The Faculty of Medicine of Harvard University
Curriculum Vitae

Date Prepared: 10/19/2024

Name: Nathan Jowett

Education:

2003	BSc (honors)	Physics	Lakehead University, Canada
2007	MD (honors)	Medicine	University of Toronto, Canada
2013	MSc	Otolaryngology – Head & Neck Surgery	McGill University, Canada
2021	PhD	Biomedical Engineering	McGill University, Canada

Postdoctoral Training:

07/07-06/12	Resident	Otolaryngology – Head & Neck Surgery	McGill University, Canada
08/12-06/14	Clinical Fellow	Head & Neck Oncologic and Reconstructive Surgery	Universitätsklinikum Hamburg-Eppendorf, Germany
08/12-06/14	Research Fellow	Ultrafast laser ablation of tissue	Universitätsklinikum Hamburg-Eppendorf / Max Planck Institute for the Structure and Dynamics of Matter, Germany
08/12-06/14	Mentored Research	Clinician Investigator Program	Royal College of Surgeons of Canada
07/14-06/16	Clinical Fellow	Facial Plastic and Reconstructive Surgery	Harvard Medical School / Massachusetts Eye and Ear

Faculty Academic Appointments:

07/16-05/17	Instructor	Otolaryngology – Head & Neck Surgery	Harvard Medical School
05/17-11/23	Assistant Professor	Otolaryngology – Head & Neck Surgery	Harvard Medical School
04/24-	Assistant Professor, Part-Time	Otolaryngology – Head & Neck Surgery	Harvard Medical School

Appointments at Hospitals/Affiliated Institutions:

10/15-11/23	Investigator	Otolaryngology – Head & Neck Surgery	Mass Eye and Ear
07/16-06/18	Assistant Surgeon	Otolaryngology – Head & Neck Surgery	Mass Eye and Ear
07/16-11/23	Clinical Associate	Otolaryngology – Head & Neck Surgery	Mass General Hospital
07/18-06/22	Associate Surgeon	Otolaryngology – Head & Neck Surgery	Mass Eye and Ear
06/22-11/23	Surgeon	Otolaryngology – Head & Neck Surgery	Mass Eye and Ear
11/23-	Active staff	Department of Surgery	Mount Auburn Hospital
05/24-	Active staff	Department of Surgery	Winchester Hospital

Major Administrative Leadership Positions:

Local

2007-2008	Chief Resident	McGill University Department of Otolaryngology – Head & Neck Surgery
2013-2014	Project Leader	European Research Council (ERC) Advanced Grant – SUREPIRL Project, University of Hamburg and Max Planck Institute for the Structure and Dynamics of Matter, Hamburg Germany (PI: RJ Dwayne Miller)
2018-2023	Director	Surgical Photonics & Engineering Laboratory, Massachusetts Eye & Ear and Harvard Medical School
2020-2023	Academic Teaching Coordinator	Division of Facial Plastic & Reconstructive Surgery, Massachusetts Eye & Ear and Harvard Medical School

Committee Service:

Local

2004-2007	Surgical Education Directorate Committee, Faculty of Medicine MD Program	University of Toronto
2005	Admissions Committee - Faculty of Medicine MD Program	University of Toronto
2006	Award Committee - Faculty of Medicine Summer Student Scholarship Program	University of Toronto
2010-2012	Admissions Committee – Otolaryngology - Head & Neck Surgery Residency Program	McGill University
2012	Fundraising Committee - Head & Neck Cancer Fund	McGill University
2016-2023	Laser Safety Committee	Massachusetts Eye and Ear
2020-2023	Resident Curriculum Committee	Otolaryngology – Head & Neck Surgery – MEE
2022-2023	Otolaryngology Technology and Innovation Collaborative	Otolaryngology – Head & Neck Surgery – MEE

National and International

2019	External examiner – Otolaryngology Head and Neck Surgery Oral Board Examination	King Saud University, Riyadh, Saudi Arabia

Professional Societies:

2003-2014	Canadian Medical Association	Member-at-large
2007-2014	Association d'Oto-rhino-laryngologie du Québec	In-training member
2007-2014	Canadian Society of Otolaryngology - Head & Neck Surgery	In-training member
2009-	American Academy of Otolaryngology- Head & Neck Surgery	Member
2012-	Royal College of Surgeons of Canada	Fellow
2014-	American Academy of Facial Plastic and Reconstructive Surgery	Member
2016-	Sir Charles Bell Society	Member
2016-	American Society for Peripheral Nerve (ASPN)	Active Member
	Scientific Program Committee	2020-2025

Grant Review Activities:

2022	U.S. National Institute of Standards and Technology	U.S.-Israel Binational Industrial R&D (BIRD) Foundation
2017	Detweiler Travelling Fellowship	Royal College of Physicians and Surgeons of Canada

Editorial Activities:

Ad hoc Reviewer

British Journal of Ophthalmology
Scientific Reports
Laryngoscope
Otology & Neurotology
Journal of Reconstructive Microsurgery
Annals of Plastic Surgery
Facial Plastic Surgery & Aesthetic Medicine
Journal of NeuroEngineering and Rehabilitation
PLOS ONE
iScience
Neurosurgery Review
Diagnostic Microbiology and Infectious Disease
IEEE Transactions on Computational Social Systems
Acta Oto-Laryngologica
British Medical Journal (BMJ) Case Reports
British Medical Journal – Point of Care/Best Practice
Journal of Biomedical Materials Research: Part B – Applied Biomaterials
Journal of Neurological Surgery Reports
Journal of Oculoplastic and Reconstructive Surgery
Laryngoscope Investigative Otolaryngology
Health Science Reports

Other Editorial Roles

2018	Co-Editor of special volume "Facial palsy: Diagnostic and Therapeutic Management"	Otolaryngologic Clinics of North America

Honors and Prizes (selected):

2000 – 2003	Presidential Scholarship	Lakehead University, Thunder Bay, Canada	Academics, athletics, and community involvement
2003	Vice-Chancellor's Medal	Lakehead University, Thunder Bay, Canada	Highest graduating average
2005 – 2007	Dr. F.J. Colling, O.B.E., Memorial Scholarship	University of Toronto Faculty of Medicine	Academics
2010	Frederick Banting and Charles Best MSc Award	Canadian Institutes of Health Research (CIHR)	Research
2012	Frank Litvack Fellowship for Clinician Scientists	McGill University Faculty of Medicine	Research
2013	German Academic Exchange Service (DAAD) Post-Doctoral Research Grant	DAAD North America (New York)	Research
2014	Detweiler Travelling Fellowship	Royal College of Physicians and Surgeons of Canada	Surgery
2020	Nomination for Excellence in Mentoring Award	Harvard Medical School	Research mentorship
2021	2021 John F. and Evangeline M. Davis Award	McGill University Department of Biomedical Engineering	Research
2022	Nomination for Excellence in Mentoring Award	Harvard Medical School	Research mentorship

Report of Funded and Unfunded Projects

Funding Information:

Past

2005 *Self-assessment of Technical Surgical Ability by Medical Student and its Impact on Training*
University of Toronto Faculty of Medicine Dean's Excellence Fund for Innovation in Medical Education
Co-Investigator (PI: Dubrowski A) (Total direct $28,620, Jowett direct $5,000)
This project seeks to determine the ability of medical trainees to accurately assess their learning of surgical skills

2010-2014 *Ultrafast laser ablation of tissue*
Canadian Institute for Photonic Innovations (CIPI) Technology Exploitation and Networking Program Collaboration Grant
Co-Investigator (PI: Wiseman P) (Total direct $50,915, Jowett direct $25,000)
This project seeks to compare osseous and soft tissue healing in a live rodent model following ultrafast laser ablation versus conventional surgical techniques

2011-2013 *Osseointegration following ultrafast laser ablation osteotomy*
American Academy of Otolaryngology – Head & Neck Surgery CORE Resident Research Grant (203371)
Principal Investigator (Total/Jowett direct $10,000)
This project seeks to examine osseointegration of a titanium implant in a live rodent model following ultrafast laser ablation

2012-2014 *Infrared imaging of ultrafast laser ablation of tissue*
McGill University Head & Neck Fund Head & Neck Research Grant

Principal Investigator (Total/Jowett direct $15,000)
This project seeks to characterize heat generation during ultrafast laser ablation of tissue

2016-2018 *Function and Form Outcomes in Patients with Facial Paralysis*
NIH - 1R21DE025295 - 01A1
Other significant contributor (PI: Trotman)
This project seeks to advance outcome analysis and surgical planning in the field of facial reanimation

2016-2022 *Surgical and Rehabilitative Management of Facial Nerve Injury*
NIH - 2R01NS071067 – 06A1, NINDS
Co-Investigator (PI: Hadlock), (Total direct $2,241,400, Jowett direct $623,220)
This project seeks to establish in a rodent model a paradigm for hemi-facial reanimation using an implantable neuroprosthetic device (Impact Score: 20, Percentile: 4)

2019-2021 *Gene Therapy for Peripheral Nerve Repair*
Charles H. Hood Foundation
Principal Investigator (Total/Jowett direct: $165,000)
To explore the potential of adeno-associated virus vector gene therapy in peripheral nerve repair in a murine model.

2019-2022 *Facial EMG for Neuroprosthetic Device Control in Facial Palsy*
AAFPRS Research Scholar Award
Principal Investigator (Total/Jowett direct: $30,000)
To characterize relationships between facial surface electromyography signals and facial displacements as a means for control of a neuroprosthetic device for hemifacial palsy.

