

**CURRICULUM VITAE
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CURRICULUM VITAE**PAUL S. LARSON, MD, FAANS**

Current Positions	<i>Southern Arizona VA Health Care System</i> Clinical Director, Neurosurgery	
	<i>University of Arizona, Department of Neurosurgery</i> Professor, Clinical Scholar Path	
Concurrent Positions	<i>ASU-Banner Neurodegenerative Disease Research Center</i> Associate	
	<i>University of California, San Francisco</i> HS Full Clinical Professor, Neurological Surgery	
Contact Information	<u>University of Arizona</u> 1501 N. Campbell Avenue PO Box 245070 Tucson, AZ 85724 (520) 626-4936 Email pslarson@arizona.edu URL University of Arizona, Banner University Medical Center Tucson	<u>Southern Arizona VA HCS</u> 3601 S. 6 th Avenue Surgical Care Line Tucson, AZ 85723 (520) 792-1450 Paul.Larson2@va.gov

LICENSURE AND CERTIFICATIONS

Arizona Medical License	License # available by request	2021-present
California Medical License	License # available by request	2001-present
DEA License	License # available by request	1995-present
American Board of Neurological Surgery	Board Certification #27101	2007-present
BLS, ACLS	Certifications available by request	1995-present

AREAS OF INTEREST

Deep brain stimulation (DBS), gene therapy, cell transplantation, interventional MRI-guided surgery, movement disorders (Parkinson's disease, essential tremor), auditory disorders (tinnitus), psychiatric disorders (obsessive compulsive disorder, Tourette's syndrome, major depressive disorder), Huntington's disease, basal ganglia physiology, high field MRI imaging, device development

CHRONOLOGY OF EDUCATION

Arizona State University <i>Department of Zoology</i>	BS	1990
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University of Arizona <i>College of Medicine and Graduate Program in Neuroscience</i>	MD	1995
University of Louisville <i>Hiram C. Polk Department of Surgery</i>	Intern	1995-1996
University of Louisville <i>Department of Neurological Surgery</i>	Resident	1996-2000
University of Louisville <i>Department of Neurological Surgery</i>	Chief Resident	2000-2001

CHRONOLOGY OF POSITIONS (BY INSTITUTION)

VETERANS HEALTH ADMINISTRATION

San Francisco VA Health Care System <i>San Francisco, CA</i>	Attending Neurosurgeon	2001-2021
San Francisco VA Health Care System <i>San Francisco, CA</i>	Chief, Neurosurgical Section	2008-2021
San Francisco VA Health Care System <i>San Francisco, CA</i>	Surgical Director, Parkinson's Disease Research, Education and Clinical Center	2011-2021
Southern Arizona VA Health Care System <i>Tucson, AZ</i>	Clinical Director, Neurosurgery	2021-present

UNIVERSITY OF CALIFORNIA, SAN FRANCISCO

Department of Neurological Surgery <i>University of California, San Francisco</i>	Assistant Clinical Professor	2001-2009
Department of Neurological Surgery <i>University of California, San Francisco</i>	Associate Clinical Professor	2009-2015
Department of Neurological Surgery <i>University of California, San Francisco</i>	Associate Director, Residency Program	2011-2019
Department of Neurological Surgery <i>University of California, San Francisco</i>	Vice Chairman	2011-2021
Department of Neurological Surgery <i>University of California, San Francisco</i>	Professor of Clinical Neurological Surgery	2015-2021
Department of Neurological Surgery <i>University of California, San Francisco</i>	HS Full Clinical Professor	2021-present

SAN FRANCISCO DEPARTMENT OF PUBLIC HEALTH

San Francisco General Hospital <i>San Francisco, CA</i>	Attending Neurosurgeon	2001-2018
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UNIVERSITY OF ARIZONA

Department of Neurosurgery <i>University of Arizona, Tucson, AZ</i>	Professor, Clinical Scholar Path	2021-present
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ARIZONA STATE UNIVERSITY

Neurodegenerative Disease Research Ctr <i>ASU-Banner, Tempe, AZ</i>	Associate	2021-present
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HONORS AND AWARDS

First Place, Biotechnology Research <i>Research Louisville 1999</i>		1999
Excellence in Clinical Education Award <i>University of Louisville School of Medicine</i>		2000
Harold Rosegay Teaching Award <i>Department of Neurological Surgery, UCSF</i>		2004
Diane D. Ralston Teaching Award <i>Department of Neurological Surgery, UCSF</i>		2007
Top 10 abstracts <i>Congress of Neurological Surgeons</i>		2010
Journal cover featured paper <i>Neuroscience 169(4)</i>		2010
Journal cover featured paper <i>J Neurosurg 112(3)</i>		2010
Journal cover featured paper <i>Neurosurgery 70(1 Suppl Operative)</i>		2012
Harold Rosegay Teaching Award <i>Department of Neurological Surgery, UCSF</i>		2013
Alumni Achievement Award <i>Arizona State University</i>		2014
Honoree, MovingDay® <i>National Parkinson Foundation</i>		2015
Excellence in Teaching Award <i>Haile T. Debas Academy of Medical Educators, UCSF</i>		2015
Top 5 most highly cited paper 2014-16 <i>Elsevier Clinical Neurology and Neurosurgery</i>		2016

Best Oral Presentation in Clinical Science, 18 th Biennial Meeting <i>World Society for Stereotactic and Functional Neurosurgery</i>	2019
Top Downloaded Paper 2018-2019 <i>Annals of Neurology</i>	2020
Harold Rosegay Teaching Award <i>Department of Neurological Surgery, UCSF</i>	2021
Journal cover featured paper <i>Neurology January 4, 2022</i>	2022

SERVICE AND OUTREACH

LOCAL/STATE SERVICE

Kentucky Organ Donor Affiliates Steering Committee <i>Louisville, KY</i>	1998-2000
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NATIONAL/INTERNATIONAL SERVICE

Intraoperative MRI Clinical Investigators Program Steering Committee <i>General Electric & University of Leipzig (Germany)</i>	1999
Congress of Neurological Surgeons Sergeant at Arms	1999
Steering Committee, International Workshop on 3D Imaging and Virtual Endoscopy <i>University of Essen (Germany) & University of Parma (Italy)</i>	2000-2001
Council of State Neurosurgical Societies Resident Delegate, Southeast Quadrant	2000-2001
The Movement Disorder Society Neurosurgery Task Force/SIG	2004-present
American Society for Stereotactic and Functional Neurosurgery Abstract Selection Committee	2006
American Society for Stereotactic and Functional Neurosurgery Executive Council	2006-2010
American Society for Stereotactic and Functional Neurosurgery Webmaster	2006-2010
American Society for Stereotactic and Functional Neurosurgery Moderator	2008
Congress of Neurological Surgeons IML Technology Moderator	2008
Grant Reviewer <i>Volkswagen Stiftung (Germany)</i>	2008
Grant Reviewer <i>Michael J. Fox Foundation</i>	2008, 2013

Grant Reviewer <i>Fondation pour la Recherche Medicale (France)</i>		2008, 2019
Congress of Neurological Surgeons	Abstract Selection Committee	2009
American Assn of Neurological Surgeons	Abstract Selection Committee	2009
AANS/CNS	Joint AANS/CNS Guidelines Committee	2009-2012
American Society for Stereotactic and Functional Neurosurgery	Moderator	2010
Society of Neurological Surgeons	PGY-1 Boot Camp Instructor	2011-2019
American Assn of Neurological Surgeons	Abstract Selection Committee	2011
Central Surgical Targeting Reviewer, CERE 120-09 AAV-Neurturin Trial <i>Ceregene, Inc.</i>		2011
Panelist, Agency for Healthcare Research and Quality <i>Rockville, MD</i>		2011
Advisory Board <i>Alpha Omega, Inc.</i>		2012-2017
Grant Reviewer <i>American Cancer Society</i>		2012
American Society for Stereotactic and Functional Neurosurgery	Abstract Selection Committee	2013
Grant Reviewer <i>Israeli Ministry of Science and Technology</i>		2013
National Football League	Unaffiliated Neurotrauma Consultant	2013-2014
Data Safety Monitoring Board, AAV-GDNF Trial <i>National Institute of Health</i>		2013-2019
American Assn of Neurological Surgeons	Abstract Selection Committee	2014
Congress of Neurological Surgeons	Practical Courses & Symposia Committee	2016
Movement Disorders Therapies Executive Advisory Board <i>Abbott</i>		2016-2020
Data Safety Monitoring Board, Cortical Recording in PD <i>DARPA/Department of Defense</i>		2016-2021
China Forum on Functional Neurosurgery <i>Beijing, China</i>	Plenary Session Moderator	2017

Grant Reviewer <i>Barrow Neurological Foundation/Dignity Health</i>	2017
Invited Guest, Scientific Advisory Board <i>Switch Bio</i>	2017
Surgical Advisory Board <i>Galvani Bioelectronics</i>	2017-2021
Steering Committee, Restore-1 Clinical Trial <i>Voyager Therapeutics</i>	2017-2020
Resident Courses Subcommittee <i>Society of Neurological Surgeons</i>	2017-2021
Chair Surgical Core, Restore-1 Clinical Trial <i>Voyager Therapeutics</i>	2018-2020
Scientific Advisory Board <i>Cellular Dynamics International</i>	2018-2020
Biotechnology Advisory Board <i>Arizona State University</i>	2018-present
Neurosurgical Consultant <i>Huntington Study Group</i>	2018-present
Medical Advisor <i>Verily</i>	2018-2021
Restore-1 Trial Investigator Workshops Facilitator <i>Voyager Therapeutics</i>	2018-2019
Consultant <i>Neurocrine Biosciences</i>	2019
Chair, Gene Therapy for PD European Advisory Board <i>Neurocrine Biosciences</i>	2019
Grant Reviewer <i>The Netherlands Organization for Health, Research and Development</i>	2019
Consultant <i>4Bio Capital</i>	2019-2020
Medical Advisory Board <i>AiM Medical Robotics</i>	2019-2020
Consultant <i>Brain Neurotherapy Bio</i>	2019-2020
PGY-2 Boot Camp Instructor <i>Society of Neurological Surgeons</i>	2019-present

Advisory Board <i>Sio Gene Therapies</i>	2019-present
Consultant <i>Aspen Neuroscience</i>	2019-present
Consultant <i>Corlieve</i>	2020-2022
Consultant <i>Sanofi</i>	2020-present
Data Safety Monitoring Board <i>Kolon Life Sciences</i>	2020-present
Advisory Board <i>Biogen</i>	2021-present
Consultant <i>BlueRock</i>	2021-present
Data Safety Monitoring Board <i>Galvani Bioelectronics</i>	2021-present
Consultant <i>BrainXell</i>	2021-present
Consultant <i>Passage Bio</i>	2021-present
Co-Chair, Neurosurgery SIG <i>Movement Disorders Society</i>	2021-present
Consultant <i>AviadoBio</i>	2022-present
Grant Reviewer <i>LifeArc Fund, London, UK</i>	2022
Diversity, Equity and Inclusion Committee Member <i>American Society for Stereotactic and Functional Neurosurgery</i>	2022-present
Consultant <i>RYNE Biotech</i>	2022-present
Consultant <i>Sana Biotechnology</i>	2022-present
Consultant <i>Sunovion</i>	2022-present

Consultant <i>AskBio</i>	2022-present
Consultant <i>Tune Therapeutics</i>	2022-present
Consultant <i>EpilepsyGTx</i>	2022-present
Consultant <i>VectorY</i>	2022-present
Study Section Reviewer <i>NIH/NINDS</i>	2023

DEPARTMENT/COLLEGE SERVICE (BY INSTITUTION)

UNIVERSITY OF LOUISVILLE

Critical Care Performance Improvement Team <i>University of Louisville College of Medicine</i>	1997-1999
Internal Residency Review Committee <i>Department of Neurosurgery, Univ of Louisville</i>	1998
Internal Residency Review Committee <i>Department of Neurology, Univ of Louisville</i>	1999
Graduate Medical Education Committee <i>University of Louisville College of Medicine</i>	2000-2001
Representative, House Staff Council <i>University of Louisville College of Medicine</i>	2000-2001

