



## Neuro emotional technique effects on brain physiology in cancer patients with traumatic stress symptoms: preliminary findings.

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### Abstract

**PURPOSE:** The purpose of this study was to characterize the neurophysiological and clinical effects that may result from the neuro emotional technique (NET) in patients with traumatic stress symptoms associated with a cancer-related event. We hypothesized that self-regulatory processing of traumatic memories would be observable as physiological changes in key brain areas after undergoing the NET intervention and that these changes would be associated with improvement of traumatic stress symptoms.

**METHODS:** We enrolled 23 participants with a prior cancer diagnosis who expressed a distressing cancer-related memory that was associated with traumatic stress symptoms of at least 6 months in duration. Participants were randomized to either the NET intervention or a waitlist control condition. To evaluate the primary outcome of neurophysiological effects, all participants received functional magnetic resonance imaging (fMRI) during the auditory presentation of both a neutral stimulus and a description of the specific traumatic event. Pre/post-comparisons were performed between the traumatic and neutral condition, within and between groups. Psychological measures included the Impact of Event Scale (IES), State Trait Anxiety Index (STAI), Brief Symptom Inventory (BSI)-18, and Posttraumatic Cognitions Inventory (PTCI).

**RESULTS:** The initial fMRI scans in both groups showed significant increases in the bilateral parahippocampus and brainstem. After NET, reactivity in the parahippocampus, brainstem, anterior cingulate, and insula was significantly decreased during the traumatic stimulus. Likewise, participants receiving the NET intervention had significant reductions ( $p < 0.05$ ) compared to the control group in distress as measured by the BSI-18 global severity index, anxiety as measured by the STAI, and traumatic stress as measured by the IES and PTCI.

**CONCLUSIONS:** This study is an initial step towards understanding mechanistic features of the NET intervention. Specifically, brain regions involved with traumatic memories and distress such as the brainstem, insula, anterior cingulate gyrus, and parahippocampus had significantly reduced activity after the NET intervention and were associated with clinical improvement of symptoms

associated with distressing recollections.

**IMPLICATIONS FOR CANCER SURVIVORS:** This preliminary study suggests that the NET intervention may be effective at reducing emotional distress in patients who suffer from traumatic stress symptoms associated with a cancer-related event.

**KEYWORDS:** Cancer; Distressing recollections; Emotional trauma; Neuro emotional technique; fMRI parahippocampus

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