NEUROSURGERY RESIDENCY
ALUMNI 2004-2023
FACULTY RESEARCH & PUBLICATIONS 2019-2023
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 evaluation, differential diagnosis and interpretation of neuro-imaging. These goals are facilitated by clinical rotations on ancillary services and in the various neurosurgery hospital services. A rich and graduated neurosurgical experience and close mentorship by the thirty-nine 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. These and core neuroscience educational objectives are covered at scheduled weekly conferences, in bedside teaching and in the operating room. Brigham and Women’s Neurosurgery Residency Program is committed to providing two years of basic or clinical research time to enhance your development as future academic neurosurgeons. We encourage participation at national meetings and have numerous visiting professors come to Boston to interface with our trainees.

WE ARE COMMITTED TO ADDING VALUE TO EVERY FACET OF YOUR TRAINING.

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 neurosurgeons. Specific educational curriculum objectives shall guide your development at every stage. You shall be taught and individually mentored, and critiqued, but also asked to evaluate us and help the Program integrate numerous educational and clinical innovations. Most of all, you will grow into a surgically skilled and academically-oriented neurosurgeon, positioned to be a future leader in the world of neurosurgery.

While a student clerkship experience in our Department is not required for application, it is highly recommended, as it will allow us to get better acquainted. Rotations can be arranged at any time during the junior or senior medical student years. Visit www.brighamandwomens.org/nsresidency to learn more about our program. Please do not hesitate to contact us directly at any stage of the application and matching process if we can answer any of your questions about the BWH/BCH/HMS Residency Program.

Sincerely,

G. REES COSGROVE, MD, FRCSC, FAANS
RESIDENCY PROGRAM DIRECTOR, BRIGHAM AND WOMEN’S HOSPITAL, BOSTON CHILDREN’S HOSPITAL, HARVARD MEDICAL SCHOOL
In memory of
R. Michael Scott, MD

February 19, 1941 – August 4, 2023

This book is dedicated to Dr. R Michael Scott who passed away this past August. Dr. Scott was a brilliant neurosurgeon and researcher who greatly contributed to the study of vascular malformations of the brain in pediatric patients and neurosurgical treatment of stroke in children.

Dr. Scott was a known leader, teacher, and mentor across Boston Children’s, Harvard Medical School, and Brigham and Women’s. We thank him for his years of dedication to his patients, our team, and to the neurosurgery field as a whole.
<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1913</td>
<td>Charles E. Dowman, Jr.</td>
</tr>
<tr>
<td>1913</td>
<td>Frederic Bremer</td>
</tr>
<tr>
<td>1913</td>
<td>John J. Morton</td>
</tr>
<tr>
<td>1913-1914</td>
<td>Wilder Penfield</td>
</tr>
<tr>
<td>1918-1919</td>
<td></td>
</tr>
<tr>
<td>1913-1914</td>
<td>Charles Bagley Jr.</td>
</tr>
<tr>
<td>1913-1914</td>
<td>Carl W. Rand</td>
</tr>
<tr>
<td>1914-1916</td>
<td>Gilbert Horrax</td>
</tr>
<tr>
<td>1919-1928</td>
<td></td>
</tr>
<tr>
<td>1920-1928</td>
<td></td>
</tr>
<tr>
<td>1914-1915</td>
<td>Edward B. Towne</td>
</tr>
<tr>
<td>1914-1915</td>
<td>L.H. Weed</td>
</tr>
<tr>
<td>1915-1918</td>
<td>Clifford B. Walker</td>
</tr>
<tr>
<td>1915-1917</td>
<td>Conrad Jacobson</td>
</tr>
<tr>
<td>1916-1917</td>
<td>Samuel C. Harvey</td>
</tr>
<tr>
<td>1917-1919</td>
<td>Henry R. Viets</td>
</tr>
<tr>
<td>1917-1920</td>
<td>J.J. Keegan</td>
</tr>
<tr>
<td>1919-1920</td>
<td>Howard Fleming</td>
</tr>
<tr>
<td>1919</td>
<td>Percival Bailey</td>
</tr>
<tr>
<td>1922-1925</td>
<td></td>
</tr>
<tr>
<td>1926-1928</td>
<td></td>
</tr>
<tr>
<td>1920-1921</td>
<td>Charles E. Locke</td>
</tr>
<tr>
<td>1920</td>
<td>Charles P. Symonds</td>
</tr>
<tr>
<td>1920</td>
<td>F. E. B. Foley</td>
</tr>
<tr>
<td>1921-1922</td>
<td>Daniel W. Wheeler</td>
</tr>
<tr>
<td>1921-1922</td>
<td>Paul Martin</td>
</tr>
<tr>
<td>1923</td>
<td>J. Paterson Ross</td>
</tr>
<tr>
<td>1923</td>
<td>Ferdinand C. Lee</td>
</tr>
<tr>
<td>1923-1924</td>
<td>Norman M. Dott</td>
</tr>
<tr>
<td>1929</td>
<td></td>
</tr>
<tr>
<td>1923-1925</td>
<td>R. Glen Spurling</td>
</tr>
<tr>
<td>1923-1924</td>
<td>Tracy J. Putnam</td>
</tr>
<tr>
<td>1924-1925</td>
<td>William P. Van Wagenen</td>
</tr>
<tr>
<td>1924-1925</td>
<td>Arthur van Dessel</td>
</tr>
<tr>
<td>1925</td>
<td>Boris M. Fried</td>
</tr>
<tr>
<td>1926</td>
<td>Jean Morelle</td>
</tr>
<tr>
<td>1925-1926</td>
<td>Leo M. Davidoff</td>
</tr>
<tr>
<td>1925-1926</td>
<td>Francis C. Grant</td>
</tr>
<tr>
<td>1925-1928</td>
<td>Franc D. Ingraham</td>
</tr>
<tr>
<td>1926</td>
<td>Walter Lehmann Gottingen</td>
</tr>
<tr>
<td>1926</td>
<td>Edgar J. Fincher, Jr.</td>
</tr>
<tr>
<td>1926-1928</td>
<td>William J. German</td>
</tr>
<tr>
<td>1926-1927</td>
<td>Hugh W. B. Cairns</td>
</tr>
<tr>
<td>1926-1927</td>
<td>Georges Schaltenbrand</td>
</tr>
<tr>
<td>1927</td>
<td>Claude S. Beck</td>
</tr>
<tr>
<td>1927</td>
<td>Lawrence B. Kubie</td>
</tr>
<tr>
<td>1927</td>
<td>Arthur J. McLean</td>
</tr>
<tr>
<td>1927-1928</td>
<td>Trygve Gunderson</td>
</tr>
<tr>
<td>1927-1928</td>
<td>Cameron L. Haight</td>
</tr>
<tr>
<td>1927-1928</td>
<td>Joseph Barr</td>
</tr>
<tr>
<td>1927-1928</td>
<td>Richard H. Meagher</td>
</tr>
<tr>
<td>1928-1929</td>
<td>John G. Scarff</td>
</tr>
<tr>
<td>1927-1928</td>
<td>Cobb Pilcher</td>
</tr>
<tr>
<td>1927-1928</td>
<td>E. Jefferson Browder</td>
</tr>
<tr>
<td>1927-1928</td>
<td>Cyril B. Courville</td>
</tr>
<tr>
<td>1927-1928</td>
<td>Frederic E. Kredel</td>
</tr>
<tr>
<td>1927-1929</td>
<td>Ignaz Oljepnick</td>
</tr>
<tr>
<td>1927-1928</td>
<td>Dmitri Bagdesev</td>
</tr>
<tr>
<td>1927-1928</td>
<td>John F. Fulton</td>
</tr>
<tr>
<td>1928-1929</td>
<td>W. Gayle Cutchfield</td>
</tr>
<tr>
<td>1928-1929</td>
<td>Frederic Schreiber</td>
</tr>
<tr>
<td>1928-1929</td>
<td>Harold M. Teel</td>
</tr>
<tr>
<td>1928-1929</td>
<td>Richard C. Buckley</td>
</tr>
<tr>
<td>1928-1929</td>
<td>Alan C. Gairdner</td>
</tr>
<tr>
<td>1928-1929</td>
<td>Edwan M. Deery</td>
</tr>
<tr>
<td>1928-1934</td>
<td>Louise Eisenhardt</td>
</tr>
<tr>
<td>1929</td>
<td>A. Herbert Olivecrona</td>
</tr>
<tr>
<td>1929</td>
<td>Attracta Halpenny</td>
</tr>
<tr>
<td>1929</td>
<td>F. A. R. Stammers</td>
</tr>
<tr>
<td>1929</td>
<td>Gaston de Coppet</td>
</tr>
<tr>
<td>1930</td>
<td>Daniel Petit-Dutallis</td>
</tr>
<tr>
<td>1930</td>
<td>Daniel C. Bell</td>
</tr>
<tr>
<td>1930-1931</td>
<td>William R. Henderson</td>
</tr>
<tr>
<td>1930-1931</td>
<td>Thomas I. Hoen</td>
</tr>
<tr>
<td>1930-1931</td>
<td>Francois Ody</td>
</tr>
<tr>
<td>1930-1931</td>
<td>Thomas Hoen</td>
</tr>
<tr>
<td>1931</td>
<td>Johannes Rives Turtu</td>
</tr>
<tr>
<td>1931-1932</td>
<td>Bronson Ray</td>
</tr>
<tr>
<td>1931-1932</td>
<td>Carl F. List</td>
</tr>
<tr>
<td>1931-1932</td>
<td>Abraham Kaplan</td>
</tr>
<tr>
<td>1931-1932</td>
<td>Benno Schlesinger</td>
</tr>
<tr>
<td>1931-1932</td>
<td>Robert A. Groff</td>
</tr>
<tr>
<td>1931-1932</td>
<td>William (C. G.) de Gutierrez Mahoney</td>
</tr>
</tbody>
</table>
CLASS OF 2004

Kadir Erkmen, MD
Medical School
University of Maryland School of Medicine
Fellowship
Skull Base Surgery, University of Arkansas Neuroendovascular Surgery, University of Texas
Subsequent Employment
Faculty, Dartmouth Hitchcock Medical Center
Current Employment
Director of Cerebrovascular Neurosurgery & Neurosurgery Residency Program, Temple University

Stephanie Greene, MD
Medical School
Albany Medical College
Fellowship
Pediatric Neurosurgery, University of Washington Children’s Hospital
Subsequent Employment
Director of Pediatric Neurosurgery, Hasbro Children’s Hospital
Current Employment
Faculty, University of Pittsburgh

CLASS OF 2005

Chima Ohaegbulam, MD
Medical School
University of Nigeria Medical School
Fellowship
Spinal Neurosurgery, Brigham and Women’s Hospital
Subsequent Employment
Faculty, New England Baptist Hospital

CLASS OF 2006

Ian Johnson, MD
Medical School
University of Kentucky School of Medicine
Fellowship
Orthopedic Spine Surgery, New England Baptist Hospital
Minimally Invasive Spine Surgery, Good Samaritan Hospital
Subsequent Employment
Faculty, Neurological Surgery, The Medical University of South Carolina, North Broward Health Coral Springs Medical
Current Employment
Chief of Neurosurgery, University Neuroscience Institute, UCSF-Fresno

Deepa Soni, MD
Medical School
Howard University
Fellowship
Cerebrovascular, Macquarie University
Subsequent Employment
Faculty, Berkshire Medical Center

CLASS OF 2007

Bryan Figueroa, MD
Medical School
University of Michigan
Fellowship
Cerebrovascular Surgery, Indianapolis Neurosurgical Group
Subsequent Employment
Staff, Spectrum Health

Jonathan Slotkin, MD
Medical School
University of Maryland School of Medicine
Fellowship
Spine Surgery, New England Baptist Hospital
Subsequent Employment
The Washington Brain & Spine Institute
Current Employment
Chief of Spine Surgery and Spinal Cord Injury Research, Geisinger Medical Center

| Neurosurgery Alumni |
CLASS OF 2008

SATHISH SUBBAIAH, MD, MS

MEDICAL SCHOOL
Harvard Medical School

GRADUATE
Yale University

FELLOWSHIP
Endoscopic/Minimally Invasive Spine Surgery, Northwestern Memorial Hospital

SUBSEQUENT EMPLOYMENT
Faculty, Mount Sinai School of Medicine; Practice, Orthopedic Associates of Long Island

