DREW KERN, MD, MS, FAAN
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Curriculum Vitae

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Anschutz Outpatient Pavilion
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EDUCATION

1999	B.A. in Kinesiology (Cum Laude), University of Colorado, Boulder, CO
2001	M.S. in Kinesiology with an emphasis in Neuroscience, University of Colorado, Boulder, CO
2004	Summer Medical Student Fellow, Mentored by Felix Eckenstein, Ph.D., University of Vermont College of Medicine, Burlington, VT
2006	Translational Research Fellowship, Mentored by John Sladek, Jr., University of Colorado, Denver, CO
2009	M.D., University of Vermont, Burlington, VT
2009-2010	Internal Medicine Internship, University of Colorado, Denver, CO
2010-2013	Neurology Residency, University of Colorado, Denver, CO
2013-2015	Movement Disorders Fellowship, Mentored by Anthony Lang, MD and Alfonso Fasano, MD, PhD. University of Toronto, Toronto, ON
2016	NINDS Clinical Trials Methodology Course, National Institute of Neurological Disorders and Stroke

ACADEMIC APPOINTMENTS

1999	Research Assistant, Neural Control of Movement Laboratory, University of Colorado, Boulder, CO
2000-2001	Teaching Assistant, Biomechanics, University of Colorado, Boulder, CO
2001	Lead Teaching Assistant, Sensory Motor Neuroscience, University of Colorado, Boulder, CO
2015-2021	Assistant Professor of Neurology, University of Colorado School of Medicine
2018-2021	Adjunct Assistant Professor of Department of Neurosurgery, University of Colorado School of Medicine
2021-present	Associate Professor of Department of Neurology, University of Colorado School of Medicine
2021-present	Adjunct Associate Professor of Department of Neurosurgery, University of Colorado School of Medicine

HOSPITAL and PROFESSIONAL POSITIONS

1997	Intern, Cardiac Catheterization Laboratory, University of California, Los Angeles, Santa Monica, CA
2001-2002	Medical Assistant, Provider: Joseph Craig, MD, Rocky Mountain Youth Medical Providers, PC (non-profit pediatric clinic), Denver, CO
2002-2003	Research Associate, Director: Rajeev Kumar, MD, "Movement disorder studies: Long-term outcomes of STN DBS," Colorado Neurological Institute, Englewood, CO
2011-2013	Resident Education Director, University of Colorado
2012-2013	Chief Neurology Resident, University of Colorado
2016-2019	Movement Disorders Resident Block Director
2017-2021	Assistant Director Outpatient Neurology Clinics, University of Colorado Hospital and University of Colorado SOM, Department of Neurology
2017-2021	Co-Director, Colorado Neurological Society
2021-2022	Interim Movement Disorders Section Head, Department of Neurology, University of Colorado SOM
2019-present	Co-Director, Deep Brain Stimulation Program, Departments of Neurosurgery and Neurology, University of Colorado School of Medicine
2021-present	Co-Director, Advanced Therapies in Movement Disorders Program, Departments of Neurosurgery and Neurology, University of Colorado School of Medicine

HONORS, SPECIAL REGOGNITIONS, and AWARDS

1996-1998	Alpha Epsilon Delta (pre-honors health society), University of Colorado, Boulder, CO
1996-1999	General Honors Program (pre-requirement of 3.3 GPA), University of Colorado, Boulder, CO
2000	Travel Grant Award, University of Colorado, Boulder, CO
2004	Medical Student Summer Research Fellowship, University of Vermont College of Medicine, Burlington, VT
2007	ASNTR Student Travel Grant Award, American Society for Neural Transplant and Repair
2008	AFAR Research Grant Award, American Foundation for Aging Research
2009	The Herbert Martin Sr. Award for Excellence in Neurology, University of Vermont College of Medicine
2011	The Arnold P. Gold Foundation Award for Humanism and Excellence in Teaching, University of Colorado, Aurora, CO
2013	Resident Research Award, University of Colorado, Department of Neurology
2013-2014	Clinical Movement Disorders Fellowship Award, Parkinson Society of Canada
2014	International Parkinson and Movement Disorder Society Travel Award, University of Toronto
2016	Student Loan Repayment Program, National Institutes of Health Loan Repayment Program (funding $70,000)
2017-2018	Faculty Development Award, Adamas Pharmaceuticals, Inc. (funded $ 9000)
2019	Parkinson Study Group Visiting Mentor Program Award (funded $ 7450)

