

**The Faculty of Medicine of Harvard University
Curriculum Vitae**

Date Prepared: Dec 3, 2020
Name: Justin M. Brown, M.D.
Office Address: 15 Parkman Street, Wang 745, Boston, MA 02114
Home Address: 115 Draper Road, Wayland, MA 01778
Work Phone: 617-726-5687
Work Email: JMBrown@MGH.Harvard.edu
Work FAX: 617-726-7836
Place of Birth: Washington, D.C., USA

Education:

1996	B.S.	Psychology Track II: Neuroscience	Vanderbilt University
2001	M.D.	Medicine	Eastern Virginia Medical School

Postdoctoral Training:

07/01-06/02	Intern	Surgery	Baylor College of Medicine
07/02-06/07	Resident	Neurosurgery	Baylor College of Medicine
07/07-06/08	Fellow	Peripheral Nerve Surgery	Washington University School of Medicine

Faculty Academic Appointments:

08/08-04/11	Assistant Professor	Department of Neurological Surgery and Division of Plastic and Reconstructive Surgery	Washington University School of Medicine
05/11-06/15	Assistant Professor	Department of Neurological Surgery	Washington University School of Medicine
07/15-11/17	Associate Professor	Department of Neurological Surgery	UCSD School of Medicine

11/17-	Associate Professor	Department of Neurosurgery	Harvard Medical School
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Appointments at Hospitals/Affiliated Institutions:

07/07-04/11	Staff Neurosurgeon	Neurosurgery	Barnes Jewish Hospital
07/08-04/11	Staff Neurosurgeon	Neurosurgery	St. Louis Children's Hospital
04/11-10/17	Staff Neurosurgeon	Neurosurgery	Hillcrest Medical Center
04/11-10/17	Staff Neurosurgeon	Neurosurgery	Thornton Hospital/Jacob's Medical Center
07/12-10/17	Staff Neurosurgeon	Neurosurgery	Rady Children's Hospital
12/17-	Associate Neurosurgeon	Neurosurgery	Massachusetts General Hospital
03/18-	Associate Neurosurgeon	Neurosurgery	Newton-Wellesley Hospital
04/18-	Associate Neurosurgeon	Neurosurgery	Spaulding Rehabilitation Hospital

Major Administrative Leadership Positions:

Local

08/08-04/11	Associate Director, Center for Nerve Injury and Paralysis	Washington University School of Medicine
09/11-07/17	Co-Director, UCSD Paralysis Center	UCSD School of Medicine
09/11-07/17	Director, Neurosurgery Peripheral Nerve Program	UCSD School of Medicine
07/16-08/17	Associate Vice Chair of Clinical Affairs, Department of Neurosurgery	UCSD School of Medicine
11/17-	Director, Reconstructive Neurosurgery	Massachusetts General Hospital
06/18-	Director, Mass General Paralysis Center	Massachusetts General Hospital
09/19 -	Adjunct Faculty Member	MGH Institute for Health Professions
10/19 -	Adjunct Faculty Member	Harvard-MIT Health Sciences and Technology Program

Regional

09/14-07/17	Co-Director, California Paralysis Center	UCSD School of Medicine (In collaboration with <i>Rehabilitation Associates Medical Group</i> and <i>The Hand and Wrist Center</i> , Long Beach, CA)
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National

06/10-6/14	Scientific Medical Advisory Board Member	American Thoracic Outlet Syndrome Association
07/10-07/12	Advisory Board Member	Missouri Spinal Cord Injuries Research Program
8/14-11/17	Volunteer Medical Advisor	Life Beyond Boundaries Rehabilitation

Committee Service:

Local

2013-2014	Medical Ethics Committee	Member
2014-2017	Anatomical Services Committee	Member
2014-2017	UCSD Surgery Quality Improvement Review Committee	Member

Professional Societies:

2002-	American Association of Neurological Surgeons	Member
2003-	Congress of Neurological Surgeons	Member
2009-2010	Society for Neuroscience	Member
2009-2012	American Spinal Injury Association	Member
2009-2012	International Spinal Cord Society	Member
2009-2012	International Society for Motor Control	Member
2009-	AANS/CNS Section on Disorders of the Spine and Peripheral Nerve	Member
2009-2019	American Association for Hand Surgery	Affiliate Membership Committee
	2015-2018	

	2017-2018	Finance Committee
	2018-2019	Membership Committee
2009-	International Society for Restorative Neurology	
	2009-2012	President and Founding Member
	2012-	Board of Directors
2010-	American Society for Peripheral Nerve	
	2013	Coding Committee
	2014	Grants Committee
	2015	Membership Committee
	2017	Technical Exhibits Committee
	2018	International Mentor
	2019	Program Committee
2011-2014	California Neurology Society	Member
2011-2014	San Diego Neurosurgery Association	Member
2018-	Pan-African Association for Christian Surgeons (PAACS)	Neurosurgery Investigative Task Force
2019-	Brachial Plexus International School	Affiliate Faculty
2019-2021	CNS/AANS Peripheral Nerve Task Force	Secretary/Treasurer

Editorial Activities:

Ad hoc Reviewer

Muscle and Nerve
Audiology and Neurotology
Clinical Neurology and Neurosurgery

Other Editorial Roles

2012	Guest Editor	Clinical Neurology and Neurosurgery
2014	Guest Editor	Clinical Neurology and Neurosurgery
2017	Guest Editor	Neurosurgical Focus

Honors and Prizes:

1995	Psi Chi	National Honor Society in Psychology
2001	Alpha Omega Alpha	Honor Medical Society
2007	Young Investigator Award	2 nd Congress of the International Society for Reconstructive Neurosurgery

2009	Sanford Larson Research Award	AANS/CNS Section on Disorders of the Spine and Peripheral Nerves for “Objective Quantification of Postural Correlates of Multilevel Nerve Compression”.
2014	Best Abstract	American Urological Association National Conference

Report of Funded and Unfunded Projects

Funding Information:

Past

2011	“Spinal Cord and Nerve Injury Research Award” Barnes Jewish Hospital Foundation Grant PI. Private grant to promote the development of nerve transfers to restore function following neuro-trauma.
2009-2010	“Comprehensive Resource for the Management of Peripheral Nerve Trauma” Department of Defense and Henry M. Jackson Foundation for the Advancement of Military Medicine, Award No. MDA 905-02-2-0007 Co-Investigator. PI Susan Mackinnon, MD This initiated the development of a comprehensive website that now exists at Washington University in St. Louis which serves as an on line educational resource to describe examination, surgical anatomy, and how-to videos of surgical procedures.
2009	“Objective Quantification of Postural Correlates of Multilevel Nerve Compression.” Sanford Larson Research Award PI. This grant supported research into the postural effects of decreased peripheral sensory input upon the motion of the thoraco-scapulo-humeral segments.
2014	“UC Care Check” UC Office of the President, Center for Health Quality and Innovation Co-Investigator. PI Greg Seymann, MD Multiyear grant to explore the effect of instituting checklists in the OR and in daily progress note documentation upon patient care and outcomes
2014	“Nerve Transfers in Spinal Cord Injury.” Kali’s Cure Research Award PI. Private grant to promote the development of nerve transfers to restore function following spinal cord injury.
2015-2017	“Novel Modular Nerve Lengthening Device for Peripheral Nerve Regeneration.” RR&D Merit Review Award (Parent I01) Consultant. PI Sameer Shah, PhD This grant explored the development of an implantable device to promote traction lengthening of peripheral nerves in a rodent model.

Current

- 2010-2020 "Bladder, Urethra and Anal Sphincter Reinnervation"
NIH 1R01NS070267-01
Co-Investigator, PI Michael Ruggieri, PhD
The goal of this grant is to develop a surgical approach to reinnervate the lower motor neuron lesioned urinary bladder so patients can regain control of bladder emptying. These studies are intended to provide the final burden of proof for human trials of somatic nerve transfer to reinnervate the urinary bladder.
- 2018-2020 "Rehabilitation and Cortical Remodeling after Surgical Intervention for Spinal Cord Injury" New York State Department of Health (SCIRB) DOH01-PART3-2019-00006
Role: Co-PI (funding amount \$150,000/year).
Co-PI Edmund Hollis, PhD
The goal of these studies is to determine whether robot-assisted, intensive rehabilitation will support the return of hand and arm function and strengthen the cortical representations of targeted muscles.
- 2019-2021 "Neural Reconstruction for Functional Repair of Chronic SCI" The Commonwealth of Massachusetts (SCI Cure Research Fund).
Role: Co-Investigator (\$270,000/year for 3 years).
PI Ted Teng, PhD
Studies a novel nerve transfer for enhancement of lower extremity function following conus injuries in a rodent model of chronic SCI. Strategies for augmenting axonal regrowth and then optimizing recovery via a multimodal approach to restore functional locomotion will be employed.
- 2020-2025 "Treatment of Severe Nerve Injury by Nerve Lengthening and End-to-End Repair"
Department of Defense (DMRDP).
Role: Consultant.
PI Sameer Shah, PhD
To evaluate a new strategy for graft-free repair of large peripheral nerve gaps. The aims of the project are (i) to test the efficacy of graft-free end-to-end repair of moderate nerve gaps with one-time nerve lengthening at the time of implantation (rabbit acute nerve injury model), (ii) to test the efficacy of graft-free repair of large nerve gaps by daily lengthening of proximal nerve stumps followed by end-to-end repair (rabbit acute nerve injury model), (iii) to test the additive efficacy of nerve lengthening and end-to-end repair with muscle volume/ endplate preservation via an injectable extracellular matrix-based hydrogel (rabbit acute nerve injury model) and (iv) to successfully submit IDE (device) and IND (hydrogel) applications, including safety evaluation, manufacturing plan, and strategy for Phase 0/1 studies (regulatory approvals).
- 2020-2024 "Medical Imaging of Nerve Degeneration and Regeneration"
Veterans Administration
Role: Co-Investigator
This proposal addresses new ultrasound and MRI approaches to imaging peripheral nerves. The aims of the project are (i) to test the efficacy of quantitative US and MR imaging strategies in assessing neuromuscular morphology and composition during peripheral nerve degeneration and following repair of acute and chronic models of rat sciatic nerve injury. (pre-clinical) and (ii) to test the efficacy of quantitative US and MR imaging strategies in assessing neuromuscular morphology and composition in acute and

chronic models of human median and ulnar nerve injury immediately prior to surgical repair.