UNIVERSITY OF CALIFORNIA, SAN FRANCISCO

Credentials Committee <i>UCSF College of Medicine</i>	2005-2009
Co-Director, Resident Neuroscience Course <i>Department of Neurological Surgery, UCSF</i>	2005-2011
VA Representative, Resident Education Committee <i>Department of Neurological Surgery, UCSF</i>	2005-2019
Chair, Resident Education Committee <i>Department of Neurological Surgery, UCSF</i>	2007-2016
Neurosurgery Resident Site Director, San Francisco VA <i>Department of Neurological Surgery, UCSF</i>	2008-2021
Evaluator, Intern Surgical Skills Laboratory <i>UCSF College of Medicine</i>	2009

Faculty Search Committee, Department of Radiology <i>UCSF College of Medicine</i>	2009
Faculty Search Committee, Department of Neurological Surgery <i>UCSF College of Medicine</i>	2009
Faculty Search Committee, Departments of Neurological Surgery and Psychiatry <i>UCSF College of Medicine</i>	2010
Associate Program Director <i>Department of Neurological Surgery, UCSF</i>	2011-2019
Graduate Medical Education Committee <i>UCSF College of Medicine</i>	2011-2019
Vice Chairman <i>Department of Neurological Surgery, UCSF</i>	2011-2021
Stewardship Review, Department of Surgery <i>UCSF College of Medicine</i>	2012
Chair, Faculty Search Committee, Department of Neurological Surgery <i>UCSF College of Medicine</i>	2013
Chair, Clinical Competency Committee <i>Department of Neurological Surgery, UCSF</i>	2013-2019
Stewardship Review, Department of Neurological Surgery <i>UCSF College of Medicine</i>	2014
Advisor, Medical Student Neurosurgery Interest Group <i>UCSF College of Medicine</i>	2015-2020
Residency Program Website/Social Media Liaison <i>Department of Neurological Surgery, UCSF</i>	2017-2019
Director, NSURG 130.01 CIEx VA Neurosurgery Elective, School of Medicine <i>UCSF College of Medicine</i>	2018-2021

VETERANS HEALTH ADMINISTRATION

Restraint Reduction Task Force <i>San Francisco VA Health Care System</i>	2002-2003
Root Cause Analysis Team <i>San Francisco VA Health Care System</i>	2004
Care of the Patient Functional Team <i>San Francisco VA Health Care System</i>	2003-2006
Operating Room New Item Committee <i>San Francisco VA Health Care System</i>	2003-2019

Chair, Operating Room New Item Committee <i>San Francisco VA Health Care System</i>	2007-2019
OR Committee/Surgical Work Group <i>San Francisco VA Health Care System</i>	2008-2021
Surgery Representative, Equipment Committee <i>San Francisco VA Health Care System</i>	2008-2018
Neurosurgery Representative, Stroke Team <i>San Francisco VA Health Care System</i>	2012-2021
Clinical Product Review Committee <i>San Francisco VA Health Care System</i>	2012-2013
Chief of Surgery Search Committee <i>San Francisco VA Health Care System</i>	2013-2014
PADRECC Director Search Committee <i>San Francisco VA Health Care System</i>	2018-2019
PADRECC Neurology Faculty Search Committee <i>San Francisco VA Health Care System</i>	2018-2019
OR-ICU Handover Process Design Team <i>San Francisco VA Health Care System</i>	2019
Root Cause Analysis Team <i>San Francisco VA Health Care System</i>	2020
Chief of Neurology Search Committee <i>San Francisco VA Health Care System</i>	2020-2021

UNIVERSITY OF ARIZONA

Neurosurgery Resident Site Director, Southern Arizona VA <i>Department of Neurosurgery</i>	2021-present
Medical Student Applicant Interviewer <i>College of Medicine</i>	2021-present
Promotion and Tenure Committee <i>Department of Neurosurgery</i>	2022-present
Neurosurgery Chair Search Committee <i>College of Medicine</i>	2022-2023

MEMBERSHIPS

Congress of Neurological Surgeons	2001-2018
AANS-CNS Joint Section on Stereotactic and Functional Neurosurgery	2001-present

American Society for Stereotactic and Functional Neurosurgery	2001-present
World Society of Stereotactic and Functional Neurosurgery	2001-present
The Movement Disorder Society	2004-present
American Association of Neurological Surgeons	2008-present
Society of Neurological Surgeons	2013-present

PROFESSIONAL PUBLICATIONS - EDITORIAL BOARDS

<i>NeuroMapping & Therapeutics</i>	2010-2020
<i>NeuroImage: Clinical</i>	2012-2021
<i>Neurosurgery</i> (Associate Editor for Psychiatry and Movement Disorders)	2009-2014
<i>Neurosurgical Focus</i> (Lead Topic Editor)	2020

PROFESSIONAL PUBLICATIONS - REVIEWER

Neurotherapeutics
Neuropsychiatric Disease and Treatment
Parkinsonism and Related Disorders
Journal of Neurosurgical Anesthesiology
The International Journal of Neuroscience
Journal of Neuro-Oncology
Journal of Neuroscience Methods
Surgical Neurology International
PLOS One
Neurosurgery
Frontiers in Human Neuroscience
Audiology & Neurotology
Neuromodulation
Clinical Neurology and Neurosurgery
Nature – Scientific Reports
Current Medical Research & Opinion
Journal of Parkinson’s Disease
Neurosurgical Focus
Stereotactic and Functional Neurosurgery
Expert Review of Neurotherapeutics

PUBLICATIONS AND CREATIVE ACTIVITY

SCHOLARLY BOOKS AND MONOGRAPHS

1. Starr PA, Barbaro N, & **Larson PS** (Eds.). (2008). *Functional Neurosurgery, 2/E*. New York: Thieme Medical Publishers.
2. Lim D, & **Larson PS** (Guest Eds.) (2009). *Intraoperative MRI in Functional Neurosurgery*. Neurosurgical Clinics of North America. New York: Elsevier.
3. **Larson PS**, Starr PA & Martin AJ (2012). *Interventional MRI-Guided DBS: A Practical Atlas*. Version 1.0, Apple Bookstore.
4. **Larson PS**, Starr PA & Martin AJ (2013). *Interventional MRI-Guided DBS: A Practical Atlas*. Version 2.1, Apple Bookstore.
5. **Larson PS**, Starr PA & Martin AJ (2016). *Interventional MRI-Guided DBS: A Practical Atlas*. Version 3.1, Apple Bookstore.

CHAPTERS IN SCHOLARLY BOOKS AND MONOGRAPHS

1. Starr PA, Martin AJ, Talke P, Ostrem J, Sootsman WK, Levesque N, Meyers J, & **Larson PS** (2007). Placement of subthalamic DBS electrodes in a radiology suite using interventional MRI. In *Proceedings of the Medtronic Forum for Neuroscience and Neuro-technology*. Berlin: Springer.
2. **Larson PS** (2008). Technical alternatives in performing DBS implantation. In D Tarsy, JL Vitek, PA Starr, & MS Okun (Eds.), *Deep Brain Stimulation in Neurological and Psychiatric Disorders*. New Jersey: The Humana Press.
3. Starr PA, Martin AJ, **Larson PS** (2010). Implantation of deep brain stimulator electrodes using interventional MRI. In WA Hall, C Nimsky & CL Truwit (Eds.), *Intra-Operative MRI-Guided Neurosurgery*. New York: Thieme Medical Publishers.
4. **Larson PS**, Martin AJ (2011). Safety concerns and limitations. In JE Arle & JL Shils (Eds.), *Essential Neuromodulation*. London, UK: Academic Press.
5. **Larson PS**, Starr PA (2012). Deep brain stimulation for intractable psychiatric illness. In A Quinones-Hinojosa (Ed.), *Schmidek & Sweet Operative Neurosurgical Techniques, 6th Edition*. Philadelphia: Elsevier Saunders.
6. **Larson PS** (2015). New techniques for deep brain stimulation lead implantation. In WJ Marks Jr. (Ed.), *Deep Brain Stimulation Management, 2nd Edition*. Cambridge, UK: Cambridge University Press.
7. **Larson PS** (Functional Section Ed.) (2016). In R Jandial, M Aizenberg & M Chen (Eds.), *100 Case Reviews in Neurosurgery, 1st Edition*. New York: Elsevier.
8. Panov F, **Larson PS**, Martin AJ, Starr PA (2016). Deep brain stimulation for Parkinson's Disease. In HR Winn (Ed.), *Youmans Neurological Surgery, 7th Edition*. New York: Elsevier.
9. **Larson PS**, Starr PA, Martin AJ (2018). Interventional MRI-guided deep brain stimulator implantation. In R Gross & N Boulis (Eds.), *Neurosurgical Operative Atlas: Functional Neurosurgery, 3rd Edition*. New York: Thieme.
10. Wharen RE, Kall, BA, Grewal SS, **Larson PS**, Uitti RJ (2018). Ablative procedures for movement disorders. In R Gross & N Boulis (Eds.), *Neurosurgical Operative Atlas: Functional Neurosurgery, 3rd Edition*. New York: Thieme.

11. **Larson PS**, Starr PA, Martin AJ (2018). Deep brain stimulation: Interventional and intraoperative MRI approaches. In A Niranjana, L Lunsford & R Richardson (Eds.), *Current Concepts in Movement Disorder Management*. Basel: Karger.
12. **Larson PS**, Levin E, Starr PA. Deep brain stimulation of the globus pallidus for Parkinson's disease. In G Samandouras (Ed.), *Masters of Neurosurgery* (in press).
13. Richardson RM, **Larson PS** (2019). Clinical methods of nervous system drug delivery for neurodegenerative disorders. In R Lonser, M Sarntinoranont & K Bankiewicz (Eds.), *Nervous System Drug Delivery: Principles and Practice*. Atlanta: Elsevier.
14. Panov F, Conner A, **Larson P**, Martin A, Starr P. Deep brain stimulation for Parkinson's disease. In HR Winn (Ed.), *Youmans Neurological Surgery, 8th Edition*. New York: Elsevier (in press).
15. Afshari M, Ostrem JL, Luciano MS, **Larson PS** (2020). Rescue Ventral Intermediate Thalamus Deep Brain Stimulation to Address Refractory Tremor Following Subthalamic Nucleus Deep Brain Stimulation with Brittle Dyskinesia. In S. Chitnis, P. Khemani & MS Okun (Eds.), *Deep Brain Stimulation*. New York: Oxford University Press.

