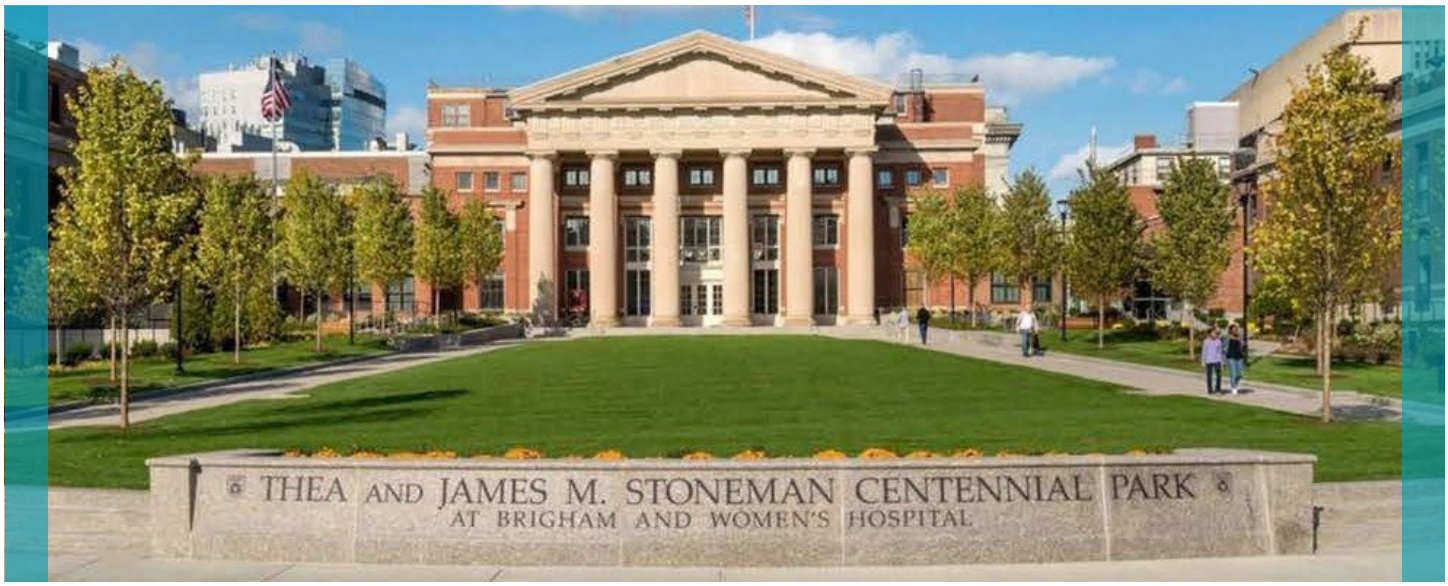
2023 - 2024

Neurosurgery Residency Program

Brigham and Women's Hospital
Founding Member, Mass General Brigham

Boston Children's Hospital

HARVARD MEDICAL SCHOOL



Neurosurgery Residency Program Overview

Thank you for your interest in the Neurosurgery Residency Program of Brigham and Women's Hospital, Boston Children's Hospital and Harvard Medical School. In our program, trainees are exposed to a wealth of neurosurgical pathology. Residents learn the fundamentals of surgical skills, the care of critically ill patients, and the principles of neurologic clinical evaluation, differential diagnosis and interpretation of neuro-imaging. These goals are facilitated by clinical rotations on ancillary services and in the various neurosurgery hospital and clinic services.

A rich and graduated neurosurgical experience and close mentorship by internationally-recognized clinical faculty allow the development and maturation of outstanding operating skills. Technical and clinical experiences are complemented by emphasis on clinical judgment, evidence-based outcome assessment, and thoughtful analysis of morbidity.

On behalf of each faculty member of the Department of Neurosurgery and our team of residents, we can affirm that we have no mission more sacred than that of training the next generation of academic neurosurgeons.

