

OVERVIEW

In addition to the unparalleled clinical training, our residents dedicate two years to research, a clinical fellowship or pursuing an advanced degree. Most residents spend two years in a laboratory of their choice as part of the residency training. The research opportunities in the Boston area are unrivaled and include Mass General (the largest recipient of NIH funding among U.S. hospitals), Harvard Medical School, Massachusetts Institute of Technology, Broad Institute, Dana Farber Cancer Center and Boston Children's Hospital. In addition to traditional scientific and clinical fellowship efforts, residents have also pursued advanced degrees at Harvard University.

Mass General is ranked as a top hospital every year and comprised of first-rate clinical services in every aspect of medicine and surgery. The Mass General neurosurgery program has a tradition of respect and camaraderie among the residents and between the residents and staff. That leads to an exceptionally supportive and stimulating educational environment. The combination of excellent clinical training, superb research and the many outstanding opportunities available here enables graduates to successfully pursue the career track of their choice.

4300 +
NEUROSURGICAL CASES PER YEAR

24
NEUROSURGICAL CLINICAL FACULTY

17
NEUROSURGICAL RESEARCH FACULTY

2 YEARS
DEDICATED TO RESEARCH AND FELLOWSHIP

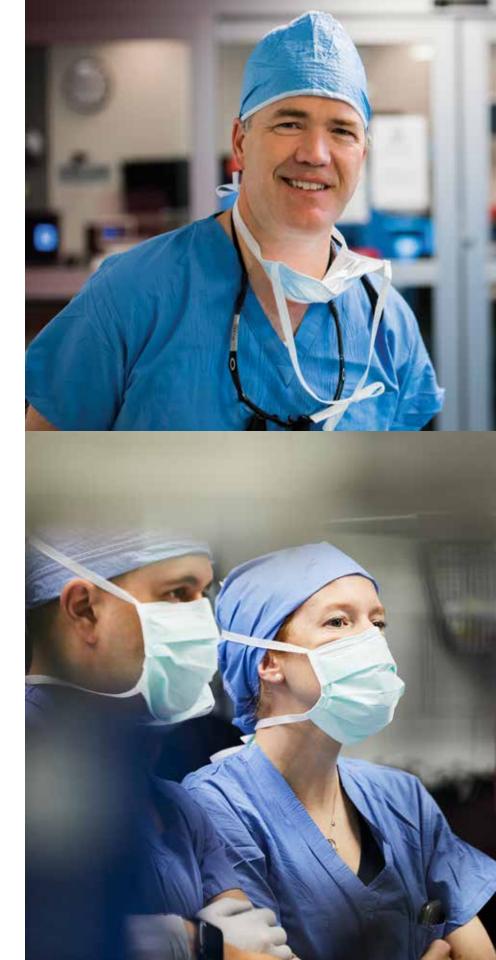


CLINICAL TRAINING PROGRAM

Our neurosurgical residents are exposed to high clinical volume, direct patient care and are expected to gain mastery of clinical and operative skills under the guidance of experienced attending neurosurgeons. It is essential that residents are exposed to each subspecialty in sufficient depth and breadth to become fully competent. Every trainee receives a focused experience in each of the main subspecialties, working in close conjunction with an expert senior attending physician who is a leader focused in brain tumor, vascular, functional, pediatric, peripheral nerve, skull-base or spine.

EDUCATION OPPORTUNITIES

Residents contribute to lectures, group discussions and symposiums with leading national and international researchers and clinicians. In addition, residents present at the neurosurgery grand rounds, Annual Frye Halloran symposium and neuroscience grand rounds with neurology, psychiatry, otolaryngology and ophthalmology. Our residents frequently present at the American Association of Neurological Surgeons, the Academy of Neurological Surgeons, the Congress of Neurological Surgeons, subspecialty section meetings and at local and regional meetings. In addition, residents attend neurosurgical courses in their desired subspecialty as junior and senior residents.



