Mankind over the past 100 years has come a long way with technological advances. Not only has the computer and communication industry improved, but also in the medical equipment we use everyday to diagnose and solve people’s medical issues. Most fascinating discoveries have been the research done our nervous system and connections with the brain’s electronic pulses. As we come to understand more why and how strokes and paralysis of limbs occur in the body, we can develop technology for patients to regain control of their limbs or help solve chronic migraine condition.

Neuromuscular Microstimulators is a fairly new technology which helps can patients with these kind of issues.

At first Neuromuscular stimulators would be placed on the skin with surface electrodes. Than in the late 80s early 90s research facilities like Alfred Mann foundation began working on a process to shrink the stimulators down to the size of a penny diameter.

The way the new microstimulator works, is a thin wire containing electrodes is implanted under the skin in the back of the head or in the damaged muscle using Bion Insertion tool. The wire extends to an implanted battery-driven impulse generator. The patient controls the rate and intensity of the pulses using a remote. The pulses create paresthesia, usually described by patients as light tingling or buzzing in the area of the occipital nerve and the distal branches of the second and third cervical nerves. Places like the Mayo clinic offer these treatments as a last resort for those who have severe migraines.

While doing my research I found a journal study performed by Dr Daniel Merrill and Dr. Ross Davis, who implanted the device into 6 different patients. The research was funded by the Alfred Mann foundation just like many other Biomedical projects performed in the United States. Their objective was to examine the effect of home-based electrical stimulation using closed-loop control of implanted microstimulators on upper limb function, impairment and subject’s perception of the system. Their results came out stating that 5 out of their 6 patients said using the system had change their lives and improved their range of motion and increase the possible tasks that they could achieve before without the device. Also, patient only complained about the inconvenience of using the external components. The reason they had to use the external device instead of the internal device is because the internal device is restricted to investigational use only in the United States. Although similar experiments where performed in the United Kingdom using the internal device, and results came back positive with an increase in arm movement after 12 weeks of stimulating.

All and all this device has great potential. Current development work in the U.K. is leading toward microstimulator devices that can also sense changes in pressure, limb angle, muscle activity and temperature. Future goals are to get past the investigation stage in the United States. Also, potentially making movements more natural or therapeutically helpful for patients. With more research the possibilities could revolutionize the way we think about modern medicine.

CITATIONS