2021-2023 *Evaluating a next generation AAV capsid for targeted transduction of Schwann cells*
Gilbert Family Foundation Gene Therapy Initiative Award
Co-investigator (PI- Maguire) (Jowett direct: $61,925)
To quantify Schwann cell transduction using a novel capsid engineered AAV vector

2022-2027 *Next-generation clinical phenotyping and pathophysiology of laryngeal dystonia & voice tremor*
NIH P50 - National Institute on Deafness and Other Communication Disorders
Other Personnel (PI – Simonyan)
To explore the potential of computer vision based objective assessment of laryngoscopy data to diagnose laryngeal movement disorders

Awarded Funding (Paused)

2016-2026 Surgical Photonics and Engineering Laboratory Seed Funding
Berthiaume Family Foundation (2016-2025)
PI – Jowett / Tan / Hadlock (Jowett allocation: $360,000 per year, total $3,600,000)
To support new knowledge discovery and development of novel therapies for complex deformities of the head & neck in the new Surgical Photonics & Engineering Laboratory at Massachusetts Eye and Ear

2023-2024 Can EVs expand the therapeutic effect of gene replacement for Tsc1 in brain?
DoD – CDMRP
Co-I (PI – Breakefield) (Jowett total costs: $170,000)
To explore the potential of AAV vector-based gene therapy to treat tuberous sclerosis

Awarded Funding (Notice of Award Received)

2024 *Elucidating the Mechanism of End-to-Side Motor Nerve Repair*
NIH NIDCR R21 DE033561-01, *Impact Score 31*
PI – Jowett (Jowett total costs $467,500)
To employ viral vectors encoding fluorescent proteins to elucidate the microanatomy of end-to-side neural coaptation

Projects Submitted for Funding

2022 *Viral Vector Functionalized Core-Shell Scaffold for Peripheral Nerve Repair*
NIH – R01 NS131539-01 *Impact Score 55, Percentile: 48* (pending funding decision)
PI – Jowett (Co-PI Wegst)
To study the potential of viral vector gene therapy to functionalize bioengineered nerve guidance conduits

Current Unfunded Projects

2021- *Viral Vector Gene Therapy for Peripheral Nerve Repair*
PI – Jowett
Pilot study to characterize the ability of AAV vectors to deliver growth factors to murine facial nerve motor axons and Schwann cells to enhance nerve regeneration

2022- *Signs and Symptoms of Lyme Disease Associated and Bell's Facial Pasly*
co-PI – Jowett
Retrospective cohort study to develop a clinical scoring tool for use at the point-of-care to diagnose Lyme disease associated facial palsy prior to seroconversion

2023- *Vasopressors in Free Gracilis Transfer*
PI – Jowett
Retrospective cohort study comparing outcomes of patients undergoing free gracilis muscle transfer who received intraoperative vasopressors intraoperatively

Training Grants and Mentored Trainee Grants

2018-2019 *Optogenetic Stimulation of the Facial Nerve*
AAFPRS Leslie Bernstein Resident Research Grant
co-Mentor (PI: Kanumuri)
To characterize whether viral optogene transfection of the facial nerve would allow for optogentic stimulation to achieve functional stimulation of facial movements.

2018-2020 *Enhancement of Axonal Penetration through Cross-Facial Nerve Grafts*
AAFPRS Leslie Bernstein Resident Research Grant
co-Mentor (PI: Mohan)
To study the effects of various surgical strategies on improving axonal regeneration along cross-facial nerve grafts.

2019-2020 *Enhancement of Axonal Penetration through Cross-facial Nerve Grafts*
NIDCR NIH 1F32DE028185-01A1
Co-Mentor (PI: Mohan, S)
To characterize transcriptional heterogeneity among nerve graft Schwann cells following injury

2019-2020 *Quantitative Model of Decompression Surgery for Bell's Palsy*
AAO-HNSF Core Resident Research Award
Faculty Mentor (PI: Malka)
To establish the impact of facial nerve decompression following various periods of neural compression on long-term facial function outcomes in a rodent model.

2019-2020 *Neuronal and Schwann Cell Transcriptional States in Peripheral Nerve Regeneration*
Plastic Surgery Foundation / American Society for Peripheral Nerve Combined Pilot Research Grant
Faculty co-Mentor (PI: Mohan)
To characterize the heterogeneity of Schwann cell transcriptional states during prolonged peripheral nerve denervation and reinnervation.

2020-2021 *Gene delivery to injured peripheral nerves*
NIDCR NIH 1 F32 DE029964-01
Mentor (PI: Miller, M)
To characterize the ability of benign viruses to deliver transgenes to murine facial nerve motor axons and Schwann cells

2020-2022 *The Effect of Electrical Stimulation on Schwann Cell States Along Nerve Grafts*
New England Otolaryngological Society Resident Research Award
Mentor (PI: Derakhshan, A)
To determine whether intravital electrical stimulation of denervated nerve grafts impacts Schwann cell phenotypes in a rat model.

2020-2022 *The Effect of Electrical Stimulation on Schwann Cell States Along Nerve Grafts*
American Academy of Facial Plastic & Reconstructive Surgery
Leslie Bernstein Resident Research Grant
Mentor (PI: Derakhshan, A)
To determine whether intravital electrical stimulation of denervated nerve grafts impacts Schwann cell phenotypes in a rat model.

2022-2023 *Visualizing the Mechanism of End-to-Side Motor Neurorrhaphy*
AAO-HNSF Core Resident Research Award
Mentor (PI: Xiao, R)
To determine whether intravital electrical stimulation of denervated nerve grafts impacts Schwann cell phenotypes in a rat model.

2023- 2026 *Super-resolved multiphoton microscopy with dual output ultrafast laser*
NIBIB NIH K25 – Impact score: 25, Active
Co-Mentor (PI: Coto Hernandez, I)
To study trafficking of adeno-associated virus vectors within murine corneal sensory axons and Schwann cells in vivo via time-lapse super-resolution microscopy

Report of Local Teaching and Training

Teaching of Students in Courses:

2018	Examination of the Head and Neck (for 1st year medical students)	HMS 3 hr teaching session
2018	Facial Nerve Anatomy (for 1st year medical students)	HMS/MIT HST Program 3 hrs teaching
2019	Facial Nerve Anatomy (for 1st year medical students)	HMS/MIT HST Program 3 hrs teaching
2023	ENT Clinical Skills Course for medical students	HMS 1 hr teaching

2024	Facial Nerve Anatomy (for Harvard Medical School Plastic Surgery residents)	J&J Depuy Synthes Institute Raynham, Massachusetts 5 hrs teaching

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

2015	Management of acute facial paralysis (for incoming otolaryngology residents)	HMS Dept of OHNS 1 hr lecture
2016	Practice (mock) oral examinations for senior otolaryngology residents	HMS Dept of OHNS 1 full day
2016	Chief rounds in Facial Plastic and Reconstructive Surgery for otolaryngology residents	HMS Dept of OHNS 1 hr lecture
2017	Practice (mock) oral examinations for senior otolaryngology residents	HMS Dept of OHNS 1 full day
2017	Chief rounds in Facial Plastic and Reconstructive Surgery for otolaryngology residents	HMS Dept of OHNS 1 hr lecture
2018	Practice (mock) oral examinations for senior otolaryngology residents	HMS Dept of OHNS 1 full day
2018	Chief rounds in Facial Plastic and Reconstructive Surgery for otolaryngology residents	HMS Dept of OHNS 1 hr lecture
2019	Practice (mock) oral examinations for senior otolaryngology residents	HMS Dept of OHNS 1 full day
2019	Chief rounds in Facial Plastic and Reconstructive Surgery for otolaryngology residents	HMS Dept of OHNS 1 hr lecture
2021	Principles of Nerve Repair	HMS Dept of OHNS 1 hr lecture
2021	Journal Club: Enhancing Recovery after Surgery	HMS Dept of OHNS 1 hr lecture
2021	Chief rounds in Facial Plastic and Reconstructive Surgery for otolaryngology residents	HMS Dept of OHNS 1 hr lecture
2022	Journal Club: Evidence Based Scar Management	HMS Dept of OHNS 1 hr lecture

Clinical Supervisory and Training Responsibilities:

2016-2023	**Massachusetts Eye and Ear**	
	Operating room (as attending surgeon) (HMS students, OHNS residents, Plastic Surgery Residents, FPRS Fellow)	1 dy/wk
	Ambulatory and procedure clinic (as attending surgeon) (HMS students, OHNS residents, Plastic Surgery Residents, FPRS Fellow)	1 dy/wk
	Otolaryngology – Head and Neck Surgery Facial Plastic & Reconstructive Surgery Back-up On-Call (HMS Dept OHNS residents, FPRS Fellow)	2 wks/rr
	Otolaryngology – Head and Neck Surgery General On-call (HMS Dept OHNS residents, FPRS Fellow)	8.5 wks/yr
2024-	**Mount Auburn Hospital**	

Operating room (as attending surgeon) ~1 dy/wk
(Open to training HMS students, OHNS residents, Plastic Surgery Residents)

New England Facial Plastic & Reconstructive Surgery
Ambulatory and procedure clinic (as attending surgeon) ~2-3 dys/wk
(Open to training HMS students, OHNS residents, Plastic Surgery Residents)

Formally Supervised Trainees (selected)