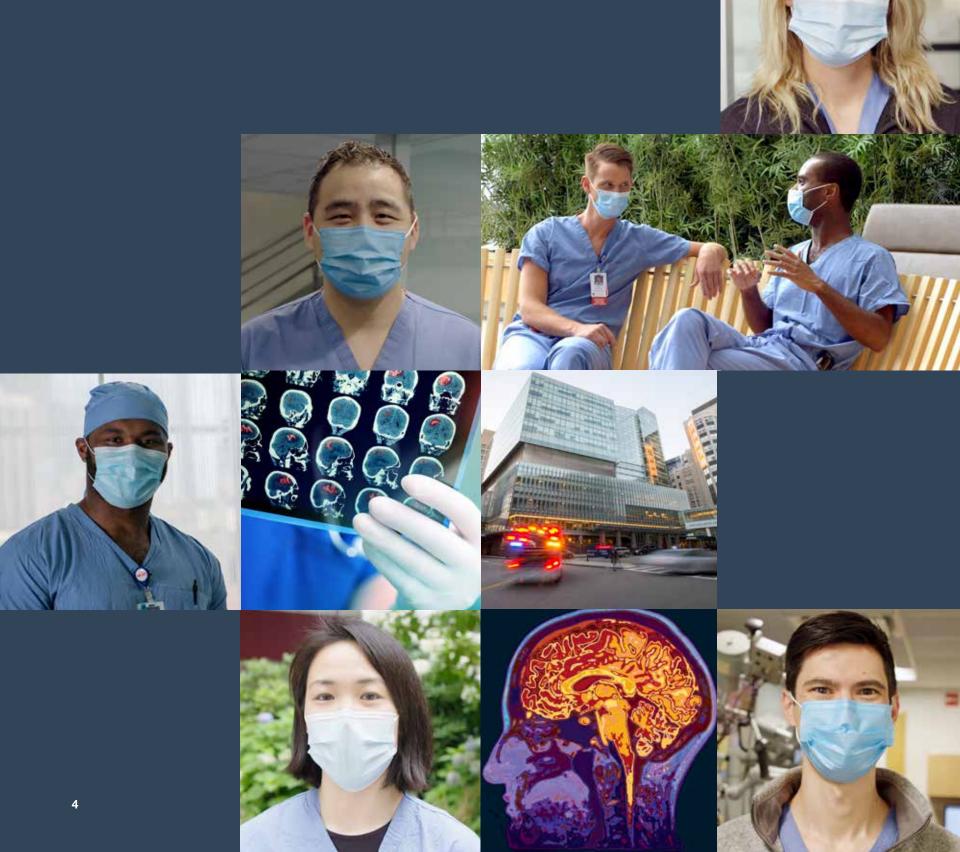
PROGRAM OVERVIEW

All program phase locations are at Mass General's main campus unless another location is specified.

| PGY1 | PGY2 + 3 | PGY4 + 5 | PGY6 + 7 |
|--|---|---------------------|--|
| General Surgery (3 months) | East Team Junior (4 months) | Research/Fellowship | East Team Senior/Chief Resident (4 months as R6 Senior and 4 months as R7 Chief) |
| Neurosurgery & ICU (6 months) | West Team Junior/ Radiosurgery (4 months) | | West Team Senior/Chief Resident (4 months as R6 Senior and 4 months as R7 Chief) |
| Neurology Service (3 months) | Boston Children's Hospital (4 months) | | North Team Chief Resident (4 months as R6 Senior and 4 months as R7 Chief) |
| | North Team Junior (4 months) | | |



NEUROSURGERY RESIDENTS



PGY7

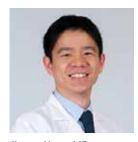


Bryan Choi, MD, PhD

Duke Medical School
Harvard



Benjamin Grannan, MD Harvard Medical School MIT



Harvard Medical School
Harvard

PGY₆



Christine Lee, MD, PhD
Stanford Medical School
Harvard



Athar Malik, MD, PhD
Harvard Medical School
Johns Hopkins



Cameron Sadegh, MD, PhD
Harvard Medical School
MIT

of neurosurgery."

