

Current

Some rehab providers are merging electrotherapy with ancient healing techniques and swearing by the results. But a lack of convincing data keeps the new discipline in the realm of possibilities.

At the University of Pennsylvania in Philadelphia, a physical therapist searches for the source of a patient's cluster headaches using a combination of ancient healing art and modern-day electromedicine. As the patient calmly submits to the therapist's care, a small, cotton-tipped probe attached by a cord to an innocuous-looking machine hunts for the source of the pain.

But the enemy isn't hunted around the patient's head, where most practitioners would look first for the problem. Instead, using a low-frequency microcurrent, the physical therapist passes the probe along key areas at the bottom of the patient's foot at a site designated as K-1 by adherents of acupuncture.

Eventually, the microcurrent finds an important point on the base of the spine. It isn't the source of the discomfort, but the place on the body where the pain can be effectively controlled. The discovery is based partly on chance and partly on knowl-

BY HOWARD KIM

edge of the body's major nerve routes, called meridians, which are meticulously mapped in the acupuncture practitioner's rulebook.

Once the right spot is found, modern medicine steps in. The microcurrent apparently does its work. After a few minutes of neural electrostimulation, or E-stim, the patient begins to feel better. Better, but not cured. The treatment doesn't hope to rid the patient of pain, but to help better manage it.

Hard-to-treat patients are most likely cases

These are patients for whom nothing has worked, says Mary Lou Galantino, PT, PhD, associate professor of physical therapy and a clinical specialist in the university's department of rehabilitation medicine. Many have suffered with serious peripheral neuropathy for years. "If we can help a patient learn to cope with his or her pain, we have to a large degree succeeded with that patient," she says.

Rehab specialists such as Galantino are changing the face of conventional treatment for pain. The once staid, mechanistic attitude toward electromedical therapy is receiving a jolt of new life in the form of combinations that integrate electromedical and nontraditional pain-management techniques once considered exotic to rehab medicine.

Hospitals around the country are confidently exploring a New Age approach. Some integrate E-stim with relaxation exercises and water aerobics. Others use it with aromatherapy, massage, meditation, nutritional programs and biofeedback techniques. Almost all who have attempted the combined modalities insist that, whatever the ultimate combination, treatment must be couched in patient education, nutritional support and psychosocial counseling.

"At the root of the physical pain, we find that in almost all cases patients are afflicted with

lifestyle and emotional pain as well," says Patricia Nelson, RN, coordinator of support services at Hammons Heart Institute in Springfield, Mo. A number of patients suffer from concomitant eating disorders, Nelson says.

For the hospital, which has worked for years on behavior modification with postoperative cardiac patients, the integration of psychosocial training into pain management was relatively easy, she says.

Electrotherapy has been moving in new directions for years due largely to the willingness by physical and occupational therapists and nurses to venture into new areas in treating patients. But the pace of innovation has picked up with the growing number of difficult-to-treat pain sufferers stemming from what Galantino describes as "the failure of conventional medicine to successfully address this patient population with medication."

Managed care fuels the revival of a lost art

Electromedicine and nutrition, for example, are enjoying a revival after being largely abandoned early in the century, observes Daniel Kirsch, PhD, a neurobiologist in Mineral Wells, Texas. Kirsch played a role in that revival. In 1981, he founded Electromedical Products International, which specializes in E-stim devices to treat stress and head-and-neck pain.

The revival also appears to be fueled by pressure from health care insurers to achieve faster, better outcomes with patients. But it's being aided further by a New Age interest in alternative medicine practices from herbal remedies to meditation, yoga and guided imagery.

But researchers are also turning up the heat with new findings not only about these drug-free options, but also about the effectiveness of newer electromedical devices.

Events

TENS (transcutaneous electrical nerve stimulation) still reigns in electro-pain therapy among high-frequency neural stimulators.

But its pre-eminence is being challenged as newer, reportedly more effective devices become available. The technology boasts better clinical outcomes with more convenience and less discomfort for patients. They also incorporate new, previously untried pulse rates, frequencies and intensity levels that only an electrical engineer could truly appreciate, but are designed to give therapists wider treatment options, according to Kirsch.