2016-2020 Ronit Malka MD / Medical Student HMS/HST MD Program. Project: Rat model of Bell's palsy to study effects of nerve decompression at distinct timepoints. Faculty Mentor on Training Grant: American Academy of Otolaryngology – Head & Neck Surgery Core Resident Research Award. Manuscripts Published: *JAMA Facial Plastic Surgery, Operative Techniques in Otolaryngology – Head & Neck Surgery,* and *Journal of Neuroscience Methods*. Posters Presented: American Society for Peripheral Nerve and American Academy of Otolaryngology – Head & Neck Surgery. Current position: Otolaryngology – Head and Neck Surgery Resident at Brooke Army Medical Center

2016-2022 Suresh Mohan MD / Otolaryngology – Head and Neck Surgery Resident Harvard Medical School. Principal project: To characterize the heterogeneity of Schwann cell transcriptional states during prolonged peripheral nerve denervation and reinnervation. Faculty Mentor on Training Grants: NIH T32 and F32, Plastic Surgery Foundation Award, American Academy of Otolaryngology – Head & Neck Surgery Core Resident Research Award. Manuscripts Published: *Laryngoscope, Journal of Neuroscience Methods, Journal of Neuropathology and Experimental Neurology, Facial Plastic Surgery and Aesthetic Medicine, Muscle & Nerve, Scientific Reports, Operative Techniques in Otolaryngology – Head & Neck Surgery, Journal of Pediatrics.* Oral Presentations: American Society for Peripheral Nerve. Current Position: Assistant Professor of Otolaryngology – Head & Neck Surgery, Facial Plastic and Reconstructive Surgery, Yale School of Medicine

2016-2018 Diego Guarin PhD / Post-doctoral fellow. Principal Project: Functional Outcomes Tracking of Facial Function. Manuscripts Published: *Plastic & Reconstructive Surgery, Laryngoscope, Journal of Neuroscience Methods, Annals of Plastic Surgery.* Current position: Assistant Professor of Applied Physiology and Kinesiology, University of Florida

2016-2019 Ivan Coto Hernandez PhD / Post-doctoral fellow. Principal Project: Multiphoton High-Resolution Imaging of Peripheral Nerve. Faculty Mentor on NIH K25 Grant. Manuscripts Published: *Plastic & Reconstructive Surgery, Laryngoscope, Journal of Neuroscience Methods, Journal of Neuropathology and Experimental Neurology, Muscle & Nerve, Scientific Reports, Journal of Biomedical Optics.* Current position: Instructor of Otolaryngology – Head & Neck Surgery, Harvard Medical School

2017-2019 Jacqueline Greene MD / Post-doctoral fellow. Principal Project: Wireless Power in Rodent Models of Nerve Regeneration. Manuscripts Published: *Laryngoscope, Facial Plastic Surgery and Aesthetic Medicine, Journal of Pediatrics.* Best paper award American Society for Peripheral Nerve. Current position: Assistant Professor of Surgery, Division of Otolaryngology – Head & Neck Surgery, UC San Diego School of Medicine.

2019-2021 Mathew Miller MD / Post-doctoral fellow. Principal Project: Gene Therapy for Nerve Regeneration. Faculty Mentor on NIH F32 Grant. Manuscripts Published: *Scientific Reports, Facial Plast Surg Clin North America, Plastic & Reconstructive Surgery.*

	*O*ral Presentation: Outstanding Paper Session Joint Meeting of the American Society for Peripheral Nerve and American Society for Reconstructive Microsurgery. Current position: Assistant Professor of Otolaryngology – Head & Neck Surgery, Facial Plastic Surgery, University of North Carolina Chapel Hill
2021-2023	Nanke Cui, MD / Post-doctoral fellow. Principal Project: AAV Gene Therapy Transduction of Transected Nerves. Poster Presentation: Retrograde Transduction of Transected Murine Sciatic Primary Sensory Neurons by Adeno-Associated Virus Vector Immersion. American Association for Peripheral Nerve Annual Meeting. Jan 2023, Miami, FL, USA. Resident, Amsterdam University Medical Center.

Laboratory and Other Research Supervisory and Training Responsibilities:

2017	Principal Investigator – Surgical Photonics and Engineering Laboratory (SPEL) at MEE	Two hour lab meetings per week One hour lectures twice monthly
	Supervision of research student Sung Kang BA (Candidate)	1:1 one hour per week (3 months total)
	Supervision of post-doctoral research fellow Wenjin Wang, MD, PhD	1:1 one hour per week (6 months total)
2018	Principal Investigator – Surgical Photonics and Engineering Laboratory (SPEL) at MEE	Two hour lab meetings per week One hour lectures twice monthly
2019	Principal Investigator – Surgical Photonics and Engineering Laboratory (SPEL) at MEE	Two hour lab meetings per week One hour lectures twice monthly
	Supervision of research student Alexander Zhu, BS	1:1 two hours per week (04-07/2019)
	Supervision of research student Nat Adamian, BS Candidate (Computer Science)	1:1 one hour per week (05-08/2019)
	Supervision / Mentorship of MSc student Rohith Bhethanabotla, BS	1:1 one hour per week (09/2019-)
2020	Supervision of research student Nat Adamian, BS Candidate (Computer Science)	1:1 two hours per week (04-12/2020)
	Supervision of research student Frank Ma, BS Candidate (Computer Science)	1:1 two hours per week (05-08/2020)
	Supervision of resident research (Focus) project Adeeb Derakhshan, MD	1:1 one hour per month (01-12/2020)
	Supervision of resident research (Focus) project Roy Xiao, MD	1:1 one hour per month (07-12/2020)
2021	Supervision of research student Nat Adamian, BS Candidate (Computer Science)	1:1 one hour per two weeks (01-06)
	Supervision of research student Frank Ma, BS Candidate (Computer Science)	1:1 two hours per week (01-6)
	Supervision of resident research (Focus) project Adeeb Derakhshan, MD	1:1 one hour per two weeks (01-12)
	Supervision of resident research (Focus) project Roy Xiao, MD	1:1 one hour per two week (01-12)
	Supervision of research intern Ansel Link, BS Candidate (Computer Science)	1:1 one hour per week (07-09)

	Supervision of research intern Adam Rubinstein, BS Candidate (Computer Science)	1:1 one hour per week (07-09)
	Supervision of research intern Louis Adamian, BS Candidate (Computer Science)	1:1 two hour per week (09-)
	Supervision of research intern Nanke Cui, MD Candidate	1:1 two hour per week (11-)
2022	Supervision of research student Louis Adamian, BS Candidate (Computer Science)	1:1 one hour per week (01-)
	Supervision of research student Nanke Cui, MD Candidate	1:1 one hour per week (01)
	Supervision of research student Jenny Yau, BS	1:1 one hour per week (01-)
	Supervision of research student Alex Cregan, BS	1:1 one hour per week (01-05)
	Supervision of research student Nat Adamian, BS Candidate (Computer Science)	1:1 one hour per week (04-08)
	Supervision of postdoctoral student Roy Xiao, MD, MS	1:1 one hour per four weeks (01-)
2023	Supervision of research student Nanke Cui, MD Candidate	1:1 one hour per week (01-06)
	Supervision of research student Jenny Yau, BS	1:1 one hour per week (01-06-)
	Supervision of research student Nat Adamian, BS Candidate (Computer Science)	1:1 one hour per week (05-)
	Supervision of postdoctoral student Chris Guirguis	1:1 one hour per four weeks (07-)
	Supervision of research student Keisha Barrera, BS	1:1 two hours per week (06-)

Formal Teaching of Peers:

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

Local Invited Presentations:

No presentations below were sponsored by outside entities

2012 Initial thermography results with PIRL vs. Er:YAG laser / Seminar series
Universitätsklinikum Hamburg-Eppendorf (UKE) Ultrafast Laser Lab, Hamburg, Germany

2013 Blood, circulation, and coagulation / Seminar series
Universitätsklinikum Hamburg-Eppendorf (UKE) Ultrafast Laser Lab, Hamburg, Germany

2013 Photocoagulation / Seminar series
Universitätsklinikum Hamburg-Eppendorf (UKE) Ultrafast Laser Lab, Hamburg, Germany

2014 Animal use in research / Seminar series
Universitätsklinikum Hamburg-Eppendorf (UKE) Ultrafast Laser Lab, Hamburg, Germany

2014 Reconstruction of the cheek: Principles and techniques / Teaching rounds
Universitätsklinikum Hamburg-Eppendorf (UKE) Department of Otolaryngology, Hamburg, Germany

2014 Regional flaps of the anterior chest wall / Teaching rounds

Universitätsklinikum Hamburg-Eppendorf (UKE) Department of Otolaryngology, Hamburg, Germany

2014 Reconstruction of the lip / Teaching rounds
Universitätsklinikum Hamburg-Eppendorf (UKE) Department of Otolaryngology, Hamburg, Germany

2014 Knowledge transfer and licensing / Seminar series
Universitätsklinikum Hamburg-Eppendorf (UKE) Ultrafast Laser Lab, Hamburg, Germany

2015 Laser-tissue interaction and applications of a novel picosecond infrared laser at 3 μm / Grand rounds
McGill University Department of Biomedical Engineering, Montréal, Canada

2016 Facial plastic and reconstructive surgery review for American Boards / Review lecture
Harvard University Department of Otolaryngology

2016 Introduction to the Surgical Photonics and Engineering Laboratory / Grand rounds
Harvard University Department of Otolaryngology – Head and Neck Surgery

