

Adam Olding Hebb, MD, FRCSC

Neurosurgeon, Colorado Brain and Spine Institute
 Director of Functional Neurosurgery, Swedish Hospital
 Affiliate Physician, Colorado Neurological Institute
 Affiliate Assistant Professor, University of Denver
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 Englewood, CO 80113
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Education

1996-2000 **MD** Dalhousie University School of Medicine. Halifax, Nova Scotia.
 1993-1996 **BSc.** Dalhousie University. Halifax, Nova Scotia. Major in Physics, with Distinction.
 1995-1996 **DipEng** Dalhousie University. Halifax, Nova Scotia. Diploma in Engineering.

Post Graduate Medical Training

2006-2007 **Neuro-oncology and Epilepsy Surgery Fellowship** University of Washington, Seattle, WA
 Supported by William Gowers Clinical Research Fellowship (Epilepsy Foundation)
 2000-2006 **Neurosurgery Residency** University of Minnesota, Minneapolis, MN

Professional Appointments

2014 - Senior Clinical Instructor, University of Colorado School of Medicine
 2012 - Medical Director of Functional Neurosurgery, Swedish Medical Center, Englewood, Colorado
 2012 - Visiting Assistant Professor, Dept of Electrical and Computer Engineering, University of Denver, Denver
 2007 - 2012 Assistant Professor, Department of Neurological Surgery, University of Washington, Seattle
 2011 - 2012 Associate Residency Program Director, University of Washington Medical Center
 2008 - 2012 Neurosurgery Resident Education Program Director

Active Clinical Privileges

Neurosurgery, Swedish Medical Center, Englewood, Colorado

Honors**Post-Graduate Medical Training**

Zhao Zi-Zhen Neurosurgery Resident Award, University of Minnesota Department of Neurosurgery, May 5, 2006.
 For clinical and operative skill, research excellence, and humanism as a physician and surgeon.
 Resident award for performance on ABNS written Neurosurgical Board Exams, 2004.

Undergraduate Medical Education

Georgina Clark Studentship in Neurodegenerative Disorders for the medical student research program 1998.

Undergraduate Education

Dr. G. H. Henderson Prize in Physics for highest overall average in the first three years of a study in Physics. 1994.
 Belle Crowe Scholarship in Chemistry for academic standing and demonstrated proficiency in Chemistry. 1996.
 Canada Scholar 1993-1996 for Sustained Academic Excellence in Science, Engineering and Technology.

Board Certification

2010 American Board of Neurological Surgeons (November 10, 2010)
 2006 Royal College of Physicians and Surgeons of Canada Fellow (Neurosurgery)
 2001 United States Medical Licensing Examination USMLE #4-073-961-7
 2001 Medical Council of Canada LMCC Number #90291

Current Medical Licensure

2004 - Minnesota Board of Medical Practice, License #46751
 2006 - Washington State Medical License #MD00045961
 2012 - Colorado State Medical License #50918

Editorial Responsibilities

Ad Hoc Reviewer, *Neurosurgery*
 Ad Hoc Reviewer, *Neuromodulation: Technology at the Neural Interface*
 Ad Hoc Reviewer, *Frontiers in Integrative Neuroscience*

Special National Responsibilities

Co-Director, *Electrocorticography in Basic Neuroscience Research* workshop.
 American Society for Stereotactic and Functional Neurosurgery 2012 Biennial Meeting San Francisco, June 3-6, 2012

Special Local Responsibilities

Course Director, Awake Techniques for Deep Brain Stimulation Surgery, February 28-29, 2016, Beaver Creek, CO

Course Director, Awake Techniques for Deep Brain Stimulation Surgery, March 1-2, 2015, Beaver Creek, CO

