# Experts caution over neurostimulation gadgets for mental health amid rising popularity



In recent times, the use of neurostimulation devices for mental health and cognitive enhancement has gained significant traction, with many products now available for consumer use, both in clinical environments and at home. These treatments, which employ electrical or magnetic pulses to influence brain activity, have attracted attention from celebrities and the general public alike, but experts caution users to distinguish between medically endorsed treatments and consumer-grade gadgets with less substantiated claims.

Tennis great Serena Williams recently brought this trend into the spotlight by sharing a sponsored Instagram post about her experience with “ExoMind,” a treatment delivered at a private facility. Williams described the treatment as part of her self-care routine, stating: “I never do enough self care and my friend introduced me to @exomindbtl and it's really changed how I've prioritized wellness, not only for my muscles with @emsculptneo, but also for my mind.” The company behind ExoMind promotes it as “a workout for your mind” and notes it is FDA-cleared for treating depression. Their offerings also include electric pulse treatments aimed at toning muscles throughout the body.

Neurostimulation, broadly defined, involves stimulating the brain, spinal cord, or peripheral nerves by electrical or magnetic means to modulate neuronal activity. However, the term encompasses a broad spectrum of methods with varying levels of efficacy and scientific validation. At one end are clinical treatments such as repetitive transcranial magnetic stimulation (rTMS), typically administered in medical settings by qualified practitioners. At the other are consumer devices like “vagal reset” headsets marketed for home use.

Adam O’Hagan, an rTMS specialist and coordinator at Priory Wellbeing Centre Harley Street, clarified for The Independent that while some at-home kits demonstrate effectiveness, they generally do not match the results achieved in controlled, clinical environments. He noted, “Some headsets use rTMS in low levels but they’re very different to what we do. They can be more cost effective but use different technologies and these can be significantly less effective.”

Clinical rTMS treatments involve placing electromagnetic coils on the scalp to deliver magnetic pulses targeting brain areas involved in mood regulation such as the dorsolateral prefrontal cortex. Sessions usually last around 30 minutes and are recommended for individuals with treatment-resistant depression, obsessive-compulsive disorder, certain eating disorders, and significant anxiety symptoms. O’Hagan explained, “During an rTMS session… it can help to alleviate the symptoms of your mental health conditions and improve wellbeing.” He added that side effects are typically minimal compared to medication, with some patients observing improvements after just five sessions.

In contrast, various consumer devices, including Flow and Neurosym headsets, claim to stimulate the vagus nerve or deliver mild electrical currents to the brain to improve “mental fitness,” encompassing benefits such as improved mood, cognition, focus, and reduced anxiety. The Neurosym device claims to “activate the parasympathetic nervous system” to manage a wide array of conditions, from chronic pain to long-COVID symptoms. Pulsetto, another headset endorsed by biohackers and visible in media such as Bryan Johnson’s Netflix documentary "Don't Die," emits ultra-low radiofrequency energy aimed at the parasympathetic nervous system.

Nonetheless, Dr Faye Begeti, a neurology practitioner at Oxford University Hospitals and author of The Phone Fix, cautioned about overstatements surrounding these devices. She expressed scepticism regarding the legitimacy of claims made under the banner of “mental fitness,” stating that scientific evidence supporting substantial long-term improvements from these consumer devices remains weak. She emphasised that lifestyle measures—adequate sleep, regular exercise, learning new skills, and stress management—have stronger evidence for enhancing brain function.

The popularity of “vagus nerve reset” techniques has been amplified by social media platforms, where instructional videos combine some scientific concepts with misinformation. Dr Begeti described the trend as “a mix of science and misinformation,” explaining that while the vagus nerve indeed plays a vital role in regulating stress and other bodily functions, portraying it as something to be “reset” or “detoxed” oversimplifies complex neurobiology. She urged caution, noting the importance of using multiple strategies and seeking professional advice rather than relying on single “hacks.”

Regarding safety, while clinical rTMS is generally considered safe under medical supervision, some studies have reported rare but serious side effects such as tinnitus, cognitive impairment, behavioural changes, and short-term memory loss. These effects are far less prevalent with consumer-grade devices due to their lower power levels; however, risks remain, especially since many brands do not disclose exact stimulation parameters. Improper use, such as stimulating incorrect brain regions, could yield unintended outcomes.

Dr Begeti advised users to thoroughly research devices, confirm peer-reviewed testing, and verify certifications such as FDA approval or CE marking for specific medical indications rather than general wellness purposes. Adam O’Hagan added that while neurostimulation headsets might assist with low mood and anxiety as part of a broader self-care regimen, they are not yet a standalone solution. He stated, “Typically I wouldn’t recommend them for people with clinical depression,” where clinical rTMS might instead be appropriate, particularly in cases unresponsive to other treatments.

With increasing mental health challenges faced by populations worldwide, such treatments represent one facet of a multifaceted approach to support wellbeing. As the science of neurostimulation evolves, continued research and expert guidance will be essential for understanding the place and effects of these technologies in mental health care and enhancement.

Source: [Noah Wire Services](https://www.noahwire.com)

## References

* <https://www.nimh.nih.gov/health/topics/brain-stimulation-therapies/brain-stimulation-therapies> - This National Institute of Mental Health page explains the principles and medical uses of repetitive transcranial magnetic stimulation (rTMS), confirming its FDA-clearance for conditions like treatment-resistant depression and OCD and describing typical session protocols and side effects, supporting the article's claims about clinical rTMS treatments and their safety profile.
* <https://www.health.harvard.edu/blog/can-electrical-brain-stimulation-boost-attention-memory-and-more-202303032898> - Harvard Health Publishing discusses transcranial direct current stimulation (tDCS) and other consumer brain stimulation devices, highlighting the gap between promising research and consumer-grade products, and the lack of FDA clearance for these home-use gadgets, which corroborates the article's caution about consumer neurostimulation devices having weaker scientific validation.
* <https://www.med.umn.edu/news/new-study-reveals-how-brain-stimulation-improves-cognition-decision-making-mental-health-disorders> - This University of Minnesota report on recent research details how brain stimulation therapies enhance cognitive flexibility and decision-making, providing scientific insight into how neurostimulation may benefit mental health conditions like depression and ADHD, thus supporting the article's discussion on evolving scientific understanding and potential of brain stimulation.
* <https://www.nimh.nih.gov/funding/grant-writing-and-application-process/concept-clearances/2024/neuromodulation-neurostimulation-device-development-for-mental-health-applications> - This National Institute of Mental Health concept clearance document underscores the ongoing development and need for advanced neurostimulation devices designed specifically for mental health applications, which aligns with the article's point about innovation and the variety of neurostimulation technologies aimed at treating psychiatric disorders.
* <https://www.globenewswire.com/news-release/2025/02/03/3019521/0/en/Nexalin-s-Breakthrough-DIFS-Neurostimulation-Device-Demonstrates-Reduction-in-Blood-Pressure-while-Enhancing-Mental-Health-According-to-New-Landmark-Study.html> - This press release details Nexalin's DIFS neurostimulation technology, which is FDA-cleared or certified in multiple countries for mental health applications and demonstrates efficacy in clinical trials for depression and other conditions, supporting the article's mention of FDA-cleared neurostimulation devices targeting brain regions for mental health treatment.