2017 Photocoagulation and Photoablation / Seminar Series Surgical Photonics & Engineering Laboratory, Massachusetts Eye and Ear

2017 Clinico-pathologic Correlate: Facial Nerve Schwannomas / Grand rounds
Harvard University Department of Otolaryngology – Head and Neck Surgery

2017 Clinico-radiologic Correlate: Facial Nerve Disorders / Guest Lecture
Massachusetts General Hospital Neuroradiology Rounds

2018 Novel Approaches to Management of VIIth and Vth Nerve Palsies / Grand rounds
Harvard Medical School Department of Otolaryngology – Head and Neck Surgery

2019 Innovation in Facial Plastic Surgery / Panelist - Grand rounds
Harvard Medical School Department of Otolaryngology – Head and Neck Surgery

2020 Wonder at Sidcup / Grand rounds
Harvard Medical School Department of Otolaryngology – Head and Neck Surgery

2021 Optimizing Perioperative Care and Enhancing Recovery after Surgery / Grand rounds panel
Harvard Medical School Department of Otolaryngology – Head and Neck Surgery

2022 Facial Nerve Reanimation and Rehabilitation / Divisional Teaching
Beth Israel Division of Otolaryngology – Head & Neck Surgery, Harvard Medical School

2022 NSAID Use in Postoperative Pain Management / Mass Eye & Ear Nursing Grand Rounds

2022 Wonder at Sidcup: Innovation During Crisis / Snoring and Sleep Disordered Breathing Course, Harvard Medical School Department of Otolaryngology – Head and Neck Surgery

2022 The Opioid Crisis and Strategies to Reduce Perioperative Opioid Use / Grand Rounds
Harvard Medical School Department of Otolaryngology – Head and Neck Surgery

2024 Facial Palsy Rehabilitation / Teaching Rounds
Harvard Medical School Department of Surgery, Division of Plastic & Reconstructive Surgery, Beth Israel Deaconess Medical Center

2024 The Opioid Crisis and Strategies to Reduce Perioperative Opioid Use / Anesthesia Rounds
Mount Auburn Hospital

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 – Invited Teaching:

2014 Management of bilateral vocal fold immobility / Invited lecture
HNO Akademie, Hamburg, Germany

2021 Facial Reanimation and Trigeminal Sensory Neurotization / Invited Lecture
New England Otolaryngological Society Meeting, Webinar, Boston, MA

National – Invited Teaching:

2016 Improving outcomes measures and progress towards a neuroprosthetic device for facial reanimation / Invited lecture
Moebius Syndrome Foundation – Scientific Meeting, Long Beach, CA

2016 Contemporary Facial Reanimation / Instructional lecture
American Association of Facial Plastic and Reconstructive Surgery (AAFPRS) 2016 Fall Meeting, Nashville, TN

2016 Quality of Life and Outcomes in Facial Reanimation / Invited Lecture
Microsurgery Symposium - American Association of Facial Plastic and Reconstructive Surgery (AAFPRS) 2016 Fall Meeting, Nashville, TN

2017 Innovations in Free Gracilis Transfer / Invited Lecture and Facial Reanimation Panel
Microsurgery Symposium - American Association of Facial Plastic and Reconstructive Surgery (AAFPRS) 2017 Fall Meeting, Phoenix, AZ

2019 The Best Time to Surgically Intervene for Idiopathic Facial Paralysis and the Management of Acute Facial Paralysis / Panel Discussion
American Association of Facial Plastic and Reconstructive Surgery (AAFPRS) 2019 Spring Meeting, Austin, TX

2019 Current Treatment Options for Facial Paralysis / Panel Discussion
Triological Society 2019 Spring Meeting, Austin, TX

2019 Trigeminal Neurotization and Facial Reanimation: The State of the Art / Instructional Lecture
Annual Meeting of the American Academy of Otolaryngology – Head and Neck Surgery (AAO-HNS), New Orleans, LA

2019 Management of Facial Synkinesis / Panel Discussion
Annual Meeting of the American College of Surgeons, San Francisco, CA

2020 Facial Nerve Anatomy and Clinical Disorders / Zoom Lecture Series during Covid-19 Crisis
National Capital Consortium Otolaryngology – Head and Neck Surgery, San Antonio, TX and Bethesda, MD

2022 Dual-Vector Gracilis Muscle Transfer for Smile Reanimation with Lower Lip Depression / Invited Panelist
Triological Society Combined Section Meeting, Hotel Del Coronado, Coronado, California

2023 Vanderbilt CME Course / Invited Speaker and Panelist (2 lectures / 2 panels), Nashville, TN

2024 Annual Meeting of the American Society for Peripheral Nerve / Invited Panelist
Management of Flaccid Facial Paralysis

2024 Annual Meeting of the American Society for Reconstructive Microsurgery / Invited Panelist
Reconstruction of Radical Parotidectomy

2025 Annual Meeting of the American Society for Reconstructive Microsurgery / Invited Panelist
What Technology Do I Find Helpful For Peripheral Nerve Surgery / Research?

International – Invited Teaching:

2013 Management of the Thyroid Nodule / Invited Lecture
Joint European Thyroid and Head & Neck Robotic Workshop, Universitätsklinikum Hamburg-Eppendorf (UKE) Hamburg, Germany
(Olympus, Fentex, CryoLifeEuropar, Ceatec)

2014 Head & neck surgical anatomy cadaver dissection / Proctor (3 days)
9th London Head & Neck Dissection Course, St. George's Hospital, London, UK

2014 The facial artery musculomucosal (FAMM) Flap: Indications and technique / Instructional Lecture
88th Annual Congress of the Korean Society of Otorhinolaryngology – Head & Neck Surgery, Seoul, Korea

2014 Novel picosecond infrared laser at 3 µm - laser tissue interaction and clinical applications / Invited lecture
International Conference on Laser Applications in Life Science (LALS), Ulm, Germany

2014 The facial artery musculomucosal flap in oropharyngeal reconstruction / Invited lecture
2nd Joint European Thyroid and Head & Neck Robotic Workshop (JETHROW), Hamburg, Germany (Olympus, Fentex, CryoLifeEuropar, Ceatec)

2015 The facial artery musculomucosal flap / Invited lecture
Head & Neck Surgical Anatomy Cadaver Dissection / Proctor (3 days)
10th London Head & Neck Dissection Course, St. George's Hospital, London, UK (Aesculap Academia)

2016 The facial artery musculomucosal flap / Invited lecture
Head & Neck Surgical Anatomy Cadaver Dissection / Proctor (3 days)
11th London Head & Neck Dissection Course, St. George's Hospital, London, UK (Aesculap Academia)

2016 Facial reanimation at the Massachusetts Eye and Ear: Current approach and future directions / Invited lecture
15th Shanghai International Plastic Surgery Conference (SIPSC 2016) and the Fifth Shanghai Plastic & Cosmetic Forum (SPCF 2016), Shanghai, China

2016 Facial reanimation / Visiting professor
1 week of lectures and teaching in ambulatory clinic and operating theatre at the 9th People's Hospital – Department of Plastic and Reconstructive Surgery
Inviter: Dr. Wei (David) Wang

2017 Regional flaps of the head and neck / Invited lecture
Head & Neck Surgical Anatomy Cadaver Dissection / Course Proctor (3 days)
12th London Head & Neck Dissection Course, St. George's Hospital, London, UK (Aesculap Academia)

2017 The MEE/HMS Approach to Facial Palsy – Surgical Management / Invited Lecture
13th International Facial Nerve Symposium, Los Angeles, CA

2018 Regional flaps of the head and neck / Invited lecture
Head & Neck Surgical Anatomy Cadaver Dissection / Proctor (3 days)
13th London Head & Neck Dissection Course, St. George's Hospital, London, UK (Aesculap Academia)

2018 Contemporary Management of Facial Palsy / Invited Lecture
Department of Otolaryngology – Head & Neck Surgery (HNO)
St. Elisabethen-Krankenhaus Frankfurt, Germany

2018 Towards a neuroprosthetic device for facial palsy / Invited Lecture
Facial Nerve Symposium at the Annual Congress of the European Association of Cranio-Maxillofacial Surgery (EACMFS), Munich, Germany

2019 Contemporary Management of Facial Palsy / Invited Lecture
McGill University Annual Update in Otolaryngology - Head and Neck Surgery, Mont-Tremblant, Québec, Canada

2019 Regional flaps of the head and neck / Invited lecture

Head & Neck Surgical Anatomy Cadaver Dissection / Proctor (3 days)
14th London Head & Neck Dissection Course, St. George's Hospital, London, UK
(Aesculap Academia)

2019 Trigeminal and Facial Reanimation: The State of the Art / Invited Lecture
Annual Meeting of Middle East Academy of Otolaryngology, Dubai, United Arab Emirates

2019 Facial Reanimation and Sensory Neurotization: The State of the Art / Invited Lecture Visiting Professor
King Saud University 30th Annual ENT Update Symposium, Riyadh, Saudi Arabia

2019 Dynamic Smile Reanimation / Invited Lecture Visiting Professor
King Saud University 30th Annual ENT Update Symposium, Riyadh, Saudi Arabia

2021 New developments, tip and tricks with the gracilis free flap for the management of facial paralysis / Invited Lecture
European Academy of Facial Plastic Surgery Webinar Series during COVID-19

