

This issue:

## Deep Brain Stimulation

Darin D. Dougherty, MD, MSc

Guest Editor



In this issue of *Psychiatric Annals*, we review the state of deep brain stimulation (DBS) for the treatment of various treatment-resistant psychiatric disorders. I chose to ask members of our Division of Neurotherapeutics at Massachusetts General Hospital to write three separate reviews that roughly correspond to the chronology of DBS research in psychiatry.

The first use of DBS for psychiatric illness was for obsessive-compulsive disorder (OCD). Investigators in Belgium implanted DBS electrodes in patients with intractable OCD at the target (the anterior limb of the internal capsule) that has been used for anterior capsulotomy for intractable OCD for decades. They reported their findings in *The Lancet* in 1999.<sup>1</sup> **Andrew K. Corse, BA, Tina Chou, BA, Amanda R. Arulpragasam, BS, BA, Navneet Kaur, BS, Thilo Deckersbach, PhD, and Cristina Cusin, MD**, review the literature to date for DBS for the treatment of intractable OCD, including the data that led to the US Food and Drug Administration approval for the treatment of intractable OCD at the ventral capsule/ventral striatum target (see page 351). The authors also cite studies that have utilized alternate DBS targets for the treatment of intractable OCD.

The next indication for DBS for treatment-refractory psychiatric illness was for treatment-resistant depression (TRD). The first published paper describing the results of a small DBS trial for TRD was published in 2005.<sup>2</sup> Since then, much exciting work has been published regarding the use of DBS, at multiple targets, for the treatment of TRD. While DBS for the treatment of intractable OCD was approved by the FDA under a humanitarian device exemption (meant for small populations), FDA approval of DBS for the treatment of TRD is *not* eligible under a humanitarian device exemption, but will require larger-scale pivotal trials for FDA approval due to the higher prevalence of TRD. **Navneet Kaur, BS, Tina Chou, BA, Amanda R. Arulpragasam, BS, BA, Andrew K. Corse, BA, Thilo Deckersbach, PhD, and Karleyton C. Evans, MD, MSc**, review the state of the research of DBS for the treatment of TRD and discuss future directions for research in this arena (see page 358).

Finally, **Amanda R. Arulpragasam, BS, BA, Tina Chou, BA, Navneet Kaur, BS, Andrew K. Corse, BA, Thilo Deckersbach, PhD, and Joan A. Camprodon, MD, MPH, PhD**, review the poten-

tial future of DBS for the treatment of psychiatric illness (See page 366). This article cites early research, including additional psychiatric indications (eg, addiction and eating disorders) as well as other disorders such as Alzheimer's disease, Tourette's syndrome, and obesity. The authors also review possible future refinements in DBS methodology, including advances in parameter and target selection and alternative approaches (eg, optogenetics) for stimulating deep brain targets.

We hope that this past to present to future approach to our reviews, while certainly not exact chronological delineations of DBS research in psychiatry, provides the reader with a historical context of DBS research in psychiatry, a review of the current data, and a roadmap for potential future directions for the field.

doi: 10.3928/00485713-20130806-02

### REFERENCES

1. Nuttin B, Cosyns P, Demeulemeester H, Gybels J, Meyerson B. Electrical stimulation in anterior limbs of internal capsules in patients with obsessive-compulsive disorder. *Lancet*. 1999; 354(9189):1526.
2. Mayberg HS, Lozano AM, Voon V, et al. Deep brain stimulation for treatment-resistant depression. *Neuron*. 2005;45(5):651-660.

about the guest editor



**Darin D. Dougherty, MD, MSc**, is the Director of the Neurotherapeutics Division in the Department of Psychiatry at Massachusetts General Hospital, the Director of the Mood Disorders Section of the Massachusetts General

Hospital Psychiatric Neuroimaging Group, and the Associate Director of the Massachusetts General Hospital Psychiatric Neuroimaging Group. Dr. Dougherty is also the Director of Medical Education at the Massachusetts General Hospital Obsessive-Compulsive Disorder Institute and the Co-Director of the Massachusetts General Hospital Trichotillomania Clinic. Additionally, Dr. Dougherty is an Associate Professor of Psychiatry at Harvard Medical School, where he co-directs the Harvard Medical School/Mas-

sachusetts Institute of Technology Health Sciences and Technology Clinical Investigator Training Program.

Dr. Dougherty also serves on many editorial boards and award committees and has given over 100 invited lectures and presentations. He is a current member of many professional societies including the American Psychiatry Association, the Society of Biological Psychiatry, and the American College of Neuropsychopharmacology. Dr. Dougherty has co-authored over 150 original articles in peer-reviewed journals, book chapters, and review articles, and has co-edited two books on neuroimaging and one on OCD. Currently Dr. Dougherty is the Principal Investigator or co-Principal Investigator on several government and industry-funded studies investigating neuroimaging and medication and neurosurgery treatments of OCD and mood disorders.