Board member, Colorado Neurological Institute. <http://www.thecni.org/>

Past Board member, Northwest Parkinson's Foundation. <http://www.nwpcf.org/>

Professional Societies

2012 Washington State Medical Association (past member)

2012 Society for Neuroscience

2009 American Epilepsy Society

2006 Canadian Neurosurgical Society (past member)

2004 American Society for Stereotactic and Functional Neurosurgery

2001 American Association of Neurological Surgeons

2001 Congress of Neurological Surgeons

Bibliography

- Niketeghad S, **Hebb AO**, Nedrud J, Hanrahan SJ, Mahoor MH. Motor task event detection using Subthalamic Nucleus Local Field Potentials. Conf Proc IEEE Eng Med Biol Soc. 2015 Aug;2015:5553-6. <http://dx.doi.org/10.1109/EMBC.2015.7319650>
- Darvas F, **Hebb AO**. Task specific inter-hemispheric coupling in human subthalamic nuclei. Front Hum Neurosci. 2014 Sep 8;8:701. <http://dx.doi.org/10.3389/fnhum.2014.00701>
- **Hebb AO**, Zhang JJ, Mahoor MH, Tsiokos C, Matlack C, Chizeck HJ, Pouratian N. Creating the Feedback Loop: Closed-Loop Neurostimulation. Neurosurg Clin N Am. 2014; 25(1): 187-204. <http://dx.doi.org/10.1016/j.nec.2013.08.006>
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4058859>
- Niketeghad S, **Hebb AO**, Nedrud J, Hanrahan SJ, Mahoor MH. Single trial behavioral task classification using subthalamic nucleus local field potential signals. Conf Proc IEEE Eng Med Biol Soc. 2014;2014:3793-6. <http://dx.doi.org/10.1109/EMBC.2014.6944449>
- Zaker N, Dutta A, Maurer A, Zhang JJ, Hanrahan S, **Hebb AO**, Kovvali N, Papandreou-Suppappola A. Adaptive learning of behavioral tasks for patients with Parkinson's disease using signals from deep brain stimulation. Asilomar Conference on Signals, Systems and Computers. 2-5 Nov. 2014; 208 - 212. <http://dx.doi.org/10.1109/IWJT.2009.5166234>
- Huaiguang J, Zhang JJ, **Hebb A**, Mahoor MH. Time-frequency analysis of brain electrical Signals for behavior recognition in patients with Parkinson's disease. Asilomar Conference on Signals, Systems and Computers. 3-6 Nov. 2013; 1843 - 1847. <http://dx.doi.org/10.1109/ACSSC.2013.6810621>
- Widge AS, Agarwal P, Giroux M, Farris S, Kimmel RJ, **Hebb AO**. Psychosis from subthalamic nucleus deep brain stimulator lesion effect. Surg Neurol Int. 2013;4:7. <http://dx.doi.org/10.4103/2152-7806.106265>
- Drane DL, Roraback-Carson J, **Hebb AO**, Hersonskey T, Lucas T, Ojemann GA, Lettich E, Silbergeld DL, Miller JW, Ojemann JG. Cortical Stimulation Mapping and Wada Results Demonstrate a Normal Variant of Right Hemisphere Language Organization. Epilepsia. 2012 Jul 10. <http://dx.doi.org/10.1111/j.1528-1167.2012.03573.x>
- Drane DD, Ojemann JG, Phatak V, Loring DW, Gross RE, **Hebb AO**, Silbergeld DL, Miller JW, Voets NL, Saindane AM, Barsalou L, Meador K, Ojemann GA, Tranel D. Famous Faces Identification in Temporal Lobe Epilepsy: Support for a multimodal integration model of semantic memory. Cortex. 2012 Sep 5. <http://dx.doi.org/10.1016/j.cortex.2012.08.009>
- Miller KJ, Hermes D, Honey CJ, **Hebb AO**, Ramsey NF, Knight RT, Ojemann JG, Fetz EE. Human motor cortical activity is selectively phase-entrained on underlying rhythms. PLoS Comput Biol. 2012 Sep;8(9):e1002655. <http://dx.doi.org/10.1371/journal.pcbi.1002655>
- **Hebb AO**, Ojemann GA. The Thalamus and Language Revisited. Brain Lang. 2012 Aug 1. <http://dx.doi.org/10.1016/j.bandl.2012.06.010>
- Hu S, **Hebb AO**. Effect of Deep Brain Stimulation on Post-encephalitic Parkinsonism – Case Report. Mov Disord. 2012 Jul;27(8):1071-2. <http://dx.doi.org/10.1002/mds.25014>
- Hakimian S, Kershenovich A, Miller JW, Ojemann JG, **Hebb AO**, D'Ambrosio R, Ojemann GA. Long-term outcome of extratemporal resection in posttraumatic epilepsy. Neurosurg Focus. 2012 Mar;32(3):E10. <http://dx.doi.org/10.3171/2012.1.FOCUS11329>
- **Hebb AO**, Darvas F, Miller KJ. Transient and State Modulation of Beta Power in Human Subthalamic Nucleus during Speech Production and Finger Movement. Neuroscience. 2012 Jan 27;202:218-33. <http://dx.doi.org/10.1016/j.neuroscience.2011.11.072>
- Grossman MS, Paralikal KJ, **Hebb AO**, Wilkinson JD, Graves-Calhoun AR, Lawson RC, Lopez JP and Powell JS: Effects on Radiation Oncology Treatments Involving Various Neuromodulation Devices. J X-ray Sci Technol 19 (2011):443-456. <http://dx.doi.org/10.3233/XST-2011-0306>
- **Hebb AO**, Yang T, Silbergeld D. The Sub-pial Resection Technique for Intrinsic Tumor Surgery. Surgical Neurology International. 2011;2:180. <http://dx.doi.org/10.4103/2152-7806.90714>
- Wray CD, Kraemer DL, Yang T, Poliachik SL, Ko AL, Poliakov A, **Hebb AO**, Novotny EJ, Ojemann JG. Freehand placement of depth electrodes using electromagnetic frameless stereotactic guidance. J Neurosurg Pediatr. 2011 Nov;8(5):464-7. <http://dx.doi.org/10.3171/2011.8.PEDS11143>
- Miller KJ, Abel TJ, **Hebb AO**, Ojemann JG: Rapid online language mapping with electrocorticography. J Neurosurgery Pediatrics 2011 May 7(5):482-490. <http://thejns.org/doi/abs/10.3171/2011.2.PEDS1156>