REFEREED JOURNAL ARTICLES

h-index = 45

i10-index = 77

Citations = 11,350+

1. Bloedel JR, Bracha V, **Larson PS**: Real time operations of the cerebellar cortex. *Can J Neurol Sci* 20(3):7-18, May 1993. PMID: 8334594
2. Timmann D, Shimanski Y, **Larson PS**, Wunderlich DA, Stelmach GE, Bloedel JR: Visuomotor learning in cerebellar patients. *Behav Brain Res* 81:99-113, Nov 1996. PMID: 8950006
3. **Larson PS**, Christiano JA Jr, Raque GH, Shields CB: Emergency magnetic resonance imaging of cervical spinal cord injuries: clinical correlation and prognosis. *Neurosurgery* 45(4):956-7, Oct 1999. PMID: 10515498
4. Eldeib A, Farag A, **Larson P**, Moriarty T: A stereovision technique for image-guided neurosurgery. *Int Congr Ser – Excerpta Med* 1214:173-78, 2000. ISSN: 0531-5131, Unique ID 105426089
5. **Larson PS**, Reisner A, Morassutti DJ, Abdulhadi B, Harpring JE: Traumatic intracranial aneurysms. *Neurosurg Focus* 8(1):e4, Jan 2000. PMID: 16906700
6. Moriarty TM, Quinones-Hinojosa A, **Larson PS**, Alexander E III, Gleason PL, Schwartz RB, Jolesz FA, Black PM: Frameless stereotactic neurosurgery using intraoperative magnetic resonance imaging: stereotactic brain biopsy. *Neurosurgery* 47(5):1138-1145, Nov 2000. PMID: 11063107
7. Papavassiliou E, Rau G, Heath S, Abosch A, Barbaro NM, **Larson PS**, Lamborn K, Starr PA: Thalamic deep brain stimulation for essential tremor: relation of lead location to outcome. *Neurosurgery* 54(5):1120-1129, May 2004. PMID: 15113466
8. Martin AJ, **Larson PS**, Ostrem JL, Sootsman WK, Talke P, Weber OM, Levesque N, Meyers J, Starr PA: Placement of deep brain stimulator electrodes using real-time high-field interventional magnetic resonance imaging. *Magn Reson Med* 54(5):1107-14, Nov 2005. PMID: 16206144
9. **Larson PS**, Richardson RM, Starr PA, Martin AJ: Magnetic resonance imaging of implanted deep brain stimulators: experience in a large series. *Stereotact Funct Neurosurg* 86(2):92-100, 2008. Epub 12 Dec 2007. PMID: 18073522
10. **Larson PS**: Deep brain stimulation for psychiatric disorders. *Neurotherapeutics* 5(1):50-58, Jan 2008. PMID: 18164483
11. Sillay K, **Larson PS**, Starr PA: Deep brain stimulator hardware infections: incidence and management in a large series. *Neurosurgery* 62(2):360-6, Feb 2008. PMID: 18382313

12. Papavassiliou E, Rau G, Heath S, Abosch A, Barbaro NM, **Larson PS**, Lamborn K, Starr PA. Thalamic deep brain stimulation for essential tremor: relation of lead location to outcome. *Neurosurgery* 62(Suppl 2):884-94, Feb 2008. PMID: 18596419
13. Martin AJ, Hall WA, Roark C, Starr PA, **Larson PS**, Truwit CL: Minimally invasive precision brain access using prospective stereotaxy and a trajectory guide. *J Magn Reson Imaging* 27(4):737-43, Apr 2008. PMID: 18383266
14. Marks WJ, Ostrem JL, Verhagen L, Starr PA, **Larson PS**, Bakay RA, Taylor R, Cahn-Weiner D, Stoessel AJ, Olanow CW, Bartus RT: Safety and tolerability of intraputamin delivery of CERE-120 (adeno-associated virus serotype 2-neurturin) to patients with idiopathic Parkinson's disease: an open-label, phase I trial. *Lancet Neurol* 7(5):400-8, 2008. Epub 2 Apr 2008. PMID: 18387850
15. Eberling JL, Jagust WJ, Christine CW, Starr P, **Larson P**, Bankiewicz KS, Aminoff MJ: Results from a phase I clinical trial of hAADC gene therapy for Parkinson's disease. *Neurology* 70(21):1980-3, 2008. Epub 9 Apr 2008. PMID: 18401019
16. Richardson RM, **Larson PS**, Bankiewicz KS. Gene and cell delivery to the degenerated striatum: status of preclinical efforts in primate models. *Neurosurgery* 63(4):629-442, Oct 2008. PMID: 18981876
17. Martin AJ, **Larson PS**, Ostrem JL, Starr PA. Interventional magnetic resonance guidance of deep brain stimulator implantation for Parkinson disease. *Top Magn Reson Imaging* 19(4):213-221, Jan 2009. PMID: 19148038
18. Weaver F, Follett K, Stern M, Hur K, Harris C, Marks WJ Jr, Rothlind J, Sagher O, Reda D, Moy CS, Pahwa R, Burchiel K, Hogarth P, Lai EC, Duda JE, Holloway K, Samii A, Horn S, Bronstein J, Stoner G, Heemskerk J, Huang GD, **CSP 468 Study Group**. Bilateral deep brain stimulation vs best medical therapy for patients with advanced Parkinson disease: a randomized controlled trial. *JAMA* 301(1):63-73, Jan 2009. PMID: 19126811
19. Glass GA, Ku S, Ostrem JL, Heath S, **Larson PS**. Fluoroscopic EMG-guided injection of botulinum toxin into the longus colli for the treatment of anterocollis. *Parkinsonism Relat Disord* 15(8):610-3, 2009. Epub 27 Feb 2009. PMID: 19250855
20. Lim DA, **Larson PS**. Intraoperative MRI in functional neurosurgery. Preface. *Neurosurg Clin N Am* 20(2):Apr 2009. PMID: 19555874
21. Starr PA, Martin AJ, **Larson PS**. Implantation of deep brain stimulator electrodes using interventional MRI. *Neurosurg Clin N Am* 20(2):193-203, Apr 2009. PMID: 19555882
22. Martin AJ, Starr PA, **Larson PS**. Software requirements for interventional MR in restorative and functional neurosurgery. *Neurosurg.Clin N Am* 20(2):179-86, Apr 2009. PMID: 19555880
23. Christine CW, Starr PA, **Larson PS**, Eberling JL, Jagust WJ, Hawkins R, VanBrocklin H, Wright JF, Bankiewicz K, Aminoff MJ. Safety and tolerability of putamin AADC gene therapy for Parkinson's disease. *Neurology* 73(20):1662-9, 2009. Epub 14 Oct 2009. PMID: 19828868
24. Shimamoto SA, **Larson PS**, Ostrem JL, Glass GA, Turner RS, Starr PA. Physiological identification of the human pedunculopontine nucleus. *J Neurol Neurosurg Psychiatry* 81(1):80-6, 2010. Epub 14 Oct 2009. PMID: 19828478
25. Starr PA, Martin AJ, Ostrem JL, Talke P, Levesque N, **Larson PS**. Subthalamic nucleus deep brain stimulator placement using high field interventional magnetic resonance imaging and a skull-mounted aiming device: technique and application accuracy. *J Neurosurg* 112(3):479-90, Mar 2010. PMID: 19681683
26. Follett KA, Weaver FM, Stern M, Hur K, Harris CL, Luo P, Marks WJ Jr, Rothlind J, Sagher O, Moy C, Pahwa R, Burchiel K, Hogarth P, Lai EC, Duda JE, Holloway K, Samii A, Horn S, Bronstein JM, Stoner G, Starr PA, Simpson R, Baltuch G, De Salles A, Huang GD, Reda DJ, **CSP 468 Study**

- Group.** Pallidal versus subthalamic deep-brain stimulation for Parkinson's disease. *N Engl J Med* 362(22):2077-91, Jun 2010. PMID: 20519680
27. Cheung SW, **Larson PS.** Tinnitus modulation by deep brain stimulation in locus of caudate neurons (area LC). *Neuroscience* 169(4):1768-78, 2010. Epub 10 Jun 2010. PMID: 20541595
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100. Wu C, Nagel S, Agarwal R, Potter-Nerger M, Hamel W, Sharan A, Connolly AT, Cheeran B, **Larson P**. Reduced risk of reoperations with modern deep brain stimulator systems: big data analysis from United States claims database. *Front Neurol*. Epub 2 Dec 2021. PMID 34925219
101. Christine CW, Richardson RM, Van Laar AD, Thompson ME, Fine EM, Khwaja OS, Li C, Liang GS, Meier A, Roberts EW, Pfau ML, Rodman JR, Bankiewicz CS, **Larson PS**. Safety of AADC gene therapy for moderately advanced Parkinson disease: three-year outcomes from the PD-1101 trial. *Neurology* 98(4):e40-50, 4 Jan 2022. PMID 34649873
102. Rothlind JC, York MK, Luo P, Carlson K, Marks WJ Jr, Weaver FM, Stern M, Follett KA, Duda JE, Reda DJ, **CSP-468 Study Group**. Predictors of multi-domain cognitive decline following DBS for treatment of Parkinson's disease. *Parkinsonism Relat Disord* 95:23-27, Feb 2022. PMID 34974395
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104. Christine CW, Richardson RM, Fine EM, Khwaja OS, Liang GS, Meier A, Roberts EW, Bankiewicz K, **Larson PS**. Author response 1: Safety of AADC gene therapy for moderately advanced Parkinson disease: three-year outcomes from the PD-1101 trial. *Neurology* 99(6):259. 9 Aug 2022. PMID 35940891
105. Christine CW, Richardson RM, Fine EM, Khwaja OS, Liang GS, Meier A, Roberts EW, Bankiewicz K, **Larson PS**. Author response 2: Safety of AADC gene therapy for moderately advanced Parkinson disease: three-year outcomes from the PD-1101 trial. *Neurology* 99(6):259. 9 Aug 2022. PMID 35940892
106. Lee AT, Han KJ, Nichols N, Sudhakar VR, Burke JF, Wozny TA, Chung JE, Volz MM, Ostrem JL, Martin AJ, **Larson PS**, Starr PA, Wang DD. Targeting accuracy and clinical outcomes of awake vs asleep interventional MRI-guided deep brain stimulation for Parkinson's disease: the UCSF experience. *Neurosurgery*. Epub 7 Sept 2022. PMID 36069560
107. Mamaril-Davis JC, Gelb AW, **Larson PS**. Procedure-related complications in sham surgeries for Parkinson's Clinical Trials: a meta-analysis. *Mov Disord*. Epub 11 May 2023. PMID 37165974

REVIEW ARTICLES (NON- REFEREED)

1. **Larson PS**, Shields CB, Moriarty TM: Intraoperative MRI and image guided neurosurgery: present and future. *Innervation (Japan)* 14(9):46-49, 1999.

OTHER SCHOLARSHIP

“Deep Brain Stimulation (DBS) of the area LC for treatment of Chronic Tinnitus”
FDA Investigational Device Exemption Number G120132, issued 2012.

CONFERENCES AND SCHOLARLY PRESENTATIONS
INTERNATIONAL

GE Clinical Investigators Steering Committee Meeting (platform speaker) <i>Leipzig, Germany</i>	May 2, 1999
St. Andrews Hospital (visiting professor) <i>Brisbane, Australia</i>	September 3-4, 2009
6 th Annual Australia/New Zealand DBS Users Meeting (honored guest) <i>Sydney, Australia</i>	September 5-6, 2009
Polish Society of Stereotactic and Functional Neurosurgery (honored guest) <i>Ustron, Poland</i>	March 4-5, 2010
Clinique de Neurochirurgie, Universite Joseph Fourier (visiting professor) <i>Grenoble, France</i>	September 15-17, 2012
Wojewodzki Szpital Brodnowski (visiting professor) <i>Warsaw, Poland</i>	May 10-11, 2013
Medtronic Procedure Solutions Meeting (invited speaker) <i>Tokyo, Japan</i>	May 26, 2013
Medtronic Symposium: Innovating in Technology (invited faculty) <i>Tokyo, Japan</i>	May 27, 2013
World Soc for Stereotactic and Functional Neurosurgery (invited speaker) <i>Tokyo, Japan</i>	May 30, 2013
Polish Neurosurgical Society and Polish-Japanese Institute of IT (honored guest) <i>Chorzow, Poland</i>	June 5-6, 2014
China Forum on Functional Neurosurgery (honored guest) <i>Beijing, China</i>	September 16-17, 2017
43 rd Annual British Columbia Neuroscience Day (P.D. Moyes Lecture) <i>Vancouver, Canada</i>	March 4, 2020
University of British Columbia (visiting professor) <i>Vancouver, Canada</i>	March 5, 2020
Gene Therapy for Neurological Disorders Europe (invited speaker) <i>Virtual</i>	July 15, 2020
European Huntington's Disease Network/SC4HD (invited speaker) <i>Bologna, Italy</i>	September 16, 2022