2022 Fellow of the American Academy of Neurology
2023 Delphi Study Participant (expert DBS panel)

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

2003-present American Academy of Neurology
2003-2006 Student Interest Group of Neurology
2006-2008 Front Range Neuroscience Group
2007-2008 Society for Neurosciences
2007-2008 American Association for the Advancement of Science
2015-present American Academy of Neurology
2013-present International Parkinson and Movement Disorders Society
2015-present Parkinson Study Group
2015-present Colorado Neurological Society
2016-present American Neurological Association
2022-present Deep Brain Stimulation Society
2024-present Congress of Neurological Surgeons

MAJOR COMMITTEE and SERVICE RESPONSIBILITIES

2007 Judge of Denver Metro High School Students' Poster Presentations, Denver Metro Regional Science and Engineering Fair
2013-2015 Biomarkers in Parkinson's Disease, Michael J. Fox Foundation
2015-present Functional Neurosurgical Working Group, Parkinson Study Group
2016-2022 Data Safety Monitoring Board, Colorado Clinical and Translational Sciences Institute (CCTSI)
2016-present AbbVie Pharmaceuticals – Marketing and Medical Board
2018-2019 Denali Therapeutics – Medical Board
2019-2020 Quality Case Review Committee – University of Colorado SOM, Department of Neurology
2018-present Medtronic – Medical Board
2018-present Boston Scientific – Medical Advisor
2023-present Insightec – Medical Advisor
2024-present Alpha Omega Engineering
2024-present Promotion and Tenure Departmental Review Committee, University of Colorado SOM, Department of Neurology

LICENSURE and BOARD CERTIFICATION

1998 Emergency Medical Technician Certification
2000 National Institute of Health Research Certification
2009-2013 State of Colorado Training License
2013 Board-Certified in Neurology, American Board of Psychiatry and Neurology
2013-2015 Postgraduate License, College of Physicians and Surgeons in Ontario
2013-present State of Colorado Medical License
2022-present State of Wyoming Medical License
2022-present State of New Mexico Medical License

REVIEW and REFEREE WORK

Publications

2015	Movement Disorders Journal
2016	The Clinical Neuropsychologist
2016	The Journal of Neuropsychiatry and Clinical Neurosciences.
2020	Brain Sciences
2020 & 21	American Academy of Neurology Annual Meeting of 2020, Abstract Review
2021	Neurology Clinical Practice
2022 & 23	Frontiers in Neurology, section Experimental Therapeutics
2022 & 23	Brain Communications
2022	Sensors
2022	Journal of the Neurological Sciences
2016, 21-25	Parkinsonism and Related Disorders
2023	NPJ Parkinson's Disease
2023	Neurotherapeutics
2023	Biomedicines
2023 & 24	Frontiers in Aging Neuroscience
2023 & 24	Annals of Neurology
2024	Bioengineering
2023-25	Movement Disorders Clinical Practice
2023 & 24	Movement Disorders
2025	Computer Methods and Program in Biomedicine
2025	Science Advances
2025	Brain Sciences
2025	BMC Neurology

Grants

2016	Knoebel Institute for Health Aging, University of Denver
2015-present	Movement Disorders Center Pilot Grant, University of Colorado SOM, Department of Neurology
2017	Parkinsonism Biomarker Review Committee – ZNS1 SRB-T (29) National Institute of Health/National Institute of Neurological Disorders and Stroke (NIH/NINDS)
2019	Neurological Foundation of New Zealand
2022	Virginia Commonwealth University, Parkinson's & Movement Disorders Center, pilot grant reviewer
2025	Department of Neurosurgery Research Innovation and Career Development, University of Colorado SOM, Department of Neurosurgery

Promotions

2022-present	Department Promotion Mid-Course Review Committee, Department of Neurology, University of Colorado SOM. Review consideration of faculty promotion in tenure track.

INVITED EXTRAMURAL LECTURES, PRESENTATIONS, and VISITING PROFESSORSHIPS
Oral Presentations/Lectures - Institutional

Neuroscience Conference at Swedish Medical Center *Sustained long-term benefit and adverse effects of bilateral subthalamic nucleus (STN) deep brain stimulation (DBS) in Parkinson's disease (PD).* December 11, 2002 Englewood, CO

University of Colorado Denver, Grand Rounds *Alpha-synuclein in skin: the need for a methodological approach*. May 22, 2013 Aurora, CO

University of Toronto, Movement Disorders Journal Club *A pilot study of focused ultrasound thalamotomy for essential tremor.* August 21, 2013 Toronto, ON

University of Toronto, Movement Disorders Video Rounds *NBIAs.* October 7, 2013 Toronto, ON

University of Toronto, Movement Disorders Journal Club *A two-year randomized controlled trial of progressive resistance exercise for Parkinson's disease.* October 16, 2013 Toronto, ON