Pamela S. Jones, MD, MPH
Resident, Class of 2016

"The faculty at Mass General are not just your teachers for the seven years, but truly remain your teachers

for life. They are never

out of reach and always

For me, Mass General Neurosurgery provided a

willing to provide counsel.

family of support, ensuring I not only made it through the gauntlet of residency training, but that I would do so with optimism, energy, and an appreciation of life

both within and beyond that

PGY5



Amy Baohan, MD, PhD
UCLA Medical School
Columbia



Victoria Clark, MD, PhD
Yale Medical School
Harvard



Arjun Khanna, MD

Harvard Medical School
Duke



PGY4



Muhamed Hadzipasic, MD, PhD

Yale Medical School Johns Hopkins



Myron Rolle, MD

Florida State Medical School Florida State



Pratik Talati, MD, PhD

Vanderbilt Medical School UAB

PGY₃



Gabriel Friedman, MD
Harvard Medical School

Pomona



Pranav Nanda, MD

Columbia University Stanford

PGY2



Ian Connolly, MD
Stanford Medical School
Stanford University



William Munoz Miranda, MD, PhD

NYU School of Medicine University of Puerto Rico



Faith Robertson, MD, MSc

Harvard Medical School Duke University



Amy Wang, MD

Harvard Medical School Harvard University

PGY₁



Kow A. Essuman, MD, PhD

Washington University in St. Louis, School of Medicine Temple University



Robert M. Gramer, MD

Duke University School of Medicine University of California, Irvine



Nathaniel Sisterson, MD

University of Pittsburgh, School of Medicine Northwestern University





Bob Carter, MD, PhD

Neurosurgical Oncology
Neurovascular Surgery



Frederick Barker, MD

Neurosurgical Oncology



Lawrence Borges, MD

Neurosurgical Spine



Justin Brown, MD
Peripheral Nerve
Neurosurgical Spine



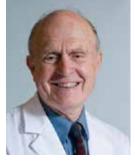
William Butler, MD

Pediatric Neurosurgery



Daniel Cahill, MD, PhD

Neurosurgical Oncology



Paul Chapman, MD
Radiosurgery



Jean-Valery Coumans, MD

Neurosurgical Spine



William Curry, MD

Neurosurgical Oncology



Tina Duhaime, MD
Pediatric Neurosurgery



Pamela Jones, MD

Neurosurgical Oncology



Bay Leslie-Mazwi, MD
Critical Care Neurology
Neuroendovascular



Robert L. Martuza, MD

Neurosurgical Oncology



Brian Nahed, MD, MSc Neurosurgical Oncology



Aman Patel, MD

Neurovascular Surgery
Neuroendovascular



James Ravinov, MD

Neuroendovascular



Mark Richardson, MD, PhD
Functional Neurosurgery



Jeffrey Schweitzer, MD, PhD Functional Neurosurgery



Ganesh M. Shankar, MD, PhD



John Shin, MD

Neurosurgical Spine Neurosurgical Spine



Christopher J. Stapleton, MD

Neurovascular Surgery



Brooke Swearingen, MD
Neurosurgical Oncology



Ziv Williams, MD
Functional Neurosurgery
Peripheral Nerve



Neurosurgery



PGY₁

General Surgery (3 months)

Residents spend three months rotating on general surgery, critical care, trauma and other surgical specialty rotations developing operative skills and management of complex medical and surgical patients.

Neurosurgery & ICU (6 months)

Residents focus on all aspects of the management of neurological and neurosurgical patients in the neuroscience ICU focused on intracranial pressure, management of IV fluids and basic management of acute neurological, cardiac and pulmonary issues common to these patients.