- Silbergeld DL, **Hebb AO**, Loeser JD: Vaginal allodynia as the presentation of a thalamic tumor. *Pain*. 2011 Mar;152(3):698-702.
- Miller KJ, Abel TJ, **Hebb AO**, Ojemann JG. The reorganization of large-scale physiology in hand motor cortex following hemispheric stroke. *Neurology*, 2011 Mar 8;76 (10):927-929.
- Miller KJ, **Hebb AO**, Hermes D, den Nijs M., Ojemann JG, Rao RPN. Brain surface electrode co-registration using MRI and x-ray, *IEEE Eng Med Biol Soc* 2010, 6015-6018. <http://dx.doi.org/10.1109/IEMBS.2010.5627597>
- Abel TJ, **Hebb AO**, Keene CD, Born DE, Silbergeld DL. Parahippocampal corpora amylacea: case report. *Neurosurg*. 2010 Jun 66(6):E1206-1207.
- **Hebb AO**, Miller KJ. Semi-automatic stereotactic coordinate identification algorithm for routine localization of Deep Brain Stimulation electrodes. *J Neurosci Methods*. 2010 Mar 15;187(1):114-119. <http://dx.doi.org/10.1016/j.jneumeth.2009.12.016>
- Miller KJ, Hermes D, Honey CJ, Sharma M, Rao RP, Nijs MD, Fetz EE, Sejnowski TJ, **Hebb AO**, Ojemann JG, Makeig S, Leuthardt EC. Dynamic modulation of local population activity by rhythm phase in human occipital cortex during a visual search task. *Frontiers in Human Neuroscience* 2010;4:197. <http://dx.doi.org/10.3389/fnhum.2010.00197>
- **Hebb AO**, Poliakov A. Imaging of Deep Brain Stimulation Leads using Extended Hounsfield Unit CT. *Stereotact Funct Neurosurg*. 2009 Mar 24;87(3):155-160. <http://dx.doi.org/10.1159/000209296>
- Abel T, **Hebb AO**, Silbergeld, DL. Cortical stimulation mapping in a patient with foreign accent syndrome: case report. *Clin Neurol Neurosurg*. 2009 Jan;111(1):97-101.
- Miller KJ, **Hebb AO**, Ojemann JG, Rao RP, Dennijs M. Task-related principal component analysis: formalism and illustration. *Conf Proc IEEE Eng Med Biol Soc*. 2007;1:5469-72.
- Miller KJ, Makeig S, **Hebb AO**, Rao RPN, Dennijs M, Ojemann JG. Cortical electrode localization from X-rays and simple mapping for electrocorticographic research: The "Location on Cortex" (LOC) package for MATLAB. *J Neurosci Methods*. 2007 May 15;162(1-2):303-8. <http://dx.doi.org/10.1016/j.jneumeth.2007.01.019>
- **Hebb AO**, Hebb K, Ramachandran AC, Mendez I. Glial cell line-derived neurotrophic factor-supplemented hibernation of fetal ventral mesencephalic neurons for transplantation in Parkinson disease: long-term storage. *J Neurosurg*. 2003 May 98(5):1078-83.
- **Hebb AO**, Cusimano MD. Idiopathic normal pressure hydrocephalus: a systematic review of diagnosis and outcome. *Neurosurgery*. 2001 Nov;49(5):1166-84.
- Mendez I, Dagher A, Hong M, **Hebb A**, Gaudet P, Law A, Weerasinghe S, King D, Desrosiers J, Darvesh S, Acorn T, Robertson H. Enhancement of survival of stored dopaminergic cells and promotion of graft survival by exposure of human fetal nigral tissue to glial cell line--derived neurotrophic factor in patients with Parkinson's disease. Report of two cases and technical considerations. *J Neurosurg*. 2000 May;92(5):863-9.