University of Toronto, Movement Disorders Journal Club *Alpha-synuclein in cutaneous autonomic nerves.* November 13, 2013 Toronto, ON

University of Toronto, Movement Disorders Video Rounds *AOAs.* December 9, 2013 Toronto, ON

University of Toronto, Movement Disorders Video Rounds *DBS cases.* December 9, 2014 Toronto, ON

University of Toronto, Movement Disorders Journal Club *Long-term safety and tolerability of ProSavin, a lentiviral vector-based gene therapy for Parkinson's disease: a dose escalation, open-label, phase 1/2 trial.* January 29, 2014 Toronto, ON

University of Toronto, Movement Disorders Journal Club *Comparison of pregabalin with pramipexole for restless legs syndrome.* February 19, 2014 Toronto, ON

University of Toronto, Movement Disorders Video Rounds *MSA.* February 24, 2014 Toronto, ON

University of Toronto, Movement Disorders Journal Club *Randomized trial of salfinamide add-on to levodopa in Parkinson's disease with motor fluctuations.* March 26, 2014 Toronto, ON

University of Toronto, Movement Disorders Video Rounds *PLMT.* May 18, 2014 Toronto, ON

University of Toronto, Movement Disorders Journal Club *Peripheral hypoxia in restless legs syndrome (Willis-Ekbom disease).* June 4, 2014 Toronto, ON

University of Toronto, Movement Disorders Video Rounds *Tics.* June 30, 2014 Toronto, ON

University of Toronto, Movement Disorders Journal Club *Randomized, controlled trial of rasagiline as an add-on to dopamine agonists in Parkinson's disease.* August 6, 2014 Toronto, ON

University of Toronto, Movement Disorders Journal Club *Droxidopa for neurogenic orthostatic hypotension.* August 20, 2014 Toronto, ON

University of Toronto, Movement Disorders Journal Club *The modern pre-levodopa era of Parkinson's disease: insights into motor complications from sub-Saharan Africa.* September 24, 2014 Toronto, ON

University of Toronto, Movement Disorders Video Rounds *Tremor and DBS.* October 6, 2014 Toronto, ON

University of Toronto, Movement Disorders Journal Club *Deferiprone in Friedreich ataxia: a 6-month randomized controlled trial.* November 19, 2014 Toronto, ON

University of Toronto, Movement Disorders Journal Club *Should genetic testing for SCAs be included in the diagnostic workup for MSA?.* December 17, 2014 Toronto, ON

University of Toronto, Movement Disorders Journal Club *Mendelian randomization of serum urate and Parkinson disease progression.* January 7, 2015 Toronto, ON

University of Toronto, Movement Disorders Video Rounds *Myoclonus.* February 9, 2015 Toronto, ON

University of Toronto, Movement Disorders Journal Club *Parkinson risk in idiopathic REM sleep behavior disorder.* March 18, 2015 Toronto, ON

University of Toronto, Movement Disorders Journal Club *Rytary.* April 29, 2015 Toronto, ON

University of Toronto, Movement Disorders Journal Club *Causes of withdrawal of duodenal levodopa infusion in advanced Parkinson disease.* May 27, 2015 Toronto, ON

University of Toronto, Movement Disorders Video Rounds *Chorea.* June 1, 2015 Toronto, ON

Department of Neurology Grand Rounds *Ironing out neurodegeneration with brain iron accumulation*. November 4, 2015, Aurora, CO

Neurosurgery Morning Research Rounds *Deep brain stimulation (DBS) of the zona incerta (Zi): stereotactic targeting an assessment of clinical outcomes compared with traditional targets.* March 22, 2016 Aurora, CO

Behavioral Neurology and Neuropsychiatry *Cognition in deep brain stimulation (DBS) for movement disorders: evaluation and outcomes.* November 1, 2016 Aurora, CO

Neurosurgery Morning Research Rounds *Deep brain stimulation (DBS) of the rostral zona incerta (rZi) for treatment of Parkinson's disease: stereotactic targeting and clinical efficacy.* November 22, 2016 Aurora, CO

University of Colorado Denver, Neurorehabilitation Rounds, *Functional movement disorders.* September 27, 2017 Aurora, CO

Department of Neurology Grand Rounds *Many roads lead to Parkinson's disease: understanding the causes and progression.* December 6, 2017Aurora, CO

Department of Neurology Grand Rounds *Practice transformation.* February 21, 2018 Aurora, CO

Department of Neurology Grand Rounds *Surgical targets less talked about in deep brain stimulation for movement disorders.* August 29, 2018 Aurora, CO

Department of Neurology Grand Rounds *Current and future research in deep brain stimulation at the University of Colorado.* August 29, 2020 Aurora, CO

