

Electromagnetic Stimulation for Longevity: What the Science Says

5 MIN READ

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BY SARAH CROW

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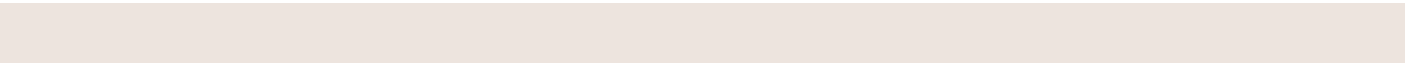
Targeted magnetic pulses are showing clinical promise for brain health, pelvic floor strength, and age-related muscle loss.

What if the key to healthy aging wasn't doing more, but making your existing longevity habits work harder? That's the philosophy driving Melinda Silva, MD, an integrative functional medicine physician who, at 62, is a competitive bikini fitness champion, an active clinician and hormone specialist, and a passionate advocate of **BTL's** proactive, science-backed longevity tools—many of which she uses on herself before recommending them to patients in her private practice.

We sat down with her to talk brain health, muscle loss, pelvic floor function, and how these tools are helping her patients not just live longer, but live better.

Sleep, Brain Health, and Social Connection for Longevity

For Dr. Silva, sleep is perhaps the most underestimated longevity lever because of the way it protects cognitive health. During deep sleep, the brain's glymphatic system clears toxic waste, including beta-amyloid, the protein linked to Alzheimer's disease. "If you don't sleep well, your brain can't rejuvenate. That accelerates cognitive decline more than almost any other modifiable factor."



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Social connection, meanwhile, is a surprisingly powerful neurological tool. “When you engage with another person, listening, responding, anticipating, you are actively stimulating neuroplasticity. Studies show that social isolation meaningfully increases the risk of dementia. The people in your life are literally keeping your brain sharp.”

Does Magnetic Stimulation Keep Your Mind Sharp?

The science of non-invasive brain stimulation is growing rapidly. Transcranial magnetic stimulation (TMS) uses targeted magnetic pulses to stimulate specific brain regions, and the clinical evidence for its cognitive effects is growing.

A **2024 systematic review and meta-analysis from Mayo Clinic**, published in *International Psychogeriatrics*, examined TMS across multiple forms of cognitive impairment and found favorable evidence of cognitive improvement, with the treatment described as safe and well tolerated. A separate **meta-analysis published in *Frontiers in Aging Neuroscience*** found that repetitive TMS combined with cognitive training significantly improved cognition in Alzheimer’s patients compared with cognitive training alone.

TMS works by delivering magnetic pulses to areas like the prefrontal cortex, the region governing decision-making, focus, and emotional regulation. The pulses create

electrical currents that strengthen neural pathways and support neuroplasticity, the brain's ability to rewire itself.

Dr. Silva served as a study site for research on an advanced ExoTMS device, **BTL's EXOMIND**, and the results were striking. Over the course of the study, published in 2025 in the ***Journal of Psychiatry and Psychiatric Disorders***—and sponsored by BTL and conducted by two of its Advisory Board members—over 80% of people reported improved sleep after just six sessions. Stress markers also declined significantly, which matters because chronic stress elevates cortisol and can shrink the hippocampus, the brain's memory center. “I had a patient who couldn't sleep without Ambien for 30 years,” she says. “After her third session, she slept through the night without medication for the first time.” The EXOMIND, which has been FDA-cleared for the treatment of major depressive disorder, has also been found effective in the treatment of binge eating disorder, per a 2025 study in ***PCN Reports*** (conducted by two BTL Advisory Board members).

Dr. Silva used the technology herself during a period of intense professional stress. “There was less chaos in my head. I couldn't believe it. My brain just got calmer.”

Muscle Loss Starts Earlier Than You Think

Sarcopenia, the age-related loss of muscle mass, strength, and function, is one of the most well-documented drivers of disability in older adults. Research published in ***Current Opinion in Clinical Nutrition and Metabolic Care*** shows that muscle mass decreases approximately **3-8% per decade after age 30**, with the rate of decline accelerating after 60. By the seventh decade, strength in the upper and lower limbs has typically dropped **20-40%**.

But Dr. Silva, who started competitive bodybuilding at 57, is proof that the trajectory is not fixed.

“I'm stronger now than I was five years ago,” she says. “I'm telling you, that is

possible.”

Can Electromagnetic Devices Preserve Strength With Age?

For patients who can’t exercise due to injury, pain, or weakness, electromagnetic muscle stimulation offers a bridge. The technology, harnessed by the **BTL Emsculpt Neo** used in Silva’s practice, delivers focused energy that triggers supramaximal contractions, the kind the body cannot produce voluntarily, simultaneously reducing fat and building muscle density.

Dr. Silva experienced this firsthand. Lower back arthritis made traditional ab work painful. “The device did the contractions for me. My core got stronger, my back pain decreased, and then I could exercise again. That’s the goal: not to replace exercise, but to get patients strong enough to start.” In a 2021 study published in the ***Journal of Cosmetic Dermatology***, authors compensated by BTL found that electromagnetic therapy resulted in a 25% average increase in muscle volume and a 30% average reduction in body fat.

Additional research presented at the Annual Symposium SCALE by researchers working as clinical investigators or speakers for BTL, found that three months after receiving four 30-minute high-intensity electromagnetic therapy (HIFEM) and synchronized radiofrequency treatments on their lower extremities with the Emsculpt Neo, 52% of the 34-person group had increased muscle strength, as measured by a dynamometer.