Projects Submitted for Funding

- 2020 “Anticipating Efficacy of Nerve Transfers in SCI Using Quantitative Neurophysiology”
Department of Defense, Spinal Cord Injury Research Program, Translational Research Award
Role: PI.
The purpose of the study is to determine predictors of successful functional recovery following nerve transfers to restore function after SCI. More specifically, to establish an objective approach to evaluating pre-op measures that will provide information to not only identify the intervention which provides the highest chance of success, but also the anticipated degree of strength gains achievable in a particular case. Aim 1: To determine the relationship between pre-operative quantitative neurophysiological and histological measures of innervation. Aim 2: To evaluate the utility of quantitative neurophysiological methods to predict post-operative functional outcomes of patients.
- 2020 "Quantitative Techniques for Anticipating Nerve Regeneration, Muscle Receptivity and Extent of Functional Recovery"
Department of Defense, Peer Reviewed Orthopedic Research Program, Clinical Translational Research Award
Role: PI
The purpose of the study is to develop an evidence-based and prospective approach to utilizing quantitative methods in the assessment of peripheral nerve injuries (PNIs). More specifically, to establish proposed methods as a clinical standard to predict and track regenerative outcomes in patients with PNIs. Aim 1: To test the efficacy of qNP strategies in assessing neuromuscular function during peripheral nerve degeneration and following repair of acute and chronic models of rat sciatic nerve injury (pre-clinical). Aim 2: To test the efficacy of qUS and qNP strategies in assessing neuromuscular morphology and function in acute and chronic models of human upper extremity injuries serially over time.
- 2020 NIH Shared Instrumentation Grant Program (S10)
for purchase of “Vevo MD ultra-high frequency ultrasound machine (Visualsonics, FUJIFILM)”
- 2020 “Neurophysiological predictors of functional outcomes of nerve transfers in individuals with spinal cord injuries”
Craig-H Nielsen Foundation, Spinal Cord Injury Research on the Translational Spectrum
Role: PI
To determine neurophysiological predictors of successful recovery following nerve transfer surgery to restore function after spinal cord injury (SCI). Aim 1: To determine the relationship between pre-operative quantitative neurophysiological measures of innervation and actual axon counts within the specific nerve branches as determined by histological measures. Aim 2: To evaluate the utility of quantitative neurophysiology to predict efficacy of post-operative functional recovery of patients.
- 2020 “Peripheral Transplantation of iPSC-Derived Spinal Motor Neurons for Functional Restoration following Spinal Cord Injury”
Morton Cure Paralysis Fund’
Role: PI

An innovative approach of transplantation of induced pluripotent stem cell-derived spinal motor neurons into the distal nerve segment to innervate and sustain muscle integrity that is essential for nerve reconstruction is proposed. This approach may also serve as a means for electrical or optogenetic stimulation to restore volitional function to denervated muscle through external control sources. Successful completion of the study can significantly enhance therapeutic efficacy for motor improvement following spinal cord injury.

- 2020 “Quantifying functional outcomes and quality of life measures in patients following lower extremity reconstructive surgery for spastic gait”
Morton Cure Paralysis Fund\
Role: PI
The purpose of this study is to comprehensively quantify the efficacy of surgical interventions to improve function and/or reduce spasticity in lower extremities of patients to correct gait-impairing spasticity.
- 2020 “The role of quantitative neurophysiology in predicting the efficacy of nerve transfers in spinal cord injury patients”
Wings for Life
Role: PI
The purpose of this project is to examine the utility of QNP in guiding surgical decisions for nerve transfers. This will be further evaluated by a comprehensive set of objective outcomes to assess strength, motor control and psychosocial wellness. The results of this study will allow surgeons to determine a patient’s likelihood of success for each nerve transfer pairing being considered, and thus reduce the variability in previously reported outcomes. It will also improve designs of clinical trials investigating nerve regeneration - a substantial barrier to the trial of new therapies for the treatment of nerve injuries is the absence of responsive outcome measures.
- 2020 “Treatment of Spastic Equinovarus Foot: BoTN-A, Phenol or Selective Neurotomy?”
Patients-Centered Outcomes Research Institute (PCORI), Cycle 3 2020 (for Addressing Disparities, Assessment of Options, Communication and Dissemination Research, Improving Healthcare Systems)
Role: PI
The purpose of this study is to compare the effectiveness of Botulinum toxin type A (BoNT-A), phenol injections (PI), and surgical selective neurotomy (SN) as treatment options for spastic equinovarus foot (SEF) in hemiplegic patients. This will be assessed by clinical, functional and psychosocial wellness measures.

Training Grants and Mentored Trainee Grants

- 2009 “Develop a Normative Kinematic Profile Quantifying SSPD in Persons Without Disability and After Interventions Which Alter Afferent Input from the Extremity”
NIH/NHLBI Training Grant, Grant No. 5 T35 HL007815-14
Project PI; Student James Essenberg
This grant supported research into the postural effects of decreased peripheral sensory input upon the motion of the thoraco-scapulo-humeral segments and healthy and affected subjects.
- 2009 “Objective Assessment of Hand Function Using Video Motion Capture: Application to Upper Extremity Peripheral Nerve Surgery”
Dean’s Summer Fellowship Grant

Project PI; Student Maryam Saheb-Al-Zamani.

This grant supported developing a motion capture protocol to assess the kinematics of fine digital movement in preparation for outcomes assessment for planned nerve transfers in patients with hand dysfunction from SCI.

Report of Local Teaching and Training

Teaching of Students in Courses:

2013-2017	Surgery 410: 3rd year medical student introduction to neurosurgery	Course Director at UCSD
2018-	Advanced Integrated Science Course: Neurobiology at Harvard Medical School	Preceptor

Clinical Supervisory and Training Responsibilities

2008-2011	Mentoring neurosurgery residents and medical students on the wards and in the operating room	Barnes-Jewish Hospital 1:1 supervision 30 hours per week
2011-2017	Mentoring neurosurgery and plastic surgery residents as well as medical students on the wards and in the operating room	UCSD Medical Center 1:1 supervision 30 hours per week
2017-	Mentoring neurosurgery residents and medical students on the wards and in the operating room	Massachusetts General Hospital 1:1 supervision 30 hours per week

Formal Teaching of Clinical Fellows and Research Fellows (post-docs):

2012	Mark A. Mahan, MD – 6 month infolded fellowship during 5th year of residency at Barrow Neurological Institute. 2 podium presentations, 4 publications, 1 internal grant (UCSD). He is now Assistant Professor of Neurosurgery at University of Utah also practicing peripheral nerve and reconstructive neurosurgery and holds leadership positions within our national organizations.	UCSD Medical Center 1:1 supervision 40 hours per week
2014	Daniela Alexandru, MD – 3 month infolded fellowship during 6th year of residency at UC Irvine Department of Neurosurgery. Now a private practice neurosurgeon in Oregon	UCSD Medical Center

		1:1 supervision 20 hours per week
2016	Catherine Christie, MD – 1 month infolded fellowship during 6th year of residency at UC Irvine Department of Neurosurgery.	UCSD Medical Center 1:1 supervision 20 hours per week
2017	Sean Kaloostian, MD – 1 month infolded fellowship during 6th year of residency at UC Irvine Department of Neurosurgery. Now assistant professor of neurosurgery at University of California, Riverside.	UCSD Medical Center 1:1 supervision 20 hours per week
2016-2017	Abdul-Wahab Shararah, MD, FRCSC – 12 month post-residency fellowship (following completion of plastic surgery and hand fellowships). Now practicing peripheral nerve surgery in private practice in Southern California.	UCSD Medical Center 1:1 supervision 40 hours per week
2018-2019	Mark Attiah, MD – 12 month research fellowship/clinical observership during 5th year of residency at UCLA Department of Neurosurgery. 2 podium presentations.	Massachusetts General Hospital 1:1 supervision 1 hour per week
2019-	Darren Nin, PhD – research fellowship at MGH Department of Neurosurgery.	Massachusetts General Hospital 1:1 supervision 40 hours per week
2020-	Stanley Bazarek, MD, PhD – research fellowship/clinical observership at MGH Department of Neurosurgery	Massachusetts General Hospital 1:1 supervision 40 hours per week