2021 Free Gracilis Muscle Transfer for Smile Reanimation Insights After 200 Flaps / Invited Lecture
International Microsurgery Club Webinar Series, Chang Gung, Taiwan

2021 Facial Reanimation Panel / Invited Panelist
5th Congress of Asian Pacific Federation of Societies for Reconstructive Microsurgery, Tsukuba, Japan

2022 Wonder at Sidcup: Sir Harold Gillies and the Birth of Modern Reconstructive Surgery / Invited Lecture Keynote
17th Annual Meeting of Middle East Academy of Otolaryngology Head and Neck Surgery, Dubai, UAE

2022 Avoid Facial Danger Zones for Safe Navigation in the Face / Invited Lecture
17th Annual Meeting of Middle East Academy of Otolaryngology Head and Neck Surgery, Dubai, UAE

2022 Facial Reanimation / Invited Lecture
17th Annual Meeting of Middle East Academy of Otolaryngology Head and Neck Surgery, Dubai, UAE

2022 A General Approach to Facial Palsy / Invited Lecture
17th Annual Meeting of Middle East Academy of Otolaryngology Head and Neck Surgery, Dubai, UAE

2023 A General Approach to Facial Palsy / Invited Lecture
International Federation of Otolaryngology Societies (IFOS) World Congress, Dubai, UAE

2023 Challenging Cases in Facial Reanimation / Invited Panelist
International Federation of Otolaryngology Societies (IFOS) World Congress, Dubai, UAE

2023 Instructional course: My Approach to Facial Palsy / Invited Speaker
International Federation of Otolaryngology Societies (IFOS) World Congress, Dubai, UAE

2023 Instructional course: Free Gracilis Transfer / Panelist
International Federation of Otolaryngology Societies (IFOS) World Congress, Dubai, UAE

2023 Facial Palsy Reconstruction Instructional Course / Invited Panelist
International Microsurgery Club, Chang Gung Memorial Hospital Zoom

2023 General Approach to Facial Palsy / Invited Lecture
McGill University Division of Plastic Surgery Teaching Rounds

2023 Facial Reanimation / Invited Panelist and Guest Speaker (3 lectures)
12th Congress of the World Society of Reconstructive Microsurgery, Singapore

2023 Facial Reanimation / Invited Speaker (2 lectures), Moderator, and Live Surgery Proctor
Free Multi-Vector Gracilis Muscle Transfer, 2nd Instructional Course for Facial Paralysis Reconstruction, Chang-Gung Memorial Hospital, Taoyuan, Taiwan

2023 Smile Reanimation by Free Gracilis Transfer: Enhancing Outcomes, Reducing Morbidity / Invited Lecture, 3rd Nordic Facial Nerve Meeting, Uppsala University Hospital (Virtual)

2024 Facial Reanimation / Invited Lecture
Head & Neck Surgical Anatomy Cadaver Dissection / Proctor (3 days)
15th London Head & Neck Dissection Course, St. George's Hospital, London, UK (Aesculap Academia)

2024 Innovations in Free Gracilis Transfer / Invited Lecture
Svensk Förening för Rekonstruktiv Mikrokirurgi, Dept of Plastic & Maxillofacial, Uppsala University Hospital

Regional – Abstract Presentations:

2005 Self-assessment of technical surgical proficiency by medical students and the impact on self-directed training (selected oral abstract)
Wilson Centre Day, University of Tor3onto, Canada

2006 Bench-model practice improves trainees' ability to multitask (selected oral abstract)
Wilson Centre Day, University of Toronto, Canada

2010 New advancements in cheek reconstruction (selected oral abstract)
Conference Annuelle de l'Association Oto-Rhino-Layngologie du Québec, Québec City, Canada

2010 Minimally invasive video assisted thyroidectomy (selected oral abstract)
Conference Annuelle de l'Association Oto-Rhino-Laryngologie du Québec, Québec City, Canada

2011 Persistent adenopathy following primary chemoradiation (CRT) in the N2/N3 neck (selected oral abstract)
Conférence Annuelle de l'Association Oto-Rhino-Laryngologie du Québec, Montréal, Canada

National – Abstract Presentations:

2006 Self-assessment of surgical skill acquisition with computer-based video training and the impact on self-directed training (selected oral abstract)
The Association for Surgical Education (ASE) Surgical Education Week, Tuscon, AZ

2006 Airway luminal diameter and shape measurement by means of an intraluminal fiber optic probe: A bench model (selected oral abstract)
21st American Society of Pediatric Otolaryngology Annual Meeting, Chicago, IL

2006 Self-assessed proficiency on technical surgical skill is an accurate predictor of technical performance (selected oral abstract)
American Association of Medical Colleges (AAMC) Research in Medical Education (RIME) Annual Meeting, Seattle, WA

2010 Minimally invasive video assisted thyroidectomy (selected oral abstract)
Canadian Society of Otolaryngology Annual Meeting, Niagara Falls, ON, Canada

2010 Linking extra-esophageal gastric reflux to chronic rhinosinusitis: Pepsinogen study of paranasal sinus and adenoid tissue (selected oral abstract)
Canadian Society of Otolaryngology Annual Meeting, Niagara Falls, ON, Canada

2014 The facial artery musculomucosal (FAMM) flap in floor of mouth reconstruction (selected oral abstract)
8th International Forum of the 85th Annual Meeting of the German Society of Oto-Rhino-Laryngology, Head & Neck Surgery, Dortmund, Germany

2016 A novel approach to synkinesis – targeted conduction blockade using high frequency alternating current (selected oral abstract)
Annual Meeting of the American Society for Peripheral Nerve, Phoenix, AZ

2016 Performance of a novel bioengineered scaffold for peripheral nerve repair in a facial nerve rodent model (selected oral abstract)
Annual Meeting of the American Head & Neck Society (AHNS), Seattle, WA

2017 Three-Dimensional Wet-Mount Imaging of Peripheral Nerves by Two-Photon Microscopy: A Transgenic Murine Model with High-Throughput Automated Histomorphometric Assessment
Annual Meeting of the American Society for Peripheral Nerve, Waikoloa, HI

2022 Resting Symmetry without Morbidity: The Descendens Hypoglossi - Hypoglossal Nerve Transfer for Facial Palsy (selected oral abstract)
Annual Meeting of the American Society for Peripheral Nerve, Carlsbad, CA

International – Abstract Presentations:

2006 Surgical skill acquisition with computer-based video training: Comparison of forced and unstructured practice (selected oral abstract)
12th International Ottawa Conference on Clinical Competence, New York City, USA

2013 Ablation of bone without thermal or acoustic injury via a novel ultrafast picosecond infrared laser (selected oral abstract)
Annual Meeting of the American Academy of Otolaryngology - Head & Neck Surgery (AAO-HNS), Vancouver, Canada

2014 Mimetic outcomes of use of the facial artery musculomucosal flap in oral cavity reconstruction (selected oral abstract)
88th Annual Congress of the Korean Society of Otorhinolaryngology – Head & Neck Surgery, Seoul, Korea

2014 Use of a novel picosecond infrared laser (PIRL) in microsurgery (selected oral abstract)
88th Annual Congress of the Korean Society of Otorhinolaryngology – Head & Neck Surgery, Seoul, Korea

2014 Utility of the buccinator myomucosal flap in floor of mouth reconstruction (selected oral abstract)
Joint American Head & Neck Society (AHNS) and International Federation of Head & Neck Oncologic Societies (IFHNOS) 5th World Congress, New York City, USA

2017 Double-Paddle Free Gracilis Flap for Two-Vector Smile Reanimation
13th International Facial Nerve Symposium, Los Angeles, CA

2017 Lyme Disease-Associated Facial Palsy: Corticosteroid Use and Long-Term Outcomes
13th International Facial Nerve Symposium, Los Angeles, CA

2018 Corneal Neurotization by Ipsilateral Great Auricular Nerve Transfer and Scleral Tunnel Incisions: 12 Month Outcomes of a Novel Therapy for Neurotrophic Keratopathy
12th International Symposium of Facial Plastic Surgery, Dallas, TX, USA

2019 Management of the Insensate Cornea Following Vestibular Schwannoma Resection: Corneal Neurotization by Great Auricular Nerve Transfer for Neurotrophic Keratopathy
8th Quadrennial International Conference on Vestibular Schwannoma and Other CPA Tumors, Mayo Clinic, Rochester, MN, USA

2019 Corneal Neurotization by Great Auricular Nerve Transfer for Neurotrophic Keratopathy. Annual Meeting of the European Academy of Facial Plastic Surgery Amsterdam, Netherlands

2021 Free Gracilis Muscle Transfer for Smile Reanimation Insights After 200 Flaps 5th Congress of Asian Pacific Federation of Societies for Reconstructive Microsurgery, Tsukuba, Japan

2022 Fluorescent Imaging for Peripheral Nerve Histomorphometry, 14th International Facial Nerve Symposium, Seoul, Korea (Virtual)

2022 Improving Dentition Show Smile: Dual Vector Free Gracilis Transfer, 14th International Facial Nerve Symposium, Seoul, Korea (Virtual)

Report of Clinical Activities and Innovations

Current Licensure and Certification:

2012- Diplomate, Royal College of Physicians and Surgeons of Canada, Otolaryngology – Head and Neck Surgery

2014 Clinician Investigator, Royal College of Physicians and Surgeons

2014- Approbation als Ärzt, Behörde für Gesundheit und Verbraucherschutz, Freie und Hansestadt Hamburg, Germany (EU Valid)

