Person B and deep breathing or exercise help Person C. If nothing else, however, music is another tool at your disposal when you want to relieve pain, reduce stress, and promote healing.

The Limitations of Music Therapy

You can summarize the current state of research on the connection between music and health by saying that we know music impacts our brains and bodies, but we don’t quite understand exactly why or how music does this. And because we don’t understand the details, it can be hard to use music for healing.

To be honest, part of these issues could be solved if researchers performed better studies. Right now, researchers aren’t doing themselves any favors because musical research rarely follows a typical format.

Here are a few common errors (and solutions). [13]

1. Current research doesn’t clearly differentiate if it is the act of playing music or the act of listening to music that benefits patients. For example, if a patient gets better after playing songs on a keyboard, chanting in different tones, or singing their favorite song, are they benefiting from the musical notes or from the act of playing music? Future studies should investigate if active performance or passive listening yields better results.
2. Current research poorly categorizes the impact of different music styles. Most researchers lump music therapy into broad “stimulating” or “relaxing” categories. Future research should include more clearly defined boundaries, so we can understand which types of music can be used to heal in specific situations.
3. Current research flip-flops on who controls the music. Sometimes the experimenter chooses the

music. Sometimes the patient chooses their own music. This can complicate things because sometimes you are more likely to see music as having a positive impact simply if you selected the music. Future research should be more clear about this selection process.

4. Current research varies between individual listening, individual playing, and group playing. In many cases, patients may benefit from simply doing an activity with a group and not the music itself. Future research should investigate these environmental factors to help clarify the impact of individual vs. group music therapy.
5. Current research, at least what I found, was universally missing a large, randomized trial. This type of study is the gold-standard of research and if music therapy interventions are to be taken seriously, then a high quality randomized study is needed.

The Health Benefits of Music

Whether it is a pick-me-up song that brightens your mood or a live-saving violin practice like that of David Binanay,

We have all felt the healing power of music. @james_clear (Click on Tweet!)

From a research standpoint, the health benefits of music are unproven. However, I have always said that I try to balance being a scientist with being a practitioner and, from a practical standpoint, there are very few reasons to avoid music as a way to improve your health and happiness. Music therapy is noninvasive, inexpensive, and convenient. And music is one of the lifestyle choices we can make that relieves stress and anxiety, decreases pain, and protects against disease.

Stefan Koelsch, a senior research fellow in neurocognition at the University of Sussex in Brighton, summarizes the healing effects of music by saying, “I can’t say music is a pill to abolish diseases. But ... So many pills have horrible side effects, both physiological and psychological. Music has no side effects, or no harmful ones.” [14, 15]

James Clear writes at *JamesClear.com*, where he shares science-based ideas for living a better life and building habits that stick. To get strategies for boosting your mental and physical performance by 10x, join his free newsletter.

You can send this letter to your Congressman to help make Physical Therapy available as a treatment for PPS.

Your Name Here

Your Street

Your City, State and Zip Code

Your Phone Number

Current date here

Your Congressman / Congresswoman

Their Address

Washington, DC 20515

Dear **your congressman's name** ,

I am contacting you both as a constituent and as someone that has been impacted personally by significant muscle weakness and paralysis as a result of the Polio Virus. You can see four pages of information about these muscle weakness & pain issues on the Pennsylvania Polio Survivor's website.*

Physical therapy techniques such as Trigger Point Therapy and Myofascial Release are proven therapies to reduce the painful muscle spasms that are a part of my everyday life. These therapies cannot be performed at home, and must be done by a licensed Physical Therapist. These are the therapies (along with others) that have allowed so many of us to live a relatively pain free life, without the side effects of significant numbers of medications; many of which polio survivors are known to respond negatively to. We will need these therapies for the rest of our lives.

Last year, Congress made an exception to the Therapy Cap and it expires on March 31st. Please vote (H.R. 775) to protect access to necessary therapy services. My access to the therapy services that I (and many others) rely on is being threatened by these payment caps under Medicare. Please understand my position, and how difficult it is to have all therapy options (physical, speech-language and occupational *combined*) limited due to the Medicare therapy cap of a total of \$1,920 annually. This bill would repeal the harmful Medicare Therapy Cap once and for all.

Medical science and my physicians believe that accessibility to this this kind of care is in my best interest. Improving the quality of my life should *never* have a cap or restriction. We must rally together to safeguard critical services not just for Polio survivors; but for *everyone* who is living with and is significantly impacted by muscle weakness and paralysis.