IAN DUNN, MD

MEDICAL SCHOOL
Harvard Medical School

FELLOWSHIP
Skull Base Surgery, University of Arkansas

SUBSEQUENT EMPLOYMENT
Faculty, Brigham and Women’s Hospital

CURRENT EMPLOYMENT
Wilkins Professor and Chair of the Department of Neurosurgery, University of Oklahoma

ALEX PAPANASTASSIOU, MD

MEDICAL SCHOOL
University of California, San Francisco

FELLOWSHIP
Epilepsy, Yale University

SUBSEQUENT EMPLOYMENT
Faculty, University of Texas

KATHLEEN O’KEEFE, MD

MEDICAL SCHOOL
University of California, San Francisco

FELLOWSHIP
Neurosurgery, University of Miami

SUBSEQUENT EMPLOYMENT
Clinical Assistant Professor of Neurosurgery, University of Miami, USA

CLASS OF 2009

LANCE GOVERNALE, MD

MEDICAL SCHOOL
Harvard Medical School

FELLOWSHIP
Shillito Pediatric Fellow, Boston Children’s Hospital

SUBSEQUENT EMPLOYMENT
Faculty, Nationwide Children’s Hospital, Ohio State

CURRENT EMPLOYMENT
Chief of Pediatric Neurosurgery, University of Florida

ALBERT KIM, MD, PHD

MEDICAL SCHOOL
New York University

GRADUATE/PHD
New York University

FELLOWSHIP
Skull Base/Vascular, Jackson Memorial Hospital

SUBSEQUENT EMPLOYMENT
Faculty, Washington University

Suzeanne Tharin, MD, PHD

MEDICAL SCHOOL
Columbia University

GRADUATE/PHD
University of Toronto, SUNY Stony Brook

FELLOWSHIP
Spine, Cleveland Clinic

SUBSEQUENT/CURRENT EMPLOYMENT
Faculty, Stanford University Medical Center

CLASS OF 2010

KEVIN CAHILL, MD, PHD

MEDICAL SCHOOL
University of Florida

GRADUATE/PHD
Harvard School of Public Health/University of Florida

FELLOWSHIP
Spine, University of Miami

SUBSEQUENT/CURRENT EMPLOYMENT
Private Practice, Carolina Neurosurgery & Spine

CLASS OF 2011

SUZANNE THARIN, MD, PHD

MEDICAL SCHOOL
Columbia University

GRADUATE/PHD
University of Toronto, SUNY Stony Brook

FELLOWSHIP
Spine, Cleveland Clinic

SUBSEQUENT/CURRENT EMPLOYMENT
Faculty, Stanford University Medical Center

| NEUROSURGERY ALUMNI |
CLASS OF 2012

SARAH JERNIGAN, MD
MEDICAL SCHOOL
University of Louisville
GRADUATE/PHD
Tulane University
FELLOWSHIP
Shillito Pediatric Fellow, Boston Children's Hospital
SUBSEQUENT/CURRENT EMPLOYMENT
Private Practice, Carolina Neurosurgery & Spine

YI LU, MD, PHD
MEDICAL SCHOOL
Columbia University
GRADUATE/PHD
Albert Einstein College of Medicine
FELLOWSHIP
Deformity & Minimally Invasive Spine Surgery, University of Miami
SUBSEQUENT/CURRENT EMPLOYMENT
Faculty, Brigham and Women's Hospital/Faulkner Hospital

CLASS OF 2013

NING LIN, MD
MEDICAL SCHOOL
Harvard Medical School
FELLOWSHIP
Endovascular Neurosurgery, SUNY Buffalo, NY
SUBSEQUENT EMPLOYMENT
Faculty, Weill Cornell Medicine Brain and Spine Center, NY

URVASHI UPADHYAY, MD
MEDICAL SCHOOL
Johns Hopkins School of Medicine
FELLOWSHIP
Skull Base Surgery, Brigham and Women's Hospital
CURRENT EMPLOYMENT
Faculty, Boston Medical Center

CLASS OF 2014

STEPHEN NALBACH, MD
MEDICAL SCHOOL
Temple University
SUBSEQUENT/CURRENT EMPLOYMENT
Private Practice, Tyler Neurosurgical Associates, TX

ALEXANDER ROPPER, MD
MEDICAL SCHOOL
Tufts University
FELLOWSHIP
Spine Fellowship, Barrow Neurological Institute
CURRENT EMPLOYMENT
Director of Spine Surgery, Assistant Professor, Baylor College of Medicine, Texas

JUDITH WONG, MD, MPH
MEDICAL SCHOOL
University of California, San Francisco
GRADUATE/MPH
Harvard School of Public Health
FELLOWSHIP
Pediatric Fellowship, University of California Los Angeles
CURRENT EMPLOYMENT
Private Practice, Kaiser Permanente, California
BRADLEY GROSS, MD
MEDICAL SCHOOL
Northwestern University
FELLOWSHIP
Neuroendovascular Fellowship, Barrow Neurological Institute
CURRENT EMPLOYMENT
Assistant Professor, University of Pittsburgh

PELEG HOROWITZ, MD, PHD
MEDICAL SCHOOL
Northwestern University
FELLOWSHIP
Skull Base Neuro-Oncology Fellowship, MD Anderson Cancer Center
CURRENT EMPLOYMENT
Assistant Professor, University of Chicago

MUHAMMAD ABD-EL-BARR, MD, PHD
MEDICAL SCHOOL
Baylor College of Medicine
FELLOWSHIP
Spine Fellowship, Brigham and Women’s Hospital
CURRENT EMPLOYMENT
Faculty, Duke University Medical Center

MICHAEL RABER, MD
MEDICAL SCHOOL
Wake Forest University School of Medicine
FELLOWSHIP
Spine Fellowship, The Johns Hopkins University
CURRENT EMPLOYMENT
Kootanai Clinic, Neurosurgery and Spine, Coeur d’Alene, Idaho

WENYA LINDA BI, MD, PHD
MEDICAL SCHOOL
Yale School of Medicine
FELLOWSHIP
Skull Base Fellowship, Brigham and Women’s Hospital
CURRENT EMPLOYMENT
Faculty, Brigham and Women’s Hospital

HORMUZDIYAR DASENBROCK, MD
MEDICAL SCHOOL
Johns Hopkins University School of Medicine
FELLOWSHIP
Endovascular Fellowship, Rush University Neuroendovascular Fellowship (enfolded), Brigham and Women’s Hospital
CURRENT EMPLOYMENT
Faculty, Boston Medical Center

MATTHEW VESTAL, MD, MHS
MEDICAL SCHOOL
Yale School of Medicine
POST-GRADUATE
Harvard Business School, MBA
FELLOWSHIP
Shilts & Pediatric Fellow, Boston Children’s Hospital
CURRENT EMPLOYMENT
Assistant Professor, Duke University Medical Center

VIREN VASUDEVAR, MD
MEDICAL SCHOOL
Medical College of Georgia School of Medicine
FELLOWSHIP
Spine Fellowship (enfolded), Brigham and Women’s Hospital, MA
CURRENT EMPLOYMENT
St. Mary’s Healthcare System, Georgia Neurological Surgery and Comprehensive Spine, Athens, GA
CLASS OF 2019

VAMSIDHAR CHAVAKULA, MD
MEDICAL SCHOOL
Harvard Medical School
FELLOWSHIP
BWH Functional Attending, Fellowship
Epilepsy Fellowship, Claudio Munari Epilepsy Center, Ospedale Niguarda, Milan, Italy
CURRENT EMPLOYMENT
Faculty, Neurosurgical Medical Clinic, San Diego, California

ZIEV MOSES, MD
MEDICAL SCHOOL
Geisel School of Medicine at Dartmouth
FELLOWSHIP
Spine Fellowship, Rush University
CURRENT EMPLOYMENT
Faculty, Beth Israel Deaconess Medical Center, Boston

POKMENG (ALFRED) SEE, MD
MEDICAL SCHOOL
Johns Hopkins University
FELLOWSHIP
Cerebrovascular Fellowship, University of Illinois at Chicago
Shillito Fellowship, Boston Children’s Hospital
CURRENT EMPLOYMENT
Faculty, Boston Children’s Hospital

CLASS OF 2020

DUSTIN DONNELLY, MD
MEDICAL SCHOOL
The Ohio State University College of Medicine
FELLOWSHIP
Spine Fellowship, Duke University
CURRENT EMPLOYMENT
Faculty, Case Western Reserve University

DAVID PENN, MD
MEDICAL SCHOOL
Sidney Kimmel Medical College, Thomas Jefferson University
FELLOWSHIP
Skull Base/ Cerebrovascular Fellowship, Case Western Reserve University
CURRENT EMPLOYMENT
Attending, Vassar Brothers Medical Center and Danbury Hospital, Nuvance Health, Poughkeepsie NY

CHRISTIAN STRONG, MD
MEDICAL SCHOOL
Harvard Medical School
FELLOWSHIP
Spine Fellowship, New England Baptist Hospital
CURRENT EMPLOYMENT
Private Practice, Wellstar Atlanta Medical Center
KEVIN TED HUANG, MD  
MEDICAL SCHOOL  
Duke University School of Medicine  
FELLOWSHIP  
Complex Spine Fellowship, Cleveland Clinic  
SUBSEQUENT EMPLOYMENT  
Faculty, Brigham and Women’s Hospital

IAN JAMES TAFEL, MD  
MEDICAL SCHOOL  
Geisinger Commonwealth School of Medicine  
FELLOWSHIP  
Spine Fellowship, University of Miami  
SUBSEQUENT EMPLOYMENT  
Faculty, University of Florida Health

PABLO ANDRES VALDES QUEVEDO, MD, PHD  
MEDICAL SCHOOL  
Geisel School of Medicine at Dartmouth  
FELLOWSHIP  
Neurosurgical Oncology and Functional Brain Mapping Fellowship, Montpellier, France  
SUBSEQUENT EMPLOYMENT  
Assistant Professor, University of Texas Medical Branch

YASSER JEELANI, MD  
MEDICAL SCHOOL  
University of Jammu, India  
FELLOWSHIP  
Skull Base and Open CV Fellowship, Arkansas Neuroscience Institute  
SUBSEQUENT EMPLOYMENT  
Faculty, University at Buffalo, Neurosurgery (UBNS)

ROSALIND LAI, MD  
MEDICAL SCHOOL  
Harvard Medical School  
FELLOWSHIP  
Cerebrovascular/Endovascular Fellowship, University at Buffalo Neurosurgery (UBNS)  
SUBSEQUENT EMPLOYMENT  
Faculty, University at Buffalo, Neurosurgery (UBNS)

KYLE WU, MD  
MEDICAL SCHOOL  
UMass Chan Medical School  
FELLOWSHIP  
Skull Base & Minimally Invasive Cranial Surgery Fellowship, The Ohio State University Wexner Medical Center & James Cancer Institute, Ohio  
CURRENT EMPLOYMENT  
Faculty, The Ohio State University, Wexner Medical Center
CLASS OF 2023

JOSEPH DRIVER, MD
MEDICAL SCHOOL
Loyola University Chicago
FELLOWSHIP
Complex Spine Fellowship, Cleveland Clinic

WALID IBN ESSAYED, MD
MEDICAL SCHOOL
Medical Faculty of Tunis, Tunisia
SUBSEQUENT EMPLOYMENT
UTHHealth Neurosciences and McGovern Medical School Houston

DAVID SEGAR, MD
MEDICAL SCHOOL
Warren Alpert Medical School of Brown University
FELLOWSHIP
Functional and Epilepsy Fellowship, University of California, San Francisco
CURRENT RESIDENTS AND FELLOWS

**RESIDENTS**
- Stanley Bazarek, MD, PhD
- Neil Klinger, MD
- Martina Mustroph, MD, PhD
- Benjamin Johnston, MD, PhD
- Ari Kappel, MD
- Genaro Villa, MD, PhD
- Joshua Bernstock, MD, PhD
- Melissa Chua, MD
- Saksham Gupta, MD
- Marcelle Altshuler, MD
- Joshua Chalif, MD, PhD
- Jason Chen, MD, PhD
- Casey Jarvis, MD
- Sean Lyne, MD
- James Tanner McMahon, MD
- Adam Glaser, MD
- David Liu, MD
- Gabrielle Luiselli, MD
- Eric Chalif, MD
- Ron Gadot, MD
- Chibueze Nwagwu, MD