Department of Neurology Grand Rounds *MRI Guided Focused Ultrasound at the University of Colorado: Review, Unknown, and Experience.* February 16, 2022 Aurora, CO

Department of Neurology *Neurology Research Retreat*. May 21, 2023 Aurora, CO

Oral Presentations/Lectures – National

Northern New England Neurological Society *Not all that shakes is narcolepsy.* October 29, 2005 Portsmouth, NH

Michael J. Fox Foundation *Alpha-synuclein in skin: the need for a methodological approach*. June 6, 2013 New York, NY

International Parkinson and Movement Disorders Society *Video Challenge* June 17, 2015 San Diego, CA

Parkinson Study Group Surgical Study Group *Interleaved stimulation: where are we and where should we go?* September 17, 2016 Portland OR

John R. Sladek Jr. Symposium *Application of lessons learned during my research fellowship: Skin as a potential biomarker in Parkinson's disease*. October 22, 2015 Aurora, CO

Neuroscience Summit *Movement disorders and surgical interventions*. September 11, 2018 Aurora, CO

Neurosurgery in the Rockies Conference. *Deep Brain Stimulation for Movement Disorders: Simplified to Complex Programming* February 24, 2020. Beaver Creek, CO

Neurosurgery in the Rockies Conference. *MRI Guided Focused Ultrasound – Gaps*. February 28, 2022. Beaver Creek, CO

ASSFN Hands-On Course. *DBS Programming*. November 13, 2022. Aurora, CO

ASSFN Hands-On Course. *Advanced Therapies in Movement Disorders*. November 5, 2023. Aurora, CO

Medtronic Advisory Leaders Forum. *Monopolar Sensing of the Subthalamic Nucleus in Parkinson's disease.* April 10, 2024.

ASSFN Hands-On Course. *Advanced Therapies (DBS Programming)*. October 27, 2024. Aurora, CO

Oral Presentations/Lectures – International

University of Calgary Movement Disorder Rounds. *Deep brain stimulation: Current and future directions*. June 18, 2020 Calgary, AB

American Academy of Neurology. *Safety of Foslevodopa/Foscarbidopa During Optimization and Maintenance Treatment: Post Hoc Analysis of a Phase 3 Trial*. April 25, 2023. Seattle, WA

American Academy of Neurology. *"Improvement of "On" and "Off" Times in Patients With Advanced Parkinson's Disease Treated With Foslevodopa/Foscarbidopa: Subgroup Analyses From a Phase 3 Randomized Study*. April 17, 2024. Denver, CO

10th Annual Symposium on "Shaping the Management of Parkinson's Disease" *Skin biopsy for synuclein inclusions should now be used in the clinical setting*. June 8, 2024. Bonita Springs, FL

Poster Presentations

American College of Sports Medicine. *Chronic surface EMG during normal daily use*. June 2, 2000**.** Indianapolis, IN

American Academy of Neurology. *Effective subthalamic nucleus (STN) deep brain stimulation (DBS) in levodopa-unresponsive parkinsonism.* April 1, 2003. Honolulu, HI

American Academy of Neurology**.** *Sustained long-term benefit and adverse effects of bilateral subthalamic nucleus (STN) deep brain stimulation (DBS) in Parkinson's disease (PD).* April 1, 2003. Honolulu, HI

Society for Neuroscience**.** *Effects of neural stem cell transplantation on total tau in an aged animal model of Down syndrome, Ts65Dn.* October 14, 2006. Atlanta, GA

Front Range Neuroscience Group. *Effects of neural stem cell transplantation on total tau in an aged animal model of Down syndrome, Ts65Dn*. November 13, 2006. Fort Collins, CO

American Society for Neural Therapy and Repair**.** *Short-term neural stem cell treatment in the Ts65Dn mouse model of Down syndrome did not significantly affect total tau in the hippocampus and olfactory bulbs.* May 3, 2007. Clearwater, FL

Society for Neuroscience. *Biocompatibility of poly(ethylene) glycol-based hydrogel in healthy brain tissue.* November 4, 2007. San Diego, CA

American Foundation for Aging Research. *Tau analysis within the Ts65Dn mouse, a model of Down syndrome.* November 8, 2008. Raleigh, NC

University of Toronto Research Retreat. *Methodological approaches for evaluating alpha-synuclein in skin as a potential biomarker in Parkinson's disease.* January 23, 2014. Toronto, ON

International Congress of Parkinson's Disease and Movement Disorders. *Methodological approaches for evaluating alpha-synuclein in skin as a potential biomarker in Parkinson's disease*. June 9, 2014. Stockholm, Sweden

