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Major Scientific Publication from the Pediatric Epilepsy Research Consortium (PERC)

New Research Published in the Top-Tier Scientific Journal “*Epilepsia Open*”

Pediatric neuromodulation for drug-resistant epilepsy: Survey of current practices, techniques, and outcomes across US epilepsy centers

<http://doi.org/10.1002/epi4.12902>

Niwot, Colorado- The Neuromodulation sub special interest group of PERC, an offshoot of PERC’s Pediatric Surgery project, was started in the fall of 2022 to foster multicenter collaboration, dialogue, and best practices in emerging intracranial palliative therapies. Of the several studies planned, the first pilot was to understand current practices across NAEC level 4 centers in the United States. Members of the group surveyed 32 pediatric epilepsy centers in the United States to highlight current practices of intracranial neuromodulation. Of the 17 that replied, it was found that most centers are now implanting thalamic targets in pediatric drug-resistant epilepsy using the RNS device. The DBS device is starting to be used in pediatric epilepsy, especially after 2020. Different strategies for target identification are enumerated. This study serves as a starting point for future collaborative research.

Neuromodulation via Responsive Neurostimulation (RNS) or Deep Brain Stimulation (DBS) is an emerging treatment strategy for pediatric drug-resistant epilepsy (DRE). Knowledge gaps exist in patient selection, surgical technique, and perioperative care. An expert survey was used to clarify practices. Four centers implant RNS only while 13 implant both RNS and DBS. Thirteen RNS programs commenced in or before 2020, and 10 of 12 DBS programs began thereafter. The busiest six centers implant 6–10 new RNS devices per year; all DBS programs implant <5 annually. The youngest RNS patient was 3 years old. Most centers (11/12) utilize MP2RAGE and/or FGATIR sequences for planning. Centromedian thalamic nuclei were the unanimous target for Lennox–Gastaut syndrome. Surgeon exposure to neuromodulation occurred mostly in clinical practice (14/17). Clinically significant hemorrhage ($n = 2$) or infection ($n = 3$) were rare. Meaningful seizure reduction (>50%) was reported by 81% (13/16) of centers. RNS and DBS are rapidly evolving treatment modalities for safe and effective treatment of pediatric DRE. There is increasing interest in multicenter collaboration to gain knowledge and facilitate dialogue.

About the Pediatric Epilepsy Research Consortium

The Pediatric Epilepsy Research Consortium (PERC) is a national collaboration of more than 75 pediatric epilepsy programs and over 350 pediatric epileptologists, pediatric neurosurgeons, pediatric neuropsychologists, and other pediatric epilepsy researchers. Founded in 2010 by physicians and scientists determined to find better treatments for their patients, PERC has grown to become the leader in pediatric epilepsy research by providing a network and infrastructure to facilitate collegial, collaborative, practice-changing research. Through thirteen special interest groups, PERC works to improve the care of every child with epilepsy. We are particularly committed to fostering development of future pediatric epileptologists by providing opportunities for junior investigators to join ongoing efforts and develop research skills.

Our vision is a world in which all children with epilepsy benefit from the most recent advances in scientific knowledge and technology, regardless of geographic or economic resources. Through large multicenter registries, as well as multicenter retrospective and prospective analyses, we hope to identify preferred diagnostic evaluations and treatments for specific epilepsy syndromes, etiologies, and comorbidities.

Learn more at www.pediatricerc.com

Epilepsy is the most frequent potentially fatal neurologic condition of childhood, affecting nearly half a million U.S. youth (<18 years of age) by 2015 estimates.