A **2025 chart review** (a review of medical charts, not an enrolled trial) of 63 patients published in *Archives of Clinical and Biomedical Research* found that patients combining GLP-1 medications with electromagnetic muscle stimulation gained muscle mass while those on GLP-1s alone lost an average of 2.9 lbs of muscle. The results are promising, though the study was small, retrospective, and conducted by investigators with ties to BTL. Larger independent trials are needed.

Dr. Silva describes a firefighter who had suffered from debilitating lower back pain for three months, unresolved by physical therapy or acupuncture. After one session using a functional wellness setting, he was moving freely and pain-free. “What was happening was that the neuromuscular stimulation was improving blood circulation to the strained tissue.”

Pelvic Floor Strength Is A Longevity Factor

If brain health and muscle loss are conversations we’re not having loudly enough, pelvic floor health might be the one we’re barely whispering about, even though it’s a major factor in overall wellbeing as we age.

“The pelvic floor is a group of muscles that forms a hammock at the base of the pelvis,” Dr. Silva explains. “It supports the bladder, uterus, and rectum. When it weakens, the consequences touch everything: continence, sexual satisfaction, core strength, back health, and even the risk of falls.”

And it’s not just a concern for people who have given birth. Dr. Silva is seeing a new wave of pelvic floor dysfunction from an unexpected source: GLP-1 medications. When patients lose weight rapidly without adequate protein intake and resistance exercise, they lose muscle, including pelvic muscle. “We’re seeing a lot of people on GLPs who are experiencing incontinence. It’s a real, underreported consequence of fast weight loss without proper support.”

How Electromagnetic Pelvic Floor Rehabilitation Works

HIFEM therapy is emerging as an effective non-invasive approach to pelvic floor rehabilitation. The technology delivers deep pelvic muscle contractions far more powerful than anything achievable through Kegel exercises alone.

A **multi-center clinical trial of 75 women** published in *Lasers in Surgery and Medicine* found that HIFEM therapy significantly improved urinary incontinence symptoms and quality of life. At three months, 70% of users reported a reduction in

their use of incontinence pads, with a 53.7% average decrease. (*Note: the trial was registered as BTL-sponsored on ClinicalTrials.gov, though the authors disclosed no conflicts*). A **randomized controlled trial** comparing HIFEM to conventional pelvic floor exercises reported a 35% average improvement in incontinence scores in the HIFEM group at six months, versus an average 13% in the exercise-only group. At 12 months, the HIFEM group maintained significant improvement while the exercise group's gains had regressed. (*Disclosure: this trial was also sponsored by BTL Industries.*) **More recent research** continues to support the approach, with improvements in both urinary symptoms and sexual function.

In Dr. Silva's practice, the results track with the published data. She describes the benefits she has seen using the **BTL Emsella** device: improved neuromuscular connection between the brain and bladder, increased blood flow to the pelvic region, better core strength, less back pain, and improved sexual satisfaction.

"When I lead with the sexual satisfaction part, patients lean in," she says with a smile. "I had a man tell me, 'Doctor, you should have led with that. I would have sat in that chair immediately.'"

Her most memorable patient? An 89-year-old woman who had worn adult diapers for years. After treatment, she no longer needed them. "She told me it was the first time she felt confident again. That's quality of life. That's what this is really about."

And it's never too late to start. "The body doesn't lose its ability to respond. As long as someone is active and proactive, I tell them: it is never too late."

Non-Invasive Tools Are Part of the Equation

"The best treatment in medicine has high reward and very low risk," Dr. Silva says. But she's clear that no technology replaces the fundamentals. "Move your body. Protect your sleep. Manage your stress. Invest in your relationships. Start with those things. Then use tools to accelerate and sustain your progress."

Her closing message: “It’s never too late. But also, don’t wait to ask yourself: is it too early? The answer is almost always no. Start now. Your brain, your body, and your future self will thank you.”

About Our Sponsor

This article is sponsored by BTL, a medical technology company whose non-invasive devices are used by clinicians worldwide for brain health, pelvic floor rehabilitation, and muscle preservation.

For cognitive health and sleep: **BTL’s EXOMIND** is an advanced transcranial magnetic stimulation (TMS) device, FDA-cleared for depression, that delivers targeted pulses to the prefrontal cortex. In Dr. Silva’s clinical experience, patients have reported improvements in sleep quality, stress resilience, focus, and anxiety. In Canada, EXOMIND has been approved for binge eating, with studies showing over 90% of people experienced reduced cravings.

For pelvic floor strength: **BTL’s Emsella** uses high-intensity focused electromagnetic (HIFEM) technology in a chair-based device that triggers thousands of supramaximal pelvic muscle contractions in a single 30-minute session. Patients remain fully clothed, and there is little to no discomfort. Published clinical trials have shown significant improvements in urinary incontinence, quality of life, and sexual function.

For muscle preservation: **BTL’s Emsculpt Neo** delivers focused electromagnetic energy to build muscle density and reduce fat. It can be applied to the core, arms, and calves, and includes a functional wellness setting for pain management, rehabilitation,

and recovery. For patients who can't exercise due to injury or pain, it offers a bridge to rebuilding strength.

Learn more about **BTL's technologies**.

*Dr. Melinda Silva is an integrative functional medicine physician based in San Diego, CA. She specializes in hormone optimization, brain health, and longevity medicine. To learn more about her practice and the **BTL** technologies discussed in this article, visit her **website**.*

*This post is sponsored by **BTL**. All patient outcomes described are based on Dr. Silva's clinical experience and available research. The author reported and edited this article independently.*

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WRITTEN BY:



Sarah Crow