Neurology Service (3 months)

Residents develop expertise in the neurological exam and diagnostic workup of neurological disease. Rotations on inpatient and out-patient neurological services include advanced neurology, neuro-oncology, neurovascular, stroke, epilepsy, movement disorders and pediatric neurology.

"The Mass General Neurosurgery Residency provided a fantastic clinical and research training environment, giving me the experience and confidence I needed to launch my career. I will always remember the lessons learned from the tremendous collection of faculty. In addition, connections to the wide Mass General network remain invaluable to me for creating new career opportunities. I can't imagine a better place to have trained."

Sameer Sheth, MD, PhD, Resident, Class of 2012



PGY3+2

East Team Junior (4 months)

Residents focus on the surgical and nonsurgical management of spinal, functional and pediatric diseases. Residents are exposed to the breadth of spinal disorders including degenerative disease, tumors, deformity and peripheral nerve. In addition, residents are exposed to functional neurosurgery including deep brain stimulation, epilepsy surgery and surgery for pain. Residents care for the surgical and nonsurgical management of pediatric cranial and spinal disease.

West Team Junior/Radiosurgery (4 months)

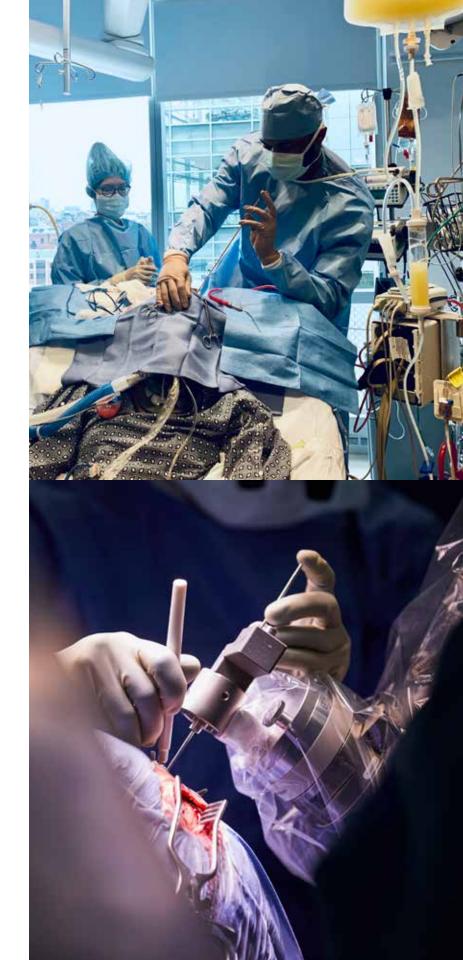
Residents focus on the surgical and nonsurgical care of brain tumor patients. In addition to the surgical skill, residents take part in the treatment and planning of single fraction radiosurgery, proton beam radiosurgery and the linear accelerator (LINAC).

Boston Children's Hospital (4 months)

Residents rotate at Boston Children's Hospital to gain additional experience in the clinical and surgical management of pediatric patients.

North Team Junior (4 months)

Residents focus on the management of vascular (open and endovascular) cases where they are exposed to surgical, nonsurgical and endovascular techniques. In addition, the residents focus on trauma, general neurosurgery and spine to operate on a breadth of neurosurgical cases.



PGY6+7

East Team Senior/Chief Resident (4 months as R6 Senior and 4 months as R7 Chief)

The East Senior/Chief assumes a large role in the operative and clinical management of complex spine, pediatric and functional cases. There is a special emphasis on complex spinal disease (degenerative, deformity and neoplasm). In addition, residents have an extensive exposure to functional neurosurgery, including deep brain stimulation, epilepsy surgery and surgery for pain. Residents are exposed to the breadth of pediatric neurosurgery during this rotation as well. There is considerable responsibility for the teaching and supervision of other residents.