NATIONAL

CNS Intraoperative MRI Practical Course (invited speaker) <i>Boston, MA</i>	October 30, 1999
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UCSF Neurological Surgery Grand Rounds (invited speaker) <i>San Francisco, CA</i>	January 11, 2001
American College of Surgeons Annual Congress (invited panelist) <i>San Francisco, CA</i>	October 3, 2002
AANS Deep Brain Stimulation Practical Course (invited faculty) <i>San Diego, CA</i>	April 26, 2003
American Soc for Stereotactic and Functional Neurosurgery (plenary speaker) <i>New York, NY</i>	May 20, 2003
CNS Deep Brain Stimulation Practical Course (invited faculty) <i>Denver, CO</i>	October 18, 2003
Focus on Activa Deep Brain Stimulation Therapy (invited faculty) <i>San Francisco, CA</i>	February 7-8, 2004
Focus on Activa Deep Brain Stimulation Therapy (invited faculty) <i>Scottsdale, AZ</i>	March 6-7, 2004
General Electric Whitney Symposium (invited speaker) <i>Niskayuna, NY</i>	March 9, 2004
Focus on Activa Deep Brain Stimulation Therapy (invited faculty) <i>Oklahoma City, OK</i>	August 21-22, 2004
American Soc for Stereotactic and Functional Neurosurgery (plenary session) <i>Cleveland, OH</i>	October 1, 2004
Focus on Activa Deep Brain Stimulation Therapy (invited faculty) <i>Memphis, TN</i>	October 9-10, 2004
CNS Image Guided Neurologics (invited speaker) <i>San Francisco, CA</i>	October 19, 2004
CNS Deep Brain Stimulation Practical Course (invited faculty) <i>San Francisco, CA</i>	October 19, 2004
Focus on Activa Deep Brain Stimulation Therapy (invited faculty) <i>Minneapolis, MN</i>	December 11-12, 2004
Focus on Activa Deep Brain Stimulation Therapy (invited faculty) <i>Salt Lake City, UT</i>	January 15-16, 2005
GKF National Gamma Knife User's Meeting (invited faculty) <i>San Francisco, CA</i>	February 26, 2005
Focus on Activa Deep Brain Stimulation Therapy (invited faculty) <i>San Francisco, CA</i>	August 11-12, 2005

Medtronic Foundations DBS Course (invited faculty) <i>Minneapolis, MN</i>	August 25, 2005
Medtronic Foundations DBS Course (invited faculty) <i>Minneapolis, MN</i>	November 2, 2005
Medtronic Foundations DBS Course (invited faculty) <i>Minneapolis, MN</i>	February 28, 2006
Frameless DBS Course (invited faculty) <i>San Francisco, CA</i>	April 1, 2006
American Association of Neurological Surgeons (invited panelist) <i>San Francisco, CA</i>	April 25, 2006
Western Regional DBS Roundtable (invited moderator) <i>Newport Beach, CA</i>	August 26, 2006
American Association of Neurological Surgeons (invited panelist) <i>Washington, DC</i>	April 16, 2007
International Essential Tremor Foundation (invited speaker) <i>San Rafael, CA</i>	July 14, 2007
Neurosurgery Update in the Wine Country (faculty) <i>Napa, CA</i>	August 3, 2007
Midwest Regional DBS Roundtable (invited moderator) <i>New Orleans, LA</i>	January 12, 2008
Intraoperative Imaging Society (invited faculty) <i>Lake Tahoe, NV</i>	February 22, 2008
American Association of Neurological Surgeons (invited panelist) <i>Chicago, IL</i>	April 28, 2008
American Society of Artificial Internal Organs (plenary speaker) <i>San Francisco, CA</i>	June 21, 2008
Taylor McAdam Bell Neuroscience Symposium (invited speaker) <i>Freemont, CA</i>	June 21, 2008
The Movement Disorder Clinic of Oklahoma (visiting professor) <i>Tulsa, OK</i>	June 26-27, 2008
Society of University Neurosurgeons (invited speaker) <i>San Francisco, CA</i>	June 30, 2008
Neurosurgery Update in the Wine Country (faculty) <i>Napa, CA</i>	July 24, 2008
American Association of Neurological Surgeons (invited panelist) <i>San Diego, CA</i>	May 5, 2009

AANS SurgiVision, Inc. (keynote speaker) <i>San Diego, CA</i>	May 5, 2009
Neurosurgery Update in the Wine Country (faculty) <i>Napa, CA</i>	July 31, 2009
CNS SurgiVision, Inc. (keynote speaker) <i>New Orleans, LA</i>	October 27, 2009
VA PADRECC Parkinson's Disease Seminar (invited faculty) <i>San Francisco, CA + video to 14 national sites</i>	November 13, 2009
American Association of Neurological Surgeons (moderator and panelist) <i>Philadelphia, PA</i>	May 5, 2010
Neurosurgery Update in the Wine Country (faculty) <i>Sonoma, CA</i>	July 30, 2010
CNS Symposium – Neuromodulation: 2010 and Beyond (invited faculty) <i>San Francisco, CA</i>	October 17, 2010
CNS Digital Masters Video Theater (invited video) <i>San Francisco, CA</i>	October 18-21, 2010
Congress of Neurological Surgeons (top 10 abstracts speaker) <i>San Francisco, CA</i>	October 18, 2010
CNS SurgiVision, Inc. (keynote speaker) <i>San Francisco, CA</i>	October 18, 2010
Congress of Neurological Surgeons (invited faculty) <i>San Francisco, CA</i>	October 20, 2010
CNS Cases and Coffee with the Masters (invited faculty) <i>San Francisco, CA</i>	October 21, 2010
American Association of Neurological Surgeons (moderator) <i>Denver, CO</i>	April 11, 2011
American Association of Neurological Surgeons (invited speaker) <i>Denver, CO</i>	April 11, 2011
AANS SurgiVision, Inc. (keynote speaker) <i>Denver, CO</i>	April 11, 2011
World Congress of IBMISPS (invited faculty) <i>San Francisco, CA</i>	June 10, 2011
Neurosurgery Update in the Wine Country (faculty) <i>Napa, CA</i>	August 5, 2011

Congress of Neurological Surgeons (invited faculty) <i>Washington, DC</i>	October 5, 2011
The DBS Forum (invited faculty) <i>San Francisco, CA</i>	October 21, 2011
AANS Update on Deep Brain Stimulation (invited faculty) <i>Miami, FL</i>	April 14, 2012
American Association of Neurological Surgeons (invited faculty) <i>Miami, FL</i>	April 17, 2012
American Association of Neurological Surgeons (plenary discussant) <i>Miami, FL</i>	April 17, 2012
American Society for Stereotactic and Functional Neurosurgery (invited faculty) <i>San Francisco, CA</i>	June 3, 2012
ClearPoint Users Group Inaugural Meeting (invited moderator) <i>San Francisco, CA</i>	June 3, 2012
American Society for Stereotactic and Functional Neurosurgery (invited speaker) <i>San Francisco, CA</i>	June 5, 2012
Neurosurgery Update in the Wine Country (faculty) <i>Sonoma, CA</i>	August 3, 2012
Congress of Neurological Surgeons (invited faculty) <i>Chicago, IL</i>	October 10, 2012
ClearPoint Hands-On Course (faculty) <i>San Francisco, CA</i>	April 5-6, 2013
Shaping the Future of Deep Brain Stimulation (moderator) <i>Gainesville, FL</i>	April 12, 2013
AANS Update on Deep Brain Stimulation (invited faculty) <i>New Orleans, LA</i>	April 28, 2013
AANS Breakfast Seminar (invited faculty) <i>New Orleans, LA</i>	May 1, 2013
American Association of Neurological Surgeons (invited speaker) <i>New Orleans, LA</i>	May 1, 2013
Neurosurgery Update in the Wine Country (faculty) <i>Napa, CA</i>	August 2, 2013
CNS Symposium – The Evolution of Neuromodulation (invited faculty) <i>San Francisco, CA</i>	October 20, 2013
MRI Interventions, Inc., ClearPoint Update (speaker and moderator) <i>San Francisco, CA</i>	October 21, 2013

Congress of Neurological Surgeons (invited speaker) <i>San Francisco, CA</i>	October 23, 2013
AANS Update on Deep Brain Stimulation (invited faculty) <i>San Francisco, CA</i>	April 5, 2014
American Association of Neurological Surgeons (invited speaker) <i>San Francisco, CA</i>	April 8, 2014
University of Virginia (visiting professor) <i>Charlottesville, VA</i>	April 10-12, 2014
Neurosurgery Update in the Wine Country (faculty) <i>Napa, CA</i>	August 8, 2014
NYU School of Medicine DBS Course (invited faculty) <i>New York, NY</i>	September 12-13, 2014
Stereotactic & Functional Neurosurgery: Hands On Workshop (invited faculty) <i>Atlanta, GA</i>	November 7-9, 2014
5 th Annual ASU Neuroscience Research Symposium (keynote speaker) <i>Tempe, AZ</i>	January 8, 2015
Medtronic Advanced Therapy Consultant Training (invited faculty) <i>Tempe, AZ</i>	March 9, 2015
University of California, Los Angeles (visiting professor) <i>Los Angeles, CA</i>	March 18, 2015
Virginia Commonwealth University (visiting professor) <i>Richmond, VA</i>	April 30, 2015
AANS Update on Deep Brain Stimulation (invited faculty) <i>Washington, DC</i>	May 3, 2015
Neurosurgery Update in the Wine Country (faculty) <i>Napa, CA</i>	August 7, 2015
Congress of Neurological Surgeons Lunch and Learn (invited speaker) <i>New Orleans, LA</i>	September 28, 2015
Stereotactic & Functional Neurosurgery: Hands On Workshop (invited faculty) <i>Denver, CO</i>	November 13-15, 2015
North American Neuromodulation Society (plenary speaker) <i>Las Vegas, NV</i>	December 11, 2015
University of California, Davis (visiting professor) <i>Davis, CA</i>	January 12, 2016

Medtronic DBS Leaders Program (moderator) <i>Scottsdale, AZ</i>	January 29-30, 2016
AANS Update on Deep Brain Stimulation (invited faculty) <i>Chicago, IL</i>	April 30, 2016
Society of Neurological Surgeons (invited speaker) <i>Indianapolis, IN</i>	June 4, 2016
MRI Interventions Sponsored Luncheon, ASSFN Biennial Meeting (invited speaker) <i>Chicago, IL</i>	June 19, 2016
American Society for Stereotactic and Functional Neurosurgery (moderator) <i>Chicago, IL</i>	June 20, 2016
Medtronic Sponsored Luncheon, ASSFN Biennial Meeting (invited speaker) <i>Chicago, IL</i>	June 21, 2016
Advances in Neurosciences 8 th Annual Symposium (invited speaker) <i>Freemont, CA</i>	July 16, 2016
Neurosurgery Update in the Wine Country (faculty) <i>Napa, CA</i>	August 12, 2016
OHSU Hands-on Functional Neurosurgery Course (invited faculty) <i>Portland, OR</i>	April 5-7, 2017
AANS Update on Deep Brain Stimulation (invited faculty) <i>Los Angeles, CA</i>	April 23, 2017
American Association of Neurological Surgeons (invited speaker) <i>Los Angeles, CA</i>	April 24, 2017
Abbott Sponsored Luncheon, AANS Annual Meeting (invited faculty) <i>Los Angeles, CA</i>	April 25, 2017
Neurosurgery Update in the Wine Country (faculty) <i>Napa, CA</i>	August 4, 2017
Stereotactic & Functional Neurosurgery: Hands On Workshop (invited faculty) <i>Denver, CO</i>	November 10-12, 2017
AANS Update on Deep Brain Stimulation (invited faculty) <i>New Orleans, LA</i>	April 29, 2018
American Society for Stereotactic and Functional Neurosurgery (course director) <i>Denver, CO</i>	June 2, 2018
American Society for Stereotactic and Functional Neurosurgery (invited speaker) <i>Denver, CO</i>	June 5, 2018
Neurosurgery Update in the Wine Country (faculty) <i>Napa, CA</i>	August 3, 2018