Book Chapters

- **Hebb AO**, Silbergeld DL. (2012) Cortical Mapping During Awake Craniotomy for Epilepsy. In Nader, Berta & Levy (Eds.), Neurosurgery Tricks of the Trade (pp. 608-611). Chapter 141, New York, Thieme Medical Publishers.
- Silbergeld DL, **Hebb AO**. (2011). Awake Craniotomy. In R Jandial, PC McCormick & PM Black (Eds), Core Techniques in Operative Neurosurgery (pp. 279-283). Chapter 39. Philadelphia, Elsevier.
- **Hebb AO**, Haines SJ. (2006). Assessing Surgical Innovation. In H.H. Schmidek & D.W. Roberts (Eds.), Schmidek and Sweet Operative Neurosurgical Techniques: Indications, Methods, and Results 5th ed. (pp. 3-12). Philadelphia: Elsevier.

Abstracts - Oral Presentations

- Motor Task Event Detection Using Subthalamic Nucleus Local Field Potentials. Invited Session: Local Field Potentials in Movement Disorders, 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Milano, Italy August 28, 2015. *Conf Proc IEEE Eng Med Biol Soc*. 2015 Aug;2015:5553-6. <http://dx.doi.org/10.1109/EMBC.2015.7319650>
- Modulation of Beta Frequency Oscillations in the Human STN. Canadian Neurological Sciences Federation, 47th Annual Congress, Ottawa, Ontario June 2012. *Can J Neurol Sci*. 39 (Suppl 3): S17. 2012.
- Prefrontal ECoG during DBS. American Society for Stereotactic and Functional Neurosurgery, San Francisco, CA, June 2012.
- Subcortical Oscillations in Parkinson's Disease. Computational and Systems Neuroscience (COSYNE) Meeting, Salt Lake City, Utah. March 2011.
- Semi-Automated Detection Algorithm for Routine Localization of Deep Brain Stimulation Electrodes using Extended Hounsfield Unit CT-MRI co-registration. World Society for Stereotactic and Functional Neurosurgery. Toronto, Ontario. May 2009.
- Recurrent Low Grade Gliomas: Prognosis and Volumetric Analysis of Resection. Canadian Neurological Sciences Federation 42nd Annual Congress. Edmonton, Alberta. June 2007. *Can J Neurol Sci*. 34 (Suppl 2): S36. 2007.
- Modulation of fusiform face response by emotional facial expression. Canadian Neurological Sciences Federation 42nd Annual Congress. Edmonton, Alberta. June 2007. *Can J Neurol Sci*. 34 (Suppl 2): S21. 2007.
- Characterization and Expansion of Human Ventral Mesencephalon Cells in Culture. Canadian Congress of Neurological Sciences. Edmonton, Alberta. June 1999.
- Characterization and Expansion of Human Ventral Mesencephalon (hFVM) Cells in Culture. Dalhousie University, Department of Surgery Research Day. Halifax, Nova Scotia. May 1999.

- Cultured Human Ventral Mesencephalon Cells for Neural Transplantation in the 6-OHDA Rodent model of Parkinson's Disease. Dalhousie University, Faculty of Medicine Student Research Competition. Halifax, Nova Scotia. December 1998.

