



Trauma and Illness as Precipitants of Post-Polio Sequelae

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I have often been asked to be an 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? 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 can result.

Many polio survivors are terrified 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."

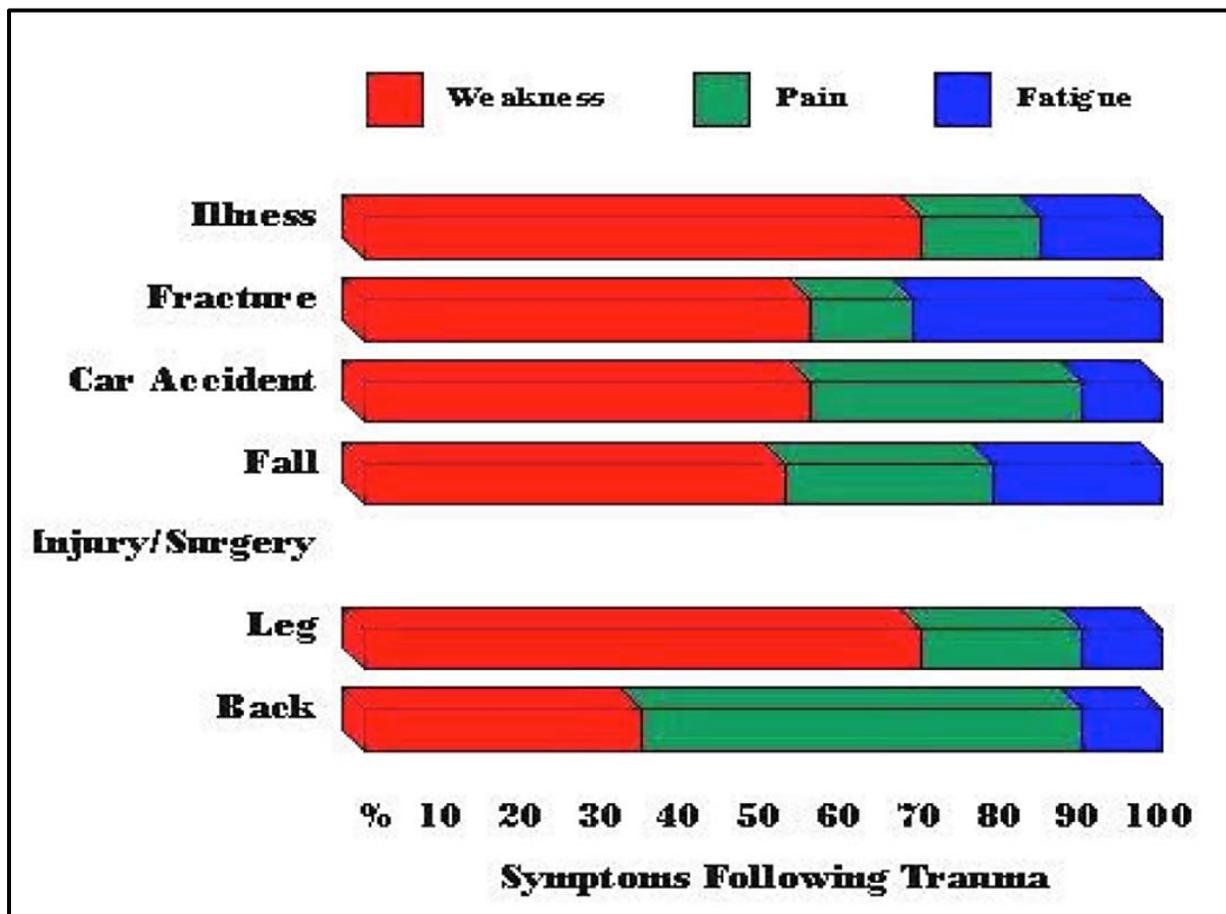
Because of the fear that an injury or surgery could trigger PPS symptoms, we wanted to find out just how many of our patients actually experienced new symptoms after trauma, what those symptoms were, whether they spread throughout the body and whether they were irreversible or treatable.

SURGERY, SPILLS AND OTHER ILLS.

We reviewed the histories of 244 consecutive polio survivors evaluated by us 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? Of those who had a psychiatric diagnosis 77% 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 even to 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 pacing 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. One patient who had been thrown to the floor of a van in which she was riding reported that muscle strength and endurance in her legs increased only slightly after therapy even though her severe back pain had been eliminated. It is noteworthy that this patient had completely recovered from two previous traumas: A fall early 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 untreatable symptoms let alone 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 symptoms 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 symptoms 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 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.