Other Mentored Trainees and Faculty:

2008-2011	William Janes, Occupational Therapy Student. Washington University School of Medicine. July 2008 – May 2011. Postural Correlates of Upper Extremity Neuropathy Syndromes. Utilizing Motion Analysis technology to identify shoulder, neck and back postures and dynamics for correlation with the development of neuropathy syndromes. July 2008 – 2011. Funding through Sanford Larson Award. Mentorship resulted in a number of presentations and publications.	Barnes-Jewish Hospital and Paraquad Group meetings 2 hours per week
2009	Maryam Saheb-Al-Zamani, Medical Student. Washington University School of Medicine. May – July, 2009. “Objective Assessment of Hand Function Using Video Motion Capture” Mentorship led to presentation at 4th Annual Research Training Symposium and Poster Session. October 28, 2009 and publication in <i>Hand</i> .	Barnes-Jewish Hospital and Paraquad Group meetings 2 hours per week

2009	James Essenberg, Medical Student. Washington University School of Medicine. “Alterations in proximal shoulder kinematics following tourniquet-induced ischemia”. Mentorship resulted in presentation at 4th Annual Research Training Symposium and Poster Session. October 28, 2009 and publication in <i>Hand</i> .	Barnes-Jewish Hospital and Paraquad Group meetings 2 hours per week
2010-2011	Jakub Godzik, Medical Student. Washington University School of Medicine. “Afferent augmentation via transcutaneous stimulation to modulate proximal shoulder postures and dynamics in upper extremity neuropathy syndromes.”	Barnes-Jewish Hospital and Paraquad Group meetings 2 hours per week
2010	Melissa Ley, Student. Washington University in St. Louis. May 2010 – August 2010. “Nerve transfers for the restoration of hand function in cervical spinal cord injury.”	Barnes-Jewish Hospital and Paraquad Group meetings 2 hours per week
2010-2011	Caitlin Burbank, Student. Washington University in St. Louis. May, 2010 – February 2011. “Objective assessment of hand function following nerve transfer operations using motion analysis and functional evaluations.” Introduction to research in human performance laboratory and mentored in publication.	Barnes-Jewish Hospital and Paraquad Group meetings 2 hours per week
2010-2011	Ronald Hoard, II, Student. Washington University in St. Louis. May 2010 – May 2011. “Effect of noxious stimuli upon proximal upper extremity postures and kinematics.” Introduction to research in human performance laboratory. Mentored in publications.	Barnes-Jewish Hospital and Paraquad Group meetings 2 hours per week
2010-2011	Rachel Meltzer, Student. Washington University in St. Louis. May 2010 – May 2011. “Alterations in proximal shoulder kinematics following tourniquet-induced ischemia.” Introduction to research in human performance laboratory.	Barnes-Jewish Hospital and Paraquad Group meetings 2 hours per week
2010	Joey Imbs, Student. Washington University in St. Louis. May 2010 – July 2010. “Effect of lidocaine-induced model of carpal tunnel syndrome upon shoulder postures and dynamics.” Introduction to research in human performance laboratory.	Barnes-Jewish Hospital and Paraquad Group meetings 2 hours per week

2010- 2011	Nicholas Vivio, Student. Washington University in St. Louis. May 2010 – May 2011. Mentored in research in the human performance lab as well as publications and grant writing.	Barnes-Jewish Hospital and Paraquad Group meetings 2 hours per week as well as 1:1 mentorship an additional 2 hours per week
2010	Ross Fellars, Nil Gural, and Alice Ndikumana, Washington University School of Engineering Student Project Team. September 2010 – December 2010. “Development of hand held device for augmenting proprioceptive input in upper extremity neuropathy: stochastic resonance vs. direct afferent stimulation”	Barnes-Jewish Hospital and Washington University in St. Louis Group meetings 1 hour per week
2010- 2011	Hue Le, Student. Washington University in St. Louis. September 2010 – May 2011. Introduction to research in human performance laboratory .	Barnes-Jewish Hospital and Paraquad Group meetings 2 hours per week
2010- 2011	Allyson Bosworth, Student. Washington University in St. Louis. September 2010 – May 2011. Introduction to research in human performance laboratory.	Barnes-Jewish Hospital and Paraquad Group meetings 2 hours per week
2010- 2011	Ashley Newton, Student. Washington University in St. Louis. September 2010 – May 2011. Introduction to research in human performance laboratory.	Barnes-Jewish Hospital and Paraquad Group meetings 2 hours per week
2010- 2011	Patricia Hong, Student. Washington University in St. Louis. September 2010 – May 2011. Introduction to research in human performance laboratory	Barnes-Jewish Hospital and Paraquad Group meetings 2 hours per week

2011-2012	David Deriso, Student. UCSD Neuroscience. May 2011 – 2012. Mentored in clinical research, IRB writing, and scientific publications	UCSD Medical Center 1:1 mentorship 2 hours per week
2014	Edgar Ortega. Medical Student, UC Riverside. Introduction to neurosurgery in the clinic and operating room.	UCSD Medical Center 1:2 mentorship 10 hours per week
2014	David Michael. Student UCSD. Introduction to neurosurgery in the clinic and operating room.	UCSD Medical Center 1:2 mentorship 10 hours per week
2016-2017	Madhawi Mitwalli. July 2016 – July 2017. Saudi Pre-Residency Mentorship Program. Daily mentorship in the clinic and operating room.	UCSD Medical Center 1:1 mentorship 30 hours per week
2018-	Willem Rinkel, MD. Resident Plastic-, Reconstructive- and Hand surgery, University Medical Center Utrecht General surgery residency, Diakonessenhuis, Utrecht.	ASPN international mentorship program
2018	Shaya Manouchehri, MD. Neurosurgery candidate from Gazi University Faculty of Medicine. Mentored sub-intern over 1 month and assisted with academic presentation.	Massachusetts General Hospital 1-2 hours per week
2019	Stanley Bazarek, MD, PhD. Neurosurgery resident with Brigham and Womens Hospital, Harvard Medical School	Massachusetts General Hospital 1-2 hours per week
2019	Benjamin Johnston, MD. Neurosurgery resident with Brigham and Womens Hospital, Harvard Medical School	Massachusetts General Hospital 1-2 hours per month
2019	Gabriel Friedman, MD, PhD. Neurosurgery resident, Massachusetts General Hospital, Harvard Medical School	Massachusetts General Hospital 1-2 hours per month

Local Invited Presentations:

No presentations below were sponsored by outside entities unless specifically indicated

Local while at Baylor College of Medicine

- 2005 “Recovery of Speech Function following a devastating Left Hemisphere Brain Injury: A Case Report and Demonstration”/Grand Rounds
Department of Neurosurgery, Baylor College of Medicine
- 2005 “A Single-Stage Dorsal Approach for the En Bloc Resection of a Sacral Chordoma”/Grand Rounds
Department of Neurosurgery, Baylor College of Medicine
- 2005 “A Case of Intracranial Rosai-Dorfman Disease Mimicking Meningiomatosis”/Grand Rounds
Department of Neurosurgery, University of Texas M.D. Anderson Cancer Center
- 2006 “Current Surgical Management of Brachial Plexus Injuries, Including Novel Nerve Transfers”/Grand Rounds
Department of Neurosurgery, Baylor College of Medicine
- 2006 “The Surgical Management of Spina Bifida and Its Sequelae”/Grand Rounds
Department of Neurosurgery, Baylor College of Medicine

Local while at Washington University in St. Louis

- 2007 “Nerve Transfers for the Restoration of Continence”/Grand Rounds
Division of Plastic and Reconstructive Surgery, Washington University
- 2008 “Reconstructive Neurosurgery: Nerve Transfers”/Grand Rounds
Department of Neurological Surgery, Washington University
- 2008 “Nerve Transfers in the Forearm and Hand”/Lecture
Annual Research Symposium, Department of Neurological Surgery, Washington University
- 2009 “Diagnosing & Addressing Lower Motor Neuron Injuries in the SCI Patient”/Presentation
Therapist in-service meeting, The Rehabilitation Institute of St. Louis
- 2009 “Nerve Transfers: From Peripheral to Central Indications”/Grand Rounds
Department of Neurorehabilitation, Washington University School of Medicine
- 2009 “From Neuropathy to Reconstructive Neurosurgery”/Grand Rounds
Department of Neurology, Washington University School of Medicine
- 2009 “Nerve Injury, Repair and Regeneration”/Lecture
Resident education series, Department of Neurosurgery, Washington University
- 2009 “Nerve Injuries: From Neuropathy to Nerve Palsy”/Grand Rounds

Christian Northeast Hospital, St. Louis, MO

- 2009 “The Double Nerve Transfer for Restoration of Shoulder Function”/Lecture
Center for Nerve Injury and Paralysis Seminar, “New Techniques in Peripheral Nerve
Reconstruction” Washington University School of Medicine
- 2010 “Nerve-Related Pain: Neuritis, Neuropathy and Neuromas”/Grand Rounds
Department of Pain Management, Washington University School of Medicine
- 2010 “An Introduction to Peripheral Neurosurgery”/Resident Education
Department of Neurosurgery, Washington University School of Medicine