Abstracts – Posters

- Abel T, Miller KJ, **Hebb AO**, Blakely T, Ojemann J. Localization of Language Cortex by High Frequency Electrocorticography. Congress of Neurological Surgeons, 2009.
- Drane DL, Roraback J, **Hebb AO**, Hersonskey T, Lucas T, Ojemann GA, Lettich E, Silbergeld DL, Ojemann JG. Results of Electrocorticography and the Wada Procedure Suggest that Right Hemisphere Language Organization can Occur as a Normal Variant of Language Development. American Epilepsy Society Annual Meeting, Seattle WA, 2008.
- **Hebb AO**, Rostomily RC, Silbergeld DL. Clinical outcome of Recurrent Low-Grade Gliomas: Role of Repeat Operation. Neuro-oncology. 2008. 10 (5): 911 (Society for Neuro-oncology. Nevada, 2008).
- **Hebb AO**, Poliakov A, Slimp J, Ramos M, Samii A. Image Co-registration technique for stereotactic localization of deep brain stimulation electrodes. Canadian Neurological Sciences Federation 43rd Annual Congress. Victoria, British Columbia. June 2008. Can J Neurol Sci. 35 (Suppl 1): S77. 2008.
- **Hebb AO**, Miller KJ, Panagiotides H, Ojemann JG. High Frequency Activity Correlates of Face and Object Recognition near Fusiform Face Area with ECoG. American Association of Neurological Surgeons Annual Meeting, Washington, DC USA. 2007.
- **Hebb AO**, Hebb K, and Mendez I. Cool Storage of Human Fetal Ventral Mesencephalic Neurons in GDNF Supplemented Hibernation Medium. American Association of Neurological Surgeons Annual Meeting, San Francisco, California USA. 2000.
- **Hebb AO**, Hebb K, and Mendez I. GDNF Supplemented Hibernation of Fetal Ventral Mesencephalic Neurons for Transplantation in Parkinson's Disease: Long Term Storage. American Society of Neural Transplantation and Repair conference. Clearwater, Florida USA. 2000.
- **Hebb AO**, Cusimano MD. Idiopathic Normal Pressure Hydrocephalus: a Systematic Review of Diagnosis and Outcome. Canadian Journal of Neurological Sciences. 2000. 27: Supp. 2. S45. (Canadian Congress of Neurological Sciences. Ottawa, Ontario. 2000).
- **Hebb AO**, Hong M, and Mendez I. Characterization and Expansion of Human Ventral Mesencephalon Cells in Culture. Canadian Journal of Neurological Sciences. 1999. 26: Supp. 1. S19. (Canadian Congress of Neurological Sciences. Edmonton, Alberta. 1999).
- **Hebb AO**, Hong M, and Mendez I. Hibernation of Human Fetal Ventral Mesencephalic Neurons for Transplantation in Parkinson's Disease. Experimental Neurology. 1999. 159(2):604. (American Society of Neural Transplantation and Repair conference. Clearwater, Florida USA. 1999.).

Invited Lectures

Lectures – 2008

Presentation Title:

Deep Brain Stimulation for Parkinson's Disease (Patient Presentation)

Jan 18, 2008 Booth Gardner Parkinson's Care Center, Kirkland WA
 Sept 8, 2008 Parkinson's Support Group, Bellingham, WA
 Sept 29, 2008 Parkinson's Support Group, Renton, WA
 October 16, 2008 Parkinson's Support Group, Puyallup, WA Shannon Tait, MA
 November 7, 2008 Parkinson's Support Group Auburn, WA)
 November 11, 2008 Parkinson's Support Group Lakewood, WA

Target Audience: Parkinson's Disease Patient Support Group

Presentation Title:

Deep Brain Stimulation

Feb 21, 2008

Walla Walla Medical Society
 Walla Walla, WA

Target Audience: Multi-specialty group

Presentation Title:

Deep Brain Stimulation for Parkinson's Disease (Nursing)

May 16, 2008 OR nursing staff Carol D Takagi staff lounge (SP 3354)
 May, 2008 Pre-anesthesia nursing staff

Target Audience: UWMC nursing and anesthesia staff

Presentation Title:

Deep Brain Stimulation for Parkinson's Disease (Radiology Imaging Techniques)

American Society of Radiologic Technologists (CME)