2016- Massachusetts Board of Registration in Medicine Medical License

2016- Controlled Substance Registration Certificate, Drug Enforcement Administration, Clinical

2016- The Commonwealth of Massachusetts, Controlled Substances, Clinical

2016- Controlled Substance Registration Certificate, Drug Enforcement Administration, Research

2016- The Commonwealth of Massachusetts, Controlled Substances, Research

2016- American Heart Association (AHA) Advanced Cardiovascular Life Support (ACLS) Program

2022- Diplomate, American Board of Facial Plastic and Reconstructive Surgery

2024- Eligible, American Board of Otolaryngology – Head & Neck Surgery

Practice Activities:

2016-2023	Ambulatory Care	Facial plastic and reconstructive surgery, Massachusetts Eye and Ear (MEE)	½ dy/wk
2016-2023	Procedure Clinic	Facial plastic and reconstructive surgery, MEE	½ dy/wk
2016-2023	Surgery	Facial plastic and reconstructive surgery, MEE	4-6 dys/mo
2016-2023	Research	Facial plastic and reconstructive surgery, MEE	3 dys/wk
2016-2023	Backup call (facial plastics)	Otolaryngology Head & Neck Surgery – MEE and Massachusetts General Hospital	1 in 6 dys
2024-	First call	Otolaryngology Head & Neck Surgery – Mount Auburn Hospital	1 in 4 dys
2024-	Surgery	Otolaryngology Head & Neck Surgery – Mount Auburn Hospital	1 dy/wk
2024-	Ambulatory clinic	New England Facial Plastic & Reconstructive Surgery	2 dys/wk
2024-	Procedure clinic	New England Facial Plastic & Reconstructive Surgery	1 dy/wk

Clinical Innovations:

Multi-vector free muscle transfer for smile reanimation	Smile reanimation techniques in patients with facial palsy restore oral commissure excursion, but ideal results are uncommonly achieved without restoration of lower lip depressor function. We characterized how the gracilis muscle flap could be elevated with a multiple paddle configuration based on a common neurovascular pedicle for multi-vector rehabilitation of joy-expressing smile (other publications #24). This technique has since been employed in over thirty cases at our institution, has been presented at national and international meetings (King Saud University 30th Annual ENT Update Symposium, Riyadh, Saudi Arabia 2019, Tribological Society 2022, International Facial Nerve Symposium 2022, International Federation of Otolaryngology Societies (IFOS) World Congress, Dubai, UAE 2023, 12th Congress of the World Society of Reconstructive Microsurgery, Singapore 2023), and was demonstrated live at the 2nd Instructional Course for Facial Paralysis Reconstruction, Department of Plastic & Reconstructive Surgery, Chang-Gung Memorial Hospital, Taoyuan, Taiwan October 2023. Other applications of this multiple-vector flap design include simultaneous reconstruction of smile and blink in facial palsy patients.
Novel approach to corneal neurotization	Neurotrophic keratopathy (NK) is a degenerative disease of the ocular surface secondary to loss of sensory input to the cornea that may result in blindness. Medical management of NK is challenging and costly. We characterized a novel surgical approach to management of this condition, whereby sensory fibers of the great auricular nerve are transposed to the affected cornea via an interposition nerve graft, with fascicles positioned directly into the corneal stroma via scleral-corneal tunnel incisions (other publications #18, 22, 25, 26, 29). Surgical outcomes included improvement in corneal sensation, corneal surface health, and visual acuity. This procedure has been performed on twelve patients thus far at our institution, and is also being employed at other centers around the globe. The technique has been presented at multiple national and international meetings (8th Quadrennial International Conference on Vestibular Schwannoma and Other CPA Tumors, Mayo Clinic, Rochester, MN, USA, 12th International Symposium of Facial Plastic Surgery, Dallas, TX, USA, Annual Meeting of the European Academy of Facial Plastic Surgery Amsterdam, Netherlands). Our NIH funded (K25) work in the laboratory seeks to investigate gene therapy delivery to corneal nerves in murine models.
Lower eyelid retraction correction in paralytic lagophthalmos	Correction of lower eyelid retraction is necessary to restore adequate blink in paralytic lagophthalmos. We characterized novel means of fascia suspension of the lower eyelid under general anesthesia using miniature incisions and demonstrated the technique yields long-term correction of lower eyelid malposition (research investigations #50). We then demonstrated in-office feasibility of this approach under local anesthesia (other peer-reviewed publications #30). This procedure has been performed in over sixty patients at our institution, and was presented at a national meeting of facial reanimation experts at the 2023 Nashville Fall CME Meeting.

Selective muscle weakening in post-paralysis facial palsy	Post-paralytic facial palsy is a permanent disfiguring sequela of facial nerve insult. We characterized how ipsilateral weakening of the depressor anguli oris muscle (e.g. through chemodenervation or surgical resection) significantly improves smile dynamics and perceived expression of positive emotion in post-paralysis facial palsy (research investigations #19). We characterized the first in-office approach to resection of the depressor anguli oris muscle under local anesthesia (other peer-reviewed publications #23). This technique has since been implemented at local, national, and international scale.

Report of Technological and Other Scientific Innovations

Electrical neural blockade and stimulation of injured nerves (Applied 2016, granted 2020/12)	**US Patent US10850097B2** As a clinical fellow, I described and reduced to practice a method and system for identifying a dysfunctional or transferred nerve, attaching an electrode array to the dysfunctional or transferred nerve proximal to the target musculature, delivering an electrical neural blockade signal, and stimulating the dysfunctional or transferred neuromusculature distal to the point of neural blockade. An immediate application of this method and system is for hemi-facial reanimation by means of an implantable neuroprosthetic device. Preliminary data used in this patent application was used as the basis for a successful NIH R01 grant.
Viral Vector Functionalized Core-Shell Scaffold	**PCT/US2024/012288 (Pending, file January 19, 2024)** My laboratory described and demonstrated proof-of-principle of biological functionalization of bioengineered nerve guidance scaffolds using viral vectors to enhance their regenerative performance for use in the surgical repair of peripheral nerve gaps.

Report of Education of Patients and Service to the Community

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

Activities:

2003	Let's Talk Science (University of Toronto, Canada) / Mentor Year-long program aimed at promoting interest in science among elementary school children, University of Toronto, Canada
2004	The Saturday Program (University of Toronto, Canada) / Mentor Summer tutoring and mentoring program for low income inner city high school students, University of Toronto, Canada
2005	The Saturday Program (University of Toronto, Canada) / Director Summer tutoring and mentoring program for low income inner city high school students, University of Toronto, Canada
2005	Growing up Healthy / Director One day conference to promote healthy eating and exercise habits for elementary school students, University of Toronto, Canada
2005	Summer Mentorship Program / Co-ordinator Mentorship program for low income inner city high school students, University of Toronto, Canada

2005 Students for Technology and Engineering in Medicine (STEM) / Lecturer
University of Toronto Faculty of Medicine, Canada
Interest group to foster interest in STEM among school children

2009 Ride to Conquer Cancer – Jewish General Hospital / Fundraiser and Participant
Completed a two-day 180km cycling tour, raising $4400 to support research as the Jewish General Hospital

2014 Massachusetts Eye and Ear Office of Global Health and Surgery / Curriculum Development
Developed two novel oral examination cases and one novel Objective Structured Assessment of Technical Skill (OSATS) examination for the Facial Plastic and Reconstructive Surgery module used in Mbarara, Uganda

2014 Massachusetts Eye and Ear Office of Global Health and Surgery / Visiting Surgeon
Participated in a two-week surgical training mission to Mbarara, Uganda to train local otolaryngology residents, delivering lectures and participating in operating cases focusing on facial plastic and reconstructive surgery, proctoring oral examinations, examinations of technical skill, and proctoring a comprehensive half-day written in-training examination

2016 Boston Marathon – Team Eye and Ear / Fundraiser and Participant
Completed the 2016 Boston Marathon, raising $9500 with my wife to support research at the Massachusetts Eye and Ear

2016 Massachusetts Eye and Ear Office of Global Health and Surgery / Curriculum Development
Developed two novel oral examination cases and one novel Objective Structured Assessment of Technical Skill (OSATS) examination for the Head & Neck Teaching module used in Mbarara, Uganda

2016 Help Us Give Smile (HUGS) Microtia Mission / Volunteer Surgeon
Participated in a one-week surgical mission to Quito, Ecuador to see patients in ambulatory clinic, and perform first and second stage auricular reconstruction surgeries for local patients with microtia

2016 Moebius Syndrome Foundation Family Conference / Invited guest speaker (Moebius Syndrome Foundation)
Travelled to Long Beach California to deliver educational lecture entitled ‘Approach to facial reanimation in Moebius syndrome at the Mass Eye and Ear Facial Nerve Center’

2017 Boston Marathon – Team Eye and Ear / Fundraiser and Participant
Completed the 2017 Boston Marathon, raising funds to support research at Mass Eye and Ear

2018 Boston Marathon – Team Eye and Ear / Fundraiser and Participant
Completed the 2018 Boston Marathon, raising funds to support research at Mass Eye and Ear

2019 Boston Marathon – Team Eye and Ear / Fundraiser and Participant
Completed the 2019 Boston Marathon, raising funds to support research at Mass Eye and Ear

2019 Facial Reanimation and Restoration of Corneal Sensation in NF2 / Lecture
Boston Neurofibromatosis Patient and Family Symposium, Boston Children’s Hospital