Local While at UC San Diego

- 2011 “Peripheral Nerve Injury and Regeneration”/Grand Rounds
Department of Neurosurgery, UCSD
- 2011 “Peripheral Nerve Surgery”/Lecture
Orthopedic Surgery Research Conference, UCSD
- 2011 “Peripheral Nerve Reconstruction and New Directions in Nerve Transfers”/Grand Rounds
Division of Plastic and Reconstructive Surgery, UCSD
- 2011 "Tumors of the Peripheral Nervous System"/ Lecture
Neuro-Oncology Conference, UCSD
- 2011 "The Surgical Treatment of the Peripheral Nervous System”/Grand Rounds
Neurosciences at Rady Children’s Hospital, San Diego, CA
- 2011 “Nerve Injury, Repair and Regeneration”/Lecture
Neurosurgery Resident Education Conference, UCSD
- 2011 “Peripheral Nerve Surgery: Tumors, Pain and Paralysis”/Grand Rounds
Department of General Surgery, UCSD
- 2011 "Peripheral Nerve Surgery and Nerve Regeneration"/Grand Rounds
Department of Pathology, UCSD
- 2011 "Nerve Injuries and the Surgical Management of Pain"/Grand Rounds
Anesthesiology Pain Management, UCSD
- 2011 “Peripheral Nerve Surgery: Tumors, Pain, Paralysis, and Spasticity”/Lecture
San Diego Neurology Society
- 2012 “The Basic Science of Nerve Regeneration”/Grand Rounds
Orthopedic Surgery Research, UCSD
- 2012 “Nerve Transfers”/Lecture
UCSD Rehab Services, Perlman Rehabilitation and Physical Therapy
- 2012 “Brachial Plexus and Peripheral Nerve Repair”/Grand Rounds

Department of Neurosurgery, Rady Children's Hospital

- 2012 "Thoracic Outlet Syndrome"/Grand Rounds
Department of Plastic Surgery, UCSD
- 2013 "Surgical Management of Infant Brachial Plexus Injury"/Grand Rounds
Hand Therapy Department, UCSD
- 2015 "Surgery in Stroke Recovery"/Lecture
UCSD Stroke Conference: Stroke 360
- 2015 "Basics of Pain Management in the Neurosurgical Patient"/Presentation
Society of Neurological Surgeons (SNS) Resident Boot Camp Conference, San Diego, CA
- 2015 "The Role of Nerve Transfers in Restoring Function Following SCI"/Lecture
UCSD-Head North *Neural Injury and Regeneration Symposium*. San Diego, CA
- 2015 "Cases in Functional Reconstruction: Choosing the Correct Intervention"/Grand Rounds
Division of Plastic and Reconstructive Surgery, UCSD
- 2015 "Select Topics in Neurosurgery"/Lecture
UCSD medical student surgery subspecialties rotation
- 2015 "Cases in Functional Reconstruction: Choosing the Correct Intervention, part 2"/Grand
Rounds
Division of Plastic and Reconstructive Surgery, UCSD
- 2016 "Practical Neurosurgical Anatomy: cadaver course"/Practical Workshop
Annual Surgery Boot Camp for 4th Year Medical Students, UCSD
- 2016 "Peripheral Nerve and Brachial Plexus Essentials"/Grand Rounds
Division of Plastic Surgery, UCSD
- 2017 "Practical Neurosurgical Anatomy: Cadaver Course"/Lecture
Annual Surgery Boot Camp for 4th Year Medical Students, UCSD

Local While at Harvard Medical School

- 2017 "Defining Lower Motor Neuron Injuries in Cervical SCI."/Grand Rounds
Neuroradiology Conference, Massachusetts General Hospital
- 2018 "Innovative Surgical Strategies to Restore Movement in Reduce Spasticity in Individuals
with Spinal Cord Injury"/Lecture
Knowledge in Motion Lecture Series, Spaulding Rehabilitation Hospital, Charlestown
- 2018 "The Role of Nerve Transfers in SCI"/Lecture
Harvard Combined Plastic Surgery Grand Rounds, Shriners' Hospital, Boston
- 2018 "Surgical Strategies to Restore Movement in Reduce Spasticity following SCI"/Lecture
Collaborative SCI Workgroup, Spaulding Rehabilitation Hospital, Charlestown

- 2018 “Peripheral Nerve Neurosurgery: From Neuropathy to Functional Restoration”/Neurology Grand Rounds
Newton-Wellesley Hospital, Newton, MA
- 2018 “Peripheral Nerve Skills Lab for Residents”/Practical Skills Seminar
Resident Teaching Hour, Department of Neurosurgery, Massachusetts General Hospital
- 2018 “Managing Peripheral Nerve Reconstruction Patients”/Neurosurgery Nursing Rounds
Department of Neurosurgery, Massachusetts General Hospital
- 2018 “SCI Hand Reanimation Using Nerve Transfers”/Lecture
MGH Reconstructive Neurosurgery Conference: *Restoring Function Following Devastating Injuries*. Massachusetts General Hospital.
I personally organized this international conference which was the first of its kind to be held at MGH
- 2018 “Post-Operative Care of Nerve Reconstruction Patients”/Lecture
Neuro Intensive Care Conference, Massachusetts General Hospital
- 2018 “Clinical Program for Upper Extremity Reanimation in SCI and the Role of Nerve Transfers”/SCI Grand Rounds
Spinal Cord Injury Unit, VA Medical Center, West Roxbury, MA
- 2018 “Clinical Program for Paralysis Reversal and Associated Neurophysiology”/Grand Rounds
Neurology Department, VA Medical Center, Jamaica Plain, MA
- 2019 “Evaluation of Brachial Plexus Injuries and Basics of Surgical Interventions”/Didactic
Resident Teaching Rounds, Department of Neurosurgery, Massachusetts General Hospital
- 2019 “Peripheral Nerve Anatomy and the Neurological Examination”/Didactic
Resident Teaching Rounds, Department of Neurosurgery, Massachusetts General Hospital
- 2019 “Peripheral Nerve Surgery in Spinal Cord Injury”/Lecture
NeuroRehabilitation 2019, Harvard Medical School
- 2019 “Neuromonitoring in Peripheral Nerve Surgery”/Lecture
MGH Intraoperative Neuromonitoring Group Grand Rounds, Department of Neurology, Massachusetts General Hospital
- 2019 “Reconstructive Neurosurgery”/Lecture
Fifth Annual Selected Topics in Neuroplastic and Reconstructive Surgery. Harvard Medical School and Johns Hopkins Medical School Combined Symposium.
- 2019 “Surgery for Paralysis Reversal”/Lecture
MGH Voice Center Grand Rounds, Massachusetts General Hospital
- 2019 “Peripheral Nerve Surgery at aMGH”/Lecture
Lunder 7 Nursing and Therapy Staff Rounds, Massachusetts General Hospital
- 2020 “Surgical Rehabilitation”
PhD Rehabilitation Sciences Interdisciplinary Research Seminar

2020 “Nerve Transfers in Spinal Cord Injuries”
Veterans Administration, SCI Service

Report of Regional, National and International Invited Teaching and Presentations

Those presentations below sponsored by outside entities are so noted and the sponsor(s) is (are) identified.

Regional

Regional while at Washington University in St. Louis

2008 “Nerve Transfers and Brachial Plexus Surgery”/Grand Rounds
Department of Neurosurgery, Saint Louis University, St. Louis, MO

2008 “Nerve Injury & Nerve Transfers”/Lecture
Lunch CME Program, Southwest Medical Group, St. Louis, MO

2008 “Understanding Entrapment Neuropathy”/Lecture
CME Symposium, Anderson Hospital, Maryville, IL

2008 “Improving Results of Brachial Plexus Surgery with Nerve Transfers”/Visiting
Professorship
Department of Neurological Surgery, University of Illinois at Peoria, Peoria, IL
St. Louis VA Medical Center, St. Louis, MO

2010 “Thoracic Outlet Syndrome”/Lecture
International Spine and Pain Institute’s St. Louis Evening Series Class
SSM Rehabilitation/DePaul Health Center, St. Louis, MO

Regional while at UC San Diego

2011 “The Role of Peripheral Nerve Surgery in NeuroRehabilitation”/Lecture
Sharp Memorial Hospital Rehabilitation Center, San Diego, CA

2011 “The Role of Nerve Transfers in Recovering Paralyzed Limbs”/Presentation
Occupational Therapy Association of California 2011 Spring Symposium, Anaheim, CA

2011 “Surgical Neurorehabilitation and Nerve Transfers”/Neuro-Rehab Grand Rounds
Rancho Los Amigos National Rehabilitation Centers, Downey, CA

2011 “The Role of Nerve Transfers in Recovering Paralyzed Limbs”/Presentation
Occupational Therapy Association of California’s 2011 Annual Meeting, Sacramento, CA

2011 “Nerve Transfers for Radial and Ulnar Deficits”/ Lecture
Annual Meeting Combined Course 203 - Nerve Transfers vs. Tendon Transfers: Timing,
Treatment Options, and Post-Operative Therapy, ASPN/AAHS, Las Vegas, Nevada