June 10, 2008 CT and MRI Technologists, UWMC

June 12, 2008 CT and MRI Technologists, UWMC

Target Audience: UWMC Radiology staff

Lectures – 2009

Presentation Title:

Semi-Automated Detection Algorithm for Routine Localization
of Deep Brain Stimulation Electrodes using Extended Hounsfield Unit CT-MRI Co-Registration

May, 2009

World Society for Stereotactic and Functional Neurosurgery

Toronto, Ontario

Target Audience: Clinical and Research Multispecialty

Presentation Title:

Deep Brain Stimulation for Parkinson's Disease

Sept 19, 2009

Tukwila, WA

WAPI (Washington Association of Indian Physicians)

Target Audience: Multispecialty group

Presentation Title:

Deep Brain Stimulation for Parkinson's Disease

Oct 22, 2009

UW Department of Neurology Grand Rounds

Target Audience: Neurology department

Lectures – 2010

Presentation Title:

Troubleshooting Deep Brain Stimulation Lead Placements: What We Have Learned

March 13, 2010

Pacific Northwest Basal Ganglia Club

Seattle, WA

Target Audience: Clinical and Research Multispecialty Neuroscience group

Presentation Title:

Simultaneous Local Field Potential and Electrocorticography during Motor and Cognitive Tasks

May, 2010

WSANS (Washington State Association of Neurological Surgeons)

Winthrop, WA

Target Audience: Clinical and Research Multispecialty

Presentation Title:

Trigeminal Neuralgia

May 27, 2010

UW Department of Neurology Grand Rounds

Target Audience: Neurology department

Lectures – 2011

Presentation Title:

Deep Brain Stimulation

Jan 10, 2011

Everett neurology group and Everett Clinic

Everett, WA

Target Audience: Neurology group

Presentation Title:

Deep Brain Stimulation

March 14, 2011

Valley Medical Center Neuroscience Center

Renton, WA

Target Audience: Neurology group

Presentation Title:

Deep Brain Stimulation

Jan 13, 2011

Kadlec Neuroscience Center

Richland, WA

Target Audience: Clinical Multispecialty Neuroscience group

Presentation Title:

Subcortical Oscillations in Parkinson's Disease

March, 2011

COSYNE (Snowbird) Meeting
Salt Lake City/Snowbird, Utah
Target Audience: Clinical and Research Multispecialty

Presentation Title:
Local Field Potential Measurements during Speech and Motor Tasks in PD
May 20, 2011
Pacific Northwest Basal Ganglia Coterie
Hood River, Oregon
Target Audience: Clinical and Research Multispecialty Neuroscience group

Presentation Title:
Beta Power in the Human Subthalamic Nucleus during Speech and Movement
July 15, 2011
MASSIN/WSANS Meeting
Seattle, WA
Target Audience: Clinical and Research Multispecialty

Presentation Title:
Surgical Treatment of Parkinson's Disease
August 17, 2011
UW Department of Neurology Lecture Series
Target Audience: Neurology department

Presentation Title:
Deep Brain Stimulation: Basal Ganglia Oscillations
September 14, 2011
UW Department of Neurological Surgery Grand Rounds
Target Audience: Neurological Surgery

Presentation Title:
Deep Brain Stimulation and Subcortical Oscillations in Parkinson's Disease
September 16, 2011
UW/Harborview Epilepsy Research Conference
Target Audience: Neurology/Epilepsy Research

Lectures – 2012

Presentation Title:
Deep Brain Stimulation: Clinical Indications, Mechanisms, and Basal Ganglia Oscillations
Jan 20, 2012
Medical College of Wisconsin Department of Neurosurgery Grand Rounds
Milwaukee, WI
Target Audience: Neurology and Neurosurgery Departments

Presentation Title:
DBS for Dystonia Clinical Indications and Expectations
June 1, 2012
Pacific Northwest Basal Ganglia Coterie
Seattle, WA
Target Audience: Clinical and Research Multispecialty Neuroscience group

Presentation Title:
South of the Border: Train and Practice
June 7, 2012
Canadian Neurological Sciences Federation, Neurosurgical Education and Workforce in Canada
Ottawa, Ontario
Target Audience: Canadian neurosurgical society

Presentation Title:
Questions and Answers about Parkinson's Disease
June 15, 2012
Northwest Parkinson's Foundation
Eastsound, WA
Target Audience: Parkinson's Disease Patient Support Group