West Team Senior/Chief Resident (4 months as R6 Senior and 4 months as R7 Chief)

The West Senior/Chief Resident plays a large role in the operative and clinical management of complex tumor cases ranging from intra-axial, extra-axial, skull base and pituitary tumors. Residents gain an extensive experience in the surgical management of brain tumors with the use of cutting-edge intraoperative mapping, intraoperative imaging, endoscopic and endonasal techniques and novel minimally invasive techniques. There is considerable responsibility for the teaching and supervision of other residents.

North Team Chief Resident (4 months as R6 Senior and as R7 Chief)

The North Chief Resident is the administrative chief resident. The North Chief has his or her own office, administrative assistant and performs a wide spectrum of cases including trauma, cerebral hemorrhage and a variety of spinal cases. The North Chief Resident is also in charge of the call schedule, the operating room assignments and has considerable responsibility for the teaching and supervision of other residents. The Vascular Chief resident plays a large role in the surgical (open vascular) and nonsurgical management of open and endovascular neurosurgical cases. The resident performs diagnostic angiograms and participates in coiling and embolization endovascular neurosurgical procedures.



RESEARCH

Research Training

Mass General Department of Neurosurgery is a leader in clinical, translational and basic science research and is a founding member of Mass General Neuroscience, a collaboration of more than 2,000 faculty, trainees, and staff dedicated to advancing translational neuroscience across a spectrum of departments. Every neurosurgical attending is engaged in research and works closely with collaborators from Neuro-oncology, Radiation Oncology, Neuropathology, Neurophysiology, Neurology and the Mass General Cancer and Vascular Centers. Residents pursue research projects with mentors stemming from neurosurgery, and researchers at Mass General, Massachusetts Institute of Technology, Broad Institute, Dana-Farber Cancer Center and Harvard University.

Research Accomplishments

The Mass General Department of Neurosurgery has a successful track record with NIH and foundation grants. Our residents are often awarded independent funding and fellowships, including awards from the NIH (NRSA, K08) NREF, ABTA, Parkinson Disease Foundation, American Parkinson Disease Associations, Burroughs Welcome Fund and many others. Numerous residents have had high-quality publications in journals such as *Science*, *Nature Neuroscience*, *Nature Medicine*, *Cancer Discovery*, *New England Journal of Medicine*, *Journal of Neuroscience*, *Journal of Neurosurgery*, among many others. The department has also been awarded the prestigious R25 training grant by the NIH to support the resident research years.

OVER 50%

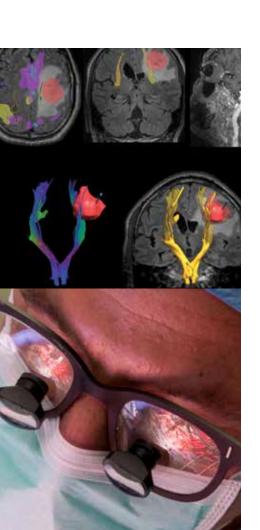
OF MGH NEUROSURGERY
RESIDENTS ARE AWARDED GRANTS

