

NEUROFEEDBACK: A PROMISING NEW TREATMENT FOR POSTTRAUMATIC STRESS DISORDER (PTSD)

A clinical trial collaboration between the Atlas Institute for Veterans and Families, the University of Ottawa, Western University and the University of Geneva, shows how neurofeedback therapy can be used to non-invasively heal parts of the brain that are impacted in the aftermath of trauma, and that contribute to PTSD symptoms.

- Two studies have recently been published on this clinical trial, **showing that neurofeedback training can help with resetting brainwaves and with emotion regulation in people with PTSD.**
- Study participants receiving neurofeedback showed **significantly decreased PTSD severity scores after treatment, with a remission rate of over 60% at the three-month follow-up**, meaning they no longer met diagnostic criteria for PTSD.
- There were no participants who dropped out of the study, suggesting that **neurofeedback therapy is both accessible and well tolerated.**
- Findings from the electroencephalogram (EEG) portion of the study report that **neurofeedback brain training resulted in a “rebound” of alpha waves (or resting state brain waves)** within the same areas of the brain that showed decreased alpha before the treatment. **Increasing alpha waves is important because it has been repeatedly shown that decreased alpha waves are highly associated with PTSD symptoms (from Nicholson et al., 2023).**
- Findings from the functional magnetic resonance imaging (fMRI) portion of the study report that **neurofeedback brain training improves engagement of cognitive (i.e., processing thoughts and making decisions) and emotional control brain areas** when a person is completing memory tasks that trigger emotion because of trauma **(from Shaw et al., 2023).**

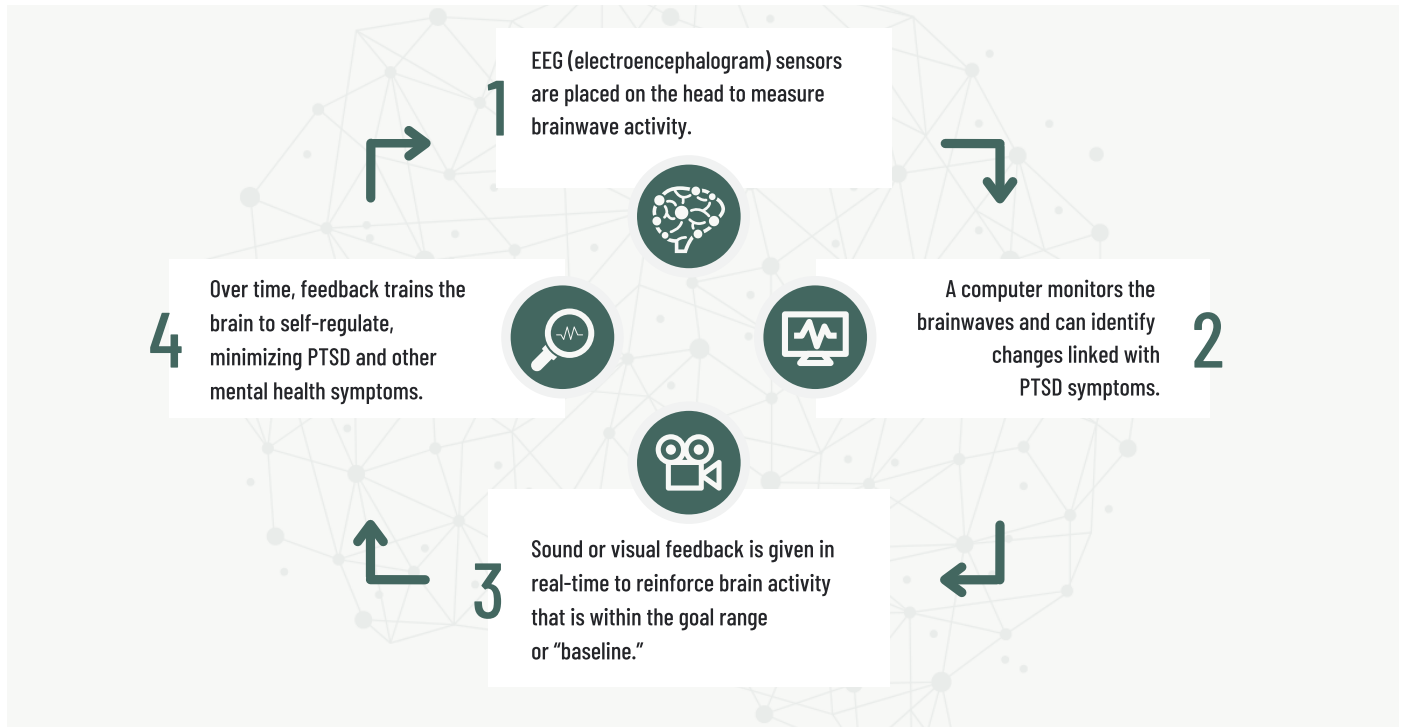


Neurofeedback has an intriguing ability to heal brain networks affected by trauma, and can be effective in helping individuals restore their sense of self and well-being in the aftermath of trauma.



