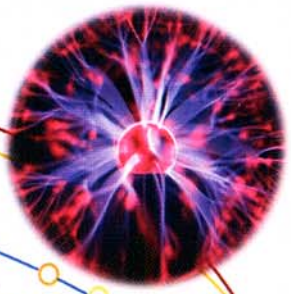
Current Thoughts:

Exploring Electrical Stimulation

By Anne Buzas



Would you submit to electrical stimulation to gain relief from your fibromyalgia symptoms? For increasing numbers of patients across the country, the answer is **"Yes."**

But what exactly does "electrical stimulation" mean?

Pain and Electricity

Electricity has been believed to be therapeutic since ancient times, when a Roman physician claimed that jolts from the black torpedo fish could ease headaches. Various figures throughout history—including that most electric personality, Ben Franklin himself—claimed electricity offered various health benefits.

Thanks to today's advanced understanding of the workings of the human body, the electrical stimulation scene is livelier than ever (so to speak). Treatments are available

from a wide variety of apparatuses—many of them FDA-approved—and some of them administer electrical current that can scarcely be felt. Home models make it possible for patients to self-treat. And studies are indicating that these treatments may be beneficial for many chronic pain disorders, including fibromyalgia.

Most patients are so hungry for help that the idea of electrical stimulation doesn't phase them, says Patrick Wood, MD, although a good number of them are still convinced that FM is a muscle disorder, and it requires some explanation on his part to help them understand that it is a problem at the brain and spinal cord level. And, he adds, that's why some electrical stimulation treatments can have such a strong impact on FM symptoms.

Transcranial electrical stimulation of the kind offered by Alpha-Stim ®, for instance, is "intended to change the electrical activity of the brain," explains Wood, who wrote the discussion portion of a study on the effect of cranial electrotherapy stimulation on FM pain. It can "cause brain centers involved with anxiety to be less active, and brain centers involved with promotion of calmness to be more active."

How does it work? It may have everything to do with the n-methyl d-aspartate—or NMDA—receptor in the brain, which has been implicated in FM pain. "Whereas the role of spinal NMDA receptors has recently come into question," Wood says, "it remains an open possibility that NMDA receptors in the limbic system may participate in FM pain."

Some researchers theorize that at a high frequency of stimulation, NMDA receptors become more active and sensitive, while a low frequency of stimulation causes them to become less active and sensitive. So Alpha-Stim could work by reducing the activity of these receptors in the limbic system of the brain. But this is just one type of electrical stimulation FM patients are undertaking to manage their pain.

Frequency Specific Microcurrent

In 1995, Carol McMakin obtained a list of electrical frequencies that had been used in the 1920s by medical doctors and osteopaths to treat a variety of health problems.

In 1996 she started using electrical stimulation to treat people with FM that had been triggered by neck injuries. A year later she started teaching other practitioners about her method in an effort to discover whether her results were reproducible. In 1999, she treated 25 patients who described their pain levels as between 7 and 9 on a scale of 10 when they came in to see her—and as a zero when they left.

"The pattern is fairly predictable now," says McMakin, a chiropractor who runs Integrated Pain Solutions in Tigard, Ore.

To administer a microcurrent treatment, McMakin wraps a graphite glove in a warm, wet towel; she places the positive one around the patient's neck, and the negative one at the lower back or on the feet. The pain starts receding from the feet and continues receding all along the body. A treatment may last 60 to 90 minutes, and the pain reduction—in which patients describe their pain levels as a 2 or lower—can last from two hours to two weeks. "There's no way to predict how long it will last," she says.

But her experience shows that after two to four months of treatment, fibromyalgia pain is under control. The patients' recovery process is just getting started, though. They have to recondition their digestive systems, undergo adrenal rehab, transition off medications that they may no longer need, and get accustomed to their "new" bodies.

"There's no way we can be making the kind of changes in neurotransmitters that we make and not be influencing brain function," McMakin says. "I think what we're doing is changing the spinal cord itself; I believe we're repairing the spinal cord. It's the only thing that explains what happens with these patients." Further research is needed, she adds, and plans for studies are underway.

