

Q. What is stellate ganglion block?

A. Stellate ganglion block (SGB), also known as cervical sympathetic block, involves injection of local anesthetic to the stellate ganglion, a collection of nerves located between the C6 and C7 vertebrae in the neck responsible for regulating blood flow and for sensory processing in the head, neck, and upper limbs. SGB inhibits sympathetic activity and pain fibers to the upper body (Hanling et al., 2016; Peterson, Bourne, Anderson, Mackey, & Helfand, 2017). SGB is performed in an outpatient setting, and has been used to treat a variety of conditions, including complex regional pain syndrome, migraines, and hot flashes (Summers & Nevin, 2016). SGB has been proposed as an adjunct therapy in individuals with chronic posttraumatic stress disorder (PTSD) who have not responded to conventional therapies.

Q. What are the potential mechanisms of action of SGB?

A. The mechanism by which SGB may reduce PTSD symptoms is unknown (Hanling et al., 2016). The stellate ganglion is connected to regions of the brain that may be abnormally activated in PTSD, such as the amygdala. SGB may inhibit connections between the peripheral sympathetic nervous system and these regions of the brain (Peterson et al., 2017). The proposed mechanism explaining the apparent long-term effects of SGB on PTSD is that it causes reduction in nerve growth factor, resulting in a decrease in sympathetic nerve growth, leading to decreased brain norepinephrine levels, which is hypothesized to reduce PTSD symptoms (Hanling et al., 2016; Lipov, Candido, & Ritchie, 2017; Peterson et al., 2017).

Q. Is SGB recommended 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 SGB.

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 guidelines and evidence reviews recommend SGB for PTSD?

A. **No.** Other authoritative reviews have not substantiated the use of SGB for treating 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) Systematic Review Repository, the Cochrane Database of Systematic Reviews, and VA Health Services Research & Development (HSR&D) Evidence-based Synthesis Program.

- AHRQ: No reviews were found on SGB as treatment for PTSD.
- Cochrane: No reviews were found on SGB as a treatment for PTSD.
- VA HSR&D: A 2017 evidence brief on the effectiveness of SGB for the treatment of PTSD found that a number of encouraging results from case studies were followed up by a randomized controlled trial (RCT) with inconclusive results (Peterson et al., 2017).

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

A. A September 2017 literature search identified one randomized controlled trial of SGB for PTSD. This study compared SGB to sham therapy in 42 military service members with PTSD, finding no significant differences in PTSD symptoms between the groups after treatment (Hanling et al., 2016). This study had a number of methodological limitations, including high attrition, absence of key outcomes, and deviance from commonly used administration techniques for SGB (Peterson et al., 2017).

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

A. The research base for SGB is emerging. The limitations of the available evidence do not allow strong conclusions to be made from the existing research that could inform clinical practice guidelines or policy decisions within the MHS. The current state of the SGB evidence base is not mature enough to recommend SGB as an evidence-based treatment for PTSD in the MHS.

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References

Department of Veterans Affairs/Department of Defense. (2017). *VA/DoD clinical practice guideline for the management of posttraumatic stress disorder and acute stress disorder. Version 3.0*. Washington, DC: Department of Veterans Affairs/Department of Defense.

Hanling, S. R., Hickey, A., Lesnik, I., Hackworth, R. J., Stedje-Larsen, E., Drastal, C. A., & McLay, R. N. (2016). Stellate ganglion block for the treatment of posttraumatic stress disorder: A randomized, double-blind, controlled Trial. *Regional Anesthesia and Pain Medicine, 41*(4), 494–500.

Lipov, E. G., Candido, K., & Ritchie, E. C. (2017). Possible reversal of PTSD-related DNA methylation by sympathetic blockade. *Journal of Molecular Neuroscience, 62*(1), 67–72.

Peterson, K., Bourne, D., Anderson, J., Mackey, K., & Helfand, M. (2017). *Evidence brief: Effectiveness of stellate ganglion block for treatment of posttraumatic stress disorder (PTSD)*. Portland, OR: Department of Veterans Affairs, Health Services Research & Development Service.

Summers, M. R., & Nevin, R. L. (2016). Stellate ganglion block in the treatment of post-traumatic stress disorder: A review of historical and recent literature. *Pain Practice, 17*(4), 546–553.