2011 “Peripheral Nerve Trauma”/Presentation
California Neurology Society Annual Meeting, Anaheim, CA

- 2011 “Surgical Rehabilitation and the Role of Epidural Stimulation in Enhancing Ambulation”/Lecture
Presentation for Boston Scientific, Valencia, CA
- 2011 “New Directions in Peripheral Nerve Reconstruction”/Grand Rounds
Department of Neurosurgery, University of California at Irvine, Irvine, CA
- 2012 “Nerve Surgery in NeuroRehabilitation”/Therapy Grand Rounds
Sharp Memorial Hospital Rehabilitation Center, San Diego, CA
- 2012 “Recent Developments in the Management of Peripheral Nerve Injury”/Lecture
San Diego Academy of Neurosurgery, La Jolla, CA
- 2012 “Function-Enhancing Procedures Program”/Lecture
Post Acute Integrative Health Rehab Facility, Health South, Tustin, CA
- 2012 “Thoracic Outlet Syndrome”/Grand Rounds
Department of Neurosurgery, UC Irvine, Irvine, CA
- 2012 “Management of Obstetrical Brachial Plexus Injury”/Lecture
Educational presentation at Practical Pediatrics: California Center for Performing Arts, Escondido, CA
- 2013 “Neurosurgical Procedures in Neurorehabilitation”/Lecture
Presentation at Oak Tree Osteopathy, San Diego, CA
- 2013 “Restoring Movement with Peripheral Nerve Surgery”/Grand Rounds
Department of Neurosurgery, UC Irvine, Irvine, CA
- 2014 “Restoration of Neurological Function after Central and Peripheral Nerve Lesions”/Neurosciences Grand Rounds
Scripps Clinic/Scripps Green Hospital, San Diego, CA
- 2014 “New Directions in Peripheral Nerve Surgery”/Grand Rounds
Department of Neurosurgery, Huntington Hospital, Los Angeles, CA
- 2014 “New Directions in Peripheral Nerve Surgery”/Grand Rounds
Department of Neurosurgery, Cedars-Sinai Medical Center, Los Angeles, CA
- 2014 “Reconstructive Neurosurgery for Spinal Cord Injury”/Lecture
Scripps Neuro-Restorative Care Conference: Rehabilitation to Recovery, San Diego, CA
- 2015 “Putting it Back Together: Peripheral Nerve Surgery”/Lecture
Scripps Code Trauma and Critical Care Nursing Symposium, San Diego, CA
- 2015 “Peripheral Nerve Surgery for Spasticity from TBI”/Lecture
Orthopedic Rehabilitation Association Annual Meeting, Carlsbad, CA
- 2015 “Essentials of Peripheral Nerve Reconstruction”/Grand Rounds
Department of Neurosurgery, UC Irvine, Irvine, CA

- 2016 “Multidisciplinary Team Approach to Function Restoration in SCI”/Group Presentation
Paradigm Annual Summit: Oceans of Opportunity, Laguna Beach, CA
- 2017 “Neuro Restoration”/Lecture
Scripps 12th Annual Brain Injury Rehabilitation Conference
Scripps Health, San Diego, CA
- 2017 “Clinical Program for Paralysis Reversal”/Lecture
2017 Spinal Cord Injury and Repair Symposium, San Diego, CA

Regional While at Harvard Medical School

- 2018 “Neural Reconstruction for Functional Repair of Chronic SCI”/Symposium
Spinal Cord Injury Awareness Day, State House, Boston, MA
- 2019 “Reconstructive Neurosurgery and Bladder Function Restoration”/Grand Rounds
Brown University Department of Neurosurgery, Providence, RI
- 2019 “Predictors of Elbow Flexion Outcomes Following Reconstructive Nerve Transfers for
Brachial Plexus Injury: An Analysis of 651 Patients/Abstract Presentation”
New England Neurosurgical Society, Brewster, MA
- 2019 “Nerve Repairs Under Tension”/Lecture
Second Annual Symposium on Reconstructive Neurosurgery, Brewster, MA

National

National while at Washington University in St. Louis

- 2007 “Reconstructive Neurosurgery: Nerve Transfers”/Grand Rounds
Department of Neurosurgery, Ohio State University Medical Center, Columbus, OH
- 2007 “Reconstructive Neurosurgery: Nerve Transfers”/Grand Rounds
Department of Neurological Surgery, University of Florida, Gainesville, FL
- 2008 “Reconstructive Neurosurgery: Nerve Transfers”/Grand Rounds
Department of Neurological Surgery, Barrow Neurological Institute, Phoenix, AZ
- 2008 “Nerve Transfers: From Peripheral to Central Indications”/Lecture
“Cookies and Research” Lecture Series, Shepherd Center Rehabilitation, Atlanta, GA
- 2009 “Nerve Transfers for the Upper Extremity- What Works”/Lecture
American Association for Hand Surgeons, Annual Meeting, Maui, HI
- 2009 “Coding in Peripheral Nerve Surgery”/Lecture
AANS/CNS Section on Disorders of the Spine and Peripheral Nerves Annual Meeting,
Scottsdale, AZ

- 2009 “Neurosurgery in SCI: Deafferentation and the Lower Motoneuron in Cervical SCI”/Lecture
American Spinal Injury Association’s 35th Annual Scientific Meeting. Dallas, TX
- 2010 “The Expanding Indications for Nerve Transfers”/Grand Rounds
Combined Neurosciences Conference, Vanderbilt University School of Medicine, Nashville, TN
- 2010 “Neurosurgical Rehabilitation for Upper Motor Neuron Disorders”/Grand Rounds
Methodist Rehabilitation Hospital Grand Rounds. Jackson, MS
- 2010 “The Expanding Indications for Nerve Transfers”/Grand Rounds
Neurosciences, University of Florida at Jacksonville, Jacksonville, FL
- 2010 “Reconstructive Neurosurgery and The Expanding Indications for Nerve Transfers”/Lecture
Combined Neurosciences Grand Rounds, UCSD, San Diego, CA
- 2010 “The Expanding Indications for Nerve Transfers”/Grand Rounds
Neurosurgery, University of Southern Florida, Tampa, FL

National while at UC San Diego

- 2012 “Transfer of Femoral Nerve Branches to Pudendal Nerve Branches Reinnervates the Urethral and Anal Sphincters in a Canine Model and is Feasible in a Cadaver Study”/Presentation
American Urological Association, Atlanta, GA
- 2012 “Surgical Interventions to Restore Sensorimotor Control in SCI”/Lecture
American Congress of Rehabilitation Medicine Annual Meeting ACRM-ASNR, Vancouver, BC
- 2013 “The Role of Peripheral Nerve Surgery in Restoring Motor Control Following Neurotrauma”/Lecture
Western Neurosurgical Society Annual Meeting, Colorado Springs, CO
- 2013 “Surgery for Upper Extremity Recovery”/Presentation
American Spinal Injury Association course, “Restorative Neurology of Upper Extremity Function in Tetraplegia: Neurobiology, Assessment, Clinical Research, and Novel Treatments”, Chicago, IL
- 2013 “Nerve Interventions for Upper Motor Neuron Disorders”/Grand Rounds
LA County University of Southern California Medical Center, Los Angeles, CA
- 2013 “Basics of Pain Management in the Neurosurgical Patient”/Presentation
Society of Neurological Surgeons (SNS) Resident Boot Camp Conference, San Diego, CA
- 2014 “Basics of Pain Management in the Neurosurgical Patient”/Presentation
Society of Neurological Surgeons (SNS) Resident Boot Camp Conference, San Diego, CA
- 2014 “Acute Peripheral Nervous System Trauma”/Presentation

California Neurology Society Annual Meeting. Reno, NV

- 2015 “Ultrasound and MRI in Nerve Injury”/Presentation
American Society of Peripheral Nerve Annual Meeting. Paradise Island, Bahamas
- 2015 “Enhancing Nerve Coaptation with Placental Tissue”/Presentation
Allosource – Denver, CO
- 2016 “Surgery to Reverse Paralysis”/Featured Speaker
AST National Surgical Technology Conference, San Diego (Sponsored)
- 2016 “Instructional Course 115: Nerve Transfers: New Techniques and New Applications”/Lecture
American Association of Hand Surgery Annual Meeting, Scottsdale, AZ
- 2016 “Peripheral Nerve Surgery in Restoring Motor Control Following SCI”/Presentation
9th World Congress for Neurorehabilitation, Philadelphia, PA
- 2016 “Peripheral Nerve Surgery”/Lecture
7th Annual ONE Spine Residents and Fellows Course
Seattle Science Foundation, Seattle, WA
- 2017 “Clinical Program for Paralysis Reversal”/Visiting Professorship
Burke Medical Research Institute, White Plains, NY
- 2017 “Surgical Management of Paralysis”/Grand Rounds
Department of Neurosurgery, Massachusetts General Hospital, Boston, MA
- 2017 “Role of Neurostimulation in Intra-Operative Decision Making”/Lecture
Presented at 2017 American Association of Hand Surgery, Waikoloa, HI (sponsored by Checkpoint Surgical)
- 2017 “Application of Peripheral Nerve Surgical Techniques after Spinal Disorders”/Lecture
Presented at 2017 American Association of Hand Surgery, Waikoloa, HI
- 2017 “Reconstructive Neurosurgery”/Grand Rounds
Department of Neurosurgery, Northwestern University, Chicago, IL
- 2018 “Reconstructive Neurosurgery: From Peripheral Nerves to the Central Nervous System”/Grand Rounds
Department of Neurosurgery, Temple University School of Medicine, Philadelphia, PA