These options have been available to therapists for years. They continue to function chiefly by acting on nerve cells to either block the pain impulse from traveling along the neural pathways as in TENS, or to stimulate the cells into allegedly mimicking the body's own ability to attain a state of homeostasis, or normalcy, regarding pain sensations.

What is significant is that therapists are now beginning to use a variety of electro-modalities with greater confidence as they move beyond conventional TENS technology, says Jennifer Rohl, a marketing services manager with Mettler Electronics. The Anaheim, Calif.-based company produces E-stim devices.

The days of stodgy, clunky machines are gone, Rohl says. Convenience and compactness are determining today's technology, especially in view of the expanding home care market, she adds.

Electromedicine developers are boasting about the benefits of innovations such as high-frequency interferential stimulation, which unlike TENS mixes two frequencies simultaneously in overlapping patterns transmitted through pairs of electrodes on various parts of the body.

Therapists and technicians can control the mixed frequencies within a wider scope than with TENS. The pulses cross each other at frequencies of up to 4,000 pulses per second and, according to proponents, can provide neuromuscular stimulation to block pain to a larger surface area.

Combined modalities give therapists wider arsenal

At the other end of the spectrum, executives at Electromedical Products believe that by using variable microcurrent applications, E-stim can perform wonders in managing acute, chronic and postoperative pain. The microcurrent electrical therapy (MET) device, which is distributed under the trade name Alpha-Stim, uses electrodes or probes to block pain along the neural path.

With separate electrodes that clip onto the patient's earlobes, the device purportedly helps to relieve anxiety, depression and insomnia by directing the microcurrent to the head in a process called cranial electrostimulation (CES), which borrows heavily from a four-decades-old Russian technology that Kirsch has adapted to modern clinical usage.

The state of the art in electromedicine lies in giving therapists and patients a wider arsenal of options for treating pain, says Kirsch. Much of the argument in favor of using the latest electrotherapeutic tools is ostensibly supported by research. Yet, much of the research is localized, isolated or inconclusive, and a lot of it appears to be self-serving.

Fortunately, rehab providers in growing numbers are keeping an open mind and judging for themselves how well these new approaches work with patients. "The bottom line is really how the patient feels at the end of each [therapy] session," says Galantino.

At the University of Pennsylvania and Hammons Heart Institute, patients can spend up to four hours a day three times a week undergoing different forms of electrotherapy. The day is supplemented with hourlong sessions of psychological counseling, nutrition education and relaxation-learning exercises. A typical day can run six hours long, and treatment can last from eight weeks to a year.

Despite a lack of persuasive outcomes data, practitioners swear by their results. And some say they are convincing skeptics — especially physicians — regarding these homeopathic combinations.

At Hammons, for example, nurse specialist Betina Talbert, RN, once counted herself as a nonbeliever. But she changed her views after her department's treatment team began to achieve significant results with some seriously ill patients.

One such case involved an elderly postoperative cardiac patient with serious pulmonary complications who could hardly walk without feeling shortness of breath and intense pain in the quad muscles of the lower extremities. After a difficult coronary artery bypass graft and three months as an inpatient, "the patient could hardly walk a few feet unassisted and without at least three liters of O₂," Talbert recalls.

Electromedicine works with biofeedback

Using an electro-acupuncture technique similar to the one adopted at the University of Pennsylvania, the rehab team found critical massage points on the patient's spinal column and back that, if subjected to therapeutic massage, would help pain reduction.

Curiously, therapists found that the acute pain was directly contributing to the patient's rapid exhaustion and indirectly to the short-

ness of breath. A daily massage regimen using the acupuncture points as targets for neural massage eventually reduced the pain and enabled the patient to reach a walking distance of 72 feet, while lowering his body's oxygen demand to 2 liters.

Physicians at the Kessler Institute for Rehabilitation in West Orange, N.J., have been using biofeedback techniques to determine the extent of muscle damage that results in pain, and also to treat the

pain partly through helping the patient hear and see the source of the discomfort.

