

The Light Stuff

Cold Laser Therapy Is Joining the Injury Treatment Team



Wide receiver David Givens was among the New England Patriots players treated with low level laser therapy, Jim Rogash, Associated Press.

By Lois Lindstrom
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The New England Patriots won Super Bowl XXXVIII with some help from a little-known form of laser technology that could change the way athletic injuries and chronic pain are treated.

The treatment, known as "cold" laser therapy or low-level laser therapy (LLLT), has been used internationally for 18 years to treat soft tissue injuries, cervical neck pain, carpal tunnel syndrome, repetitive stress injuries, tendinitis, hamstring injuries, arthritis and wound healing, among others.

The lasers -- hand-held, flashlight-like devices that direct a beam of narrow-spectrum (but not hot) light at injured tissue beneath the skin -- have been integrated into medical practice in Japan, Russia and the United Kingdom. In the United Kingdom, cold laser therapy has become a preferred treatment for "whiplash" injuries, neuralgia and shingles. In Japan, the lasers were approved in 1987 and are in widespread use today.

In the United States, the technology received marketing clearance from the Food and Drug Administration (FDA) in 2002 for treating carpal tunnel syndrome, a painful inflammation of the wrists and hands that results from repetitive motion. But the mainstream medical establishment still considers the cold laser's benefits unproven. Most U.S. users are athletic trainers, chiropractors and practitioners of alternative medicine.

"The medical community needs more scientific studies done in the United States," said Wayne Good, a general surgeon in Waterford, Mich., who participated in the clinical trials that led to FDA clearance of the laser device. Good worked with General Motors Corp., which hosted the double-blind, placebo-controlled trials on serious carpal tunnel sufferers as a way to seek more cost-effective treatment for the condition, which affects many auto workers.

Good said the treatment proved about 70 percent effective in getting injured workers, most of whom had failed to respond to other treatments, back on the job. GM offers the treatment to injured workers in its in-plant medical clinics.

But insurance payment for the procedure is also an issue holding doctors back, Good said. Many U.S. insurers will not pay for cold laser treatment, citing the need for further research proving its benefits.

"If the major insurance companies . . . do not pay for the technology," Good said, "the doctor cannot be reimbursed for treating his patients."

Sport and Health

While mainstream medicine remains on the sidelines, practitioners of sports medicine, who are highly motivated to find new ways to heal soft-tissue injuries and bruises, are getting right into the cold laser game.

In the week preceding the Super Bowl, Boston based registered nurse Ellen Spicuzza treated more than 10 Patriot players with cold laser therapy for tendon and muscle injuries.

"A couple of days prior to the Super Bowl weekend, I treated [Patriot wide receiver] David Givens, who had a locked-up hamstring," she said. She rotated the \$4,000, pen-like laser over the "belly" of his hamstring muscle for about five minutes, she said. "The laser released it."

Spicuzza, an independent nurse/physical therapist in Boston, usually treats Patriot players' injuries with medical massage. For the big game, she for the first time used low level laser therapy on the athletes' most troublesome pain spots. Before using the cold laser, Spicuzza was skeptical.

"I am not into gimmicks," she said. "I didn't think it would help."

But she changed her mind after seeing how the laser expedited healing of some players' soreness and pain.

"I don't think [the improved recoveries were] a coincidence," Spicuzza said. "It did help. I used it on a flared-up sciatic nerve, and the player had relief soon after treatment."

The Light and the Tunnel

Spicuzza was trained by Michael Barbour, president of MicroLight Corp., a Houston-based company that in 2001 acquired rights to manufacture the ML830 cold laser device. It was his company's laser that received market clearance from the FDA in 2002 for the non-surgical treatment of carpal tunnel syndrome.

Carpal tunnel syndrome occurs when tendons or ligaments in the wrist become enlarged, often from inflammation. Nearly 500,000 Americans have surgical treatment for carpal tunnel syndrome each year; surgery costs \$8,000 to \$10,000 per patient, according to the American College of Orthopedic Surgeons.

