



## Fainting and Fatigue in Polio Survivors

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The relationship between fatigue, brain stem damage and low blood pressure links polio survivors to another bunch of very tired folk: those with chronic fatigue syndrome.

Question: I had polio with weakness in my left leg. I recovered and carried on a normal life until the early 1990's when I started to have fatigue, heart palpitations, skipped beats and low blood pressure, especially after I eat. Should my doctor be considering any tie-in with polio?

Answer: Oh, yes! Fifty years ago polio pioneer David Bodian discovered that every polio survivor had some poliovirus-damaged to neurons in the brain stem, the so-called "bulb" of the brain. When brain stem damage was severe "bulbar" polio was diagnosed whose icon, the iron lung, was needed when brain stem breathing-control neurons stopped working. But the most common symptom of "bulbar" polio was trouble swallowing, not trouble breathing. And some "bulbar" polio patients had severe difficulty controlling their blood pressure and heart rate which was the leading cause of death in these patients, not being unable to breathe.

The brain stem neurons damaged by the poliovirus that are responsible for controlling breathing, swallowing and blood pressure work by way of the vagus nerve, which carries commands from the brain stem to activate muscles in your throat, esophagus, stomach and intestines and also slows your heart rate. But the vagus nerve is a two-way street, since it also "listens" to activity in the gut and sends that information back up to brain stem neurons.

Vagus/brain stem damage disrupting the normal functioning of the gut may explain our Post-Polio Survey findings that swallowing difficulty, diarrhea, colitis, ulcers and constipation are as much as six times more common in polio survivors than in non-polio survivors. And the symptoms you describe may result from poliovirus-damage to the vagus as well as brain stem blood pressure and heart rate control neurons. We have a growing number of post-polio patients who feel exhausted after a meal. We found that, when their stomachs fill with food, the vagus is apparently over stimulated and triggers a drop in blood pressure and heart rate, causing feelings of fatigue and sometimes palpitations. Polio survivors have also been reporting another problem: Food sticking in the upper esophagus. We think this is due to the vagus not stimulating esophagus muscles to move the food downward. When food gets stuck, irritation triggers a painful esophagus muscle spasm that also stimulates the vagus nerve, causing blood pressure to drop and the heart to race or to slow.

Although their blood pressure drops, our post-polio patients rarely faint, which is consistent with our 1995 Post-Polio Survey finding that polio survivors do not faint any more frequently than those who didn't have polio. But the 1995 Survey did find that anyone who had fainted even *once* in their lifetimes reported significantly more daily fatigue than those who had never fainted. This suggests that damage to brain stem blood pressure control and vagus nerve neurons may be coupled to poliovirus damage to bulbar "brain activating system" neurons, those which our laboratory research suggests are responsible for post-polio brain fatigue.

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patients have fatigue that is associated with low blood pressure or increased heart rate. Some CFS another bunch of very tired folk: those with chronic fatigue syndrome. About one quarter of CFS patients report fatigue when a hot shower or hot room causes blood pressure to drop, as do about one third of polio survivors. Other CFS patients have blue feet, just like our patients' "polio feet," suggesting that blood pooling in the legs contributes to low blood pressure.

Polio survivors should have a doctor take their blood pressure and heart rate lying, sitting and--if possible--standing. Polio survivors, who have fatigue associated with a drop in blood pressure or a slowed or racing heart, need to see a cardiologist who treats *low* blood pressure. Compression stockings, which push blood back toward the heart, and medications that increase the fluid in your blood or stop blood from pooling in the legs can be helpful. If fatigue follows eating, frequent, small, higher protein meals can prevent the stomach from getting too full and stimulating the vagus nerve. Polio survivors having trouble swallowing should see an ENT doctor. Eating smaller bites of softer foods and washing down each bite can prevent food from sticking in the esophagus. For those who still have a sticking problem, a low dose of the muscle relaxant Klonopin taken 30 minutes before eating can prevent muscle spasms and help food slide down.