

let there be light!

light therapy is emerging as the go-to treatment for conditions beyond depression, including chronic pain

BY LAURIE SPRAGUE

Six years ago Gabriele Machado, of Deptford, PA, had lumbar fusion surgery to alleviate her painful symptoms of lower-disc deterioration. But the results weren't what she'd bargained for: During the operation, her sacral nerve was accidentally cut, resulting in cauda equina syndrome (CES) and leaving her right glute and upper thigh numb and in pain. Machado started extensive physical therapy shortly after her surgery but stopped when she exhausted her medical benefits, roughly six months later. Four years ago, still numb and in constant pain and with nowhere to turn, she decided to try Pilates.

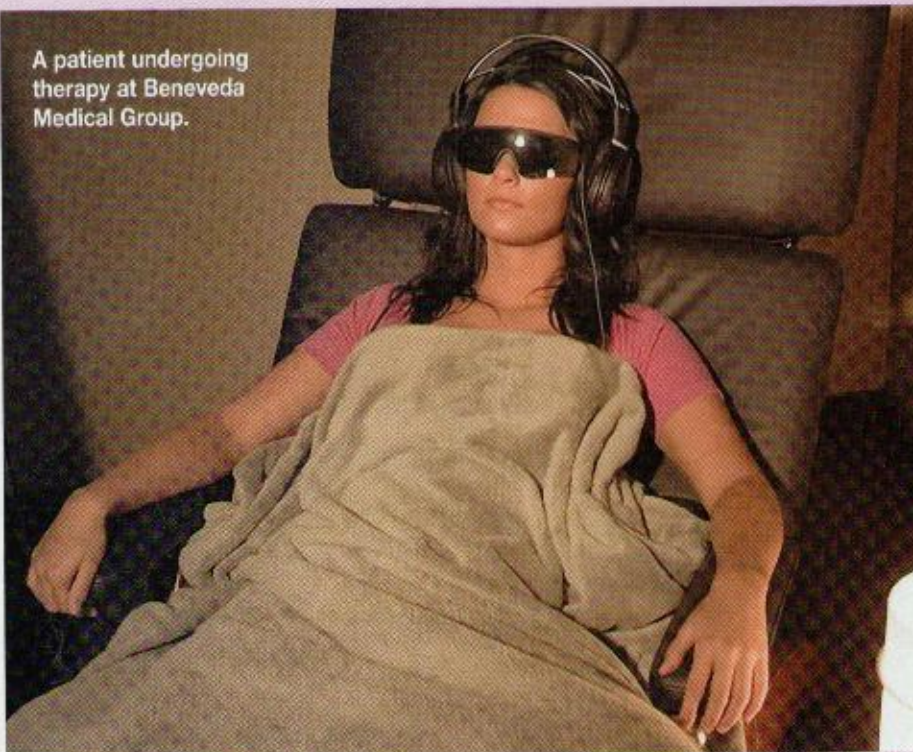
She began taking a mix of private and group classes at Nelson Chiropractic & Pilates Center in Atco, NJ, which is owned by Pilates instructor Kerri Nelson, DC, CCSP, and her husband, Eric, who are both sports chiropractors. "In the beginning just getting on the Reformer was a challenge," says Machado, now 54. So about six months later, she started getting chiropractic adjustments from Eric Nelson, which seemed to relieve

some of the extreme tightness in her lower right side. Then last year, Nelson suggested she try something new: laser light treatments. "I didn't count on it doing a lot," says Machado, "but it was amazing. I saw almost immediate

results." After just two 10-minute sessions, her pain had decreased, she had a lot more flexibility—and her bumpy, red scar tissue was visibly reduced and smoother.

Light has been used to treat a wide range of ailments for centuries, so it's no surprise that today the term "light therapy" has come to mean many different things. Most people have probably heard about the advantages of using light therapy to treat seasonal affective disorder (SAD), but its benefits go light-years beyond improving one's mood. In addition to SAD—where exposure to specific levels of light helps regulate the body's circadian cycles by suppressing the release of melatonin—light therapy has also been shown to help improve symptoms of OCD, jet lag, postpartum depression, some forms of PMS, certain skin disorders like psoriasis and even some cancers. Because of this broad scope, light therapy is offered at a wide range of facilities, including the offices of doctors, physical therapists, chiropractors and dermatologists and now,

A patient undergoing therapy at Beneveda Medical Group.