**Chief Resident**
- Stanley Bazarek, MD, PhD
- Neil Klinger, MD
- Martina Mustroph, MD, PhD

**PGY-6**
- Benjamin Johnston, MD, PhD
- Ari Kappel, MD
- Genaro Villa, MD, PhD
- Joshua Bernstock, MD, PhD
- Melissa Chua, MD
- Saksham Gupta, MD
- Joshua Chalif, MD, PhD
- Jason Chen, MD, PhD
- Casey Jarvis, MD
- Sean Lyne, MD
- James Tanner McMahon, MD
- Adam Glaser, MD
- David Liu, MD
- Gabrielle Luiselli, MD
- Eric Chalif, MD
- Ron Gadot, MD
- Chibueze Nwagwu, MD

**PGY-5**
- Marcelle Altshuler, MD
- Joshua Chalif, MD, PhD

**PGY-4**
- Jason Chen, MD, PhD
- Casey Jarvis, MD
- Sean Lyne, MD
- James Tanner McMahon, MD
- Adam Glaser, MD
- David Liu, MD
- Gabrielle Luiselli, MD
- Eric Chalif, MD
- Ron Gadot, MD
- Chibueze Nwagwu, MD

**PGY-3**
- Marcelle Altshuler, MD
- Joshua Chalif, MD, PhD
- Jason Chen, MD, PhD
- Casey Jarvis, MD
- Sean Lyne, MD
- James Tanner McMahon, MD
- Adam Glaser, MD
- David Liu, MD
- Gabrielle Luiselli, MD
- Eric Chalif, MD
- Ron Gadot, MD
- Chibueze Nwagwu, MD

**PGY-2**
- Marcelle Altshuler, MD
- Joshua Chalif, MD, PhD
- Jason Chen, MD, PhD
- Casey Jarvis, MD
- Sean Lyne, MD
- James Tanner McMahon, MD
- Adam Glaser, MD
- David Liu, MD
- Gabrielle Luiselli, MD
- Eric Chalif, MD
- Ron Gadot, MD
- Chibueze Nwagwu, MD

**PGY-1**
- Marcelle Altshuler, MD
- Joshua Chalif, MD, PhD
- Jason Chen, MD, PhD
- Casey Jarvis, MD
- Sean Lyne, MD
- James Tanner McMahon, MD
- Adam Glaser, MD
- David Liu, MD
- Gabrielle Luiselli, MD
- Eric Chalif, MD
- Ron Gadot, MD
- Chibueze Nwagwu, MD

**FELLOWS**
- David Bass, MD, PhD
- Abdullah Feroze, MD
- Charles Couturier, MD, PhD
- Erickson Torio, MD
- Christopher Hong MD
- Serdar Kaya, MD

**CV-EV Fellow**
- David Bass, MD, PhD
- Abdullah Feroze, MD

**Image Guided Surgery Fellow**
- Charles Couturier, MD, PhD

**Pituitary Fellow**
- Christopher Hong MD

**Skull Base Fellow**
- Serdar Kaya, MD

**STIMULATED RAMAN SPECTROSCOPY IMAGE OF BRAIN TUMOR SECTION**
Image courtesy of Golby Lab
<table>
<thead>
<tr>
<th>DAY</th>
<th>TIME</th>
<th>CONFERENCE</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>MONDAY</td>
<td>7:00am</td>
<td>Cushing Service Didactics</td>
<td>BWH</td>
</tr>
<tr>
<td></td>
<td>7:30am</td>
<td>Neuro-Oncology/Tumor Board</td>
<td>BWH/Dana-Farber</td>
</tr>
<tr>
<td>TUESDAY</td>
<td>7:00am</td>
<td>Dandy Service Didactics</td>
<td>BWH</td>
</tr>
<tr>
<td>WEDNESDAY</td>
<td>6:30am</td>
<td>Morbidity/Mortality Conference</td>
<td>BWH (every Wed except 1st)</td>
</tr>
<tr>
<td></td>
<td>7:00am</td>
<td>Combined QI Conference</td>
<td>BWH (1st Wed of each month)</td>
</tr>
<tr>
<td></td>
<td>7:00am</td>
<td>Neurosurgery Grand Rounds</td>
<td>BWH (every Wed except 1st)</td>
</tr>
<tr>
<td></td>
<td>7:00am</td>
<td>Skull Base Cadaver Lab</td>
<td>BWH (Quarterly)</td>
</tr>
<tr>
<td></td>
<td>8:00am</td>
<td>Neuroradiology Conference</td>
<td>BWH</td>
</tr>
<tr>
<td></td>
<td>4:00pm</td>
<td>Movement Disorder Conference</td>
<td>BWH (1st &amp; 3rd Wed of each month)</td>
</tr>
<tr>
<td>THURSDAY</td>
<td>7:00am</td>
<td>Cerebrovascular/Endovascular</td>
<td>BWH</td>
</tr>
<tr>
<td></td>
<td>7:00am</td>
<td>Skull Base Conference</td>
<td>BWH (every other Thurs)</td>
</tr>
<tr>
<td></td>
<td>9:30am</td>
<td>Pituitary Multidisciplinary</td>
<td>BWH (monthly)</td>
</tr>
<tr>
<td></td>
<td>10:00am</td>
<td>Resident Clinics (PGY 2 &amp; 6s)</td>
<td>BCH</td>
</tr>
<tr>
<td></td>
<td>12:00pm</td>
<td>Resident Core Curriculum Conference</td>
<td>BWH</td>
</tr>
<tr>
<td></td>
<td>1:00pm</td>
<td>Epilepsy Conference</td>
<td>BWH</td>
</tr>
<tr>
<td></td>
<td>6:15pm</td>
<td>Educational Conference</td>
<td>BWH</td>
</tr>
<tr>
<td>FRIDAY</td>
<td>7:30am</td>
<td>Neuropathology/Brain cutting</td>
<td>BWH</td>
</tr>
</tbody>
</table>
GRAND ROUNDS SCHEDULE 2022-2023

JUNE 29, 2022
Neurosurgery for Gilles de la Tourette Syndrome (GTS)
Ludovic Zrinzo, MD PhD FRCS UOM

JULY 13, 2022
Evolution of My Preferred Skull Base Approaches over 28 Years
Carl B. Heilman, M.D.

JULY 20, 2022
Speech neuroprosthesis
Edward F Chang, MD

JULY 27, 2022
Global Surgery 2.0: Reconciling National and International Health Priorities
Kavitha Ranganathan, MD

AUGUST 10, 2022
Neurosurgery’s Moonshot
Dr. Gail Rosseau

AUGUST 17, 2022
The Role of Medical Illustration in the Evolution of Transsphenoidal Surgery
James Napier, MD and William B. Westwood, MS

SEPTEMBER 14, 2022
Closing the loop on impulsivity: what we can learn from BITES
Casey Halpern, MD

SEPTEMBER 21, 2022
Role of the VA in Neurosurgical Education
Jacob Rachlin, MD and Michael Mooney, MD

SEPTEMBER 28, 2022
Management of penetrating injury traumatic CSF leaks
Petej M. Horowitz, M.D., Ph.D.

OCTOBER 5, 2022
Microsurgical Approaches to the Thalamus
Professor Ugur Ture

OCTOBER 19, 2022
GBM: Perspectives from off the beaten path
L. Gerard Toussaint III, MD

OCTOBER 26, 2022
The Future of the Neurosurgery Residency Match
Lola B. Chambers, MD, FAANS

NOVEMBER 9, 2022
The Role of Medical Illustration in the Evolution of Transsphenoidal Surgery
James Napier, MD and William B. Westwood, MS

NOVEMBER 16, 2022
A Path Forward: Understanding implicit bias, microaggressions in medicine and cultivating an advocacy mindset
Tina Gubernma, MSW, LCSW, RNC; and Galen Henderson, MD, FANC

NOVEMBER 30, 2022
Fostering technology and collaboration to improve clinical care in LMICs
Alexandra J. Gollby, MD

DECEMBER 11, 2022
Healer or Technician: Reflection of a Dinosaur
Dr. Ossama Al-Mefty

DECEMBER 18, 2022
Reconsidering management of small and medium-sized sporadic vestibular schwannoma
Matthew L. Carlson, MD

JANUARY 15, 2023
Improving Access to Stroke Care: How future devices, robotics, and AI will change the landscape of care
Raymond D. Turner, IV, M.D., FAANS

JANUARY 22, 2023
Microsurgical Anatomy of the Limbic System
Dr. Paulo Abdo do Seixo Kadri

MARCH 8, 2023
Therapeutic Modulation of Complement Cascade for Stroke and COVID
E. Sander Connolly, Jr., M.D., F.A.A.N.S., F.A.C.S

MARCH 22, 2023
Peripheral Nerve Surgery: The Lost Art?
Dr. E. Antonio Chiocca

APRIL 12, 2023
Neurosurgery and Health Care Policy: Working for You in Washington
Katie O’Hara Omico, Esq.

APRIL 26, 2023
Bypass Training: Developing Hand Skills
Dr. Ahmad Hafez

APRIL 12, 2023
Building a Scientific Framework to Advance the Care of Pediatric Neurosurgical Disease
Dr. David D. Limbrick, Jr., MD, PhD

MAY 10, 2023
Striking the Balance: Career, Life and Leadership
Dr. Ann R. Stroink, MD, CPE, FACS, FAANS

MAY 24, 2023
Innovations In The Diagnosis And Surgical Treatment Of Pediatric Epilepsy
P. David Adelson, MD, FACS, FAAP, FAANS

JUNE 21, 2023
New Frontiers in Spine Surgery: Research Update
Praveen V. Murmanneni, MD, MBA

JULY 12, 2023
Post-operative pharmacology in the neurosurgical patient
Michael J. Schountz, PharmD, BCPS, BCCCP

JULY 19, 2023
MicroFUS in Movement Disorder Surgery
Dr. G. Rees Coggrave

JULY 26, 2023
Updates on Artificial Intelligence in Neurosurgery: Promises and Pitfalls
Kevin Huang, MD

AUGUST 16, 2023
Harvey Cushing at the Brigham
Dr. Edward Laws

AUGUST 23, 2023
Medical Innovation at Mass General Brigham
Dr. William Gormley

SEPTEMBER 13, 2023
Aerospace Medicine in Neurosurgery
Marvin William Jackson, M.D., M.S., FABPM

SEPTEMBER 27, 2023
Optimizing Mental Performance in Teams: The Role of Mental Skills to Enhance Self-Awareness and Communication
Ari S. Miller, MA, CMPC (ASM Performance Consulting, LLC)
RESEARCH STUDIES

THE DEPARTMENT OF NEUROSURGERY AT BRIGHAM AND WOMEN'S HOSPITAL IS A PIONEER IN NEUROSCIENCE AND IS DEDICATED TO THE RESEARCH OF NEUROLOGICAL DISORDERS INCLUDING TUMOR BIOLOGY, ANEURYSMS, STROKE, EPILEPSY, AND SPINAL DISORDERS.

Below are our current research studies and clinical trials. Please note that not all of the studies are human subject trials.