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E.Antonio Chiocca, MD, PhD
Department Chair

G .Rees Cosgrove, MD, FRCSC, FAANS
Residency Program Director

What you need to know **STAT**

4,789

surgical cases per year

Neurosurgery and Neurology ranked within **top 20** of *U.S. News & World Report* Honor Roll of Best Hospitals

39

Surgeons and Specialists

21

Residents in training

Clinical Training Program

Program Overview

Neurosurgical training at Brigham and Women's/Boston Children's Hospitals/Harvard Medical School is a comprehensive seven-year program designed specifically to prepare each resident for a career in clinical and academic neurosurgery. Neurosurgical training starts during PGY-1 year with rotations in the NICU, neurosciences, pediatrics, and fundamental clinical skills.

The residency training period is a time of collaboration. Just as the faculty have set goals for the residents to ensure proper training, the faculty have also set goals to ensure the program continues to evolve and adapt to changes in resident education. The guidelines and expectations outlined should be viewed as our ongoing attempt to continuously improve the quality of the training and educational experience of the residents.

Research Opportunities

Residents are provided two years dedicated to research, clinical fellowship, or in pursuit of an advanced degree. Research opportunities in Boston are abundant and include those at the Brigham and Women's Hospital (BWH), Boston Children's Hospital (BCH), Massachusetts General Hospital (MGH), Dana Farber Cancer Institute (DFCI), Broad Institute, Wyss Institute, Harvard Medical School (HMS), Harvard School of Public Health, Harvard University (HSPH), and Massachusetts Institute of Technology (MIT).

Educational Opportunities

Resident educational opportunities are an integral part of the program. Residents are encouraged to attend neurosurgical courses throughout their training in their chosen sub-specialty. The program sponsors residents to present their research at neurosurgery grand rounds and at national conferences including the American Association of Neurosurgical Surgeons, the Congress of Neurological Surgeons, and sub-specialty section meetings.

In addition, BWH residents play an important role educating more junior colleagues and mentoring Harvard Medical Students and its AANS Chapter to host neurosurgical lectures, teach neuroanatomy, introduce surgical skills, and host monthly educational events.

The goal of our program is to train neurosurgical residents to:

1. Develop all necessary clinical and technical skills
2. Competently devise and execute a plan of patient management
3. Be able to critique the neurosurgical literature
4. Add to the growth of the specialty through research and other scholarly activities
5. Become knowledgeable about clinical and basic neurosciences
6. Participate in activities that involve practice-based learning and improvement
7. Understand and practice a high level of professionalism
8. Develop and refine interpersonal and communication skills
9. Understand systems based medical practice and medical socioeconomics

Program Structure

PGY-1 (Intern)

PGY-1s will spend four months on a *Critical Care (NICU)* rotation. PGY-1s will also spend two months on rotation at *BCH*, where (s)he shares night-time coverage with rotators from other programs (i.e. BI, MGH, and Tufts). Lastly, PGY-1s will spend four months doing a *Nights and Neuroscience rotation* focusing on neuroradiology, interventional procedures, and radiosurgery, one month on the *Neurosurgery* floor service and one month doing *Angiography*. Residents will be exposed to patients with multiple trauma and head injuries or spinal cord injuries far above and beyond what they currently receive in their *NICU* rotation.

PGY-2 & PGY-3 (Junior Resident)

PGY-2 neurosurgery residents spend ten months on the BWH service and 2 months at BCH. The BWH service is staffed by three residents depending on rotations from the PGY-2 and 3 residents, each of whom is primarily assigned to one of three inpatient services named the Cushing, Dandy, and Penfield services. PGY-3s will spend nine months on neurosurgical service rotations at BWH, with each three month rotation emphasizing spinal disorders, neuro-oncology, or cerebrovascular disorders and their surgical treatments. Three months are spent at the Boston VA Medical Center in West Roxbury for a longitudinal patient care experience - participating in twice-weekly clinic, operative cases, daily rounding and inpatient care, under the supervision of Dr. Jacob Rachlin and Dr. Michael Mooney.