2021 Boston Marathon – Team Eye and Ear / Fundraiser and Participant
Completed the 2021 Boston Marathon, raising funds to support research at Mass Eye and Ear

2022 Boston Marathon – Team Eye and Ear / Fundraiser and Participant
Completed the 2022 Boston Marathon, raising funds to support research at Mass Eye and Ear (2:57 personal record)

2023	Boston Marathon – Team Eye and Ear / Fundraiser and Participant Completed the 2022 Boston Marathon, raising funds to support research at Mass Eye and Ear (2:57)	

Recognition:

2016	Publicity on Laryngoscope article on Lyme disease-associated facial palsy	Science Daily US Gov Dept of HHS
2018	Response to paper in JAMA FPS on traumatic facial palsy	Reuters Health
2018	Lyme Disease and Facial Weakness: What You Should Know	Mass Eye and Ear Focus Blog
2018	Corneal Neurotization	Harvard Otolaryngology Magazine
2018	A Defining Moment of Convergence	Harvard Medical School News
2019	'Bionic face' experiments could lead to new treatment approach for facial paralysis	Science Daily Wolters Kluwer Health
2020	Corneal Neurotization for Trigeminal Anesthesia	Bulletin – Content hub of AAO-HNS
2020	Why you shouldn't worry about a connection between Bell's palsy and COVID-19 vaccines	Business Insider
2023	Nerves rerouted from her tongue restore woman's smile	Harvard Gazette

Report of Scholarship

Peer reviewed publications in print or other media

Research Investigations:

1. **Jowett N**, LeBlanc V, Xeroulis G, MacRae H, and Dubrowski A. Surgical skill acquisition with self-directed practice using computer-based video training. Am J Surg. Feb 2007;193(2):237-42. PMID: 17236854
2. **Jowett N**, Weersink R, Zhang K, Campisi P, Forte V. Airway luminal diameter and shape measurement by means of an intraluminal fiber optic probe: A bench model. Arch Otolaryngol Head Neck Surg. Jun 2008;134(6):637-42. PMID: 18559732
3. Grierson L, Melnyk M, **Jowett N** [sic], Backstein D, Dubrowski A. Bench model surgical skill training improves novice ability to multitask: a randomized controlled study. Stud Health Technol Inform. 2011;163:192-8. PMID: 21335787
4. Böttcher A, Clauditz TS, Kucher S, Wöllmer W, Sauter G, Krötz P, **Jowett N**, Knecht R, Dalchow CV, Münscher A, Miller RJD. A novel tool in laryngeal surgery - Preliminary results of the picosecond infrared laser (PIRL). Laryngoscope. 2013 Nov;123(11):2770-5. PMID: 23670639
5. **Jowett N**, Wöllmer W, Mlynarek MA, Wiseman P, Segal B, Franjic K, Krötz P, Knecht R, Böttcher A, Miller RJD. Heat generation during ablation of porcine skin with Er:Yag laser versus a novel picosecond infrared laser (PIRL). JAMA Otolaryngol - Head Neck Surg. Aug 2013;139(8):828-33. PMID: 23949359
6. Böttcher A, Mencke T, Zitzmann A, Knecht R, **Jowett N**, Nöldge-Schomburg G, Dommerich S. Laryngeal injuries following endotracheal intubation in ENT surgery: Predictive value of anatomical scores. Eur Arch Otorhinolaryngol. Feb 2014;271(2):345-352. PMID: 23990031
7. [**Jowett N**, Böttcher A], Kucher S, Reimer R, Schumacher U, Knecht R, Wöllmer W, Munscher A, Dalchow CV., Knecht R, Dalchow CV. Use of a microsecond Er:YAG laser in laryngeal surgery reduces collateral thermal injury in comparison to superpulsed CO2 laser. Eur Arch Otorhinolaryngol. 2014 May;271(5):1121-8. PMID: 24114067

8. **Jowett N**, Wöllmer W, Reimer R, Zustin J, Schumacher U, Wiseman P, Mlynarek A, Böttcher A, Dalchow C, Lörincz B, Knecht R, Miller RJD. Bone ablation without thermal or acoustic mechanical injury via a novel picosecond infrared laser (PIRL). Otolaryngol - Head Neck Surg. Mar 2014;150 (3):385-393. PMID: 24376121
9. Löwenthal M, **Jowett N**, Thomalla R, Knecht R, Dalchow CV. A comparison of hearing results following stapedotomy under local versus general anesthesia. Eur Arch Otorhinolaryngol. 2015 Sep;272(9):2121-7. PMID: 24728229
10. Böttcher A, Kucher S, Knecht R, **Jowett N**, Krötz P, Reimer R, Schumacher U, Anders S, Münscher A, Dalchow CV, and Miller RJD. Reduction of thermocoagulative injury via use of a picosecond infrared laser (PIRL) in laryngeal tissues. Eur Arch Otorhinolaryngol. 2015 Apr; 272(4):941-8. PMID: 25575843
11. Linke SJ, Frings A, Ren L, Gomolka A, Schumacher U, Reimer R, Hansen NO, **Jowett N**, Richard G, Miller RJ. A new technology for applanation free corneal trephination: The picosecond infrared laser (PIRL). PLoS One. 2015; 10(3):e0120944. PMID: 25781907
12. Iacolucci CM, Banks C, **Jowett N**, Kozin ED, Bhama PK, Barbara M, Hadlock TA. Development and validation of a spontaneous smile assay. JAMA Facial Plast Surg. 2015 May 1;17(3):191-6. PMID: 25811938
13. Abboud T, Regelsberger J, Matschke J, **Jowett N**, Westphal M, Dalchow C. Long-term vestibulocochlear functional outcome following retro-sigmoid approach to resection of vestibular schwannomas. Eur Arch Otorhinolaryngol. 2016 Mar;273(3):719-25. PMID: 25700833
14. Böttcher A, Dommerich S, Sander S, Olze H, Stromberger C, Coordes A, **Jowett N**, Knopke S. Nodal yield of neck dissections and influence on outcome in laryngectomized patients. Eur Arch Otorhinolaryngol. 2016 Oct;273(10):3321-9. PMID: 26874731
15. Gaudin R, Robinson M, Banks C, Baiungo J, **Jowett N**, Hadlock TA. Emerging versus time-tested methods of facial grading among patients with facial paralysis. JAMA Facial Plast Surg. 2016 Jul 1;18(4):251-7. PMID: 27101446
16. Banks C, **Jowett N**, Hadlock C, Hadlock TA. Weighting of facial grading variables to disfigurement in facial palsy. JAMA Facial Plast Surg. 2016 Jul 1;18(4):292-8. PMID: 27124886
17. **Jowett N**, Hadlock TA, Sela E, Toth M, Knecht R, Lorincz BB. Facial mimetic, cosmetic, and functional standardised assessment of the facial artery musculomucosal (FAMM) flap. Auris Nasus Larynx. 2017 Apr;44(2):220-226. PMID: 27452415
18. **Jowett N**, Gaudin R, Bank CA, Hadlock TA. Steroid use in Lyme disease-associated facial palsy is associated with worse long-term outcomes. Laryngoscope. 2017 Jun;127(6):1451-1458. PMID: 27598389
19. **Jowett N**, Malka R, Hadlock TA. Weakening of ipsilateral depressor anguli oris improves smile symmetry in post-paralysis facial palsy. JAMA Facial Plast Surg. 2017 Jan 1;19(1):29-33. PMID: 27658020
20. Banks CA, **Jowett N**, Azizzadeh B, Beurskens C, Bhama P, Borschel G, Gavilan J, Snyder-Warwick A, Hadlock T. Worldwide testing of eFACE facial nerve clinician-graded scale. Plast Reconstr Surg. 2017 Feb;139(2):491e-498e. PMID: 28121888
21. Banks CA, **Jowett N***, Hadlock TA. Test-retest reliability and agreement between in-person and documented video assessment of facial mimetic function using the eFACE facial grading system. JAMA Facial Plast Surg. [Epub ahead of print] 2016 Dec 22. PMID: 28006048
22. Phillips KM, Heiser A, Gaudin R, Hadlock TA, **Jowett N**. Onset of Bell's palsy in late pregnancy and early puerperium is associated with worse long-term outcomes. Laryngoscope. 2017 12; 127(12):2854-2859. PMID: 28349542
23. Guarin DL, Dusseldorp J, Hadlock TA, **Jowett N**. A Machine Learning Approach for Automated Facial Measurements in Facial Palsy. JAMA Facial Plast Surg. 2018 Jul 01; 20(4):335-337. PMID: 29543955.
24. Mohan S, Hernández IC, Wang W, Yin K, Sundback CA, Wegst UGK, **Jowett N**. Fluorescent Reporter Mice for Nerve Guidance Conduit Assessment: A High-Throughput in vivo Model. Laryngoscope. 2018 Aug 10. PMID: 30098047.

