

HOPE FOR STROKE SURVIVORS (08/02/2005)

Israeli firm offering portable machine that stimulates muscles. Shmuel Steinberg Editorial Intern

Husain Bashey was at the racetrack about two years ago enjoying his retirement after 35 years teaching at the University of Washington, mostly to doctoral and master's candidates.

While considering his selections for a race, Bashey recalled "I began to feel funny about myself."

Nine months into his retirement, he was having a stroke.

Bashey, now 73 and living in Seattle, said he has no clear memory of the time following the episode.

"I was not very oriented," he said.

The stroke would change his life forever.

In time his mind returned, but he has never regained full use of his muscles despite therapy. At first he could not speak or recognize the people around him. Nor could he walk; the right side of his body was paralyzed.

Bashey is not alone in his struggle to rebuild his life. More than 4 million Americans are living with the effects of a stroke, according to the National Stroke Association, making it the leading cause of adult disability in the United States.

But now there is hope. An Israeli company, Curatronic Ltd., recently received FDA approval to begin marketing the Biomove 3000, an inexpensive, portable muscle stimulator used to rehabilitate paralyzed muscles following a stroke.

Its creator, Ben Philipson, said the Biomove is the only device in the rehabilitation of stroke survivors developed for home use.

Some experts are saying the battery powered machine holds great promise.

Bashey, who has been using the Biomove 3000 for slightly more than a month, said he already has seen results.

"It's a damn good machine," he said. Of the many machines Bashey has employed in his therapy, he said he is happiest with the Biomove, which he uses twice a day.



"The best part is that it gives the patient the power to control the machine," he said. "All the machines are passive; you do not have control.

"His wife, Jevra, said she's seen a remarkable change in Bashey since he started using the Biomove.

"This is the first time that he has really felt like he was going to make progress with this machine," she said. "So that is a great motivation."

EFFECTS OF A STROKE

A stroke occurs when a clot interrupts blood flow to the brain or a blood vessel bursts. With the flow of oxygen and nutrients interrupted, the brain cells in the area begin to die, causing a chain reaction and damaging the surrounding area of the brain. After the cells die, the functions they controlled . speech, memory and movement are lost.

The amount of damage is determined by the size of the stroke. A minor stroke will cause weakness and numbness in the limbs, while a severe stroke can cause paralysis and an inability to express or process language.

After a stroke, the brain cannot send an electromyographic signal, or EMG, to the muscles. Without that signal the muscle cannot contract, causing paralysis in the limb.

The Biomove must be able to detect an EMG signal if a patient can move a finger or toe, that's enough. A muscle that has atrophied completely is beyond the help of the device. Through small electronic leads, the Biomove measures the signal being sent from the brain, and once it has passed a certain threshold determined by the machine's setting it electrically stimulates the muscle, causing an artificial contraction.

Patients develop new neural pathways from the brain toward the muscles, increasing the electrical activity of the muscle itself, according to Philipson, the CEO of Curatronic.

Repetition is the key. The muscle will atrophy if not used on a regular basis.

"After a stroke what you are trying to do for patients, with or without a device, is to get them to attempt to move as many times as possible," said Professor Leonard Elbaum of the Department of Physical Therapy at Florida International University.

Elbaum, a physical therapist, teaches electrical stimulation for rehabilitation.

Exercising a muscle that does not move can be frustrating for patients.

"Many people after a stroke can generate so little activation of muscle that they really don't know if they are contracting [the right muscle]," Elbaum said.

With the Biomove, the patient sees the results. When the Biomove induces a muscle contraction, "you know that you are thinking the right thing and that the limb is actually moving," Elbaum said. "And you also get the sensory experience of seeing and feeling the limb move."

SEEING RESULTS

Bashey said the fact that he sees the progress of the machine and the effect on his limb helps him continue with the rehabilitation.

Elbaum speaks highly of the device, which costs less than \$1,000.

“There is a high level of expertise that has gone into designing this,” he said. “The EMG signal is measured in micro volts, in millionths of a volt. It’s a very small magnitude signal. So to capture it consistently and be able to drive an electrical stimulation system with it is a pretty high level of engineering.”

It has two controls: one sets the sensitivity level for picking up electrical muscle signal, the other sets the level of stimulation impulse to the muscle.

“It’s a very simple small device, it does not scare off the patient, it is not complicated to use and it is inexpensive,” said Philipson, who lives in Israel with his four children and eight grandchildren. “All these things together promise a lot of possibilities with stroke patients.” The device is now available in the United States through the Curatronic Ltd. Web site. A doctor’s prescription is needed.

The Biomove only recently has started selling in Israel. Philipson waited for approval by the Food and Drug Administration before seeking Israeli approval.

“FDA approval is not endorsed [in Israel], but it is more or less recognized by Israeli authorities,” he said. Also, he noted, the American market is much larger. Philipson is seeking approval to sell the Biomove in Europe.

Philipson, who was born and educated in Holland, has dedicated his career to advancing medical technology. He has a degree in biomedical engineering. His specialty is biofeedback devices, notably EMG biofeedback.

Before immigrating to Israel in 1983, he developed an array of electro acupuncture devices. Philipson said he was the first to develop a helium neon laser device for dermatological purposes, which were sold throughout Europe.

For many years Philipson worked on the research end of medical technology before moving into sales. After 10 years selling medical equipment in Europe and Israel, he established his own R&D firm.