PGY-4 & PGY-5 (Research Resident)

The bulk of this time is spent in the laboratory completing a research project developed and approved in the PGY-3 year. This experience is strongly encouraged to take place in a laboratory at the Brigham and Women's Hospital, Boston Children's Hospital, Dana-Farber Cancer Institute or Harvard Medical School so that they can continue to participate in teaching conferences. PGY-4 residents participate in the call rotation at BWH, which approximates one call per week and an occasional weekend 24-hour shift. PGY-5 residents do not take call to be able to concentrate more fully on their research projects and see them to completion.

"The first day I was here, I got to do a massive brain aneurysm surgery. The chief resident walked me and taught me through the entire surgery.

I got to do more that day than I'd previously done in any day of medical school, including other rotations."

- Saksham Gupta, PGY-5

Residents must pass the ABNS written primary exam before embarking on their final two yeas of clinical training.

PGY-6 (Senior Resident)

PGY-6s will spend eight months on neurosurgical service rotations at BWH, emphasizing spinal disorders, neuro-oncology, or cerebrovascular disorders and their surgical treatments. (S)he will also spend four months as Chief Resident on the Ingraham neurosurgical service rotations *at* BCH. The senior resident is generally expected to clearly demonstrate the ability to be or become a skilled and capable neurosurgeon, both clinically and technically.

PGY-7 (Chief Resident)

The PGY-7 year is spent as Chief Resident and is divided into three 4-month segments, all at BWH. The chief resident also supervises the junior residents, coordinates the entire service including teaching, work rounds, and conferences. He/she must evaluate and manage surgical complications, including organizing and presenting at Morbidity and Mortality (M&M) conferences. The chief resident also has a significantly expanded operative experience and some additional clinic time with senior faculty.

Neurosurgery Residency Program, 2022 - 2023

Neurosurgery Residents 2023 - 2024

Chief Residents

Stanley Bazarek, MD, PhD
Rosalind Franklin University - Chicago Medical School

Neil Klinger, MD
Wayne State University School of Medicine

Martina Mustroph, MD, PhD
University of Illinois College of Medicine at Urbana

PGY-6

Benjamin Johnson, MD, PhD
Warren Alpert Medical School of Brown University

Ari Kappel, MD
Stony Brook University School of Medicine

Genaro Villa, MD, PhD
David Geffen School of Medicine at UCLA

PGY-5

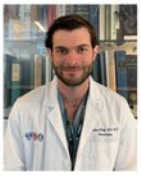
Joshua Bernstock, MD, PhD
University of Alabama, Birmingham

Melissa Chua, MD
Boston University School of Medicine

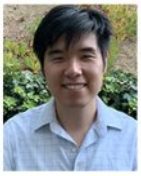
Saksham Gupta, MD
Harvard Medical School