International Congress of Parkinson's Disease and Movement Disorders. *Optimized Imaging at 3.0 T of the Rostral Zona Incerta (rZI) for Deep Brain Stimulation (DBS) in Parkinson's Disease (PD).* October 6, 2018. Hong Kong, China

American Academy of Neurology *Enhancing Care Teams with Medical Assistants: A Novel Clinic Model.* May 5, 2019. Philadelphia, PA

International Congress of Parkinson's Disease and Movement Disorders. *Rapid improvement in dystonia after pallidal deep brain stimulation in a patient with myoclonus-dystonia syndrome: A case report.* September 25, 2019. Nice, FR

International Congress of Parkinson's Disease and Movement Disorders. *Correlation of local field potentials (LFPs) to electromyography (EMG) of the rostral zona incerta (rZI) and subthalamic nucleus (STN) in Parkinson's Disease (PD).* September 25, 2019. Nice, France

International Congress of Parkinson's Disease and Movement Disorders. *Characteristics of patients with essential tremor evaluated for deep brain stimulation surgery at a tertiary center.* September 24, 2019. Nice, FR

American Academy of Neurology Annual Meeting*. Neuro-anatomical volumetric changes in deep brain stimulation of Parkinson's disease patients.* Virtual 2020

International Congress of Parkinson's Disease and Movement Disorders. *Pilot study to investigate the use of in-clinic sensing to identify optimal stimulation parameters for deep brain stimulation therapy in Parkinson's disease.* September 17, 2022. Philadelphia, PA

International Congress of Parkinson's Disease and Movement Disorders. *Safety of Foslevodopa/foscarbidopa during optimization and maintenance treatment: post hoc analysis of a phase 3, single-arm trial*. August 28, 2023. Copenhagen, DK

International Congress of Parkinson's Disease and Movement Disorders. *Pilot study to investigate the use of monopolar sensing to improve the efficiency of DBS programming in Parkinson's disease*. August 29, 2023. Copenhagen, DK

International Congress of Parkinson's Disease and Movement Disorders. *Comparison of monopolar and bipolar sensing of beta frequency in Parkinson's disease of the subthalamic nucleus for deep brain stimulation*. September 27, 2024. Philadelphia, PA

TEACHING RECORD

Movement Disorders Resident Block Director

2017- 2019

Responsible for the core resident education on movement disorders

Medical Student and resident rotations in Movement disorders Clinics

2015-present

Bedside teaching of movement disorders including examination, diagnosis, work-up and treatment at UCHealth and Denver Health.

American Society for Stereotactic and Functional Neurosurgery (ASSFN)

2018, 2019, 2022-2024

Hands-on teaching to residents and fellows of neurology and neurosurgery in stereotactic and functional neurology in deep brain stimulation programming

DBS Fellows Course

2022-2025

Hands-on teaching course for movement disorders neurology fellows in Austin, TX

Mentoring Record

<u>Advanced Therapies in Movement Disorders Neurology Fellows</u>

- Bridget Ollesch, MD (2024)
- Ondrea Timmermann, DO (2025)

<u>Movement Disorder Neurology Fellows</u>

- Kristin King, MD (2017-2018)
- Kristin Mitrovich, MD (2017-2018)
- Trevor Hawkins, MD (2016-2018)
- Christopher Groth, MD (2016-2018)
- Lisa Deuel, MD (2018-2019)
- Jeanne Feuerstein, MD (2018-2019)
- Caroline Goldin, MD (2019-2020)
- Theresa Lee, MD (2019-2020)
- Alexander Baumgartner, MD (2020-2022)
- Michael Korsmo, MD (2020-2022)
- Antonia Pusso, MD (2021-2023)
- Heather Heiser, MD (2021-2023)
- Matthew Woodward, MD (2022-2024)
- Brooke Heffernan, MD (2022-2024)
- Stereotactic and Functional Neurosurgery Hands-On Workshop, Annual Course. 2018, 2019, 2022-24. Aurora, Colorado. Lecture and workshop on deep brain stimulation taught to nationally invited neurosurgery fellows and residents throughout North America.

<u>Residents</u>

- Ian McGuinness, MD (2018-2019). Review goals of education and career development
- John "Kyle" Jenkins, MD (2019-2023). Review goals of education and career development

Medical Students

- Mashal Talat (2018), visiting international student, supervisor for extended observership
- Yaswanth Chintaluru (2020-present), medical student at University of Colorado pursuing a research track, co-mentor

Graduate Students

- Nathan Davis (2018-2019), Master's candidate, Modern Human Anatomy, University of Colorado SOM. Advisor for capstone project.
- Gary Cahill (2022-2023), Master's candidate, Modern Human Anatomy, University of Colorado SOM. Advisor for capstone project.
- Erin Radcliffe (2022-present), PhD candidate, Biomedical Engineering, University of Colorado SOM. Co-mentor.