Unlike surgery, treatments involving low level laser therapy are non-invasive and require no healing time. There are no gels or ointments applied prior to the treatment. The most notable sensation is the pressure of the head of the laser on the skin, though some patients report a small tingling.

Cold laser treatments usually cost \$25 to \$50, with a typical course of treatment involving 10 to 15 sessions over time.

Barbour said that while the FDA cleared the laser only for carpal tunnel syndrome treatment, "medical clinicians have the option of using it for adjunctive use for pain therapy if in their medical opinion it is indicated." Such off-label uses are common in the world of drugs.

Proposed by Albert Einstein in 1917, low level light therapy was not developed until 1960. A Hungarian surgeon, the late Endre Mester, first reported his experience using laser light to treat non-healing infections and inflammations in rats. Mester's reported 70 percent success rate in treating these infections led to the development of a science he labeled "laser biostimulation," or the stimulation of the local immune system.

According to Richard Martin, a Santa Monica, Calif., photobiologist specializing in laser therapy, cells and tissues subjected to inflammation, edema and injury have been shown to have a significantly higher response to low level laser irradiation than normal healthy structures. There is no evidence the light damages the cells.

Since 1967, more than 2,000 clinical studies have been published worldwide on cold lasers. Supporters of the technology cite the fact that most are positive, showing the devices safe and effective in a variety of clinical uses.

Others come to different conclusion, saying most of the studies are small and poorly controlled and lack a standardized treatment that could let researchers compare results equally. The Cochrane Collaboration, an international nonprofit group that evaluates research about clinical practices, has published several reports on low level laser therapy; the most recent were issued this year. The researchers found that data from several studies showed no benefit in treating osteoarthritis pain -- but two of the studies in particular showed very positive results. The group concluded there is an "urgent need" for large-scale clinical trials for this use.

Another research summary concluded that low level laser therapy was effective in reducing pain and morning stiffness for those with rheumatoid arthritis. But there were no differences in the treated subjects in overall disability, swelling or range of motion. And no data was available for effects beyond 4-10 weeks of treatment.

Other Cochrane reports show some benefits from low level laser therapy for frozen shoulder, but no benefits when used on rotator cuff tendinitis.

Swedish physicist Lars Hode, president of the Swedish Laser-Medical Society, says the safety and efficacy of low level laser therapy is better documented than that for ultrasound therapy, which is well accepted medically. However, he says, there were some negative articles about cold lasers 20 years ago.

"In the '80s, the medical industry had inferior lasers," he said. "With the advent of stronger lasers at reasonable prices, the situation today has changed considerably."

Olympian Ambitions

The U.S. Olympic training centers in Colorado Springs and Chula Vista, Calif., are using cold lasers. The Olympic training center in Lake Placid, N.Y., plans to offer the therapy within a few months.

According to Edward Ryan III, director of Sports Medicine for the U.S. Olympic Training Center, the cold laser has given athletes significant relief from pain and increased their range of motion. Because the device is hand-held and portable, he said, it can even be used in competition venues.

Chadwick Smith, clinical professor of orthopedics and bioengineering at the University of Southern California Medical School, has mainstream medical credentials and is enthusiastic about cold lasers.

"Cold lasers speed the healing process," said Smith, who uses the device in his clinical practice. "It used to take at least seven to ten days for a hamstring injury to heal. Cold laser therapy cuts it down to two to three days."

As for Ellen Spicuzza, she said the Super Bowl experience led her to use the cold laser on her own neck, which she injured in a skiing accident 10 years ago.

"I used it in my hotel in Houston during Super Bowl weekend," she said happily. "It brought me quick relief of my muscle spasms."

Lois Lindstrom is author of "Memoirs of a Swedish War Nurse" (Goose River Press, 2002). She is based in Stockholm and is co-writing a book about cold laser therapy with a Swedish clinician.