MGH HAS BEEN AWARDED THE PRESTIGIOUS R25 TRAINING GRANT TO SUPPORT RESIDENT RESEARCH



LABORATORY-BASED RESEARCH FACULTY

| Bob S. Carter, MD, PhD Leonora Balaj, PhD | BLOOD-BASED BIOMARKERS FOR BRAIN TUMORS The lab is developing the first blood test to diagnose and monitor patients with brain tumors. | | |
|--|--|--|--|
| Jeffrey Schweitzer, MD, PhD Bob S. Carter, MD, PhD | CELLULAR NEUROTHERAPEUTICS AND NEURORESTORATION LABORATORY The lab is developing novel iPS dervied therapeutics for Parkinson's disease. | | |
| Daniel P. Cahill, MD, PhD | TRANSLATIONAL NEURO-ONCOLOGY The lab aims to identify genetic alterations that underlie development, progression and resistance of brain tumors. | | |
| William T. Curry, MD | TRANSLATIONAL BRAIN TUMOR IMMUNOLOGY The lab focuses on the development and evaluation of novel therapies for brain tumors. | | |
| Beth Costine, PhD Ann-Christine "Tina" Duhaime, MD | BRAIN TRAUMA The Brain Trauma Lab is aimed at learning how to better treat the millions of children with brain trauma and similar problems, now and in the future. | | |
| Shelley I. Fried, PhD | NEURAL PROSTHETIC The lab seeks to improve the effectiveness of CNS-based neural prosthetics. | | |
| Robert L. Martuza, MD Samuel D. Rabkin, PhD | MOLECULAR NEUROSURGERY The lab focuses on the use of herpes simplex virus (HSV) vectors for cancer therapy and gene delivery in the nervous system, with the long-term goal being the therapeutic application of these vectors to patients. | | |
| Brian V. Nahed, MD, MSc Shannon Stott, PhD | BLOOD-BASED BIOMARKERS FOR BRAIN TUMORS The lab is developing the first blood test to diagnose and monitor patients with brain tumors. | | |
| John S. Pezaris, PhD | VISUAL PROSTHESIS The lab works to restore sight to the blind by sending signals from a digital camera directly into the brain. | | |
| Mark Richardson, MD, PhD | BRAIN MODULATION LAB The lab conducts human systems neuroscience research using intracranial recording and stimulation in patients undergoing surgery for epilepsy, movement disorders and psychiatric diseases. | | |
| Kathleen Sweadner, PhD | MEMBRANE BIOLOGY The lab studies ATP-hydrolyzing enzymes control sodium, potassium and calcium movements. | | |
| Hiroaki Wakimoto, MD, PhD | BRAIN TUMOR STEM CELL The lab develops novel therapeutic strategies for GBM through a better understanding of the biological and molecular characteristics of GBM stem cells. | | |
| Ziv Williams, MD | NEURONAL COMMUNICATION/RESTORATION The lab probes mechanisms which neurons communicate locally and across cortical areas, and communication across areas disrupted within the CNS. | | |
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2020

Christopher Alvarez-Breckenridge, MD. PhD

MD Anderson Cancer Center Neuro-Oncology Fellow

Matthew Koch, MD

UIC, College of Medicine Cerebrovascular Fellow

Robert Koffie, MD, PhD

Barrow Neurological Institute Spine Fellow

2019

Sarah Bick

Vanderbilt Assistant Professor, Functional Neurosurgery

Vijay Yanamdala

Albert Einstein College of Medicine Assistant Professor, Neurosurgery

Marcus Zachariah

Ohio State University Assistant Professor, University of Mississippi Neurosurgeon, Skull Base Oncology

2018

Andrew Venteicher

U Minnesota Assistant Professor, Skull Base Neurosurgery

Christopher Stapleton

Massachusetts General Hospital Instructor, Cerebrovascular Surgery

Matthew Mian

Colorado Carepoint Functional Neurosurgery

2017

Pankaj Agarwalla

Rutgers Neurosurgery Assistant Professor, Skull Base Neurosurgery

Katie Fehnel

Boston Children's Hospital Instructor, Pediatric Neurosurgery

Ganesh M. Shankar

Massachusetts General Hospital Assistant Professor, Neurosurgical Spine

2016

Anoop Patel

University of Washington Assistant Professor, Skull Base and Endoscopic Surgery; Neurosurgical Oncology

Pamela S. Jones

Massachusetts General Hospital Assistant Professor, Neurosurgical Oncology

Josh Aronson

Dartmouth Assistant Professor; Director of Functional Neurosurgery

2015

Navid Redial

Capital Institute
Attending; Director of
Neurosurgical Oncology

Brian Walcott

Northshore University System Assistant Professor, Cerebrovascular Neurosurgery

Patrick Codd

Duke

Assistant Professor; Director of Endoscopic Neurosurgery

Director, Congenital Anomaly

2014

Kris Kahle

Yale Assistant Professor, Pediatric Neurosurgery;