BRAIN TUMOR RESEARCH

A Phase I Study of the Treatment of Recurrent Malignant Glioma with IQNesin34.5v2, a Genetically Engineered HSV-1 Virus, and Immunomodulation with Cyclophosphamide
PI: E. Antonio Chiocca, MD, PhD

A Randomized, double-blind, Placebo-controlled Phase 2 Study of ERT (E1670/CM-CSF/Cyclophosphamide)- Bevacizumab vs. Placebo/Injection/Paclitaxel/PB in the Treatment of Recurrent/Progressive Bevacizumab naïve Glioblastoma and Gliosarcoma Patients (WHO grade IV malignant gliomas, GBM)
PI: E. Antonio Chiocca, MD, PhD

A Multicenter Phase 2 Study of Oncolytic Polio/Rhinovirus Recombinant (PVRISPO) in Recurrent WHO Grade IV Malignant Glioma Patients
PI: E. Antonio Chiocca, MD, PhD

A Phase 2, Open-label, Single-arm Study Evaluating the Efficacy, Safety, and Tolerability of Oncolytic Polio/Rhinovirus Recombinant (PVRISPO) and the Immune Checkpoint inhibitor Pembrolizumab in the Treatment of Patients with Recurrent Glioblastoma
PI: Patrick Wen, MD

Protocol AT1001-102 Substudy: Evaluation of Ad-RTS-HL-12 + Veledimex in Combination with Nivolumab in Subjects with Recurrent or Progressive Glioblastoma
PI: E. Antonio Chiocca, MD, PhD

Assessment of Safety and Feasibility of Exablate Blood-Brain Barrier Disruption for the Treatment of High Grade Glioma in Patients Undergoing Standard Chemotherapy
PI: Wenya Linda Bi, MD, PhD

A Pilot Study of an Implantable Microdevice for In Situ Evaluation of Drug Response in Patients with Primary Brain Tumors
PI: Pier Paolo Peruzzi, MD, PhD

Treatment response assessment maps (TRAM) in the delineation of radiation necrosis from tumor progression after stereotactic radiation in patients with brain metastases: A prospective study
PI: Wenya Linda Bi, MD, PhD

SPINE RESEARCH

SJ Stabilization in Long Fusion to the Pelvic Randomized Controlled Trial
PI: Yi Lu, MD, PhD

A prospective, randomized, control-blind, dose-finding multicenter, parallel group study of the safety and efficacy of LI20-113 Bone Graft (TGFβ3-5.34 in fibrin) versus local autograft for the treatment of patients undergoing single-level translaminar lumbar interbody fusion (the STRUCTURE study)
PI: John Chi, MD, MPH

Study to Assess the Efficacy and Safety of VX-210 Subjects with Acute Traumatic Cervical Spinal Cord Injury
PI: Yi Lu, MD, PhD

The INSPIRE Study: Probably Benefit of the Neuro-Spinal Scaffold for Treatment of AIS. A Thoracic Acute Spinal Cord Injury
PI: Yi Lu, MD, PhD

A Clinical Study to Assess the Safety and Effectiveness of the Premia Spine TOPS System
PI: John Chi, MD, MPH

A Prospective, Concurrently Controlled, Multi-Center Study to Evaluate the Safety and Effectiveness of the Spinal Kinetics M6-C™ Artificial Cervical Disc Compared to Anterior Cervical Discectomy and Fusion (ACDF) for the Treatment of Contiguous Two-Level Symptomatic Cervical Radiculopathy
PI: John Chi, MD, MPH

The coffeeCOMMUNITY Study: An Observational Study of coffee/interleukin-12
PI: Yi Lu, MD, PhD

FUNCTIONAL DISORDER CLINICAL TRIALS

A Randomized, Placebo Surgery Controlled, Double-blind, Multi-center, Phase 2 Clinical Trial, Evaluating the Efficacy and Safety of V1-AADC02 in Advanced Parkinson’s Disease with Motor Fluctuations
PI: G. Riers Cosgrove, MD

Exablate Transcranial MitFus of the Globus Pallidum for Treatment of Parkinson’s Disease
PI: G. Riers Cosgrove, MD

Global Registry: Exablate 4000 Transcranial MR Guided Focused Ultrasound (tCtMVigFUS) of Neurological Disorders
PI: G. Riers Cosgrove, MD

CEREBROVASCULAR CLINICAL TRIALS

ENRICH: Early MIninally-invasive Removal of ICH
PI: M. Ali Aziz-Sultan, MD

SURF: A Prospective, Multicenter Study Assessing the Embolization of Intracranial Aneurysms using WAVE™ Extra Soft coils, a part of the Penumbra SMART COIL® System
PI: Nirav J. Patel, MD

Cerebrotendinous Xanthomatosis (CTX) and the Treatment of Cerebrovascular Disease
PI: M. Ali Aziz-Sultan, MD

HUMANITARIAN USE DEVICE STUDIES

MicroVention Low-profile Visualized Intraluminal Support (VIS) Device
PI: M. Ali Aziz-Sultan, MD

Codman Neurovascular Enterprise Vascular Reconstruction Device and Delivery System
PI: Kai Frerichs, MD

Wingspan Stent System with Gateway PTA Balloon Catheter for the Treatment of Symptomatic Atherosclerotic Disease for Humanitarian Use
PI: Kai Frerichs, MD

Use of the Neuroform Atlas Stent, a Humanitarian Use Device, for the Treatment of wide-necked Cerebral Aneurysms
PI: Kai Frerichs, MD

PulseRider Aneurysm Neck Reconstruction Device
PI: M. Ali Aziz-Sultan, MD

ADDITIONAL CLINICAL RESEARCH STUDIES

Behavioral and MRI Studies in Healthy Subjects
PI: Alexandra Goddy, MD
RESEARCH STUDIES
(continued)

Optical Coherence Tomography: Evaluation of the Retinal Thickness and Correlation with Clinical Outcomes after Transphenoidal Surgery
Pt: Edward Laws, MD

Endocrine and Surgical Complications in Pure Endoscopic Endonasal Transphenoidal Surgery
Pt: Edward Laws, MD

Outcomes for Neurosurgical Patients
Pt: Elizabeth Claus, MD, PhD

Retrospective Review of Imaging Characteristics of Patients with Dural Arteriovenous Fistulas
Pt: M. Ali Azz-Sultan, MD

Biomarkers in Stroke and Intracerebral Hemorrhage
Pt: Rose Du, MD, PhD

The Gliogene (Glioma Genetic) Study
Pt: Elizabeth Claus, MD, PhD

Risk Factors and Outcomes for Glioma (Gliogene International Case/Control Study)
Pt: Elizabeth Claus, MD, PhD

Three-Dimensional Angiography for Intraoperative Neuronavigation During Intracranial Tumor Resection: A Technical Note and Case Series
Pt: M. Ali Azz-Sultan, MD

Genetics of Intracranial Vessels
Pt: Rose Du, MD, PhD

Gene Expression in Cerebral Aneurysms
Pt: Rose Du, MD, PhD

Identification of Dalkrim Biomarkers Using Multimodal Sensor Data from the E4 Wristband Wearable Device
Pt: William Gormley, MD, MPH, MBA

Radiographic Analysis of Image-Guidance Technology to Improve Accuracy and Reduce Intraoperative Hemorrhage Associated with Ventriculoscopy
Pt: William Gormley, MD, MPH, MBA

Image and Function Guided Surgery of Brain Lesions
Pt: Alexandra Gobley, MD

Brain Basis of Memory Studied by fMRI and Intracranial EEG
Pt: Alexandra Gobley, MD

Digital Phenotyping of the Neurosurgical Patient: Towards More Effective Post-Operative Care – A Pilot Study
Pt: Timothy R. Smith, MD, PhD, MPH

Outcomes in Patients Undergoing Spine Surgery
Pt: Michael Groff, MD

Biomarkers of Traumatic Brain Injury
Pt: William Gormley, MD, MPH, MBA

Intrathecal Stereotactic Molecular Imaging of Brain Tumor Margins
Pt: Alexandra Gobley, MD

Incidence of C2 Disagreement After C1 Lateral Mass Screw: Comparison Between Techniques of C2 Nerve Sectioning and C2 Nerve Preservation
Pt: Michael Groff, MD

Retrospective Review of Patients Undergoing Arthroplasty vs ACOF
Pt: John Chi, MD, MPH

GWAS Database for Aneurysms
Pt: Rose Du, MD, PhD

Nanoscale Imaging of Neuronal Diseases
Pt: E. Antonio Chiocca, MD, PhD

Retrospective Review of Transitional Care from Hospital to Discharge
Pt: William Gormley, MD, MPH, MBA

Management of CNS Disorders Using Functional and Stereotactic Neurosurgical Interventions: Identifying Differentiating Features and Predictors of Improved Outcomes, in order to Improve Quality of Care
Pt: G. Rees Cosgrove, MD

Retrospective Analysis of the Operative Management of Chronic Subdural Hematomas Following a Modified Technique for Introduction of a Subdural Catheter
Pt: John Chi, MD, MPH

Diagnosis and Management of Rare CNS Lesions: Identifying Differentiating Features and Predictors of Improved Outcomes, in order to Improve Quality of Care
Pt: Timothy R. Smith, MD, PhD, MPH

Genetic Epidemiology of Cerebral Aneurysms
Pt: Rose Du, MD, PhD

Clinical Implications of Pipeline Embolization of Paraclinoidal Aneurysms
Pt: M. Ali Azz-Sultan, MD

The Impact of Medical School Research Funding on Career Choices
Pt: Timothy R. Smith, MD, PhD, MPH

Long-term Outcomes for Neurosurgical Patients with Intracranial Neoplasms
Pt: Elizabeth Claus, MD, PhD

Database of Skull Based Surgery Outcomes
Pt: Linda Bi, MD, PhD

Degenerative Spine Disease – Characteristics, Treatments and Complications
Pt: John Chi, MD, MPH

Neurovascular Disease Study
Pt: Rose Du, MD, PhD

Spine Surgery Discharge Disposition
Pt: William Gormley, MD, MPH, MBA

Evaluation and Treatment of Neurosurgical Disorders
Pt: Alexandra Gobley, MD

Craniectomy Associated Complications
Pt: William Gormley, MD, MPH, MBA

Dural AVF Study
Pt: Rose Du, MD, PhD

Analyzing Semantic Differences in the Documented Clinical Histories of Patients Undergoing Different Methods of Spinal Surgical Intervention
Pt: Michael Groff, MD

Medical Complications in Patients with Intracranial Hemorrhage Managed in the NICU
Pt: William Gormley, MD, MPH, MBA

Non-Invasive Collection of Physiologic Data Using a Novel Diffuse Optical Tomography Device for Measurement of Cerebral Oximetry in Intracranial Stroke: A Prospective, Non-Randomized, Single Center, Single Arm, Observational Physiologic Data Collection Trial
Pt: William Gormley, MD, MPH, MBA

Indocyanine Green Angiography Guidance in Cranial Neurosurgery
Pt: Linda Bi, MD, PhD

Patient-Reported Outcome Measure for Meningiomas
Pt: Timothy R. Smith, MD, PhD, MPH

Use of Diffusion Tensor Imaging in Interventional MRI Implantation of Deep Brain Stimulation Electrodes
Pt: G. Rees Cosgrove, MD

Efficacy of 68Ga-DOTATATE PET/CT in the Diagnosis of Ectopic ACTH-Producing Tumors After Failed Surgery for Cushing’s Disease
Pt: Edward Laws, MD

Biomarkers in Urethra
Pt: William Gormley, MD, MPH, MBA

Meningioma Segmentation Public Database
Pt: Linda Bi, MD, PhD

S-ALA Intraoperative Fluorescence Imaging of Brain Tumors
Pt: Alexandra Gobley, MD

Machine learning of CT imaging for stroke patients
Pt: Omar Arnaout, MD

Retrospective analysis of the outcomes of patients managed with Coffee Interstitial Stabilization device
Pt: Yi Lu, MD, PhD

Immune escape mechanisms in brain tumors
Pt: Sean E. Lawler, PhD

Radiographic Changes in Spinal Biomechanics after Thoracolumbar Fusion
Pt: Yi Lu, MD, PhD
Our new state-of-the-art Hale Building for Transformative Medicine (BTM), brings together the world’s finest clinicians and scientists to accelerate breakthroughs and transform patient care in the neurosciences, orthopedics, rheumatology, immunology, and musculoskeletal health. Over one hundred years ago, the Peter Bent Brigham Hospital was erected behind Harvard Medical School so that its curious minds in science and medicine would never be too far from the laboratory bench. The BTM takes that idea and adapts it for 21st century medicine: bringing our clinicians and scientists together in one building to tackle the toughest dilemmas in healthcare.

This carefully constructed building located on the Brigham and Women’s Hospital main campus is made of glass and steel, reaching 13 stories above ground and three below. The goal of the BTM is to promote collaboration and accelerate advancements in care for patients suffering from neurologic, orthopedic, and rheumatologic conditions such as Alzheimer’s disease, Parkinson’s disease, spinal disorders, brain tumors, multiple sclerosis and cerebrovascular disorders.

The BTM is home of the Neurosciences Center, which offers a multidisciplinary clinic where patients can receive a comprehensive evaluation and consensus opinion from several disciplines in one location. Traditionally, patients would have to visit separate clinics, which made coordination of care difficult. With one Neurosciences Center, patients have a new experience with their treatment being led by highly skilled, collaborative teams. Patients are able to meet with top clinicians and specialists regarding the management and treatment of their condition.

In addition to these multidisciplinary centers, the facility also includes the following services and features:

- The Ann Romney Center for Neurologic Diseases
- Ambulatory Infusion Service
- Center for Alzheimer Research and Treatment (CART)
- Center for Brain Therapeutics
- Conference Center
- A cafe with a full-service menu for patients, visitors, and staff
- All Neurosurgical Laboratories (see page 36)
- Imaging services, including MRI, CT and X-Ray
- Innovation Hub
- Parking facility, including valet assistance
- Neuro-Procedural Suite for Diagnostics and Treatment, which includes EMG, EEG and TMS
- Neurosciences Center which includes, ophthalmology rooms, neuropsychiatry testing rooms, 28 exam rooms, 16 consult rooms and 2 procedure rooms.
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 parkinsonian tremor, blood brain barrier, and other neuro conditions via clinical trials here at Brigham and Women’s Hospital.

