Novel adjunct treatments for posttraumatic stress disorder: Neurofeedback and deep brain reorienting

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Dr. Ruth Lanius, Scientist at London Health Sciences Centre Research Institute (LHSCRI) and Psychiatrist at London Health Sciences Centre (LHSC) discusses the need for novel adjunct treatments for posttraumatic stress disorder (PTSD), highlighting two promising approaches: neurofeedback and Deep Brain Reorienting (DBR)

Approximately 50% of patients with PTSD do not respond to the gold standard treatments currently available.

What is neurofeedback?

Neurofeedback is a form of 'brain training.' It helps people learn to change the way their brains function by providing them with real-time feedback on their brain activity. Typically, small sensors are placed on the scalp to measure brain waves using a safe and painless technique called electroencephalography (EEG). These sensors do not send any information into the brain; they record its activity.

The brain-wave patterns are shown on a computer screen, often as a moving image, a game, or a sound. When the person's brain moves toward a more balanced or calm pattern, they get a positive signal (like a pleasant sound or a character moving forward). When their brain activity shifts in an unhelpful direction, the signal changes. Over time, the brain learns from this feedback and starts to naturally spend more time in balanced, regulated states.

How might neurofeedback help PTSD?

Here are a few ways it might work:

- By training the brain to reduce over-arousal (e.g., too high a level of alertness, constant 'on' state) or excessive low arousal (e.g., numbing, dissociation).
- By improving connectivity between brain regions involved in emotion regulation, memory, and self-reflection, all of which are often affected in PTSD.
- By helping you gain more internal control: instead of being passively overwhelmed by symptoms (flashbacks, hypervigilance, emotional reactivity), you're actively learning to modulate your brain state.

Because it is non-pharmacological (no drugs required), it can be used alongside therapy and medication.

What does the research say so far?

The evidence is promising but still developing. Here are key findings:

A systematic review and meta-analysis of ten trials (293 participants) found that EEG-neurofeedback (NFB) produced a significant reduction in PTSD symptoms, as well as improvements in anxiety/depression.

A meta-analysis (17 studies, 628 participants) reported that neurofeedback had a clinically meaningful effect size, and that the effect tended to grow at follow-up (i.e., benefit persisted).

What are the advantages and limitations?

One major advantage of neurofeedback is that it is non-invasive. It may also empower people by giving them an active role in their recovery, helping them learn to self-regulate their arousal and related emotions. On the other hand, neurofeedback can be time- consuming and costly, and it requires specialized training. The approach is not yet standardized, and it should always be used as part of a comprehensive treatment plan supervised by trained professionals.

In summary, neurofeedback offers a promising new way to support people with PTSD by helping them retrain their brains toward healthier functioning. While it is not a replacement for traditional therapy or medication, ongoing research is helping clarify how and for whom it works best. With further study and refinement, neurofeedback could become an important addition to the range of tools available for healing after trauma.

What is Deep Brain Reorienting?

Deep Brain Reorienting (DBR) is an emerging trauma-therapeutic approach grounded in contemporary neuroscience, designed to address the often-intractable symptoms of PTSD, complex trauma and attachment-based wounding. Developed by Dr. Frank M. Corrigan, its foundational premise is that many traumatic responses are driven by early and rapid brainstem reactions. The brainstem, located at the base of the brain, reacts automatically to keep us safe during threatening or stressful situations; this is an essential mechanism for survival. Research indicates that the brainstem also plays a key role in processing prediction error: when something unexpected occurs, the brain detects this mismatch and updates its internal model to adapt to a changing environment. In the context of trauma, the intense emotional ‘shock’ that arises when encountering something horrific or overwhelming may represent a massive prediction error that overwhelms the system. This unprocessed shock is thought to persist in post-traumatic stress conditions such as PTSD, maintaining defensive responding and preventing conscious cognitive integration of the traumatic experience. In this way, pre-affective defensive and shock responses, those that occur before conscious emotion or thought, continue to drive symptoms long after the threat has passed.

At its core, DBR maps a three-phase neurophysiological sequence: 1) an orienting response (for example, tension in the forehead, neck, or the base of the skull as the individual orients toward a trigger associated with a traumatic memory or the traumatic memory itself; 2) a shock response; and finally 3) a raw affective activation (emotion such as fear, terror, rage, grief). This

sequence is initiated through an ‘activating stimulus’ chosen by the client in collaboration with the therapist. Importantly, this activating stimulus can be a present-day trigger, such as a recent emotional upset in response to a sound or a physical reaction to a critical look from a co-worker. In this way, DBR does not require the client to revisit traumatic memories that are too overwhelming, instead using a gentler inroad to the brainstem-level sequence of reactivity to traumatic reminders.

How might Deep Brain Reorienting help PTSD?

DBR uses this sequence as its therapeutic roadmap: by carefully tracking and staying with the bodily sensations linked to the orienting and shock phases, rather than moving too quickly into the emotional response to trauma, the process is postulated to allow the nervous system to fully process shock at the level of the brainstem and midbrain. It is further hypothesized that dissipating this underlying shock is essential, as it makes subsequent engagement with the deeper affective experience more tolerable, integrated, and less likely to overwhelm the client.

DBR emphasizes a ‘bottom-up’ somatic approach: the therapist guides the client to notice the immediate bodily cues of orienting tension, to stay with those sensations, then to allow any resulting shock or affect (raw emotion) to emerge in a well-contained way. Finally, the client gains the capacity to integrate the resolution (or re- orientation) through a ‘new perspective’ on the initial activating event. This approach may be particularly suitable for individuals who find traditional trauma work highly activating or who have hit a plateau with other modalities.

What does the research say so far?

There is emerging empirical support. A published randomized controlled trial (RCT) found that an eight-session video-based DBR intervention for PTSD produced significant reductions in clinician-rated PTSD symptom severity (measured by the CAPS-5), with large effect sizes (Cohen’s d ≈ 1.17 at post- treatment and ~1.18 at three-month follow-up). In the DBR group, approximately 48.3% of participants no longer met PTSD diagnostic criteria at post-treatment, with this improvement maintained at ~52.0% at three-month follow-up. Critically, the drop-out rate for DBR was 5%, substantially lower than the average rate of approximately 20% reported for first-line treatments (Imel et al., 2013).

That suggests DBR may be a well- tolerated and promising adjunct for trauma-therapy, especially when conventional approaches have been insufficient.

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