Congress of Neurological Surgeons Systematic Review and Evidence-Based Guidelines for Occipital Nerve Stimulation for the Treatment of Patients With Medically Refractory Occipital Neuralgia: Update

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CNS Guidelines follow a robust and systematic methodology, some language used here is part of a template for all CNS guidelines methodology. This work contains language previously used in Staudt MD, Pouratian N, Miller JP, et al, "Congress of Neurological Surgeons Systematic Review and Evidence-Based Guidelines for Deep Brain Stimulation for Obsessive Compulsive Disorder: Update of the 2014 Guidelines," 2021meeting.cns.org/guidelines.

Sponsored by: Congress of Neurological Surgeons (CNS) and the Section on Pain.

Endorsed by: Reviewed for evidence-based integrity and endorsed by the American Association of Neurological Surgeons (AANS) and Congress of Neurological Surgeons (CNS).

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Received, March 27, 2023; **Accepted,** May 10, 2023; **Published Online,** July 17, 2023.

BACKGROUND: The Guidelines Task Force conducted a systematic review of the relevant literature on occipital nerve stimulation (ONS) for occipital neuralgia (ON) to update the original 2015 guidelines to ensure timeliness and accuracy for clinical practice.

OBJECTIVE: To conduct a systematic review of the literature and update the evidence-based guidelines on ONS for ON.

METHODS: The Guidelines Task Force conducted another systematic review of the relevant literature, using the same search terms and strategies used to search PubMed and Embase for relevant literature. The updated search included studies published between 1966 and January 2023. The same inclusion/exclusion criteria as the original guideline were also applied. Abstracts were reviewed, and relevant full text articles were retrieved and graded. Of 307 articles, 18 were retrieved for full-text review and analysis. Recommendations were updated according to new evidence yielded by this update.

RESULTS: Nine studies were included in the original guideline, reporting the use of ONS as an effective treatment option for patients with medically refractory ON. An additional 6 studies were included in this update. All studies in the original guideline and this current update provide Class III evidence.

CONCLUSION: Based on the availability of new literature, the current article is a minor update only that does not result in modification of the prior recommendations: Clinicians may use ONS as a treatment option for patients with medically refractory ON.

KEY WORDS: Craniofacial pain, Cervicogenic headaches, Guidelines, Occipital nerve stimulation, Occipital neuralgia, Peripheral nerve stimulation

Neurosurgery 00:1–3, 2023 https://doi.org/10.1227/neu.0000000000002578

ABBREVIATIONS: CNS, Congress of Neurological Surgeons; **ON,** occipital neuralgia; **ONS,** occipital nerve stimulation; **PNS,** peripheral nerve stimulation.

RECOMMENDATIONS

1. Clinicians may use occipital nerve stimulation as a treatment option for patients with medically refractory occipital neuralgia (Level III).

BRIEF COMMUNICATION

In 2015, guidelines for the treatment of occipital neuralgia (ON) with occipital nerve stimulation (ONS) were established by the Congress of Neurological Surgeons (CNS).[1] These guidelines were based on a literature review performed between 1966 and April 2014. The current article is an updated review of the medical literature in accordance with the standard operating procedures and methodology of the CNS for developing clinical practice guidelines. These guidelines are intended to evaluate and rank current evidence through multidisciplinary panel agreement.

In the original 2015 guidelines, 9 articles were included for analysis, all of which provided Class III evidence.[2-10] Based on the data derived from this previous literature review, the following Level III recommendation was made: The use of ONS is a treatment option for patients with medically refractory ON.

The authors performed an updated literature search (in PubMed and Embase) through a medical librarian at the CNS using the search terms from the original guideline,[1] updating the search through January 2023. A total of 307 new references were obtained contemporary to the original search. Authors reviewed the new abstracts. Appropriate articles were pulled for full-text review. There was not enough new medical literature to warrant a major revision of the existing guidelines. A summary of the findings is presented below.

At the time of publication of the original guidelines, the practice of ONS in the United States required the off-label use of neurostimulation devices approved by the US Food and Drug Administration. In the interim, multiple wireless peripheral nerve stimulation (PNS) systems have received Food and Drug Administration approval for the treatment of pain in the trunk and the extremities, with one device recently receiving an expanded indication for the treatment of headache and axial neck pain. Notably, no permanent device has received approval for the treatment of pain in the craniofacial region. Conversely, noninvasive devices which stimulate the occipital and trigeminal nerves have been developed, with efficacy demonstrated in the acute treatment of migraines; however, no noninvasive modality has been studied specifically for ON.

