

functioning are altered during and after the seizure activity. This treatment works quickly than medication or psychotherapy, however, it can cause side effects such as memory impairment. The main benefit of this treatment is that it's often effective when other treatments aren't helpful. New treatments for depression are continually being researched, and currently treatments such as transcranial magnetic stimulation and vagal nerve stimulation are being investigated.

Depression is one of the most prevalent diseases in the world today. Thanks to improved medications and treatments, depression is

treatable. With appropriate treatment, approximately eight out of 10 people with depression will improve and can return to their normal lives. Unfortunately, too many people often don't seek treatments, either because they are unaware that they have depression, or because of misconceptions that depression isn't a real illness and admitting depression is a sign of weakness. It is crucial to treat depression as it can interfere significantly in one's physical and social functioning, and too often, untreated depression is associated with suicide. ■

AFTER THE STORM POLIO AND POST POLIO SYNDROME

BY ABHISHEK RAUT

It was not before 1916 that Polio first took center stage in international awareness. In that year, the first major US epidemic occurred. In New York City alone, the number of cases of Poliomyelitis were upwards of 9000 and resulted in 2400 deaths. Because the vast majority of those affected were under the age of five years, Polio was also known as Infantile Paralysis. During the 1930s, 1940s and 1950s, the Polio epidemics grew to unimaginable proportions. Almost 60 000 cases were reported during 1952 making it the largest epidemic year on record. On April 12, 1955, the nightmare was finally over. The Salk vaccine was deemed both safe and effective. Together, the Salk and Sabin vaccines made Polio almost completely disappear. But for those who faced the nightmare of Polio and survived, it seems that their troubles are still far from over.

The Stages of Polio

Previously, Polio had been divided into three distinct stages: acute illness, period of recovery, and stable disability. We now understand that there is one more stage which brings on a new set of symptoms related to the original Polio attack. This stage has various terms including Post-Polio Sequelae, Post-Polio Muscular Atrophy, Post-Polio Muscle Dysfunction, or Post-Polio Syndrome. Acute Illness (Stage 1) begins with a mild fever, headache, sore throat, diarrhea or vomiting, and malaise. To the majority of people affected, these symptoms will disappear after about three days. However, in a minority in the range of 5%, the virus invades the central nervous system resulting in high fever, stiff neck, severe headache, and muscle pains. The infection can spread even more producing muscle paralysis or weakness in the limbs, trunk, face and neck. Stage 2 is the recovery phase, and begins as soon as the patient's temperature returns to normal. Children take the longest time to recover with an average length of eight years. Stage 3 begins when the person reaches a plateau of maximum recovery. In this stage, the patient believes he/she has made a full recovery, and it really does seem this way considering that this stage usually lasts about 25 years. However, Stage 4 begins with an onset of new weaknesses, and is accompanied by fatigue, pain in muscles and joints, and decreased function. Pain in the joints and the muscles is also noted. Symptoms can include muscle atrophy, breathing and swallowing difficulties, and cold intolerance. Stage 4 begins on average about 33 years after the initial polio illness, and lasts for the entire life of the individual. Because these symptoms occur together, they are labeled

collectively as a syndrome. The table below shows the percentage of people with Post Polio Syndrome that are affected by the various symptoms.

Symptom (Range)	Percent
Fatigue	86-87
Muscle pain	71-86
Joint pain	71-79
Weakness in muscles	69-87
Cold intolerance	29-56
Atrophy	28-39

* Statistics from "Managing Post-Polio", Halstead.

Causes of Post Polio Syndrome

The word *poliomyelitis* comes from the Greek words *polios* (grey), and *myelos* (marrow) with the English word *itis* (inflammation). The poliovirus produces an inflammation of the gray marrow portion of the spinal cord. More specifically, it affects the motor nerve cells in the anterior horn of the spinal cord. This results in a variable amount of paralysis to the infected person. The virus is widely distributed and infects over 95 percent of the motor neurons in the spinal cord and other cells in the brain as well. After the infection, the affected cells either die or shed the virus and regain a near normal appearance. Since many of the neurons die, the ones that survive can develop additional terminal axon sprouts. This is done to reconnected nerves to muscle fibers which are disconnected from the rest of the body due to the death of their original motor neurons. This additional growth of axon sprouts is the body's way of keeping as many muscle cells in working condition as possible. This compensatory process allows a recovered motor neuron to adapt up to ten additional muscle fibres for every muscle cell stimulated originally. This means that a motor neuron that was designed to supply 1000 muscle fibres might take on the function of supplying as many as 10 000 fibers. The size of these motor units increase significantly after acute polio, and are known as 'giant motor units'. This makes it possible for a few motor neurons to do the work of many more. However, this process is a temporary solution at best. Any cell which is overworked to nine times its original function will malfunction at a much quicker rate than a normal

cell. And thus, the greatly enlarged motor units which labour for decades under an increased burden eventually result in degradation. And so the onset of Post Polio Syndrome begins.

Research into Post Polio Syndrome is quite recent, and has still much greater lengths to go before the lives of

Polio victims can reach normality. However, like all research, scientists will trudge on in the darkness, searching for treatments to alleviate the suffering that is felt once more by the victims of Polio. ■