Thank you for your time and I look forward to hearing from you regarding this issue.

Your Signature here

Trauma and Illness as Precipitants of Post-Polio Sequelae. ***By Dr. Richard L. Bruno***

About once a month I get a call from an attorney somewhere in these litigious United States. I am asked to be the expert witness for a polio survivor who's been rear-ended in their car, hit by a bus, taken a header down some stairs or simply slipped and fell. Regardless of the type of accident, the lawyer always asks the same question: Can a traumatic event trigger Post-Polio Sequelae, the new and sometimes disabling muscle weakness, fatigue, pain and respiratory problems that occur in as many as 77% of polio survivors? And regardless of the type of accident, my answer is always the same: Yes and no. PPS is not a disease that is just waiting inside polio survivors for a trigger to set it loose to wreak

havoc throughout the body. So trauma can't trigger a disease that is not there.

But our 1985 National Survey did show that PPS symptoms are caused by physically or emotionally stressing the poliovirus-damaged motor nerves that remained after survivors' original bout with polio. Many polio survivors have been able to function for 40 years with about half the spinal motor nerves of someone who didn't have polio. So breaking a leg in a fall, having major surgery -- even a whiplash injury -- could sufficiently stress the remaining polio-damaged motor neurons to "blow a fuse" When those fuses blow, neurons function less well and muscle weakness, fatigue, pain may result.

Many polio survivors are terrified about about losing function after trauma. One survivor said, "I am afraid if I fall and break something I will never walk again." Fear also causes polio survivors to postpone even necessary surgery because, as one survivor put it, "I know I'll never survive the anesthetic. I will spend the rest of my days in an iron lung."

Because of the fear that an injury or surgery could cause PPS, we wanted to find out just how many of our patients actually experienced new symptoms after trauma, what those symptoms were, whether they spread throughout the body and whether they were irreversible or treatable.

Surgery, Spills and Other Ills.

We reviewed the histories of 244 consecutive polio survivors evaluated by Kessler Institute's Post-Polio Service who had no other conditions that might cause new fatigue, weakness or pain. Of those patients, 44 (18%) said that their PPS began after a traumatic event. The typical patient was 59 years old and had polio at age 8 in the early 1940's. There were as many men as women reporting these post-traumatic PPS.

The traumas that preceded new symptoms included medical illnesses and surgeries (pneumonia, viral infection, hysterectomy, mastectomy with chemotherapy, pregnancy), fractures of the ankle, leg or hip, falls, auto accidents, and injury or surgery to the leg (ankle sprains, knee surgery, hip or knee replacement) or the back (herniated discs, laminectomies, spinal fusions)(see graph). The most common injury was to the leg (71% of patients) while 26% had back injuries. Regardless of the type of trauma or location of the injury, the most common symptom reported was new muscle weakness (55% of patients) followed by pain (34%) and fatigue (11%). There was no evidence that new symptoms began in an injured area and then "spread" throughout the body. Seventy-one percent of patients had new symptoms only in the body area that had been injured, while 26% had symptoms in the injured area plus one other nearby location.

For example, 40% of those who injured one leg developed weakness or pain in the other leg. This is a common problem for polio survivors, who compensate for injury to one part of the body by overusing another part whose nerves were also damaged by the poliovirus.

Only 5% of patients developed symptoms in more than two body areas. One patient who had a hip replacement reported "loss of muscle tone all over," while another who had been in a coma after an auto accident reported weakness in all of his muscles. Two patients who had had fractures, two with back injuries and one with an ankle injury reported new fatigue. However, no patient reported that their trauma "triggered" symptoms unrelated to the injury, such as arm weakness after breaking a leg or difficulty swallowing following a knee replacement.

Can Post-Traumatic PPS be Treated?

All of the clinical experience and research on treating non-traumatic PPS supports one conclusion: If patients decrease physical and emotional stress their symptoms will at very least stop progressing and typically will get noticeably better. Does this hold true for post-traumatic PPS? There's good news and bad news. The bad news is that the majority (63%) of patients with post-traumatic symptoms refused treatment altogether or refused to complete therapy for their symptoms; more than twice as many post-traumatic PPS patients actually quit therapy.

What might cause this? Seventy-seven percent of those who had a psychiatric diagnosis refused therapy, versus 53% of those without psychological problems. The most frequent psychiatric problem was a major depressive episode; 89% of those who were depressed refused therapy. Depression has been identified before as a significant cause of therapy refusal in polio survivors and highlights how important it is for psychological problems to be identified and treated if therapies for PPS are to even begin.