7 TESLA (7.0T MRI)
This device aids our clinicians and researchers to visualize critical structures and pathologies that, until now, were not visible through 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.

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.

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.

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.

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

BUILDING ON EXCELLENCE
CUTTING-EDGE TECHNOLOGIES AVAILABLE

NEUROSURGERY CLINICIANS AND RESEARCHERS HAVE ACCESS TO ADVANCED TOOLS AND OPPORTUNITIES TO COLLABORATE AND PUSH THE BOUNDARIES OF DISCOVERY IN WAYS THAT HAVE NEVER BEEN POSSIBLE BEFORE NOW.
THE DEPARTMENT OF NEUROSURGERY AIMS TO UNDERTAKE RELEVANT RESEARCH AND PROVIDE ACCESS TO RESOURCES AND PROFESSIONAL DEVELOPMENT OPPORTUNITIES FOR ALL ESTABLISHED PHYSICIANS AND SURGEONS, AS WELL AS THE EDUCATION AND TRAINING OF RESIDENTS AND FELLOWS — THE NEXT GENERATION OF MEDICAL PROFESSIONALS.

ANATOMICAL TRAINING LABORATORY
The Anatomical Training Laboratory (ATL) is a joint venture between neurosurgical departments at Boston Children’s Hospital and Brigham and Women’s Hospital to provide the Harvard medical community and other not for profit academic research institutions with training space, equipment and expert faculty resources to create the highest quality training environment for users to learn the latest neurosurgical techniques.

STRATUS CENTER
The STRATUS Center for Medical Stimulation is dedicated to advancing healthcare education, enhancing patient safety, and improving clinical outcomes. We leverage simulation’s array of applications to support clinicians, researchers, industry, and other simulation centers. To learn more, visit www.brighamandwomens.org/STRATUS.

OUR INTERDISCIPLINARY CENTER Focuses on
EDUCATION
ASSESSMENT
RESEARCH
PROCESS IMPROVEMENT
To learn more, visit www.brighamandwomens.org/STRATUS.
The Neurosurgery Residency Program of Brigham and Women's Hospital, Boston Children's Hospital and Harvard Medical School has a tradition of encouraging residents to participate in clinical and basic research studies with faculty, with exposure to emerging concepts and innovations.

Our clinical faculty set an impressive example for presenting research studies, publishing peer-reviewed articles, textbooks, abstracts and presentations.

The following booklet contains a listing of the Brigham and Women’s Hospital affiliated neurosurgical research laboratories, as well as the research publications authored by the 34 neurosurgical clinical faculty at BWH and BCH over the past six years. As you will see, the range and depth of neurosurgical topics covered is impressive, and a testament to both the knowledge of our faculty and the dedication we have to the advancement of neurosurgical treatment and care.
1. **BEI LABORATORY**

**PRINCIPAL INVESTIGATOR:** Fengfeng Bei, PhD

**FOCUS:** Established at the end of 2016, the Bei laboratory seeks to understand why damaged brain circuits cannot regenerate their connection and repair themselves. The lab studies this broad question in a range of model systems, using standard molecular and histological tools, electrophysiological assessment, biochemical analysis, as well as novel gene therapy approaches and transplantation strategies. Current projects include attempts to repair the optic nerve axons to restore vision, to regenerate the brain-spinal cord projecting axons for treating.

2. **CENTER FOR STEM CELL THERAPEUTICS AND IMAGING (CSTI)**

**PRINCIPAL INVESTIGATORS:** Brian P. Chou, MD, PhD; E. Antonio Chiocca, MD, PhD

**FOCUS:** The overall goal of CSTI is to develop and test targeted cell-based therapies for cancer. The Center’s theme is unique as it focuses on developing engineered cell-based therapies for cancer and integrates state of the art imaging techniques to assess the fate and therapeutic efficacy of such therapies in mouse tumor models that mimic clinical settings. Previously, the CSTI developed different mouse tumor models that mimic clinical settings. This approach has led to the development of novel non-coding RNA (ncRNA) - based therapeutic approaches for the treatment of the most common and most deadly brain tumor cells, glioblastoma.

3. **CEREBROVASCULAR LABORATORY**

**PRINCIPAL INVESTIGATOR:** Rose Du, MD, PhD

**FOCUS:** The Cerebrovascular Laboratory studies the genetics of cerebrovascular diseases including intracranial aneurysms and stroke.

4. **COMPUTATIONAL NEUROSCIENCE OUTCOMES CENTER (CNOC)**

**PRINCIPAL INVESTIGATORS:** William B. Gormley, MD, MPH, MBA; Timothy R. Smith, MD, PhD, MPH; Omar Arashide, MD; Hasan A. Zaidi, MD

**FOCUS:** CNOC was developed by William Gormley, MD, MPH, MBA and Timothy R. Smith, MD, MPH, PhD in 2015. The center has grown out of the collaboration between leading healthcare organizations involved in the management and study of Neurosurgical disease. The center incorporates the clinical expertise of one of the leading Neurosurgical Centers in the world at Brigham and Women’s Hospital in Boston, Massachusetts, the resources and groundbreaking health care philosophy of Harvard Medical School. Along with the experience of two of the leading schools of Public Health in the United States; the Harvard T.H. Chan School of Public Health and the Yale School of Public Health. The academic and innovation skills of these institutions are brought together at the CNOC to expand knowledge and create and deliver improved patient centered outcomes in neurosurgery. The core values of the center include research-based care, artificial intelligence (AI) analytics, patient-centered care, value-based care, clinical innovation, and global education.

5. **HARVEY CUSHING NEURO-ONCOLOGY LABORATORIES (HCNL)**

**PRINCIPAL INVESTIGATOR:** E. Antonio Chiocca, MD, PhD

**FOCUS:** Named after the father of modern Neurosurgery, Harvey Cushing, the goal of the laboratory is to perform research to improve the outcomes of patients suffering from brain tumors. Under the direction of E. Antonio Chiocca (Director) and Sean Lawler (Managing Director), the HCNL studies mouse tumor models, in vitro systems, and state of the art cell and molecular biology to meet this challenge. Major areas of interest include oncolytic viruses, extracellular vesicles, tumor immunology, anti-invasive drugs, the role of CMV in cancer, the blood brain barrier and non-coding RNAs. The HCNL is comprised of seven distinct research lab groups: Chiocca, Bronisz, Cho, Godlewski, Lawler, Nakashima, and Peruzzi. In this highly collaborative environment, the HCNL is able to conduct cutting edge research that is being pushed forward into clinical trials, which will improve the basic understanding and ability to treat these challenging and devastating tumors.

HCNL – CHIOCCA LABORATORY

**PRINCIPAL INVESTIGATOR:** E. Antonio Chiocca, MD, PhD

**FOCUS:** The Chiocca lab focuses on developing therapies for brain tumors based on oncolytic viruses. The lab was involved in the first trials for locally delivering viral therapies for glioblastoma and has developed a number of novel, improved next generation viruses for tumor therapy and are engaged in numerous clinical trials in this area. The current focus is to determine how oncolytic viruses engage the immune system to promote sustained anti-tumor immunity, by acting as in situ vaccines.

HCNL – BRONISZ LABORATORY

**PRINCIPAL INVESTIGATOR:** Agnieszka Bronisz, PhD

**FOCUS:** The Bronisz lab utilizes cancer research approaches coupled with biochemistry, molecular biology, cell biology, functional assays, and computation to derive principles of cellular and extracellular ncRNAs mediated regulation of tumor cells’ function in the context of the microenvironmental niches. The lab is focused on identifying and determining the function and mechanism of clinically-relevant ncRNAs in an unbiased manner, utilizing patient-derived cells in the model of heterogeneous intracranial xenografts. The lab uses molecular approaches to test various experimental assays to define the formation of ncRNA/protein complexes and their function. Together with the computational group, pathology expertise, clinical support and collaboration with RNA biology group group’s goal is to test the hypothesis that extracellular vesicles and ncRNA-dependent signaling modify cellular response to the microenvironment and mediates the interaction between heterogeneous brain tumor cells and their anatomic niches.

HCNL – CHO LABORATORY

**PRINCIPAL INVESTIGATOR:** Choi-Fong Cho, PhD

**FOCUS:** The Cho lab focuses on developing peptide(s) that can specifically bind high-grade gliomas, generating novel peptide-based anti-glioma therapeutics that can specifically target brain tumor cells and cross the blood-brain-barrier, developing the blood-brain-barrier organoid model, and bio-printing the blood-brain-barrier model on a chip.

HCNL – GODLEWSKI LABORATORY

**PRINCIPAL INVESTIGATOR:** Jakub Godlewski, PhD

**FOCUS:** The focus of the Godlewski lab is the development of novel non-coding RNA (ncRNA) - based therapeutic approaches for the treatment of the most common and most deadly brain tumor in adults – glioblastoma.
biochemistry, microscopy, and immunological approaches. The lab extensively uses pre-clinical murine models, patient specimens, glioblastoma cell lines, a range of custom assays, and online databases to identify and characterize novel experimental approaches for the treatment of glioblastoma, a very challenging and aggressive brain tumor with a very poor prognosis. The lab’s primary skills are in the areas of molecular and cellular biology, with some biochemistry, microscopy, and immunological approaches.

**HCNL – NAKASHIMA LABORATORY**

**PRINCIPAL INVESTIGATOR:** Hiroshi Nakashima, PhD

**FOCUS:** The Nakashima lab focuses on the development of novel successful oncolytic virus (OVs) therapeutic approach for glioblastoma patients. The lab has committed to preclinical in vivo evaluation of promising OV in brain tumor models and revealed complex interplay of virus and immunosuppressive glial microenvironments. Past work includes the study of virus and host relationships at the cellular level to improve the OV approach in glioma and generated preclinical and clinical trials. OVs. The team has been expanding this relationship at the host level, adaptive immunity, for the comprehensive therapeutic approach.

**HCNL – PERUZZI LABORATORY**

**PRINCIPAL INVESTIGATOR:** Pier Paolo Peruzzi, MD, PhD

**FOCUS:** The Peruzzi Lab investigates the role of non-coding RNAs in the biology and therapy of brain cancers. More specifically, the major goal is to define novel biological features of microRNAs in order to develop a new generation gene therapy application, based on multifactorial genetic interference of cancer cells and disruption of their epigenetic regulation.

**NEURO-EPIGENOMICS LABORATORY**

**PRINCIPAL INVESTIGATOR:** Elizabeth Claus, MD, PhD

**FOCUS:** The Neuro-epigenomics Laboratory focuses on cancer and genetic epidemiology with an emphasis on the development of risk models for breast and brain tumors. Elizabeth Claud, MD, PhD is the overall PI of the Meningioma Consortium, the Meningioma Genome-Wide Association Study, and the Yale Acoustic Neuroma Study as well as a co-investigator of the GlioGENE (Genes for Glioma) and International Glioma Case-Control (GICC) projects in partnership with national patient brain tumor organizations including the American Brain Tumor Association (ABTA), the National Brain Tumor Society (NBTS) and the ANA. Dr. Claus works to develop cost- and time-efficient web- and smartphone- based recruitment strategies to be used in the study of brain tumors. She has developed such work in collaboration with the ANA and has funding from the ABTA/NBTS to develop a web-based registry for patients with low grade glioma to advance research efforts for this group of patients.

**SKULL BASE LABORATORY**

**PRINCIPAL INVESTIGATOR:** Wenya Linda Bi, MD, PhD

**FOCUS:** The Skull Base Laboratory focuses on the translational biology of skull base tumors, including meningiomas, pituitary tumors, and vestibular schwannomas. The group applies genomic, immune, computational, and advanced microscopy imaging methodologies to define the biological landscape of skull base tumors, the mechanisms underlying their tumorigenesis, tumor evolution during recurrence, and treatment resistance for aggressive subtypes.

**SPINAL CORD INJURY RESEARCH LABORATORY**

**PRINCIPAL INVESTIGATOR:** Yi Lu, MD, PhD

**FOCUS:** The Spinal Cord Injury Research Laboratory focuses on research that has the potential to advance the clinical functional recovery in patients suffering from spinal cord injury and other traumatic neurological injuries. The main areas of interest include the mechanisms of axon regeneration with neurotrophic factors and integrins and the mechanisms of dormant pathway activation after incomplete injury leading to enhanced functional recovery.