National Meetings while at Harvard Medical School

- 2018 “Discussion: Upper Extremity Entrapments”/Discussion
Spine Summit 2018: The Annual Meeting of the AANS/CNS Section on Disorders of the Spine and Peripheral Nerves, Orlando, FL
- 2018 “Lower Extremity Nerve Entrapments”/Lecture
CNS Annual Meeting, Houston, TX

- 2018 “Management of Brachial Plexus Injuries”/Moderator
CNS Annual Meeting, Houston, TX
- 2018 “Reconstructive Neurosurgery: Restoring function following SCI”/Grand Rounds
Department of Neurosurgery, University of Louisville, Louisville, KY
- 2018 “Lower Extremity Nerve Reconstruction”/Lecture
2018 AANS Annual Meeting. New Orleans, LA
- 2018 “Management of Brachial Plexus Injuries: From Birth to Adult”/Seminar
2018 CNS Annual Meeting. Houston, TX
- 2019 “Brachial Plexus Trauma”/Didactic Lecture
Spine Summit 2019: The Annual Meeting of the AANS/CNS Section on Disorders of the Spine and Peripheral Nerves. Miami, FL
- 2019 “Electrodiagnostic Workup of Weakness”/Lecture
Spine Summit 2019: The Annual Meeting of the AANS/CNS Section on Disorders of the Spine and Peripheral Nerves. Miami, FL
- 2019 “Ulnar Nerve Transposition”/Lecture
2019 CNS Annual Meeting. San Francisco, CA
- 2019 “Upper Extremity Entrapment Syndromes”/Lecture
2019 CNS Annual Meeting. San Francisco, CA
- 2020 “Upper Extremity Reconstruction for Tetraplegia” Instructional Course
2020 ASPN Annual Meeting, Fort Lauderdale, FL

International

- 2006 “Where We Are and Where We Are Going in Reconstructive Neurosurgery of the Spinal Cord and Related Peripheral Nerves”/Lecture
International Symposium on Spinal Cord Motor Control “From Denervated Muscles to NeuroControl of Locomotion” with the 22nd Dr. Janez Faganel Memorial Lecture.
Ljubljana, Slovenia
- 2008 “Nerve Transfers in the Forearm and Hand”/Presentation
1st Sino-European Meeting on Brachial Plexus Microreconstructive Surgery, Venice, Italy
- 2008 “Functional Neurosurgery of the Chronic Spinal Cord Injury Patient”/Lecture
Vienna International Restorative Neurology Symposium: “Summer School for the Biological Treatment of Chronic Spinal Cord Injury”, Vienna, Austria
- 2009 “Diagnosing & Addressing Lower Motor Neuron Injuries in the SCI Patient”/Lecture
7th International Symposium on Experimental Spinal Cord Repair and Regeneration.
Brescia, Italy
- 2009 “Nerve Tumors: What We Should Know About Them”/Lecture

13th Annual Esser Course, Beurs World Trade Center, Rotterdam, Netherlands

- 2010 “Advantages and Limitations of Nerve Transfers in the Upper Extremity”/Lecture
Japanese Society for Surgery of the Hand (JSSH) Annual Meeting. Niigata, Japan
- 2010 “Nerve Transfers and Potential Applications in Spinal Cord Injury”/Lecture
General Assembly Teaching Conference, Nantong Rich Hospital. Nantong-Jiangsu, China
- 2010 “Human Spinal Cord Model of Injury and Strategies for Repair”/Presentation
3rd Annual Conference for the International Association of Neurorestoratology. Beijing,
China
- 2010 “Spontaneous Recovery in Spinal Cord Injury”/Presentation
3rd Annual Conference for the International Association of Neurorestoratology, Beijing,
China
- 2010 “The Effect of a Peripheral Nerve Lesion Upon Postural Control”/Presentation
2nd Asian and Oceanian Conference of Physical and Rehabilitation Medicine, Symposium
on Motor Control of Spinal Cord Injury. Taipei, Taiwan
- 2011 “Utility of Nerve Transfers in the Forearm and Hand”/Lecture
Presented at ASPN Annual Meeting. Course 204: Adult Brachial Plexus Lesions. Cancun,
Mexico
- 2011 “Recovering Tetraplegic Hands with Nerve Transfers”/Lecture
Presented at “Tribute to the Life and Career of Wagih El Masri.” Oswestry, England
- 2012 “The Clinical Practice of Reconstructive Neurosurgery”/Lecture
Presented at the International Society for Restorative Neurology Inaugural Meeting,
Melbourne, Australia
- 2012 “New Directions in Peripheral Nerve Surgery”/Lecture
Guadalajara Neurosurgical Summit, Guadalajara, Mexico
- 2013 “Assessment and Management of Obstetrical Brachial Plexus Injuries”/Lecture
The Second Abu Dhabi Pediatric Neurology Conference 2013, Abu Dhabi, United Arab
Emirates
- 2013 “Deep Temporal Nerve Transfer for Facial Reanimation”/Lecture
Presentation at the 12th International Facial Nerve Symposium, Boston, MA
- 2013 “Restoring Motor Control Following Neurotrauma”/Lecture
Neurotrauma Grand Rounds, Mafraq Hospital, Abu Dhabi, United Arab Emirates
- 2013 “Somatic Nerve Transfer to Pelvic Nerve Reinnervates the Detrusor Muscle After Spinal
Root Injury”/Presentation
43rd Annual Meeting of the ICS: International Continence Society, Barcelona, Spain
- 2016 “Why Should We Use the Combined Median/Ulnar Nerve Transfer”/Lecture
Brachial Plexus and Peripheral Nerve Surgery 3: A Surgical Jam Session, Madrid, Spain

- 2016 “Nerve Transfer Options for Low Palsies: Our Strategy”/Lecture
Brachial Plexus and Peripheral Nerve Surgery 3: A Surgical Jam Session, Madrid, Spain
- 2016 “The Role of Nerve Transfers in Chronic SCI: Candidate Identification and Early Results”/Lecture
Brachial Plexus and Peripheral Nerve Surgery 3: A Surgical Jam Session, Madrid, Spain
- 2016 “Basic Concepts in the Biology of Nerve Injury and Regeneration”/Lecture
Myelin Clinic Course: Brachial Plexus and Peripheral Nerve, Torreon, Mexico
- 2016 “Principles of Successful Nerve Transfers”/Lecture
Myelin Clinic Course: Brachial Plexus and Peripheral Nerve, Torreon, Mexico
- 2017 “What’s New in Peripheral Nerve Surgery?”/Lecture
6th Latin American Congress for Surgery and Rehabilitation of the Brachial Plexus, Guadalajara, Mexico
- 2017 “Suprascapular Nerve Injury and Repair”/Lecture
6th Latin American Congress for Surgery and Rehabilitation of the Brachial Plexus, Guadalajara, Mexico
- 2017 “C5-7 Nerve Injuries: Our Strategy”/Lecture
6th Latin American Congress for Surgery and Rehabilitation of the Brachial Plexus, Guadalajara, Mexico
- 2017 “Physician Education in Brachial Plexus Surgery in the US”/Lecture
6th Latin American Congress for Surgery and Rehabilitation of the Brachial Plexus, Guadalajara, Mexico
- 2017 “Introduction: Pathology of Brachial Plexus Trauma”/Lecture
BRACHIALCON 2017, 9th Biennial National Conference of Brachial Plexus Surgery Group of India, Mangalore, India
- 2017 “Distal Nerve Transfers in Spinal Cord Injury”/Lecture
BRACHIALCON 2017, 9th Biennial National Conference of Brachial Plexus Surgery Group of India, Mangalore, India
- 2017 “Late Nerve Reconstruction”/Lecture
BRACHIALCON 2017, 9th Biennial National Conference of Brachial Plexus Surgery Group of India, Mangalore, India
- 2017 “Round Table Discussion: Partial Adult Palsy”/Discussion
BRACHIALCON 2017, 9th Biennial National Conference of Brachial Plexus Surgery Group of India, Mangalore, India
- 2018 “The Double Crush Syndrome and Upper Extremity Nerve Entrapments”/Lecture
Spring Symposium of the Dutch Association for Hand Therapy. Bussum, Netherlands
- 2018 “The Double Crush Syndrome and Upper Extremity Nerve Entrapments”/Lecture
Dutch Society of the Hands, Hertogenbosch, Netherlands