The good news is that 86% of patients regardless of the type of trauma or severity of their injuries had significant reductions in pain, fatigue and muscle weakness after complying with therapies known to be effective in treating PPS: reducing physical and emotional stress, using appropriate assistive devices, energy conservation, adequate rest and the pacing of activities.

The remaining patients experienced a reduction in some symptoms, especially pain, but continued to report muscle weakness or fatigue. Two patients who did not stop strenuous work or recreational activities reported slowly increasing muscle weakness and pain over several years. Another patient who had been thrown to the floor of a van in 1995 reported that muscle strength and endurance in her legs increased only slightly after therapy even though her severe back pain has been eliminated. It is noteworthy that this patient had completely recovered from two previous traumas: a fall early in 1995 that fractured her lower right leg and another auto accident seven years before that herniated a disc. This patient's ability to recover from two previous traumas is also good news. For each of our patients who reported PPS symptoms after a trauma there was at least one other patient who had had the same trauma but did not develop PPS. So while trauma can be sufficient to cause PPS, PPS do not necessarily "cometh after a fall."

The Golden Rule

These findings in our patients should put polio survivors' minds at ease. Neither major surgery nor even a fall that causes a fracture will necessarily push polio survivors down a slippery slope toward total disability. Still, caution must be exercised since damaged motor neurons make polio survivors more susceptible to problems that typically do follow trauma. A leg that has been in a cast for months can become weak, as can the opposite leg that has had to take up the slack for its damaged partner. And bed rest after surgery can more easily cause deconditioning and fatigue in polio survivors. However, post-traumatic symptoms in polio survivors should not be treated aggressively as they often are in those who didn't have polio. All PPS need to be treated carefully and slowly. Polio survivors and their therapists should not assume that a leg weakened after being in a cast has merely "been resting too long" and will respond to an aggressive program of weight lifting. Polio survivors who have had surgery should not be rushed out of bed to prevent deconditioning, because the lingering effects of anesthetic and post-operative pain are more likely to cause falls than to prevent fatigue.

Regardless of the cause of PPS the "Golden Rule" for polio survivors always applies: If an activity causes fatigue, weakness or pain, don't do it!" Doctors, nurses, and therapists must listen carefully to their patients -- and polio survivors must listen carefully to their own bodies -- to determine how much

exercise or therapy causes fatigue, weakness or pain, and to stop before those symptoms appear, so that therapy for PPS does not become just another type of trauma. The experience of our patients is that post-traumatic PPS are treatable if polio survivors follow through with therapy. But even more important is that many traumas can be avoided, like the falls and fractures caused by compulsive overdoing, ignoring new muscle weakness and refusing to use a needed brace, cane or crutch. For polio survivors physical overexertion, like pride, does goeth before a fall

Stupidity Hurts *by Millie Malone Lill*

How many times have you heard me say, “If you are mentally challenged, you can't help it. But if you are just being stupid, you are doing it to annoy me and it is working!” I admit it. I have a low tolerance for people doing stupid things. I've even said that if stupidity hurt, people would stop doing stupid stuff. Not for one minute did I think it would apply to me. I was so wrong!

Yesterday I had an appointment to change the oil in my van. Thus started a cascade of Stupid Stuff. For instance:

1. I did not unload my chair at the dealership. It's not that far to the customer lounge. I can walk that far. It will probably be good for me. Except by the time I was about $\frac{3}{4}$ of the way there, I realized that it was indeed too far. I was dragging my leg by the time I got to the seating area.
2. I figured I could rest up enough while the oil was being changed that the trek back to my van would be doable. I did not figure on the overly high chairs in the lounge and my overly short legs. I felt like Edith Ann from Laugh In as I sat there for an hour with my legs dangling and my sciatic nerve calling me words I cannot repeat here.
3. When my van was done, it was, of course, parked on the far side of the lot. I'd left myself no choice but to drag my aching body across that endless cement sea and climb in.
4. Did I then go home and rest, perhaps take some Advil? Nope. Stupidity had a death grip on me, I guess, because I then went shopping for a baby gift for a shower I am going to attend next Sunday. The store I went into was not accessible for my chair, so I used a shopping cart as a walker and picked up the gift and a pretty gift bag to put it in, as well as a card. If you are thinking that all of these items were right beside each other, you would be wrong.
5. OK, NOW did I go home and rest? Nope. Not me. Not Contender For Biggest Idiot of the Year me. I came home, but I then stood at the sink for half an hour peeling shrimp for a shrimp stir fry I'd invited some people over for. My limit for standing in one spot is about 5 minutes, so half an hour is way overkill.