Stereotactic & Functional Neurosurgery: Hands On Workshop (invited faculty) <i>Denver, CO</i>	November 9-11, 2018
Intraoperative Imaging Society (invited faculty) <i>Houston, TX</i>	March 16, 2019
AANS Update on Deep Brain Stimulation (invited faculty) <i>San Diego, CA</i>	April 13, 2019
American Association of Neurological Surgeons (invited speaker) <i>San Diego, CA</i>	April 15, 2019
Voyager Therapeutics Gene Therapy Symposium (moderator) <i>New York, NY</i>	June 24, 2019
World Soc for Stereotactic and Functional Neurosurgery (invited faculty) <i>New York, NY</i>	June 24, 2019
World Soc for Stereotactic and Functional Neurosurgery (plenary speaker) <i>New York, NY</i>	June 25, 2019
Neurosurgery Update in the Wine Country (faculty) <i>Sonoma, CA</i>	August 2, 2019
Congress of Neurological Surgeons (invited speaker) <i>San Francisco, CA</i>	October 19, 2019
Congress of Neurological Surgeons (invited speaker) <i>San Francisco, CA</i>	October 20, 2019
Huntington Study Group 2019: Navigating HD (plenary speaker) <i>Sacramento, CA</i>	November 8, 2019
Stereotactic & Functional Neurosurgery: Hands On Workshop (invited faculty) <i>Denver, CO</i>	November 15-17, 2019
University of Utah (visiting professor) <i>Salt Lake City, UT</i>	January 29, 2020
Abbott Sponsored Luncheon, ASSFN Biennial Meeting (invited speaker) <i>Virtual</i>	June 28, 2020
Barrow Neurological Institute Neuroscience Grand Rounds (invited speaker) <i>Phoenix, AZ</i>	September 4, 2020
Mayo Clinic Arizona Neurosurgery/ENT conference (invited speaker) <i>Phoenix, AZ</i>	February 15, 2021
Mayo Clinic Arizona Circle of Willis Teaching Conference (visiting professor) <i>Phoenix, AZ</i>	March 17, 2021

Mayo Clinic Arizona Neurosurgery Grand Rounds (visiting professor) <i>Phoenix, AZ</i>	March 19, 2021
UCSF Neurosurgery Update in the Wine Country (faculty) <i>Napa, CA</i>	July 30, 2021
Boston Scientific DBS Anatomy Workshop (faculty) <i>Seattle, WA</i>	September 25, 2021
Stereotactic & Functional Neurosurgery: Hands On Workshop (faculty) <i>Denver, CO</i>	November 12-14, 2021
Deep Brain Stimulation (faculty) <i>Boston Scientific Webinar</i>	September 25, 2021
Gene Therapy for Neurodegenerative Disorders (faculty) <i>Boston, MA</i>	December 8, 2021
Deep Brain Stimulation: Fact or Fiction (faculty) <i>Medtronic Webinar</i>	January 6, 2022
Biological Approaches to Surgical Treatment of Parkinson's (faculty) <i>PMD Alliance Webinar</i>	January 7, 2022
Surgical Treatment for Parkinson's disease (faculty) <i>Boston Scientific Webinar</i>	February 22, 2022
Inaugural ClearPoint Champions Hour (faculty) <i>ClearPoint Webinar</i>	March 30, 2022
Inaugural ClearPoint Resident/Fellows Course (faculty) <i>Solana Beach, CA</i>	April 1-3, 2022
Medtronic DBS Leaders Forum (faculty and moderator) <i>Scottsdale, AZ</i>	May 13, 2022
American Society for Stereotactic and Functional Neurosurgery (invited speaker) <i>Atlanta, GA</i>	June 7, 2022
ASU-Banner Neurodegenerative Disease Research Conference (invited speaker) <i>Tempe, AZ</i>	October 25, 2022
Stereotactic & Functional Neurosurgery: Hands On Workshop (invited faculty) <i>Denver, CO</i>	November 11, 2022
Data-Driven Evolution of MRI-Guided Delivery(faculty) <i>ClearPoint Webinar</i>	November 28, 2022
Neurorestorative Group, Hope Center, Washington University (invited speaker) <i>St Louis, MO</i>	January 4, 2023

REGIONAL AND OTHER INVITED PRESENTATIONS

Univ of Louisville 7 th Annual International Medical Conference (invited speaker) <i>Louisville, KY</i>	May 17, 1999
Kentucky-Indiana Society of Radiology Technologists (invited speaker) <i>Louisville, KY</i>	March 6, 2000
Univ of Louisville Department of Anesthesia Grand Rounds (invited speaker) <i>Louisville, KY</i>	March 14, 2000
Kentucky Association of Surgical Technologists (invited speaker) <i>Louisville, KY</i>	March 3, 2001
Daly City Parkinson's Support Group (invited speaker) <i>Daly City, CA</i>	March 4, 2003
Santa Rosa Parkinson's Disease Support Group (invited speaker) <i>Santa Rosa, CA</i>	April 5, 2003
Magnolia Peninsula Support Group (invited speaker) <i>Millbrae, CA</i>	April 10, 2003
San Francisco Parkinson's Disease Support Group (invited speaker) <i>San Francisco, CA</i>	June 17, 2003
North Bay Neurology Dinner Program (invited speaker) <i>Santa Rosa, CA</i>	November 20, 2003
Medtronic Deep Brain Stimulation Patient Symposium (invited speaker) <i>Petaluma, CA</i>	November 20, 2004
Mill Valley Parkinson's Support Group (invited speaker) <i>Mill Valley, CA</i>	November 23, 2004
San Francisco Parkinson's Support Group (invited speaker) <i>San Francisco, CA</i>	April 21, 2005
Sonoma Valley Parkinson's Support Group (invited speaker) <i>Santa Rosa, CA</i>	August 6, 2005
Santa Rosa Memorial Hospital Grand Rounds (invited speaker) <i>Santa Rosa, CA</i>	October 28, 2005
Marin General Hospital Grand Rounds (invited speaker) <i>Greenbrae, CA</i>	December 6, 2005
Good Samaritan Hospital Grand Rounds (invited speaker) <i>San Jose, CA</i>	January 3, 2007
Medtronic DBS Patient Education Seminar (invited speaker) <i>Berkeley, CA</i>	October 11, 2007

Parkinson Association of Northern California (invited speaker) <i>Sacramento, CA</i>	October 19, 2007
San Francisco Neurological Society (invited speaker) <i>Monterey, CA</i>	March 15, 2008
Parkinson Association of Northern California (invited speaker) <i>Sacramento, CA</i>	September 13, 2008
UCSF Department of Psychiatry Grand Rounds (invited speaker) <i>San Francisco, CA</i>	September 15, 2008
National Alliance on Mental Illness (invited speaker) <i>San Francisco, CA</i>	February 18, 2009
Parkinson Association of Northern California (invited speaker) <i>Napa, CA</i>	July 30, 2009
Medtronic DBS for OCD Physician Dinner (invited speaker) <i>San Francisco, CA</i>	August 13, 2009
UCSF Conference on Parkinson's Disease (invited speaker) <i>San Francisco, CA</i>	November 14, 2009
International Essential Tremor Foundation (invited speaker) <i>Walnut Creek, CA</i>	March 20, 2010
Medtronic DBS for OCD Physician Dinner (invited speaker) <i>Oakland, CA</i>	June 7, 2010
Santa Rosa Memorial Hospital Grand Rounds (invited speaker) <i>Santa Rosa, CA</i>	July 23, 2010
Parkinson Association of Northern California (invited speaker) <i>Rohnert Park, CA</i>	November 13, 2010
Medtronic DBS for OCD Physician Dinner (invited speaker) <i>Walnut Creek, CA</i>	December 16, 2010
California Association of Neurological Surgeons (invited discussant) <i>San Francisco, CA</i>	January 15, 2011
Medtronic DBS for OCD Physician Dinner (invited speaker) <i>Sacramento, CA</i>	March 14, 2011
UCSF Department of Psychiatry Grand Rounds (invited speaker) <i>San Francisco, CA</i>	April 25, 2011
SFVA Department of Psychiatry Grand Rounds (invited speaker) <i>San Francisco, CA</i>	September 2, 2011
UCSF Conference on Parkinson's Disease (invited speaker) <i>San Francisco, CA</i>	November 12, 2011

East Bay/IETF Essential Tremor Support Group (invited speaker) <i>San Ramon, CA</i>	January 21, 2012
Sequoia Hospital Grand Rounds (invited speaker) <i>Redwood City, CA</i>	February 14, 2012
Skyline College Honors Biology (invited lecturer) <i>San Bruno, CA</i>	March 2, 2012
Novato Community Hospital Grand Rounds (invited speaker) <i>Novato, CA</i>	March 12, 2012
San Francisco Parkinson's Support Group (invited speaker) <i>San Francisco, CA</i>	July 12, 2012
Skyline College Honors Biology (invited lecturer) <i>San Bruno, CA</i>	March 1, 2013
The Parkinson's Institute (invited speaker) <i>Sunnyvale, CA</i>	March 6, 2013
Medtronic Surgery for Parkinson's Physician Dinner (invited speaker) <i>Berkeley, CA</i>	March 13, 2014
Department of Medicine Grand Rounds, VA Medical Center (invited speaker) <i>San Francisco, CA</i>	March 25, 2014
San Francisco Parkinson's Support Group (invited speaker) <i>San Francisco, CA</i>	November 13, 2014
Parkinson's Support Group of Sonoma County (invited speaker) <i>Santa Rosa, CA</i>	April 4, 2015
VA Research Week Special Symposium (invited speaker) <i>San Francisco, CA</i>	May 21, 2015
California Association of Nurse Practitioners (invited speaker) <i>Oakland, CA</i>	June 17, 2015
St. Francis Hospital Grand Rounds (invited speaker) <i>San Francisco, CA</i>	March 1, 2016
UCSF Fresno Neuroscience Grand Rounds (invited speaker) <i>Fresno, CA</i>	March 23, 2017
Parkinson's Support Group of Sonoma County (invited speaker) <i>Santa Rosa, CA</i>	November 4, 2017
Young Onset Parkinson's Support Group (invited speaker) <i>San Francisco, CA</i>	November 6, 2018

Marin Parkinson's Support Group (invited speaker) <i>Mill Valley, CA</i>	February 22, 2019
Young Onset Parkinson's Support Group (invited speaker) <i>San Francisco, CA</i>	March 2, 2021
Northwest Parkinson's Support Group (invited speaker) <i>Oro Valley, AZ</i>	September 28, 2021
Neuroscience Grand Rounds, University of Arizona (invited speaker) <i>Tucson, AZ</i>	October 1, 2021
Parkinson's Support Group of Green Valley (invited speaker) <i>Green Valley, AZ</i>	October 1, 2021
Biomedical Engineering Seminar, University of Arizona (invited speaker) <i>Tucson, AZ</i>	October 4, 2021
Saddlebrooke Parkinson's Support Group (invited speaker) <i>Saddlebrooke, AZ</i>	February 17, 2022
Boston Scientific Neuroanatomy and DBS Programming (faculty) <i>Tucson, AZ</i>	April 30, 2022
PWR! Wellness Series (invited speaker) <i>Webinar</i>	May 18, 2022
PWR! Annual Parkinson's Retreat (invited speaker) <i>Scottsdale, AZ</i>	June 2, 2022
PWR! Wellness Series (invited speaker) <i>Tucson, AZ and Webinar</i>	September 21, 2022
Arizona Neurosurgical Society (invited speaker) <i>Phoenix, AZ</i>	September 24, 2022
Neuroscience Grand Rounds, University of Arizona (invited speaker) <i>Tucson, AZ</i>	October 14, 2022
AZ Neurosurgery and Neurology Student Conference (invited speaker) <i>Tucson, AZ</i>	March 4, 2023
Saddlebrooke Parkinson's Support Group (invited speaker) <i>Saddlebrooke, AZ</i>	March 10, 2023
Tucson Jewish Community Center PD event (invited speaker) <i>Tucson, AZ</i>	April 3, 2023