**SURGICAL BRAIN MAPPING LABORATORY (SBML)**

**PRINCIPAL INVESTIGATOR:** Alexandra Golby, MD

**FOCUS:** The Surgical Brain Mapping Laboratory leads the Department's research in surgical brain mapping, intraoperative imaging, and image guided neurosurgery through the use of intra-operative imaging to gain surgical insights, development and validation of tissue markets to guide surgery for brain tumors, develop diffusion imaging as a tool for pre-surgical mapping of white matter, translation of fMRI from neuroscience applications towards a tool for pre-surgical brain mapping in patients, and clinical trial of MR guided focused ultrasound for targeted blood brain barrier opening in patients with brain tumors. Building on a long history of preclinical and clinical use of MRgFUS at BWH, the lab is working with the industry leader to use non-invasive FUS as an adjunct to the clinical standard of care with the Stupp protocol.

**SBML – TIE RESEARCH GROUP**

**PRINCIPAL INVESTIGATOR:** Yannwei Tie, PhD

**FOCUS:** The Tie research group develops neuroimaging techniques, such as functional magnetic resonance imaging (fMRI) and diffusion MRI, to improve presurgical mapping of brain functions for neurosurgery planning and guidance. Additionally, the group combines brain functional and structural connectivity approaches to understand neural mechanism of disease pathophysiology, and to develop neuroimaging biomarkers for treatment-induced cognitive impairment in cancer patients. The goals are to inform therapeutic development and improve patient’s overall well-being.

**SPINAL CORD INJURY RESEARCH LABORATORY**

**PRINCIPAL INVESTIGATOR:** Nathalie Agar, PhD

**FOCUS:** The Surgical Molecular Imaging Laboratory develops and implements mass spectrometry and optical imaging approaches for surgical pathology and oncology. The lab also develops, validates, and applies imaging approaches for drug development research and molecular classification of disease, and works toward translating methodologies for the practice of individualized medicine. More specifically, part of the research takes place in the AMIGO suite, standard operating rooms, and a state-of-the-art laboratory equipped for tissue culture and optical and mass spectrometry imaging. Since receiving the NIH Director’s New Innovator Award in 2010 for the work on “Real-Time Stereotactic Mass Spectrometry Tissue Analysis for Intraoperative Neurosurgical Guidance”, the lab has implemented mass spectrometry protocols in the operating room for brain and breast cancer surgery. The work on the real-time analysis of an oncometabolite (2-HG) to support surgical decision making now constitutes the basis for the very first IRB-approved study to use mass spectrometry derived diagnostic information to support surgical decision making. The effort to improve the management of brain tumors also includes extensive imaging of targeted therapies that transit through the blood-brain barrier in pre-clinical animal models and clinical trial patients with correlation to non-invasive radiologic imaging and detailed pharmacodynamics. Using MALDI FTICR mass spectrometry imaging we can specifically image most drugs and spatially resolve their distribution as it relates to the vasculature by simultaneously imaging heme as a natural biomarker of the vasculature. Using the same approach on stereotactic MRI-registered surgical samples from clinical trials for primary brain tumors and brain metastases we further assess drug distribution in the 3D anatomy of the tumor and brain to account for the effect of brain anatomy and tumor heterogeneity on the permeability of blood-brain and blood-tumor barriers.
Acoustic neuroma, aneurysms, arteriovenous malformations, brain tumors, bypass, cavernomas, cavernous malformations, cerebral revascularization, cranial neuropathies, gliomas, glomus tumors, jugular foramen tumors, meningiomas, percutaneous radiofrequency, pineal region tumor, pituitary tumors, radiosurgery, skull base neurosurgery, skull base tumors, spinal tumors, trigeminal neuralgia

PUBLICATIONS


TRACY ANSAY, MD
ACADEMIC TITLE
Instructor, Harvard Medical School
MEDICAL SCHOOL
University of Arizona College of Medicine, 2006
RESIDENCY
University of Arizona Medical Center, Neurosurgery, 2012
FELLOWSHIP
University of Cincinnati, Neurosurgical Oncology, 2013
CLINICAL INTERESTS
Artificial disc replacement, cervical radiculopathy, Chiari malformation, degenerative disc disease, endoscopic neurosurgery, image-guided surgery, lumbar radiculopathy, minimally invasive surgery, neurological oncology, pituitary tumors, radiosurgery, skull base neurosurgery, spinal disorders, spinal fusion, spine tumors, trigeminal neuralgia


PUBLICATIONS


23. PMID: 33330622


38. Bi WL. Improved optic nerve visualization and surgical planning through a novel MRI protocol. 2020. [In review]


49. *Co-first author


JOHN CHI, MD, MPH
DIRECTOR, NEUROSURGICAL SPINE CANCER, BRIGHAM AND WOMEN'S HOSPITAL

ACADEMIC TITLE
Associate Professor, Harvard Medical School

MEDICAL SCHOOL
Columbia College of Physicians and Surgeons, 2001

INTERNSHIP
University of California, San Francisco Medical Center/ Children's Hospital, General Surgery, 2002

RESIDENCY
University of California, San Francisco Medical Center/ Children's Hospital, Neurosurgery, 2007

FELLOWSHIP
Johns Hopkins Hospital, Spine, 2008

CERTIFICATIONS
Neurological Surgery, 2012

CLINICAL INTERESTS
Anthraxolytic, artificial disc replacement, brachial plexus injury, brachial plexus tumor, carpal tunnel syndrome, cervical radioculopathy, cervical stenosis, Chiari malformation, chondrosarcoma, chordoma, claudication, cubital tunnel syndrome, degenerative disc disease, disc herniation, entrapped neuropathy, ependymoma, image-guided surgery, lumbar radioculopathy, lumbar stenosis, minimally invasive surgery, myelopathy, osteosarcoma, pain management, peripheral nerve disease, scoliosis, slipped disc, spinal cord tumors, spinal deformity, spinal disorders, spinal fusion, spine tumors, spondylolisthesis, thoracic outlet syndrome

PUBLICATIONS


E. ANTONIO CHIOCCA, MD, PHD
CHAIRMAN, DEPARTMENT OF NEUROSURGERY, BRIGHAM AND WOMEN’S HOSPITAL
CO-DIRECTOR, INSTITUTE FOR THE NEUROS CIENCES, BRIGHAM AND WOMEN’S HOSPITAL

ACADEMIC TITLE
Harvey W. Cushing Professor of Neurosurgery, Harvard Medical School

MEDICAL SCHOOL
University of Texas Health Science Center, General Surgery, 1989

RESIDENCY
Massachusetts General Hospital, Neurological Surgery, 1995

CERTIFICATIONS
Neurological Surgery, 2000

CLINICAL INTERESTS
Brain tumors, Glioblastoma, Neurological Oncology, Peripheral Nerve Disease, Spinal Cord Tumors, Spinal Tumors

PUBLICATIONS


PUBLICATIONS

ELIZABETH CLAUS, MD, PHD
DIRECTOR, STEREOTACTIC RADIOSURGERY


PUBLICATIONS

MARC CHRISTENSEN, MD, PHD

ACADEMIC TITLE
Instructor, Harvard Medical School

MEDICAL SCHOOL
University of Texas Health Science Center, 1993

RESIDENCY
SUNY Upstate Medical University, 2003

FELLOWSHIP
Massachusetts General Hospital, WBK 107, 2003

University at Buffalo School of Medicine, 2020

CLINICAL INTERESTS

MEDICAL SCHOOL
Yale University School of Medicine, 1994

INTERNSHIP
Yale-New Haven Hospital, General Surgery, 1996

RESIDENCY
Yale-New Haven Hospital, Neurosurgery, 2002

FELLOWSHIP
Brigham and Women’s Hospital, Neurosurgery, 2003

CERTIFICATIONS
Neurological Surgery, 2013

CLINICAL INTERESTS
Acoustic Neuroma, Astrocytoma, Brain Tumors, Glioblastoma, Gliomas, Hydrocephalus, Image-Guided Surgery, Meningiomas, Oligodendroglioma

PUBLICATIONS


29. Ostrom QT, Byun J, Amos CI, Claus EB, Bondy ML. Genomic- wide association study in individuals of Ashkenazi Jewish ancestry identifies novel risk loci for glioma (Submitted).

30. Ostrom QT, Byun J, Amos CI, Claus EB, Bondy ML. Genomic- wide association study in individuals of Ashkenazi Jewish ancestry identifies novel risk loci for glioma (Submitted).


34. Ostrom QT, Byun J, Amos CI, Claus EB, Bondy ML. Genomic- wide association study in individuals of Ashkenazi Jewish ancestry identifies novel risk loci for glioma (Submitted).


KURTUS DAFFORD, MD

ACADEMIC TITLE
Instructor in Neurosurgery, Harvard Medical School

MEDICAL SCHOOL
American University of the Caribbean, 2002

RESIDENCY
Tulane University, Neurological Surgery, 2009

FELLOWSHIPS
University of Washington, Harborview Medical Center Neurological Surgery, 2009
Oregon Health and Sciences University, Orthopaedic Spine Fellowship, 2010

CERTIFICATIONS
Neurological Surgery, 2015

CLINICAL INTERESTS
Artificial disc replacement, cervical radiculopathy, cervical stenosis, degenerative disc disease, lumbar radiculopathy, lumbar stenosis, minimally invasive surgery, spinal deformity, spine tumors, spondylolisthesis


ROSE DU, MD, PhD  
DIRECTOR OF CEREBROVASCULAR SURGERY  
DIRECTOR OF BYPASS AND MOYAMOYA PROGRAM, DEPARTMENT OF NEUROSURGERY

ACADEMIC TITLE  
Professor of Neurosurgery, Harvard Medical School  
MEDICAL SCHOOL  
Harvard Medical School, 2000

INTERNSHIP  
University of California at San Francisco, General Surgery, 2001

RESIDENCY  
University of California, San Francisco School of Medicine, Neurosurgery, 2006

FELLOWSHIP  
Brigham and Women’s Hospital, Cerebrovascular and Skull Base Surgery, 2007

CERTIFICATIONS  
Neurological Surgery, 2011

CLINICAL INTERESTS  
Aneurysms, Arteriovenous Malformations, Brain Tumors, Byssos, Carotid Artery Disease, Cavernomas, Cerebral Infarction, Cerebral Ischemia, Cerebral Revascularization, Cerebrovascular Disease, Dural/tension, Encephalomalacia, Moyamoya Disease, Skull Base Surgery, Skull Base Tumors, Trigeminal Neuralgia

PUBLICATIONS


51. Das A S, Vicenty-Padilla JC, Chua MMJ, Jeelani Y, Das A S, Vicenty-Padilla JC, Chua MMJ, Jeelani Y,
52. Subat Y W, Dasenbrock HH, Gross BA, Patel NJ, Subat Y W, Dasenbrock HH, Gross BA, Patel NJ,
53. Gerstl J VE, Blitz SE, Qu QR, Yearley AG, Lassarén P, Gerstl J VE, Blitz SE, Qu QR, Yearley AG, Lassarén P,
55. Schuster PA LR, Crossnohere NL, Bachini M, Blair CK, Schuster PA LR, Crossnohere NL, Bachini M, Blair CK,

56. Dmytriv AA, Dibas M, Aedeob N, Diestro JDB, Phan K, Dmytriv AA, Dibas M, Aedeob N, Diestro JDB, Phan K,
Regenwardt RH, Vranic JE, Lylyk L, Foreman PM, Regenwardt RH, Vranic JE, Lylyk L, Foreman PM,
Waqas M, Tudino VM, Rabinov JD, Ren Y, Schirmer CM, Waqas M, Tudino VM, Rabinov JD, Ren Y, Schirmer CM,
Hassan AE, Salehni A, Sporns P, Jones J, Hassan AE, Salehni A, Sporns P, Jones J,
Siddiqui A, Druer AF, Uabolt C, Kusshie J, Siddiqui A, Druer AF, Uabolt C, Kusshie J,
Duncalf EU, Albuquerque FC, Du R, Kuan P, Duncalf EU, Albuquerque FC, Du R, Kuan P,
Kalousovsky V, Lylyk L, Boddid S, Kropman J, Azz-Sultan MA, Kalousovsky V, Lylyk L, Boddid S, Kropman J, Azz-Sultan MA,

57. Benceri-Gaiant A, Ding D, Ironside N, Buell TJ, Benceri-Gaiant A, Ding D, Ironside N, Buell TJ,
di J, Potigeuer ARE, Starke RM, Peterson EC, di J, Potigeuer ARE, Starke RM, Peterson EC,


Kim L Levitt M, Abecassis IJ, Bulters D, Fox WC, Kuroda S, Tietjen GE, Yaghi S;
Levitt M, Abecassis IJ, Bulters D, Fox WC, Kuroda S, Tietjen GE, Yaghi S;
Durnford A J, Akarca D, Culliford D, Millar J, Guniganti

Azz-Sultan MA, Boulos AS, Barrow DL, Batjer HH, Azz-Sultan MA, Boulos AS, Barrow DL, Batjer HH,
Bryanlin TR, Blackburn SL, Chang EF, Chen PR, Colby GP, Bryanlin TR, Blackburn SL, Chang EF, Chen PR, Colby GP,
Gormley WB, Frerichs KU, Du R, Aziz-Sultan MA, Gormley WB, Frerichs KU, Du R, Aziz-Sultan MA,


62. Frameless Stereotactic Navigation during Insular Ischemia, Cerebral Revascularization, and Cancer Genomics: A Meta-Analysis” has been successfully submitted to the Journal of Neurosurgery. Your manuscript ID is: JNS18-3204.