25. Abt NB, Quatela O, Heiser A, **Jowett N**, Tessler O, Lee LN. Association of Hair Loss with Health Utility Measurements Before and After Hair Transplant Surgery in Men and Women. JAMA Facial Plast Surg. 2018 Sep 13. PMID: 30242313.
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4. Tsror G, Guarin DL, **Jowett N**, Kearney RE. Eyelid and Blink Tracking in an Animal Model of Facial Palsy. 40th International Engineering in Medicine and Biology Conference. July 17-21, 2018, Honolulu, HI.
5. Green JJ, Tavares J, Guarin DL, Quetela O, **Jowett N**, Hadlock TA. The Spectrum of Facial Palsy: The Facial Palsy Photo and Video Standard Set. Triological Society Combined Sections Meeting, Coronado, CA, Jan 24-26, 2019.
6. Green JJ, Guarin DL, Knox CJ, Hadlock TA, **Jowett N**. A Low-Cost, Wirelessly Powered Implantable Microcontroller for Neural Stimulation. American Association for Peripheral Nerve Annual Meeting. Feb 1-3, 2019, Palm Desert, CA. **(**Awarded best research paper*).**
7. Guarin DL, Dusseldorp JR, **Jowett N**. High Frequency Alternating Current Neural Blockade as an Alternative Treatment for Spasticity. American Association for Peripheral Nerve Annual Meeting. Feb 1-3, 2019, Palm Desert, CA.
8. Guarin DL, **Jowett N**. Facial Muscle Electromyography Activity for Neuroprosthetic Device Control in Facial Reanimation: Dynamic Relation between Facial Surface EMG and Facial Displacements. American Association for Peripheral Nerve Annual Meeting. Feb 1-3, 2019, Palm Desert, CA.
9. Mohan S, Fortier E, **Jowett N**. Layperson and Artificial Intelligence Assessed Emotion in Facial Palsy. Spring Meeting of the American Association of Facial Plastic Surgery, May 1-2, 2019, Austin, TX
10. Derakhshan A, Guarin D, **Jowett N**. Smile Excursion and Facial Bulk following Free Gracilis Transfer: What is the Ideal Flap Weight? Spring Meeting of the American Association of Facial Plastic Surgery, May 1-2, 2019, Austin, TX
11. Naunheim MR, Adamian N, **Jowett N**. Vocal fold tracking by artificial intelligence. The Fall Voice Conference, Oct 17-19, 2019, Dallas, TX
12. Derakhshan A, Guarin DL, Wang W, Gadkaree S, Hadlock TA, **Jowett N.** Flap Mass and Outcomes in Gracilis Muscle Transfer for Smile Reanimation. Annual Meeting of the American Society for Peripheral Nerve (ASPN), January 2021 (Virtual)
13. Dusseldorp JR, Guarin DL, van Veen MM, **Jowett N**, Hadlock TA. Automated Spontaneity Assessment after Smile Reanimation: A Machine Learning Approach. Annual Meeting of the American Society for Peripheral Nerve (ASPN), January 2021 (Virtual)
14. Miller MQ, Coto Hernández I, Minderler S, Nammou J, Ng C, Maguire CA, **Jowett N**. Adeno-Associated Virus Vector Retrograde Transduction of Transected Murine Facial Motor Neurons. Annual Meeting of the American Society for Peripheral Nerve (ASPN) and American Society of Reconstructive Microsurgery (ASRM) Joint Session, January 2022, Carlsbad, CA, USA (****Selected for outstanding paper session)***

15. S. Minderler, **N. Jowett**, I. Coto Hernández. Multiphoton Microscopy for Three-dimensional Histomorphometry of Peripheral Nerve. 2022 Frontiers in Neurophotonics Quebec City, Canada
16. Yau J, Minderler S, Cui N, Coto Hernández I, Yin Kaiyang, Wegst UGK, **Jowett N**. Nerve Guidance Conduit Assessment and Functionalization via AAV Viral Vector in Mice. American Association for Peripheral Nerve Annual Meeting. Jan 2023, Miami, FL, USA.

Narrative Report:

I am an NIH funded fellowship-trained MD PhD surgeon-scientist specializing in reconstructive surgery of the head and neck. My driving passion is to advance treatment and outcomes for patients suffering from devastating loss of motor and sensory function of the head and neck, including facial paralysis and trigeminal anesthesia. From 2016-2023, I served on faculty in the Department of Otolaryngology – Head and Neck Surgery as a full-time Assistant Professor at HMS based at the Massachusetts Eye and Ear Infirmary. I launched and directed the Surgical Photonics & Engineering Laboratory from 2018-2023, securing over $5,000,000 in combined grant and philanthropic funding to support our research focused on novel therapeutic approaches for management of cranial nerve injury. Since 2020, I have served on the Program Committee for the American Society for Peripheral Nerve and have served as an ad hoc reviewer for leading journals in my field, including the British Journal of Ophthalmology, Laryngoscope, Otology & Neurotology, Journal of Reconstructive Microsurgery, and the Annals of Plastic Surgery.

My clinical focus is on management of patients with facial palsy and loss of corneal and facial sensation. At the Mass Eye and Ear Facial Nerve Center, I received directed patient referrals from colleagues locally, regionally, nationally, and internationally, including Canada and Saudi Arabia. In 2022/2023, my annual volume of facial palsy patient visits exceeded 1000, including over 100 new patient consultations. In 2017, together with my colleague Dr. Roberto Pineda in ophthalmology, we launched a corneal neurotization program at MEE and developed a new surgical technique to treat this blinding neuropathic disease, published in the British Journal of Ophthalmology. In 2018, I developed a novel surgical technique to restore a joy-expressing dental display smile by free functional transfer of a multi-paddle gracilis muscle flap, published in Laryngoscope. This work was recognized by invited lectures regionally, nationally, and internationally, including invitations to lecture on the technique at the 2023 World Society for Reconstructive Microsurgery in Singapore, and to perform the technique on a live facial palsy patient at Chang Gung Memorial Hospital in Taiwan in October 2023 as invited Faculty for the Department of Plastic & Reconstructive Surgery 2nd International Course for Facial Paralysis Reconstruction. The technique has since been adopted by surgeons around the globe, including Japan, South Korea, and Sweden. Recently, my team has transitioned our surgical pathways to align with enhanced recovery after surgery (ERAS) principles including early hospital discharge and opioid sparing analgesia and have encouraged adoption of these techniques to enhance patient safety and quality through grand rounds presentations and peer-reviewed publications.

In the laboratory, my research efforts aligned with my clinical focus. Our laboratory employed a vertically integrated research platform comprising murine fluorescent reporter models, functional outcomes assessment, free-floating immunofluorescence, whole mount and in vivo multiphoton and super-resolution microscopy, and machine-learning based segmentation for quantitative assessment of cranial nerve structure, function, and response to injury. We have developed several novel approaches for high-resolution quantitative imaging of peripheral nerves to improve neural histomorphometry efficiency and inform intraoperative surgical decision making. We are presently leveraging our research platform to explore the potential of targeted transduction of peripheral neurons and Schwann cells using adeno-associated virus vectors to enhance nerve recovery after injury and to advance understanding of nerve transfer procedures. Our laboratory research was awarded best research paper at the 2019 American Society for Peripheral Nerve (ASPN) Annual meeting and was chosen as Outstanding Paper at the at the Joint Session of the 2022 Annual Meeting of the ASPN, American Association for Hand Society (AAHS), and American Society of Reconstructive Microsurgery (ASRM). I received funding

from the NINDS (R01) and the Department of Defense as co-Investigator, and from the Charles H Hood Foundation as Principal Investigator. I was recently (March 2024) awarded NIH funding for an R21 grant from the NIDCR as sole PI to explore the role of viral vector gene therapy to enhance understanding of nerve transfer techniques, and have a scored R01 as co-PI within NINDS exploring the potential of viral vector functionalization of bioengineered nerve conduits pending a funding decision.

My clinical teaching passion is in surgical anatomy and technique. From 2016-2019, I proctored a head and neck surgical anatomy dissection course at St. George's Hospital, University of London, UK for residents and consultants, and will be proctoring the first post-Covid course again in September 2024. From 2016-2023, I taught HMS medical students, sub-interns, and OHNS residents at MEE in the clinic (one day/week), procedure clinic (half-day/week), and the operating theatre (4-6 days/month). I served as proctor mock-oral examinations for senior MEE/HMS residents most years and organized the academic program for the MEEI Division of Facial Plastic & Reconstructive Surgery from 2020 to 2023. I've been twice nominated for the Excellence in Mentoring Award from Harvard Medical School (**2020**, **2022**). I have taught head and neck anatomy in the dissection lab, ENT clinical skills in a workshop setting, and lectured on facial palsy in a class setting to HMS junior medical students, HMS OHNS residents, and HMS Plastic Surgery residents. In the laboratory, I have mentored five residents on American Academy of Otolaryngology – Head & Neck Surgery Research Grants, have served as co-mentor on two NIH F32 awards, and currently serve as mentor to an HMS Investigator on his NIH K25 award.

Since my appointment as Assistant Professor at HMS, I have strived to provide exceptional clinical care for patients with devastating sensorimotor deficits of the head and neck, while mentoring students, residents, and fellows in the operating theatre, clinic, and the laboratory. Through my invited lectures at local, regional, national, and international forums, my peer-reviewed publications and book chapters, my laboratory research on peripheral nerve imaging and regeneration, my faculty committee service, and my professional involvement in the American Society for Peripheral Nerve, I have endeavored to improve the care for patients with facial palsy, neurotrophic keratopathy, and other cranial and peripheral nerve deficits, while also striving to inspire the next generation of clinicians and researchers in the field. In November 2023, I resigned from Mass Eye and Ear to join the Medical Staff at Mount Auburn Hospital, a teaching hospital of Harvard Medical School, in the Department of Surgery in academic private practice, affiliated with the Beth Israel Lahey Health network, where I plan to continue to train and help inspire the next generation of surgeon-scientists within the HMS community and abroad.