TEACHING AND MENTORING
PREDOCTORAL STUDENTS SUPERVISED OR MENTORED

Dates	Name	Program or School	Role	Last Known Position
2002-2003	Gabriel Zada, MS III	Longitudinal Clinical Experience, UCSF School of Medicine	Mentored	Associate Professor, USC
2003-2004	Matt Potts, MS III	Longitudinal Clinical Experience, UCSF School of Medicine	Mentored	Asst Prof, Northwestern
2003-2004	Brian J. Baker, MS III	Longitudinal Clinical Experience, UCSF School of Medicine	<i>Supervised</i>	ER Medicine, New York
2004-2005	Jonathan Rosenson, MS III	Longitudinal Clinical Experience, UCSF School of Medicine	<i>Supervised</i>	ER Medicine, Berkeley, CA
2004-2005	Jason Cheng, MS III	Longitudinal Clinical Experience, UCSF School of Medicine	Mentored	Priv Practice, Oakland, CA
2005	Michael Ivan, MS II	Summer Research Volunteer Univ Medicine and Dentistry NJ	Mentored	Asst Prof, U of Miami
2005-2006	Maria Carolina-Court, MS III	Longitudinal Clinical Experience, UCSF School of Medicine	<i>Supervised</i>	Family Practice, San Diego, CA
2005-2006	Catherine Chan Christie, MS III	Longitudinal Clinical Experience, UCSF School of Medicine	Mentored	Priv Practice, New Jersey
2006-2007	Chris Potter, MS III	Longitudinal Clinical Experience, UCSF School of Medicine	<i>Supervised</i>	Radiology, U of Washington
2006-2007	Malcolm Anthony, MS III	Longitudinal Clinical Experience, UCSF School of Medicine	<i>Supervised</i>	Resident, UTH (last known)
2007-2008	Jonathan Chong, MS III	VALOR Mentoring Program, UCSF/VA Medical Center	<i>Supervised</i>	Plastic Surg, Seattle, WA
2008	Mike Tseng, MSI	OR Assist Elective, UCSF School of Medicine	<i>Supervised</i>	Orthopedics, Oakland, CA
2008-2009	Ari Kane, MSIII	Longitudinal Clinical Experience, UCSF School of Medicine	<i>Supervised</i>	Assistant Prof Rad, UCSF
2009	Laurent Menut, MSI	OR Assist Elective, UCSF School of Medicine	<i>Supervised</i>	Anesthesia, Berkeley, CA
2009-2010	Derek Southwell, MSIII	Longitudinal Clinical Experience, UCSF School of Medicine	Mentored	Asst Professor, Duke
2010	Lusine Danakian, MSI	OR Assist Elective, UCSF School of Medicine	<i>Supervised</i>	Anes, San Francisco, CA
2011	Jay Yarlagadda, MSII	Research Volunteer, Jefferson U School of Med, Philadelphia, PA	<i>Supervised</i>	Int Medicine, Antioch, CA
2011	Vivek Sudhakar	Summer Research Volunteer	Mentored	Med Student, U of Pittsburgh
2012, 2013	Nima Hejazi	Summer Research Volunteer	Mentored	Undergrad, UC Berkeley
2012-2013	Pouriya Ghayoumi, MSIII	Longitudinal Clinical Experience, UCSF School of Medicine	<i>Supervised</i>	Ortho Surgery, LA County/USC
2013	Daniel Hausrath, MSI	OR Assist Elective, UCSF School of Medicine	<i>Supervised</i>	Int Med Res, Stanford
2013-2014	Tiffany Tsai, MSIII	Longitudinal Clinical Experience, UCSF School of Medicine	<i>Supervised</i>	Int Med Res, Mass General

2013	Jeyling Chou, MSIII	PISCES Program, UCSF School of Medicine	<i>Supervised</i>	OB/GYN, Santa Clara, CA
2013-2014	Michael Khanjyan, MSI	Foundations of Patient Care, UCSF School of Medicine	<i>Supervised</i>	Radiology Res, UCSF
2014	Margaret Zhou, MSI	OR Assist Elective, UCSF School of Medicine	<i>Supervised</i>	(Unknown)
2015	Eric Foo, MSI	Foundations of Patient Care, UCSF School of Medicine	<i>Supervised</i>	Radiology Res, Stanford
2015	Caitlin Contag, MSI	OR Assist Elective, UCSF School of Medicine	<i>Supervised</i>	Int Med Res, Stanford
2015	John Ibrahim, MSI	OR Assist Elective, UCSF School of Medicine	<i>Supervised</i>	Research Fellow, UCSF
2015	Michael Diaz, MSII	Pathways to Discovery Summer Explore Program	Mentored	Neurology Res, UCSF
2016	Karsyn Bailey, MSI	Foundations of Patient Care, UCSF School of Medicine	<i>Supervised</i>	Skeletal Lab, UCSF
2016	Ugomma Eze, MSI	OR Assist Elective, UCSF School of Medicine	<i>Supervised</i>	Kriegstein Lab, UCSF
2016	Lindsey Ward, MSI	OR Assist Elective, UCSF School of Medicine	<i>Supervised</i>	MSIV
2016-2017	Karolina Plonowska, MSIII	Longitudinal Clinical Experience, UCSF School of Medicine	<i>Supervised</i>	ENT Resident, UCSF
2017	Edgar Ochoa, MSI	OR Assist Elective, UCSF School of Medicine	<i>Supervised</i>	MSIII
2017	Caleb Edwards, MSI	OR Assist Elective, UCSF School of Medicine	<i>Supervised</i>	MSIII
2017	Vivek Sudhakar	NREF Summer Fellowship	Mentored	Med Student, U of Pittsburgh
2017	Dominic Tanzillo	Summer Research Volunteer Duke University	Mentored	Undergrad, Duke Univ
2018	Alexander Aabedi, MSI	OR Assist Elective, UCSF School of Medicine	<i>Supervised</i>	MSII
2019	Joseph Garcia, MSIII	Research Volunteer, UCSF School of Medicine	<i>Supervised</i>	MSIII
2019	Enrique Vargas, MSI	OR Assist Elective, UCSF School of Medicine	<i>Supervised</i>	MSII
2019	Maria Castro, MSI	OR Assist Elective, UCSF School of Medicine	<i>Supervised</i>	MSII
2019	Luis Carrete, MSI	OR Assist Elective, UCSF School of Medicine	<i>Supervised</i>	MSII

POSTDOCTORAL FELLOWS AND RESIDENTS DIRECTLY *SUPERVISED* OR MENTORED

Dates	Name	Position	Faculty Role	Last Known Position
2001	Steven Ojemann, MD	Neurosurgical Resident	<i>Supervised</i>	Assoc Professor, Univ of Colorado
2001-2002	Philip Theodosopoulos, MD	Neurosurgical Resident	<i>Supervised</i>	Professor, UCSF
2002	Matthew Smyth, MD	Neurosurgical Resident	<i>Supervised</i>	Professor, Washington U

2002	Jay Chun, MD, PhD	Neurosurgical Resident	<i>Supervised</i>	Private Practice, New Jersey
2003	G. Edward Vates, MD, PhD	Neurosurgical Resident	<i>Supervised</i>	Professor, Univ of Rochester
2002-2003	Efstathios Papavassiliou, MD	Functional Neurosurgery Fellow	<i>Supervised</i>	Instructor, Harvard/Beth Israel Deconess
2003	Rose Du, MD, PhD	Neurosurgical Resident	<i>Supervised</i>	Professor, Brigham Women's
2003	Kurtis Auguste, MD	Neurosurgical Resident	<i>Supervised</i>	Professor, UCSF
2004	Justin Smith, MD, PhD	Neurosurgical Resident	<i>Supervised</i>	Professor, UVA
2004	Marcus Ware, MD, PhD	Neurosurgical Resident	<i>Supervised</i>	Ochsner Health, New Orleans
2004	John Chi, MD, MPH	Neurosurgical Resident	<i>Supervised</i>	Assoc Professor, Brigham/Women's
2005	Devin Binder, MD, PhD	Neurosurgical Resident	<i>Supervised</i>	Assoc Prof, UC Riverside
2005	Alfredo Quinones, MD	Neurosurgical Resident	<i>Supervised</i>	Chair, Mayo Jacksonville
2004-2005	Paul House, MD	Functional Neurosurgery Fellow	<u>Mentored</u>	Priv Practice, Salt Lake City, UT
2005	Dan Lim, MD, PhD	Neurosurgical Resident	<i>Supervised</i>	Professor, UCSF
2005-2006	Rene Sanchez-Mejia, MD	Neurosurgical Resident	<i>Supervised</i>	Scripps Clinic, La Jolla, CA
2006	Frank Acosta, MD	Neurosurgical Resident	<i>Supervised</i>	(Deceased)
2006-2007	Karl Sillay, MD	Functional Neurosurgery Fellow	<u>Mentored</u>	Priv Practice, Nashville, TN
2006	James Waldron, MD	Neurosurgical Resident	<i>Supervised</i>	Asst Prof, UT Austin
2006-2007	Dan Lu, MD, PhD	Neurosurgical Resident	<i>Supervised</i>	Professor, UCLA
2007	Nader Sanai, MD	Neurosurgical Resident	<i>Supervised</i>	BNI
2007-2008	Sepehr Sani, MD	Functional Neurosurgery Fellow	<u>Mentored</u>	Assoc Professor, Rush
2007	Edward Chang, MD	Neurosurgical Resident	<i>Supervised</i>	Professor and Chair, UCSF
2007-2008	Vincent Wang, MD, PhD	Neurosurgical Resident	<i>Supervised</i>	Asst Prof, UT Austin
2008	Isaac Yang, MD	Neurosurgical Resident	<i>Supervised</i>	Assoc Professor, UCLA
2008-2009	Michael Sughrue, MD	Neurosurgical Resident	<i>Supervised</i>	Prince of Wales, Sydney, Australia
2008-2009	R. Mark Richardson, MD, PhD	Neurosurgical Resident	<u>Mentored</u>	Assoc Professor, MGH
2009-2010	Kia Shahlaie, MD	Functional Neurosurgery Fellow	<u>Mentored</u>	Assoc Professor, UC Davis
2009	Matthew Tate, MD, PhD	Neurosurgical Resident	<i>Supervised</i>	Asst Professor, Northwestern