COURTESY OF BENEVEDA MEDICAL GROUP

fitness studios and spas.

One application of light therapy may be of particular interest to active, athletic people, like Pilates practitioners. Over the past 40 years, a wealth of new research and anecdotal evidence has shown that light therapy can also help reduce pain and inflammation—a boon to anyone who has been injured but wants to maintain their mobility and level of activity. Among the latest, most successful versions of this therapy is low-level laser therapy (LLLT)—also called photobiomodulation, cold-laser therapy and laser biostimulation—in which lasers, light-emitting diodes (LEDs) or intense pulsed light is used to treat conditions ranging from sports injuries, chronic arthritis and tendonitis to carpal tunnel syndrome and fibromyalgia. In fact, the use of LLLT is generating a lot of excitement in sports medicine circles today, largely because it has been shown to reduce healing time, allowing athletes to get back on their feet, and back onto the playing field much faster than traditional treatments alone. And by reducing pain and inflammation, it also helps reduce the need for pain medications.

shedding light on the subject

While it seems incredible that something as simple as light can be used therapeutically for a range of conditions that includes nonsurgical face-lifts, depression, pain and even life-threatening diseases, it is in fact a vast and complex area of study, with years of scientific research behind it. The first thing to understand is that the type of light used therapeutically isn't ordinary lighting. Therapeutic light falls in the middle of the electromagnetic spectrum, meaning ultraviolet light, visible light (like LEDs, cold lasers and colored light or phototherapy) and invisible light (e.g., infrared or near-infrared light). Every type and color of light on the spectrum has a different wavelength, and specific types and frequencies of light have been found to treat various complaints. For example, SAD is usually treated with

bright white or narrow-frequency blue light. Psoriasis can be treated with ultraviolet B (UVB) light, which is a present in sunlight.

The types of light that are most effective in treating pain and inflammation are red and infrared light, both of which stimulate circulation and are used in low-power lasers. LLLT, which can incorporate either red or infrared light, is delivered as a targeted beam, and doesn't burn or destroy tissue like high-powered surgical lasers that are used to cut through tissue. Instead, red and infrared light therapy increases blood flow (which subsequently breaks down the buildup of lactic acid in injured tissue) and ultimately helps to repair damage and decrease swelling.

pain management

In the U.S., lasers were first used by veterinarians to treat tissue damage in horses around 1970, but once their positive results became obvious, the technology was quickly adapted for human use. Today lasers are used by a variety of practitioners, including MDs, physical therapists and chiropractors. They're an increasingly popular option because they can be very directly targeted to an injury or pain source, offering greater precision than standard infrared therapy. According to Raymond Lanzafame, MD, editor in chief of the journal *Photomedicine and Laser Surgery* and a practicing general surgeon in Rochester, NY, both red and near-infrared light can reduce the compounds that cause pain and inflammation, but only if that light falls in "the sweet spot"—a very specific wavelength at a very specific intensity. "Different wavelengths penetrate at different depths," he says, adding that because of this, the "dosing" is different for everyone, depending on their body and the injury they're being treated for.

Gabriele Machado's chiropractor, Eric Nelson, began hearing good things about LLLT a few years ago. "Many of my colleagues in the sports medicine

community have had great success using LLLT to complement their treatments with professional, Olympic and Ironman athletes," he says. Nelson began using



Anodyne Therapy, an infrared light device, helps reduce pain.

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LLLT himself about a year ago and has found it helpful in treating almost all soft tissue and repetitive stress injuries. In August 2009 he took part in a two-week chiropractic rotation at the U.S. Olympic Training Center in Chula Vista, CA, where he regularly used LLLT, as well as chiropractic adjustments and treatments when working with the Olympians. "It really helped speed up their recovery," he says. "It also decreased swelling pretty efficiently, especially in one athlete's postsurgical knee." Nelson points out that in addition to combating pain and swelling, LLLT also helps stimulate rapid cell growth, promotes faster wound healing, decreases scar tissue and increases nerve-cell regeneration. Machado says she's experienced many of these benefits using a combination of LLLT and chiropractic treatments, but as far as she's concerned, the most important result is that she's no longer in constant pain.