PGY-4

Marcelle Altshuler, MD
Georgetown University School of Medicine



Joshua Chalif, MD, PhD
Columbia University College of Physicians and Surgeons



Jason Chen, MD, PhD
David Geffen School of Medicine at UCLA

PGY-3

Casey Jarvis, MD
Keck School of Medicine, USC

Sean Lyne, MD
University of Chicago Pritzker School of Medicine

James Tanner McMahon, MD
Emory University School of Medicine

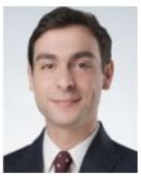
PGY-2

Adam Glaser, MD
Dartmouth Geisel School of Medicine

David Liu, MD
Warren Alpert Medical School of Brown University

Gabrielle Luiselli, MD
University of Massachusetts Medical School

PGY-1



Eric Chalif, MD
ıool of Medicine and Health Sciences, George Washington

Ron Gadot, MD
Baylor College of Medicine

Chibueze Nwagwu, MD
Emory University School of Medicine

BWH Neurosurgery Clinical Faculty


Ossama Al-Mefty, MD


Tracy Ansay, MD


Omar Arnaout, MD


M. Ali Aziz-Sultan, MD


Wenya Linda Bi, MD, PhD


John Chi, MD, MPH


E. Antonio Chiocca, MD, PhD


Marc Christensen, MD, PhD


Elizabeth Claus, MD, PhD


G. Rees Cosgrove, MD


Kurtus Dafford, MD


Rose Du, MD, PhD


Kai Frerichs, MD


Alexandra Golby, MD


William Gormley, MD, MPH, MBA


Michael Groff, MD


Kevin Huang, MD

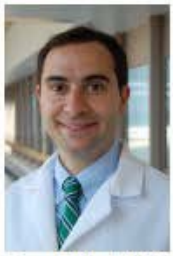

Edward Laws, MD


Yi Lu, MD, PhD


Michael Mooney, MD


Nirav Patel, MD


Pier Paolo Peruzzi, MD, PhD


Jason Rahal, MD


John Rolston, MD, PhD


Stephen Saris, MD


James Stephen, MD


Danielle Sarno, MD


Timothy Smith, MD, PhD, MPH


Hasan Zaidi, MD

BCH Neurosurgery Clinical Faculty

Lissa Baird, MD

Katie Pricola Fehnel, MD

Joseph R. Madsen, MD

Weston Northam, MD

Mark Proctor, MD

Alfred Pokmeng See, MD

Edward Robert Smith, MD

Scellig S.D. Stone, MD, PhD, FRCSC

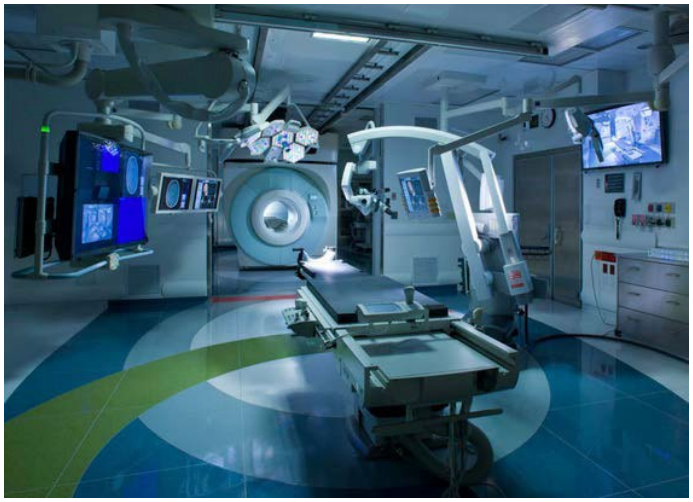
Benjamin C. Warf, MD

Available Technology

MRI Guided Focused Ultrasound (MRGFUS)

Focused ultrasound treatments can be performed on an outpatient basis, require no incisions, and can result in minimal discomfort and few complications, allowing for rapid recovery. This technology is currently FDA approved for the treatment of essential tremor and is currently being evaluated on its capability to treat parksonian tremor, blood brain barrier, and other neuro conditions via clinical trials here at Brigham and Women's Hospital.

In early 2020, Brigham and Women's Hospital became the first site in the United States to treat 100 patients (outside of a clinical trial) with focused ultrasound (FUS).



Advanced Multimodality Image Guided Operating (AMIGO) Suite

A state-of-the-art medical and surgical research environment that houses a complete array of advanced imaging equipment and interventional surgical systems.

ROSA™ Robotic Surgical Assistant

ROSA™ acts as an assistant in the operating room and provides a service to help navigate and map the brain, similar to a GPS.

It can be used in any type of cranial or spinal procedure that requires surgical planning with preoperative data and precise position and handling of instruments.

Available Technology

O-Arm®

The O-arm® and StealthStation® systems eliminate the need to wear lead protective apparel during the navigated steps of the procedure. The O-arm offers multiple image protocols allowing you the flexibility to minimize dose to your patient based on your individual clinical objectives.

Hybrid OR (operating room)

This system allows our staff to perform high-end diagnostic imaging and multiple surgical or non-surgical interventions for an individual patient without ever leaving the operating room.