2009-2010	Orin Bloch, MD	Neurosurgical Resident	<i>Supervised</i>	Asst Professor, Northwestern
2010	Brian Jian, MD, PhD	Neurosurgical Resident	<i>Supervised</i>	Kaiser, Sacramento, CA
2010	Wojciech Kukier, MD	Visiting Resident, Univ of Silesia, Katowice, Poland	<i>Supervised</i>	Private Practice, Mikolow, Poland
2010	Wojciech Slusarczyk, MD	Visiting Resident, Univ of Silesia, Katowice, Poland	<i>Supervised</i>	Senior Assistant, Univ of Silesia
2010-2011	Ellen Air, MD, PhD	Functional Neurosurgery Fellow	<u>Mentored</u>	Asst Professor, Henry Ford
2010-2013	Phiroz Tarapore, MD	Neurosurgical Resident	<u>Mentored</u>	Assoc Professor, UCSF
2010-2011	Michael Oh, MD, PhD	Neurosurgical Resident	<i>Supervised</i>	Private Practice, Dallas, TX
2011	Matt Potts, MD	Neurosurgical Resident	<i>Supervised</i>	Asst Prof, Northwestern
2011	Timothy Lucas II, MD, PhD	Functional Neurosurgery Fellow	<u>Mentored</u>	Asst Prof, Univ Penn
2011-2014	Jason Cheng, MD	Neurosurgical Resident	<u>Mentored</u>	CEO, Livewell Neurosurgery
2011	Mike Ivan, MD	Neurosurgical Resident	<u>Mentored</u>	Asst Prof, U of Miami
2011-2013	Nathan Rowland, MD, PhD	Neurosurgical Resident	<u>Mentored</u>	Asst Professor, MUSC
2011-2012	Aaron Clark, MD, PhD	Neurosurgical Resident	<i>Supervised</i>	Asst Professor, UCSF
2012	Rajiv Saigal, MD, PhD	Neurosurgical Resident	<i>Supervised</i>	Asst Prof, Univ of Washington
2012-2013	Jessica Wilden, MD, PhD	Functional Neurosurgery Fellow	<u>Mentored</u>	Asst Professor, LSU
2012-2013	Jason Davies, MD, PhD	Neurosurgical Resident	<i>Supervised</i>	Asst Prof, Univ at Buffalo
2013	Seunggu Han, MD	Neurosurgical Resident	<i>Supervised</i>	Asst Prof, OHSU
2013-2014	Emily Levin, MD	Functional Neurosurgery Fellow	<u>Mentored</u>	Asst Prof, U of Michigan
2013-2017	Doris Wang, MD, PhD	Neurosurgical Resident	<u>Mentored</u>	Asst Professor, UCSF
2013-2014	Dario Englot, MD, PhD	Neurosurgical Resident	<i>Supervised</i>	Asst Professor, Vanderbilt
2014	Tene Cage, MD	Neurosurgical Resident	<i>Supervised</i>	Asst Professor, Stanford
2014-2015	Fedor Panov, MD	Functional Neurosurgery Fellow	<u>Mentored</u>	Asst Prof, Mt. Sinai, NY
2014-2017	Corinna Zygourakis, MD	Neurosurgical Resident	<u>Mentored</u>	Asst Professor, Stanford
2014	John Rolston, MD, PhD	Neurosurgical Resident	<u>Mentored</u>	Asst Prof, Brigham
2015-2016	Brian Lee, MD, PhD	Functional Neurosurgery Fellow	<u>Mentored</u>	Asst Professor, USC
2015	Joseph Osorio, MD, PhD	Neurosurgical Resident	<i>Supervised</i>	Asst Professor, UCSD

2015	Derek Southwell, MD, PhD	Neurosurgical Resident	<i>Supervised</i>	Asst Professor, Duke
2016	Jonathan Breshears, MD	Neurosurgical Resident	<i>Supervised</i>	Private Practice, Kansas City
2016	Martin Rutkowski, MD	Neurosurgical Resident	<i>Supervised</i>	Asst Professor, Augusta Univ
2016-2017	Rory Murphy, MD	Functional Neurosurgery Fellow	<i>Supervised</i>	BNI
2016-2018	Idit Tamir, MD	Functional Neurosurgery Fellow	<u>Mentored</u>	Hadassah Med Ctr, Jerusalem
2016	Stephen Magill, MD, PhD	Neurosurgical Resident	<i>Supervised</i>	Fellow, Ohio State University
2016-2017	Darryl Lau, MD	Neurosurgical Resident	<i>Supervised</i>	Fellow, Shriners Philadelphia
2017	Caleb Rutledge, MD	Neurosurgical Resident	<i>Supervised</i>	Fellow, BNI
2017	Andrew Chan, MD	Neurosurgical Resident	<i>Supervised</i>	Chief Resident
2017-2018	Michael Safaee, MD	Neurosurgical Resident	<i>Supervised</i>	Chief Resident
2018	Ethan Winkler, MD	Neurosurgical Resident	<i>Supervised</i>	Chief Resident
2018-2019	Andrew Conner, MD	Functional Neurosurgery Fellow	<u>Mentored</u>	Asst Prof, Univ of Oklahoma
2018	Taemin Oh, MD	Neurosurgical Resident	<i>Supervised</i>	Resident
2018-2019	Kunal Raygor, MD	Neurosurgical Resident	<i>Supervised</i>	Resident
2019	John Burke, MD, PhD	Neurosurgical Resident	<i>Supervised</i>	Resident
2019-2020	Max Krucoff, MD	Functional Neurosurgery Fellow	<u>Mentored</u>	Asst Prof, Med Coll Wisconsin
2019	Young Lee, MD	Neurosurgical Resident	<i>Supervised</i>	Resident
2019-2020	Justin Scheer, MD	Neurosurgical Resident	<i>Supervised</i>	Resident
2020	Ramin Morshed, MD	Neurosurgical Resident	<i>Supervised</i>	Resident
2020-2021	Ryan Kochanski, MD	Functional Neurosurgery Fellow	<u>Mentored</u>	Fellow
2020	Winward Choy, MD	Neurosurgical Resident	<i>Supervised</i>	Resident
2020-2021	Jacob Young, MD	Neurosurgical Resident	<i>Supervised</i>	Resident
2021	Alex Lu, MD	Neurosurgical Resident	<i>Supervised</i>	Resident
2021	Thomas Wozny, MD	Neurosurgical Resident	<i>Supervised</i>	Resident
2021	Neil Joshi, MD	Neurosurgical Resident	<i>Supervised</i>	Resident
2022	Andres Monserrate, MD	Neurosurgical Resident	<i>Supervised</i>	Resident
2022	Pedro Aguilar, MD	Neurosurgical Resident	<i>Supervised</i>	Resident

2022-present	Ryan Palsma, MD	Neurosurgical Resident	<i>Supervised</i>	
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FACULTY MENTORED

Dates	Name	Position while Mentored	Mentoring Role	Current Position
2007-2009	Dan Lim, MD, PhD	Assistant Professor, Neurological Surgery	Academic and Career Advisor	Professor, UCSF
2009-2010	Edward Chang, MD	Assistant Professor, Neurological Surgery	Academic and Career Advisor	Professor and Chair, UCSF
2009-2010	Maria Pease, MD	Assistant Clinical Professor, Psychiatry	Academic and Career Advisor	(Deceased)
2013-2018	Phiroz Tarapore, MD	Assistant Professor, Neurological Surgery	Academic and Career Advisor	Assoc Prof, UCSF

OTHER VISITING FACULTY MENTORED

Dates	Name	Position	Faculty Role	Current Position
2008	Seok Ho Hong, MD, PhD	Asst Professor, Neurosurgery, Univ of Ulsan, Seoul, Korea	Observership	Professor, Univ of Ulsan
2009	Yi Guo, MD	Professor, Neurosurgery, Peking Union Medical College, Beijing, China	Observership	Professor, Peking Union Medical College
2011	Stephan Chabardes, MD	Professor, Universite Joseph Fourier, Grenoble, France	Observership	Professor, Univ Joseph Fourier
2014	Takashi Agari, MD	Assistant Professor, Neurosurgery, Okayama University, Okayama, Japan	Observership	Asst Professor, Okayama Univ
2018	Jonathan Reiner, MD	Neurologist, Hadassah Medical Center, Jerusalem, Israel	Observership	Neurologist, Hadassah Medical Center

MENTORING NARRATIVE

I have mentored 11 predoctoral students, 22 residents/fellows and 4 junior faculty members. In addition, I have hosted and/or supervised 5 international visiting neurosurgeons or neurologists for 1 to 3 month observerships in deep brain stimulation techniques.

TEACHING AWARDS

2000	Excellence in Clinical Education Award	University of Louisville School of Medicine
2004	Harold Rosegay Teaching Award	Department of Neurological Surgery, UCSF
2007	Diane D. Ralston Teaching Award	Department of Neurological Surgery, UCSF
2013	Harold Rosegay Teaching Award	Department of Neurological Surgery, UCSF

2015	Excellence in Teaching Award	Haile T. Debas Academy of Medical Educators, UCSF
2021	Harold Rosegay Teaching Award	Department of Neurological Surgery, UCSF

AWARDED GRANTS AND CONTRACTS
CURRENT

Voyager Therapeutics, OYA15463 (Larson PI SFVA, Christine PI UCSF) 1/10/19-9/1/23
\$308,537

Title: "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"

Description: This is a multicenter Phase II trial to study the safety and efficacy of AAV-hAADC gene therapy infusions using interventional MRI and a posterior approach to the putamen.

Role: SFVA site PI and National Surgical Core Chair

Brain Neurotherapy Bio, 135427A (Larson PI) 7/28/20-7/27/25
\$1,995,000

Title: "Open-Label Safety Study of Glial Cell Line-Derived Neurotrophic Factor Gene Transfer (AAV2-GDNF) in Parkinson's Disease"

Description: This is a phase I trial to study the safety and efficacy of AAV2-GDNF gene therapy infusions using interventional MRI to provide real-time convection enhanced delivery via a posterior approach.

Role: PI

uniQure, 134945A (Geschwind PI) 3/16/2020-3/16/2025
\$7,682,327

Title: "A Phase I/II, Randomized, Double-blind, Sham Control Study to Explore Safety, Tolerability, and Efficacy Signals of Multiple Ascending Doses of Striatically-Administered rAAV5-miHTT Total Huntingtin Gene (HTT) Lowering Therapy (AMT 130) in Early Manifest Huntington Disease"

Description: This is a first in human Phase I/II trial to study the safety and preliminary efficacy of gene therapy for Huntington's disease.

Role: Co-PI and National Neurosurgical Planning Committee

Flinn Foundation, 23-06543 (Witte PI) Preliminary 7/1/23-6/30/25
\$99,947

Title: Transcranial Acoustoelectric Imaging of Deep Brain Stimulation Currents

Description: This study aims to use proprietary 4D transcranial acoustoelectric brain imaging technologies that exploit the acoustoelectric effect to visualize current generated by deep brain stimulation electrodes and co-register these current maps to structural imaging.

Role: Co-PI

PENDING

NIH U01 (Larson PI) Pending
\$2,800,928

Title: "Phase Ib Trial of Caudate Deep Brain Stimulation for Tinnitus"

Description: This is a phase Ib follow-up to our first-in-human pilot clinical trial to investigate the use of DBS in human subjects to treat chronic, medically refractory tinnitus. This trial will use a novel method of caudate target selection using patient-specific functional connectivity mapping.

Role: PI

PAST

Voyager Therapeutics, 129845A 8/1/17-7/26/22
\$593,582

Title: "An Open-label Safety and Efficacy Study of AAV2-hAADC Administered by MRI-Guided Convective Infusion using a Posterior Trajectory into the Putamen of Participants with Parkinson's Disease with Fluctuating Responses to Levodopa"

Description: This is a Phase Ib bridging study to study the safety and efficacy of AAV-hAADC gene therapy infusions using interventional MRI and a posterior approach to the putamen.

Role: PI

Michael J. Fox Foundation, A119476

4/1/2012-12/31/2016

\$1,237,901

Voyager Therapeutics, 126601A

10/8/2015-12/31/2020

\$2,241,248

Title: "A Phase I Bridging Study of Adeno-Associated Virus Encoding Human Aromatic L-Amino Acid Decarboxylase (AAV2-hAADC) Administered by MRI-Guided Real-Time Convective Infusion in the Putamen of Subjects with Parkinson's Disease" – (funded initially by MJFF, then Voyager Therapeutics)

Description: This is a Phase Ib bridging trial to study the safety and efficacy of AAV-hAADC gene therapy infusions using interventional MRI to provide real-time convection enhanced delivery.

Role: PI

NIH U01, DC013029-01

4/1/2013-3/31/2019

\$3,380,211

Title: "Deep Brain Stimulation for Chronic Tinnitus"

Description: This is a pilot clinical trial to investigate the use of DBS in human subjects to treat chronic, medically refractory tinnitus. This is the first clinical trial ever performed to study the use of DBS to treat a phantom percept disorder.

Role: PI (Larson and Cheung PIs)

NIH R01, 1R01NS094292-01

7/30/15-6/30/19

\$3,404,543

Title: "An Open-label Safety and Efficacy Study of AAV2-hAADC Administered by MRI-Guided Convective Infusion Into the Midbrain in Pediatric Patients with AADC Deficiency"

Description: This is a Phase I study investigating the safety and tolerability of CED infusion in the midbrain for children with AADC deficiency, a rare congenital neurologic disorder.