KAI U. FRERICHS, MD
DIRECTOR OF INTERVENTIONAL NEURORADIOLOGY, BRIGHAM AND WOMEN’S HOSPITAL

DIRECTOR OF ENDOVASCULAR NEUROSURGERY, BRIGHAM AND WOMEN’S HOSPITAL

ACADEMIC TITLE
Assistant Professor, Harvard Medical School

MEDICAL SCHOOL
Ludwig-Maximilians-Universitat Munchen, Medical School, 1988

RESIDENCY
Brigham and Women’s Hospital, 1994

FELLOWSHIP
Brigham and Women’s Hospital, Interventional Neuroendourology, 2002

CERTIFICATIONS
Neurological Surgery, 2005

INTERESTS
Aneurysms, arteriovenous malformations, Carotid Artery Disease, Cerebral Hemorrhage, Cerebral Ischemia, Cerebral Revascularization, Cerebrovascular Disease, Embolization, Neurologic, Endovascular Neurosurgery, Petroartery Sinus Sampling, Stroke Therapy.

PUBLICATIONS
5. Periprocedural Intracranial Hemorrhage after Embolization of Cerebral Arteriovenous Malformations: A Meta-Analysis” has been successfully submitted to the Journal of Neurosurgery. Your manuscript ID is: JNS18-3204.
6. Frameless Stereotactic Navigation during Insular Ischemia, Cerebral Revascularization, and Cancer Genomics: A Meta-Analysis” has been successfully submitted to the Journal of Neurosurgery. Your manuscript ID is: JNS18-3204.


14. Yao, Shun MD; Liebenthal E, Juvekar, Parikshit; Bunevicius, Adomas MD, PhD; Vera, Matthew BS; Rigolo, Laura MS, Golby, Alexandra J MD; Tie, Yairre PhD. Sex Difference in Language Processing in Patients With Malignant Brain Tumors. Neurosurgery 66(4): p 310-507, September 2019. | DOI: 10.1093/neuros/nyy310_507


---

**VIEW OF THE BRAIN SHOWS RESULTS FROM STRUCTURAL MRI, FUNCTIONAL MRI AND DIFFUSION MRI TO ILLUSTRATE THE RELATIONSHIP BETWEEN THE TUMOR, FUNCTIONAL CORTEX SERVING THE HAND, AND THE WHITE MATTER TRACTS**

Image courtesy of S. Pujol and A. Golby


52. Noh, Thomas MD; Juevaek, Parikshit; Zhang, Faru Bose, Mitalk, Frisken, Sarah; Golby, Alexandra J MD. Preliminary Clinical Validation of Multi-tensor Tractography and Automated Tract Segmentation for Surgical Planning in Brain Tumors. Neurosurgery 67(Supplement_1), December 2020. | DOI: 10.1093/neuros/nyaa447_864


WILLIAM GORMLEY, MD, MPH, MBA
DIRECTOR, NEUROSURGICAL CRITICAL CARE, BRIGHAM AND WOMEN’S HOSPITAL
DIRECTOR, PERFORMANCE IMPROVEMENT, BRIGHAM AND WOMEN’S HOSPITAL

ACADEMIC TITLE
Associate Professor, Harvard Medical School

MEDICAL SCHOOL
Autonomous University of Guadalajara, 1985

INTERNSHIP
American British Cowdray Hospital, Internal Medicine, 1986
St. Matthew’s Community Hospital, Internal Medicine, 1987

RESIDENCY
Henry Ford Hospital, General Surgery & Neurosurgery, 1994

FELLOWSHIP
Allegheny General Hospital, Neurosurgery, 1995
George Washington University, Neurosurgery, 1995
Mordardt Krankenhaus, University of Pittsburgh Medical School, 1996

University of Texas Medical School at Houston, Critical Care Medicine, 2005

CERTIFICATIONS
Neurological Surgery, 2002
Surgical Critical Care, 2007

CLINICAL INTERESTS
Cerebral blood flow monitoring, cerebral hemorrhage, cerebral tissue protection, concussion evaluation and management, critical care, endoscopic neurosurgery, head injury, intracranial waveform analysis, spinal cord injury, spinal fracture reconstruction, traumatic brain injury, variance reduction in neurosurgical practice


MICHAEL GROFF, MD
VICE CHAIRMAN FOR CLINICAL AFFAIRS, NEUROSURGERY, BRIGHAM AND WOMEN’S HOSPITAL
DIRECTOR OF NEUROSURGICAL SPINE SERVICE, BRIGHAM AND WOMEN’S HOSPITAL
CO-DIRECTOR, COMPREHENSIVE SPINE SURGERY

ACADEMIC TITLE
Assistant Professor, Harvard Medical School
Chair, National Neurosurgical Spine Society

MEDICAL SCHOOL
University of Pittsburgh School of Medicine, 1993

INTERNSHIP
Mount Sinai-NYU Medical Center, Surgery/Neurosurgery, 1999

RESIDENCY
Mount Sinai-NYU Medical Center, Surgery/Neurosurgery, 1999

CERTIFICATIONS
Neurological Surgery, 2005

CLINICAL INTERESTS
Arthroplasty, artificial disc replacement, brachial plexus injury, brachial plexus tumor, cervical radiculopathy, cervical stenosis, Chari malformation, chondrosarcoma, degenerative disc disease, disc herniation, image-guided surgery, Klippel-Feil syndrome, lumbar radiculopathy, lumbar stenosis, minimally invasive surgery, myelopathy, neurotological oncology, pain management, quality and safety metrics in care delivery, slipped disc, spinal cord injury, spinal cord tumors, spinal deformity, spinal disorders, spinal fracture reconstruction, spinal fusion, spine tumors, spondylolisthesis, tethered cord

PUBLICATIONS

EDWARD LAWS, MD
SURGICAL CO-DIRECTOR, MULTIDISCIPLINARY PITUITARY CENTER

ACADEMIC TITLE
Professor, Harvard Medical School

MEDICAL SCHOOL
Johns Hopkins University School of Medicine, 1963

INTERNSHIP
The Johns Hopkins Hospital, 1971

RESIDENCY
The Johns Hopkins Hospital, General Surgery, 1964

CERTIFICATIONS
Neurological Surgery, 1974

CLINICAL INTERESTS
Craniopharyngioma, endoscopic neurosurgery, epilepsy, pituitary tumors, transnasal endoscopic pituitary surgery

PUBLICATIONS


38. BWH FACULTY | LAWS

105


PUBLICATIONS


PUBLICATIONS


Clinical SPECIALTIES

Anesthesiology, artificial disc replacement, astrocytoma, brachial plexus injury, carpal tunnel syndrome, cervical radiculopathy, cervical stenosis, Chiari malformation, chondrosarcoma, chordoma, degenerative disc disease, disc herniation, image-guided surgery, Kippel-Fel syndrome, lumbar radiculopathy, lumbar stenosis, meningiomas, minimally invasive surgery, myelopathy, peripheral nerve disease, scoliosis, slipped disc, spinal cord injury, spinal cord tumors, spinal deformity, spinal disorders, spinal fracture reconstruction, spinal fusion, spine tumors, spondylolisthesis, tethered cord, thoracic outlet syndrome

COLUMBIA UNIVERSITY College of Physicians & Surgeons, 2006

ACADEMIC TITLE
Assistant Professor, Harvard Medical School

FELLOWSHIP
University of Miami Department of Neurosurgery, Spine, 2013

COLUMBIA UNIVERSITY College of Physicians & Surgeons, 2005

INTERNSHIP
Brigham and Women’s Hospital, General Surgery, 2006

RESIDENCY
Brigham and Women’s Hospital/ Boston Children’s Hospital, Neurosurgery, 2012

M.D., Ph.D.

DIRECTOR, NEUROSURGICAL TRAUMA, BRIGHAM AND WOMEN’S HOSPITAL

CO-DIRECTOR, ADULT DEFORMITY AND SCIOLIOSIS SURGERY

YI LU, M.D., PH.D.

BRIGHAM AND WOMEN'S HOSPITAL


MICHAEL A. MOONEY, MD
DIRECTOR, CLINICAL CARE REDESIGN
ACADEMIC TITLE
Assistant Professor, Harvard Medical School
MEDICAL SCHOOL
Weill Cornell Medicine, 2013
RESIDENCY
Barrow Neurological Institute, 2020
FELLOWSHIP
 Brigham and Women’s Hospital, 2019

CLINICAL INTERESTS
Acoustic Neuroma, Awake Surgery for Speech and Motor Monitoring, Brain Tumors, Cervical Spondylosis, Chiordromas, Chondrosarcoma, Craniofacial Tumors, Endoscopic Neurosurgery, Gliomas, Image-Guided Surgery, Jugular Foramen Tumors, Lumbar Spondylosis, Meningiomas, Neurological Oncology, Pituitary Tumors, Skull Base Neurosurgery, Skull Base Tumors, Spinal Disorders, Spinal Cord Tumors, Trigeminal Neuralgia

PUBLICATIONS


25. Kappel AD, Bernstock JD, Patel NJ. Cerebral Hyperperfusion After Double Barrel Superficial Temporal Artery-Middle Cerebral Artery Bypass. Stroke. 2022 May 3; doi: 10.1161/STROKEAHA.122.039227. Epub ahead of print. PMID: 35502661 (April 2022)


27. “Recycling” a Failed Superficial Temporal Artery Indirect Bypass into a Double Barrel Direct Bypass in Moyamoya Disease. Journal of Stroke and Cerebrovascular Diseases. (May 2022)


PIER PAOLO PERUZZI, MD, PHD

ACADEMIC TITLES
Assistant Professor, Harvard Medical School

MEDICAL SCHOOL
Università La Sapienza di Roma, Medicine, 2004

RESIDENCY
Ohio State University Medical Center, Neurosurgery, 2014

FELLOWSHIP
Nationwide Children’s Hospital, Pediatric Neurosurgery, 2015

CLINICAL INTERESTS
Awake Surgery for Speech and Motor Monitoring, Brain Metastases, Brain tumors, Chiari malformation, endoscopic neurosurgery, gliomas, meningiomas, peripheral nerve disease, skull base neurosurgery, spinal cord tumors, spinal disorders

PUBLICATIONS


JASON P. RAHAL, MD

ACADEMIC TITLES
Instructor of Neurosurgery, Harvard Medical School

MEDICAL SCHOOL
Tufts University School of Medicine, 2008

INTERNSHIP
Tufts Medical Center, 2009

RESIDENCY
Tufts Medical Center 2014

BOARD CERTIFICATION
ABNS, Neurosurgery 2020

CLINICAL INTERESTS
Artificial Disc Replacement, Cervical Radiculopathy, Chiasm Malformation, Degenerative Disc Disease, Endoscopic Neurosurgery, Image-Guided Surgery, Lumbar Radiculopathy, Neurological Oncology, Pituitary Tumors, Radiosurgery, Skull Base Neurosurgery, Spinal Disorders, Spinal Fusion, Spine Treatment, Cervical Stenosis, Lumbar Stenosis, Spinal Deformity, Spondylothesis

JOHN ROLSTON, MD, PHD

DIRECTOR, MAPPING & ENGINEERING NEURAL DYNAMICS (MEND) LABORATORY

ACADEMIC TITLE
Associate Professor, Harvard Medical School

MEDICAL SCHOOL
Emory University School of Medicine, 2011

RESIDENCY
University of California, San Francisco, 2017

BOARD CERTIFICATION
Neurological Surgery, 2020

CLINICAL INTERESTS
Deep Brain Stimulation, Dystonia, Epilepsy, Essential Tremor, Focused Ultrasound, Hemifacial Spasm, Laser Ablation, Microvascular Decompression, Movement Disorder Surgery, Parkinson’s Disease, Psychiatric Neurosurgery, Seizure Management, Trigeminal Neuralgia