By the time my guests left and I'd loaded the dishwasher, my entire body was in a muscle spasm. My left thigh, which I would have sworn had no muscle left, started rippling. I thought rippling muscles was a good thing, but not this time! When it got done rippling, it tried to attach my kneecap to my hipbone. About that time, a hitherto unknown muscle in the flab where my waist used to be back in the day joined the act. This muscle wanted to tie my uppermost rib to my ankle. I managed to get to my Flexoril which I had previously cut into fourths. I know a whole one will knock me out for a couple of days, but a fourth of one sometimes stops the spasms and lets me sleep. Nope. One fourth tablet helped but not enough. I finally took another fragment. Oh boy, did that work! I managed to get into bed before zonking out completely.

This morning, I began to rethink my attitude. I no longer think stupid stuff should hurt. At least, it shouldn't hurt me! I keep forgetting that I am a polio survivor, that I have PPS and that I passed the Young Chick stage of my life many miles back. It is now evening and in spite of sleeping most of the day, my ears are still buzzing from the muscle relaxer and I am looking forward to going back to bed. I know how I react to muscle relaxers. My muscles get so relaxed they can barely stay on my bones. I also know I had no choice last night. But I think I've learned my lesson. Unload the chair, no matter how much I don't want to bother! Someone else can be Idiot of the Year.

Web Corner

PHI Post Polio Health:

<http://www.post-polio.org/edu/pphnews/pph30-4c.html>

How to Know Whether to Believe a Health Study

http://www.nytimes.com/2015/08/18/upshot/how-to-know-whether-to-believe-a-health-study.html?smid=fb-share&_r=1&abt=0002&abg=1

Disability History Museum:

<http://www.disabilitymuseum.org/dhm/lib/catcard.html?id=327>

Yeast's New Use Making Narcotic Pain Killers

https://www.nlm.nih.gov/medlineplus/news/fullstory_154099.html

The Pain Medication Conundrum”

<http://www.nytimes.com/2015/08/13/opinion/the-pain-medication-conundrum.html?smid=fb-share>

Sunny Roller's Blog

<http://www.sunnyrollerblog.com/on-giving-an-epiphany-in-the-north-woods/>

Tuning Into Your Favorite Music May Boos Post-operative Recovery

https://www.nlm.nih.gov/medlineplus/news/fullstory_154069.html

Bruno's Bytes

<http://www.papolionetwork.org/bruno-bytes.html>

Information on prices of pills

<http://www.goodrx.com/>

How Yoga Works

<https://yogainternational.com/article/view/scientific-research-how-yoga-works>

A Little Bit of Humor

Thoughts from an unhinged mind:

The location of your mailbox shows you how far away from your house you can be in a robe, before you start looking like a mental patient.

My therapist said that my narcissism causes me to misread social situations. I'm pretty sure she was hitting on me.

My 60 year kindergarten reunion is coming up soon and I'm worried about the 195 lbs. I've gained.

I'm getting kind of tired always slowly raising my hand when someone asks, "Who does something like that?!?"

I always wondered what the job application is like at Hooters.. do they just give you a bra and say, "Here fill this out"..?

Four-time NASCAR Sprint Cup champion Jeff Gordon announced that this will be his final season of racing. You could tell it was time for him to retire during his last race when he had his blinker on the whole time.

The speed in which a woman says "nothing" when asked "What's wrong?" is inversely proportional to the severity of the storm that's coming.

Denny's has a slogan, 'If it's your birthday, the meal is on us.' If you're in Denny's and it's your birthday... Your life sucks!

If I make you breakfast in bed, a simple "Thank you" is all I need.....not all this, "How did you get in my house?" business!

The pharmacist asked me my birthday again today....Pretty sure she's going to get me something.

On average, an American man will have sex two to three times a week; whereas a Japanese man will have sex only one or two times a year....This is pretty upsetting news to me..... I had no idea I was Japanese.

I can't understand why women are okay that JC Penny has an older women's clothing line named, "Sag Harbor."

I think it's pretty cool how Chinese people made a language entirely out of tattoos.

What is it about a car that makes people think we can't see them pick their nose?