With the aid of electromyography, the Kessler program's director, Joseph Valenza, MD, performs muscle studies on patients with a range of disorders, including nonmalignant radiculopathy (spinal cord disease), reflex sympathetic dystrophy, and failed laminectomies.

But during the sessions, which often are conducted by a physical therapist and a

psychologist when a physician isn't needed, team members use relaxation techniques such as assisted meditation or guided visualization to calm the patient and to slow muscle contractions. (The techniques are not to be confused with hypnosis.)

By sending a low current of electricity into the affected muscle, the rehab team can diagnose the affected nerve and determine the extent of damage. By measuring the path and "distance" the current travels in the nerve on a graphical readout, physicians can determine the nature of the disorder.


Meanwhile, the patient can see the spiking line patterns on the readout tape and can hear the scratchy sounds made by the current traveling through the nerve.

Using the information, Valenza's team applies a needle invasive therapy similar to acupuncture, which is designed to break up the muscle spasm and allow blood to flow more freely to heal the damaged muscle tissue. In many cases, E-stim can substitute for the needle therapy, Valenza says.

Researchers tackle unanswered questions

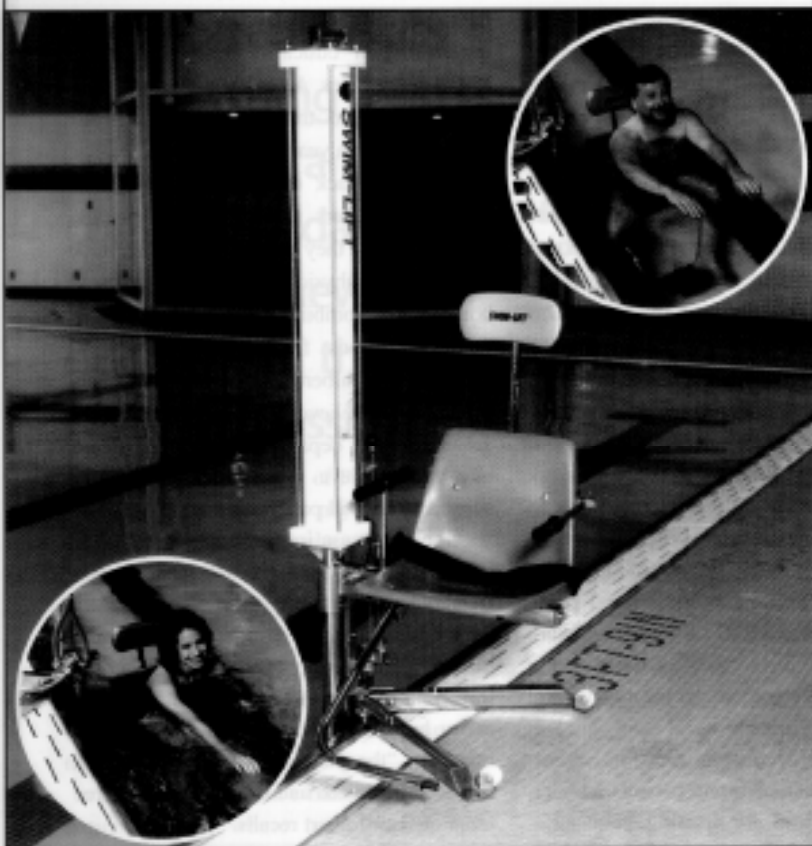
In some ways, the most difficult part to understand about holistic electromedicine involves its effectiveness. Issues such as prescribed protocols, treatment duration and measurable outcomes are vaguely understood, much less discussed with certainty. Some patients can be successfully treated in only two sessions. Others take much longer, and providers can't seem to explain the reasons.

Another challenge lies in understanding exactly how to weave electrotherapy with activities such as meditation and psychotherapy. Electrotherapy seems to work well with certain homeopathic options but not others. And providers have only a general understanding of why. Still more intriguing is whether these modalities are truly integrated or just happen to work in tandem.

"All of this is as much art as science," notes Galantino. In the absence of objective data, patient satisfaction when it can be achieved may be the ultimate marker of success. 

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