Published in final edited form as:

Epilepsia. 2015 August ; 56(8): 1318–1319. doi:10.1111/epi.13065.

In response: Naming and recognition after laser amygdalohippocampotomy: Is the hippocampus involved?

Daniel L. Drane, Ph.D.^{1,2,3}, David W. Loring, Ph.D.^{1,2}, Natalie L. Voets, Ph.D.⁴, Michele Price, MSW¹, Jeffrey G. Ojemann, MD⁵, Jon T. Willie, MD, Ph.D.^{1,6}, Amit M. Saindane, MD⁷, Vaishali Phatak, Ph.D.³, Mirjana Ivanisevic, BS¹, Scott Millis, Ph.D.⁸, Sandra L. Helmers, MD, MPH^{1,2}, John W. Miller, MD, Ph.D.^{3,5}, Kimford J. Meador, MD^{1,2}, and Robert E. Gross, MD, Ph.D.^{1,6}

¹Department of Neurology, Emory University School of Medicine, Atlanta, GA

²Department of Pediatrics, Emory University School of Medicine, Atlanta, GA

³Department of Neurology, University of Washington School of Medicine, Seattle, WA

⁴Nuffield Department of Clinical Neurosciences, FMRIB Centre, University of Oxford, UK

⁵Department of Neurological Surgery, University of Washington School of Medicine, Seattle, WA

⁶Department of Neurosurgery, Emory University School of Medicine, Atlanta, GA

⁷Department of Radiology, Emory University School of Medicine, Atlanta, GA

Corresponding Author: Daniel L. Drane, Ph.D., Departments of Neurology and Pediatrics, Emory University School of Medicine, Woodruff Memorial Research Building, 101 Woodruff Circle, Suite 6111, Mailstop 1930-001-1AN, Atlanta, GA 30322, USA, (404)727-2844 (office phone), ddrane@emory.edu.

DISCLOSURES

Dr. Drane has received three grants from the NIH/NINDS, which supported his work on the manuscript recently published in *Epilepsia* related to this letter to the editor response (K23 NS049100, K02 NS070960, & R01NS088748). These grants provided salary support for Dr. Drane and his laboratory staff, and covered the cost of neuroimaging and other study related expenses. Funding was provided to Emory University by way of a clinical study agreement from Visualase, Inc., which develops products related to the research described in this paper. These funds assisted with the study-related costs of the patients undergoing the SLAH procedure only. In addition, Dr. Gross served as a consultant to Visualase and received compensation for those services. He also serves as a consultant to Medtronic, the current owner of the Visualase technology. The terms of these arrangements have been reviewed and approved by Emory University in accordance with its conflict of interest policies.

Dr. Gross also receives consulting fees from Eli Lilly, Neuropace, St. Jude Medical Corp., Deep Brain Innovations, and Duke University.

Dr. Loring reports receiving consulting fees from NeuroPace and Supernus and current grant support from PCORI and NIH; receives royalties from Oxford University Press; serves on the Professional Advisory Board for the Epilepsy Foundation, and sits on the editorial boards for *Epilepsia*, *Epilepsy Research*, and *Neuropsychology Review*. He also receives funds related to neuropsychological assessment of patients with epilepsy including Wada testing.

Dr. Meador reports active grants included NIH/NINDS 2U01-NS038455-11A1, NIH R01 NS076665-01A1, PCORI 527 and a UCB Pharma grant; other grants include money from: NIH Epilepsy Foundation, Cybertronics, GSK, Eisai, Marius, Myriad, Neuropace, Pfizer, SAM Technology, Schwartz Bioscience (UCB Pharma) and UCB Pharma; consultancies: Epilepsy Study Consortium which received money from multiple pharmaceutical companies: Eisai, Neuropace, Novartis, Supernus, Upsher Smith Laboratories, UCB Pharma and Vivus Pharmaceuticals; funds from consulting were paid to his university; travel support from Sanofi Aventis to a lecture in 2010; clinical income from EEG procedures and care of neurological patients.

Dr. Miller receives research funding from the NIH, CDC, Pfizer, UCB Pharma, and Sunovion. He is on the editorial boards for *Neurology*® and *Neurotherapeutics*. He is a shareholder and serves on the board of directors of Thermo Neurosciences.

Dr. Ojemann receives funding from NIH, NSF and serves on the editorial boards of *Neurosurgery* and the *Journal of Neurosurgery*. He bills for the performance of both laser ablation and resective surgery. He is Chief Medical Officer for Thermo Neuroscience, Inc.

Dr. Willie has served as a consultant to Medtronic, Inc., MRI Interventions, Inc., and Monteris Medical, Inc.

No other co-investigators have any financial disclosures or conflicts of interest to report related to this project.

⁸Department of Physical Medicine & Rehabilitation, Wayne State University School of Medicine, Detroit, MI

We thank Dr. Abel and colleagues for their insightful comments regarding our recent publication in *Epilepsia*.¹ We agree that our findings that relate naming and object recognition deficits following a variety of open epilepsy surgical resections to extra-mesial temporal lobe (TL) regions/pathways are consistent with findings from the broader neuroscience literature. However, as we observed, many in the epilepsy community believe that the hippocampus plays a critical role in recognition and name retrieval for objects and faces, yet this view was not supported when examining cognitive outcomes following stereotactic laser amygdalohippocampotomy (SLAH).

We agree that our findings do not address a potential role for the hippocampus in the prospective acquisition of names for objects or faces, and, accordingly, we drew no conclusions in this regard in the manuscript. Our statements about the hippocampus should be restricted to the context of its lack of an essential role in the retrieval of known information presented in a visual-confrontational context or derived from the presentation of a verbal description of an object or person. We are presently collecting prospective learning data to determine what contribution the hippocampus makes to the acquisition of new information.

Relatedly, Abel and colleagues wonder about broader cognitive outcomes of SLAH. We have completed the SLAH procedure in more than 40 patients, and have completed stereotactic laser ablation outside the amygdalar-hippocampal complex in an additional 30 patients. All patients have been evaluated extensively with neuropsychological measures, behavioral/psychiatric instruments, and a variety of neuroimaging modalities. Our initial presentation of memory outcome data has appeared promising compared to our experience with open resection, but our results await peer reviewed publication.²⁻⁴ We believe our results, both published and forthcoming, suggest that stereotactic laser ablation holds great promise for reducing the cognitive morbidity associated with neurosurgical intervention.

References

1. Drane DL, Loring DW, Voets NL, et al. Better object recognition and naming outcome with MRI-guided stereotactic laser amygdalohippocampotomy for temporal lobe epilepsy. *Epilepsia*. 2015; 56:101–113. [PubMed: 25489630]
2. Drane, DL.; Gross, RE. Updates on cognitive outcome with stereotactic laser ablation. Paper presented at: American Epilepsy Society; 2014; Seattle, WA.
3. Drane, DL.; Loring, DW.; Voets, NL., et al. Temporal lobe epilepsy surgical patients undergoing MRI-guided stereotactic laser ablation exhibit better episodic memory outcome as compared to standard surgical approaches. Paper presented at the American Epilepsy Society; 2013; Washington, D. C.
4. Drane, DL.; Willie, JT.; Loring, DW., et al. Cognitive outcome of patients undergoing stereotactic laser ablation of cavernous malformations to control chronic seizures. Paper presented at the American Epilepsy Society; 2014; Seattle, WA.