- 2018 “Nerve Repair Under Tension: A Concept Revisited”/Lecture
Dutch Society of the Hands, Hertogenbosch, Netherlands
- 2018 “Nerve Transfer to Restore Bladder Function After Spinal Cord Injury”/Lecture
Working to Walk 2018, Vancouver, B.C., Canada
- 2018 “Upper Motor Neuron Functional Assessment for Evaluation of Potential Restorative
Intervention”/Lecture
2018 International Association for NeuroRestoratology, Rutgers University, Newark, NJ
- 2018 “Reconstructive Neurosurgery for Restoration of Movement Following SCI”/Lecture
International Association for NeuroRestoratology, Rutgers University, Newark, NJ
- 2019 “End to Side Nerve Repair: Is it a Reasonable Approach”/Lecture
Graduating Conference of the Brachial Plexus International School, “Perlas en Cirugia de
Plexo Brachial”, Guadalajara, Mexico
- 2019 “Acute Nerve Injury: Diagnosing and Addressing the Source”/Lecture
Graduating Conference of the Brachial Plexus International School, “Perlas en Cirugia de
Plexo Brachial”, Guadalajara, Mexico
- 2019 “The Role of Conduits in Nerve Repair”/Lecture
Graduating Conference of the Brachial Plexus International School, “Perlas en Cirugia de
Plexo Brachial”, Guadalajara, Mexico
- 2019 “The Role of Medications in Nerve Repair”/Lecture
Graduating Conference of the Brachial Plexus International School, “Perlas en Cirugia de
Plexo Brachial”, Guadalajara, Mexico
- 2019 “Nerve Repairs Under Tension”/Lecture
Graduating Conference of the Brachial Plexus International School, “Perlas en Cirugia de
Plexo Brachial”, Guadalajara, Mexico
- 2019 “Basics of Neurophysiology”/Lecture
Graduating Conference of the Brachial Plexus International School, “Perlas en Cirugia de
Plexo Brachial”, Guadalajara, Mexico
- 2019 “Reconstructive Neurosurgery in Spinal Cord Injury”/Lecture
13th Vienna International Workshop on Functional Electrical Stimulation, Vienna, Austria

Report of Clinical Activities and Innovations

Current Licensure and Certification:

- 2008-2012 Missouri Medical License
- 2012-2022 American Board of Neurological Surgery
- 2017-2020 Massachusetts Medical License

Practice Activities:

2017-	Peripheral nerve and reconstructive neurosurgery	Neurosurgery, MGH	3 days/week in OR, 2 days/week outpatient clinic
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Clinical Innovations:

2008-2011
Washington University in St Louis

As assistant professor of neurosurgery at Washington University in St. Louis, I held a joint appointment with the Division of Plastic and Reconstructive Surgery and, together with them, formed the interdisciplinary “Center for Nerve Injury and Paralysis.” While prior to this, only nerve injuries were treated with these techniques, following establishment of the center we began expansion beyond peripheral nerve injury to that of spinal cord injury. Four nerve transfers to restore hand function following spinal cord injury were performed within the center at that time. I performed 3 of the first 4 performed in the United States. At the same time, I had an active research group of premedical students with whom I pursued a number of objectives, including the development kinematic assessment methods to capture outcomes of this and other reconstructive procedures. we also researched and outlined other potential central nervous system disorders that may be amenable to reconstruction with nerve transfers. At that time, I began a collaborative relationship with Dr. Ruggieri at Temple who had developed an animal model of flaccid bladder and was exploring the role of nerve transfers in this context. We began exploring human cadaveric feasibility studies and I soon became a part of his ongoing NIH funded research. After receiving an unrestricted grant to support these activities, I travelled internationally to gain insights into other procedures not commonly performed in the US to assess their efficacy and potential for implementation. These procedures included the selective peripheral neurotomy, side to side nerve repair in SCI, and contralateral pre-spinal transfer of the contralateral C7 nerve root to restore function.

2011-2017
UCSD

After moving my practice to San Diego, I established several multidisciplinary clinics: facial paralysis clinic, spinal cord injury clinic, and peripheral nerve injury clinic, all under the umbrella of the UCSD Paralysis Center. I was able to successfully implement the procedures that were adopted from the overseas travels and built a busy practice performing such restorative procedures. Selective peripheral neurotomies proved quite successful and was the source of local news stories. We went on to do quite a few spinal cord injury nerve transfer interventions, becoming the busiest practice in the united states to offer this procedure. We received local media coverage for this as well. I additionally added to my clinical armamentarium by traveling internationally for additional training in hand surgery techniques and subsequently teaming up with a plastic and orthopedic hand surgeon to implement these tendon transfers and bony fusions to augment the results of these nerve transfers. We also established a collaboration in the Los Angeles region, the California Paralysis Center, which provided multidisciplinary care for these patients in that region. Additionally, I performed some of the first complete contralateral C7 nerve root transfers in the US at that time (certainly the first at UCSD) for severe brachial plexus injuries.

2017-
MGH

Since moving my practice to MGH, I have reproduced these efforts, now having established the Mass General Paralysis Center. The center now includes specialists from physical medicine and rehabilitation, neurology, physical therapy, occupational therapy, plastic surgery, orthopedic surgery, and urology. We have now established a busy spinal cord injury hand reanimation practice in collaboration with Spaulding Rehabilitation (the first spinal cord injury nerve transfers performed in Boston). We have initiated a spasticity program and have now performed the first selective peripheral neurotomies in Boston. Additionally, we now have a multi-disciplinary brachial plexus practice as part of this center. I have recently performed the first phrenic nerve transfer for elbow flexion that has been performed at MGH. Our combined clinic employs diagnostic techniques not previously employed- using quantitative neurophysiology to establish recovery potential and reconstruction potential within specific muscle groups. Our center is now gearing up to translate the bladder function restoration work that has been continued with Dr. Ruggieri over the past decade. We have now assembled the team for this and submitted the IRB. We will soon be the first center to undertake this specific transfer for recovery of urinary function.

Report of Education of Patients and Service to the Community

No presentations below were sponsored by outside entities

Educational Material for Patients and the Lay Community:

Books, monographs, articles and presentations in other media (e.g., video and websites, movies, television and radio) that educate the public about medicine, health or biomedical sciences

2012	Treatments to Enhance arm, hand and ambulatory function following stroke	Presentation at the San Diego Brain Injury Foundation Meeting
2012	The Role of Peripheral Nerve Surgery in Restoring Motor Control Following Neurotrauma	Presented at Unite 2 Fight Paralysis - Working 2 Walk Science & Advocacy Symposium; Irvine CA
2013	Selective Peripheral Neurotomy	Interview with KPBS
2013	Selective Peripheral Neurotomy	Interview with NBC Channel 7
2013	Nerve Transfers & Paralysis	Interview at San Diego 6 News
2013	Restoring Function after Spinal Cord Injury	Presentation at Sharp Memorial Hospital, Spinal Cord Injury Support Group, San Diego, CA
2014	Restoring Function in SCI Using Nerve Transfers	Kali's Cure Annual Fund-Raiser. Charlevoix, MI

2014	Reversing Paralysis	Healthy Matters with Dr. David Granet, UCSD TV, San Diego, CA
2015	Clinical Practice of Function Restoration in Chronic SCI	Working to Walk, Unite to Fight Paralysis, Bethesda, MD
2016	Surgical Rehabilitation in Spinal Cord Injury	Lecture and demonstration. (Featured speaker) <i>Contemporary Trends in Spinal Cord Injury Management</i> , Kennedy Krieger Institute, Baltimore, MD
2017	Restoring hand function after spinal cord injury	Interview at San Diego 6 News
2018	Surgical Neurorehabilitation	Knowledge in Motion Lecture Series, Spaulding Rehabilitation Hospital, Boston, MA
2018	Regaining Movement after Paralysis	Doctor Radio, Sirius XM radio broadcast
2018	Nerve Transfer Boosts Recovery after Brachial Plexus Injury	Advances in Motion Interview
2018	Nerve Transfers Restore Function After Cervical Spine Injury	Advances in Motion Interview
2019	Nerve Surgery Reverses Some Paralysis	WCVB Channel 5 ABC Boston

Report of Scholarship

Peer-Reviewed Scholarship in print or other media:

Research Investigations

1. Mokhtee DB, **Brown JM**, Mackinnon SE, Tung TH. Reconstruction of posterior interosseous nerve injury following biceps tendon repair: case report and cadaveric study. *Hand* 2009;4(2):134-139.
2. **Brown JM**, Mokhtee D, Evangelista MS, Mackinnon SE. Scratch collapse test localizes Osborne's band as the point of maximal nerve compression in cubital tunnel syndrome. *Hand* 2010;5(2): 141-147.
3. Ruggieri MR, Braverman AS, Bernal R, Lamarre NS, **Brown JM**, Barbe MF. Reinnervation of urethral and anal sphincters with femoral motor nerve to pudendal nerve transfer. *Urodynamics* 2011; 30(8):1695-1704.
4. Barbe MF, **Brown JM**, Pontari MA, Dean GE, Braverman AS, Ruggieri Sr, MR. Feasibility of a femoral nerve motor branch for transfer to the pudendal nerve for restoring continence: a cadaveric study: Laboratory investigation. *Journal of Neurosurgery: Spine* 2011;15(5):526-531.
5. **Brown JM**, Barbe MF, Albo ME, Lai HH, Ruggieri MR. Anatomical feasibility of performing intercostal and ilioinguinal nerve to pelvic nerve transfer: a possible technique to restore lower urinary tract innervation. *Journal of Neurosurgery: Spine* 2012;17(4):357-362.