Faculty

- Alexander Baumgartner (2022-present), Assistant Professor, University of Colorado SOM
- Jessica Barr (2023-present), Instructor, University of Colorado SOM

COMMUNITY SERVICE

Volunteer in Classroom with 3rd Grade Developmental Delayed Children, Bal Swan Children's Center, 1998 Broomfield, CO

Aurora Central High School. *Nervous System*. November 9, 2017 Aurora CO

Patient Education

E3 Conference Parkinson Association of the Rockies. *Sleep and Fatigue in Parkinson's Disease.* October 9, 2015 Denver CO

Parkinson Association of the Rockies. *Fatigue and sleep disorders in Parkinson's disease and resources at the University of Colorado, Movement Disorders Center.* May 14, 2016 Grand Junction, CO

Bionic Brigade DBS Support Group. *DBS in Movement Disorders*. November 11, 2016. Englewood CO

Parkinson Support Group. *Carbidopa Levodopa Enteral Suspension*. April 7, 2017 Aurora CO

Parkinson Support Group. *Sleep and Fatigue*. June 16, 2017 Westminster CO

Colorado Neurological Institute. *Pathogenesis of Parkinson Disease*. November 11, 2017 Englewood CO

Boulder Support Group. *Parkinson Disease*. October 23, 2018 Boulder CO

Tri Lakes Support Group*. Advanced Parkinson's Disease Treatments.* June 16, 2018 Englewood CO

Parkinson Association of the Rockies *PD 101: Medications* May 15, 2019

Longmont Parkinson Disease Support Group *Advanced Treatments for Parkinson's Disease* June 12, 2019
Davis Phinney Foundation Webinar *Parkinson's Research & Clinical Trials* October 16, 2019
Parkinson Association of the Rockies *Deep Brain Stimulation for Parkinson's Disease and Essential Tremor* May 21, 2020
Parkinson Association of the Rockies *Advanced PD Treatments* June 11, 2020
Parkinson and Movement Disorders Alliance *Collaboration of Neuro-palliative care and Advanced Treatments in Movement Disorders* July 29, 2020
Movement Disorders Foundation 2nd Annual Seminar. *Treatment of complex motor problems in Parkinson's disease* August 29, 2020
INSIGHT Into Parkinson's 2023. *What is Advanced PD?* April 2023.
INSIGHTEC. *From Dependent to Independent: Treatment Options for Essential Tremor* July 23, 2023, September 24, 2023, November 12, 2023, and January 14, 2024.
FUS Patient Education. May 10, 2024; July 26, 2024.

Graduate Education Lectures

Sensory Motor Neuroscience Course *Locomotion.* University of Colorado Boulder. April, 4, 2001 Boulder, CO
Sensory Motor Neuroscience Course *Basal ganglia disorders.* University of Colorado Boulder. April 27, 2001 Boulder, CO
Neurology Resident Education *Phenomenology of movement disorders.* University of Colorado School of Medicine. August 19, 2015 Aurora, CO
Neurology Resident Education *Movement disorders emergencies.* University of Colorado School of Medicine. July 27, 2017 Aurora, CO
Neurology Resident Education *Phenomenology and anatomy of movement disorders.* University of Colorado School of Medicine. October 11, 2017 Aurora, CO
Neurology Resident Education *Functional movement disorders.* University of Colorado School of Medicine. October 11, 2017 Aurora, CO
Neurology Resident Education. *Phenomenology.* University of Colorado School of Medicine. December 5, 2018 Aurora, CO
Neurology Resident Education. *Functional Movement Disorders.* University of Colorado School of Medicine. February 27, 2019 Aurora, CO
Neuropsychology Fellowship Lecture Series, Department of Neurosurgery. *Approach to functional movement disorders*. University of Colorado School of Medicine. March 13, 2018 Aurora, CO
Neuropsychology Seminar. *Diagnosis of Parkinson's Disease and other Movement Disorders.* University of Colorado School of Medicine. March 13, 2019 Aurora, CO
Neurology Resident Education. *Advanced Parkinson Disease.* University of Colorado School of Medicine. October 23, 2019 Aurora, CO
Neurology Resident Education. *Botulinum Toxin and Deep Brain Stimulation Introduction and Workshop.* University of Colorado School of Medicine. October 30, 2019 Aurora, CO