Matthew Goodemote, MPT, founder of Community Physical Therapy and Wellness Center in Gloversville, NY, also treats patients with infrared light—but his method uses LEDs not lasers—and he has seen similar results. Goodemote, whose studio offers Pilates and yoga classes in addition to traditional physical therapy treatments, started using infrared light about five years ago to treat an older patient who suffered from neuropathy. While it was helpful for that patient and others with nerve problems, he noticed that muscular and

joint problems seem to benefit the most from infrared light. "Pain is caused by irritants in the blood," he says. "Infrared light increases circulation, which helps to wash away these toxins and decreases pain and inflammation."

As Goodemote explains, infrared light penetrates deeper than ultrasound or massage, which makes it a much more targeted, and therefore more effective, treatment. While lacking the

pinpoint accuracy of a laser, the LED device he uses reportedly penetrates 3 to 5 cm below the skin surface, which accelerates healing, especially in soft-tissue injuries and chronic-pain patients. When compared with traditional modalities, for example, he says, the results are truly impressive: An injury that might normally take 10 to 14 days to heal using ultrasound often only takes 7 to 10 when treated with infrared

light, which is particularly helpful for athletes and people whose injuries are keeping them out of work.

Machado is walking proof of this, noting that before LLLT, she had tried both ultrasound and trigger-point therapy, but both required more treatments to be effective—and the results weren't as profound. "Laser therapy is definitely more efficient than anything else I've used," she says.

Thom E. Lobe, MD, founder of Beneveda Medical Group in Beverly Hills, offers a wide range of light-related treatments at his facility. He emphasizes that light therapy—whether LLLT or phototherapy—is not a one-size-fits-all solution. "Everyone responds differently," he notes. "Some people might feel relief right away, but for others it may take longer. It's important to give it time to work." In general, he says, one can expect to see results in a week or 10 days. And keep in mind that light therapy usually requires multiple sessions to be effective. "Typically, just one treatment won't do it," he says. And depending on the condition you're treating, once you have things under control you might also need an occasional "tune-up" or follow-up treatment, particularly when dealing with a chronic ailment.

The range of light-therapy devices on the market—from xenon lamps to LEDs to lasers, and beyond—is almost as mind-boggling as the variety of conditions the modality can treat. While some are more effective for certain conditions than others, virtually all commercial-grade machines work well, says Lobe. "The most important thing is that you work with someone who is trained to use that machine and that you trust them," he says. "The truth is that light therapy is not all science: It's a little bit of art, too." In other words, the way the light works is based on science, but the practitioner needs to assess the exact nature of the problem, as well as how to use light therapy in that situation, and for how long.

at-home devices: worth the investment?

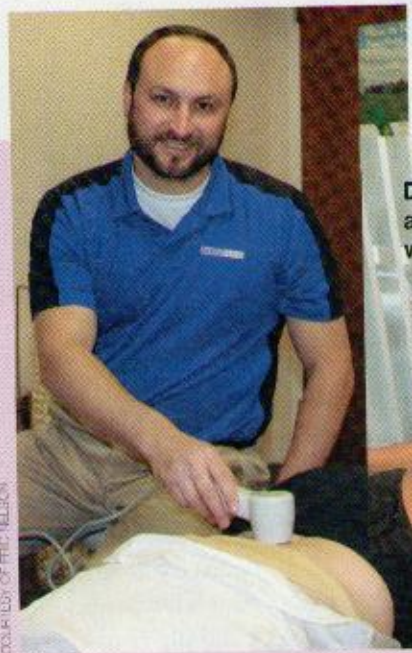
Whether you're surfing the net or watching late-night TV, you don't have to go far these days to be bombarded with all sorts of ads for home light-therapy devices, including LEDs and lasers. "Sure, these things can help you save money—especially if you have a chronic condition," says Lobe. "But the bottom line is, you usually get what you pay for."

Lanzafame, who has served on panels that evaluate medical devices for the FDA, cautions that the most credible devices are not available for home use. Most noncommercial products tend to make very broad claims, and they also lack the fine-tuning required for professional results. He suggests that anyone looking to purchase at-home light-therapy equipment should ask their doctor, physical therapist or chiropractor to recommend a specific device, and then use it under the advice of that practitioner. "Buyer beware," he says. "This [therapy] can definitely be helpful, but don't expect miracles."

resources:

For more information on light therapy and other light-based technologies, as well as on some of the experts quoted in this article:

- **ASLMS (American Society for Laser Medicine & Surgery, Inc.)** Promotes excellence in patient care by advancing biomedical application of lasers and other related technologies worldwide. aslms.org
- **NAALT (North American Association for Laser Therapy)** A forum for laser therapy users in the U.S., Mexico and Canada that aims to improve understanding of the photobiological mechanisms, basic laser physics, treatment parameters, techniques, regulatory issues and reimbursement. naalt.org
- **WALT (World Association for Laser Therapy)** Promotes research, education and clinical application of laser photostimulation worldwide. www.walt.mt
- **Photomedicine and Laser Surgery** The official journal of WALT, NAALT and the International Musculoskeletal Laser Society; Raymond J. Lanzafame, MD, MBA, FACS, editor in chief. liebertpub.com/products/product.aspx?pid=128
- **Beneveda Medical Group**, Beverly Hills, CA; Thom E. Lobe, MD, founder and director. beneveda.com
- **Community Wellness Center**, Gloversville, NY; Matthew Goodemote, MPT, founder. matthewgoodemote.com
- **Nelson Chiropractic & Pilates Center**, Atco, NJ; Eric Nelson, DC, CCSP, founder. nelsonpilates.com



Dr. Eric Nelson (left) and Dr. Thom E. Lobe work with patients.

extreme overexposure)—particularly in patients who have extremely sensitive skin or who are frequent users. Goggles

While you should always ice a new injury for the first 24 hours, once you're past the acute stage, the two modalities work well together, says Goodemote. "They have a synergistic effect," he says, explaining that Pilates is systemic, meaning that it gets the blood moving throughout your body, while infrared light is much more localized, targeting treatment to the specific injury site. The key, he says, is to keep as much blood as possible in the area to decrease pain and promote healing. If you do use LLLT for a new injury,

When it comes to light therapy, there currently isn't a specific standard of training required for providers. According to Lanzafame, above all it's essential to confirm that your provider is appropriately licensed in their specialty or discipline and in their state. And before undergoing any light treatment-type therapy, prospective patients should feel comfortable asking about that provider's training and experience with that treatment.

It's also important to point out that, based on our conversations with experts, most insurance companies do not cover light-therapy treatments. Anyone considering using this modality should consult their insurance company before starting treatment, to clarify what it will and won't cover.

on the bright side...

One of the biggest advantages of light therapy (particularly infrared therapy) is the fact that as long as it is administered properly, it has very few side effects. In the very rare instances when they do occur, side effects tend to include photosensitivity or skin reactions, including redness, blisters or minor burns (usually the result of

are often advised, because staring directly into the beam of light can cause eye damage. Beyond this, you should always consult with a doctor before starting any new treatment if you're pregnant or if you are being (or have been) treated for cancer or other serious conditions. The effects of light therapy can be altered—or even inhibited—by some OTC and prescription meds, as well as some illnesses, so it's essential to discuss any meds and medical conditions with your practitioner before starting therapy.

a perfect pilates partner

Pilates is, of course, widely recognized for its rehabilitative and strengthening qualities. In fact, many people who practice Pilates are initially drawn to it because they're suffering from an injury or chronic condition. For these people in particular, using LLLT as an adjunct to their Pilates routine can be a smart move—and may even speed healing. It's interesting to note that some LLLT providers also recommend Pilates to their clients.

As was the case with his patient Gabriele Machado, Nelson typically prescribes some combination of LLLT, chiropractic treatments and Pilates (both mat and apparatus) to treat his patients' soft-tissue conditions.

Lanzafame says "pretreatment" is best. "It's most effective right after the injury but before going back to your regular workout routine," he says. For chronic conditions, he recommends using infrared treatments after your Pilates session.

Although specifics will vary depending on the individual and the condition being treated, all our experts agree that, for most patients, LLLT works best when used roughly two to three times a week for 15- to 30-minute sessions. "Alternate days between light-therapy treatments and Pilates sessions," suggests Lobe. "Experiment and find what works best for you."

Gabriele Machado is still taking Pilates classes twice a week, but because of the nature and severity of her injuries, she'll probably need to have occasional light therapy treatments for the rest of her life, as well. "I need to have 'tune-ups' about four or five times a year—10-minute sessions twice a week for a few weeks. If I don't do it, I really feel it. It's a constant fight. But the results are definitely worth it."

Laurie Sprague is a New York-based writer and editor whose work has appeared in numerous publications, including Glamour, Fitness and Spa magazines.