Presentation Title:

Modulation of beta frequency oscillations in the human STN

Sept 20, 2012

Denver University

School of Engineering and Computer Science

Denver, CO

Target Audience: Faculty and graduate student seminar

Presentation Title:

Modulation of beta frequency oscillations in the human STN and Pre-Frontal ECoG during DBS

Sept 21, 2012

Colorado University, Boulder

Department of Psychology and Neuroscience, Institute of Cognitive Science, Center for Neuroscience

Boulder, CO

Target Audience: Faculty and graduate student seminar

Presentation Title:

Searching for Synchrony between Cortical and Subcortical Oscillations in Parkinson's Disease

Nov 1, 2012

University of Washington

Department of Physiology and Biophysics

Seattle, WA

Target Audience: Physiology and Biophysics Department

Presentation Title:

Modulation of beta frequency oscillations in Parkinson's Disease

Nov 11, 2012

University of Washington

Department of Neurology and Psychiatry & Behavioral Sciences

Seattle, WA

Target Audience: Neurology Department

Presentation Title:

Deep Brain Stimulation for Parkinson's Disease

Dec 8, 2012

Colorado Neurological Institute

Denver, CO

Target Audience: Patient and Families affected by Parkinson's Disease

Lectures - 2013

Presentation Title:

The Brain Radio and DBS in the 21st Century

Feb 7, 2013

Medtronic Navigation DBS Training Education Center

Louisville CO

Target Audience: Medtronic representatives for DBS

Presentation Title:

Deep Brain Stimulation: a tutorial

Mar 23, 2013

"Deep Brain Stimulation-Get the facts" Symposium for Parkinson's Disease and Essential Tremor

Highlands Ranch, CO

Target Audience: Patient and Families affected by Parkinson's Disease and Essential Tremor

Presentation Title:

DBS in the 21st Century

Apr 9, 2013

CME Presentation, Swedish Grand Rounds

Englewood, CO

Target audience: Physicians

Presentation Title:

DBS in the 21st Century

May 10, 2013

The Denver DBS Support Group (Bionic Brigade)

Cherry Hills Village, CO

Target audience: Patient and families affected by Parkinson's disease

Presentation Title:
Deep Brain Stimulation: surgery for dystonia
 Nov 23, 2013
 Colorado Neurological Institute
 Denver, CO
 Target Audience: Patient and Families affected by Dystonia

Presentation Title:
Peripheral nerve injuries
 October 23, 2013
 CME Presentation, Swedish Medical Center
 Denver, CO
 Target Audience: Primary care physicians

Presentation Title:
Deep Brain Stimulation: current applications and future directions
 May 28, 2013
 CME Presentation, Wyoming Medical Center
 Casper, WY
 Target audience: Physicians

Presentation Title:
Movement Disorders: Advance in Deep Brain Stimulation
 Sept 4, 2013
 CME Presentation, HealthOne University Webinar
 Denver, CO
 Target audience: Physicians

Presentation Title:
Deep Brain Stimulation: current applications and future directions
 Oct 2, 2013
 CME Presentation, Cheyenne Regional Medical Center
 Cheyenne, WY
 Target audience: Physicians

Presentation Title:
Deep Brain Stimulation: current applications and future directions
 Sept 18, 2013
 CME Presentation, Regional West Medical Center
 Scottsbluff, NE
 Target audience: Physicians

Lectures - 2014

Presentation Title:
Smart DBS: Advances in Deep Brain Stimulation
 A Toast of Hope: Thriving with Parkinson's Disease and Essential Tremor
 January 23, 2014
 The Wildlife Experience, Parker, CO
 Parkinson's Association of the Rockies
 Target Audience: Patient and Families affected by Essential Tremor and Parkinson's disease

Presentation Title:
Deep Brain Stimulation: Current Therapy for Movement Disorders
 February 8, 2014
 CME Presentation, Frontiers In Wyoming Medicine 2014
 Jackson, WY
 Target Audience: Physicians

Presentation Title:
Deep Brain Stimulation: Current Therapy for Movement Disorders
 July 19, 2014
 DBS University, Movement and Neuroperformance Center
 Colorado Springs, CO
 Target Audience: Patient and Families affected by Essential Tremor, Dystonia and Parkinson's disease