Clinician Education Lectures

Colorado Neurological Society *Droxidopa for the treatment of neurogenic orthostatic hypotension*. September 21, 2015 Denver, CO
Colorado Neurological Society *When to initiate levodopa,* February 17, 2016 Denver, CO
University of Colorado Denver, Movement Disorders Lecture *Filling the gaps: treatments for advanced Parkinson's disease.* June 16, 2016 Aurora, CO
University of Colorado Denver, Resident Education *Movement disorders emergencies.* July 14, 2016 Aurora, CO
University of Colorado Denver Resident Education *Phenomenology and anatomy of movement disorders.* September 28, 2016 Aurora, CO
Good Samaritan. *Advanced Treatments in Parkinson Disease*. July 20, 2017 Lafayette CO
Boulder General Clinicians. *DBS Therapy*. August 25, 2017 Boulder CO
UC Health Neurology Clinics and Banner Health. *Advanced Treatments*. March 21, 2018 Fort Collins CO
Miramont Family Practice. *Tremor: Diagnosis and treatment*. April 5, 2018 Fort Collins CO
Colorado Springs Educational Dinner (Colorado Springs Neurology Associates, UCHealth Neurology, and DaVita Internal and Family Medicine) *Advanced Treatments for Movement Disorders* May 22, 2019 Colorado Springs, CO
Colorado Neurological Society. *Deep Brain Stimulation Interesting Cases* March 9, 2020. Denver, CO
PD Foundation COE. *Advanced Therapies in Parkinson's Disease* March 1, 2021; March 8, 2021; April 26, 2021; May 6, 2021; May 24, 2021; June 14, 2021. Denver, CO

Media

AARP Webinar and Parkinson Association of the Rockies. *Parkinson Disease and Non-motor symptoms: Sleep Disorders and Fatigue.* November 4, 2016 Denver CO
No Copay Radio Interview. *Parkinson Disease*. February 15, 2018 Denver CO
CU Anschutz Today. Advances in Deep Brain Stimulatin May Reduce Parkinson's Disease Symptoms. December 16, 2024.
UCHealth Today. *Vyalev Pump Eases "off" Periods for Advanced Parkinson's Patients.* January 22, 2025.
Medscape. FDA Oks *First Adaptive DBS System for Parkinson's disease.* February 24, 2025

GRANT SUPPORT

Current Independent Investigator Studies

Beta Utilization For Field Shaping (BUFFS): proof-of-concept study to determine whether fractionated amplitude defined by beta outperforms single contact therapy.

Funding: Medtronic
Role: Principal Investigator
Total Costs (Direct and Indirect): $15,744

Implementation of adaptive deep brain stimulation to offset subthalamic dysregulation during exercise and reduce exertion in Parkinson's disease.

Funding: Medtronic
Role: Principal Investigator

Total Costs (Direct and Indirect): $138,940

LFP sensing from directional leads and associated clinical outcomes in the acute clinical setting
Funding: Medtronic
Role: Principal Investigator
Total Costs (Direct and Indirect): $136,919

DBS for Severe treatment refractory Methamphetamine Use Disorder.
Funding: NIH BRAIN R01 NIDA
Role: Co-Investigator (PIs: Joe Sakai and Jody Tanabe)
Total Costs (Direct and Indirect): $6,616,804

Current Industry and Foundation Funded Studies

A Multi-Center, Controlled Study to Evaluate Use of CereGate Therapy to Reduce Freezing of Gait in Participants Diagnosed with Parkinson's Disease
Funding: Ceregate Inc.
Role: Principal Investigator
Total Costs (Direct and Indirect): $10,209 Directs $12,761 w/ Indirects per enrolled subject

Registry of deep Brain stimulation with the VERCISE™ System: Vercise™ DBS registry
Sponsor: Boston Scientific
Role: Site Principal Investigator
Total Costs (Direct and Indirect): $168,044.92 Directs $215,097.50 w/ Indirects (estimating 25 patients)

Parkinson's Disease: An extension of Study M15-741 evaluating the safety and tolerability of ABBV-951 in subjects with Parkinson's disease
Sponsor: AbbVie, Inc
Role: Site Principal Investigator
Total Costs (Direct and Indirect): $378,153.79 Directs $525,213.60 w/ Indirects

Advanced Parkinson's disease: An open-label extension of studies M15-736 and M20-339 evaluating the safety and tolerability of ABBV-951 (M20-098)
Sponsor: AbbVie, Inc
Role: Site Principal Investigator
Total Costs (Direct and Indirect): $536,081.65 Directs $744,557.84 w/ Indirects

Completed Independent Investigator Studies

Predicting the optimal therapeutic contact of a deep brain stimulation electrode in Parkinson's disease based upon measurement of beta activity
Funding: Medtronic
Role: Principal Investigator
Total Costs (Direct and Indirect): $205,000

