

Can sound stimulation lessen long-term concussion symptoms?

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New research indicates that acoustic stimulation of the brain may ease persistent symptoms in individuals who have experienced mild traumatic brain injury in the past.

The study, which was published in *Annals of Clinical and Translational Neurology*, included 106 military service members, veterans, or their spouses with [persistent symptoms](#) after [mild traumatic brain injury](#) three months to 10 years ago. Participants were randomized 1:1 to receive 10 sessions of engineered tones linked to brainwaves (intervention), or random engineered tones not linked to brainwaves (sham control).

All participants rested comfortably in a zero-gravity chair in the dark with eyes closed and listened to the computer-generated tones via earbud-style headphones. The primary outcome was a change in symptom scores, with secondary outcomes of heart rate variability and self-reported measures of sleep, mood, and anxiety.

Among all study participants, symptom scores were clinically and statistically improved compared with baseline, with benefits largely sustained at three months and six months; however, there were no significant differences between the intervention and control groups. Similar patterns were observed for secondary outcomes.

The results indicate that although acoustic stimulation is associated with marked improvement in post-concussive symptoms, listening to acoustic stimulation based on brain [electrical activity](#), as it was delivered in this study, may not improve symptoms, [brain function](#), or [heart rate variability](#) more than randomly generated, computer engineered acoustic stimulation.

"Post-concussive symptoms have proven very difficult to treat, and the degree of improvement seen in this study is virtually unheard of, though further research is needed to identify what elements are key to its success," said corresponding author Michael J. Roy, MD, MPH, of Uniformed Services University and the Walter Reed National Military Medical Center, in Bethesda.

More information: Randomized, Controlled Clinical Trial of Acoustic Stimulation to Reduce Postconcussive Symptoms, *Annals of Clinical and Translational Neurology* (2023). [DOI: 10.1002/acn3.51937](https://doi.org/10.1002/acn3.51937) , onlinelibrary.wiley.com/doi/10.1002/acn3.51937

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