Role: Co-Investigator

Neuralink

2018-2019*

**project stopped by sponsor 3/1/19*

Title: "Large Scale Brain Machine Interface in the Ovine and Porcine Model"

Description: This was a proposed animal study investigating a novel approach to BMI using an automated delivery mechanism to deliver a large number of microfiber electrodes across multiple cortical regions.

Role: PI

MRI Interventions

2013-2017

Title: "Technical Evaluation of Novel Hardware and Software Developments"

Description: This project involved both the development of hardware and software technologies to perform DBS implantation using interventional MRI.

Role: Co-PI

California Institute of Regenerative Medicine

2011-2014

Title: "Development and Preclinical Testing of New Devices for Transplantation to the Human Brain"

Description: This project involved the development and testing of hardware technologies to deliver cell transplants to the human basal ganglia.

Role: Co-Investigator

- MRI Interventions, Inc. Multiple awards 2011-2014
Title: "Interventional MRI Deep Brain Stimulator Implantation"
Description: This project involved both the development of hardware and software technologies to perform DBS implantation using interventional MRI and a clinical trial studying outcomes in Parkinson's subjects.
Role: Co-PI
- Ceregene, Inc./Michael J. Fox Foundation 2010-2013
Title: "A Phase I/II Trial Assessing the Safety and Efficacy of Bilateral Intraputaminal and Intranigral Administration of CERE-120 (Adeno-Associated Virus Serotype 2 [AAV2]-Neurturin [NTN]) in Subjects with Idiopathic Parkinson's Disease"
Description: A phase II, double blind, sham controlled clinical trial to examine the efficacy of bilateral intraputaminal and intranigral infusion of AAV-Neurturin in subjects with Parkinson's disease.
Role: Co-Investigator
- NIH/NIBIB (R21) 2009-2013
Title: "MR Guided DBS Implantation for Parkinson's Disease"
Description: This project aimed to improve STN visualization and surgical target selection in interventional MRI using diffusion tensor imaging, high field strength MRI and internal micro-MR coils.
Role: Consultant
- Advanced Neuromodulation Systems, Inc./St. Jude Medical, Inc. 2005-2012
Title: "A Clinical Evaluation of the ANS Totally Implantable Deep Brain Stimulation System for the Suppression of Tremor in the Upper Extremities of Patients With Essential Tremor"
Description: This clinical trial investigated the use of a new DBS system in human subjects with ET.
Role: Co-PI
- Ceregene, Inc./Michael J. Fox Foundation 2006-2008
Title: "A Phase II Clinical Trial of Intraatrial Injection of AAV-Neurturin for Advanced Parkinson's Disease"
Description: A phase II, double blind, sham controlled clinical trial examining the efficacy of bilateral intraputaminal infusion of AAV-Neurturin in subjects with Parkinson's disease performed at eight centers. UCSF enrolled 11 of the 56 patients in the trial.
Role: Co-Investigator
- Genzyme, Inc. (formerly Avigen, Inc.) 2005-2008
Title: "A Phase I Clinical Trial of Intraatrial Injection of AAV-AADC for Motor Fluctuations in Parkinson's Disease"
Description: A phase I clinical trial examining the safety and tolerability of bilateral intraputaminal infusion of AAV-AADC in subjects with Parkinson's disease. UCSF was the only clinical site and enrolled all 10 patients in the trial.
Role: Co-Investigator
- VA Health Administration 2001-2007
Title: "A Randomized Trial of Deep Brain Stimulation of the Globus Pallidus or Subthalamic Nucleus Versus Best Medical Therapy for Parkinson's Disease"
Description: This was a six center clinical trial studying best medical therapy vs DBS and subsequently GPi vs STN DBS in the treatment of Parkinson's disease. We enrolled 80 of the 316 patients in the trial.
Role: Co-Investigator
- Image Guided Neurologics, Inc./Medtronic, Inc. Multiple awards 2003-2007
Title: "Implantation of Deep Brain Stimulators Using Interventional MRI "

Description: This project involved the development of hardware, software and a methodology for DBS implantation using interventional MRI as well as clinical trial studying application accuracy and preliminary outcomes in Parkinson's subjects undergoing this novel procedure.

Role: Co-PI

Ceregene, Inc./Michael J. Fox Foundation

2005-2006

Title: "A Phase I Clinical Trial of Intrastratial Injection of AAV-Neurturin for Advanced Parkinson's Disease"

Description: A phase I clinical trial examining the safety and tolerability of bilateral intraputaminial infusion of AAV-Neurturin in subjects with Parkinson's disease. UCSF was the lead clinical site and enrolled 8 of the 12 patients in the trial.

Role: Co-Investigator

UCSF School of Medicine, Office of the Dean, REAC Program

2002-2003

Title: "Stimulation of Neurotransplants in a Rodent Model of Parkinson's Disease"

Description: This project involved the development of an animal model to study the effects of physiologic stimulation of fetal cell grafts in 6-OHDA rats.

Role: PI

University of California Academic Senate

2003-2004

Title: "Stimulation of Cell Transplants in Parkinson's Disease"

Description: This project involved the development of an animal model to study the effects of physiologic stimulation of fetal cell grafts in 6-OHDA rats.

Role: PI

RESEARCH PROGRAM

FIVE SIGNIFICANT PUBLICATIONS

1. Christine C, Bankiewicz K, Van Laar A, Richardson R, Ravina B, Kells A, Brendon B, Martin A, Nutt J, Thompson M, **Larson P**. MRI-guided phase 1 trial of putaminal AADC gene therapy for Parkinson's disease. *Ann Neurol*. Epub 25 Feb 2019. PMID 30802998

This paper describes the results of a phase 1b gene therapy clinical trial using AAV-AADC to treat Parkinson's disease. This was the first to use viral vector co-infused with gadoteridol to perform MRI-guided infusions in humans. I was the PI of this trial and personally involved in all aspects of study design, regulatory approval, trial performance and manuscript preparation. I was also one of three investigators that developed the surgical platform used in the trial.

2. Richardson RM, Bankiewicz KS, Christine CW, Van Laar AD, Gross RE, Lonser R, Factor SA, Kostyk SK, Kells AP, Ravina B, **Larson PS**. Data-driven evolution of neurosurgical gene therapy delivery in Parkinson's disease. *J Neurol Neurosurg Psychiatry*, Epub 30 July 2020. PMID 32732384.

This paper describes the evolution of our surgical methodology for intracranial gene therapy delivery in Parkinson's disease over the past 15 years. I have performed more intracranial gene therapy surgeries than anyone else in the world, was one of three investigators at UCSF that developed the MRI-guided platform used in six of the most recent or current gene therapy trials. I helped develop and refine the infusion techniques described in the paper along with Dr.s Krysz Bankiewicz, Mark Richardson and others. I shared responsibility for preparation of the manuscript with my co-authors.

3. Cheung SW, **Larson PS**. Tinnitus modulation by deep brain stimulation in locus of caudate neurons (area LC). *Neuroscience* 169(4):1768-78, 2010. Epub 10 Jun 2010. PMID: 20541595

This is the first paper ever to describe the use of deep brain stimulation in the caudate to modulate tinnitus. It is also the first time that the caudate nucleus has been shown to have a role in auditory perception, which is a completely novel concept in the field of basal ganglia physiology. I was the PI of the IRB protocol, designed the trial with Dr. Cheung, performed all of the surgeries in the study and collected the physiologic data. I shared responsibility for preparation of the manuscript with my co-author (SWC).

4. **Larson PS**, Cheung SW. Deep brain stimulation in area LC controllably triggers auditory phantom percepts. *Neurosurgery* 70(2):398-405, 2012. PMID: 21849922

This is the first publication ever to describe the triggering of phantom sounds in human subjects. Stimulation was performed acutely in Area LC, a subsite of the caudate nucleus that was first described in publication #2 above. The paper includes a proposed new model for the basal ganglia that accounts for these findings and explains the natural history of tinnitus. I was PI of the IRB protocol, designed the trial with Dr. Cheung, performed all of the surgeries in the study and collected the physiologic data. I shared responsibility for preparation of the manuscript with my co-author (SWC).

5. Cheung SW, Racine CA, Henderson-Sabes J, Demopoulos C, Molinaro AM, Heath S, Nagarajan SS, Bourne AL, Rietchek JE, Wang SS, **Larson PS**. Phase I trial of caudate deep brain stimulation for treatment-resistant tinnitus. *J Neurosurg*, Epub 24 Sept 2019. PMID 31553940

This paper describes the results of a first-in-human phase 1 clinical trial of bilateral Area LC DBS for the treatment of severe, treatment refractory tinnitus. Dr. Cheung and I were PIs of the trial. I was the IDE holder, performed all of the surgical procedures and shared direct responsibility with Dr. Cheung for all aspects of trial design, regulatory approval, study performance and manuscript preparation.

CURRENT RESEARCH PROGRAM

My research program focuses on three primary areas of interest:

Gene therapy for Parkinson's disease and other neurological disorders – We have been extensively involved in 11 gene therapy trials since 2004. These include the AAV-Neurturin PD program (phase 1, 2 and 2b), AAV-AADC PD pipeline (phase 1, 1b, 1c and 2), pediatric AADC deficiency trial (phase 1), AAV-GDNF for PD (phase 1b) and AAV-miHTT for HD (phase 1/2). Our group was the solo, lead or highest enrolling site in all of the trials completed to date, and we were directly involved in the development of the clinical protocols and surgical delivery methods used in all of these studies. By virtue of our participation in the planning and execution of these trials, we have become the most experienced group for intracranial gene therapy in the world.

One major limitation of early trials was the inability to monitor the infusions to ensure adequate coverage of the intended target. We received a grant in 2012 to design and perform the first ever gene therapy trial to address this shortcoming, using real time MRI-guided infusions of vector mixed with gadoteridol. The subsequent trials using AAV-AADC and AAV-GDNF were the first ever to use a posterior approach to the putamen, which has significant advantages in achieving maximal coverage of the putamen. In addition to holding leadership positions in two Parkinson's and one Huntington's national and international trials, I currently have formal development/consulting agreements for future gene therapy and cell transplantation trials with over 15 biotech companies.

Tinnitus and the role of the basal ganglia in auditory perception – This is a long-standing collaboration with Dr. Steven Cheung at UCSF on studies related to the role of the basal ganglia in auditory perception. Our early work involved acute deep brain stimulation (DBS) of the caudate in a cohort of movement disorders patients with comorbid tinnitus undergoing DBS surgery. This led to the discovery of a specific area of the caudate (area LC) that modulates tinnitus when stimulated. We subsequently discovered that acute stimulation of area LC causes triggering of phantom sounds in patients without tinnitus. These experiments provided evidence for the first time that the caudate is involved in phantom auditory perception, and led to a proposed new model for the human basal ganglia to account for these findings and explain the natural history of tinnitus. We were granted an IDE from the FDA in 2012 and received a U01 grant from the NIH (NIDCD) in 2013 for a first-in-human phase 1 clinical trial to investigate the use of DBS in patients with medically refractory tinnitus. This study was completed in late 2018. NIH grant submission for a phase 1b clinical trial with a personalized targeting methodology based on patient-specific functional imaging is currently underway.

Interventional MRI (iMRI)-guided stereotaxy – This is a completely novel method for implanting DBS electrodes that was conceived by our group at UCSF in 2003. Traditional surgical methods for DBS implantation require an awake patient and involve physiologic mapping of the brain, which results in multiple brain penetrations, longer procedures times and patient discomfort. Our group devised a technique to place DBS electrodes under general anesthesia using real-time MRI imaging; this eliminated the need for awake physiological mapping, improved accuracy and dramatically reduced operative times. We partnered with private industry to develop surgical instruments specifically designed for this procedure, and launched a first-in-humans clinical trial in Parkinson's subjects in 2004. We subsequently developed a second-generation system (ClearPoint) in collaboration with MRI Interventions that was approved by the FDA in 2010. This technique is now being used in over 50 centers in the US and Europe. ClearPoint is now the delivery platform of choice for most of the current clinical trials involving CNS delivery of biologics for neurodegenerative disorders.