Narrowing the knowledge gap between primary care providers (PCPs) and movement disorders neurologists in the treatment of advanced PD
Funding: Parkinson's Foundation Center of Excellence Core Grant
Role: Principal Investigator
Total Costs (Direct and Indirect): $25,000 Directs (Indirects not allowed)

Improving efficiency of initial DBS programming for electrodes with multiple independent constant current
Funding: Boston Scientific
Role: Principal Investigator
Total Costs (Direct and Indirect): $87,907.00 Directs $112,520.96 w/ Indirects

Sex disparities in patients with essential tremor
Funding: University of Colorado, Movement Disorders Center Grant
Role: Co-Investigator, Co-mentor

Evaluating the impact of adding 3D printed brains to pre-surgical patient education meetings
Funding: Investigator research account (John Thompson) and Gerhard Family Gift
Role: Co-Investigator

Patient preference in deep brain stimulation products
Funding: Investigator research account (Drew Kern)
Role: Co-Investigator, Co-mentor

Deep brain stimulation (DBS) of the rostral zona incerta (rZI) for Parkinson's disease (PD)
Funding: Department of Neurology Intradepartmental Grant
Role: Principal Investigator
Total Costs (Direct and Indirect): $40,000 Directs (Indirects not allowed)

Alpha-synuclein deposition in skin of patients with Parkinson's disease, multiple systems atrophy, and progressive supranuclear palsy
Funding: Skin Disease Research Center, University of Colorado Grant
Role: Principal Investigator

Cutaneous alpha-synuclein staining as a diagnostic marker for Parkinson's disease and related disorders.
University Health Network, REB #12-0447-AE
Role: Co-Investigator

Synuclein staining in the rectosigmoid mucosa as a diagnostic biomarker for Parkinson's disease
University Health Network, REB #12-0374-A
Role: Co-Investigator

Completed Industry and Foundation Funded Studies

Parkinson's disease: safety and tolerability of 24-hour daily exposure to ABBV-951 by continuous subcutaneous infusion (M15-741)
Sponsor: AbbVie, Inc
Role: Site Principal Investigator
Total Costs (Direct and Indirect): $270,470.00 Directs $346,201.60 w/ Indirects

Advanced Parkinson's disease: double-blind, double-dummy, active-controlled, efficacy and safety of ABBV-951 versus oral carbidopa-levodopa (M15-736)
Sponsor: AbbVie, Inc
Role: Site Principal Investigator
Total Costs (Direct and Indirect): $274,980 Directs $351,974.40 w/ Indirects

Parkinson's Disease: A comparative study of levodopa and carbidopa bioavailability following foslevodopa/foscarbidopa infusion at different subcutaneous sites in Parkinson's disease patients (M20-339)
Sponsor: AbbVie, Inc
Role: Site Principal Investigator
Total Costs (Direct and Indirect): $428,692.72 Directs $595,406.56 w/ Indirects

A randomized, placebo surgery controlled, double-blinded, multi-center, phase 2 clinical trial, evaluating the efficacy and safety of VY-AADC02 in advanced Parkinson's disease with motor fluctuations
Sponsor: Voyager Therapeutics
Role: Site Sub-Investigator

A post-market study evaluating the safety of Infinity DBS system with MR conditional labeling
Sponsor: Abbott
Role: Site Sub-Investigator

Registry for the advancement of DBS for Parkinson's disease (RAD-PD)
Sponsor: Parkinson Study Group and Michael J. Fox Foundation
Role: Site Principal Investigator
Total Costs (Direct and Indirect): $26,000 Directs $30,375 w/ Indirects (25% paid on patient care only per contract)

A phase 3, open-label study of the safety, efficacy, and tolerability of apomorphine administered by continuous subcutaneous infusion in advanced Parkinson's disease patients with unsatisfactory control on available therapy
Sponsor: USWM
Role: Site Sub-Investigator

A multicenter, international, open-label, safety study of ND0612, a solution of levodopa/carbidopa delivered via a pump system as a continuous subcutaneous infusion in subjects with advanced Parkinson's Disease

Sponsor: Neuroderm, Ltd.
Role: Site Sub-Investigator

A phase 1B, multicenter, randomized, placebo-controlled, double-blind study to determine the safety, tolerability, pharmokinetics, and pharmacodynamics of DNL201 in subjects with Parkinson's disease
Sponsor: Denali Therapeutics Inc
Role: Site Principal Investigator
Total Costs (Direct and Indirect): $300,725 Directs $384,928 w/ Indirects

A phase 3, long-term, open-label and single-arm study of MYOBLOC® in the treatment of troublesome sialorrhea in adult subjects
Sponsor: Solstice
Role: Sub-Investigator

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