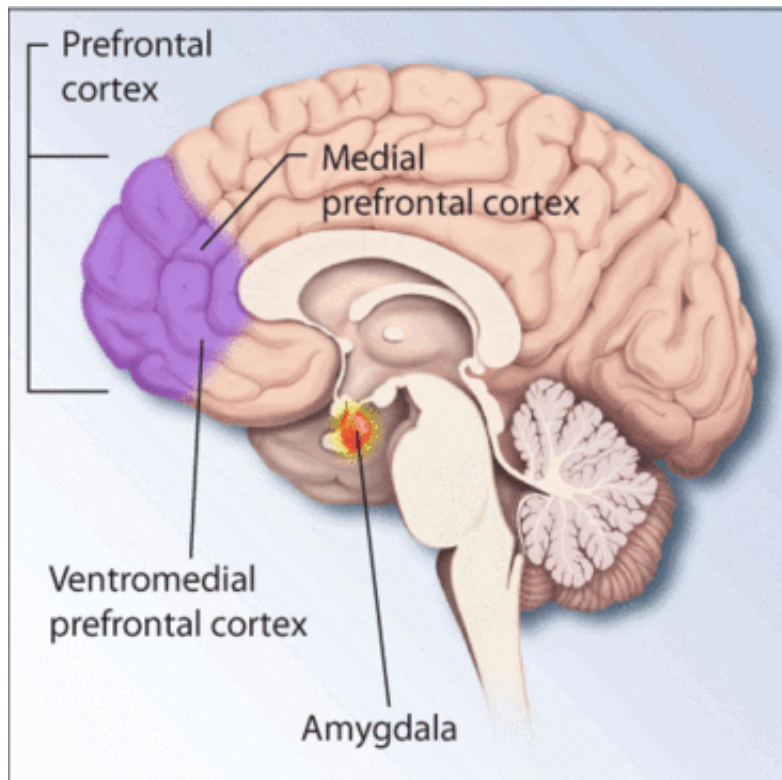


Noninvasive brainwave technology improved post-traumatic stress symptoms in military

December 27 2017



Regions of the brain associated with stress and posttraumatic stress disorder.
Credit: National Institutes of Health

A noninvasive brainwave mirroring technology significantly reduced symptoms of post-traumatic stress in military personnel in a pilot study conducted at Wake Forest Baptist Medical Center. The study is published in the Dec. 22 online edition of the journal *Military Medical*

Research.

"Ongoing symptoms of post-traumatic stress, whether clinically diagnosed or not, are a pervasive problem in the military," said the study's principal investigator, Charles H. Tegeler, M.D., professor of neurology at Wake Forest School of Medicine, a part of Wake Forest Baptist.

"Medications are often used to help control specific symptoms, but can produce side effects. Other treatments may not be well tolerated, and few show a benefit for the associated sleep disturbance. Additional noninvasive, non-drug therapies are needed."

According to the U.S. Department of Veterans Affairs, approximately 31 percent of Vietnam veterans, 10 percent of Gulf War (Desert Storm) veterans and 11 percent of veterans of the war in Afghanistan experience PTSD. Symptoms can include insomnia, poor concentration, sadness, re-experiencing [traumatic events](#), irritability or hyper-alertness, as well as diminished autonomic cardiovascular regulation.

The neurotechnology used in this study - High-resolution, relational, resonance-based, electroencephalic mirroring (HIRREM) - is a noninvasive, closed-loop, acoustic stimulation approach, in which computer software algorithms translate specific brain frequencies into audible tones in real time.

Figuratively speaking, this provides a chance for the brain to listen to itself through an acoustic mirror, Tegeler said. Likely through resonance between brain frequencies and the acoustic stimulation, the brain is supported to make self-adjustments towards improved balance and reduced hyperarousal, with no conscious, cognitive activity required. The net effect is to support the brain to reset stress response patterns that have been rewired by repetitive traumatic events, physical or

nonphysical.

HIRREM is a registered trademark of Brain State Technologies based in Scottsdale, Arizona, and has been licensed to Wake Forest Baptist for collaborative research since 2011.

In this single-site study, 18 service members or recent veterans, who experienced symptoms over one to 25 years, received an average of 19½ HIRREM sessions over 12 days. Symptom data were collected before and after the study sessions, and follow-up online interviews were conducted at one-, three- and six-month intervals. In addition, heart rate and blood pressure readings were recorded after the first and second visits to analyze downstream autonomic balance with heart rate variability and baroreflex sensitivity.

"We observed reductions in post-traumatic symptoms, including insomnia, depressive mood and anxiety that were durable through six months after the use of HIRREM, but additional research is needed to confirm these initial findings," he said.

"This study is also the first to report improvement in [heart rate variability](#) and baroreflex sensitivity - physiological responses to stress - after the use of an intervention for service members or veterans with ongoing symptoms of post-traumatic stress."

Limitations of the study include the small number of participants and the absence of a control group. It also was an open-label project, meaning that both researchers and participants knew what treatment was being administered.

Provided by Wake Forest University Baptist Medical Center

Citation: Noninvasive brainwave technology improved post-traumatic stress symptoms in military (2017, December 27) retrieved 26 April 2024 from <https://medicalxpress.com/news/2017-12-noninvasive-brainwave-technology-post-traumatic-stress.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.