Neurosurgery

Peter Fecci

Duke Assistant Professor, Neurosurgical Oncology

Anna Terry

Duke

Assistant Professor, Neurosurgical Spine

2013

Gavin Dunn

Washington University, St. Louis Associate Professor, Neurosurgical Oncology

John Barr

Duke

Assistant Professor, Neurosurgical Spine

2012

David Jho

Allegheny General Hospital Assistant Professor, Neurosurgical Spine; Director of Endoscopic Skull Base and Spine

Sameer Sheth

Baylor College of Medicine Associate Professor, Vice Chair Research Functional Neurosurgery

Eric Chang

Providence Medical Center, Washington Attending, Neurosurgery

2011

Brian Nahed

Massachusetts General Hospital Associate Professor, Neurosurgical Oncology; Associate Residency Program Director

Rollin Hu

Kaiser Permanente Attending, Neurosurgical Spine

2010

Jason Gerrard

Yale

Assistant Professor, Director of Functional Neurosurgery

Wael Asaad

Brown

Associate Professor; Director of Functional Neurosurgery & Epilepsy

Travis Tierney

CHI Health, St. Mary's, Nebraska City Functional Neurosurgeony

2009

Christopher Farrell

Thomas Jefferson Assistant Professor, Skull Base and Endoscopic Surgery; Neurosurgical Oncology

Manuel Ferreira

University of Washington Associate Professor, Skull Base and Neurosurgical Oncology; Chief, Neurosurgical Surgery

2008

Daniel Cahill

Massachusetts General Hospital Associate Professor, Neurosurgical Oncology

Clark Chen

University of Minnesota Professor and Department Chair, Neurosurgical Oncology

2007

Manish Aghi

UCSF

Professor, Neurosurgical Oncology; Co-Director, Center for Minimally Invasive Skull Base Surgery

Ramin Amirnovin

Inland Neurosurgery Attending, Neurosurgery

2006

Ziv Williams

Massachusetts General Hospital Associate Professor, Functional Neurosurgery; Director of Peripheral Nerve Surgery

Khalid Abbed

Yale

Associate Professor, Chief of Neurosurgery Spine

2005

Brian Hoh

University of Florida Professor, Chair of Neurosurgery; Chief of Cerebrovascular Surgery

Ekkehard Kasper

Professor and Division Head, McMaster University

2004

Joseph Neimat

University of Louisville Professor and Department Chair, Functional Neurosurgery

William Curry

Massachusetts General Hospital Professor; Director of Neurosurgical Oncology; Co-Director, Neurosciences Institute

2003

Steve Kalkanis

Henry Ford Professor and Department Chair, Neurosurgical Oncology

Edward Smith

Boston Children's Hospital Professor; Director of Pediatric Cerebrovascular Neurosurgery

2002

John Brisman

NSPC

Attending, Neurosurgery

Yogish Kamath

Kell West Regional Hospital Chair, Department of Neurosurgery

2001

Albert Lee

Tallahassee Neurological Attending, Neurosurgery

Sepi Amin-Hanjani

UIC

Professor Cerebrovascular Surgery; Residency Program Director

2000

Richard Chung

Neurosurgical Associates of Santa Barbara Attending, Neurosurgery

Emad Eskandar

Chief of Neurosurgery, Albert Einstein Medical Center

1999

Zoher Ghogawala

Lahey Clinic

Professor and Department Chair, Neurosurgical Spine

Bob Carter

Massachusetts General Hospital Professor and Department Chair, Neurosurgical Oncology