Presentation Title:
Deep Brain Stimulation: Current Therapy for Movement Disorders
 September 13, 2014
 Colorado Neurological Institute, Thriving with Neurological Conditions
 Target Audience: Patient and Families affected by Essential Tremor, Dystonia and Parkinson's disease

Presentation Title:
Smart DBS: Advances in Deep Brain Stimulation
 September 23, 2014
 Webinar
 Denver, CO
 Target Audience: Physicians

Presentation Title:
Deep Brain Stimulation: Current Evidence and Next Steps
 November 6, 2014
 Colorado Society of Clinical Neurologists
 Denver, CO
 Target Audience: Neurologists

Presentation Title:
Deep Brain Stimulation: Current Evidence and Next Steps
 December 6, 2014
 DBS University
 Longmont, CO
 Target Audience: Patient and Families affected by Essential Tremor, Dystonia and Parkinson's disease

Lectures - 2015

Presentation Title:
Innovation in Deep Brain Stimulation: Next Steps
 February 11, 2015
 Celebrate Courage
 Wildlife Experience, Parker CO
 Parkinson's Association of the Rockies
 Target Audience: Patient and Families affected by Essential Tremor, Dystonia and Parkinson's disease

Presentation Title:
Deep Brain Stimulation: Current Evidence and Next Steps (CME)
 June 26, 2015
 Arkansas Valley Regional Medical Center
 La Junta, CO
 Target Audience: Physicians

Presentation Title:
Motor Task Event Detection Using Subthalamic Nucleus Local Field Potentials
 August 28, 2015
 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Milano, Italy
 Invited Session: Local Field Potentials in Movement Disorders
 Target Audience: Neurosurgeons, Neurologists, Research scientists

Presentation Title:
Deep Brain Stimulation: Current Evidence and Next Steps
 Sept 25, 2015
 CME Presentation, Swedish Neuroscience Summit
 Denver Marriott Tech Center, Denver
 Target Audience: Physicians

Presentation Title:
Surgical Management of Epilepsy and Focal Cortical Dysplasia in Language Dominant Cortex
 Sept 25, 2015
 CME Presentation, Swedish Neuroscience Summit
 Denver Marriott Tech Center, Denver
 Target Audience: Physicians

Presentation Title:
Deep Brain Stimulation: A Patient Experience

October 1, 2015
 Blue Bonnet Café
 Deep Brain Stimulation Patient Event with Dr. Aaron Haug
 Target Audience: Patient and Families affected by Essential Tremor, Dystonia and Parkinson's disease

Presentation Title:
Smart DBS: Advances in Deep Brain Stimulation
 Oct 3, 2015

Colorado Neurological Institute Trending Towards Tomorrow, Doubletree Stapleton North, Denver CO
 Target Audience: Patient and Families affected by Essential Tremor, Dystonia and Parkinson's disease

Lectures - 2016

Presentation Title:
Innovations in Human Brain Stimulation
 January 13, 2016
 Brain Rounds, University of Denver Center for Professional Development
 Target Audience: University faculty and students

Presentation Title:
DBS: Current Evidence and Next Steps
 May 7, 2016
 Colorado Community Conference on Parkinson's Disease
 Westminster, Colorado
 Parkinson's Association of the Rockies
 Target Audience: Patient and Families affected by Parkinson's disease

Focused Training Courses

Washington State Medical Association/University of Washington Physician Leadership Course
 September 7- November 9, 2012
 Seattle, WA

Minimally Invasive Lateral Interbody Fusion: Minimally Invasive Pedicle Screw Approaches
 June 29-30, 2012
 Orthopaedic Learning Center (OLC), Chicago IL

Storz Spinal Endoscopy training course
 February 24, 2013
 Denver, CO

Joimax Spinal Endoscopy training course
 April 5-6, 2013
 Irvine, CA

Joimax Spinal Endoscopy training course
 June 1, 2013
 Denver, CO

Scoliosis Research Society Cadaver Training Course
 October 9-11, 2014
 Chicago, IL

Johns Hopkins University Fourth Annual Spine Workshop
 September 5-6, 2014
 Baltimore, MD

Washington State Medical Association Dyad Leadership course
 January 8-9, 2016
 Seattle, WA

Scoliosis Research Society Spine Deformities Solutions: A Hands-on course
 February 4-6, 2016
 Las Vegas, NV