7 Tesla (7.0T MRI)

This device aids our clinicians and researchers to visualize critical structures and pathologies that until now were not visible by MRI. Seeing these structures and pathologies will help clinicians differentiate between diseases and conditions in which symptoms may be similar and, in turn, choose the best treatment option for patients.

Interventional Neuroradiology Suite

Endovascular procedures are performed in the angiographic suite rather than the operating room. Fluoroscopy (x-rays), ultrasound (US), compute tomography (CT), and magnetic resonance imaging (MRI) are used to guide their way through the body without making a skin incision.

Weekly Conference Schedule

Monday

7-7:30 a.m.	Cushing Service Didactics	BWH
7:30-8:15 a.m.	Neuro-Oncology/Tumor Board Conference	BWH/Dana-Farber

Tuesday

7-7:30 a.m.	Dandy Service Didactics	BWH

Wednesday

6:30-7 a.m.	Morbidity/Mortality Conference	BWH (each Wed except 1st)
7-8 a.m.	Combined QI Conference	BWH (1st Wed of each month)
7-8 a.m.	Neurosurgery Grand Rounds	BWH (every Wed except 1st)
7- 9 a.m.	Skull Base Cadaver Lab	BWH (Quarterly)
8-9 a.m.	Neuroradiology Conference	BWH
4-5 p.m.	Movement Disorder Conference	BWH (1st & 3rd of each month)

Thursday

7-8 a.m.	Cerebrovascular/Endovascular Conference	BWH
7-8 a.m.	Skull Base Conference	BWH (every other Thurs)
9:30-10:30 a.m.	Pituitary Multidisciplinary Conference	BWH (monthly)
10 a.m.-12 p.m.	Resident Clinics (PGY 2 & 6s)	BCH
1-2 p.m.	Epilepsy Conference	BWH
6:15-7:15 p.m.	Thursday Resident Educational Conference	BWH

Friday

7:30-8:30 a.m.	Neuropathology/Brain Cutting	BWH

Weekly Conference Schedule Descriptions

Brain Tumor Conference (Monday 7:30-8:15 a.m.):

This conference is a multi-disciplinary effort (neurosurgery, neuroradiology, neuropathology, radiation oncology and neuro-oncology) that reviews current brain tumor patients that have undergone surgery and discusses course of treatment. It also reviews patients where there are questions related to treatment or diagnosis.

Morbidity And Mortality Conference (Wednesday 6:30-7 a.m.):

This weekly conference includes faculty, residents and fellows. Morbidities and mortalities on the service during the prior week are discussed. This incorporates quality discussions as well as risk avoidance.

Grand Rounds (Wednesday 7-8 a.m.):

This weekly conference is an important teaching tool in medical education by providing residents and faculty with a way to stay up to date on important and ever-evolving areas of Neurosurgery and are held in conjunction with other education conferences.

Neuroradiology Conference (Wednesday 8-9 a.m.):

One-hour weekly case-based presentation of recent neurosurgical cases in conjunction with the neurosurgical and neuroradiological attending staff and visiting professors when present.

Skull Base Educational Conference (Thursday 7-8 a.m.):

One-hour weekly conference moderated by a senior skull base neurosurgeon reviewing skull base surgical approaches as well as clinical, pathological and radiographic presentation of many disease processes. Once a month this conference is a multidisciplinary review of several recent cases including radiographic imaging, pathologic imaging, surgical intervention and adjuvant treatment/follow-up care discussions with attending staff from other disciplines (radiology, pathology, neuro-oncology, radiation oncology).

Pituitary/Neuroedocrine Educational Conference (Thursday 9:30-10:30 a.m.):

One hour monthly conference moderated by senior pituitary neurosurgeon reviewing endoscopic and microscopic transsphenoidal surgery approaches as well as clinical, pathological and radiographic presentation of sellar region disease processes. Once a month this conference is a multidisciplinary review of several recent cases including radiographic imaging, pathologic imaging, surgical intervention and adjuvant treatment/follow-up care discussions with attending staff from other disciplines (radiology, pathology, endocrinology).