The authors believe that significant new literature may be published over the next few regarding wireless PNS systems. The authors will review the literature in 5 years for a major update.

The following summarizes the new literature yielded by this review:

The updated literature search yielded 307 abstracts. The task force selected 18 full-text articles for full-text review. Of these, 12 were rejected for not meeting inclusion criteria or for being off-topic. A total of 6 studies met inclusion criteria and were selected for systematic review.[11-16] These studies confirmed the recommendation from the original guidelines that the use of ONS is a treatment option for patients with medically refractory ON.

ONS may be an effective treatment option for patients with medically refractory ON. Unfortunately, the overall level of evidence remains low because of the lack of commercially available dedicated craniofacial PNS devices, of insurance coverage for many patients, and of trials specifically designed to evaluate neuromodulation for craniofacial pain.

Conflict of Interest

All Guideline Task Force members were required to disclose all potential COIs prior to beginning work on the guideline, using the COI disclosure form of the American Association of Neurological Surgeons/CNS Joint Guidelines Review Committee. The CNS Guidelines Committee and Guideline Task Force Chair reviewed the disclosures and either approved or disapproved the nomination and participation on the task force. The CNS Guidelines Committee and Guideline Task Force Chair may approve nominations of task force members with possible conflicts and restrict the writing, reviewing, and/or voting privileges of that person to topics that are unrelated to the possible COIs. See below for a complete list of disclosures.

Michael D. Staudt, MD, MSc—No disclosures; Salim M. Hayek, MD, PhD—Financial relationships with Saluda Medical and Mainstay Medical; Joshua M. Rosenow, MD—Financial relationships with Boston Scientific Neuromodulation, Monteris, Stryker, and AIM Medical Robotics (consulting); Samer Narouze, MD, PhD—No disclosures; Jeffrey E. Arle, MD, PhD—No disclosures; Julie G. Pilitsis, MD, PhD—Grants/Research Support: Medtronic, Boston Scientific, Abbott, Nevro, Saluda, NIH 2R01CA166379, NIH R01EB030324, NIH Blueprint 3U54EB015408, and NIH U44NS115111. Consultant: Boston Scientific, Nevro, Medtronic, Saluda and Abbott. Medical advisor for Aim Medical Robotics and has stock equity; Jason M. Schwalb, MD—Grants/Research Support: Medtronic; Steven M. Falowski, MD—Grants/Research Support: Abbott, Medtronic, Aurora, Mainstay, Saluda. Consultant: Abbott, Medtronic, Aurora, Saluda, CornerLoc, Vertos, Relievant, Avanos. Stock Shareholder (purchased direct, ie, not through Mutual Fund, retirement package, etc.): Aurora, SPR, CornerLoc, Painteq, SurgenTec, Synerfuse, Thermaquil, Saluda; Jennifer A. Sweet, MD—No disclosures.

Disclosure of Funding

These evidence-based clinical practice guidelines were funded exclusively by the Congress of Neurological Surgeons, which received no funding from outside commercial sources to support the development of this document.

Disclaimer of Liability

This clinical systematic review and evidence-based guideline were developed by a physician volunteer task force as an educational tool that reflects the current state of knowledge at the time of completion. Each chapter is designed to provide an accurate review of the subject matter covered. This guideline is disseminated with the understanding that the recommendations by the authors and consultants who have collaborated in their development are not meant to replace the individualized care and treatment advice from a patient's physician(s). If medical advice or assistance is required, the services of a competent physician should be sought. The proposals contained in these guidelines may not be suitable for use in all circumstances. The choice to implement any particular recommendation contained in these guidelines must be made by a managing physician in light of the situation in each particular patient and on the basis of existing resources.

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Acknowledgments

The Guidelines Task Force acknowledge the CNS Guidelines Committee for their contributions throughout the development of the guideline, the American Association of Neurological Surgeons/CNS Joint Guidelines Review Committee, as well as the contributions Trish Rehring, MPH, Director for Evidence-Based Practice Initiatives for the CNS, and Janet Waters, MLS, BSN, RN, for assistance with the literature searches. Throughout the review process, the reviewers and authors were blinded from one another. At this time, the guidelines task force acknowledge the following individual peer reviewers for their contributions: Steve Kalkanis, MD, Koji Ebersole, MD, Andrew Carlson, MD, MS, and Jamie Van Gompel, MD.