6. Janes WE, **Brown JM**, Essenberg JM, Engsborg, JR. Development of a method for analyzing three-dimensional scapula kinematics. *Hand* 2012;7(4):400-406.
7. **Brown JM**, Barbe MF, Albo ME, Ruggieri MR. Anatomical feasibility of performing a nerve transfer from the femoral branch to bilateral pelvic nerves in a cadaver: a potential method to restore bladder function following proximal spinal cord injury: Laboratory investigation. *Journal of Neurosurgery: Spine* 2013;18(6):598-605.
8. Hoard RW, Janes WE, **Brown JM**, Stephens CL, Engsborg JR. Measuring scapular movement using three-dimensional acromial projection. *Shoulder & Elbow* 2013;5(2):93-99.
9. Jahn J, Janes WE, Saheb-Al-Zamani M, Burbank CM, **Brown JM**, Engsborg JR. Identification of three movement phases of the hand during lateral and pulp pinches using video motion capture. *Hand* 2013;8(2):123-131.
10. Mahan MA, Gasco J, Mokhtee DB, **Brown JM**. Anatomical considerations of fascial release in ulnar nerve transposition: a concept revisited. *Journal of Neurosurgery* 2015;123(5):1216-1222.
11. Mahan MA, Vaz KM, Weingarten D, **Brown JM**, Shah SB. Altered ulnar nerve kinematic behavior in a cadaver model of entrapment. *Neurosurgery* 2015;76(6):747-755.
12. Gomez-Amaya SM, Barbe MF, **Brown JM**, Lamarre NS, Braverman AS, Massicotte VS, Ruggieri MR. Bladder reinnervation using a primarily motor donor nerve (femoral nerve branches) is functionally superior to using a primarily sensory donor nerve (genitofemoral nerve). *The Journal of Urology* 2015;193(3):1042-1051.
13. Gomez-Amaya SM, Barbe MF, Lamarre NS, **Brown JM**, Braverman AS, Ruggieri MR. Neuromuscular nicotinic receptors mediate bladder contractions following bladder reinnervation with somatic to autonomic nerve transfer after decentralization by spinal root transection. *The Journal of Urology* 2015;193(6):2138-2145.
14. Verenna AMA, Alexandru D, Karimi A, **Brown JM**, Bove GM, Daly FJ, Pastore AM, Pearson HE, Barbe MF. Dorsal scapular artery variations and relationship to the brachial plexus, and a related thoracic outlet syndrome case. *Journal of Brachial Plexus and Peripheral Nerve Injury* 2016;11(01): e21-e28.
15. Barbe MF, Gomez-Amaya S, Braverman AS, **Brown JM**, Lamarre NS, Massicotte VS, Lewis JK, Dachert SR, Ruggieri MR 2017 Evidence of vagus nerve sprouting to innervate the urinary bladder and clitoris in a canine model of lower motoneuron lesioned bladder. *Neurourology and Urodynamics*, 2017;36(1):91-97.
16. Wali AR, Park CC, **Brown JM**, Mandeville R. Analyzing cost-effectiveness of ulnar and median nerve transfers to regain forearm flexion. *Neurosurgical Focus* 2017;42(3):E11.
17. Bhatia A, Doshi P, Koul A, Shah V, **Brown JM**, Salama M. Contralateral C-7 transfer: is direct repair really superior to grafting? *Neurosurgical Focus* 2017;43(1):E3.
18. Wali AR, Santiago-Dieppa DR, **Brown JM**, Mandeville R. Nerve transfer versus muscle transfer to restore elbow flexion after pan-brachial plexus injury: a cost-effectiveness analysis. *Neurosurgical Focus* 2017;43(1):E4.
19. Wali AR, Gabel B, Mitwalli M, Tubbs RS, **Brown JM**. Clarification of eponymous anatomical terminology: structures named after Dr Geoffrey V. Osborne that compress the ulnar nerve at the elbow. *HAND* 2018;13(3):355-359.
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Narrative Report

Introduction

I am a neurosurgeon who specializes in providing restorative procedures to patients left weak or paralyzed as a result of a neurological injury. After completing my training in Neurosurgery at Baylor College of Medicine, I went on to receive fellowship training in peripheral nerve surgery in the Division of Plastic and Reconstructive Surgery at Washington University in St. Louis. I was then hired by the Department of Neurosurgery at that institution following fellowship. After 3 years, I moved my practice to UCSD and joined Dr. Bob Carter who helped promote the development of my program there. This became the country's first comprehensive "paralysis center" where we treated all forms of weakness and paralysis, including nerve injuries, plexus injuries, spinal cord injuries, and various brain injuries. When Dr. Carter was recruited to become the new Chairman of Neurosurgery at MGH, he encouraged me to follow him. Given the additional resources available in Boston, including the superb rehabilitation infrastructure and the lack of a specialist addressing such cases, this appeared to be a strategic move.

Area of Excellence – Clinical Expertise and Innovation

My clinical interests and expertise revolve around the practice of peripheral nerve reconstruction for restoration of function. Since 2008 I have been involved in clinical work, providing treatment for patients afflicted with brachial plexus injuries, peripheral nerve injuries, nerve root pathology, spinal cord injuries as well as stroke and brain injuries. My practice in San Diego became a regional and national referral center – really the "go-to" center for these types of injuries – serving southern California and the southwest region of the US. After only 18 months here at MGH, we now have a good number of regional and growing number of national referrals.

We have now established the Mass General Paralysis Center with a team established to address all of the forms of paralysis listed above. The system being put in place is capturing substantial data on all patients, from strength, range of motion, kinematics, functional scoring, quality of life impact, etc. The therapists committed to this program are capturing videos and other inventories and together we are developing rehabilitation protocols for this unique population who have undergone uncommon operations.

Teaching

While in San Diego, I was the clerkship director for the 3rd year neurosurgery rotation, holding Friday morning for didactic sessions with the rotating students. I also participated in the annual neurosurgery "Boot Camp" in which junior neurosurgery residents from all over the country would come to our institution and participate in didactic teaching and practical skills labs. I have always been actively involved in teaching and supervision of medical students and residents both formerly and since I joined the MGH/HMS faculty. I have hosted a number of teaching sessions and workshops for our residents here and actively involve them in academic pursuits. I have mentored rotating sub-interns and I now serve as a preceptor in the AISC Neurobiology course at HMS. I am also currently hosting a neurosurgery resident from UCLA for a research fellowship here at MGH. He has been mentored in a couple of presentations of our work at national neurosurgery meetings with past year and is now working towards publishing this work. I am currently working with Dr. Jean Coumans to organize a new course that will be offered to medical students, covering the evaluation and care of patients with spinal and peripheral nerve disorders, including weakness and paralysis.

Teaching goes beyond the walls of MGH and, through our national organizations, I am able to teach more broadly to other experts in the field. I am involved in mini-symposia annually at these conferences and I am on the program committee for the American Society for Peripheral Nerve this year. I now serve as a visiting professor for the Brachial Plexus International School. In addition to this, our center recently (last September) organized our first international symposium on Reconstructive Neurosurgery. Visitors (neurosurgeons, orthopedic surgeons and plastic surgeons) from England, India, China, Central

America and across the US attended and experiences with paralysis reversal techniques were shared and discussed. The conference was very well received and will be repeated again this year. We hope to continue utilize this venue to both augment our own skills as well as help other centers reproduce the successes that we are having locally.

Supporting Activity - Investigation

In addition to providing administrative oversight, clinical care, and teaching, I have been conducting clinical research on two primary questions: 1) the ability to predict ultimate outcomes of natural history following nerve injury using quantitative neurophysiology; and 2) anticipating outcomes and quality of life impact of reconstructive procedures based upon neurophysiological predictors, pathology, and specific interventions. Additionally, I am actively collaborating with basic scientists to provide additional mechanistic foundations for a greater understanding of the ultimate function attained following reconstruction. We now have an active collaboration with Dr. Randy Trumbower's *Inspire* Laboratory at Spaulding, Cambridge where aspects of recovery such as cortical plasticity will be evaluated in these patients.

To add a dimension to our understanding of these restorative intervention, I have developed collaborations with basic science PhDs to study underlying mechanisms that contribute to recovery in these populations. We have recently received funding from the Commonwealth of Massachusetts SCI Cure Research Fund (co-investigator), New York State Department of Health (SCIRB) (site PI).

Finally, the next intervention in the "paralysis" field that I have been working on is the bladder restoration via nerve transfers project. I have served as a co-investigator in this NIH funded-effort for several years now (Mike Ruggieri, PI). We are now ready to translate this work clinically and, as a result, we have recently submitted a grant that proposes the clinical translation of this work. We expect this to be a "first" for MGH and are excited about the potential impact of this intervention.

Summary

Since my appointment as member of the faculty at HMS I have endeavored to provide excellent clinical care, administrative oversight, and teaching, while also conducting clinical and basic science research in my area of clinical expertise.

Through my lecturing (at a local, regional, national, and international level), my written works (including peer-reviewed original research, topical reviews of the literature, and book chapters in well-regarded texts), my research, and my involvement with professional societies, I have sought to improve the care for patient suffering with paralyses of all kinds.