Weekly Conference Schedule Descriptions

Epilepsy Conference (Thursday 1-2 p.m.):

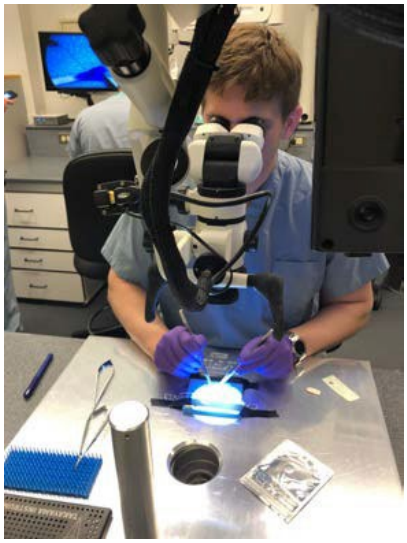
This is a weekly multi-disciplinary conference that focuses on the surgical management of 1-2 patients with intractable epilepsy. All relevant presurgical evaluation is discussed including clinical history, neuroimaging, EEG findings and neuropsychology. Treatment options including resective surgery, LITT, neuromodulation and invasive intracranial EEG recordings are discussed among the participants and recommendations are made.

Thursday Resident Education Conference (Thursday 6:15-7:15 p.m.):

One hour conference reviewing anatomy, surgical approaches and treatment paradigms of various neurosurgical topics using current literature and an interactive format. These conferences are scheduled to complement the summer skull base sessions and other conferences to reinforce concepts and provide additional educational opportunities.

Neuropathology (Friday 7:30-8:30 a.m.):

Twelve one-hour lectures that review a variety of brain, spine and peripheral nerve pathology slides with attending neuropathologists. These conferences are coordinated with resident conferences to discuss the clinical aspects related to the neuropathology topic.



Living in Boston

The City

Boston is one of America's oldest and most revered cities. The largest city in New England, Boston is located at the mouth of the Charles River and the Massachusetts Bay. The area is home to over 50 colleges and universities, and the city's large, diverse, international population is made up of young professionals, students and families. Residents enjoy the city's rich history and abundant cultural activities, including Boston's sports teams, the Boston Symphony orchestra, world class museums and diverse restaurants.

Boston is home to four major league sports teams: the Boston Celtics, Boston Bruins, Boston Red Sox and New England Patriots. The city also hosts the Boston Marathon, the Head of the Charles Regatta, and numerous college and university sports teams.

Brigham and Women's Hospital

Brigham and Women's Hospital is located adjacent to Harvard Medical School in the Longwood Medical Area. Longwood is home to some of the nation's most widely recognized hospitals and healthcare organizations, including Beth Israel/Deaconess Hospital, Boston Children's Hospital, Dana-Farber Cancer Institute, and the Joslin Diabetes Center. There is an abundance of restaurants and take-out food options located nearby for busy hospital staff. The area also houses the Countway Library, one of the country's major medical libraries, a number of colleges, the Museum of Fine Arts, and the Isabella Gardner museum. The area is readily accessible through public transportation.

Living in Boston

Recreation

One major advantage of Boston is the accessibility of wonderful places for day or weekend trips. Cape Cod, the Berkshires, Tanglewood, and the mountains and lakes of New Hampshire, Maine and Vermont are all within a few hours drive. Residents engage in activities including: organized sports, hiking, jogging, sailing, and biking throughout the city. Skiing and snowboarding are available after a short drive to local ski resorts.

Living in Boston

Residents choose to live in a variety of communities in and around Boston. Current residents live in a wide variety of locations including: apartments immediately surrounding the hospital, Brookline, Jamaica Plain, Fenway, Mission Hill, Back Bay, South End, Downtown Boston or more distant suburbs. Due to the number of students in the area, apartments often have a high turnover rate and residents rarely have trouble finding housing that works for them.

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