1998

Marius Maxwell

Arctic Spine Attending, Neurosurgery

Robert Friedlander

University of Pittsburgh Professor and Department Chair, Cerebrovascular Surgery

1997

John Yu

Cedars-Sinai Attending; Co-Director, Comprehensive Brain Tumor Program

Stephen Tatter

Wake Forrest Professor, Chief of Neurosurgical Oncology

1996

Nicole Moyaeri

Kaiser Permanente Attending, Neurosurgery

Peyman Pakzaban

Pasadena Neurosurgery Attending, Neurosurgery

1995

E. Antonio Chiocca

Brigham & Women's Professor and Department Chair, Neurosurgical Oncology

David Frim

University of Chicago Professor and Department Chair, Pediatric Neurosurgery

1994

William Butler

Massachusetts General Hospital Assistant Professor, Pediatric Neurosurgery

William Rosenberg

Midwest Neurosurgery Attending, Neurosurgery

1993

Andrea Halliday

Spine & Brain Center Attending, Neurosurgery

Richard Westmark

Houston Neurosurgery Attending, Neurosurgery

1992

Jim Schumacher

Sarasota Neurosurgery Attending, Neurosurgery

Fred Barker

Massachusetts General Hospital Professor, Neurosurgical Oncology; Director. Skull Base Center

1991

John Steichen

Charleston Neurosurgery Attending, Neurosurgery

Chris Ogilvy

Beth Israel Deaconess Professor, Cerebrovascular Surgery; Director, Endovascular and Operative Surgery

1990

Kevin McGrail

Georgetown Professor and Department Chair, Cerebrovascular Surgery

Allan Hamilton

University of Arizona Attending, Neurosurgery; Executive Director, ASTEC

1989

Debbie Petrucci

Yale

Attending; Neurosurgery Chair Emeritus, White Plains Hospital and Lincoln Hospital

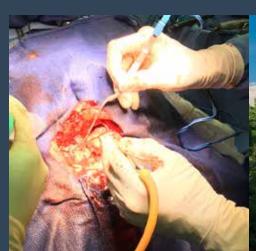
Joe Madsen

Boston Children's Hospital Professor, Pediatric Neurosurgery; Director, Epilepsy Surgery

To see more of our alumni visit massgeneral.org/neurosurgery/alumni

RESIDENCY IN BOSTON











BOSTON & BEYOND

Boston is a truly exceptional place to live with something to offer for all. The city is distinguished by its proud, vibrant and unique neighborhoods, each with its own individual flair and character. More than 11 million annual visitors and residents frequent Newbury Street, Copley Place and the Prudential Center for shopping. With 37 sports titles, Boston is known as "The City of Champions." There are miles of pathways for exercise and leisure along the Charles River and Jamaicaway. Nearby athletic options include cross-country skiing or golfing at Franklin Park, hiking at the Blue Hills Reservation and sailing and swimming at 20 regional beaches.

Boston's diverse restaurants serve up everything from Ethiopian to Japanese to Colombian cuisines. Hundreds of food trucks operate day and night across the city. Almost 30 neighborhood farmers markets are sprinkled throughout the city.

While Boston is perhaps best known for its rich history, it is also full of true artistic and cultural gems, like the Institute of Contemporary Art, the Museum of Fine Arts, the Opera House and Boston Creates, which rotates public art displays and soundscapes along the mile-and-a-half long Rose Kennedy Greenway. The city also comes alive during each season with different festivals, concerts, markets and crafts fairs.

Beyond all the great experiences Boston offers residents, Massachusetts is consistently ranked among the top places in the country to raise a family. The years in residency can be as formidable personally as they are professionally, and many current and former Mass General residents have started their own families during their time here.



4,500+

FOOD AND RETAIL ESTABLISHMENTS, INCLUDING 100+ FOOD TRUCKS

16
JAMES BEARD AWARD WINNERS

500+

ARTS AND CULTURE EVENTS
PER YEAR

20+
BREWERIES

98%
OF BOSTONIANS LIVE WITHIN
A 10-MINUTE WALK OF A PARK
OR OPEN SPACE

PUBLIC PARKS, 65 PUBLIC SQUARES, OVER 35,000 STREET TREES

HOUR'S DRIVE TO BEACHES, LAKES, OR MOUNTAINS

