

Q. What is electroconvulsive therapy?

A. Electroconvulsive therapy (ECT) is a noninvasive brain stimulation therapy. ECT is used most often as a therapy for treatment-resistant mental health disorders, including depressive disorders, bipolar disorders, and schizophrenia. During ECT, electrical stimulation is applied via electrodes placed on the scalp to induce a seizure while the patient is under anesthesia (Novakovic et al., 2011). The U.S. Food and Drug Administration (FDA) updated its' guidance in 2018 to specify that Class II (moderate risk) indications for ECT include the treatment of catatonia or a severe major depressive episode associated with major depressive disorder (MDD) or bipolar disorder in patients age 13 or older who are treatment-resistant or who require a rapid response treatment due to the severity of their condition (FDA, 2018). ECT has been used off-label for posttraumatic stress disorder (PTSD), particularly in patients with comorbid treatment-resistant depression (Ahmadi, Moss, Simon, Nemeroff, & Atre-Vaidya, 2016; Watts, 2007).

Q. What are the potential mechanisms of action underlying ECT for the treatment of PTSD?

A. The seizure induced during ECT results in therapeutic effects related to modulation of hormones, neurotransmitters, and the hypothalamic-pituitary-adrenal (HPA) axis, as well as changes in synaptic plasticity (Margoob, Ali, & Andrade, 2010; Novakovic et al., 2011). These mechanisms are not well understood. As with other brain stimulation therapies, cortical stimulation is believed to modulate brain activity associated with PTSD symptoms (Novakovic et al., 2011). Gahr, Schonfeldt-Lecuona, Spitzer, & Graf (2014) hypothesized that the efficacy of ECT for the treatment of PTSD, thus far demonstrated in case reports, retrospective studies, and open-label studies, may be due to impaired reactivation of trauma memories related to temporary impairment of memory, a common side effect of ECT. In this scenario, ECT would be most effective when delivered after reactivation of traumatic memory, in order to impair reconsolidation of the memory. A practical reason for investigating ECT as a treatment for PTSD is that PTSD and MDD are frequently comorbid, with moderately overlapping symptoms, and the efficacy of ECT for MDD is well established (Margoob et al., 2010).

Q. Is ECT recommended as a treatment for PTSD in the Military Health System (MHS)?

A. **No.** The 2017 VA/DoD *Clinical Practice Guideline for the Management of Posttraumatic Stress Disorder and Acute Stress Disorder* states that there is insufficient evidence to recommend for or against ECT.

The MHS relies on the Department of Veterans Affairs (VA)/Department of Defense (DoD) clinical practice guidelines (CPGs) to inform best clinical practices. The CPGs are developed under the purview of clinical experts and are derived through a transparent and systematic approach that includes, but is not limited to, systematic reviews of the literature on a given topic and development of recommendations using a graded system that takes into account the overall quality of the evidence and the magnitude of the net benefit of the recommendation. A further description of this process and CPGs on specific topics can be found on the VA clinical practice guidelines website.

Q. Do other authoritative reviews recommend ECT as a treatment for PTSD?

A. **No.** Other authoritative reviews have not substantiated the use of ECT for PTSD.

Several other recognized organizations conduct systematic reviews and evidence syntheses on psychological health topics using similar grading systems as the VA/DoD CPGs. These include the Agency for Healthcare Research and Quality (AHRQ) and Cochrane.

- AHRQ: No comparative effectiveness reviews were identified that include ECT as treatment for PTSD.
- Cochrane: No systematic reviews were identified on ECT as treatment for PTSD.

Q. Is there any recent research on ECT as a treatment for PTSD?

A. A March 2021 literature search identified a single randomized controlled trial investigating ECT as a treatment for PTSD. This small pilot study examined low amplitude seizure therapy, a novel seizure therapy that involves increasing stimulation focality in order to reduce unwanted cognitive side effects. The study compared low amplitude seizure therapy with standard right unilateral electroconvulsive therapy (Youssef, Dhanani, Rosenquist, McCloud, & McCall, 2020). While PTSD symptoms were the primary outcome of interest, eligibility for the study was based on depression diagnosis, and no PTSD symptom threshold was required to be met by participants. Data were analyzed for five participants only (out of eight randomized). As a result, though both groups exhibited rapid improvement in self-reported PTSD symptoms, the sample sizes were too limited to yield conclusive findings. Additional RCTs are needed to evaluate the efficacy of ECT in individuals diagnosed with PTSD.

A 2017 systematic review of ECT as a treatment for PTSD identified three retrospective studies, one prospective uncontrolled trial, and five case reports (Youssef, McCall, & Andrade, 2017). The authors concluded that current data do not allow for a conclusive understanding of the effects of ECT on PTSD symptoms, separate from the effects of ECT on depression.

Q. What conclusions can be drawn about the use of ECT as a treatment for PTSD in the MHS?

A. Because there is insufficient evidence that ECT is effective in the treatment of PTSD, ECT is not recommended by current guidelines or authoritative reviews. Well-designed randomized controlled trials with adequate sample sizes are needed to establish the efficacy of ECT as a treatment for PTSD (Rosenquist, Youssef, Surya, & McCall, 2018). Though alterations in ECT practices have been implemented in recent years in order to reduce cognitive adverse effects, use of ECT is rare and in decline, perhaps due to stigma and fear of unwanted side effects (Landry, Moreno, Patry, Potvin, & Lemasson, 2020). With modern ECT techniques, most ECT-related cognitive deficits are temporary, and improve within a month post-treatment. However, there is a lack of standardization of the type and timing of cognitive assessments, and more studies are needed for a full understanding of individual risk (Landry et al., 2020).

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