Cheryl Hryciw is a family nurse practitioner in the Division of Arthritis and Rheumatology at Oregon Health and Science University, and has been working in the fibromyalgia field for five years—but it's only relatively recently that she has gotten involved with microcurrent treatments.

When she heard that McMakin was using microcurrent to treat FM symptoms, Hryciw visited Integrated Pain Solutions to talk with her and observe treatment. Then she performed a demonstration on a patient with rheumatoid arthritis and FM for her colleagues at OHSU. The patient, who had been coming in for trigger point injections every three weeks, "walked out of there pain-free," says Hryciw. "I did not see her [again] for eight months. One hour of microcurrent each morning reduced her pain and stiffness to a 2 out of 10."

That doesn't mean, she emphasizes, that microcurrent is a miracle "cure." Just like medication, not everyone responds to microcurrent. But it has very positively impacted many of her patients who have undergone

treatments. "I use it to get at both the central component of pain and peripheral pain generators, such as muscle trigger points. It is particularly useful after trigger point injections," she says. "You put the gloves on, trial a particular frequency, and all of a sudden the muscles go 'smush.'"

McMakin has also developed a home unit, the Home Care, that costs $1400. For some patients, the one-time cost of the Home Care is less expensive than seeing a practitioner several times a week; practitioners can prescribe the home unit, though an insurance company may or may not agree to pay for it. (Medicare does not cover the cost.)

Alpha-Stim

Published in *The Internet Journal of Anesthesiology*, a study from the LSU Health Sciences Center in Shreveport, LA, entitled "The Effect of Cranial Electrotherapy Stimulation (CES) on Pain Associated with Fibromyalgia" looked at the use of Alpha-Stim technology on fibromyalgia pain and other symptoms.

In this study, patients underwent treatments via electrodes that clipped onto their earlobes. "A preliminary study was published using Alpha-Stim CES with FM in New Jersey, and I thought it could be valuable to see if it really helped our patients here," says the LSU study's lead author, Randall Cork, MD, Ph.D. "As CES is primarily used for anxiety, depression and insomnia, I thought that if it could reduce these conditions, that alone would be of great benefit for FM patients."

The study results prove him right. "As reported in the study, it helped significantly in reducing their pain, and in improving their mood and ability to sleep," he says. "The local Alpha-Stim distributor mentioned that he still sells supplies to the people who participated in the study. Some 43 out of the 74 people in the study were impressed enough to buy Alpha-Stims, even though it was probably somewhat expensive for most of them."

Wood prescribes these treatments for some of his patients who have fibromyalgia, but third-party payers often balk at paying for them. He has resolved the issue by prescribing physical therapy with one of three local allied health partners who offer Alpha-Stim. (Electromedical Products International, Inc., which produces Alpha-Stim, can also provide assistance to patients arguing with their insurance companies about paying for the device.) Cost for a home unit ranges from $495 to $895. ■

TENS

Perhaps the best-known method of electrical stimulation for the purposes of pain relief is TENS, or Transcutaneous Electrical Nerve Stimulator units. The goal is to interrupt communication from the body to the spinal cord—and from there to the brain—by preventing the travel of pain signals.

While microcurrent is subsensory, so patients don't even feel it, TENS treatments can create a sensation of warmth or tingling. TENS typically uses 60 – 100 milliamps of electricity, while Alpha-Stim, for instance, uses 600 microamps (a microamp is one ten-thousandth of an amp; a milliamp is one thousandth of an amp). TENS treatments usually last five to 15 minutes.

TENS was developed in the 1960s and has evolved over the decades. Now more than 100 types of TENS units are approved by the FDA, and a portable system has been developed for home use. Cost can vary widely.

Opinions vary on the value of TENS treatments; some analysis has shown that TENS therapy may reduce the need for analgesics following surgery, while other analysis has shown that TENS is no better than placebo or sham treatment for treating chronic back pain.