RUTH A. LANIUS, M.D., PH.D.,
PSYCHIATRY PROFESSOR AND
HARRIS-WOODMAN CHAIR,
WESTERN UNIVERSITY

HOW NEUROFEEDBACK WORKS



When people develop PTSD, certain parts of their brain can be over- or under-activated, triggering thoughts, emotions, moods and behaviours that can be unhelpful or distressing. These responses can be unconscious and happen very quickly, making them hard to manage.

Neurofeedback helps people learn how to self-control brain activity and regulate PTSD symptoms.

It can be used alone or along with other forms of treatment, such as psychotherapy, cognitive behavioural therapy (CBT) or medication.

Neurofeedback helps people:

- ✓ Think more clearly
- ✓ Balance emotional responses
- ✓ Control triggered behaviours
- ✓ Function better in everyday activities

As a non-invasive therapy, neurofeedback:

- ✗ Doesn't hurt
- ✗ Doesn't require sedation or medications
- ✗ Doesn't always require exposure to trauma reminders (for example, distressing images or audio)

After a neurofeedback session it's safe to return to regular daily routines. Some people may feel tired or mentally exhausted after the session.

“The way neurofeedback works is that it provides the opportunity for individuals to train their brains in the same manner as one might work out muscles at the gym. Here, individuals learn to non-invasively regulate areas of the brain that can become dysregulated in the aftermath of trauma.”

DR. ANDREW NICHOLSON,
DIRECTOR OF CLINICAL RESEARCH,
ATLAS INSTITUTE

Neurofeedback is a non-invasive therapy that doesn't hurt or involve medication. It helps people learn how to self-control brain activity so that they can respond and think more clearly, balance their emotional responses and control triggered behaviours like avoidance, anxiety or panic.



CLINICAL TRIAL RESULTS SUGGEST NEUROFEEDBACK IS ON PAR WITH GOLD STANDARD TREATMENTS FOR PTSD

Although neurofeedback and other forms of biofeedback (i.e., heart rate feedback) have been around for decades, this is the first clinical trial in Canada examining neurofeedback as a treatment for PTSD.

60%+

Trial participants receiving neurofeedback no longer met diagnostic criteria for PTSD by the end of the trial.

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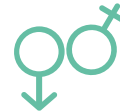
No study participants left the trial, suggesting that neurofeedback therapy is easy to tolerate and effective for patients.



Brain imaging of participants before and after treatment showed that disrupted brain networks that cause symptoms of PTSD were normalized after the trial.

METHODOLOGY

Participants were given identical instructions and followed the same treatment protocols. Neurofeedback was provided using a combination of auditory and visual cues presented as an interactive game.



25 females and 10 males completed the study



20-minute weekly sessions, over 20 weeks



Ages 21-59



40 participants with a primary diagnosis of PTSD.



Double-blind randomized, sham-controlled trial (to test for placebo effect only some participants received active neurofeedback, those who didn't weren't aware of this fact).

Participants were recruited over a four-year period between 2014 and 2018 from referrals from physicians, mental healthcare providers, psychiatry clinics and community advertisements in London, Ontario, Canada.

Treatment protocol

Electrodes were used to passively measure electrical activity in the brain and provide real-time feedback when brain activity was in- or outside of the target resting state range.

- Participants attempted to modulate brain activity using a game-like interface
- Two types of feedback were used to account for preferences and engagement
- Short break halfway through each session

Participants received only neurofeedback as a form of therapy for the duration of the study.

NEXT STEPS AND OPPORTUNITIES

Neurofeedback/EEG Biofeedback is approved by Veterans Affairs Canada as a second-line therapy for PTSD, generalized anxiety disorder and major depressive disorder, with a referral by a primary doctor or registered mental health professional. However, finding a certified neurofeedback practitioner and accessing the service in local clinics can be a challenge because it's still a form of therapy people and service providers don't have a lot of awareness about.

BUILDING THE EVIDENCE-BASE – The clinical research team at the Atlas Institute is engaged in several neurofeedback studies that aim to continue to build the evidence base for neurofeedback as a treatment option.

INCREASING ACCESS – The Atlas Institute aims to address barriers to access through a current research project assessing the effectiveness of low-cost, wearable neurofeedback technology that can be used at home.

RAISING AWARENESS – The Atlas Institute is actively sharing evidence and good practices about neurofeedback with the Veteran community, health care providers, clinicians and researchers.

[Learn more about neurofeedback therapy and the Atlas Institute's clinical research in this area.](#)

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