PUBLICATIONS


STEPHENC. SARIS, MD

ACADEMIC TITLES
Lecturer, part-time, Harvard Medical School

MEDICAL SCHOOL
Boston University School of Medicine, 1979

RESIDENCY
Duke Hospital - Duke Medical School, Neurosurgery, 1985

FELLOWSHIP
Massachusetts General Hospital, Neurosurgery, 1981

National Institutes of Health, 1989

CERTIFICATIONS
Neurological Surgery, 1988

CLINICAL INTERESTS
Cervical radiculopathy, cervical stenosis, disc herniation, hydrocephalus, lumbar radiculopathy, lumbar stenosis, meningiomas, spinal fusion, spondylolisthesis

DANIELLE SARNO, MD
DIRECTOR, INTERVENTIONAL PAIN MANAGEMENT

CO-DIRECTOR, HARVARD INTERVENTIONAL PAIN SIMULATION CENTER

ACADEMIC TITLE
Instructor in Physical Medicine and Rehabilitation, Harvard Medical School

MEDICAL SCHOOL
George Washington University School of Medicine, 2011

RESIDENCY
New York-Presbyterian/Columbia University and Weill Cornell Medical Center, Physical Medicine and Rehabilitation, 2015

FELLOWSHIP
Massachusetts General Hospital, Pain Management, 2016

CERTIFICATIONS
Physical Medicine & Rehabilitation, 2017

Pain Medicine, 2018

CLINICAL INTERESTS
Interventional Pain Management. Low Back Pain/ Lumbar Spine Disorders, Musculoskeletal Rehabilitation/Exercise Therapy, Myofascial Pain and Trigger Point Injections, Neck Pain/ Cervical Spine Disorders, Sacroiliac Joint Disorders, Sciatica, Spine Arthritis


PUBLICATIONS


43. Senders JT, Karhade AV, Cote DJ, Mehtash A, Lamba N, Dillsio A, Muskens IS, Gormley WB, Smith TR, Broekman MLD. Arnasoud G. Natural Language Processing for Automated Quantification of Brain Metastases Reported in Free-Text Radiology Reports. JCO Clin Cancer Inform. 2019;3:1-9. Epub 2019/04/20. doi: 10.1200/ci.18.00318. PubMed PMID: 31002562; PMCID: PMC6873936 manuscript. All relationships are considered compensated. Relationships are self-held unless noted. I = Immediate Family Member, Inst = My Institution. Relationships may not relate to the subject matter of this manuscript. For more information about ASCO's conflict of interest policy, please refer to www.asco.org/wc or ascopubs.org/jco/site/ifc. MARIKE L.D. BROEKMAN: Employment: Vertex (I) No other potential conflicts of interest were reported.


PUBLICATIONS


OVERVIEW

Laboratory research in the Neurosurgery Department focuses on the basic mechanisms of common neurosurgical conditions such as trauma to the brain and spinal cord, the genetic make-up of brain tumors, and the dynamics of brain and cerebrospinal fluid pulsation. The researchers are investigating the utility of measuring certain enzymatic compounds as markers of tumor growth and recurrence, as well as of cerebral ischemia. They are also exploring the role of temporarily-implanted cortical electrodes in the study of memory and learning paradigms.

RESEARCHERS

Larry Benowitz, PhD  
FOCUS: Brain rewiring after injury

Katie Fehnel, MD  
FOCUS: Brain Tumors

Joseph Madsen, MD  
FOCUS: Epilepsy

Mark Proctor, MD  
FOCUS: Improvement of longterm outcomes in neurotrauma, Craniosynostosis

Alfred Pokemeng See, MD  
FOCUS: Venous malformations

Edward R. Smith, MD  
FOCUS: Moyamoya syndrome, Brain tumors

Scellig Stone, MD, PhD  
FOCUS: Pediatric Movement Disorders

Xin Tang, PhD  
FOCUS: Pathology of brain disorders, molecular mechanism-guided therapeutics

Benjamin C. Warf, MD  
FOCUS: Hydrocephalus

AREAS OF CURRENT RESEARCH

- The role of novel growth factors in optic nerve regeneration, stroke, and spinal cord injury;
- Inosine and cell-signaling pathways in the CNS;
- Finite element analysis description of the changes in brain and ventricular system during the cardiac cycle;
- Detailed genetic analysis of malignant and non-malignant brain tumors in children;
- The role of matrix metalloproteinases in the detection of recurrence of pediatric brain tumors;
- Advance precision medicine for brain disorders using genome-edited human stem cells.
PUBLICATIONS


2. See AP, Fehnel KP, Orbach DB, Smith ER. Microsurgical Ligation of Residual Fistulous Anterior Spinal Arteriovenous Shunt From a Radicular Artery to a Thoracic Arteriovenous Malformation: 2-Dimensional Operative Video. Oper Neurosurg (Hagerstown), 2019


7. Tsotsios S, Butler W, Borges L, Fehnel KP. Dimensional Operative Video. Oper Neurosurg (Hagerstown), 2019


PUBLICATIONS


2. see AP, Fehnel KP, Orbach DB, Smith ER. Microsurgical Ligation of Residual Fusiform Arteriovenous Shunt From a Radicular Artery to a Thoracic Arteriovenous Malformation: 2- Dimensional Operative Video. Oper Neurosurg (Hagerstown), 2019.


17. Blandin AF, Giglio R, Graham MS, Garcia G, Malinowski BWH FACULTY | FEHNEL

Pricola Fehnel K, Smith ER. Neogenin is highly expressed in diffuse intrinsic pontine glioma and influences tumor invasion. Brain Res. 2021 Jul. PMID:


PUBLICATIONS


BWH FACULTY | FEHNEL
BWH FACULTY | MADSEN

JOSEPH R. MADSEN, MD
DIRECTOR OF NEURODYNAMICS LABORATORY
DIRECTOR, EPILEPSY SURGERY, BOSTON CHILDREN’S HOSPITAL
NEUROSURGERY CLINICAL INNOVATION AND TRANSLATIONAL RESEARCH CHAIR

ACADEMIC TITLE
Professor, Harvard Medical School

MEDICAL SCHOOL
Harvard Medical School, 1981

RESIDENCY
Massachusetts General Hospital, 1988

FELLOWSHIP
Beth Israel Hospital, Surgery, 1982
Beth Israel Hospital / Cerebrospinal Fluid (CSF) Physiology, 1983
Massachusetts General Hospital, Surgery, 1989 Massachusetts General Hospital, Surgery, 1988

CLINICAL INTERESTS

PUBLICATIONS
Research Investigations


MARK R. PROCTOR, MD
NEUROSURGEON-IN-CHIEF,
BOSTON CHILDREN’S HOSPITAL
CO-DIRECTOR, BRAIN INJURY CENTER,
BOSTON CHILDREN’S HOSPITAL
FRANC D. INGRAHAM PROFESSOR OF NEUROSURGERY, HARVARD MEDICAL SCHOOL
IMMEDIATE PAST CHAIR, JOINT SECTION ON PEDIATRICS OF THE AANS/CNS

ACADEMIC TITLE
Franc D. Ingraham Professor of Neurosurgery, Harvard Medical School

MEDICAL SCHOOL
Columbia University, College of Physicians and Surgeons, 1990

INTERNSHIP
Columbia Presbyterian Medical Center, 1991

RESIDENCY
Children’s National Medical Center, Pediatric Neurosurgery, 1993
Shock Trauma Hospital, University of Maryland, 1993
Georgetown University Hospital, Neurosurgery, 1997

FELLOWSHIP
Boston Children’s Hospital, Pediatric Neurosurgery, 1998

CLINICAL INTERESTS
Craniosynostosis, cranial malformations, craniofacial anomalies or disorders, brain tumors, spinal cord tumors, spinal disorders, neurotrauma, brain and spine trauma, sports related head and spine injury, general neurosurgery

PUBLICATIONS


PUBLICATIONS


EDWARD ROBERT SMITH, MD
CO-DIRECTOR, CEREBROVASCULAR SURGERY AND INTERVENTIONS CENTER
DIRECTOR, PEDIATRIC CEREBROVASCULAR SURGERY
DIRECTOR, QUALITY IMPROVEMENT, DEPARTMENT OF NEUROSURGERY
CO-DIRECTOR, PEDIATRIC CEREBROVASCULAR SURGERY AND INTERVENTIONAL RADIOLOGY FELLOWSHIP
VICE CHAIR OF THE DEPARTMENT FOR ACADEMICS AND RESEARCH, BOSTON CHILDREN’S HOSPITAL
R. MICHAEL SCOTT CHAIR IN NEUROSURGERY
ACADEMIC TITLE
Professor, Harvard Medical School
MEDICAL SCHOOL
Columbia University, 1996
INTERNSHIP
Massachusetts General Hospital, General Surgery, 1997
RESIDENCY
Massachusetts General Hospital, Neurosurgery, 2003
FELLOWSHIP
Massachusetts General Hospital, Neuro- oncology, 2001
Boston Children’s Hospital, Pediatric Neurosurgery, 2004
CLINICAL INTERESTS
Aneurysms, arteriovenous malformation (AVM), brain tumors, cavernous malformations, cranial malformations, general neurosurgery, moyamoya, neuro-trauma, pediatric stroke, pituitary tumors, skull base lesions, vascular anomalies

PUBLICATIONS
10. Riodan CP, Storey A, Cote DJ, Smith ER, Scott RM: Results of more than 20 years of follow-up in pediatric patients with moyamoya disease undergoing pial angiogenesis. J Neurosurg Pediatr 1:7-19, 2019
12. See AP, Fehnel KP, Orbach DB, Smith ER: Microsurgical Ligation of Residual Fistulous Arteriovenous Shunt From a Radicular Artery to a Thoracic Arteriovenous Malformation: 2-Dimensional Operative Video. Oper Neurosurg (Hagerstown), 2019
13. Smith ER: Eratium. Results of more than 20 years of follow-up in pediatric patients with moyamoya disease undergoing pial angiogenesis. J Neurosurg Pediatr 1:9, 2019
16. Rosi A, Riodan CP, Smith ER, Scott RM, Orbach DB. Clinical status and evolution in moyamoya: which angiographic findings correlate? Brain Communications, Volume 1, Issue 1, 2019, fcz029
24. Montaser A, Smith ER, Moyamoya Disease, Practical Neurology, 2020, Jan p.2-8


PUBLICATIONS


10. Bernstock, JD; Tafel, I; Segar, D.J; ... Aglan, O; Montaizer, A; Gupta, S; Johnston, B; Judge, J; Feinbel, K; Stone, S.S; Warf, B.C. Complex Management of Hydrocephalus Secondary To Chiroid Plexus Hyperplasia, World Neurosurgery, 2020, ISSN 1878-8750. https://doi.org/10.1016/j.wneu.2020.05.211


PUBLICATIONS


23. 20th Hulsbergen A FC, Siddi F, McAvoy M, Lynch BT. Epub ahead of print. PMID: 34798615. PMCID: PMC8594737.


31. Parental arsenic exposure and DNA methylation in Bangladesh infants with spina bifida G Tindula, SK Mukherjee, SM Ekramullah, DM Arman, J Islam, B Lemos, ... J Neurosurgery Pediatrics 2022 (1)

32. The role of routine imaging for hydrocephalus surveillance ResponseBC Warf, WB Gormley, SSD Stone, MR Proctor JOURNAL OF NEUROSURGERY-PEDIATRICS 2023 (5)

33. Paenibacillosis: An Emerging Cause of Neonatal Sepsis JE Ericson, K Burgos, C Hehrly, E Kumbakumba, M Ochoro, ... Open Forum Infectious Diseases 9 (Supplement_2), 596-597

34. PO02-01 PRENATAL CLOSURE OF MYELOMENINGOCELE IS ASSOCIATED WITH HIGHER RISK FOR EARLY SECONDARY SPINAL CORD TETHERING HH Wang, D Morhardt, B Warf, L Karlin, A Hoijat, S Khoshbin, ... The Journal of Urology 207 (Supplement 5), e35


37. Endoscopic third ventriculostomy with choroid plexus cauterization: predictors of long-term success and comparison with shunt placement for primary treatment of infant hydrocephalus... BCH FACULTY | WARF 187